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Letting September 18, 2026

Notice to Bidders, Specifications and Proposal



**Contract No. 61K62
LAKE County
Section 15-00038-07-WR
Route FAU 1257 (DeErfield Road)
Project 2NE0-590 ()
District 1 Construction Funds**

Prepared by

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Checked by

(Printed by authority of the State of Illinois)



NOTICE TO BIDDERS

- 1. TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. September 18, 2026 at which time the bids will be publicly opened from the iCX SecureVault.
- 2. DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 61K62
LAKE County
Section 15-00038-07-WR
Project 2NE0-590 ()
Route FAU 1257 (DeErfield Road)
District 1 Construction Funds**

- 3. INSTRUCTIONS TO BIDDERS.** (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.

(b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.
- 4. AWARD CRITERIA AND REJECTION OF BIDS.** This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to re-advertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Gia Biagi,
Secretary

CONTRACT 61K62

INDEX FOR SUPPLEMENTAL SPECIFICATIONS AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2026

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction
(Adopted 1-1-22) (Revised 1-1-26)

SUPPLEMENTAL SPECIFICATIONS

<u>Std. Spec. Sec.</u>	<u>Page No.</u>
109 Measurement and Payment	1
202 Earth and Rock Excavation	2
204 Borrow and Furnished Excavation	3
207 Porous Granular Embankment	4
211 Topsoil and Compost	5
214 Grading and Shaping Ditches	6
406 Hot-Mix Asphalt Binder and Surface Course	7
407 Hot-Mix Asphalt Pavement (Full-Depth)	9
420 Portland Cement Concrete Pavement	10
502 Excavation for Structures	11
504 Precast Concrete Structures	12
509 Metal Railings	13
522 Retaining Walls	14
540 Box Culverts	15
542 Pipe Culverts	35
550 Storm Sewers	44
586 Granular Backfill for Structures	51
601 Pipe Drains, Pipe Underdrains, and French Drains	52
630 Steel Plate Beam Guardrail	53
632 Guardrail and Cable Road Guard Removal	54
644 High Tension Cable Median Barrier	55
665 Woven Wire Fence	56
701 Work Zone Traffic Control and Protection	57
781 Raised Reflective Pavement Markers	59
782 Reflectors	60
801 Electrical Requirements	62
821 Roadway Luminaires	65
1003 Fine Aggregates	66
1004 Coarse Aggregates	67
1010 Finely Divided Minerals	69
1020 Portland Cement Concrete	70
1030 Hot-Mix Asphalt	73
1040 Drain Pipe, Tile, and Wall Drain	74
1042 Precast Concrete Products	75
1061 Waterproofing Membrane System	76
1067 Luminaire	77
1097 Reflectors	84
1102 Hot-Mix Asphalt Equipment	85

RECURRING SPECIAL PROVISIONS

The following RECURRING SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

<u>CHECK SHEET #</u>		<u>PAGE NO.</u>
1	☒ Additional State Requirements for Federal-Aid Construction Contracts	87
2	☒ Subletting of Contracts (Federal-Aid Contracts)	90
3	☒ EEO	91
4	☐ Specific EEO Responsibilities Non Federal-Aid Contracts	101
5	☐ Required Provisions - State Contracts	106
6	☐ Asbestos Bearing Pad Removal	112
7	☐ Asbestos Waterproofing Membrane and Asbestos HMA Surface Removal	113
8	☐ Temporary Stream Crossings and In-Stream Work Pads	114
9	☒ Construction Layout Stakes	115
10	☐ Use of Geotextile Fabric for Railroad Crossing	118
11	☐ Subsealing of Concrete Pavements	120
12	☐ Hot-Mix Asphalt Surface Correction	124
13	☐ Pavement and Shoulder Resurfacing	126
14	☐ Patching with Hot-Mix Asphalt Overlay Removal	127
15	☐ Polymer Concrete	129
16	Reserved	131
17	☐ Bicycle Racks	132
18	☐ Temporary Portable Bridge Traffic Signals	134
19	☐ Nighttime Inspection of Roadway Lighting	136
20	☐ English Substitution of Metric Bolts	137
21	☐ Calcium Chloride Accelerator for Portland Cement Concrete	138
22	☐ Quality Control of Concrete Mixtures at the Plant	139
23	☒ Quality Control/Quality Assurance of Concrete Mixtures	147
24	Reserved	163
25	Reserved	164
26	☐ Temporary Raised Pavement Markers	165
27	☐ Restoring Bridge Approach Pavements Using High-Density Foam	166
28	☐ Portland Cement Concrete Inlay or Overlay	169
29	☐ Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	173
30	☐ Longitudinal Joint and Crack Patching	176
31	☐ Concrete Mix Design – Department Provided	178
32	☐ Station Numbers in Pavements or Overlays	179

LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

Table of Contents

<u>CHECK SHEET #</u>			<u>PAGE NO.</u>
LRS 1		Reserved	181
LRS 2	☐	Furnished Excavation	182
LRS 3	☒	Work Zone Traffic Control Surveillance	183
LRS 4	☐	Flaggers in Work Zones	184
LRS 5	☐	Contract Claims	185
LRS 6	☐	Bidding Requirements and Conditions for Contract Proposals	186
LRS 7	☐	Bidding Requirements and Conditions for Material Proposals	192
LRS 8		Reserved	198
LRS 9	☐	Bituminous Surface Treatments	199
LRS 10		Reserved	203
LRS 11	☐	Employment Practices	204
LRS 12	☐	Wages of Employees on Public Works	206
LRS 13	☐	Selection of Labor	208
LRS 14	☐	Paving Brick and Concrete Paver Pavements and Sidewalks	209
LRS 15	☐	Partial Payments	212
LRS 16	☐	Protests on Local Lettings	213
LRS 17	☐	Substance Abuse Prevention Program	214
LRS 18	☐	Multigrade Cold Mix Asphalt	215
LRS 19	☐	Reflective Crack Control Treatment	216

TABLE OF CONTENTS

LOCATION OF IMPROVEMENT	1
DESCRIPTION OF IMPROVEMENT	1
COMPLETION DATE PLUS WORKING DAYS (D1)	2
COOPERATION WITH ADJACENT CONTRACTS	2
ARTICLE 105.03(e) ENVIRONMENTAL PERMITTING AGENCIES	3
ARTICLE 105.09 SURVEY CONTROL POINTS (LCDOT)	4
ARTICLE 107.09 PUBLIC CONVENIENCE AND SAFETY (LCDOT)	5
ARTICLE 107.29 OPENING OF SECTION OF HIGHWAY TO TRAFFIC (LCDOT)	7
ARTICLE 107.39 CONTRACTOR'S RESPONSIBILITY FOR LOCATING AND PROTECTING UTILITY PROPERTY AND SERVICES (LCDOT) 8	
DIVISION 200. EARTHWORK, LANDSCAPING, AND EROSION CONTROL	9
DIVISION 200 PHOSPHORUS FERTILIZER NUTRIENT BAN (LCDOT)	9
20100XXX TREE REMOVAL (XX) (LCDOT)	10
20101200 TREE ROOT PRUNING (LCDOT)	11
PROTECTION OF EXISTING TREES	12
20200100 EARTH EXCAVATION (LCDOT)	17
ARTICLE 202.03 REMOVAL AND DISPOSAL OF SURPLUS, UNSTABLE, AND UNSUITABLE MATERIALS AND ORGANIC WASTE (LCDOT)	19
21101615 TOPSOIL FURNISH AND PLACE, 4" (LCDOT)	22
28000305 TEMPORARY DITCH CHECKS (LCDOT)	23
28000400 PERIMETER EROSION BARRIER (LCDOT)	24
28000510 INLET FILTERS (LCDOT)	28
DIVISION 400. SURFACE COURSES, PAVEMENTS, REHABILITATION, AND SHOULDERS	29
ARTICLE 406.11 SURFACE TESTS (LCDOT)	29
42001300 PROTECTIVE COAT (LCDOT)	30
42400800 DETECTABLE WARNINGS	31
DIVISION 500. STRUCTURES	33
50105220 PIPE CULVERT REMOVAL	33
SECTION 542 AND SECTION 550 – JOINT TIES FOR CONCRETE PIPE (LCDOT)	34
SECTION 550 STORM SEWER (LCDOT)	35
TEMPORARY WATER SHUTDOWNS	36
56100XXX WATER MAIN	37
56105XXX WATER VALVES	39
561105XXX INSERTING VALVES	40
56200XXX WATER SERVICE LINE	41
56201800 CORPORATION STOPS 2"	42
56300300 ADJUSTING WATER SERVICE LINES	43

56400500	FIRE HYDRANTS TO BE REMOVED.....	44
56400820	FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX.....	45
56400825	FIRE HYDRANT WITH AUXILIARY VALVE, VALVE BOX AND TEE.....	47
56500600	DOMESTIC WATER SERVICE BOXES TO BE ADJUSTED.....	49
X562003X	WATER SERVICE CONNECTION.....	50
60248700	VALVE VAULTS, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID.....	52
60248900	VALVE VAULTS, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID.....	52
X5610804	NON-PRESSURE CONNECTION TO EXISTING WATER MAIN.....	53
X5610806	PRESSURE CONNECTION TO EXISTING WATER MAIN.....	54
X56300XX	CUT AND CAP EXISTING WATER MAIN.....	55
X6026057	SANITARY MANHOLES TO BE RECONSTRUCTED WITH NEW TYPE 1 FRAME, CLOSED LID.....	56
X6026622	VALVE VAULTS TO BE REMOVED.....	57
	CONCRETE MEDIAN (SPECIAL).....	58
	DIVISION 600. INCIDENTAL CONSTRUCTION.....	59
60108104	PIPE UNDERDRAINS, TYPE 1, 4" (LCDOT).....	59
SECTION 602	RESTRICTED DEPTH DRAINAGE STRUCTURES (LCDOT).....	60
SECTION 602	CATCH BASIN, MANHOLE, INLET, DRAINAGE STRUCTURE,.....	61
	AND VALVE VAULT CONSTRUCTION, ADJUSTMENT, AND RECONSTRUCTION (LCDOT).....	61
6020XXXX	CATCH BASINS, TYPE A (LCDOT).....	62
	MANHOLES, TYPE A, 10'-DIAMETER, TYPE 1 FRAME, CLOSED LID.....	63
SECTION 604	FRAMES, GRATES, AND MEDIAN INLETS (LCDOT).....	64
63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 SPECIAL (TANGENT) (LCDOT).....	65
	REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (PROJECT SPECIFIC).....	66
70107025	CHANGEABLE MESSAGE SIGN (LCDOT).....	73
SECTION 703	WORK ZONE PAVEMENT MARKING (LCDOT).....	74
SECTION 780	PAVEMENT STRIPING (LCDOT).....	75
78011XXX	GROOVING FOR RECESSED PAVEMENT MARKING (LCDOT).....	76
	DIVISION 1000. MATERIALS.....	79
	ARTICLE 1030.06 (d) (2) DENSITY SAMPLES (LCDOT).....	79
	PERENNIAL PLANTS, WETLAND TYPE, 2" DIAMETER BY 4" DEEP PLUG.....	80
	TREE REMOVAL AND FORESTRY WORK RESTRICTIONS – ENDANGERED SPECIES ACT.....	84
	WEED CONTROL, AQUATIC.....	85
	GENERAL REQUIREMENTS FOR WEED CONTROL SPRAYING.....	86
	PLANTING WOODY PLANTS.....	90
	SUPPLEMENTAL WATERING.....	98
	FAILURE TO COMPLETE PLANTING, PLANT CARE, AND ESTABLISHMENT WORK ON TIME.....	100
	IDOT DESIGN TEMPORARY PAY ITEMS.....	101
K1004595	PRUNING FOR SAFETY AND EQUIPMENT CLEARANCE.....	101
X0323557	SANITARY SEWER TELEVISION INSPECTION, VIDETAPING AND RECORDING.....	102
XX032XXXX	SANITARY FORCE MAIN.....	105

XX001470	SANITARY SERVICE CONNECTION	107
X0325815	REMOVE EXISTING CABLE	108
	WASHOUT BASIN	109
X0426200	DEWATERING	110
	EXPLORATION TRENCH (SPECIAL)	113
X1200042	MANHOLES, TYPE A, 9'-DIAMETER, WITH 2 TYPE 1 FRAMES, CLOSED LID, RESTRICTOR PLATE	114
	WATER MAIN IN CASING PIPE, PVC.....	115
X5400005	BOX CULVERT REMOVAL.....	116
X2010516	SELECTIVE CLEARING (NEAR WATER)	117
X2070304	POROUS GRANULAR EMBANKMENT, SPECIAL (LCDOT)	118
X2800500	INLET PROTECTION, SPECIAL (LCDOT)	120
X5017307	PROTECTIVE SHIELD (SPECIAL)	121
X4403800	MEDIAN SURFACE REMOVAL	122
X5030290	STAINING CONCRETE STRUCTURES.....	123
X5091725	BICYCLE RAILING, SPECIAL (LCDOT)	126
X55103XX	SANITARY SEWER REMOVAL	130
X5509910	ABANDON AND FILL EXISTING SANITARY MANHOLE	131
X5631212	CONNECTION TO EXISTING FORCE MAIN, 12"	132
X5610700	WATER MAIN REMOVAL	133
X56107XX	WATER MAIN LINE STOP	134
X6022XXX	SANITARY SEWER MANHOLE	135
XX006088	GATE VALVE AND BOX.....	138
X1200XXX	JUNCTION CHAMBER.....	140
X8100105	CONDUIT SPLICE	142
X6700405	ENGINEER'S FIELD OFFICE, TYPE A (MODIFIED) (LCDOT)	143
Z0074310	TEMPORARY SUPPORT SYSTEM, LOCATION 1	144
Z0074320	TEMPORARY SUPPORT SYSTEM, LOCATION 2	145
	CONDUIT ATTACHED TO STRUCTURE, 6" DIA., GALVANIZED STEEL	146
X5091765	PIPE HANDRAIL (SPECIAL).....	147
XX007646	SEEDING, MESIC TO WET NATIVE GRASSES	148
K0013055	PERENNIAL PLANTS, WETLAND EMERGENT	150
	IDOT LOCAL ROADS TEMPORARY PAY ITEMS	151
XX000300	CONCRETE STEPS.....	151
XX000856	MAILBOX REMOVAL AND RELOCATION (LCDOT)	152
XX003668	PRECONSTRUCTION VIDEOTAPING (LCDOT).....	153
XX008865	PERMEABLE PLASTIC BERM (LCDOT)	154
XX007031	FRAME AND GRATE, SPECIAL	156
	RELOCATE EXISTNG PTZ CAMERA	157
XX005266	WOOD DECKING SPECIAL	158
XX009142	PAVEMENT MARKING REMOVAL (SPECIAL).....	159

Z0013797	STABILIZED CONSTRUCTION ENTRANCE (LCDOT)	160
Z0013798	CONSTRUCTION LAYOUT (LCDOT)	162
X6640104	FENCE REMOVAL (LCDOT)	166
	LUMINAIRE SAFETY CABLE ASSEMBLY	167
XX009528	ABANDON EXISTING SANITARY SEWER, FILL WITH CLSM	168
	SANITARY MANHOLES TO BE ADJUSTED	169
XX004360	SANITARY SEWER BYPASS PUMPING	170
	LIGHT POLE FOUNDATION, METAL, SPECIAL	171
Z0033028	MAINTAIN EXISTING LIGHTING SYSTEM	172
Z0004552	APPROACH SLAB REMOVAL	176
Z00566XX	STORM SEWER (WATER MAIN REQUIREMENTS) (LCDOT)	177
XX0001XXX	SANITARY SEWER	179
Z0067700	STEEL CASINGS	180
X0326490	CABLE GATE ASSEMBLY	181
Z0062458	TEMPORARY PAVEMENT (VARIABLE DEPTH)	182
	LAKE COUNTY TRAFFIC CONTROL AND PROTECTION	183
	TRAFFIC CONTROL PLAN (L.C.-T- SECTION 700)	183
X7010216	TRAFFIC CONTROL AND PROTECTION, (SPECIAL)	186
	MAINTENANCE OF ROADWAYS (D1)	195
	TEMPORARY INFORMATION SIGNING	196
	STATUS OF UTILITIES	198
	TEMPORARY PAVEMENT (D1)	215
	AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS (D1)	215
	MINERALIZED CARBON DIOXIDE CONCRETE (D-1)	218
	HOT-MIX ASPHALT BINDER AND SURFACE COURSE (D1)	220
	FRICTION AGGREGATE (D1)	229
	HOT-MIX ASPHALT – MIXTURE DESIGN VERIFICATION AND PRODUCTION (D1)	233
	GENERAL ELECTRICAL REQUIREMENTS (D1)	235
	UNIT DUCT	256
	WIRE AND CABLE (D1)	258
	TRAFFIC SIGNAL SPECIAL PROVISIONS	260
	DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	260
	TRAFFIC SIGNAL GENERAL REQUIREMENTS (IDOT)	260
	COILABLE NON-METALLIC CONDUIT (IDOT) – DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	278
	LED SIGNAL FACE, LENS COVER (IDOT) – DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	279
	DETECTOR LOOP (IDOT) – DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	280
	CABLE REMOVAL FROM CONDUIT (IDOT) – DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	283
	FULL-ACTUATED CONTROLLER AND CABINET (IDOT) – DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	285
	ACCESSIBLE PEDESTRIAN SIGNALS (IDOT) – DEERFIELD ROAD AT ALL SIGNALIZED INTERSECTION	288
	REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT (DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)	293

TRAFFIC SIGNAL POST (DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE).....	294
DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE	295
PEDESTRIAN SIGNAL POST.....	295
MAST ARM ASSEMBLY AND POLE (DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE).....	297
CONCRETE FOUNDATIONS (DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE).....	298
TRAFFIC SIGNAL GENERAL REQUIREMENTS - LCDOT	299
RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM	316
XX006052 SANITARY SEWER REMOVAL (SPECIAL).....	319
XX400216 LAYER II (DATALINK) SWITCH (LCDOT).....	324
X1400326 RECTANGULAR RAPID FLASHING BEACON ASSEMBLY (COMPLETE) (LCDOT).....	325
SERVICE INSTALLATION (TRAFFIC SIGNALS)	328
UNDERGROUND RACEWAYS	332
HANDHOLES.....	333
FIBER OPTIC TRACER CABLE	335
MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION (LCDOT).....	336
UNINTERRUPTABLE POWER SUPPLY, SPECIAL.....	339
X8710074 UNDERGROUND FIBER OPTIC SPLICE CLOSURE, WATERTIGHT	344
LUMINAIRE SHIELD.....	345
ELECTRIC CABLE (IDOT).....	346
ELECTRIC CABLE (LCDOT)	347
UNDERGROUND NON-METALLIC CONDUIT	348
EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C.....	350
RELOCATE EXISTING RADIO INTERCONNECT SYSTEM.....	351
LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD.....	352
LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD	356
TRAFFIC SIGNAL BACKPLATE	359
XX005723 VIDEO DETECTION SYSTEM COMPLETE INTERSECTION (LCDOT).....	360
EMERGENCY VEHICLE PRIORITY SYSTEM	362
TEMPORARY TRAFFIC SIGNAL INSTALLATION	363
TEMPORARY TRAFFIC SIGNAL TIMING - LCDOT.....	371
X1400215 REMOTE CONTROLLED VIDEO SYSTEM.....	373
RELOCATE EXISTING SWITCH (SPECIAL).....	375
X1400238 LUMINAIRE, LED, SPECIAL.....	376
FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL.....	382
FIBER OPTIC CABLE	385
X1400102 OUTDOOR RATED NETWORK CABLE (LCDOT)	388
NETWORK SWITCH ACCESS.....	389
TRAFFIC SIGNAL POST (SPECIAL).....	394
STEEL MAST ARM ASSEMBLY AND POLE (SPECIAL)	396
STEEL COMBINATION MAST ARM ASSEMBLY AND POLE (SPECIAL)	396

CONCRETE FOUNDATION (LCDOT)	399
LED INTERNALLY ILLUMINATED STREET NAME SIGN.....	401
XX006926 ILLUMINATED STREET NAME SIGN	405
89502375 REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT	407
REMOVE EXISTING DOUBLE HANDHOLE.....	409
XX008293 CURB WALL (SPECIAL).....	410
X4240460 PORTLAND CEMENT CONCRETE SIDEWALK 8 INCH, SPECIAL	411
PARKING BLOCKS.....	412
REMOVE EXISTING PARKING BLOCKS	413
MECHANICAL TECHNICAL SPECIFICATIONS.....	414
EQUIPMENT SUBMITTALS.....	415
FACILITY STARTUP.....	423
DEMOLITION	425
CONCRETE FORMWORK	435
CONCRETE REINFORCEMENT	438
CONCRETE ACCESSORIES	441
CAST-IN-PLACE CONCRETE	445
PRECAST CONCRETE STRUCTURES	463
PRECAST CONCRETE BOX CULVERT 12' X 5' (SPECIAL);.....	470
GENERAL PROVISIONS FOR ELECTRICAL WORK	471
BASIC ELECTRICAL MATERIALS AND METHODS.....	477
LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES.....	481
CONTROL-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES	486
GROUNDING AND BONDING OF ELECTRICAL SYSTEMS.....	490
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS.....	493
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS	495
IDENTIFICATION FOR ELECTRICAL SYSTEMS	506
ELECTRICAL CABINETS AND ENCLOSURES	508
PUMP CONTROL PANEL.....	512
VARIABLE FREQUENCY DRIVE	521
ENGINE GENERATOR.....	527
AUTOMATIC TRANSFER SWITCH.....	544
SITE LIGHTING	550
ELECTRIC SERVICE AND DISTRIBUTION	556
PUMP STATION SCADA SYSTEM	559
EARTH EXCAVATION	565
DEWATERING (PUMP STATION WORK ONLY)	568
BOLLARD	574
GENERAL PROVISIONS FOR MECHANICAL WORK.....	577
UTILITY PIPING.....	591

PUMPS AND ACCESSORIES	604
TEMPORARY BYPASS PUMPING SYSTEM	616
PAVEMENT CORE INFORMATION	621
AVAILABLE REPORTS.....	622
IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION.....	623
LR 107-4	626
LR 1030-2	627
SWPPP	629
LPC-663 (IDOT - MILWAUKEE AVENUE)	644
LPC-663 (LOCAL – DEERFIELD ROAD, PORTWINE ROAD, SAUNDERS ROAD).....	648
REGULATED FLOODWAY CONSTRUCTION PERMIT	650
NATIONWIDE PERMIT – ACOE.....	652
LAKE COUNTY SMC PERMIT	656

BDE SPECIAL PROVISIONS

The following special provisions indicated by an "X" are applicable to this contract. An * indicates a new or revised special provision for the letting.

<u>File Name</u>	<u>Pg.</u>		<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80099	660	☒	Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2022
80274	662	☒	Aggregate Subgrade Improvement	April 1, 2012	April 1, 2022
80192		☐	Automated Flagger Assistance Device	Jan. 1, 2008	April 1, 2023
80173	665	☒	Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2017
80426		☐	Bituminous Surface Treatment with Fog Seal	Jan. 1, 2020	April 1, 2026
80475		☐	Bridge Deck Concrete Overlays	Jan. 1, 2026	
80241		☐	Bridge Demolition Debris	July 1, 2009	
50531		☐	Building Removal	Sept. 1, 1990	Aug. 1, 2022
50261		☐	Building Removal with Asbestos Abatement	Sept. 1, 1990	Aug. 1, 2022
80460	667	☒	Cement, Finely Divided Minerals, Admixtures, Concrete, and Mortar	Jan. 1, 2025	Jan. 1, 2026
80384	684	☒	Compensable Delay Costs	June 2, 2017	April 1, 2019
80198		☐	Completion Date (via calendar days)	April 1, 2008	
80199		☐	Completion Date (via calendar days) Plus Working Days	April 1, 2008	
80461		☐	Concrete Barrier	Jan. 1, 2025	
80453		☐	Concrete Sealer	Nov. 1, 2023	
80261	688	☒	Construction Air Quality – Diesel Retrofit	June 1, 2010	Jan. 1, 2025
80476		☐	Deck Slab Repair	Jan. 1, 2026	
* 80029	690	☒	Disadvantaged Business Enterprise Participation	Sept. 1, 2000	July 2, 2026
80467	694	☒	Erosion Control Blanket	Aug. 1, 2025	
80229		☐	Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
80452		☐	Full Lane Sealant Waterproofing System	Nov. 1, 2023	
80433		☐	Green Preformed Thermoplastic Pavement Markings	Jan. 1, 2021	Jan. 1, 2022
80471	697	☒	Guardrail	Nov. 1, 2025	
80472		☐	High Friction Surface Treatment	Nov. 1, 2025	
80456		☐	Hot-Mix Asphalt	Jan. 1, 2024	April 1, 2026
80446	698	☒	Hot-Mix Asphalt – Longitudinal Joint Sealant	Nov. 1, 2022	Aug. 1, 2023
80438		☐	Illinois Works Apprenticeship Initiative – State Funded Contracts	June 2, 2021	April 2, 2024
80483	700	☒	Inlet Filters	April 1, 2026	
* 80477		☐	Longitudinal Tining	Jan. 1, 2026	July 1, 2026
80450		☐	Mechanically Stabilized Earth Retaining Walls	Aug. 1, 2023	Aug. 1, 2025
80478		☐	Modified Longitudinal Construction Joint	Jan. 1, 2026	
80464	702	☒	Pavement Marking	April 1, 2025	Nov. 1, 2025
80468		☐	Pavement Patching	Aug. 1, 2025	
80441	703	☒	Performance Graded Asphalt Binder	Jan 1, 2023	April 1, 2026
80459		☐	Preformed Plastic Pavement Marking	June 2, 2024	
34261		☐	Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2022
80473	709	☒	Raised Reflective Pavement Markers	Nov. 1, 2025	
80455	710	☒	Removal and Disposal of Regulated Substances	Jan. 1, 2024	April 1, 2026
80474		☐	Residential Driveway Temporary Signal	Nov. 1, 2025	
* 80445	712	☒	Seeding	Nov. 1, 2022	July 1, 2026
80457	718	☒	Short Term and Temporary Pavement Markings	April 1, 2024	April 2, 2024
80462	722	☒	Sign Panels and Appurtenances	Jan. 1, 2025	Jan. 1, 2026
80479		☐	Sinusoidal Rumble Strips	Jan. 1, 2026	
80469		☐	Slope Wall	Aug. 1, 2025	
80448	724	☒	Source of Supply and Quality Requirements	Jan. 2, 2023	Jan. 1, 2026
80340		☐	Speed Display Trailer	April 2, 2014	Jan. 1, 2022
80127		☐	Steel Cost Adjustment	April 2, 2004	Nov. 1, 2025
80480		☐	Structural Repair of Concrete	Jan. 1, 2026	
80397	726	☒	Subcontractor and DBE Payment Reporting	April 2, 2018	
80391	727	☒	Subcontractor Mobilization Payments	Nov. 2, 2017	April 1, 2019
80463	728	☒	Submission of Bidders List Information	Jan. 2, 2025	Mar. 2, 2025

<u>File Name</u>	<u>Pg.</u>		<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80482	729	☒	Submission of Payroll Records – Federal Aid Contract	April 1, 2026	
80437		☐	Submission of Payroll Records – State Contract	April 1, 2021	April 1, 2026
80435		☐	Surface Testing of Pavements – IRI	Jan. 1, 2021	Jan. 1, 2023
80465	731	☒	Surveying Services	April 1, 2025	
80481	732	☒	Temporary Concrete Barrier	Jan. 1, 2026	
80466		☐	Temporary Rumble Strips	April 1, 2025	
* 80484		☐	Tolerance in Thickness for Continuously Reinforced PCC Pavement	July 1, 2026	
80470		☐	Traffic Signal Backplate	Aug. 1, 2025	
20338	733	☒	Training Special Provisions	Oct. 15, 1975	Sept. 2, 2021
80429		☐	Ultra-Thin Bonded Wearing Course	April 1, 2020	Jan. 1, 2022
80439	736	☒	Vehicle and Equipment Warning Lights	Nov. 1, 2021	Nov. 1, 2022
80458		☐	Waterproofing Membrane System	Aug. 1, 2024	
80302	737	☒	Weekly DBE Trucking Reports	June 2, 2012	Jan. 2, 2025
80454		☐	Wood Sign Support	Nov. 1, 2023	
80427	738	☒	Work Zone Traffic Control Devices	Mar. 2, 2020	Jan. 1, 2026
* 80485	741	☒	Work Zone Width Restriction	July 1, 2026	
80071		☐	Working Days	Jan. 1, 2002	

GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET

Effective as of the: January 16, 2026 Letting

Pg #	✓	File Name	Title	Effective	Revised
	☐	*GBSP 4	Polymer Modified Portland Cement Mortar	June 7, 1994	Oct 17, 2025
	☐	GBSP 13	High-Load Multi-Rotational Bearings	Oct 13, 1988	June 28, 2024
742	☒	GBSP 14	Jack and Remove Existing Bearings	April 20, 1994	April 13, 2018
	☐	GBSP 16	Jacking Existing Superstructure	Jan 11, 1993	April 13, 2018
	☐	GBSP 18	Modular Expansion Joint	May 19, 1994	Oct 27, 2023
744	☒	GBSP 21	Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003	Oct 23, 2020
	☐	*GBSP 25	Cleaning and Painting Existing Steel Structures	Oct 2, 2001	Oct 17, 2025
	☐	GBSP 26	Containment and Disposal of Lead Paint Cleaning Residues	Oct 2, 2001	Apr 22, 2016
	☐	GBSP 33	Pedestrian Truss Superstructure	Jan 13, 1998	Oct 27, 2023
	☐	*GBSP 34	Concrete Wearing Surface	June 23, 1994	Oct 17, 2025
	☐	GBSP 45	Bridge Deck Thin Polymer Overlay	May 7, 1997	June 28, 2024
	☐	GBSP 55	Erection of Curved Steel Structures	June 1, 2007	
	☐	GBSP 59	Diamond Grinding and Surface Testing Bridge Sections	Dec 6, 2004	April 15, 2022
	☐	GBSP 60	Containment and Disposal of Non-Lead Paint Cleaning Residues	Nov 25, 2004	Apr 22, 2016
	☐	GBSP 61	Slipform Parapet	June 1, 2007	April 15, 2022
	☐	GBSP 67	Structural Assessment Reports for Contractor's Means and Methods	Mar 6, 2009	Oct 5, 2015
	☐	GBSP 71	Aggregate Column Ground Improvement	Jan 15, 2009	Oct 15, 2011
	☐	GBSP 78	Bridge Deck Construction	Oct 22, 2013	Dec 21, 2016
	☐	GBSP 79	Bridge Deck Grooving (Longitudinal)	Dec 29, 2014	Mar 29, 2017
768	☒	GBSP 81	Membrane Waterproofing for Buried Structures	Oct 4, 2016	March 1, 2019
	☐	GBSP 82	Metallizing of Structural Steel	Oct 4, 2016	Oct 20, 2017
	☐	GBSP 83	Hot Dip Galvanizing for Structural Steel	Oct 4, 2016	June 28, 2024
	☐	GBSP 85	Micropiles	Apr 19, 1996	Oct 23, 2020
770	☒	GBSP 86	Drilled Shafts	Oct 5, 2015	Oct 27, 2023
	☐	GBSP 87	Lightweight Cellular Concrete Fill	Nov 11, 2001	Apr 1, 2016
	☐	GBSP 88	Corrugated Structural Plate Structures	Apr 22, 2016	April 13, 2018
	☐	GBSP 89	Preformed Pavement Joint Seal	Oct 4, 2016	March 24, 2023
	☐	GBSP 90	Three Sided Precast Concrete Structure (Special)	Dec 21, 2016	March 22, 2024
	☐	GBSP 91	Crosshole Sonic Logging Testing of Drilled Shafts	Apr 20, 2016	March 24, 2023
	☐	GBSP 92	Thermal Integrity Profile Testing of Drilled Shafts	Apr 20, 2016	March 24, 2023
	☐	GBSP 93	Preformed Bridge Joint Seal	Dec 21, 2016	June 28, 2024
	☐	GBSP 94	Warranty for Cleaning and Painting Steel Structures	Mar 3, 2000	Nov 24, 2004
	☐	GBSP 96	Erection of Bridge Girders Over or Adjacent to Railroads	Aug 9, 2019	
	☐	GBSP 97	Folded/Formed PVC Pipeliner	April 15, 2022	
	☐	GBSP 98	Cured-in-Place Pipe Liner	April 15, 2022	
	☐	GBSP 99	Spray-Applied Pipe Liner	April 15, 2022	
782	☒	GBSP 100	Bar Splicers, Headed Reinforcement	Sept 2, 2022	Oct 27, 2023
783	☒	*GBSP 101	Noise Abatement Wall, Ground Wall	Dec 9, 2022	Oct 17, 2025
	☐	*GBSP 102	Noise Abatement Wall, Structure Mounted	Dec 9, 2022	Oct 17, 2025
	☐	GBSP 103	Noise Abatement Wall Anchor Rod Assembly	Dec 9, 2022	

An * indicates a new or revised special provision.

STATE OF ILLINOIS SPECIAL PROVISIONS

The following Special Provisions supplement the specifications listed in the table below, which apply to and govern the proposed improvement designated as Lake County Section **15-00038-07-WR**, Contract 61K62, and in case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and govern.

SPECIFICATION	ADOPTED/DATED
Standard Specifications for Road and Bridge Construction	January 1, 2022
Manual on Uniform Traffic Control Devices for Streets and Highways Illinois Supplement	February 2026
Supplemental Specifications and Recurring Special Provisions (indicated on the Check Sheet included herein)	January 1, 2026
Standard Specifications for Water and Sewer Construction in Illinois	8 th Edition, 2020

LOCATION OF IMPROVEMENT

The project is located in the Village of Buffalo Grove, Village of Riverwoods, and Village of Deerfield in Lake County. The improvement on Deerfield Road begins west of Milwaukee Avenue (US 45) and ends east of Saunders Road (13,054 feet – 2.47 miles). Milwaukee Avenue will be widened from south of Deerfield Road to north Deerfield Road (1,959 feet – 0.37 miles). Portwine Road will be reconstructed from south of Deerfield Road to north of Deerfield Road (1,041 feet – 0.20 mile). Work on Saunders Road will extend from south of Deerfield Road to north of Deerfield Road (2,780 feet – 0.53 miles). The total project gross and net length is 18,835 feet (3.57 miles).

DESCRIPTION OF IMPROVEMENT

The work consists of the reconstruction of Deerfield Road with full-depth HMA pavement, curb and gutter, drainage improvements, construction of pre-cast box culverts, the redecking of the Deerfield Road bridge over the Des Plaines River, construction of sidewalk and a multi-use path, sanitary sewer replacement, proposed sanitary force main extension and lift station replacement, water main, installation of retaining walls, parking lot reconstruction/resurfacing, traffic signal modernization, ADA ramps with detectable warnings, driveway removal and replacement, tree removal, erosion control, pavement markings, restoration, and all incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

COMPLETION DATE PLUS WORKING DAYS (D1)

Effective: September 30, 1985

Revised: January 1, 2007

Revise Article 108.05 (b) of the Standard Specifications as follows:

"When a completion date plus working days is specified, the Contractor shall complete all contract items and safely open all roadways to traffic by 11:59 PM on, October 31, 2028 except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within 10 working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for clean up work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

Article 108.09 or the Special Provision for "Failure to Complete the Work on Time", if included in this contract, shall apply to both the completion date and the number of working days.

COOPERATION WITH ADJACENT CONTRACTS

The intent of this provision is to inform the Contractor that the Lake County Division of Transportation is aware of adjacent contracts that are currently scheduled during the same time period as this contract. See below for additional details.

Illinois Department of Transportation
Section Number 2025-2116-RS, SW
Contract Number 80C62

The Contractor is required to cooperate with this, and any other adjacent contracts, in accordance with Section 105.08 of the Standard Specifications and may be required to modify his/her staging operations in order to meet these requirements. No additional compensation will be allowed for delays or modifications to the maintenance of traffic plans to accommodate the other contract(s).

DIVISION 100. GENERAL REQUIREMENTS AND COVENANTS

ARTICLE 105.03(e) ENVIRONMENTAL PERMITTING AGENCIES

Effective: December 22, 2014

Revised: February 26, 2016

Add the following paragraph to Article 105.03 of the "Standard Specifications"

- (e) Permitting Agency Deduction: Any monetary payment required from a permitting agency related to improper erosion and sediment control may be passed along to the Contractor as a deduction from future pay estimates. Monetary payments will include fees and violations attributable to the Contractor's actions or inaction resulting in improper erosion and sediment control. The deduction will be applied to monies due or that might become due to the Contractor. Permitting agencies include the Lake County Stormwater Management Commission, the Illinois Environmental Protection Agency, the Army Corps of Engineers, and other regulatory agencies.

ARTICLE 105.09 SURVEY CONTROL POINTS (LCDOT)

Effective: January 1, 2007

Revised: June 6, 2014

The Contractor shall furnish the Engineer with the materials required to establish survey control points according to Article 105.09 of the "Standard Specifications" and the following:

Paint: The Contractor shall furnish, at their expense, white, pink or purple pavement marking paint in aerosol cans, for use by the Engineer. The paint shall last up to 6 months; be non-freezing, be functional to 14°F; and be fully operational in an inverted position.

The Contractor and subcontractors shall only use white, pink or purple colors for their own markings. At no time will the Contractor use any of the J.U.L.I.E. utility colors listed in Article 107.31 of the "Standard Specifications".

Hubs: The Contractor shall furnish, at their expense, hubs for use by the Engineer according to the following:

1. Shall be 1 $\frac{3}{8}$ " x $\frac{7}{8}$ " x 18" (actual dimension).
2. Shall be furnished in securely banded (on each end) bundles of 25 pieces.
3. The material shall be kiln dried Douglas fir, oak or maple and surfaced on the 2 larger sides and without splits, pitch pockets, wane, knots or decayed wood.
4. The tapered end on each hub shall be pencil point tapered.

Lath: The Contractor shall furnish, at their expense, lath for use by the Engineer according to the following:

1. Shall be 1 $\frac{1}{8}$ " x $\frac{1}{2}$ " x 48" (actual dimension).
2. Shall be furnished in securely banded (on each end) bundles of 50 pieces.
3. The material shall be kiln dried Douglas fir, oak or maple and surfaced on the 2 larger sides and without splits, pitch pockets, wane, knots or decayed wood.
4. The tapered end may be saw-cut tapered, or pencil tapered.

ARTICLE 107.09 PUBLIC CONVENIENCE AND SAFETY (LCDOT)

Effective: January 1, 2007

Revised: January 6, 2017

The Contractor shall limit public inconveniences and safety conflicts according to Article 107.09 of the "Standard Specifications" and the following:

Keeping Roads Open to Traffic:

For this project the Contractor shall maintain traffic according to the Maintenance of Traffic Plan shown on the plans. The Contractor shall limit flagging operations affecting the open lanes i.e. flagging for vehicles entering or leaving the construction site etc..., to the following times:

Monday - Friday	9:00 am	to	3:00 pm

At all other times, including periods of no construction activity, the Contractor shall maintain the available traffic lanes.

If local and/or area conditions warrant the above times may be adjusted (i.e., lengthened or shortened) by the Engineer. To request a change the Contractor shall submit to the Engineer a plan including the revised start and end time a minimum of 48 hours prior to the proposed revision. The Engineer will notify the Contractor 24 hours in advance with an approval or disapproval.

If the Contractor fails to provide a plan and/or the Contractor disregards the decision by of the Engineer, the Traffic Control Deficiency Charge will be applied as stated in the Special Provisions for Traffic Control and Protection.

Safety and Convenience: The Contractor shall maintain entrances along the proposed improvement. Interference with traffic movements and inconvenience to owners of abutting property and the public shall be kept to a minimum. Any delays or inconveniences caused by the Contractor, by complying with these requirements shall be considered as included in the unit bid prices of the contract and no additional compensation will be allowed.

Contractor shall plan their work so that there will be no open holes in the pavement and that all barricades will be removed from the roadway during non-working hours, except where required for public safety.

Steel road plates may be used as temporary cover over excavations. Anytime steel road plates are in the roadway these requirements apply:

- The steel road plate shall sit flat on the pavement and be free of defects and warping
- It shall be shimmed with non-asphaltic material to prevent vertical movement
- If the steel road plate is not under constant surveillance, it shall be pinned to prevent horizontal movement by a minimum of 6 pins; 4 pins predrilled into the corners of the plates and 1 pin predrilled into each side parallel to the trench. Pins shall be drilled 3 inches into the pavement and not protrude above the pavement surface
- The steel road plate shall be at least 1 inch thick and large enough to allow a minimum of 1 foot of bearing on each side of the trench
- A one foot wide HMA surface course ramp shall be placed around the perimeter of the plate
- Multiple steel road plates shall be tack welded together to prevent separation if they are not under constant surveillance
- Appropriate advanced warning signs (W8-24 "STEEL PLATE AHEAD" and W8-1 "BUMP") are required

Steel road plates may be left in place overnight, in emergency situations and with the concurrence of the Engineer. Steel road plates left in place overnight shall be attached to the roadway by a minimum of 6 pins; 4 pins predrilled into the corners of the plates and 1 pin predrilled into each side parallel to the trench. Pins shall be drilled 3 inches into the pavement and not protrude above the pavement surface.

Steel road plates left in-place for more than 72 hours, shall also be:

- Recessed into the street surface the thickness of the steel road plate with no difference in elevation with the existing surface
- Secured in-place to prevent horizontal movement with HMA surface course between the existing pavement vertical edge and the steel road plate

Road plates shall not be used from November 15th to April 15th without approval from the Engineer.

ARTICLE 107.29 OPENING OF SECTION OF HIGHWAY TO TRAFFIC (LCDOT)

Effective: January 1, 2007

Revised: May 19, 2014

Work under construction shall be opened to traffic according to Article 107.29 of the "Standard Specifications" and the following:

The Contractor shall work expeditiously to open traffic lanes closed due to roadwork. The Engineer shall be the sole judge of when a lane is ready to be opened to traffic. The opening of a lane to traffic shall be according to Section 107.29 of the "Standard Specifications".

Roadwork requiring a closure of a lane, which has been opened previously to traffic, will be allowed at the discretion of the Engineer and under the following conditions:

1. The lane closure shall only be in effect while workers are present in or near the closed lane.
2. The closed lane will be reopened to traffic at the end of the workday.
3. All traffic control devices pertaining to the lane closure shall be removed from the roadway at the end of the workday.

ARTICLE 107.39 CONTRACTOR'S RESPONSIBILITY FOR LOCATING AND PROTECTING UTILITY PROPERTY AND SERVICES (LCDOT)

Effective: May 19, 2017
Revised: April 20, 2022

The Contractor shall protect utility properties and services within and adjacent to the project limits according to The Illinois Underground Utility Facilities Damage Prevention Act; Article 107.39 of the "Standard Specifications" and the following:

Under the State-Wide One Call Notification System the Contractor shall contact JULIE (800-892-0123), and/or the individual utilities (for non-JULIE members) for the horizontal locations of the utilities, a minimum of 48 hours in advance of work being done.

IDOT traffic signal facilities are not part of any of the one-call locating services such as J.U.L.I.E or Digger. If this Contract requires the services of an Electrical Contractor or Subcontractor, the Contractor shall be responsible at his/her own expense for locating existing IDOT electrical facilities prior to performing any work. If this Contract does not require the services of an Electrical Contractor or Subcontractor, the Contractor may request one free locate for existing IDOT electrical facilities from the District One Electrical Maintenance Contractor prior to the start of any work. Additional locate requests shall be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

For vertical locations, the Contractor shall perform exploratory potholing in hard surfaces and/or vegetated areas. Potholes in hard surfaces i.e., hot-mix asphalt and/or concrete may be temporarily filled with a material approved by the Engineer. The potholes shall be permanently replaced in kind.

Potholes in vegetated areas may be filled with sand as approved by the Engineer. The backfilled area shall be covered with a minimum of 4" of topsoil and sodded or seeded as applicable. In mowed lawns, the damaged area shall be replaced with an approved sod according to Section 252 of the "Standard Specifications". The replacement sod shall include the required watering according to Article 252.08 of the "Standard Specifications". In unmowed sections, the damaged area shall be seeded according to Sections 250 and 251 of the "Standard Specifications".

Basis of Payment: This work will not be paid for separately, but shall be included in unit bid prices of the various underground work items (e.g. installation of storm sewer and/or other drainage items; installation of conduit for traffic signals or interconnects; installation of casing pipe for utilities; construction of foundations; installation of guardrail posts etc), shown in the Summary of Quantities. Initial and/or additional locates for non JULIE member utilities will not be paid for separately, but shall be likewise included in unit bid prices of the various underground work items.

**DIVISION 200. EARTHWORK, LANDSCAPING,
AND EROSION CONTROL**

DIVISION 200 PHOSPHORUS FERTILIZER NUTRIENT BAN (LCDOT)

Effective: January 1, 2009

Revised: May 10, 2018

Phosphorus Fertilizer Nutrient shall not be used within Lake County Right-of-Way.

20100XXX TREE REMOVAL (XX) (LCDOT)

Effective: January 1, 2007

Revised: July 18, 2023

Description: This work shall consist of cutting, grubbing, removing and disposing of trees and stumps.

General: The work shall be performed according to Article 201.04 of the "Standard Specifications" and the following:

Cut trees and limbs shall be disposed of within five working days. The cut trees and limbs shall be disposed of according to Article 202.03 of the "Standard Specifications".

No tree clearing (of trees three (3) inches or greater in diameter at breast height) shall occur between April 1 and October 31 to avoid impacts to bats.

Method of Measurement: Tree Removal will be measured for payment according to Article 201.10(b) of the "Standard Specifications".

Basis of Payment: This work will be paid for at the contract unit price per unit diameter for TREE REMOVAL of the size range specified or per acre for TREE REMOVAL, ACRES. The unit price shall include all equipment, materials and labor required to remove and dispose of designated trees and stumps.

20101200 TREE ROOT PRUNING (LCDOT)

Effective: January 1, 2007

Revised: May 13, 2015

Description: This work shall consist of pruning existing tree roots prior to trenching or excavation operations.

General: The work shall be performed according to Article 201.06 of the "Standard Specifications" and the following:

Before any trenching or excavation in the area of a tree, tree roots shall be cut with appropriate root pruning equipment to a minimum of 24" deep. The cuts shall be made 6" to 12" closer to the tree than the construction limit. This allows for root regeneration (within the 6" to 12" area) during the construction period. Pruning shall not be done at the construction limit, since the cut surfaces of the roots will remain exposed resulting in root dieback.

The application of Fertilizer Nutrients and Supplemental Watering shall be performed according to Article 201.06 of the "Standard Specifications". The Fertilizer Nutrients and Supplemental Watering shall not be paid for separately but shall be included in the contract unit price for TREE ROOT PRUNING.

Removed material shall be disposed outside the right of way according to Article 202.03 of the "Standard Specifications".

Method of Measurement: Tree Root Pruning will be measured for payment as each per tree according to Article 201.10(d) of the "Standard Specifications".

Basis of Payment: This work will be paid for at the contract unit price per each for TREE ROOT PRUNING. The unit price shall include all equipment, materials, and labor required to prune the existing tree roots and to transport & dispose of the removed material. The unit price shall also include all equipment, materials and labor required to accomplish the application of fertilizer nutrients and supplemental watering.

PROTECTION OF EXISTING TREES

The Contractor shall be responsible for taking measures to minimize damage to the tree limbs, tree trunks, and tree roots at each work site. All such measures shall be included in the contract price for other work except that payment will be made for TEMPORARY FENCE, TREE TRUNK PROTECTION, TREE ROOT PRUNING, and TREE PRUNING.

The Contractor shall coordinate with the village forester/arborist or IDOT Roadside Development Unit (847.705.4171) prior to the start of construction to do a walk through and determine which trees or shrubs are to be protected, method of protection, and determine type of work to minimize damage to the tree.

All work, materials and equipment shall conform to Section 201 and 1081 of the Standard Specifications except as modified herein.

A. Earth Saw Cut of Tree Roots (Root Pruning):

1. Whenever proposed excavation falls within a drip-line of a tree, the Contractor shall:
 - a. Root prune 6-inches behind and parallel to the proposed edge of trench a neat, clean vertical cut to a minimum depth directed by the Engineer through all affected tree roots.
 - b. Root prune to a maximum width of 4-inches using a reciprocating saw blade for cutting tree roots or similar cutting machine. Trenching machines will not be permitted.
 - c. Exercise care not to cut any existing utilities.
 - d. If during construction it becomes necessary to expose tree roots which have not been pre-cut, the Engineer shall be notified and the Contractor shall provide a clean, vertical cut at the proper root location, nearer the tree trunk, as necessary, by means of hand-digging and trimming with chain saw or hand saw. Ripping, shredding, shearing, chopping, or tearing will not be permitted.
 - e. Top Pruning: When thirty percent (30%) or more of the root zone is pruned, an equivalent amount of the top vegetative growth or the plant material shall be pruned off within one (1) week following root pruning.

2. Whenever curb and gutter is removed for replacement, or excavation for removal of or construction of a structure is within the drip line/root zone of a tree, the Contractor shall:
 - a. Root prune 6-inches behind the curbing so as to neatly cut the tree roots.
 - b. Depth of cut shall be 12 inches for curb removal and replacement and 24 inches for structural work. Any roots encountered at a greater depth shall be neatly sawcut at no additional cost.
 - c. Locations where earth saw cutting of tree roots is required will be marked in the field by the Engineer.
3. All root pruning work is to be performed through the services of a licensed arborist to be approved by the Engineer.

Root pruning will be paid for at the contract unit price each for TREE ROOT PRUNING, which price shall be payment for all labor, materials, and equipment.

Tree limb pruning will be paid for at the contract unit price per each for TREE PRUNING (1 TO 10 INCH DIAMETER) and/or TREE PRUNING (OVER 10 INCH DIAMETER), which price shall include labor, materials, and equipment.

B. Temporary Fence:

1. The Contractor shall erect a temporary fence around all trees within the construction area to establish a "tree protection zone" before any work begins or any material is delivered to the jobsite. No work is to be performed (other than root pruning), materials stored, or vehicles driven or parked within the "tree protection zone".
2. The exact location and establishment of the "tree protection zone" fence shall be approved by the Engineer prior to setting the fence.
3. The fence shall be erected on three sides of the tree at the drip-line of the tree or as determined by the Engineer.
4. All work within the "tree protection zone" shall have the Engineer's prior approval. All slopes and other areas not regarded should be avoided so that unnecessary damage is not done to the existing turf, tree root system ground cover.

5. The grade within the “tree protection zone” shall not be changed unless approved by the Engineer prior to making said changes or performing the work.

The fence shall be similar to wood lath snow fence (48 inches high), plastic poly-type or and other type of highly visible barrier approved by the Engineer. This fence shall be properly maintained and shall remain up until final restoration unless the Engineer directs removal otherwise. Tree fence shall be supported using T-Post style fence posts. **Utilizing re-bar as a fence post will not be permitted.**

Temporary fence will be paid for at the contract unit price per foot for TEMPORARY FENCE, which price shall include furnishing, installing, maintaining, and removing.

C. Tree Trunk Protection:

1. The Contractor shall erect trunk protection around all trees within the construction area to prevent damage to the trunk of the tree when temporary fence is not an option before any work begins or any material is delivered to the jobsite. No work is to be performed (other than root pruning), materials stored, or vehicles driven or parked within the “tree protection zone”.
2. The 2 inch x 8 inch x 8 foot boards shall be banded continuously around the trunk of each tree to prevent scarring of the trees shown on the plans or designated by the Engineer.
3. Multi-stem trees, saplings, and shrubs to be protected within the area of construction, temporary fence may be used for trunk protection.

Tree trunk protection will be paid for at the contract unit price per each for TREE TRUNK PROTECTION , which price shall include materials, installation, and removal.

D. Tree Limb Pruning:

1. The Contractor shall inspect the work site in advance and arrange with the IDOT Roadside Development Unit (847.705.4171) and/or village forester/arborist to have any tree limbs pruned that might be damaged by equipment operations at least one week prior to the start of construction. Any tree limbs that are broken by construction equipment after the initial pruning must be pruned correctly within 72 hours.
2. Top Pruning: When thirty percent (30%) or more of the root zone of a tree is pruned, an equivalent amount of the top vegetative growth or the plant material shall be pruned off within one (1) week following root pruning.

Tree limb pruning will be paid for at the contract unit price per each for TREE PRUNING (1 TO 10 INCH DIAMETER) and/or TREE PRUNING (OVER 10 INCH DIAMETER), which price shall include labor, materials, and equipment.

E. Removal of Driveway Pavement and Sidewalk:

1. In order to minimize the potential damage to the tree root system(s), the Contractor will not be allowed to operate any construction equipment or machinery within the "tree protection zone" located between the curb or edge of pavement and the right-of-way property line.
2. Sidewalk to be removed in the areas adjacent to the "tree protection zones" shall be removed with equipment operated from the street pavement. Removal shall be done by excavation equipment, or by hand, or a combination of these methods. The method of removal shall be approved by the Engineer prior to commencing any work.
3. Any pavement or pavement related work that is removed shall be immediately disposed of from the area and shall not be stockpiled or stored within the parkway area under any circumstances.

F. Backfilling:

1. Prior to placing the topsoil and/or sod, in areas outside the protection zone, the existing ground shall be disked to a depth no greater than one (1"), unless otherwise directed by the Engineer. No grading will be allowed within the drip-line of any tree unless directed by the Engineer.

G. Damages:

1. In the event that a tree not scheduled for removal is injured such that potential irreparable damage may ensure, as determined by the Roadside Development Unit, the Contractor shall be required to remove the damage tree and replace it on a three to one (3:1) basis, at his own expense. The Roadside Development Unit will select replacement trees from the pay items already established in the contract.
2. The Contractor shall place extreme importance upon the protection and care of trees and shrubs which are to remain during all times of this improvement. It is of paramount importance that the trees and shrubs which are to remain are adequately protected by the Contractor and made safe from harm and potential damage from the operations and construction of this improvement. If the Contractor is found to be in violation of storage or operations within the "tree protection zone" or construction activities not

approved by the Engineer, a penalty shall be levied against the Contractor with the monies being deducted from the contract. The amount of the penalty shall be two hundred fifty dollars (\$250.00) per occurrence per day.

20200100 EARTH EXCAVATION (LCDOT)

Effective: January 1, 2007

Revised: January 28, 2015

Description: This work shall consist of the excavation and transportation of suitable excavated material to embankment locations throughout the limits of the project. This work shall also consist of the excavation, transportation and off-site disposal of excess and unsuitable materials.

For this Project the Earth Excavation shall consist of:

1. ☒ Excavation to the subgrade elevation.
2. ☒ Excavation for topsoil placement.
3. ☒ The removal of existing hot-mix asphalt pavement and aggregate base course not included in any other pay item.
4. ☒ Undercutting, as determined by the Engineer to include:
 - a. ☒ Removal of existing topsoil under proposed embankment.
 - b. ☒ Removal of unsuitable material in wet areas.
5. ☐ Undercutting, based on the recommendations of the soil survey and report.
 - a. An estimated quantity of excavation for undercutting has been included in the quantity of Earth Excavation and is shown on the plans.
 - b. Undercutting may be employed only at the discretion of the Engineer after it has been determined that the provisions of Section 301 of the "Standard Specifications" will not yield sufficient results to allow the timely progress of the project.

General: This work shall conform to the requirements of Section 202 of the "Standard Specifications" and the following:

Removal and disposal of unstable, unsuitable and/or excess material will not be paid for separately but is included in the contract unit price for Earth Excavation. All unstable, unsuitable and/or excess material shall be disposed of outside the right-of-way according to Article 202.03 of the "Standard Specifications".

All suitable excess material from sewer trenches, side roads, entrances or other necessary excavations may be used in the construction of the roadway. Placement and

compaction of this material shall be considered included in the unit price for Earth Excavation.

Excavation required to: clean side road ditches, construct driveways, and/or construct side road approaches, will not be paid for separately, but shall be considered included in the unit cost of Earth Excavation.

Earth moved more than once due to construction staging and/or procedures selected by the Contractor, will not be paid for separately, but shall be considered included in the unit cost of Earth Excavation.

When embankments are to be widened, if directed by the Engineer, steps shall be cut into the existing slopes according to Article 205.03 of the "Standard Specifications" and the IDOT D1 standard BD-51 Benching Detail for Embankment Widening, at no additional cost to the contract.

Incidental Dewatering: In the event that excavations require dewatering, the Contractor shall furnish all labor, equipment and material necessary for dewatering. All dewatering operations shall be approved by the Engineer before implementation. For projects covered by an NPDES Permit the Contractor shall develop a dewatering plan in compliance with NPDES regulations. The plan shall be submitted to the Engineer and Lake County Stormwater Management Commission (LCSMC) for approval. The cost of all equipment, materials and labor necessary to comply with the above provisions will not be paid for separately but shall be considered included in the unit price for Earth Excavation, and no additional compensation will be allowed.

A Soil Survey and Report:

- ☒ Was performed – A copy is available online with the project plans and contract specifications and it is available for inspection and review at LCDOT.
- ☐ Was not performed.

Method of Measurement: Earth Excavation will be measured in its original position and the volume in cubic yards computed by the method of average end areas.

Basis of Payment: This work will be paid for at the contract unit price per cubic yard for EARTH EXCAVATION. The unit price shall include all equipment and labor required to excavate, transport and distribute earth.

ARTICLE 202.03 REMOVAL AND DISPOSAL OF SURPLUS, UNSTABLE, AND UNSUITABLE MATERIALS AND ORGANIC WASTE (LCDOT)

Effective: February 18, 2013

Revised: May 5, 2020

Description: This work shall consist of the off-site disposal at pre-approved Clean Construction or Demolition Debris (CCDD) facilities of excess uncontaminated soil generated by Lake County Division of Transportation (LCDOT) contract construction projects.

Definitions:

Clean construction or demolition debris (CCDD): CCDD is uncontaminated broken concrete without protruding metal bars, bricks, rock, stone, or reclaimed asphalt pavement generated from construction or demolition activities. CCDD material may include small incidental quantities of soil that are comingled as part of the removal process. When uncontaminated soil is mixed with any of these materials, the uncontaminated soil is also considered CCDD. Uncontaminated soil that is not mixed with other CCDD materials is not CCDD.

Uncontaminated Soil: What constitutes "uncontaminated soil" for purposes of CCDD and uncontaminated soil fill operations is defined in 35 Ill. Adm. Code 1100. Uncontaminated soil means soil that does not contain contaminants in concentrations that pose a threat to human health and safety and the environment.

General: CCDD that does not contain any uncontaminated soil may be disposed of at CCDD facilities without additional paperwork. CCDD containing uncontaminated soil from the LCDOT construction site may be disposed at preapproved facilities

LCDOT's Responsibility: LCDOT will collect and analyze enough soil samples to meet the requirements of area CCDD facilities. The lab analysis will be submitted to one or more facilities requesting preapproval to dispose of the CCDD material and uncontaminated soil. The letter(s) of preapproval and signed IEPA forms 662 and/or 663 are included in the bid package.

Contractor's Responsibility: The Contractor is expected to use one or more of the County's pre-approved uncontaminated soil disposal facilities listed below. Should a Contractor elect to use an alternate facility for uncontaminated soil disposal, the Contractor shall be responsible for obtaining approval from the facility utilizing the soils analysis documentation provided to the Contractor by LCDOT. Additionally, the Contractor shall be responsible for all costs associated with trucking and tipping fees

for proper disposal of all accepted loads, and all costs associated with proper disposal of all rejected loads.

The Contractor shall stage and transport material to the pre-approved receiving facility and shall be responsible for coordination with such facilities on operating hours.

The Contractor shall submit a Material Disposal Plan a minimum of 14 days prior to beginning earthwork activities. The Material Disposal Plan shall detail the methods of removal and disposal of all un-contaminated soil and CCDD leaving the site. The Material Disposal Plan will be reviewed and approved by the Engineer prior to beginning earthwork activities.

In the event that a pre-approved disposal facility rejects the material, the Contractor shall return the material to the project site for stockpile at a location and manner designated by the Engineer according to the special provision for REJECTED LOAD TRANSPORTATION.

No soil testing shall be conducted by the Contractor with the exception of onsite photo ionization detectors (PID) screening (at the Contractor's option).

CCDD and uncontaminated soil from this project may be disposed of at the following preapproved sites:

- Thelen Sand & Gravel, Antioch, IL
- Bluff City Materials, Inc., Bartlett, IL
- Reliable Sand & Gravel Co, Inc., McHenry, IL

Alternative Methods of Disposal:

- a) With the consent of the Engineer, the excess soil may be transported and used as fill, within the LCDOT right-of-way, on other LCDOT construction projects.

The Contractor shall be responsible for making all arrangements, including coordinating with Engineer for both projects, as well as with the Contractor for the other project. The Contractor shall coordinate the transportation and placing of the excess soil on the other project. No additional compensation will be allowed or provided for this option.

- b) With the consent of the Engineer the Contractor may dispose of the excess material on the job site. If the soil is used for fill locations within the right-of-way but outside the project construction limits, the Contractor shall specify to the Engineer, in writing, how the landscape restoration of the fill area(s) will be

accomplished. The excess soil placement shall not result in any flood plain or wetland impacts. The excess soil placement shall not reduce sight distance for vehicles on the roadway or adjoining entrances or side roads. The material shall be graded to blend in with the surrounding ground to the Engineer's satisfaction.

Method of Measurement: This work will not be measured for payment.

Basis for Payment: The off-site disposal of uncontaminated soil and/or CCDD, including transportation, facility disposal fees and all other work necessary, will not be paid for separately, but shall be included in the contract unit price per cubic yard of EARTH EXCAVATION, CHANNEL EXCAVATION, STRUCTURE EXCAVATION, and REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL FOR STRUCTURES.

21101615 TOPSOIL FURNISH AND PLACE, 4" (LCDOT)

Effective: January 1, 2007

Revised: May 10, 2022

Description: This work shall consist of furnishing, excavating, transporting and placing topsoil.

Materials: Topsoil (furnished from outside the right-of-way) shall meet the requirements of Article 1081.05(a) of the "Standard Specifications".

General: The work shall be performed according to Section 211 of the "Standard Specifications" and the following:

The work shall also comply with the "Illinois State Agency Historic Resources Preservation Act" (Public Act 86-707, effective January 1, 1990). Under this Act:

1. The Contractor shall complete a Borrow Sites Review form for each borrow site (BDE form 2289 2/23/17 included herein), along with all required attachments, and submit them to the Engineer as soon as possible.
2. The Engineer shall submit the Borrow Site Review form to IDOT for review and approval. Any and all costs incurred, associated with said review and approval will be borne by the Contractor.
3. The Contractor shall not begin work on any borrow areas until the Borrow Site Review has been approved.

The Contractor shall collect one representative soil sample from the proposed growing surface which shall be analyzed by an agricultural laboratory approved by the Engineer. The Contractor shall submit the proposed laboratory name and address to the Engineer at the pre-construction conference. The soils analysis shall include (but is not limited to) the recommended application rates of nitrogen and potassium fertilizer nutrients.

Plan quantities reflect a 4" thick topsoil placement in all disturbed areas.

Method of Measurement: Topsoil Furnish and Place will be measured for payment in square yards according to Article 211.07 of the "Standard Specifications".

Basis of Payment: This work will be paid for at the contract unit price per square yard for TOPSOIL FURNISH AND PLACE, 4". The cost of the soil analysis will not be paid for separately but will be included in the cost of TOPSOIL FURNISH AND PLACE, 4". The unit price shall include all equipment, materials and labor required to furnish and place the topsoil. No additional compensation will be allowed for topsoil furnished from locations outside the ROW.

28000305 TEMPORARY DITCH CHECKS (LCDOT)

Effective: April 22, 2010

Revised: October 17, 2016

Description: This work shall consist of furnishing, constructing, maintaining, and removing temporary ditch checks.

General: The work shall be performed according to Section 280 of the "Standard Specifications", LCDOT Standard Drawing LC2050 and the following:

The temporary ditch check shall be triangular shaped, urethane foam covered with a geotextile fabric. The temporary ditch check shall be installed on a geotextile fabric apron. The temporary ditch check shall have a triangle base 16" – 20" wide and a minimum triangle height of 8" – 10". The temporary ditch checks shall be installed at the locations specified on the Erosion Control Plan, and/or as directed by the Engineer. The temporary ditch check installation shall be according to the detail shown on the plans and the manufacturer's recommendations.

The geotextile fabric shall conform to Article 1080.05 of the "Standard Specifications", for Geotechnical Fabric for French Drains.

The temporary ditch checks shall remain in place until just before placing the final landscaping in the ditch area. The Contractor shall not remove the temporary ditch checks if it is raining and/or rain is in the immediate forecast.

The ditch checks shall become the property of the Contractor upon their removal.

During the construction operation when any loose material is deposited in the flow line of ditches, gutters or drainage structures so the natural flow of water is obstructed, the material shall be removed at the close of each working day.

At the conclusion of the construction operations all drainage structures shall be free from all dirt and debris. This work will not be paid for separately but shall be considered included in the unit cost of TEMPORARY DITCH CHECKS.

Method of Measurement: Temporary Ditch Checks will be measured in place and the length calculated in feet for each ditch check section actually installed.

Basis of Payment: This work will be paid for at the contract unit price per foot for TEMPORARY DITCH CHECKS. The unit price shall include all work and materials necessary to properly install the temporary ditch checks, maintain the temporary ditch checks throughout the project, and to remove and dispose of the used materials at the completion of the project.

28000400 PERIMETER EROSION BARRIER (LCDOT)

Effective: January 1, 2007

Revised: October 17, 2016

Description: This work shall consist of constructing, maintaining, removing and disposing of perimeter erosion barrier as part of the project's temporary erosion control system.

General: The work shall be performed according to Section 280 of the "Standard Specifications" and the following:

The perimeter erosion barrier shall be limited to temporary silt filter fence meeting the requirements of AASHTO Standard M 288-00. This specification is applicable to the use of a geotextile as a vertical, permeable interceptor designed to remove suspended soil from overland water flow. The function of a temporary silt fence is to filter and allow settlement of soil particles from sediment-laden water. The purpose is to prevent the eroded soil from being transported off the construction site by water runoff.

All removed materials shall be disposed of outside the right-of-way according to Article 202.03 of the "Standard Specifications".

Materials:

Geotextile Requirements: The geotextile used for the temporary silt fence shall be classified as supported (with a wire or polymeric mesh backing) or unsupported (no backing). The temporary silt fence geotextile shall meet the requirements of Table 6 included below. All numeric values except Apparent Opening Size (AOS) represent Minimum Average Roll Values (MARV as defined in ASTM D4439). The values for AOS are the Maximum Average Roll Values.

Table 6 – Temporary Silt Fence Requirements

Requirements	Test Methods	Wire Backed Supported Silt Fence ^a	Unsupported Silt Fence	
			Geotextile Elongation ≥50% ^b	Geotextile Elongation <50% ^b
Maximum Post Spacing		4 feet	4 feet	6 feet
Grab Strength	ASTM D 4632			
Machine direction		90 lbs	124 lbs	124 lbs
X-Machine direction		90 lbs	100 lbs	100lbs
Permittivity ^c	ASTM D 4491	0.05 sec ⁻¹	0.05 sec ⁻¹	0.05 sec ⁻¹
Apparent Opening Size	ASTM D 4751	0.024in maximum average roll value		
Ultraviolet stability (retained strength)	ASTM D 4355	70% after 500 hours of exposure		

Notes:

- a) Silt fence support shall consist of 14-gauge steel wire with a mesh backing of 6" x 6" or prefabricated polymeric mesh of equivalent strength.
- b) As measured according to ASTM D 4632.
- c) These default filtration property values are based on empirical evidence with a variety of sediments. For environmentally sensitive areas, a review of previous experience and/or site or regionally specific geotextile tests should be performed by the agency to confirm suitability of these requirements.

Support Posts: The support posts may be composed of wood, steel or a synthetic material. The posts shall be a minimum length of 3 feet plus the buried depth. They shall have sufficient strength to resist damage during installation and to the support the applied loads due to material build up behind the silt fence.

- 1) Hardwood posts shall be a minimum of 1.2" x 1.2"
- 2) No. 2 southern pine posts shall be a minimum of 2.6" x 2.6"
- 3) Steel posts may be U, T, L, or C shape, weighing 1.3 lbs per foot.

Fence Support: The wire or polymer support fence shall be at least 30" high and strong enough to support the applied loads. Polymer support fences shall meet the same ultraviolet degradation requirements as the geotextile material (see table 6).

The wire support fence shall:

- Be a minimum of 14-gauge.
- Have a minimum of six horizontal wires.
- The maximum vertical wire spacing shall be 6".

Construction:

The silt fence shall be installed with a minimum height above ground of 30". The geotextile at the bottom of the fence shall be buried, in a "J" configuration to a minimum depth of 6", in a trench so that no flow can pass under the silt fence. The trench shall be backfilled and the soil compacted over the geotextile.

The geotextile shall be spliced together with a sewn seam or two sections of fence may be overlapped instead. The sewn seam shall be positioned only at a support post.

The Contractor must demonstrate to the satisfaction of the Engineer that the geotextile can withstand the anticipated sediment loading.

The posts shall be placed at the spacing shown on the project plans. The posts shall be driven or placed a minimum of 20" into the ground. The depth shall be increased to 24"

if the fence is placed on a slope of 3:1 or greater. If the 20" depth is impossible to obtain, the posts shall be adequately secured to prevent overturning of the fence due to sediment loading.

The support fence shall be securely fastened to the upslope side of the fence post. The support fence shall extend from the ground surface to the top of the geotextile.

When un-supported fence is used, the geotextile shall be securely fastened to the fence posts.

Field monitoring shall be performed to verify that the placement of an armor system does not damage the geotextile.

Silt fences should be continuous and transverse to the flow. The silt fence should follow the contours of the site as closely as possible. The fence shall also be placed such that run off cannot flow around the end(s) of the fence.

The silt fence should be located so that the drainage area is limited to an area equivalent to 1000 square feet for each 10 feet of fence length. Caution should be used where the site slope is greater than 1:1, and/or water flow rates exceed 0.1 cubic feet per second for each 10 feet of fence length.

Maintenance:

The Contractor shall inspect all temporary silt fences immediately after each rainfall and at least daily during prolonged rainfall. The Contractor shall immediately correct any deficiencies.

The Contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist as determined by the Engineer, additional silt fence shall be installed as directed by the Engineer.

Damaged or otherwise ineffective silt fences shall be repaired or replaced promptly.

Sediment deposits shall either be removed when the deposit reaches half the height of the fence or a second silt fence shall be installed as directed by the Engineer.

The silt fence shall remain in place until the Engineer directs it to be removed. After the fence removal, the Contractor shall remove and dispose of any excess sediment accumulations, dress the area to give it a pleasing appearance, and cover with vegetation all bare areas according to the contract requirements.

The removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the Engineer.

During the construction operation when any loose material is deposited in the flow line of ditches, gutters or drainage structures so the natural flow of water is obstructed, the material shall be removed at the close of each working day.

At the conclusion of the construction operations all drainage structures shall be free from all dirt and debris. This work will not be paid for separately but shall be considered included in the unit cost of PERIMETER EROSION BARRIER.

Method of Measurement: This work will be measured for payment in place in feet.

Basis of Payment: This work will be paid for at the contract unit price per foot for PERIMETER EROSION BARRIER. The unit price shall include all work and materials necessary to properly install the perimeter erosion barrier, maintain the perimeter erosion barrier throughout the project, and to remove and dispose of the used materials at the completion of the project.

28000510 INLET FILTERS (LCDOT)

Effective: October 17, 2016

Revised: May 16, 2018

Description: This work shall consist of furnishing, constructing, maintaining, removing, and disposing of inlet filters as part of the project's temporary erosion control system.

Materials: Materials shall be according to Article 1081.15 of the "Standard Specifications", and the following:

Drop-in inlet protection devices shall include an overflow which prevents stormwater from flooding paved areas.

General: The work shall be performed according to Section 280 of the "Standard Specifications", and the following:

During the construction operation when any loose material is deposited in the flow line of ditches, gutters or drainage structures so the natural flow of water is obstructed, the material shall be removed at the close of each working day.

At the conclusion of the construction operations all drainage structures shall be free from all dirt and debris. This work will not be paid for separately but shall be considered included in the unit cost of INLET FILTERS.

Method of Measurement: This work will be measured for payment as individual items and the unit of measurement will be each regardless of the size or type of inlet being protected.

Basis of Payment: This work will be paid for at the contract unit price per each for INLET FILTERS. The unit price shall include all work and materials necessary to properly install the inlet protection, maintain the inlet protection throughout the project, and to remove and dispose of the used materials at the completion of the project.

**DIVISION 400. SURFACE COURSES, PAVEMENTS,
REHABILITATION, AND SHOULDERS**

ARTICLE 406.11 SURFACE TESTS (LCDOT)

Effective: April 1, 2008

Revised: May 19, 2014

The completed surface course will be tested for smoothness in the wheel paths with a 16 ft straightedge according to Article 406.11 of the "Standard Specifications" and the following:

The Contractor shall furnish the appropriate personnel and equipment required to perform the surface course testing according to Article 406.11 of the "Standard Specifications". The testing shall be performed to the satisfaction of the Engineer. The testing shall be performed at a time and date chosen by the Engineer, which may or may not be the day of paving. Traffic control and protection for the testing shall be included. The testing, including all required personnel and equipment, will be considered included in the unit bid prices for Hot-Mix Asphalt Surface Course of the Mix and, N value specified and provided at no additional cost to the Department. No additional compensation will be allowed for testing not performed on the day of paving.

At the Engineer's discretion the surface testing may include sections of the highway repaired with partial depth or full depth pavement patching and/or areas of pavement replacement.

42001300 PROTECTIVE COAT (LCDOT)

Effective: January 1, 2007

Revised: May 19, 2014

Description: This work shall consist of applying a protective coat to exposed concrete surfaces.

Materials: The protective coat shall meet the requirements of Article 1023.01 of the "Standard Specifications".

General: The work shall be performed according to Article 420.18 of the "Standard Specifications" except that:

The protective coat shall be applied to the exposed surfaces of all concrete pavements and appurtenances regardless of the calendar date limitations contained in the first paragraph of Article 420.18 of the "Standard Specifications".

Method of Measurement: The exposed surfaces of all concrete pavements and appurtenances will be measured in place and the area computed in square yards.

Basis of Payment: This work will be paid for at the contract unit price per square yard for PROTECTIVE COAT. The unit price shall include all materials, equipment and labor required for two applications of protective coat to exposed surfaces of concrete pavements and appurtenances. The unit price shall include both applications with no additional compensation for the second coat.

42400800 DETECTABLE WARNINGS

Description: This work shall consist of furnishing and installing PROWAG compliant detectable warnings in concrete accessibility ramps.

Materials: The detectable warnings shall be cast iron panels or powder coated, 10 gauge galvanized steel panels, of the sizes shown on the plans.

➤ **The cast iron panels shall meet the following material specification:**

The detectable warning plate shall be constructed of gray iron meeting the requirements of Article 1006.14 of the "Standard Specifications" and ASTM A48, CLASS 30A, 30B or 35B; or cast ductile iron meeting the requirements of Article 1006.15 of the "Standard Specifications".

The coating system shall consist of a rust inhibiting epoxy primer and a finish coat.

The epoxy primer shall have the following properties:

Property	Test Method	Performance
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Corrosion Resistance (Salt Spray)	ASTM B117	1000 Hours Minimum

Cold Rolled Steel Lab Panels

The finish coat shall be a powder coat and shall have the following properties:

Property	Test Method	Performance
Color	---	Federal Yellow
Corrosion Resistance (Salt Spray)	ASTM B117	1000 Hours Minimum

Cold Rolled Steel Lab Panels

➤ **The galvanized steel panels shall meet the following material specification:**

The detectable warning plate shall be constructed of 10 gauge steel with a G-90 grade galvanization.

The galvanized surface shall be chemically etched and sealed for stabilization. The finish coat shall be a powder coat and shall have the following properties:

Property	Test Method	Performance
Color	---	Federal Yellow #33538
Corrosion Resistance (Salt Spray)	ASTM B117	1000 Hours Minimum

General: The installation of detectable warnings shall meet the requirements of Article 424.09 of the “Standard Specifications” and the following:

Contractors shall not mix the panel materials in a single ramp and/or intersection installation.

Field Cutting of Detectable Warnings: Panels may be field cut, as required, and as directed by the Engineer, in accordance with manufacturer’s specifications. The exposed edge of cut panels shall be treated with a rust inhibiting epoxy primer and a finish coat to match the manufacturer applied epoxy primer and finish coat. In addition, the drilling of anchor holes, as required, shall be completed as directed by the Engineer and in accordance with manufacturer’s specifications.

Method of Measurement: This work will be measured for payment in place installed, in square feet. The concrete area under the detectable warnings will be measured for payment as PORTLAND CEMENT CONCRETE SIDEWALK of the thickness specified, with no deductions made for the detectable warning panels located within the ramp.

Basis of Payment: This work will be paid for at the contract unit price per square foot of DETECTABLE WARNINGS. The unit price shall include all equipment, materials and labor required to install the panels.

DIVISION 500. STRUCTURES

50105220 PIPE CULVERT REMOVAL

Effective: April 11, 2017

Revised: October 31, 2022

Description: This work shall consist of the removal of existing pipe culverts including pipes, end sections, and grates. The existing culverts may be constructed of reinforced concrete, metal, and/or plastic.

General: The work shall be performed according to Section 501 of the "Standard Specifications" and the following:

None of the pipe culvert items/components scheduled for removal have been designated for salvage by LCDOT. The Contractor shall transport the removed culvert components from the project site and dispose of them outside the ROW according to Article 202.03 of the "Standard Specifications".

Trenches resulting from the removal of pipe culverts shall be backfilled according to the applicable requirements of Article 550.07 of the "Standard Specifications".

"All Materials" shall include existing concrete, metal and/or plastic pipes.

Method of Measurement: Pipe Culvert Removal will be measured in place, in feet along the invert of the existing culvert.

Basis of Payment: Pipe culvert removal will be paid for at the contract unit price per foot for PIPE CULVERT REMOVAL, for PIPE CULVERT REMOVAL (SPECIAL), or for PIPE CULVERT REMOVAL, SPECIAL of the group specified. The unit price shall include all materials, labor and equipment required to excavate and remove the existing pipe; store and safeguard any pipe and/or components designated for salvage; transport and dispose of removed materials; and backfill the excavated trench. For removals under existing and/or proposed pavement the backfill will be paid for per cubic yard of TRENCH BACKFILL and pavement replacement will be paid for as CLASS D PATCHES, TYPE III, 12 INCH. Pipe culvert removal shall include pipes, end sections and grates.

SECTION 542 AND SECTION 550 – JOINT TIES FOR CONCRETE PIPE (LCDOT)

Effective: January 1, 2008

Revised: May 19, 2014

Description: This work shall consist of furnishing and installing joint ties for concrete pipe culverts and/or concrete storm sewers.

Materials: The steel threaded rod, eye bolts, sleeve nuts, hex nuts, and washers, shall meet the requirements of ASTM A 307. They shall be zinc-coated according to AASHTO M 232 or AASHTO M 298, Class 50. The galvanized coat shall be a maximum of 6 mils thick.

The steel cast-in-place inserts shall be zinc-coated according to AASHTO M 232, AASHTO M 298, Class 50 with galvanizing not to exceed 6 mils, or ASTM B 633 SC 3.

General: The installation of pipe culvert shall be according to Section 542 of the “Standard Specifications” and the installation of storm sewers shall be according to Section 550 of the “Standard Specifications” with the addition of the following:

The work shall include the installation of joint ties. The joint ties shall be installed according to the LCDOT standard LC5402 JOINT TIES FOR CONCRETE PIPE, included in the plans. The ties shall be installed at the locations as shown on the standard and/or as directed by the Engineer.

Basis of Payment: The work will not be paid for separately. For proposed culverts and/or storm sewer the cost of furnishing and installing the ties, including all required materials and labor, shall be included in the contract unit price of the concrete PIPE CULVERTS and/or concrete STORM SEWERS of the size and type specified.

SECTION 550 STORM SEWER (LCDOT)

Effective: October 17, 2016

Description: This work shall consist of constructing storm sewers.

General: The work shall be performed according to Section 550 of the "Standard Specifications" and the following:

The cost of connecting proposed storm sewer to existing structures shall be included in the unit cost of the proposed storm sewer. Additional pipe required to complete the connections will be paid for at the contract unit price for STORM SEWER of the type, size and class required.

Temporary sheeting or bracing for sewer trenches that may be required shall be the responsibility of the Contractor. The cost of this work shall be included in the unit price for STORM SEWER of the type, size and class specified.

At locations where the proposed storm sewer crosses over utilities, a 4" Styrofoam cushion shall be placed under the storm sewer when directed to do so by the Engineer. This work shall be included in the unit price for STORM SEWER of the type, size and class specified.

Basis of Payment: This work will be paid for according to Article 550.10 of the "Standard Specifications".

TEMPORARY WATER SHUTDOWNS

Description. The Village of Riverwoods Water Division shall be notified at least forty-eight (48) hours (not including holidays and weekends) in advance of any water shutdown. The Village will determine what residences will be affected by the shutdown and supply to the Contractor shut-off notice handouts and those areas to be notified. The Contractor shall be responsible for distributing handouts to affected residences.

The turning of any valve other than those installed but not yet accepted by the Village shall be performed by water division personnel. Before the system is returned to service, a fire hydrant must be opened to relieve any air in the line and to flush the system. After the system is fully flushed, Contractor will collect chlorine residual and bacteriological samples. Another sample will be collected after 24 hours.

Basis of Payment. This work will not be paid for separately but shall be included in the bid price for WATER MAIN.

56100XXX WATER MAIN

Description. This work shall consist of constructing water main.

General. This item shall include all labor, material, and equipment necessary to furnish and construct water main and fittings, of the diameter specified in accordance with Section 561 of the Standard Specifications, Section 41 of the Standard Specifications for Water and Sewer Construction in Illinois, and as specified herein.

Materials. Water Main shall be AWWA C900/1B Pressure Pipe conforming to AWWA Standard C-900-16 and as follows:

1. Dimension Ratio: DR 18
2. Pipe Compound: ASTM D1784 Cell Class 12454
3. Pipe Joint Standard: ASTM D3139
4. Gasket Standard: ASTM F477, UL 157
5. Installation Standard: AWWA C605

All bends, fittings and accessories required for installation of the water main as specified and shown on the plans shall be included in the cost of water main. 90-degree bends will not be allowed. Additionally, any fittings required that are not shown on the plans, will be included in the cost of the water main.

Tracer wire shall be furnished and installed with the PVC water main with underground utility warning tape installed 12-inches above the main. The tracer wire shall be either taped or zip tied to the PVC water main as approved by the Engineer. The tracer wire shall be taped/tied to the right side of the main (south or east depending on water main orientation). The warning tape shall be placed on the top of the initial backfill directly above the centerline of the water main. Tracer wire shall be accessible at all fire hydrant auxiliary valves and water valve vaults. Tracer wire shall be anchored to the inside of valve boxes and/or valve vaults at a location that can easily be accessed from the opening of the box/vault. Method of anchoring tracer wire shall be approved by the Engineer. Tracer wire shall be #10 solid insulated copper wire. Splicing of wires and conduit between valve boxes or vaults will not be permitted. Conduit shall extend into and terminate with the valve box or valve vault. If the tracer wire is damaged, the Contractor will be responsible for replacing the entire line at his own expense including all work and materials required to remove the damaged line and install the new line. Tracer wire and underground warning tape shall not be paid for separately but shall be included in the cost of the PVC water main. This shall include labor, materials, and equipment wire.

Construction. The requirements of Section 40-2.01 of the Standard Specifications for Water and Sewer Construction in Illinois are modified as follows:

No deflection of pipe will be allowed unless specified on the plans or approved in writing by the Engineer.

Vertical offsets shown on the plans will not be paid for separately but shall be included in the linear foot price of the water main.

Thrust Blocking. Preformed concrete block thrust blocking shall be provided at all bends greater than 10 degrees, at all mechanical joint connections, and at all fire hydrants.

Testing and Chlorination. All testing and chlorination shall conform to Sections 41-2.12 and 41-2.13 of the Standard Specifications for Water and Sewer Construction in Illinois AWWA C651-14 and the requirements of the Municipality.

Pressure testing of water main shall be in accordance with Section 41-2.12 of the Standard Specifications for Water and Sewer Construction in Illinois and as specified herein. Water main shall be subjected to a minimum hydrostatic pressure test of 150 pounds per square inch (psi) for a period of not less than two (2) hours. The maximum allowable leakage shall be as stated in Section 41-2.14C of the Standard Specifications for Water and Sewer Construction in Illinois. In addition, the hydrostatic pressure shall not drop more than five (5) psi during the test.

Disinfection of water main shall be performed according to AWWA C651-14 and Section 41-2.15 of the Standard Specifications for Water and Sewer Construction in Illinois. Where conflicts between the above requirements exist, the more restrictive requirement shall govern or as approved by the Engineer. Chlorine shall be applied by the use of (1) liquid chlorine only.

Method of Measurement. This work will be measured for payment in place in feet. The length measured will include fittings.

Basis of Payment. This work will be paid for at the contract unit price per foot for WATER MAIN, of the diameter specified.

56105XXX WATER VALVES

Description. This work shall consist of all labor, material, and equipment necessary to furnish and install water valves.

General. This work shall be completed in accordance with Section 561 of the Standard Specifications, Section 42 of the Standard Specifications for Water and Sewer Construction in Illinois, and as specified herein.

Materials. Water valves shall right-hand closing Resilient Wedge gate valves, conforming to AWWA Standard C-5151 as manufactured by the Clow Corporation or Waterous Company. All below grade factory installed bolts and fasteners shall be 304- grade stainless steel.

Basis of Payment. This work will be measured in place and paid for at the contract unit price per each for WATER VALVES of the size specified.

561105XXX INSERTING VALVES

Description. This work shall consist of installing water valves into existing water main under pressure at the locations as shown on the plans or as directed by the Engineer.

Connections shall be made through a gate valve that complies with the special provision for Water Valves.

The Contractor shall submit the proposed method of valve insertion to the Engineer for his review before any work is performed. The method used must be watertight and shall not interrupt flow through the water main.

Measurement and Payment: This work will be paid for at the contract unit price each for INSERTING VALVES, of the diameter specified, which price shall be payment in full for all excavation, sheeting, shoring and trench backfill. Valve vaults will be paid for separately.

56200XXX WATER SERVICE LINE

Description. This work shall consist of constructing a water service line.

General. This work shall be completed in accordance with Section 41 of the Standard Specifications for Water and Sewer Construction in Illinois, Section 562 of the Standard Specifications, and as specified herein.

Construction. The Contractor has the option of installing the short service lines with open cut or trenchless methods. Any trench backfill, capping stone, capping stone removal prior to paving, additional saw cuts, additional restoration from drilling equipment or other items as necessary to facilitate the installation of the service lines shall be included in the cost of the work.

All long service lines are required to be installed via an approved trenchless method.

Trench backfill required for excavations to make connections under sidewalks or driveways will be paid for separately.

Materials. Water service line shall be copper tube, Type K, meeting ASTM B88. Corporation stops shall be Mueller H-15000N, 1" minimum, meeting AWWA C800, direct tap.

Method of Measurement. This work will be measured for payment in place in feet. The length measured will include corporation stops and curb stops.

Basis of Payment. This work will be paid for at the contract unit price per foot for WATER SERVICE LINE of the diameter specified.

56201800 CORPORATION STOPS 2"

Description. This work shall consist of installing a corporation stop, with copper tubing, for water main testing.

Construction. Work shall include the installation of a new corporation stop and tap connection to the water main, tapping sleeve, any necessary copper tubing

Materials. Corporation stops shall be Mueller H-15000N, meeting AWWA C800, direct tap. Water service line shall be copper tube, Type K, meeting ASTM B88.

Basis of Payment. This work will be paid for at the contract unit price per each for CORPORATION STOPS 2".

56300300 ADJUSTING WATER SERVICE LINES

Description. This work shall consist of adjusting water service lines.

General. This work shall be completed in accordance with Section 41 of the Standard Specifications for Water and Sewer Construction in Illinois, Section 563 of the Standard Specifications, and as specified herein.

Materials. Water service line shall be copper tube, Type K, meeting ASTM B88. Connections to existing water service lines shall be completed with Mueller H-15400N straight, three-part unions.

Method of Measurement. This work will be measured for payment in place in feet.

Basis of Payment. This work will be paid for at the contract unit price per foot for ADJUSTING WATER SERVICE LINES.

56400500 FIRE HYDRANTS TO BE REMOVED

Description. This work shall consist of the removal and disposal of existing fire hydrant assemblies, including the lead-in water main.

General. Fire hydrants shall be removed completely, including, but not limited to, the entire barrel section including the seat and the valve box, and disposed of in accordance with Article 202.03 of the Standard Specifications. The open excavation shall be backfilled with trench backfill or other engineer-approved materials (included in the cost of the work).

Basis of Payment. This work will be measured in place and paid for at the contract unit price per each for FIRE HYDRANTS TO BE REMOVED.

56400820 FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX

Description. This work shall include all labor, material, and equipment necessary to furnish and install fire hydrant assemblies.

General. This work shall include the installation of a new tee and fire hydrant and shall be completed in accordance with Section 564 of the Standard Specifications, Section 45 of the Standard Specifications for Water and Sewer Construction in Illinois, as specified herein, and the details in the plans.

Materials.

Fire Hydrants shall be: Waterous Pacer Model WB-67-250 – Red Factory and shall include:

1. 6" mechanical joint connection
2. 5 1/4" valve opening
3. 5-1/2' cover over hydrant lateral
4. 6" valve on lateral
5. "Hydra-finder" standard hydrant locator, installed
6. Valve box shall have a valve box stabilizer installed*
7. 30" center hydrant to center of valve.
8. *(Valve box adaptor #2 type A, as made by Adaptor, Inc.)
9. All hydrants shall have a sacrificial anode. (see drawing in Section X)
10. Fire Hydrant Paint: Safety Red Tinted via Chromascan system

This work effort includes all materials required to fully complete the fire hydrant assembly installation in accordance with the plan detail including, but not limited to, fire hydrant tee, "direct assembly" auxiliary valve, mechanical joint gaskets, auxiliary valve box and stabilizer, thrust blocking, joint restraints and backfill, etc., except open excavations shall be backfilled trench backfill. All lead in piping from the main to the new hydrant location will be paid for separately.

The Contractor will be responsible for protecting the installed hydrants during construction. It is recommended that the hydrants be covered with a protective bag to prevent chipping, scratching or other damage to the hydrants during construction. Any damage to the factory installed paint shall be repaired at the factory. Touch up paint or spray paint will not be an acceptable method of painting for any new hydrants.

Fire hydrants shall be set plumb and level with their nozzles paralleled with or at right angles to the roadway, with the pumper nozzle normal to the roadway. They shall conform

to the established grade, with nozzles at a minimum of eighteen (18) inches above finished grade.

Open excavations shall be backfilled with trench backfill, which shall be included in the cost of the work.

Basis of Payment. This work will be measured in place and paid for at the contract unit price per each for FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX.

56400825 FIRE HYDRANT WITH AUXILIARY VALVE, VALVE BOX AND TEE

Description. This work shall include all labor, material, and equipment necessary to furnish and install fire hydrant assemblies. The fire hydrant will be installed through a new tee on the existing water main.

General. This work shall include the installation of a new tee and fire hydrant. This work shall also include the removal of an existing tee and the installation of new water main, including all fittings to replace the tee that is removed. Removal of existing fire hydrants will be paid for separately. This work shall be completed in accordance with Section 564 of the Standard Specifications, Section 45 of the Standard Specifications for Water and Sewer Construction in Illinois, as specified herein, and the details in the plans.

Existing fire hydrants shall remain in service until the proposed fire hydrants are accepted by the Engineer and ready to be put into service.

Materials.

Fire Hydrants shall be: Waterous Pacer Model WB-67-250 – Red Factory and shall include:

- 11. 6" mechanical joint connection
- 12. 5 1/4" valve opening
- 13. 5-1/2' cover over hydrant lateral
- 14. 6" valve on lateral
- 15. "Hydra-finder" standard hydrant locator, installed
- 16. Valve box shall have a valve box stabilizer installed*
- 17. 30" center hydrant to center of valve.
- 18. *(Valve box adaptor #2 type A, as made by Adaptor, Inc.)
- 19. All hydrants shall have a sacrificial anode. (see drawing in Section X)
- 20. Fire Hydrant Paint: Safety Red Tinted via Chromascan system, Color Number 71016 Base-QNA044/3GL.

This work effort includes all materials required to fully complete the fire hydrant assembly installation in accordance with the plan detail including, but not limited to, fire hydrant tee, "direct assembly" auxiliary valve, mechanical joint gaskets, auxiliary valve box and stabilizer, thrust blocking, joint restraints and backfill, etc., except open excavations shall be backfilled trench backfill. All lead in piping from the main to the new hydrant location will be paid for separately.

The existing water system will have to be shut down for the fire hydrant to be installed, which shall be paid for separately as non-pressure connection to existing water main.

The Contractor shall have all necessary materials and equipment on hand at the locations of the fire hydrant installation before the shutdowns are made. The shut down period for the fire hydrant installation shall not exceed 6 hours.

The Contractor will be responsible for protecting the installed hydrants during construction. It is recommended that the hydrants be covered with a protective bag to prevent chipping, scratching or other damage to the hydrants during construction. Any damage to the factory installed paint shall be repaired at the factory. Touch up paint or spray paint will not be an acceptable method of painting for any new hydrants.

Fire hydrants shall be set plumb and level with their nozzles paralleled with or at right angles to the roadway, with the pumper nozzle normal to the roadway. They shall conform to the established grade, with nozzles at a minimum of eighteen (18) inches above finished grade.

Open excavations shall be backfilled with trench backfill, which shall be included in the cost of the work.

Basis of Payment. This work will be measured in place and paid for at the contract unit price per each for FIRE HYDRANT WITH AUXILIARY VALVE, VALVE BOX AND TEE.

56500600 DOMESTIC WATER SERVICE BOXES TO BE ADJUSTED

Description. This work shall consist of adjusting existing domestic water service boxes.

Construction Requirements. Boxes shall be adjusted to proposed grade by rotating the upper screw-threaded element, or in a manner with the approval of the Engineer. The adjustment shall not lift the lower piece off the shutoff valve, and the Contractor shall ensure that the box remains tight fitting to the valve nozzle.

If extensions are required, they will not be paid for separately but shall be included in the cost of the work.

Method of Measurement. This work will be measured for payment in place in units of each existing water service box adjusted to proposed grade.

Basis of Payment. This item will be paid for at the contract unit price per each for DOMESTIC WATER SERVICE BOXES TO BE ADJUSTED.

X562003X WATER SERVICE CONNECTION

Description. This work shall consist of connecting new water service piping to the existing water service.

General. This work shall include all labor, material, and equipment necessary to complete the connection of the new water service piping to the existing water service and shall be completed in accordance with Section 41 (with special attention to Article 41.2.13) of the Standard Specifications for Water and Sewer Construction in Illinois and as specified herein.

All service boxes will be replaced. The existing water service piping is unknown and may include lead, copper, galvanized iron, or other material types. The Contractor shall provide all necessary fittings to connect new water service to the existing water service including a new curb stop and service box. It is the Contractor's responsibility to determine the existing material, depth, size, and location of the existing service at the connection location.

House connections to proposed main shall be made individually and in as short of time as possible after testing and disinfection. No water customer shall be without water in excess of two (2) hours and shall be notified prior to disconnecting service.

Any damage to existing water service lines during construction shall be repaired with the existing main under pressure. The contractor shall have a crimping tool and e-z out or freeze kit onsite to make repairs as needed. Repair of service lines in this manner shall only be performed on lines that will be abandoned as part of this project. This work shall be included in the cost of the work. All water services shall be connected back to the existing service line as approved by the Engineer. The contractor is responsible for locating the service line at the point of connection on the house side of the b-box.

If larger than one inch (1") services are encountered during construction the Contractor shall match the existing service size. This additional work will be paid for with applicable pay items or in accordance with Article 109.04 Payment for Extra Work of the Standard Specifications.

Disposal of existing water service boxes, curb stops, etc. shall be completed in accordance with Article 202.03 of the Standard Specifications.

Materials. Curb stops shall be Mueller H-15154N, resilient wedge counterclockwise to open, AWWA C500. Joint end—mechanical, AWWA C111. Curb boxes shall be Mueller H-10302.

All fittings for copper service lines shall be of the "flare" type regardless of temporary or permanent use.

All work as listed and as shown on the plan and details shall be included with this pay item.

Homeowner Notification. The Contractor will be required to notify homeowners and business owners 48 hours prior to affecting their service line. Upon reconnection of water services to the new water main the Contractor shall hang a door tag with instructions for the homeowner to be provided by the Village. The information on this door tag will not relieve the Contractor from normal duties expected when installing and reconnecting water service lines to prevent damage to internal plumbing systems of a residence or business.

Basis of Payment. This work will be paid for at the contract unit price per each for WATER SERVICE CONNECTION of the diameter specified.

60248700 VALVE VAULTS, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID
60248900 VALVE VAULTS, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID

Description. This work shall consist of constructing valve vaults with frames and lids.

General. This work shall be completed in accordance with Section 602 of the Standard Specifications and as follows:

- Barrel sections shall be sealed using a butyl rubber or rubber strip
- The words "WATER" and "Village of Riverwoods" shall be cast into the surface of the lid
- All vaults shall include steps.

Basis of Payment. This work will be measured in place and paid for at the contract unit price per each for VALVE VAULTS, TYPE A, TYPE 1 FRAME, CLOSED LID of the diameter specified.

X5610804 NON-PRESSURE CONNECTION TO EXISTING WATER MAIN

Description. This work shall consist of completing non-pressure connections between the proposed water main and existing water main.

General. This work shall be completed in accordance with Section 41 of the Standard Specifications for Water and Sewer Construction in Illinois and as specified herein.

Construction Requirements. The work shall include all pipe, reducers, fittings, solid sleeves, excavation, concrete thrust blocking, and disposal of surplus excavated materials. Connection of ductile iron water main to existing cast iron water main will require the use of a solid sleeve, as approved by the Engineer. The Contractor shall notify the Engineer a minimum of 72 hours prior to any required water main shutdowns.

Since these connections cannot be pressure tested or chlorinated, the Contractor shall swab all pipe fittings with a 2% hypochlorite solution using a new clean long-string mop in the presence of the Engineer, and the new section of water main must be pressurized prior to backfilling. 441 OMNI Couplings shall not be permitted.

This pay item shall also include the removal of the existing water main pipe as necessary to install the proposed improvements as shown on the Engineering plans. All ductile iron water main will be paid for separately to the connection point at the existing main.

Because of the age of the existing water system, the Village cannot assure that a complete shutdown will be achievable. The Contractor shall be equipped with enough pumps as necessary to complete the work as specified herein.

Basis of Payment. This work will be paid for at the contract unit price per each for NON-PRESSURE CONNECTION TO EXISTING WATER MAIN.

X5610806 PRESSURE CONNECTION TO EXISTING WATER MAIN

Description. This work shall consist of completing pressure connections of the proposed water main to the existing water main.

General. This work shall be completed in accordance with Section 46 of the Standard Specifications for Water and Sewer Construction in Illinois and as specified herein.

Materials. The pressure connection tapping sleeve shall be Ford FTSS Style and shall be manufactured of 100% stainless steel and shall feature Type 304 stainless steel body, outlet, flange, studs, nuts, washers, lugs, and armor, and shall be pressure-rated for 250 psi.

The tapping valve shall be resilient wedge type with bodies and bonnets made of ductile iron for 250 psig working pressure. All tapping valves shall include a minimum 3/8" NPT pipe plug on the bonnet of the valve body to aid in the field testing of the valve. All interior and exterior ferrous surfaces shall be protected against corrosion by fusion-bonded epoxy coating. The coating shall be applied prior to assembly to assure coverage of all exposed areas, including bolt holes.

The Contractor shall provide shop drawings to the Engineer for the tapping sleeve and tapping valve prior to ordering materials.

Basis of Payment. This work will be paid for at the contract unit price per each for PRESSURE CONNECTION TO EXISTING WATER MAIN.

X56300XX CUT AND CAP EXISTING WATER MAIN

Description. This work shall include all labor, material, and equipment necessary to excavate, expose, and cut and cap existing water main pipe

General. This item shall only be used at locations shown on the Engineering plans or at the direction of the Engineer. If applicable, plugs or caps that are required at existing fire hydrant leads, valves that were removed, or for temporary use to abandon the water main in place will be included in the cost of each applicable pay item.

This work shall be completed in a neat and workmanlike manner as specified herein. This item shall only be used at locations shown on the Engineering plans or at the direction of the Engineer.

Materials. Ends shall be capped with an Engineer-approved mechanical plug or cap to prevent infiltration into the abandoned water main. Aggregate trench backfill material will be paid for according to Article 208.04 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for CUT AND CAP EXISTING WATER MAIN, of the diameter specified.

X6026057 SANITARY MANHOLES TO BE RECONSTRUCTED WITH NEW TYPE 1 FRAME, CLOSED LID

Description. This work shall consist of reconstructing sanitary manholes (including replacing flat slab tops) with new Type 1 Frames, Closed Lids.

General. This work shall be completed in accordance with Section 602 of the Standard Specifications and the provisions below. The frames and lids and flat slab tops shall be removed and disposed of in accordance with Article 202.03 of the Standard Specifications. The Contractor shall remove that portion of the sanitary manhole necessary to bring the frame and lid to the finished grade of the proposed improvement. The manhole wall shall be sawcut the entire thickness before removing concrete. The use of breakers will not be allowed. The Contractor shall repair any damage to that portion of the manhole that is to remain to the satisfaction of the Engineer.

Construction Requirements. Flat slab tops shall meet the requirements of Highway Standard 602601. Frames and lids shall be set in a full bituminous mastic bed or approved rubber gasket seal. The frame and lid shall be set accurately to the finished elevation so that no subsequent adjustment will be necessary. A chimney sealing system shall also be furnished.

The type 1 frames and lids shall meet the requirements of Highway Standard 604001, except that the lids shall be stamped with the word "SANITARY" and have concealed pick holes and watertight gaskets installed in accordance with Section 604 of the Standard Specifications.

Adjusting rings shall be in accordance with Section 1042, Article 1043.02 or Article 1043.03 of the Standard Specifications. The minimum thickness for concrete adjusting rings shall be 2".

Locations. This work shall be completed at the following locations:

- Station 111+20, 26' Rt
- Station 115+79, 24' Rt
- Station 117+17, 25' Rt

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE RECONSTRUCTED WITH NEW TYPE 1 FRAME, CLOSED LID.

X6026622 VALVE VAULTS TO BE REMOVED

Description. This work shall consist of removing valve vaults.

General. This work shall be completed in accordance with Section 605 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for VALVE VAULTS TO BE REMOVED.

CONCRETE MEDIAN (SPECIAL)

Description. This work shall consist of constructing concrete median with curb and gutter.

Construction. This work shall be completed in accordance with Section 606 of the Standard Specifications, IDOT Highway Standard 606301, and the details in the plans.

Method of Measurement. This work will be measured for payment in place and the area computed in square feet, including the curb and gutter.

Basis of Payment. This work will be paid for at the contract unit price per square foot for CONCRETE MEDIAN (SPECIAL).

DIVISION 600. INCIDENTAL CONSTRUCTION

60108104 PIPE UNDERDRAINS, TYPE 1, 4" (LCDOT)

Effective: January 1, 2007

Revised: March 3, 2016

Description: This work shall consist of constructing pipe underdrains.

Materials: The pipe underdrain materials shall meet the requirements of Article 601.02(b) of the "Standard Specifications" except that:

The pipe shall be limited to:

- (2) Perforated Polyvinyl Chloride (PVC) Pipe [1040.03(b)]
- (3) Perforated Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior [1040.03(c)]
- (5) Perforated Corrugated Polyethylene (PE) Pipe with a Smooth Interior [1040.04(a)]

General: The work shall be performed according to Section 601 of the "Standard Specifications" and the following:

Rodent shields and square concrete collars (where required) as shown on LCDOT standard drawing LC6020, shall be included in PIPE UNDERDRAINS, TYPE 1, 4".

Method of Measurement: Pipe underdrains shall be measured in place, in feet, of actual pipe installed.

Basis of Payment: This work will be paid for at the contract unit price per foot for PIPE UNDERDRAINS, TYPE 1, 4". The unit price shall include furnishing and placing all pipe, fittings, connecting pipes, rodent shields, bedding and concrete collars. The unit price shall also include all equipment, materials and labor required to furnish and construct the pipe underdrains.

SECTION 602 RESTRICTED DEPTH DRAINAGE STRUCTURES (LCDOT)

Effective: June 9, 2011
Revised: May 21, 2014

Description: This work shall consist of constructing restricted depth manholes, catch basins and inlets with a specified frame and grate/lid at locations identified on the plans.

Materials: The materials shall meet the requirements of Article 602.02 of the "Standard Specifications".

General: The work shall be performed according to Section 602 of the "Standard Specifications"; the applicable IDOT Highway Standard(s) for the drainage structure type (manhole, catch basin or inlet); the IDOT Highway Standard Drawing 602601 [flat slab top] and the following:

- The reinforced concrete slab shall be used in lieu of the cone section.
- A 24" sump shall be provided in a Catch Basin.
- For structures having Type 8 grates, a 24" inside diameter by 4" (minimum) high riser shall be installed on the flat slab to provide earth cover over the slab for vegetation.

Method of Measurement: This work will be measured per each of the type drainage structure installed. Drainage structures of like type, size and frame and grate/lid will be counted under the same pay item regardless of whether a cone section (regular) or flat slab (restricted depth) top is used.

Basis of Payment: This work will be paid for at the contract unit price per each for MANHOLES, CATCH BASINS or INLETS, of the type and diameter specified, and with the frame and grate or frame and lid specified. The unit price shall include all equipment, labor and materials to install the drainage structure. No additional compensation will be made for drainage structures constructed as restricted depth.

**SECTION 602 CATCH BASIN, MANHOLE, INLET, DRAINAGE STRUCTURE,
AND VALVE VAULT CONSTRUCTION, ADJUSTMENT, AND RECONSTRUCTION
(LCDOT)**

Effective: October 17, 2016

Revised: January 25, 2019

Description: This work shall consist of constructing, adjusting, or reconstructing catch basins, manholes, inlets, or valve vaults, with frames and grates or lids, and constructing drainage structures with frames and grates.

General: The work shall be performed according to Section 602 of the "Standard Specifications" and the following:

Precast concrete adjustment rings and/or common brick shall not be used within Lake County right-of-way to adjust or reconstruct catch basin, manhole, inlet and valve vault structures. The Contractor may use Expanded Polypropylene (EPP), High Density Expanded Polystyrene, High Density Polyethylene (HDPE) or Recycled Rubber adjusting rings. The Contractor shall comply with the maximum adjustment height limit specified for each material. No additional compensation will be allowed for reordering rings of a different material to meet the adjustment height required. The cost of furnishing and installing adjustment rings shall be included in the unit price for each proposed adjusted or reconstructed structure.

To accommodate topsoil placement all type 8 grates installed on flat slab tops shall be adjusted to the plan grade with a minimum of 4" of adjusting rings. The cost of furnishing and installing adjustment rings shall be included in the unit price for each proposed drainage structure.

The cost of connecting existing storm sewer to proposed structures shall be included in the unit cost of the proposed structure. Additional pipe required to complete the connections will be paid for at the contract unit price for "STORM SEWER" of the type, size and class required

All frames with closed lids to be furnished as part of this contract, for the construction, adjustment or reconstruction of manholes, catch basins, inlets, valve vaults, or meter vaults shall have cast into the lid one of the following words: Lids for storm sewer structures shall bear the word STORM. Lids for sanitary sewer structures shall bear the word SANITARY. Lids for water system structures shall bear the word WATER. Additionally, open grates or lids shall include the wording DUMP NO WASTE, DRAINS TO WATERWAYS. This work shall be included in the unit cost of the structure being constructed, adjusted or reconstructed.

Basis of Payment: This work will be paid for according to Article 602.16 of the "Standard Specifications".

6020XXXX CATCH BASINS, TYPE A (LCDOT)

Effective: January 1, 2007

Revised: May 19, 2014

Description: This work shall consist of constructing type A catch basins with frames and grates and/or frames and lids.

Materials: The materials shall meet the requirements of Article 602.02 of the "Standard Specifications".

General: The work shall be performed according to Section 602 of the "Standard Specifications", IDOT Standard Drawing 602001 and the following:

The half trap option shown on Standard 602001 is not required.

A 24" sump shall be provided.

Basis of Payment: This work will be paid for at the contract unit price per each for CATCH BASINS, TYPE A of the diameter specified, and with the frame and grate and/or frame and lid specified. The unit price shall include all equipment, materials and labor required to construct the catch basin.

MANHOLES, TYPE A, 10'-DIAMETER, TYPE 1 FRAME, CLOSED LID

Description. This work shall consist of constructing manholes with frames and lids.

General Requirements. This work shall be completed in accordance with Section 602 of the Standard Specifications and Highway Standard 602426-03.

Method of Measurement. This work will be measured for payment in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for MANHOLES, TYPE A, 10'-DIAMETER, TYPE 1 FRAME, CLOSED LID.

SECTION 604 FRAMES, GRATES, AND MEDIAN INLETS (LCDOT)

Effective: January 1, 2007

Revised: May 19, 2014

Description: This work shall be according to Section 604 of the “Standard Specifications” and the following:

This work shall consist of providing an environmental notice prominently cast into the above grade portion of the frame or grate/lid for all new or proposed drainage structures.

General: The environmental notice shall be “DUMP NO WASTE, DRAINS TO WATERWAYS” or similar wording. The frames, lids and grates shall be according to Section 604 of the “Standard Specifications”. The notice shall be cast into the Type 1 lids (open only), Type 8 grates, Type 11 grates, and Type 24 grates.

Basis of Payment: This work will not be paid for separately, but shall be included in the unit cost of the drainage structure with frame and grate/lid specified.

63100167 TRAFFIC BARRIER TERMINAL, TYPE 1 SPECIAL (TANGENT)
(LCDOT)

Effective: January 1, 2007

Revised: May 19, 2014

Description: This work shall consist of furnishing and erecting traffic barrier terminals, type 1 special (tangent).

Materials: The materials shall meet the requirements of Article 631.02 of the "Standard Specifications".

General: The work shall be performed according to Section 631 of the "Standard Specifications" and the following:

The terminal markers will be supplied and installed by the County.

Method of Measurement: The Traffic Barrier Terminal, Type 1 Special (Tangent) will be measured for payment, complete in place, in units of each, according to Article 631.12 of the "Standard Specifications".

Basis of Payment: This work will be paid for at the contract unit price per each for TRAFFIC BARRIER TERMINAL, TYPE 1 SPECIAL (TANGENT). The unit price shall include all equipment, materials and labor required to furnish and erect the traffic barrier terminal.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (PROJECT SPECIFIC)

Description. This work shall consist of the removal and disposal of regulated substances according to Section 669 of the Standard Specifications as revised below.

Contract Specific Sites. The excavated soil and groundwater within the areas listed below shall be managed as either “uncontaminated soil”, hazardous waste, special waste or non-special waste. For stationing, the lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit, whichever is less.

Soil Disposal Analysis. When the waste material requires sampling for landfill disposal acceptance, the Contractor shall secure a written list of the specific analytical parameters and analytical methods required by the landfill. The Contractor shall collect and analyze the required number of samples for the parameters required by the landfill using the appropriate analytical procedures. A copy of the required parameters and analytical methods (from landfill email or on landfill letterhead) shall be provided as Attachment 4A of the BDE 2733 (Regulated Substances Final Construction Report). The price shall include all sampling materials and effort necessary for collection and management of the samples, including transportation of samples from the job site to the laboratory. The Contractor shall be responsible for determining the specific disposal facilities to be utilized; and collect and analyze any samples required for disposal facility acceptance using a NELAP certified analytical laboratory registered with the State of Illinois.

Site 3488V-7: The Shoppes of Riverwoods, 2001-2055 N. Milwaukee Avenue, Riverwoods, Lake County

- Station 82+25 to Station 83+35 (CL Milwaukee Avenue), 0 to 65 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.

Site 3488V-8: Woodman's, 1550 Deerfield Parkway, Buffalo Grove, Lake County

- Station 74+00 to Station 75+15 (CL Milwaukee Avenue), 0 to 110 feet LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.

Site 3488V-10: Northside Community Bank, 1155 N. Milwaukee Avenue, Riverwoods, Lake County

- Station 76+15 to Station 76+60 (CL Milwaukee Avenue), 0 to 55 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameters: Benzo(a)pyrene, Lead, and Manganese.

Site 3488V-11: Riverwoods Medical and Wellness Center, 1105 N. Milwaukee Avenue, Riverwoods, Lake County

- Station 74+00 to Station 75+65 (CL Milwaukee Avenue), 0 to 105 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: VOCs, Benzo(a)pyrene, Arsenic, and Manganese.
- Station 100+00 to Station 101+10 (CL Deerfield Road), 0 to 55 feet LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Benzo(a)pyrene, and Manganese.

At the Riverwoods Medical and Wellness Center property, Volatile Organic Carbon (VOCs) was detected at 2,866 MU at soil boring 3488V-11-B01 from the sample interval 10 to 12 feet deep, as noted in the Final Preliminary Site Investigation Report for this project, submitted April 21, 2025 by WSP USA, Inc. Procedures shall be implemented to protect site workers and observers from hazards including VOCs via vapor inhalation encountered during construction activities in locations containing contaminated materials, pursuant to Article 669 of the Standard Specifications for Road and Bridge Construction manual.

Backfill Plugs. Backfill plugs shall be placed within the storm sewer trench at the following locations, in accordance with Article 669.05(d):

- Station 74+30 (CL Milwaukee Avenue), 105 feet RT (Riverwoods Medical and Wellness Center). Contaminants of concern sampling parameters: VOCs.
- Station 74+60 (CL Milwaukee Avenue), 55 feet RT (Riverwoods Medical and Wellness Center) Contaminants of concern sampling parameters: VOCs.

Method of Measurement: Backfill plugs will be measured for payment in place and the volume computed in cubic yards.

Basis of Payment: Backfill plugs will be paid for at the contract unit price per cubic yard for BACKFILL PLUGS.

Engineered Barrier. An engineered barrier shall be installed in storm sewer, trenches and soil excavation areas to limit the exposure and control the migration of contamination from the contaminated soil that remains within the storm sewer trench excavation and soil excavation areas. It shall be placed beneath the trench backfill material and soil excavation areas at the following locations:

- Station 74+00 to Station 75+65 (CL Milwaukee Avenue), 0 to 105 feet RT (Riverwoods Medical and Wellness Center) – non-special waste. Contaminants of concern sampling parameters: VOCs.

The engineered barrier shall consist of a geosynthetic clay liner system, geomembrane liner, or equivalent material as approved by the Engineer. A geosynthetic clay liner shall be composed of a bentonite clay liner approximately 0.25 inches thick. The engineered barrier shall have a permeability of less than 10^{-7} cm/sec. Installation of the geosynthetic clay liner system shall be in accordance with the manufacturer's recommendations except that all laps shall face down-slope.

The geomembrane liner shall have a minimum thickness of 30 mils. The geomembrane liner shall line the entire trench and installed in accordance with the manufacturer's recommendations.

No equipment will be allowed on the engineered barrier until it is covered by a minimum of 1 foot of backfill. Any damage to the engineered barrier caused by the Contractor shall be repaired at no additional expense to the Department in accordance with the manufacturer's recommendations and as directed by the Engineer.

Method of Measurement: The engineered barrier will be measured for payment in place and the area computed in square yards.

Basis of Payment: The engineered barrier will be paid for at the contract unit price per square yard for ENGINEERED BARRIER.

- Station 75+65 to Station 76+15 (CL Milwaukee Avenue), 0 to 50 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Lead, and Manganese.
- A no further remediation (NFR) letter was issued by the Illinois Environmental Protection Agency (IEPA) for PESA Site 3488V-11. The letter was issued to resolve a site remediation program (SRP) investigation at the property. Soil impacted by lead was left in place on site. As such, an engineered barrier is present at this site which consists of 3' of clean soil above remaining contaminated soil. The NFR letter also requires a site-specific construction worker health and safety plan be implemented prior to any soil excavation in the area. A copy of the NFR letter is included with the contract documents.
- BDE 2730 Regulated Substances Pre-Construction Plan shall include a site-specific health and safety plan as described under the Health and Safety Plan section below. The BDE 2730 shall also contain specific details for soil excavation, management, and disposal at this site, along with a plan for backfilling the area with at least 3' of clean material.
- Following soil excavation at this site, the area shall be backfilled with clean material to ensure at least 3' of clean material is present over contaminated soils.
- BDE 2733 Regulated Substances Final Construction Report shall contain documentation of soil excavation, management, disposal, and backfill at the site.

This should include photographs of site activities and specific locations where soil was excavated from the site. The contractor shall demonstrate that all requirements listed in the NFR letter were adhered to during the project, and that final site conditions are in compliance with the terms of the NFR letter.

- **Work Zone monitoring will be required at this property.**

Health and Safety Plan

The Contractor shall develop a project specific Health and Safety Plan and submit the plan to the Engineer **a minimum of 28 days before beginning construction** activities.

The plan shall specify procedures and equipment to protect site workers and observers from hazards encountered during activities in locations containing contaminated material. A qualified industrial hygienist or health and safety specialist shall prepare the Health and Safety Plan. The Contractor's Corporate Officer responsible for worker health and safety shall approve and sign the plan before submittal to the Department.

A qualified industrial hygienist is defined as having a minimum of five years of experience in the industrial hygiene field, an academic degree in a related science field, and successful completion of two days of testing presented by the American Board of Industrial Hygiene. A Certified Industrial Hygienist (CIH) meets the above definition.

A qualified Health and Safety Specialist is defined as having a minimum of three years experience in hazardous waste operations, familiar with applicable health and safety procedures and protocols, and holds current training status according to 29 CFR 1910.120. This person may be a Certified Safety Professional (CSP) or an Illinois Registered Professional Engineer. A CSP has a minimum of four years of professional safety experience, has a baccalaureate degree in safety, and has successfully completed the Safety Fundamentals examination and subsequent Specialty Examination presented by the Board of Certified Safety Professionals.

The Contractor's Corporate Officer responsible for the Contractor's health and safety program and approval of the Health and Safety Plan shall be able to identify hazards; assess employee exposure and risk; have knowledge of OSHA standards, hazards correction techniques and practices, work place safety, and health program requirements. This person shall also be able to effectively communicate this knowledge both orally and in writing or contract for these abilities with a qualified Industrial Hygienist or Health and Safety Specialist.

The responsibility for the implementation and enforcement of all health and safety requirements lies solely with the Contractor. The Contractor shall take all necessary precautions for the safety of, and provide the necessary protection to prevent damage, injury or loss to construction personnel performing work within the Exclusion and Decontamination Zones. The Contractor shall ensure all workers involved in any activities within the contaminated locations or associated with the contaminated materials

are conversant with all the requirements of the Health and Safety Plan and have signed off and dated personal acknowledgment of the plan. The Contractor shall post copies of the plan at various locations throughout the work area to facilitate spontaneous review.

Site 3488V-12: Commercial Building, 1555-1567 Deerfield Parkway and 820-848 N. Milwaukee Avenue, Buffalo Grove, Lake County

- Station 72+00 to Station 72+60 (CL Milwaukee Avenue), 0 to 65 feet LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 72+60 to Station 73+00 (CL Milwaukee Avenue), 0 to 80 feet LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameter: Benzo(a)pyrene.
- Station 73+00 to Station 74+00 (CL Milwaukee Avenue), 0 to 110 feet LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: Lead, and Manganese.

Site 3488V-13: Vacant Land, 1055 N. Milwaukee Avenue, Riverwoods, Lake County

- Station 70+80 to Station 71+70 (CL Milwaukee Avenue), 0 to 80 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameters: Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Lead, and Manganese.
- Station 71+70 to Station 72+10 (CL Milwaukee Avenue), 0 to 80 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Manganese.
- Station 72+10 to Station 72+50 (CL Milwaukee Avenue), 0 to 80 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameter: Benzo(a)pyrene.
- Station 72+50 to Station 72+85 (CL Milwaukee Avenue), 0 to 90 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Benzo(a)pyrene, and Manganese.
- Station 72+85 to Station 73+75 (CL Milwaukee Avenue), 0 to 110 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameters: Benzo(a)pyrene, and Manganese.
- Station 100+00 to Station 101+20 (CL Deerfield Road), 0 to 45 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in

accordance with Article 669.05(a)(3). Contaminants of concern sampling parameters: Benzo(a)pyrene, and Manganese.

Site 3488V-14: CubeSmart Storage, 3725 Deerfield Road, Riverwoods, Lake County

- Station 70+25 to Station 70+80 (CL Milwaukee Avenue), 0 to 80 feet RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Iron, Lead, and Manganese.

Work Zones

Three distinct OSHA HAZWOPER work zones (exclusion, decontamination, and support) shall apply to projects adjacent to or within sites with documented leaking underground storage tank (LUST) incidents, or sites under management in accordance with the requirements of the Site Remediation Program (SRP), Resource Conservation and Recovery Act (RCRA), or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or as deemed necessary. For this project, the work zones apply for the following ISGS PESA Sites: **Site 3488V-11 (Riverwoods Medical and Wellness Center).**

Deerfield Road, Riverwoods, Lake County

- Station 153+97, 19' RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: PID > 1 ppm.

Portwine Road, Riverwoods, Lake County

- Station 297+33, 20' LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Iron.

Deerfield Road, Riverwoods, Lake County

- Station 201+05, 36' RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Iron.

Deerfield Road, Riverwoods, Lake County

- Station 171+25, 29' LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: PID > 1 ppm.

Deerfield Road, Riverwoods, Lake County

- Station 144+70, 25' LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Manganese.

Deerfield Road, Riverwoods, Lake County

- Station 131+70, 17' LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: PNAs.

Deerfield Road, Riverwoods, Lake County

- Station 125+70, 24' LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: PID > 1 ppm.

Deerfield Road, Riverwoods, Lake County

- Station 105+65, 32' LT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Manganese.

Saunders Road, Riverwoods, Lake County

- Station 408+40, 46' RT: The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: PID > 1 ppm.

Thorngate Creek, Riverwoods, Lake County

- The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Risk Managed.

Proposed Compensatory Storage Area, Riverwoods, Lake County

- The Engineer has determined this material meets the criteria of, and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Risk Managed.

DIVISION 700. WORK ZONE TRAFFIC CONTROL AND PROTECTION, SIGNING,
AND PAVEMENT MARKING

70107025 CHANGEABLE MESSAGE SIGN (LCDOT)

Effective: October 5, 2022

Description: This work shall consist of furnishing, installing, maintaining, relocating and removing Changeable Message Signs.

Equipment: The equipment shall be according to Article 1106.02 of the "Standard Specifications" and meet the requirements included in the LCDOT special provision for Traffic Control and Protection, (Special) included herein.

General: The Contractor shall furnish the Changeable Message Signs to announce work zone stage changes and/or changes in traffic patterns. The signs shall be in place, displaying the change message, 14 days prior to the change. The signs shall remain in place until 14 days following the implementation of the change. For this project signs are planned for the number of locations and work stages/phases below:

- Number of Signs/Locations: 10
- Number of Work Stages/Phases: 12

When not in use the Changeable Message Sign shall be treated as nonoperating equipment. When not in use the sign may be removed from the worksite. Signs remaining on the worksite shall be parked/stored according to Article 701.11 of the "Standard Specifications".

Signs not in use will not be paid for regardless of their location (onsite or offsite). Additionally, if the Contractor elects to remove the sign(s) not in use from the work site no additional compensation will be paid for remobilizing the signs back to the work site.

Method of Measurement: Changeable Message Signs will be measured for payment in calendar days of actual use per sign location. Actual use will be any day the sign is displaying a message according to the duration(s) above and/or as directed by the Engineer. The total number of calendar days will be computed from the sum of days of actual use for all sign locations.

Basis of Payment: This work will be paid for at the contract unit price per calendar day for CHANGEABLE MESSAGE SIGN. The unit price shall include all equipment, materials and labor required to furnish, install, program, maintain, relocate and remove the sign(s) required. No additional payment will be allowed for a sign not in use either on site or remobilized.

SECTION 703 WORK ZONE PAVEMENT MARKING (LCDOT)

Effective: October 7, 2019

Revised: October 31, 2022

Description: This work shall consist of furnishing, installing, maintaining, and removing short term pavement markings.

General: This work shall be performed according to Section 703 of the “Standard Specifications”, and the following:

Short Term Pavement Markings shall be limited to application on HMA Base, Binder, & Leveling Binder Courses. Short Term Pavement Markings shall also be used on HMA Base, Binder, & Leveling Binder Courses that have been covered with a prime coat or tack coat.

The Contractor shall not use Short Term Pavement Markings on the Surface Course.

The Contractor shall use Temporary Pavement Marking – Line 4”- Type IV Tape on the Surface Course.

Basis of Payment: This work will be paid for at the contract unit price per foot for SHORT TERM PAVEMENT MARKING or for TEMPORARY PAVEMENT MARKING – LINE 4” - TYPE IV TAPE. The unit price shall include all equipment, materials and labor required to furnish and install the Short Term Pavement Markings.

SECTION 780 PAVEMENT STRIPING (LCDOT)

Effective: July 1, 2007

Revised: April 18, 2023

Description: This work shall consist of furnishing and applying surface laid and recessed thermoplastic pavement markings.

General: This work shall be performed according to Section 780 of the “Standard Specifications” and the following:

A binder sealer shall be applied on all hot-mix asphalt (HMA) pavements where the new thermoplastic material is to be installed. The binder sealer material shall be applied as recommended by the manufacturer of the thermoplastic and in sufficient quantities to entirely cover the surface on which the thermoplastic is to be laid.

The equipment used to apply thermoplastic pavement markings, under this contract, shall be limited to hand-operated equipment only. Truck-mounted equipment shall not be used.

A binder sealer shall be applied on all hot-mix asphalt (HMA) pavements where the new thermoplastic material is to be installed. The binder sealer material shall be applied as recommended by the manufacturer of the thermoplastic and in sufficient quantities to entirely cover the surface on which the thermoplastic is to be laid.

Method of Measurement: Lines will be measured for payment in place in feet. Double yellow lines will be measured as two separate lines.

Words and symbols shall conform to the sizes and dimensions specified in the Illinois Manual on Uniform Traffic Control Devices and IDOT Highway Standard 780001. They will be measured based on the total areas indicated in Table 1 of Section 780 of the “Standard Specifications”, or as indicated on the plans.

Basis of Payment: This work will be paid for at the contract price per foot of applied THERMOPLASTIC PAVEMENT MARKING – LINE of the width specified; and/or per square foot for THERMOPLASTIC PAVEMENT MARKING – LETTERS AND SYMBOLS. For recessed Thermoplastic Pavement Markings, the grooves will be paid for separately as GROOVING FOR RECESSED PAVEMENT MARKING of the groove width specified or as GROOVING FOR RECESSED PAVEMENT MARKING, LETTERS AND SYMBOLS. The unit price shall include all equipment, materials and labor required to furnish and install the Thermoplastic Pavement Markings.

78011XXX GROOVING FOR RECESSED PAVEMENT MARKING (LCDOT)

Effective: May 21, 2018

Revised: May 5, 2022

Description: This work shall consist of grooving the pavement surface in preparation for the application of recessed pavement markings.

Equipment: The equipment shall be according to the following:

Thermoplastic Pavement Marking:

Equipment: The grooving equipment shall be equipped with either a free-floating saw blade cutting head or a free-floating grinder cutting head configuration with diamond or carbide tipped cutters and shall produce an irregular textured surface.

Preformed Thermoplastic & Preformed Plastic, Type D Pavement Marking:

Equipment: Use grooving equipment with a free-floating, independent cutting head equipped with gang-stacked diamond saw blades. The diamond saw blades shall be of uniform wear and shall produce a smooth textured surface.

General: The Contractor shall supply the Engineer with a copy of the pavement marking material manufacturer's recommendations for constructing a groove. The work shall be according to Section 780 of the "Standard Specifications" and the following:

Pavement Grooving Methods: Plane the grooved lines according to details shown on the plans and per manufacturer's recommendations. The grooves for recessed pavement markings shall be constructed using the following methods:

- (a) **Wet Cutting Head Operation:** When water is required or used to cool the cutting head, the groove shall be flushed with high pressure water immediately following the cut to avoid build up and hardening of slurry in the groove. The pavement surface shall be allowed to dry for a minimum of 24 hours prior to the final cleaning of the groove and application of the pavement marking material.
- (b) **Dry Cutting Head Operation:** When used on HMA pavements, the groove shall be vacuumed or cleaned by blasting with a high-pressure air blower with at least 185 ft³/min air flow and 120 psi air pressure to remove loose aggregate, debris, and dust generated during the cutting operation. When used on PCC pavements, the groove shall be flushed with high pressure water or shot blasted to remove any PCC particles that may have become destabilized during the grooving process. If high pressure water is used, the pavement surface shall be

allowed to dry for a minimum of 24 hours prior to the final cleaning of the groove and application of the pavement marking material.

Pavement Grooving: Grooving shall not cause ravels, aggregate fractures, spalling or disturbance of the joints to the underlying surface of the pavement. Grooves shall be cut into the pavement prior to the application of the pavement marking material. Grooves shall be cut such that the width is 1 inch greater than the width of the pavement marking line as specified on the plans. Grooves for letters and symbols shall be cut in the shape of the symbol and such that all dimensions are 1 inch greater than the corresponding dimensions of the symbol.

The position of the edge of the grooves shall be a minimum of 2 inches from the edge of all longitudinal joints. The Contractor shall achieve straight alignment with the grooving equipment.

The depth of the groove shall not be less than the manufacturer's recommendations for the pavement marking material specified, but shall be installed to a minimum depth of 120 mils $\pm$ 10mils from the pavement surface or, if tined, from the high point of the tined surface. To measure the depth, the contractor may use a depth plate placed in the groove and a straightedge placed across the plate and groove, or the contractor may use a straightedge placed perpendicular to the groove. The Engineer may periodically check groove depths. The cutting head shall be operated at the appropriate speed in order to prevent undulation of the cutting head and grooving at an inconsistent depth.

At the start of grooving operations, a 50 ft test section shall be installed and depth measurements shall be made at 10 ft intervals within the test section. The individual depth measurements shall be within the allowable ranges according to this Special Provision. If it is determined the test section has not been grooved at the appropriate depth or texture, adjustments shall be made to the cutting head and another 50 ft test section shall be installed and checked. This process shall continue until the test section meets the requirements of this Special Provision.

For new HMA pavements, grooves shall not be installed within 5 days of the placement of the final course of pavement.

Final Cleaning:

Concrete – If water is used in the grooving process, allow the groove to dry a minimum of 24 hours after groove cleaning, and prior to pavement marking application. The groove surface shall be clean and dry before applying the adhesive, and pavement marking tape. Immediately prior to the application of the pavement marking material or primer sealer, the groove shall be cleaned with a high-pressure air blower with at least 185 ft³/min air flow and 120 psi air pressure. Use of the air blower does not decrease the amount of time required for the groove to dry.

New HMA - Use a high-pressure air blower with at least 185 ft³/min air flow and 120 psi air pressure to clean the groove.

When a vacuum is used for cleaning, it shall collect the loose material and dust for disposal outside the limits of the right-of-way according to Article 202.03 of the "Standard Specifications" and/or as directed by the Engineer. The collected material shall not be exhausted into the air.

Method of Measurement: Grooves for lines will be measured for payment in place in feet. Grooves for double yellow lines will be measured as two separate lines.

Grooves for letter, numbers and symbols shall be measured for payment in place and the area computed in square feet.

Grooves for markings with contrast will be 1" wider than the minimum contrast width. Contractors electing to include wider contrast with the Engineer's approval, will require a wider groove. No additional payment will be allowed for the wider groove.

Basis of Payment: This work will be paid for at the contract unit price per foot for GROOVING FOR RECESSED PAVEMENT MARKING of the groove width specified; and per square foot for GROOVING FOR RECESSED PAVEMENT MARKING, LETTERS AND SYMBOLS. The unit price shall include all equipment, materials and labor required to groove and clean the pavement in preparation for the installation of recessed pavement markings. No additional payment will be allowed for a wider groove to accommodate any extra contrast width.

DIVISION 1000. MATERIALS

ARTICLE 1030.06 (d) (2) DENSITY SAMPLES (LCDOT)

Effective: January 20, 2022

Revised: October 25, 2023

Upon completion of coring for density testing and/or thickness checks the core holes shall be backfilled according to Article 1030.06 (d) (2) of the Standard Specifications.

PERENNIAL PLANTS, WETLAND TYPE, 2" DIAMETER BY 4" DEEP PLUG

Description. This work shall consist of furnishing and installing wetland plugs and goose grid barrier, initial watering of the plugs and other materials required in the planting operation including super absorbent moisture containment medium in areas as shown in the plans and details and as directed by the Engineer.

All work, materials, and equipment shall conform to Sections 254 and 1081 of the Standard Specifications except as modified herein.

Add the following to Article 254.02 Materials:

All plants shall be healthy, vigorous, and true to species and variety. All materials shall be provided by a certified nursery and shall be free of pests and disease. All plant materials shall comply with State and federal laws with respect to inspection for plant diseases and infestations. Written approval shall be necessary for substitutions.

Plugs – original seed source shall be within 150 miles of the project site location. Written approval will be required for substitutions and plant material purchased outside a 150 mile radius of the site.

Delete Article 254.03 (b) Planting Time and substitute the following:

Plugs shall only be planted between May 1 and June 15. Approval from the Engineer must be received for all planting dates.

Add the following to Article 254.04 Transporting and Storing Plants:

Each species should be handled and packed in the manner approved for the plant, having regard for the soil climatic conditions at the time and place of digging and delivery, and for the time that will be consumed for transit and delivery.

Plant materials shall be packed to ensure adequate protection against damage during transit. The plants shall be protected with wet material to ensure that the plant materials are delivered in a moist and cool condition. The vehicle should be ventilated to prevent overheating.

Plant materials shall be stored in a shaded area. Watering shall occur to maintain plant vigor during on-site storage.

An on-site inspection will be made prior to the installation of plant material. Any plant material not meeting specifications (that being of good health) must be moved off the site.

Delete Article 254.05 Layout of Planting and substitute the following:

When plants are specified to be planted in prepared soil planting beds, the planting bed shall be approved by the Engineer prior to planting. The Contractor shall be responsible for all plant layout. The layout must be performed by qualified personnel. The planting locations must be laid out as shown in the landscape plan. Plant plugs according to planting plan in overlapping zones to provide a natural gradient. Bed limits shall be painted or flagged. Individual plants layout shall be marked prior to installation. The Engineer will contact the Roadside Development Unit at (847) 705-4171 to approve the layout prior to installation. Allow a minimum of three (3) days prior to installation for approval.

Delete Article 254.06 (b) Planting Procedures and substitute the following:

When planting plugs in areas as shown on the plans or as directed by the Engineer, the following work shall be performed prior to planting:

- o Permanent Seeding and Erosion Control Blanket must be installed prior to planting plugs to avoid damage to plantings.
- o Trees and shrubs must be installed first to establish proper layout and to avoid damage to other plantings.
- o Snags must be placed first to establish proper layout and to avoid damage to other plantings.

Install plugs through erosion control blanket with planting bar. Planting holes shall be as deep or slightly deeper than the plug roots to allow placing the plant without bending roots. Plant shall be placed flush with the earth surface. Hole shall be filled with soil carefully to avoid damage to roots and to leave no voids and pressed firm to earth surface to ensure soil contact.

Each installed plug shall receive the manufacturer's recommended amount of super absorbent moisture containment medium (Terra-Sorb or equivalent) and shall contain 93% of the active ingredient, Potassium Polyacrylamide Acrylate Copolymer. The super absorbent moisture containment medium label shall be submitted to the Engineer for approval at least seventy-two (72) hours prior to application.

Contractor shall provide and maintain all equipment necessary for planting, including watering equipment, water, and hoses. Immediately after planting, thoroughly water plant beds. Do not wash soil onto crowns of plants. The soil

surface should be damp and all plugs must receive a minimum of equal to at least 1" of rain per week for the first four weeks following planting.

Install Goose Grid Barrier(s) along the perimeters of wetland planting pods (groupings) to prevent geese from uprooting and damaging the native plug plantings. Goose Grid Barrier(s) shall be installed at the time of planting to protect plugs from predation. The Contractor will not be relieved in any way from the responsibility of protecting plugs from geese predation due to lack of proper maintenance of Goose Grid Barriers.

1. Posts – 1" x 4" x 48" square Oak stakes or metal posts place 7-10' on center
2. Poultry fence, 24" with ¾" x 1" grid, along the perimeter with cable ties.
3. Install bailing twine, from post top to post top (to form an "X"), to prevent the geese from entering the enclosure from the air.
4. Repair as necessary to remain effective for 12 months.
5. Remove and dispose when directed by the Engineer.

Delete the first sentence of Article 254.07 Mulching and substitute the following:

The plugs are not required to be mulched.

Delete Article 254.08 (b) Period of Establishment and substitute the following:

Plugs must undergo a 30-day period of establishment. Additional watering shall be performed not less than three times a week for four weeks following installation. Water shall be applied at the rate of at least 2 gallons per square foot. Should excess moisture prevail, the Engineer may delete any or all of the additional watering cycles. In severe weather, the Engineer may require additional watering.

A spray nozzle that does not damage small plants must be used when watering native plant plugs. Water shall be applied at the base of the plant to keep as much water as possible off plant leaves. The plants to be watered and the method of application will be approved by the Engineer. The Contractor will not be relieved in any way from the responsibility for unsatisfactory plants due to the amount of watering.

At the end of the period of establishment, all Goose Grid Barriers shall be removed.

Add the following to Article 254.09 Method of Measurement:

- a) Disposal of debris (rock, stones, concrete, bottles, plastic bags, Goose Grid Barrier, etc.) removed from the plug plantings as specified in Article 202.03.

- b) Super absorbent moisture containment medium (Terra-Sorb or equivalent) will not be measured for payment.
- c) Goose Grid Barrier will not be measured for payment.

Add the following to Article 254.10 Basis of Payment:

- a) Payment for super absorbent moisture containment medium (Terra-Sorb or equivalent) shall be included in the in the contract unit price of the Perennial Plants, Wetland Type Plug pay item.
- b) Payment for Goose Grid Barrier shall be included in the contract unit price of the Perennial Plants, Wetland Type Plug pay item.
- c) The unit price shall include the cost of all materials, soil amendments, equipment, labor, plant care, removal, disposal and incidentals required to complete the work as specified herein and to the satisfaction of the Engineer.

TREE REMOVAL AND FORESTRY WORK RESTRICTIONS – ENDANGERED SPECIES ACT

This work shall be according to Section 201 of the Standard Specifications, except shall only be allowed between November 1 and March 31, when the endangered species are not present.

Work includes tree pruning and tree limb removal of live or dead branches, clearcutting, selective clearing, and the removal of live or dead trees measuring 3 inches (3”) in diameter or greater at a point of 4.5 feet (4.5’) above the highest ground level at the base of the tree.

Work that is considered hazardous or a safety concern can be removed any time during the calendar year with written approval by the Engineer.

No additional compensation or extension of time will be allowed to comply with these restrictions.

WEED CONTROL, AQUATIC

Description: This work shall consist of the application of herbicide along highway roadsides for weed control in wet areas. Applications may only be made for the control of undesirable vegetation in and around standing and flowing water. Equal formulation must be approved to use in or near water.

Materials: The herbicide shall have the following formulation:

Active Ingredient:

Isopropylamine salt of Imazapyr (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-Pyridinecarboxylic acid)*.....	28.7%
Inert Ingredients:.....	<u>71.3%</u>
Total	100.0%

The Contractor shall submit a certificate, including the following, prior to starting work:

1. The chemical names of the compound and the percentage by weight of the ingredients which must match the above specified formulation.
2. A statement that the material is in a solution which will form a satisfactory emulsion for use when diluted with water for normal spraying conditions.
3. A statement that the herbicide, when mixed with water, will be completely soluble and dispersible and remain in suspension with continuous agitation.
4. A statement describing the products proposed for use when the herbicide that surfactants, drift control agents, or other additives be used with the product. These tank mix additives shall be used as specified by the manufacturer. Required additives will not be paid for separately.

All material shall be brought to the spray area in the original, unopened containers supplied by the manufacturer.

Application Rate: The herbicide shall be applied at the rate of 6 pints per acre. Formulation shall be diluted with a minimum of one hundred (100) gallons of water and applied as a mixture. Water for dilution of the mixture will not be paid for separately.

For Treatment of Phragmites: Apply herbicide to actively growing green foliage after full leaf elongation. Ensure 100% coverage. If stand of phragmites has substantial amount of old stem tissue, mow, and allow to regrow to approximately five feet (5') in height before treatment.

Method of Measurement: Weed Control, Aquatic will not be measured for payment.

Basis of Payment: Weed Control, Aquatic will not be paid for separately but shall be included in the cost of SELECTIVE CLEARING.

GENERAL REQUIREMENTS FOR WEED CONTROL SPRAYING

Experience

The Contractor shall have previous experience with the use of weed control chemicals. He/she shall have had at least three (3) season's experience in ecological restoration and the ability to identify and differentiate between targeted weeds and vegetation to remain. The Contractor shall observe and comply with all sections of the Illinois Custom Spray Law, including licensing. Contractor personnel applying herbicides shall have a valid pesticide applicator license issued by the Illinois Department of Agriculture.

The licensed pesticide applicator shall attend the preconstruction meeting and submit his/her current license to the Engineer. The licensed pesticide applicator shall be qualified at a minimum in Right-of-Way and Aquatics. The licensed applicator shall work on-site for every work order issued and approved.

Equipment

The equipment used shall consist of a vehicle-mounted tank, pump, spray bar and handgun, plus any other accessories needed to complete the specified work. Spraying shall be done through multiple low-pressure flooding or broad jet nozzles mounted on spray bars operated not more than 36" above the ground. If different sizes or types of nozzles are used to make up the spray pattern, the pressure, sizes and capacities shall be adjusted to provide a uniform rate of application for each segment of the spray pattern. Hand spray guns may be used for spraying areas around traffic control devices, lighting standard and similar inaccessible areas. Maximum speed of the spray vehicle during application of chemical shall be ten (10) miles per hour.

Pumps used shall have a volume and pressure capacity range sufficient to deliver the mixture at a pressure to provide the required coverage and to keep the spray pattern full and steady without pulsation or excessive pressure as to cause fogging. Maximum pressure for application shall be 15 PSI. Quick acting shut-off valves and spring-loaded ball check valves shall be provided to stop the spray pattern with a minimum of nozzle drip. In areas where the spray vehicle must traverse the right-of-way, a four-wheel drive vehicle with flotation tires will be required to minimize damage to the ground surface.

Additional equipment used shall consist of swiping gloves, wicks, wands, hand spray guns and/or backpack sprayers, plus any other accessories needed to complete the specified work as directed by the Engineer. Wick applicators, swiping gloves, or other such devices may be required to ensure herbicides are applied only to target species. If hand spray guns used are attached to spray vehicle, maximum speed of the spray vehicle during application of chemical shall be five (5) miles per hour. In areas where a vehicle is needed to traverse the right-of-way, a four-wheel drive vehicle with flotation tires will be required to minimize damage to the ground surface.

Prior to beginning work, the Contractor shall obtain approval from the Engineer of the spraying equipment proposed for completing this work. The proposed equipment shall be in an operational condition and available for inspection by the Engineer at least two (2) weeks prior to the proposed starting time. If requested by the Engineer, the Contractor shall demonstrate the calibration of the equipment.

The equipment must provide consistently uniform coverage and keep the spray mixture sufficiently agitated or the work will be suspended until the equipment is repaired or replaced.

Spraying Areas

This work includes roadsides and other types of right-of-way of various widths and gradients. Spray areas often extend more than thirty (30) feet from the edge of the roadway, requiring both spray bar and handgun applications.

When the description of work requires weed control of a stated species, such as teasel, the chemical shall be applied only to locations where the stated species is present. When the description of work requires general weed control within a bed or area, such as broadleaf weed control in turf, then the chemical shall be applied to the entire bed or area.

Exclusion of Spraying Areas

Areas where weed control spraying is inappropriate or detrimental to the environment, desirable planting, or private property shall be excluded from the spray area.

Spraying will not be permitted over any drainage swales or waterways, or other areas where the chemical label prohibits application. Spraying within 150 feet of a natural area or site where endangered or threatened species occur.

Responsibility for Prevention of Damage to Private Property

The Contractor shall, at all times, exercise extreme caution to prevent damage to residential plantings, flower or vegetable gardens, vegetable crops, farm crops, orchard or desirable plants adjacent to the roadside.

The Contractor or Department receives a complaint; the Contractor shall contact a complaint within ten (10) days after receiving a claim for damages, either in person or by letter. The Contractor, or his authorized representative, shall make a personal contact with the complainant within twenty (20) days. The Engineer shall also be notified by the Contractor of all claims for damage he received and shall keep the Engineer informed as to the progress in arriving at a settlement for such claims.

Communication with the Engineer

The Contractor is required to communicate with the Engineer to receive all required approvals in a timely way and to assure that the Engineer can accurately document the work performed.

All work orders with herbicide application shall be directly supervised by the Engineer for quality assurance and for payment purposes. If the Contractor performs work without the Engineer's supervision, work will not be paid for.

It shall be the Contractor's responsibility to assure that all chemical containers are opened and added to the spray mixture in the presence of the Engineer.

The Contractor shall obtain approval from the Engineer to proceed with spraying at each location 24 hours prior to the proposed spray operations.

The Contractor's superintendent shall closely coordinate work with the Engineer at all times in accordance with Article 105.06. The superintendent shall attend weekly progress meetings with the Engineer at the Engineer's office or other mutually agreed upon location. The superintendent shall communicate with the Engineer in the field during weed control activities to facilitate accurate completion of work while it is occurring. At the request of the Engineer, the Contractor shall provide a cell phone number where the superintendent can be reached during working hours. The Contractor shall notify the Engineer at least twenty-four (24) hours in advance of either discontinuing or resuming operations on all work orders.

Notification of Pesticide Application

The Contractor will be required to properly provide notification of pesticide application as required by the IL Public Act 103-0976 (Pesticide Application on Rights-of Way Notification Act).

Two weeks prior to the application of pesticides, including but not limited to herbicides, insecticides, algaecides, and fungicides, the Contractor shall complete Operations form "OPER 758" which may be found at the following link:

<https://idot.illinois.gov/resources/forms.html>

The Contractor shall return the completed form to the Engineer. The completed form will be uploaded on the IDOT website as required by the Department of Agriculture and IL Public Act 103-0976 at:

<https://idot.illinois.gov/transportation-system/environment/natural-resources/roadside-maintenance/pesticide-application.html>

The Contractor shall confirm submission of the form has been uploaded before starting spraying operations. Submissions will be sorted by District (One) and County (Cook, DuPage, Kane, Lake, McHenry, or Will). Allow at least a week for notifications to be uploaded.

Pesticide Application Daily Spray Record

The Contractor will be required to properly track pesticide applications as required by the ILG87 Permit. Reported data from this form will be collected and compiled annually and reported to the IEPA as required.

Within 48 hours of the application of pesticides, including but not limited to herbicides, insecticides, algaecides, and fungicides, the Contractor shall complete and return to the Engineer, Operations form "OPER 2720". OPER 2720 may be found at the following link:

<https://idot.illinois.gov/resources/forms.html>

PLANTING WOODY PLANTS

This work shall consist of planting woody plants as specified in Section 253 of the Standard Specifications with the following revisions:

Delete Article 253.03 Planting Time and substitute the following:

Spring Planting. This work shall be performed between March 15th and May 31st except that evergreen planting shall be performed between March 15th and April 30th in the northern zone.

Add the following to Article 253.03 (a) (2) and (b):

All plants shall be obtained from Illinois Nurserymen's Association or appropriate state chapter nurseries. All trees and shrubs shall be dug prior to leafing out (bud break) in the spring or when plants have gone dormant in the fall, except for the following species which are only to be dug prior to leafing out in the spring:

- Red Maple (*Acer rubra*)
- Alder (*alnus* spp.)
- Buckeye (*Aesculus* spp.)
- Birch (*Betulus* spp.)
- American Hornbeam (*Carpinus carolina*)
- Hickory (*Carya* spp.)
- Eastern Redbud (*Cercis* spp.)
- American Yellowwood (*Cladrastis kentuckea* spp.)
- Corylus (*Filbert* spp.)
- Hawthorn (*Crataegus* spp.)
- Walnut (*Juglans* spp.)
- Sweetgum (*Liquidambar* spp.)
- Tuliptree (*Liriodendron* spp.)
- Dawn Redwood (*Metasequoia* spp.)
- Black Tupelo (*Nyssa sylvatica*)
- American Hophornbeam (*Ostrya virginiana*)
- Planetree (*Platanus* spp.)
- Poplar (*Populus* spp.)
- Cherry (*Prunus* spp.)
- Oak (*Quercus* spp.)
- Willow (*Salix* spp.)
- Sassafras (*Sassafras albidum*)
- Baldcypress (*Taxodium distichum*)
- Broadleaf Evergreens (all)

- Vines (all)

Fall Planting. This work shall be performed between October 1 and November 30 except that evergreen planting shall be performed between August 15 and October 15.

Planting dates are dependent on species of plant material and weather. Planting might begin or end prior or after above dates as approved by the Engineer. Do not plant when soil is muddy or during frost.

Add the following to Article 253.05 Transportation:

Cover plants during transport to prevent desiccation. Plant material transported without cover shall be automatically rejected. During loading and unloading, plants shall be handled such that stems are not stressed, scraped, or broken and that root balls are kept intact.

Delete the third sentence of Article 253.07 and substitute the following:

Trees must be installed first to establish proper layout and to avoid damage to other plantings such as shrubs and perennials.

The Contractor shall be responsible for all tree, shrub, and vine layout. The layout must be performed by qualified personnel. The planting locations must be laid out as shown in the landscape plan. This will require the use of an engineer's scale to determine dimensions.

Tree and shrub locations within each planting area shall be marked with different color stakes/flags and labeled to denote the different tree and shrub species.

Shrub and vine beds will first be marked out with flags to delineate the perimeter of the planting bed. Once the planting bed has been approved by the Roadside Development Unit, the perimeter shall be painted prior to the removal of the flags and turf. The removal of the existing turf will be by a method approved by the Engineer.

Prior to shrub, vine installation, all plants shall be placed above ground or planting locations clearly marked out.

All utilities shall have been marked prior to contacting the Roadside Development Unit. The Engineer will contact the Roadside Development Unit at (847) 705-4171 to approve the layout prior to installation. Allow a minimum of seven (7) working days prior to installation for approval.

Delete the first paragraph to Article 253.08 Excavation of Plant Holes and substitute with the following:

Protect structures, utilities, sidewalks, bicycle paths, knee walls, fences, pavements, utility boxes, other facilities, lawns, and existing plants from damage caused by planting operations. Excavation of the planting hole may be performed by either hand, machine excavator, or auger.

The excavated material shall not be stockpiled on turf, in ditches, or used to create enormous water saucer berms around newly installed trees or shrubs. Remove all excess excavated subsoil from the site and dispose as specified in Article 202.03.

Delete the second sentence of Article 253.08 Excavation of Plant Holes (a) and the third paragraph of Article 253.08(b) and substitute with the following:

Excavation of planting hole width. Planting holes for trees, shrubs, and vines shall be three times the diameter of the root mass and with 45-degree sides sloping down to the base of the root mass to encourage rapid root growth. Roots can become deformed by the edge of the hole if the hole is too small and will hinder root growth.

Planting holes dug with an auger shall have the sides cut down with a shovel to eliminate the glazed, smooth sides and create sloping sides.

Excavation of planting hole depth. The root flare shall be visible at the top of the root mass. If the trunk flare is not visible, carefully remove soil from around the trunk until the root flare is visible without damaging the roots. Remove excess soil until the top of the root mass exposes the root collar.

The root flare shall always be slightly above the surface of the surrounding soil. The depth of the hole shall be equal to the depth of the root mass minus one (1) inch allowing the tree or shrub to sit one (1) inch higher than the surrounding soil surface for trees that have a 1-inch caliper or smaller. The depth of the hole shall be equal to the depth of the root mass minus two (2) inches allowing the tree or shrub to sit two (2) inches higher than the surrounding soil surface for trees that have a 2-inch caliper or larger.

For stability, the root mass shall sit on existing undisturbed soil. If the hole was inadvertently dug too deep, backfill and recompact the soil to the correct depth.

Excavation of planting hole on slopes. Excavate away the slope above the planting hole to create a flattened area uphill of the planting hole to prevent the uphill roots from being buried too deep. Place the excess soil on the downslope of the planting hole to extend the planting shelf to ensure roots on the downhill side of the tree remain buried. The planting hole shall be three times the diameter of the root mass and saucer shaped. The hole may be a bit elongated to fit the contour of the slope as opposed to the typical round hole on flat ground.

Add backfill to create a small berm on the downhill portion of the planting shelf to trap water and encourage movement into the soil to increase water filtration around the tree. Smooth out the slope above the plant where you have cut into the soil so the old slope and the new slope transition together smoothly.

Add the following to Article 253.08 Excavation of Plant Holes (b):

When planting shrubs in shrub beds or vines in vine beds as shown on the plans or as directed by the Engineer, the Contractor will contact the Roadside Development Unit at (847) 705-4171 to approve the layout prior to removing the existing turf. The removal of the existing turf will be by a method approved by the Engineer. Areas damaged outside the delineated planting beds shall be restored at the Contractor's expense.

Spade a planting bed edge at approximately a 45-degree angle and to a depth of approximately 3-inches around the perimeter of the shrub bed prior to placement of the mulch. Remove any debris created in the spade edging process and dispose of as specified in Article 202.03.

Delete Article 253.09 (b) Pruning and substitute with the following:

Deciduous Shrubs. Shrubs shall be pruned to remove dead, conflicting, or broken branches and shall preserve the natural form of the shrub.

Delete the third and fourth paragraphs of Article 253.10 Planting Procedures and Article 253.10 (a) and substitute the following:

Approved watering equipment shall be at the immediate work site area and in operational condition PRIOR TO STARTING the planting operation and DURING all planting operations OR PLANTING WILL NOT BE ALLOWED.

All plants shall be placed in a plumb position and avoid the appearance of leaning. Confirm the tree is straight from two directions prior to backfilling.

Before the plant is placed in the hole, any paper or cardboard trunk wrap shall be removed. Check that the trunk is not damaged. Any soil covering the tree's root flare shall be removed to expose the crown prior to planting.

Check the depth of the root ball in the planting hole. With the root flare exposed, one-inch caliper trees shall be set one inch higher than the surrounding soil and two-inch and larger caliper trees shall be set two inches higher than the surrounding soil. The root flare shall always be slightly above the surface of the surrounding soil. For stability, the root ball shall sit on existing undisturbed soil. If the hole was inadvertently dug too deep, backfill and recompact the soil to the correct depth.

After the plant is placed in the hole, all cords and burlap shall be removed from the trunk. Remove the wire basket from the top three quarters (3/4) of the root ball. The remaining burlap shall be loosened and scored to provide the root system quick contact with the soil. All ropes or twine shall be removed from the root ball and tree trunk. All materials shall be disposed of properly.

The plant hole shall be backfilled with the same soil that was removed from the hole. Clay soil clumps shall be broken up as much as possible. Where rocks, gravel, heavy clay, or other debris are encountered, clean topsoil shall be used. Do not backfill excavation with subsoil.

The hole shall be 1/3 filled with soil and firmly packed to assure the plant remains in plumb, then saturated with water. After the water has soaked in, complete the remaining backfill in 8" lifts, tamping the topsoil to eliminate voids, and then the hole shall be saturated again. Maintain plumb during backfilling. Backfill to the edge of the root mass and do not place any soil on top of the root mass. Visible root flare shall be left exposed, uncovered by the addition of soil.

Add the following to Article 253.10 (b):

After removal of the container, inspect the root system for circling, matted or crowded roots at the container sides and bottom. Using a sharp knife or hand pruners, prune, cut, and loosen any parts of the root system requiring corrective action.

Delete the first sentence of Article 253.10(e) and substitute with the following:

Water Saucer. All plants placed individually and not specified to be bedded with other plants, shall have a water saucer constructed of soil by mounding up the soil 4-inches high x 8-inches wide outside the edge of the planting hole.

Delete Article 253.11 and substitute the following:

Individual trees, shrubs, shrub beds, and vines shall be mulched within 48 hours after being planted. No weed barrier fabric will be required for tree and shrub plantings.

The mulch shall consist of wood chips or shredded tree bark free not to exceed two (2) inches in its largest dimension, free of foreign matter, sticks, stones, and clods. Mulch shall be aged in stockpiles for a minimum of four (4) months where interior temperatures reach a minimum of 140-degrees. The mulch shall be free from inorganic materials, contaminants, fuels, invasive weed seeds, disease, harmful insects such as emerald ash borer or any other type of material detrimental to plant growth. A sample must be supplied to the Roadside Development Unit for approval prior to performing any work. Allow a minimum of seven (7) working days prior to installation for approval.

Mulch shall be applied at a depth of 4-inches around all plants within the entire mulched bed area or around each individual tree forming a minimum 5-foot diameter mulch ring around each tree. An excess of 4-inches of mulch is unacceptable, and excess shall be removed. Mulch shall not be tapered so that no mulch shall be placed within 6-inches of the shrub base or trunk to allow the root flare to be exposed and shall be free of mulch contact.

Care shall be taken not to bury leaves, stems, or vines under mulch material. All finished mulch areas shall be left smooth and level to maintain uniform surface and appearance. After the mulch placement, any debris or piles of material shall be immediately removed from the right of way, including raking excess mulch out of turf areas in accordance with Article 202.03.

Pre-emergent Herbicide shall be used in the around the plant beds and tree rings after the placement of mulch. See specification for Weed Control, Pre-emergent Herbicide.

Delete Article 253.12 Wrapping and substitute the following:

Within 48 hours after planting, screen mesh shall be wrapped around the trunk of all deciduous trees with a caliper of 1-inch or greater. Multi-stem or clump form trees, with individual stems having a caliper of 1-inch or greater, shall have each stem wrapped separately. The screen mesh shall be secured to itself with staples or single wire strands tied to the mesh. Trees shall be wrapped at time of planting, before the installation of mulch. The lower edge of the screen wire shall be in continuous contact with the ground and shall extend up to a minimum of 36-inches or to the lowest major branch, whichever is less. Replacement plantings shall not be wrapped.

Delete Article 253.13 Bracing and substitute with the following:

Unless otherwise specified by the Engineer, within 48 hours after planting all deciduous and evergreen trees, with the exception of multi-stem or clump form specimens, over 8-feet in height shall require three 6-foot long steel posts so placed that they are equidistant from each other and adjacent to the outside of the ball. The posts shall be driven vertically to a depth of 18-inches below the bottom of the hole. The anchor plate shall be aligned perpendicular to a line between the tree and the post. The tree shall be firmly attached to each post with a double guy of 14-gauge steel wire. The portion of the wire in contact with the tree shall be encased in a hose of a type and length approved by the Engineer.

During the life of the contract, within 72 hours the Contractor shall straighten any tree that deviates from a plumb position. The Contractor shall adjust backfill compaction and install or adjust bracing on the tree as necessary to maintain a plumb position. Replacement trees shall not be braced.

Delete the second sentence of the first paragraph of Article 253.14 Period of Establishment and substitute the following:

This period shall begin in April and end in November of the same year.

Delete the first paragraph of Article 253.15 Plant Care and substitute the following:

During the period of establishment, the Contractor shall properly care for all plants including weeding, watering, adjusting of braces, repair of water saucers, pruning, cultivating, tightening, and repairing supports, repair of wrapping, and furnishing and applying sprays as necessary to keep the plants free of insects and disease, or other work which is necessary to maintain the health and satisfactory appearance of the plantings. The Contractor shall provide plant care a minimum of every two weeks, or within 36 hours following notification by the Engineer. All requirements for plant care shall be considered as included in the cost of the contract.

Delete the first paragraph of Article 253.15 Plant Care (a) and substitute with the following:

During the period of establishment, watering (initial) shall be performed at least every 30 days following installation during the months of May through November and is included in the cost of the contract unit price per each for TREES, SHRUBS, or VINES, of the species, root type, and plant size specified. The Contractor shall apply per week a minimum of 15 gallons of water per tree, 10 gallons per large shrub, 5 gallons per small shrub, and 2 gallons per vine.

Additional watering will be done once a week (3 times a month) following installation during the months of May through November. Any required additional watering in between the regularly scheduled (initial) watering(s) will be paid for as Supplemental Watering.

Special consideration in determining water needs must be given during extreme weather conditions or if plants exhibit any signs of stress in between the regularly scheduled every thirty-day watering during the period of establishment. Water immediately if plants show signs of wilting or if top (1) inch to two (2) inches of soil is dry. Water to ensure that moisture penetrates throughout the root zone, including the surrounding soil, and only as frequently as necessary to maintain healthy growth. **Do not overwater.**

The Engineer may direct the Contractor to adjust the watering rate and frequency depending upon weather conditions. Should excess moisture prevail, the Engineer may delete any or all the additional watering cycles.

Add the following to Article 253.15 Plant Care (c):

The contractor shall correct any vine growing across the ground plane that should be growing up desired vertical element (noise wall, retaining wall, fence, knee wall, etc.). Work may include but is not limited to carefully weaving vines through fence and/or taping vines to vertical elements.

Add the following to Article 253.15 Plant Care (d):

The Contractor shall inspect all trees, shrubs, and vines for pests and diseases at least every two weeks during the months of initial planting through final acceptance. Contractor must identify and monitor pest and diseases and determine action required to maintain the good appearance, health, and top performance of all plant material. Contractor shall notify the Engineer with their inspection findings and recommendations within twenty-four (24) hours of findings. The recommendations for action by the Contractor must be reviewed and by the Engineer for approval/rejection. All approved corrective activities will be considered as included in the cost of the contract and shall be performed within thirty-six (36) hours following notification by the Engineer.

Add the following to Article 253.16 Method of Measurement:

Pre-emergent Herbicide will be measured for payment as specified in Weed Control, Pre-emergent Granular Herbicide.

Additional Watering will be measured for payment as specified in Supplemental Watering.

Delete Article 253.17 Basis of Payment and substitute the following:

This work will be paid for at the contract unit price per each for TREES, SHRUBS, or VINES, of the species, root type, and plant size specified, and per unit for SEEDLINGS. The unit price shall include the cost of all materials, equipment, labor, plant care, removal, disposal, and incidentals required to complete the work as specified herein and to the satisfaction of the Engineer. Payment will be made according to the following schedule:

- (a) Initial Payment. Upon completion of planting, mulching, wrapping, and bracing, 75 percent of the pay item(s) will be paid.
- (b) Final Payment. Upon inspection and acceptance of the plant material, or upon execution of a third-party bond, the remaining 25 percent of the pay item(s) will be paid."
- (c) The placement of Pre-emergent Herbicide shall be paid for at the contract unit price for WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE.
- (d) Additional Watering will be paid for as specified in SUPPLEMENTAL WATERING.

SUPPLEMENTAL WATERING

Modified July 16, 2025

This work will include watering sod, trees, shrubs, vines, and perennials at the rates specified and as directed by the Engineer.

Schedule: Watering will only begin after the successful completion of all period of establishment requirements. However, if plant material requires additional watering due to extreme weather (drought/high temperatures) supplemental watering may be used to water during the period of establishment.

Water trees, shrubs, and vines every 7 days throughout the growing season (April 1 to November 30). Water perennials, plugs, and sod a minimum of twice a week. The Engineer may direct the Contractor to adjust the watering rate and frequency depending upon weather conditions. Do not overwater.

Watering must be completed in a timely manner. When the Engineer directs the Contractor to do supplemental watering, the Contractor must begin the watering operation within 24 hours of notice. **The Contractor shall give an approximate time window of when they will begin at the work location to the Engineer. The Engineer shall be present during the watering operation.** A minimum of 10 units of water per day must be applied until the work is complete.

Should the Contractor fail to complete the work on a timely basis or within such extended times as may have been allowed by the Department, the Contractor shall be liable to the Department liquidated damages as outlined in the **“Failure to Complete Plant Care and Establishment Work on Time” special provision.**

In fixing the damages as set out herein, the desire is to establish a mode of calculation for the work since the Department's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This said mode is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of the trees if the watering is delayed. The Department shall not be required to provide any actual loss in order to recover these liquidated damages provided herein, as said damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

Source of Water: The Contractor shall notify the Engineer of the source of water used and provide written certification that the water does not contain chemicals harmful to plant growth.

Rate of Application: The normal rates of application for watering are as follows. The Engineer will adjust these rates as needed depending upon weather conditions.

- 35 gallons per tree
- 25 gallons per large shrub
- 15 gallons per small shrub
- 4 gallons per vine
- 6 gallons per square yard for Perennial Beds
- 6 gallons per square yard for Sodded Areas

Method of Application: A spray nozzle that does not damage small plants must be used when watering all vegetation. Water shall be applied at the base of the plant to keep as much water as possible off plant leaves. An open hose may be used to water trees, shrubs, and seedlings if mulch and soil are not displaced by watering. The water shall be applied to individual plants in such a manner that the plant hole shall be saturated without allowing the water to overflow beyond the earthen saucer. Watering of plants in beds shall be applied in such a manner that all plant holes are uniformly saturated without allowing the water flow beyond the periphery of the bed. Water shall slowly infiltrate into soil and completely soak the root zone. The Contractor must supply metering equipment as needed to assure the specified application rate of water.

Method of Measurement: Supplemental watering will be measured in units of 1000 gallons of water applied as directed.

Basis of Payment: This work will be paid for at the contract unit price per unit of SUPPLEMENTAL WATERING, measured as specified. Payment will include the cost of all water, equipment and labor needed to complete the work specified herein and to the satisfaction of the Engineer.

**FAILURE TO COMPLETE PLANTING, PLANT CARE, AND ESTABLISHMENT
WORK ON TIME**

Should the Contractor fail to complete the planting, plant care, and/or supplemental watering work within the scheduled time frame as specified in the Special Provision for "Planting Woody Plants" and "Supplemental Watering", or within 24 hours notification from the Engineer, or within such extended times as may have been allowed by the Department, the Contractor shall be liable to the Department in the amount of:

- \$50.00 per tree/per day
- \$40.00 per large shrub/per day
- \$35.00 per small shrub/per day
- \$20.00 per vine/per day
- \$20.00 per perennial/per day
- \$20.00 per sq yd sod/per day

not as penalty but as liquidated damages, for each calendar day or a portion thereof of overrun in the contract time or such extended time as may have been allowed.

In fixing the damages as set out herein, the desire is to establish a mode of calculation for the work since the Department's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This said mode is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of the tree(s) if the watering or plant care is delayed. The Department shall not be required to provide any actual loss in order to recover these liquidated damages provided herein, as said damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

IDOT DESIGN TEMPORARY PAY ITEMS

K1004595 PRUNING FOR SAFETY AND EQUIPMENT CLEARANCE

Description: All work, materials, and equipment shall conform to Section 201 of the Standard Specifications except as modified herein.

Prior to start of any work, the Contractor shall inspect all tree branches that overhang into the roadway. Any branches that will be in conflict with construction equipment shall be reported to the Engineer. The Engineer will make the final decision on trees requiring tree pruning.

Pruning will be done on tree branches that overhang into the roadway and will be in conflict with construction equipment along roadsides. All pruning shall be done according to the current ANSI A300 (Part 1) – Pruning standard. Plant material shall be pruned to provide a minimum vertical clearance of 14 ft from the finished surface of the roadbed and shoulders. Pruning for sight distance and other safety purposes shall be as directed by the Engineer. Branches on existing trees to remain that need to be removed for safety and equipment clearance shall be pruned prior to the resurfacing operation.

Breaking off branches of plant material to remain during construction operations will not be allowed. Pruning shall be done in the presence of the Engineer and in such a manner as to preserve the natural growth habit of each tree.

If a dead and/or hazardous limb is found to be at a higher elevation than the pruning clearance requirement, the Contractor shall prune the limb and will not be paid separately.

Any tree limbs that are broken by construction equipment after the initial pruning must be pruned correctly within 72 hours.

Method of Measurement: Pruning for Safety and Equipment Clearance will be measured for payment on a lump sum basis.

Basis of Payment: Pruning for Safety and Equipment Clearance will be paid for at the contract lump sum price for PRUNING FOR SAFETY AND EQUIPMENT CLEARANCE.

X0323557 SANITARY SEWER TELEVISION INSPECTION, VIDETAPING AND RECORDING

Description. This work shall consist of full line video of all sanitary sewer mains (MH to MH) within the projects scope for proposed pipes. **Postconstruction televising shall also include televising of all new sanitary services, which should be completed and approved by the Engineer prior to final street Surface Course installation.**

Certification

NASSCO-certified televising is required.

All manhole inspections shall meet Level 2 NASSCO specifications. Level 2 inspection may be done via camera.

CCTV Equipment

The CONTRACTOR shall provide a closed-circuit television (CCTV) and audio-video recording system for internal inspection of mainline sewers capable of producing picture quality to the satisfaction of LCPW.

Preparatory Cleaning

The CONTRACTOR shall provide preparatory cleaning of the sewer section to permit unobstructed passage of the television camera and clean enough for the camera to discern structural defects, misalignment, and service lateral connections, points of infiltration and to the satisfaction of the ENGINEER.

Inspection Report

The CONTRACTOR shall ensure that a minimum of 90% of the internal pipe diameter is viewable for inspection and:

- (2) Move the camera at a speed no greater than 30 feet per minute and stopping at all defects and points of infiltration and pan as necessary to permit proper documentation of the sewer's condition.
- (3) When encountered the CONTRACTOR shall stop and thoroughly inspect each of the following:
 - a. Change in pipe material and/or sewer repair locations
 - b. Collapsed pipe, obstructions
 - c. Stop at all service connections
 - d. Missing portion of pipe wall
 - e. Sag, excessively deflected joint
 - f. Missing, damaged pipe
 - g. Protruding and break-in connections, and manufactured wyes or tees.
- (4) Stop televising if the camera becomes submerged and use high-pressure jetting or other means to lower water level within the sewer to a point below camera or provide

temporary plugs or by-pass pumping as directed by LCPW.

- (5) If the camera is unable to pass an obstruction even though flow is unobstructed, the CONTRACTOR shall also approach the obstruction from the other direction in order to obtain complete video on both sides of the obstruction. The CONTRACTOR shall notify the ENGINEER whenever an obstruction is encountered. The ENGINEER will determine if the obstruction must be removed.

The CONTRACTOR shall:

- 1) Begin each recording with the current date and project name followed by general locations, manhole basin and number, manhole invert depth, direction of viewing and beginning footage count superimposed on the video signal. The recording shall also provide a continuous footage counter and manhole segment identifier on all video recordings.
- 2) Label all digital drives with the date, basin number, manhole number, and type of sewer. The digital files shall be labeled accordingly.
- 3) Provide inspection logs with:
 - Contractor's name
 - Inspector's name
 - Date
 - Basin #
 - From MH # ____
 - To MH # ____
 - Direction of flow
 - Type of pipe material
 - Joint spacing
 - Manhole conditions
 - Section length
 - Diameter Pipe size
 - Depth of upstream and downstream invert
 - Direction of inspection (camera movement)
 - Surface conditions (parkway or street)
- 4) Document the footage and clock orientation of all pipe defects, change in pipe material, infiltration, building service connections and any other abnormal conditions
- 5) Use terminology generally accepted by the industry
- 6) Provide computer generated entries on inspection logs
- 7) Complete inspection log in the field
- 8) Provide audio track describing all information documented in the inspection

log.

Method of Measurement and Basis of Payment. This work shall be paid for at the contract unit price per FOOT for SANITARY SEWER TELEVISION INSPECTION, VIDEOTAPING AND RECORDING, which price shall be full compensation for all labor, equipment, and material to complete the work as specified in these special provisions.

XX032XXXX SANITARY FORCE MAIN

Description. This work consists of constructing sanitary sewer forcemain of the specified diameter at the locations shown on the plans, meeting the material and installation requirements of AWWA C900, the latest edition of the "Standard Specifications for Water and Sewer Main Construction in Illinois", the applicable portions of Section 550 of the Standard Specifications, and LCPW's Standard Specifications and Standard Drawings. The PVC piping shall be Certa-Lok PVC as manufactured by Westlake Pipe & Fittings.

Products delivered under this specification shall be manufactured only from water distribution pipe and couplings conforming to AWWA C900. The restrained pipe system shall also meet all short and long term pressure test requirements of AWWA C900. Pipe, couplings and locking splines shall be completely non-metallic to eliminate corrosion problems. Pipe and couplings shall be made from unplasticized PVC compounds having a minimum cell classification of 12454, as defined in ASTM D 1784. The compound shall qualify for a Hydrostatic Design Basis (HDB) of 4000 psi for water at 73.4°F, in accordance with the requirements of ASTM D 2837. Nominal outside diameters and wall thicknesses of restrained joint pipe shall conform to the requirements of AWWA C900. Restrained joint pipe shall be furnished in 4", 6", 8", 10" and 12" sizes, in Class 235 (DR18) and Class 305 (DR14). Pipe shall be furnished in standard lengths of 20 feet. Piping shall be green colored for wastewater. Pipe shall be joined using non-metallic couplings to form an integral system for maximum reliability and interchangeability. High-strength, flexible thermoplastic splines shall be inserted into mating, precision machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading. Couplings shall be designed for use at or above the pressure class of the pipe with which they are utilized and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F 477. Joints shall be designed to meet the zero leakage test requirements of ASTM D 3139.

PVC Pipe Installation:

1. Install pipe by direction boring methods. Install PVC pipe by pulling the pipe into place.
 - a. Provide winch systems designed to protect structures, provide directional stability, and pull pipe from insertion point to exit point without causing damage to the pipe being inserted.
 - b. Insert pipe in a continuous operation from point to point.
 - c. Provide lubricants as specified by pipe manufacturer to avoid stressing of pipe beyond its elastic limit during insertion.
 - d. Provide silencers, mufflers, or other devices required to reduce noise from compressors and other equipment to meet limits as outlined by Owner's local ordinances.

2. Provide equipment and procedures in strict compliance with the pipe manufacturer's recommendations.
3. Provide pipe insertion pits necessary for complete installation of pipe.
 - a. In general, position pits in the least disruptive location whenever possible.
 - b. Provide all traffic control, barricades, flagmen, and other items at insertion pit areas as necessary to complete the work.
 - c. Provide tight sheeting at insertion pits to keep pit to the minimum size necessary to do the work. Remove sheeting when work is completed.

Method of Measurement and Basis of Payment. This work will be paid for at the contract unit price per FOOT for FORCEMAIN, of the diameter specified, and shall include all materials, labor, equipment, and rubber couplings.

XX001470 SANITARY SERVICE CONNECTION

Description. This work shall consist of all work and materials required for making a connection from the existing or proposed sanitary sewer service to an existing or proposed main line sanitary sewer.

General. The existing sanitary services are all assumed to be six (6) inch diameter unless otherwise stated on the plans. The existing pipe will be cut within the public ROW with the approval of the Engineer. Any connection to an existing sewer main shall utilize a ROMAC STYLE "CB"™ sewer saddle. A saddle or kor-n-tee fitting shall be utilized to connect the existing/proposed sanitary service to the existing/proposed sewer main. Coring of the mainline sanitary sewer is required at the needed diameter to achieve a proper connection. The coring method shall be approved by the Engineer. Any required trench backfill and bedding material shall be included in the cost of this work. Trench Backfill material shall be per Section 208 of the SSRBC.

The CONTRACTOR shall install a new polyvinyl chloride wye fitting and cleanout at the location of the repair to the sewer main and shall remove and replace a sufficient length of existing service pipe to re-establish the service at the property line (which shall be paid for at the unit price for SANITARY SEWER REMOVAL and SANITARY SEWER, PVC of the size specified). The replacement service pipe shall be polyvinyl chloride (PVC) conforming to ASTM D-3034 with gasket joints conforming to ASTM-3212 and a Standard Dimension Ration (SDR) of 26. All connections to existing pipes shall be made with non-shear, stainless steel couplings. The couplings shall be equipped with stainless steel bands. Vertical cleanouts with removable caps shall be constructed at the locations indicated on the plans or as directed by the ENGINEER. Contractor shall use non-shear rubber couplings to connect new SDR 21 PVC sanitary pipe to existing service pipe if water tight bell and spigot joints cannot be maintained. All connections between dissimilar pipe material shall utilize a non-shear mission coupling such as MaxAdaptor, or Fernco Strongback. Fittings shall only be SDR-26. Sanitary sewer riser and service material shall be same as mainline sewer. Sewer service riser shall be used when mainline sewer exceeds 12-feet in depth. All sanitary sewers including service lines shall be cleaned and subjected to an air test, applicable deflection test and TV inspection by the contractor..

A section of pipe shall be removed in order for the tee or wye connection to be installed if the existing sanitary main is not lined.

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY SERVICE CONNECTION.

X0325815 REMOVE EXISTING CABLE

Description. This work shall consist of removing existing lighting cables from conduit at the locations shown on the plans and disposing of them. All electric cables shall be disconnected from their source and removed all together from the conduit.

Construction Requirements. The Contractor shall be responsible for verifying the upstream source of power, and downstream electrical equipment connected prior to disconnecting.

If cables cannot be removed from the conduit, the Contractor shall inform the engineer.

Work to be performed under this pay item is indicated in contract plan drawings and shall be in conformance with NEC, IDOT and local ordinances.

Method of Measurement. This item will be measured for payment for per lineal foot of conduit that cables are removed from (not by the number or total length of cables removed).

Basis of Payment. The work shall be paid for at the contract unit price per foot for REMOVE EXISTING CABLE, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

WASHOUT BASIN

Description: The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, reservoirs, and wetlands with fuels, oils, bitumens, calcium chloride, or other harmful materials according to Article 107.23 of the Standard Specifications.

General: To prevent pollution by residual concrete and/or the byproduct of washing out the concrete trucks, concrete washout facilities shall be constructed and maintained on any project which includes cast-in-place concrete items. The concrete washout shall be constructed, maintained, and removed according to this special provision and LCDOT standard LC4202 included in these plans. Concrete washout facilities shall be required on all projects regardless of the need for NPDES permitting. On projects requiring NPDES permitting, concrete washout facilities shall also be addressed in the Storm Water Pollution Prevention Plan.

The concrete washout facility shall be constructed on the job site according to LC4202. The Contractor may elect to use a prefabricated portable concrete washout structure. The Contractor shall submit a plan for the concrete washout facility, to the Engineer for approval, a minimum of 10 calendar days before the first concrete pour. The working concrete washout facility shall be in place before any delivery of concrete to the site. The Contractor shall ensure that all concrete washout activities are limited to the designated area.

The concrete washout facility shall be located no closer than 50 feet from any environmentally sensitive areas, such as water bodies, wetlands, and/or other areas indicated on the plans. Adequate signage shall be placed at the washout facility and elsewhere as necessary to clearly indicate the location of the concrete washout facility to the operators of concrete trucks.

The concrete washout facility shall be adequately sized to fully contain the concrete washout needs of the project. The contents of the concrete washout facility shall not exceed 75% of the facility capacity. Once the 75% capacity is reached, concrete placement shall be discontinued until the facility is cleaned out. Hardened concrete shall be removed and properly disposed of outside the right-of-way. Slurry shall be allowed to evaporate or shall be removed and properly disposed of outside the right-of-way. The Contractor shall immediately replace damaged basin liners or other washout facility components to prevent leakage of concrete waste from the washout facility. Concrete washout facilities shall be inspected by the Contractor after each use. All spills shall be reported to the Engineer and cleaned up immediately. The Contractor shall remove the concrete washout facility when it is no longer needed.

Basis of Payment: This work will be paid at the lump sum price for WASHOUT BASIN.

X0426200 DEWATERING

Effective: January 23, 2017
Revised: October 1, 2022

Description: This work shall consist of all labor, equipment, and materials necessary to construct, maintain, and remove dewatering systems to allow for construction in dry conditions. The dewatering method shall be designed to maintain a dry condition for the work area and to pass, on demand, the 2-year frequency flood at a minimum as shown on the plans.

Flood Frequency:

Unnamed Tributary to Des Plaines River at Station 105+00

- The 2 year peak flow is 7.5 cfs.
- The Estimated Water Surface Elevation is 641.59 feet.

Thorngate Creek at Station at 148+50

- The 2 year peak flow for this project is 28.18 cfs.
- The Estimated Water Surface Elevation is 643.72 feet.

General: The work shall be performed according to the following:

- The Contractor shall determine the means and methods to accomplish the dewatering including the choice of products and equipment to be used. The Contractor shall be responsible for the design, installation, operation, and removal of the dewatering materials and equipment for the work site.
- The above means and methods shall be subject to review by the Engineer and by the Lake County Stormwater Management Commission (LCSMC) Inspector. All products, equipment, and “means and methods” selected shall be adequate for the intended use/application. The Engineer’s/Inspector’s review does not relieve the Contractor from compliance with the requirements specified herein.
- For this project the construction, maintenance and removal of COFFERDAMS shall be included in the pay item for DEWATERING. The cofferdams shall be constructed according to Section 502 of the “Standard Specifications”.
- The dewatering operation(s) shall be active 24 hours a day, seven days per week. This means that pumping may be required at any time day or night. This does not mean that pumping is required continuously all day and all night. The bypass pumping only needs to operate to keep the water level upstream below the upstream cofferdam. Continuous pumping may not be necessary and/or desirable

if the upstream water level is not rising to the top of the upstream cofferdam. It is not the County's desire to over drain the upstream water basin.

- The Contractor may wish to consider a series of pumps for the project site. For example, using a single pump adjustable to variable flow requirements (rising or falling water levels) to operate within a specified water level range for day to day operations and additional pumps on standby to handle storm events up to the 2 year frequency. To make sure the additional pumps can respond promptly to a storm event, day or night, they should be maintained in a primed condition.
- The Contractor's proposed excavation for cofferdams and/or the installation of other components of the proposed dewatering process shall not conflict with existing utilities. No additional compensation and/or time shall be allowed for delays caused by plan revisions due to utility conflicts.
- The Contractor shall select the pumps, the rate at which the pumps discharge, and provide adequate protection at the pump discharge point subject to review by the Engineer/Inspector.
- The Contractor shall ensure that downstream water quality is not impaired. The water shall be discharged with adequate erosion and sediment control protection at the point of discharge.
- Water pumped or drained from the work area shall be disposed of in a safe and suitable manner without damage to adjacent waterways; wetlands; adjacent property or streets; and/or to other work under construction.
- Water shall not be discharged into storm or sanitary sewers.
- If possible, water shall not be discharged within 50 feet of wetland boundaries. Where this is impactable e.g. locations with a large wetland area downstream, the discharge location shall be coordinated with the Engineer/Inspector.
- If possible, water shall be discharged to an upland area to allow filtration through vegetation.
- Unless authorized by the Engineer for reuse on site, all BMPs and sediment associated with dewatering shall be removed and properly disposed of outside the right-of-way according to Article 202.03 of the "Standard Specifications".
- Any and all damages caused by dewatering the work area shall be promptly repaired by the Contractor.

Submittals: The Contractor shall submit to the Engineer for review a description of dewatering techniques and equipment to be used. The submittal shall include detail drawings showing the lengths of discharge piping; the point(s) of discharge; and the included sediment and erosion control procedures using Best Management Practices (BMPs).

Best Management Practices:

- Deep Sump Pits
- Pumps, Hoses, etc.
- Wellpoints
- Point Source Discharge Protection (Riprap with vegetative buffer, etc.)
- Flocculation Logs
- Flocculation Powder
- Erosion Control Blanket
- Rock Checks
- Ditch Checks
- Geotextile Fabric
- Dewatering Filter Bags
- Additional erosion and sediment control BMPs as per Engineer's direction

Method of Measurement: These items of work will be measured on a lump sum basis for furnishing, installing, maintaining, replacing, relocating and removing the dewatering systems required in the plans and these special provisions.

Basis of Payment: This work will be paid for at the contract unit price per lump sum for DEWATERING. The lump sum shall include, but not limited to, dewatering at both the Basin at Station 105+00 and Thorngate Creek at Station 148+50. The unit price shall include all equipment, labor and materials required to furnish, construct, maintain and remove the dewatering system. The unit price shall also include the transportation and disposal of removed BMPs and accumulated sediment.

EXPLORATION TRENCH (SPECIAL)

Description. This item shall consist of excavating a trench for the purpose of locating existing tile lines or other underground facilities within the limits of the proposed improvement.

General: Exploration Trench work will be done with hydro excavation equipment, unless otherwise directed by the Engineer. The trench shall be deep enough to expose the line but not more than one foot deeper than the line, and the width of the trench shall be sufficient to allow proper investigation to determine if the line needs to be relocated or replaced.

This work shall be performed according to Article 611.03 and Section 213 of the Standard Specifications except as modified herein.

Excavated material shall be disposed of in accordance with Article 202.03 of the Standard Specifications.

This work shall not be completed without prior approval from the Engineer.

Materials. The exploration trench shall be backfilled with gradation CA-11 stone, the cost of which shall be included in the cost of the work.

Method of Measurement. Exploration trench (special) will be measured for payment in feet of actual trench constructed.

Basis of Payment. This work will be paid for at the contract unit price per foot for EXPLORATION TRENCH (SPECIAL), regardless of the depth required, and no extra compensation will be allowed for any delays, inconveniences or damages sustained by the Contractor in performing the work.

**X1200042 MANHOLES, TYPE A, 9'-DIAMETER, WITH 2 TYPE 1 FRAMES,
CLOSED LID, RESTRICTOR PLATE**

Description. This work shall consist of constructing a Type A manhole of the diameter specified with a restrictor plate.

General. This work shall be completed in accordance with Sections 602 and 1006 of the Standard Specifications, the plan details, as specified herein, and/or as directed by the Engineer.

Construction shall conform to the details shown in the plans, all applicable Standard Drawings, and all applicable portions of Sections 602 and 1006 of the Standard Specifications. The structure shall have a 2-foot deep sump between the bottom of the lowest storm sewer invert and the bottom of the structure. Price shall include frames, lids, sand cushion, steps, 6" concrete wall, flat slab tops, all excavation and backfilling, and all other labor, materials, and equipment needed to perform the work as specified herein.

Method of Measurement. This work will be measured for payment in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for MANHOLES, TYPE A, 9'-DIAMETER, WITH 2 TYPE 1 FRAMES, CLOSED LID, RESTRICTOR PLATE.

WATER MAIN IN CASING PIPE, PVC

Description. This work shall consist of installing the water main (carrier pipe) within a previously installed steel casing pipe.

Materials for PVC pipe used for water main installation shall meet the requirements of the appropriate special provisions.

Construction Requirements. Casing spacers of the bolt-on, spider style shall be provided with the pipe to facilitate positioning of the pipe within the casing pipe. Casing spacers shall be provided with a shell made in two sections of heavy T-304 stainless steel. Connecting flanges of shell shall be ribbed. The shell section shall be lined with a 0.90" thick ribbed PVC extrusion with a retaining section that overlaps the edges of the shell and prevents slippage. All nuts and bolts shall be 18-8 stainless steel. Runners shall be made of ultra-high molecular weight polymer with inherent high abrasion resistance and a low coefficient of friction. Runners shall be supported by shell risers made of heavy T-304 stainless steel. The height of the supports and runners combined shall be sufficient to approximately center the carrier pipe inside the casing pipe. Casing spacers shall be by a reputable manufacturer and approved by the Engineer.

After the casing pipe has been installed and accepted by the ENGINEER, the carrier shall be installed as previously specified. The carrier pipe shall be pushed and pulled into place in such a manner that there is no opportunity for a joint to be opened. For water main, all push-on joints in casing shall have "field lock gaskets". The carrier pipe length shall be adjusted so that the end extends past the end of the casing pipe approximately 12 to 18 inches. Carrier pipe for water main shall be hydrostatically pressure tested prior to sealing annular space. A minimum of 3 casing spacers shall be provided per standard 18 ft to 20 ft length of piping or approximately every 6 feet. After the installation of the water main within the steel casing pipe is complete, the annular space between the carrier pipe and the casing pipe shall be filled with sand or pea gravel and the casing pipe at both ends shall be sealed using casing end seals and shall be manufactured by a reputable manufacturer and approved by the Engineer.

Method of Measurement. This work will be measured for payment in place in feet.

Basis of Payment. This work will be paid for at the contract unit price per foot for WATER MAIN IN CASING PIPE, PVC, of the diameter specified.

X5400005 BOX CULVERT REMOVAL

Description. This work shall consist of the removal and disposal of box culverts.

General. This work shall be completed in accordance with the applicable articles of Sections 501 and 551 of the Standard Specifications, and as directed by the Engineer.

The contractor shall dispose of all culverts according to Article 202.03 of the Standard Specifications.

Following removal of the box culvert, the resulting excavation shall be backfilled with Trench Backfill. Trench backfill will be paid for separately.

Method of Measurement. Box culvert removal will be measured in place in feet of existing culvert to be removed from end to end, regardless of culvert size. The measurement shall be made along the flow line of the culvert.

Basis of Payment. The work will be paid for at the contract unit price per foot for BOX CULVERT REMOVAL.

X2010516 SELECTIVE CLEARING (NEAR WATER)

Description: This work shall consist of extensive removal and disposal of shrubs, brush, debris (including rocks, bottles, etc.) and selected trees up to six (6) inches (150 mm) in diameter. All trees and shrubs to be saved shall be carefully protected as provided by Article 201.05 of the Standard Specifications. Locations for Selective Clearing and vegetation to be cleared or saved shall be designated by the Roadside Development Unit. Please contact a representative of the Roadside Development Unit at (847) 705-4171 at least 10 days prior to work.

The undesirable trees and brush (Siberian Elm, Russian Olive, Mulberry, Tree of Heaven, Buckthorn, etc.) shall be cut flush with the ground and all stubs or stumps shall be treated within 2 hours after cutting with a tinted WATER SAFE re-sprout herbicide approved by the Engineer to prevent re-growth from the stumps. Branches on remaining trees shall be pruned off up to 7 feet from the ground.

All cleared areas shall be graded, trimmed, smoothed, and finished uniformly to the satisfaction of the Engineer with equipment approved by the Engineer. Disposal of material shall be done in accordance with Article 202.03.

This work shall only pertain to the selective clearing required to construct the compensatory storage basin at Thorngate Creek. Clearing at all other locations shall be completed in accordance with Section 201 of the Standard Specifications and will not be measured for payment.

Method of Measurement: Selective Clearing will be measured in units of 1,000 square feet (90 square meters). The unit price shall include the cost of all material, equipment, labor, disposal, and incidental items required to complete the work as specified herein and to the satisfaction of the Engineer. If the inspection discloses any work as being unsatisfactory, the Engineer will give the Contractor the necessary instructions for correction of same, and the Contractor shall immediately comply with such instructions and correct the unsatisfactory work. Areas not meeting the satisfaction of the Engineer shall not be measured for payment. Plan quantities are estimates only. Actual quantities will be measured in place. Agreement to plan quantities will not be allowed.

Basis of Payment: This work will be paid for at the contract unit price per unit for SELECTIVE CLEARING. Payment for Selective Clearing shall include the cost of all minor grading, debris removal and disposal, water safe herbicide treatment, trimming, pruning, smoothing, finishing, labor, materials, tools and equipment required to complete the work as specified herein and to the satisfaction of the Engineer.

X2070304 POROUS GRANULAR EMBANKMENT, SPECIAL (LCDOT)

Effective: January 1, 2007

Revised: January 22, 2015

Description: This work shall consist of furnishing and placing porous granular embankment.

Materials: The aggregate shall meet the requirements of Article 1004.05 of the "Standard Specifications" except as follows:

1. *Crushed Stone, Crushed Blast Furnace Slag, or Crushed Concrete meeting the requirements of the following table will be permitted.*

Sieve Size	Percent Passing
8"	100
6"	97 +/- 3
4"	90+/- 10
2"	45 +/- 25
#4	20+/-20
#200	5 +/- 5

2. *Crushed Gravel meeting the requirements of the following table will be permitted.*

Sieve Size	Percent Passing
8"	100
6"	97 +/- 3
4"	90+/- 10
2"	55 +/- 25
#4	30 +/- 20
#200	5 +/- 5

3. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with the above aggregate materials but shall not exceed 40 percent of the total product. The RAP shall have a top size of 4" and be well graded.

Steel slag and other expansive materials will not be permitted.

Crushed Gravel shall be defined as meeting a target of 97% with +/-3% variance for one-face or more crushed according to Crushed Particle Content: ASTM D 5821 (Illinois Modified).

Equipment: A vibratory roller meeting the requirements of Article 1101.01(g) of the "Standard Specifications" shall be used to roll each lift of material.

General: The work shall be performed according to Section 207 of the "Standard Specifications" and the following:

A vibratory roller shall be used to roll each lift of material to obtain the desired keying or interlock and necessary compaction. The Engineer will verify that adequate keying has been obtained.

Porous Granular Embankment, Special shall be used in all widening and pavement reconstruction areas as shown on the plans. Undercut and PGE placement in addition to the plan thickness will be done as field conditions warrant. No adjustment in unit price will be allowed for an increase or decrease in quantities from the estimated quantities shown in the plans.

Method of Measurement: Porous Granular Embankment, Special will be measured for payment in cubic yards according to Article 311.08(b) of the "Standard Specifications".

Basis of Payment: This work will be paid for at the contract unit price per cubic yard for POROUS GRANULAR EMBANKMENT, SPECIAL. The unit price shall include all equipment and labor required to furnish and place the porous granular embankment.

X2800500 INLET PROTECTION, SPECIAL (LCDOT)

Effective: January 1, 2007

Revised: October 17, 2016

Description: This work shall consist of furnishing, constructing, maintaining, removing, and disposing of inlet protection as part of the project's temporary erosion control system.

General: The work shall be performed according to Section 280 of the "Standard Specifications", and the following:

The inlet protection shall consist of silt filter fence placed around the perimeter of the inlet. The silt filter fence shall be supported by 1" x 2" wooden stakes with a minimum length of three feet. The stakes shall be spaced no more than three feet apart, and shall be driven into the ground a minimum of 8".

The filter fabric shall be installed in a backfilled trench 6" deep and securely attached to the posts by a method approved by the Engineer. The rim elevation of the casting shall be temporarily set a minimum of 6" above the adjacent grade. This elevation may vary to avoid flooding conditions as determined by the Engineer.

During the construction operation when any loose material is deposited in the flow line of ditches, gutters or drainage structures so the natural flow of water is obstructed, the material shall be removed at the close of each working day.

At the conclusion of the construction operations all drainage structures shall be free from all dirt and debris. This work will not be paid for separately but shall be considered included in the unit cost of INLET PROTECTION SPECIAL.

Method of Measurement: This work will be measured for payment as individual items and the unit of measurement will be each regardless of the size or type of inlet being protected.

Basis of Payment: This work will be paid for at the contract unit price per each for INLET PROTECTION, SPECIAL. The unit price shall include all work and materials necessary to properly install the inlet protection, maintain the inlet protection throughout the project, and to remove and dispose of the used materials at the completion of the project.

X5017307 PROTECTIVE SHIELD (SPECIAL)

Description: This work shall consist of furnishing, constructing, and maintaining a protective shield system to protect the North Shore Gas main and AT&T steel conduits while the Deerfield Road over Des Plaines River bridge deck is removed and replaced.

General: The work shall be performed according to Section 501 of the Standard Specifications and the following:

The protective shield system shall be designed and constructed to sustain loads of 200 lb/sq ft in addition to its own weight. Protective shield systems comprised of wood members shall be designed for a minimum loading duration of seven days. The system The existing vertical clearances above roadways and/or railroad tracks shall be maintained. The Contractor shall coordinate the installation with North Shore Gas and AT&T to ensure protection of their facilities during the bridge deck removal and replacement process.

The Contractor shall submit working drawings and calculations prepared and sealed by an Illinois Licensed Structural Engineer to the Engineer for the protective shield system. The drawings shall provide full details, dimensions, and types of materials proposed for use. The protective shield system shall not be installed until authorization to proceed is given by the Engineer.

Concrete removal shall not commence until the protective shield system is in place and in conformity with the sealed working drawings.

Method of Measurement: The protective shield system will be measured for payment in place and the area computed in square yards. The length will be measured along the centerline of the structure. The width will be measured between the beam webs of each of the two bays where the utilities are located

Basis of Payment: This work will be paid for at the contract unit price per square yard for PROTECTIVE SHIELD (SPECIAL).

X4403800 MEDIAN SURFACE REMOVAL

Description. This work shall consist of the complete removal of existing concrete median surface.

General. All existing concrete median surfaces, which interfere with construction work, shall be completely removed as shown on the plans or as directed by the Engineer.

Disposal. Materials resulting from the removal of existing median surface shall be disposed of according to Article 202.03 of the Standard Specifications.

Method of Measurement. Median surface removal will be measured for payment in place and the area computed in square feet.

Basis of Payment. This work will be paid for at the contract unit price per square foot for MEDIAN SURFACE REMOVAL.

X5030290 STAINING CONCRETE STRUCTURES

Effective: January 1, 2007

Revised: June 2, 2017

Description: This work shall consist of staining permanently exposed surfaces of designated concrete structures that have been formed with an approved form liner to replicate actual stone masonry.



The staining shall approximate the colors of natural limestone and achieve the color variations present in natural limestone. The final coloration of the cast stone concrete surface shall accurately simulate the appearance of real stone including the multiple colors, shades, flecking, and veining that are apparent in real stone. It shall also simulate the colors that may be present from aging, e.g. staining from oxidation, rusting and/or organic staining from soil and vegetation. The staining shall be similar to the coloring of the wall in the adjacent example.

The staining shall use the following colors.

- Base coat: Aztec Sand
- 1st Highlight: Corn Muffin
- 2nd Coat Highlight: Terra Cotta
- 2nd Coat Highlight: Autumn Brow
- Grout Lines: Muddy Gray

Materials: The stain shall create a surface finish that is breathable (allows water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight and/or weathering. The stain shall be odor free and V.O.C. compliant. The stain shall meet the requirements for weathering resistance of 2000 hours accelerated exposure.

Sample Panel: Once the Engineer has approved the style of form liner to be used (see the special provision for FORM LINER TEXTURED SURFACE) the Contractor shall submit a proposed procedure to obtain the simulated finish using the approved architectural form liner style. The procedure shall include plans and details for the form liner pattern and dimensions. The procedure shall also include the process for the staining. The procedure shall be submitted to the Engineer for approval within 30 calendar days following the date of notification of approval of the form liner style. Plans and details not satisfactory to the Engineer and/or LCDOT shall be revised by the

Contractor as required by the Engineer and/or LCDOT at no additional cost to the Department.

Upon approval of the form liner plans and proposed procedure, the Contractor shall submit a 3' by 3' (minimum) sample concrete panel of the simulated stone masonry complete with form liner pattern and staining. The sample panel shall be delivered to the job site and positioned at a location to be determined by the Engineer.

General: The surfaces to be stained shall be structurally sound, clean, dry, and fully cured. The concrete shall be at least 30 days old prior to applying the stain. Curing agents shall be removed a minimum of 14 days prior to staining to allow the concrete to dry out.

Temperature and relative humidity conditions shall meet the manufacturer's application instructions. The Contractor shall not apply the stain under rainy conditions or within three days after surfaces become wet from rainfall or other moisture. Do not apply when the weather is foggy or overcast.

The concrete surface shall be cleaned prior to the applying the stain materials. The Contractor shall follow the manufacturer's recommendations for the methods and materials used for cleaning the substrate. The Contractor shall insure that the surface is free of latency, dirt, dust, grease, efflorescence, paint, or other foreign material. The Contractor shall not use sandblasting as a cleaning method. The preferred method to remove latency is pressure washing with water, at a minimum 3000 psi (3-4 gal/min), using fan nozzle. The nozzle should be positioned perpendicular to and at a distance of 1-2 feet from the concrete surface. The cleaned surface shall be free of blemishes, discoloration, surface voids and unnatural form marks.

The stain shall be thoroughly mixed according to the manufacturer's directions using an air-driven or other explosion-proof power mixer. Mix each container thoroughly prior to application. Do not thin the material.

A test section of the concrete structure, approximately ten square feet in area, shall be selected; cleaned; prepared; and stained to verify surface preparation, adhesion and color pallet.

The base coat (Aztec Sand) shall cover 100% of the exposed surface. The 1st highlight (Corn Muffin) shall cover approximately 60% of the exposed surface. The 2nd (Terra Cotta) and 3rd (Autumn Brown) highlights shall be applied as needed to match the desired color scheme. The materials shall be applied at the rate recommended by the manufacturer. Absorption rates may increase or decrease the application rate, depending upon the surface texture and porosity of the substrate, so as to achieve even staining. The Contractor shall wait until the last application of stain has dried i.e. lost its tack, before applying the next color. Once the Engineer has approved the results from the test area the rest of the exposed surfaces may be stained.

The Contractor shall avoid staining the “mortar joints” by providing suitable protection over the joints during the staining process. The “mortar joints” shall be masked after the application of the base coat (Aztec Sand) and before the application of the 1st highlight (Corn Muffin). After the 2nd (Terra Cotta) and 3rd (Autumn Brown) highlights have been applied and dried the mortar joints shall be un masked and stained (Muddy Gray) using an air-brushing technique or other method approved by the Engineer.

An anti-graffiti coat shall be applied to the final exposed surface. The anti-graffiti coating shall be Protective and Marine Coating. The anti-graffiti coat shall be applied at least five calendar days after the application of the final wall stain.

Throughout the staining process the Contractor shall take precautions to ensure that workmen and work areas are adequately protected from fire and health hazards resulting from handling, mixing and applying the materials. The Contractor shall furnish all the necessary equipment to complete the work. The Contractor shall provide drop cloths and other forms of protection necessary to protect adjoining work and undisturbed areas from overspray and splash from the concrete stain work. Any areas or surfaces, which have been damaged or splattered, shall be cleaned, restored, and/or replaced to the satisfaction of the Engineer.

Additionally the Contractor shall coordinate the color stain application with earthwork and back-filling of any wall areas to ensure that all simulated stone texture that might fall below grade is colored prior to back-filling. The Contractor shall delay adjacent plantings until color application is completed. The Contractor shall coordinate the staining to permit coloring applications without interference from other trades. The Contractor shall provide temporary cover of the in-progress or completed staining in areas where exposed soil or pavement is adjacent which may spatter dirt or soil from rainfall, or where surface may be subject to over-spray from other processes,

Method of Measurement: The exposed stained surfaces will be measured in place, and the area computed in square feet. The area of the sample panel will not be included in the computed area.

Basis of Payment: This work will be paid for at the contract unit price per square foot for STAINING CONCRETE STRUCTURES. The unit price shall include all materials, equipment, and labor required to stain the exposed concrete surfaces. The unit price shall include all cleaning and prep work; furnishing and applying all five stains; furnishing and applying the anti-graffiti coat; and site cleanup. The unit price shall also include the preparation and submittal of the proposed procedure and the staining of the 3’ x 3’ sample. The construction of the sample including materials, equipment, labor, transportation and disposal shall be included in the unit price for FORM LINER TEXTURED SURFACE.

X5091725 BICYCLE RAILING, SPECIAL (LCDOT)

Effective: April 29, 2021

Description: This work shall consist of furnishing and installing a steel bicycle railing, gates and accessories as shown on the plans.

Materials:

- A. The steel material for the fence framework (i.e., tubular pickets, rails and posts) shall meet the following:
 - I. Galvanized after forming:
 - a. Conform to the requirements of ASTM A1011/1011M
 - b. Minimum yield strength of 50,000 psi.
 - c. The exterior shall be hot-dip galvanized with a 0.45 oz/ft² minimum zinc weight.
 - d. The interior surface shall be coated with a minimum 81% normal zinc pigmented coating, 0.3 mils minimum thickness.
 - II. Galvanized prior forming
 - a. Conform to the requirements of ASTM A924/A924M
 - b. Minimum yield strength of 50,000 psi.
 - c. The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft², Coating Designation G-90.
- B. The manufactured galvanized framework shall be subjected to a thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a zinc-rich thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils. The color shall be as specified on the standard drawing included in the plans. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in the following table.

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 1 – Coating Performance Requirements

- C. The material for the fence pickets shall be 1" square x 16 gauge tubing. The cross-sectional shape of the rails shall conform to the manufacturer's design with outside cross section dimensions of 1.75" square and a minimum thickness of 14 gauge. Picket holes in the horizontal rail shall be spaced 4.98" on center. The picket retaining rods shall be made of 0.125" diameter galvanized steel. The minimum post size shall be 2½" square x 12 gauge. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

The manufacturer's literature (or shop drawings and specifications) shall be submitted to the Engineer prior to ordering the fence. The bicycle railing, as shown on LCDOT standard detail LC6610, and as specified herein, is an industrial quality ornamental steel fence system. The drawings and dimensions were furnished by one manufacturer. An equivalent fence system may be proposed for substitution. The Engineer is the sole judge of what is an equivalent substitution.

General: Installation of the fence shall be according to the applicable portions of Section 664 [Chain Link Fence] of the "Standard Specifications", except as follows:

1. Dimensions and design details are as shown on the plans.
2. At some locations, the fencing shall be attached to concrete retaining walls. The attachment methods shall conform to the requirements of the "AASHTO LRFD (Load and Resistance Factor Design) Bridge Design Specifications" (AASHTO 2007) Section 13, "Railings". The allowable attachment methods include coring the concrete to 9" depth and grouting the fence posts in the holes or using mounting brackets and anchors.
3. Fence post installation in soil shall be done using concrete footings as shown on the plans.

Fence Fabrication:

- A. The pickets, rails and posts shall be precut to specified lengths. The horizontal rails shall be pre-punched to accept the pickets.
- B. The grommets shall be inserted into the pre-punched holes in the rails and the pickets shall be inserted through the grommets so that the pre-drilled picket holes align with the internal upper raceway of the horizontal rails. (Note: This can best be accomplished by using an alignment template.) Retaining rods shall be inserted into each horizontal rail so that they pass through the predrilled holes in each picket completing the panel assembly.
- C. The completed panels shall be capable of supporting a 600lb load (applied at midspan) without any permanent deformation. Panels with rings shall be biasable to a 12.5% change in grade. Panels without rings shall be biasable to a 25% change in grade.
- D. Gates shall be fabricated using the same components as the fence system. The panel material and gate ends will have the same outside cross section dimensions as the horizontal rail. All rail and upright intersections shall be joined by welding. Picket and rail intersections shall be joined by welding or the same retaining rod used for the panel assembly.

Installation:

The fence posts shall be set according to the spacing shown in Table 2, $\pm\frac{1}{2}$ ", depending on the nominal span specified.

Span	6' Nominal (67 $\frac{3}{4}$ " Rail)				8' Nominal (92 $\frac{5}{8}$ " Rail)			
Post Size	2 $\frac{1}{2}$ "	3"	2 $\frac{1}{2}$ "	3"	2 $\frac{1}{2}$ "	3"	2 $\frac{1}{2}$ "	3"
Bracket Type	Standard (BB301)		Angle (BB304)		Standard (BB301)		Angle (BB304)	
Post Settings $\pm \frac{1}{2}$ " O.C.	71 $\frac{1}{2}$ "	72"	73"	73 $\frac{1}{2}$ "	96"	96 $\frac{1}{2}$ "	97 $\frac{1}{2}$ "	98"

Table 2 – Post Spacing Requirements

For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. For fencing installed in soil, posts shall be set in concrete footings having a minimum depth of 36" as shown on LCDOT standard detail LC6610 included in the plans.

For fence installed on top of a concrete retaining wall, posts shall be set by methods such as plated posts or grouted core-drilled footings. The anchor method shall conform to the requirements of the "AASHTO LRFD (Load and Resistance Factor Design) Bridge Design Specifications" (AASHTO 2007), Section 13, "Railings". The Contractor shall provide shop drawings of the anchor method to the Engineer for review and approval.

FENCE INSTALLATION MAINTENANCE

When cutting/drilling rails or posts adhere to the following steps to seal the exposed surfaces:

- 1) Remove all metal shavings from cut area.
- 2) Apply custom finish paint matching fence color.

GATE INSTALLATION

Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out to out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application, weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacturer of the gate and shall be installed per manufacturer's recommendations

Gate posts shall be spaced according to the gate openings specified in the construction plans. The fence panels shall be attached to the posts using mechanically fastened panel brackets supplied by the manufacturer.

Method of Measurement: Bicycle Railing, Special will be measured for payment in feet along the top of the fence from center to center of the end posts.

Basis of Payment: This work will be paid for at the contract unit price per foot for BICYCLE RAILING, SPECIAL. The unit price shall include furnishing and installing the railing, including all railing connections, connection to a retaining wall (where required), concrete foundations, fence openings and gates (where indicated) and electric grounding. The unit price shall also include all equipment, materials and labor required to install the railing.

X55103XX SANITARY SEWER REMOVAL

Description. This work shall consist of the removal of existing sanitary sewer pipe, including sawcutting, and removal and disposal of existing pavement; protection, repair or replacement of utilities; excavation; removal and disposal of waste excavated material; trench dewatering, including erosion and sedimentation control; watertight connections to existing pipes or structures; installation of pipe; bracing, bedding and covering of pipe; granular trench backfill material at pipe crossing and below all pavement; and cleanup. Trench Backfill material shall be per Section 208 of the SSRBC.

Method of Measurement and Basis of Payment. The work shall be measured and paid for per foot for SANITARY SEWER REMOVAL, measured along the centerline of the pipe, of the size indicated. This item shall cover the removal of all material types of sanitary sewer, and include backfill (Trench Backfill as necessary).

X5509910 ABANDON AND FILL EXISTING SANITARY MANHOLE

Description. This work shall consist of the abandonment of existing sewer manholes to be abandoned as shown on the plans and as directed by the Engineer to construct the proposed improvements.

Construction Requirements. The tops of all existing manholes to be abandoned shall be removed to an elevation of at least 3 in. below the earth subgrade of the proposed improvement. All storm sewer connections shall be securely sealed with Class SI concrete or brick and mortar. After the concrete or mortar has set, the existing manhole shall be filled with sand and the sand compacted.

Disposal of Excess Material. All material resulting from the abandoning of manholes shall be disposed of by the Contractor according to Article 202.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price each for ABANDON AND FILL EXISTING SANITARY MANHOLE.

X5631212 CONNECTION TO EXISTING FORCE MAIN, 12"

Description. This work shall consist of all work and materials required for making a connection from the proposed forcemain to the existing forcemain at the locations indicated. All materials, coupling, and gaskets shall match the proposed forcemain specifications.

The connection to the existing forcemain from the proposed forcemain from the new lift station (Sta 125+79) shall also include a wye fitting and removal of the section of the existing forcemain required for the work. This work shall also include a 2" Air Release Valve to the specifications seen in the pump station specifications. The gate valve adjacent to the wye shall be paid for under Gate Valve and Box 12". The existing forcemain from the old lift station and wye shall be capped.

The connection to the existing forcemain west of the Des Plaines River (Sta 119+56) for the emergency bypass shall include a new wye or tee fitting and removal of the section of the existing forcemain required for the work.

Basis of Payment. This work will be paid for at the contract unit price EACH for CONNECTION TO EXISTING FORCE MAIN 12".

X5610700 WATER MAIN REMOVAL

Description. This work shall consist of the removal of existing water main that is in direct conflict with the proposed improvements.

General. This work shall be completed in accordance with applicable portions of Section 551 of the Standard Specifications, except that the material shall not be salvaged, but shall be disposed of according to Article 202.03 of the Standard Specifications. All diameters of water main to be removed will be covered under this pay item. This work shall also include any necessary sawcutting of the existing water main and the removal of bends, tees, water main casing pipe, and other appurtenances (excluding valves and fire hydrants).

The ends of the existing water main shall be plugged as specified for CUT AND CAP EXISTING WATER MAIN of the diameter specified.

Trenches resulting from the removal of water main shall be backfilled in accordance with the applicable requirements of Article 550.07. Trench backfill will be included in this item.

Basis of Payment. This work will be paid for at the contract unit price per foot for WATER MAIN REMOVAL of the diameter specified

X56107XX WATER MAIN LINE STOP

Description. This work shall consist of furnishing and placing a self-contained hydraulic unit within an operating water main for the purpose of installing a valve and/or other connection with the existing system without interruption of service.

Materials. The line stop unit shall be a self-contained hydraulic (hand pump operated) ram. The line stopping device shall be of such design that, when hydraulic pressure is applied, the bladder will expand and conform to the I.D. of the pipe and tuberculation inside the main (if any) will be moved outside of the sealing area.

The line stop shall be of the 'bolt-on' variety, which will require removing only the top of the pipe during the operation. All fittings shall employ an I.D. thread, screw type engagement together with O-Ring seal for bubble tight completion. After insertion of plug, a screw-on cap will be used and bolted down. The system shall be capable of containing a water pressure of 150 psi. The line stopping system shall be approved by the Engineer prior to mobilization/installation.

General. The work shall include all materials; labor and equipment required for: supply and installation of the placement of required plugs; testing/inspection; correction of defects; removal of the line stop, and related work required to complete the installation of the line stop.

Basis of Payment. This work will be paid for at the contract unit price per each for WATER MAIN LINE STOP.

X6022XXX SANITARY SEWER MANHOLE

Description. This work shall consist of furnishing and installing sanitary sewer manholes of the precast reinforced concrete type and shall comply with ASTM C-478 and be provided with monolithically precast base, unless the requirements of the installation or the plans show otherwise. Each manhole shall be provided complete in accordance with the plans. **All sanitary manholes shall have precast benches.**

Description.

1. Top: Precast concrete, of cone, top type, as indicated.
2. Base: Precast concrete, with compound base riser section and base slab, as indicated; except that separate base slab shall be provided as required for the application.

Steps: M.A. Industries PS2-PF integrally cast into manhole sidewalls.

Pipe Connectors: Resilient, complying with ASTM C 923.

3. Vacuum Testing of Manholes: Manholes shall be tested before the ring and cover and grade adjustment rings are installed, and after backfill and compaction is complete. Tests shall be performed in accordance with ASTM C1244 and these Specifications.
 - a. Preparation for tests:
 1. All lift holes, joints and other imperfections shall be filled with an approved non-shrink grout, to provide a smooth finish appearance.
 2. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manholes.
 - b. Test procedure:
 1. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendation.
 2. A vacuum of 10-inches mercury shall be drawn in the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9-inches mercury.
 3. The manhole shall pass if the time for the vacuum reading to drop from 10-inches mercury to 9-inches mercury meets or exceeds the values indicated in the following table:

Minimum Test Times for 48" Manhole	
Depth (ft)	Time (s)
8	20
10	25
12	30
14	35
16	40
18	45
20	50
22	55
24	59
26	64
28	69
30	74

- a. If the manhole fails any test, necessary repairs shall be made by an approved method and the manhole shall be retested until a satisfactory test is obtained.

The outside of the manhole shall be coated with a waterproofing membrane and internal chimney seals shall be provided in accordance with ASTM C-923.

Materials.

Manhole Casting. All frames and lids shall be Neenah R-1772 or East Jordan 1022 Frame & Lid w/Concealed Pickhole and self-sealing gasket, with machined horizontal bearing surface with word "SANITARY" cast into lid.

External Chimney Seal. Shall conform to ASTM C923 and shall be Cretex Classic, Canusa "Wrapidseal", or Adaptor Inc.

Barrel Section Joint External Wraps. All Barrel section joints to have external wrap same supplies as external chimney seal.

Adjustment Rings. Shall be 2" minimum, 8" max. Cretex Pro-Ring rings shall be rated for H-20 loading.

Drop Manhole Connections. Drop manhole connections shall be used whenever any sewer or service enters 2' above the lowest invert. All drop connections shall be external and constructed to LCPW standard details.

Drop Manhole Coatings. Force main discharge manholes, drop manholes, and manholes adjacent to force main discharge manholes shall be spray lined with a minimum

1-inch of hydrogen sulfide resistant cementitious mortar. Coating shall be applied in strict conformance with manufacturer's written procedures. In lieu of the foregoing, an additive such as "CONSHIELD", can be added to the mix at the time of manufacture. Certification from the manufacturer shall be provided and approved prior to acceptance.

Bitumastic Gasket Material. shall meet or exceed Federal Specification SS-S-210A.

Sewer, Service, and Forcemain Connections. shall be included in the cost of the manhole, including coring, ASTM C923 Resilient Connectors, and hydraulic grouting.

Submittals. All materials sheets are to be submitted and approved before installation can proceed.

Method of Measurement and Basis of Payment. This work shall be considered included in the unit price per EACH for SANITARY SEWER MANHOLE of the type (including drop manholes), diameter, and frame & lid specified, and shall include all labor and materials for manhole as described in the above provisions. Pipe connections, trench backfill and final adjustment of frame and grate shall be included in the cost of this work.

XX006088 GATE VALVE AND BOX

Description. This work shall consist of the installation of water valves of the resilient wedge gate valve type suitable for ordinary sanitary forcemain services, intended to be installed in a normal position on buried pipe lines for sanitary forcemain systems. This work shall be completed in accordance with applicable Department standards as noted on the plans.

Materials. All materials shall be per applicable Department Standard Details. All wedges shall be brass, two (2) per joint.

1. **Manufacturer and Marking** - The gate valves shall be standard pattern and shall have the name or mark of the manufacturer, size and working pressure plainly cast in raised letters on the valve body. Gate valves and taps shall be in accordance with Department Standards. Valve manufacturer shall be American Flow Control.
2. **Type and Mounting** - The valve bodies shall be mounted with approved non-corrosive metals. All wearing surfaces shall be brass or other approved non-corrosive material and there shall be no moving bearing or contact surfaces of iron in contact with iron. Contact surfaces shall be machined and finished in the best workmanlike manner, and all wearing surfaces shall be easily renewable. All trim bolts shall be 300 series stainless steel. The resilient-seated disc wedge shall be of the resilient wedge fully-supported type. Solid guide lugs shall travel within channels in the body of the valve. The disc and guide lugs shall be fully (100%) encapsulated in SBR (styrene butadiene) rubber. Disc wedges that are not 100% fully encapsulated shall not be acceptable. Guide caps of an acetal copolymer bearing material shall be provided to protect the rubber-encapsulated solid guide lugs from abrasion for long life and ease of operation. All internal and external exposed ferrous surfaces of the valve shall be coated with a fusion-bonded, thermosetting powder epoxy coating. Coating thickness shall be nominal 10 mils. The stem shall be of high tensile strength brass or other approved non-corrosive metal, providing 70,000 PSI tensile strength with 15% elongation and a yield strength of 30,000 PSI. All nonferrous bushings shall be of substantial thickness, tightly fitted and pressed into machine seats. All valves shall open by turning to the left (counterclockwise), unless otherwise specified.
3. **End Connections** - End connections of gate valves shall consist of Mechanical Joints and Mega-Lug retainer glands. All water valve (including auxiliary valves) bolts shall be stainless steel. All pipe joints at any valve or fitting, including those where the proposed water main ties into the existing water main, shall be restrained with retainer glands. Retainer glands shall be Mega Lugs by EBAA Iron. Sac-nuts shall be required per applicable Department Standards. The valve boxes shall be Mueller H-10300 Series, shall be set at finished grade.

Method of Measurement and Basis of Payment. This work will be paid for at the contract unit price per EACH for GATE VALVE AND BOX, of the diameter specified, and shall include all materials, labor, and equipment.

X1200XXX JUNCTION CHAMBER

Description. This work shall consist of all work and materials required for the construction of a junction chamber in accordance with the plans and as specified herein. The dimensions shown on the plans are measured to the inside face of the chamber walls.

Materials.

Concrete:	IDOT Section 1020 Class PC (f' c min = 4,500 PSI)
Reinforcing Steel:	ASTM A 706, Grade 60 (IL Modified)
Pipe Grates:	Galvanized Steel in accordance with Article 1006.27(b) of the "Standard Specifications"
Bolts/Nuts/ Washers:	Article 1006.27(f) of the "Standard Specifications"
Precast Riser/Slab:	IDOT Standard 602401 and 602601
Steps:	IDOT Standard 602701
Mastic Joint Sealer:	IDOT Section 1056
Loading:	Soil Loads and AASHTO HS-20

Construction Requirements. The junction chambers shall be constructed in accordance with Sections 503/504 of the Special Provisions. All excavation and granular backfill material shall be in accordance with Section 502 of the Standard Specifications. The Contractor shall be responsible for verifying the size, inverts and locations of the sewers to be connected to the proposed junction chamber. A cast in place concrete bench slab shall be poured up to the inverts of the pipes to prevent standing water on the bottom slab. The Contractor shall be take necessary precautions to prevent the chamber from becoming buoyant during construction.

The Contractor has the option of constructing the junction chamber using cast in place concrete in accordance with IDOT Section 503, with prior permission from the LCDOT. Cast in place concrete shall be IDOT class SI (f'c min = 3500 PSI).

The Contractor shall submit calculations and detailed shop drawings that are signed and sealed by a Structural Engineer licensed in the State of Illinois to the Engineer for review prior to ordering material or starting construction. The required thickness of the chamber

bottom slab, sidewalls and top slab, and reinforcement details shall be shown on the shop drawings.

A temporary shoring plan, signed and sealed by a Structural Engineer licensed in the State of Illinois, shall be submitted to LCDOT with corresponding calculations and other necessary information, for all temporary shoring required to accommodate safety and other requirements during construction. Temporary shoring plan shall be approved by LCDOT prior to installation of temporary shoring.

Basis of Payment. This work will be paid for at the contract unit price per each for JUNCTION CHAMBER, of the number specified. All labor and materials associated with excavation, granular backfill, granular subbase, concrete, reinforcement bars, cast iron steps, precast concrete riser and slab, temporary shoring and any miscellaneous items required for the junction chamber will not be paid for separately, but shall be included in the cost of the work.

X8100105 CONDUIT SPLICE

Description: This item shall consist of splicing two high density polyethylene (HDPE) unit duct type conduits together at the location shown on the drawings.

The splice shall be waterproof made with a clamp on type coupler made from HDPE with corrosion resistant stainless steel band clamps and locking rings. The coupler shall be UL listed for underground HDPE conduit connections in wet locations. Prior to splicing, the ends of the conduits shall be beveled per the Manufacturers installation requirements.

The contractor shall record the location of the conduit splice and include it on the Record Drawings.

Measurement and Payment: This work shall be paid for at the contract unit price per each for CONDUIT SPLICE, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

X6700405 ENGINEER'S FIELD OFFICE, TYPE A (MODIFIED) (LCDOT)

Effective: January 1, 2007

Revised: April 20, 2022

Description: This work shall consist of furnishing and maintaining in good condition, for the exclusive use of the Engineer, a weatherproof building at a location approved by the Engineer.

General: The field office shall meet the requirements of Article 670.02 of the "Standard Specifications", and the following:

The field office shall include the following additional equipment, supplies and services:

- An electric pencil sharpener.
- A hand sanitizer shall be included in the restroom facilities.
- A scanner capable of scanning and saving documents, up to 11" x 17", in PDF format. The scanner may be a function included on the copier or a separate unit. The unit (copier or separate scanner) shall have a USB port for connection to a computer or flash drive to download the scanned documents.
- The field office internet connection shall provide an average download speed of 50 Mbps. The internet connection download speed shall not slow to less than 25 Mbps.

The field office and required equipment, supplies and services shall all meet the approval of the Engineer.

Basis of Payment: This item will be paid for at the contract unit price per calendar month for ENGINEER'S FIELD OFFICE, TYPE A (MODIFIED). The unit price shall include all supplies, equipment, materials and labor required to furnish and maintain the field office.

Z0074310 TEMPORARY SUPPORT SYSTEM, LOCATION 1

Description. This work shall consist of the temporarily supporting a 4" gas main and casing pipe, that is currently mounted to the underside of the deck of the Deerfield Road bridge over the Des Plaines River to allow for the removal of the bridge deck.



EXISTING GAS MAIN MOUNTED TO UNDERSIDE OF DEERFIELD ROAD BRIDGE
OVER DES PLAINES RIVER

General. The Contractor shall remove the existing utility supports and construct new utility supports prior to removing the bridge deck. Drilling into or welding supports to the steel beams will not be allowed. The utility supports should be designed to allow the Contractor to place protective shield over the utilities prior to the removal of the bridge deck.

No horizontal or vertical movement of the gas main will be allowed. The Contractor shall contact North Shore Gas prior to beginning work.

Construction. The Contractor shall submit working drawings and calculations prepared and sealed by an Illinois Licensed Structural Engineer to the Engineer for the temporary support system. The drawings shall provide full details, dimensions, and types of materials proposed for use. The temporary support system shall not be installed until authorization to proceed is given by the Engineer.

Basis of Payment. This work will be paid for at the contract unit price per each for TEMPORARY SUPPORT SYSTEM, LOCATION 1, which price shall include the preparation of shop drawings and all materials and labor necessary to design and construct a temporary support system for the existing gas main along the entire length of the Deerfield Road bridge over the Des Plaines River from abutment to abutment.

Z0074320 TEMPORARY SUPPORT SYSTEM, LOCATION 2

Description. This work shall consist of the temporary support of a 9-steel conduits that are currently mounted to the underside of the deck of the Deerfield Road bridge over the Des Plaines River.



EXISTING AT&T STEEL CONDUITS MOUNTED TO UNDERSIDE OF DEERFIELD
ROAD BRIDGE OVER DES PLAINES RIVER

General. The Contractor shall remove the existing utility supports and construct new utility supports prior to removing the bridge deck. Drilling into or welding supports to the steel beams will not be allowed. The utility supports should be designed to allow the Contractor to place protective shield over the utilities prior to the removal of the bridge deck.

No horizontal or vertical movement of the steel conduits will be allowed. The Contractor shall contact AT&T prior to beginning work.

Construction. The Contractor shall submit working drawings and calculations prepared and sealed by an Illinois Licensed Structural Engineer to the Engineer for the temporary support system. The drawings shall provide full details, dimensions, and types of materials proposed for use. The temporary support system shall not be installed until authorization to proceed is given by the Engineer.

Basis of Payment. This work will be paid for at the contract unit price per each for TEMPORARY SUPPORT SYSTEM, LOCATION 2, which price shall include the preparation of shop drawings and all materials and labor necessary to design and construct a temporary support system for the existing AT&T steel conduits along the entire length of the Deerfield Road bridge over the Des Plaines River from abutment to abutment.

CONDUIT ATTACHED TO STRUCTURE, 6" DIA., GALVANIZED STEEL

Description. This work shall consist of furnishing and installing galvanized steel conduit attached to the outside of the south parapet wall on the Deerfield Road bridge over the Des Plaines River.

General. This work shall be completed in accordance with Section 811 of the Standard Specifications and as follows:

Handholes will be placed at both ends of the bridge where a transition from the conduit used to cross the bridge to HDPE will be made. The handholes will be supplied and constructed by Lumen.

All attachment brackets shall be hot-dipped galvanized steel.

The Contractor shall provide and install vibration-dampening materials for easing vibration stress caused by road traffic. Neoprene insulators or equivalent will have a minimum of one-quarter inch (1/4") thickness.

All nuts (top cone lock-nuts, side-lock nuts or equivalent), bolts and lock washers will be of stainless steel or hot-dipped galvanized design. Neoprene vibration insulators will be used in assembly. When embedding bracket studs in concrete, an epoxy cartridge will be used.

Attachment brackets will be placed to adequately support the conduit structure. A general guideline would be attachment at optimum intervals of ten feet (10'). A length equal to one diameter of the bolt will be exposed after the nut is in place.

The design of bridge attachments shall minimize bends and to the greatest possible extent shall maintain a horizontally and vertically straight conduit alignment. If there are expansion joints in the bridge design, a conduit coupler that allows for expansion or an attachment that allows for conduit movement should be utilized.

Method of Measurement. This work will be measured in accordance with Article 811.04 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per foot for CONDUIT ATTACHED TO STRUCTURE, 6" DIA., GALVANIZED STEEL.

X5091765 PIPE HANDRAIL (SPECIAL)

Description. This work shall consist of furnishing and installing steel railing at pedestrian ramps and stairs.

General. The work shall be completed in accordance with Section 509 of the Standard Specifications, in accordance with the plan details, and as directed by the Engineer.

Shop Drawings. Shop drawings for the proposed railing shall be approved by the Engineer before ordering materials. These drawings shall indicate post spacing and detail the attachment and layout of the railing. All railings and connection details shall be shown in the shop drawings.

Method of Measurement. This work will be measured for payment in place in feet. The length measured will be the overall length along the top longitudinal railing member through all posts and gaps.

Basis of Payment. This work shall be paid for at the contract unit price per foot for PIPE HANDRAIL (SPECIAL).

XX007646 SEEDING, MESIC TO WET NATIVE GRASSES

Description. This work shall consist of preparing the seed bed and placing the seed within the proposed retention pond on the north side of Deerfield Road at approximate Station 105+00, as shown on the plans.

General. This work shall be completed in accordance with Section 250 of the Standard Specifications.

The seed mixture, as shown below, shall be placed within the proposed retention pond.

WET MESIC PRAIRIE SEED MIXTURE

SCIENTIFIC NAME	COMMON NAME	OZ / ACRE	LBS / ACRE
Grasses & Sedges:			
<i>Adropogon gerardii</i>	Big bluestem	13.8	
<i>Bouteloua curtipendula</i>	Side oats grama	47.2	
<i>Carex vulpinoidea</i>	Brown fox sedge	0.9	
<i>Panicum virgatum</i>	Switch grass	15.7	
<i>Schizachyrium scoparium</i>	Little bluestem	200.0	
Total Grasses		277.6	17.4
Forbs:			
<i>Asclepias tuberosa</i>	Butterfly weed	16.2	
<i>Asclepia incarnata</i>	Swamp milkweed	12.5	
<i>Echinacea pallida</i>	Pale purple coneflower	17.0	
<i>Echinacea purpurea</i>	Purple coneflower	12.9	
<i>Eryngium yuccifolium</i>	Rattlesnake master	10.6	
<i>Monarda fistulosa</i>	Wild bergamot	0.7	
<i>Penstemon digitalis</i>	Foxglove beard tongue	0.6	
<i>Petalostemum purpurea</i>	Purple prairie clover	7.1	
<i>Rudbeckia hirta</i>	Black-eyed susan	1.0	
<i>Ratibida pinnata</i>	Yellow coneflower	2.2	
<i>Rudbeckia subtomentosa</i>	Sweet black-eyed Susan	1.9	
<i>Symphoyotrichum nova-angliae</i>	New England aster	1.5	
<i>Tradescantia ohiensis</i>	Spiderwort	10.8	
Total Forbs		95.0	5.9
Total All Species		372.6	23.3
Temporary Cover Crop:			
<i>Elymus canadensis</i>	Canada wild rye	8.0	
<i>Avena sativa</i>	Common oats	320.0	

Method of Measurement. Seeding will be measured in acres.

Basis of Payment. This work will be paid for at the contract unit price per acre for SEEDING, MESIC TO WET NATIVE GRASSES.

K0013055 PERENNIAL PLANTS, WETLAND EMERGENT

Description. This work shall consist of furnishing, transporting, and planting perennial plants within the proposed retention pond on the north side of Deerfield Road at approximate Station 105+00, as shown on the plans.

General. This work shall be completed in accordance with Section 254 of the Standard Specifications.

The plant material shown below shall be planted within the proposed retention pond.

EMERGENT PLANT PLUGS

Scientific Name	Common Name	# of Plugs	Spacing	Notes
Pontedria cordata	Pickereel Weed	405	Alt 4.0' O.C.	12" below NWL to 8" below NWL
Sagittaria latifolia	Arrowhead	307	Alt 3.0' O.C.	8" below NWL to 4" below NWL
Sparganium eurycarpum	Burreed	307	Alt 3.0' O.C.	8" below NWL to 4" below NWL
Iris virginica	Blueflagiris	381	Alt 3.0' O.C.	4" below NWL to 6" above NWL
Juncus effusus	Common Rush	381	Alt 3.0' O.C.	4" below NWL to 6" above NWL

Method of Measurement. This work will be measured for payment in acres.

Basis of Payment. This work will be paid for at the contract unit price per acre for PERENNIAL PLANTS, WETLAND EMERGENT.

IDOT LOCAL ROADS TEMPORARY PAY ITEMS

XX000300 CONCRETE STEPS

Description. This work shall consist of constructing concrete steps.

General. This work shall be completed in accordance with Section 424 of the Standard Specifications and the details in the plans. Reinforcing steel will not be paid for separately but shall be included in the cost of the work.

Method of Measurement. This work will be measured for payment in place of top surface of the concrete steps and the area computed in square feet.

Basis of Payment. This work will be paid for at the contract unit price per square foot for CONCRETE STEPS.

XX000856 MAILBOX REMOVAL AND RELOCATION (LCDOT)

Effective: September 1, 2011
Revised: May 19, 2014

Description: This work shall consist of removing and relocating an existing mailbox.

General: This work shall consist of removing and relocating an existing mailbox to the proposed location shown on the plans. The new location of the mailbox shall be approved by the Engineer.

The relocated mailbox shall be installed on a new 4" x 4" square or 4½" diameter round treated wood post. The new post shall be embedded no more than 24" into the ground. The resulting hole shall be backfilled with suitable excavated material, approved by the Engineer.

The existing post shall be removed and disposed of according to the requirements of Article 202.03 of the Standard Specifications. The hole for the existing post shall be backfilled and the area restored.

Method of Measurement: This work will be measured for payment as each mailbox to be relocated.

Basis of Payment: This work will be paid for at the contract unit price per each for MAILBOX REMOVAL AND RELOCATION. The unit price shall include all equipment, materials and labor required to relocate the mailbox and to restore the existing location. No additional compensation will be allowed for any temporary relocation or for the removal and disposal of the existing post.

XX003668 PRECONSTRUCTION VIDEOTAPING (LCDOT)

Effective: September 25, 2009
Revised: May 20, 2014

Description: This work shall consist of videotaping the project site prior to commencing construction activities in order to provide a basis to determine whether visible damage occurred during construction.

General: The work shall include videotaping on all streets within the project limits. The videotaping shall encompass the entire area between the right-of-way lines. Prior to videotaping the Contractor shall coordinate with the Engineer to ensure that any areas of special emphasis are noted and sufficiently covered during the videotaping process.

The videotaping shall consist of a minimum of two passes. The videotaping shall be performed at a traversing speed not to exceed 50 feet per minute.

The recording shall include an audio track. The accompanying narrative shall note the condition of existing facilities and project site objects. The narrative shall also include address information.

The Contractor shall provide one copy of the recording in DVD format to the Engineer. The recording shall be of suitable photographic clarity to serve as a basis for establishing whether visible damage occurred during construction. The Contractor may not begin construction activities until the Engineer has approved the recording.

Basis of Payment: This work will be paid for at the contract lump sum price for PRECONSTRUCTION VIDEOTAPING. The contract lump sum price shall be payment in full for all materials, labor and equipment required to perform the videotaping as described herein.

XX008865 PERMEABLE PLASTIC BERM (LCDOT)

Effective: November 1, 2009

Revised: May 20, 2014

Description: This work shall consist of furnishing, installing, and removing a permeable plastic berm. The plastic berm may be used in conjunction with erosion control mat, sediment bags and other components of a water treatment train and/or as a temporary ditch check while establishing final landscaping.

For this project the Permeable Plastic Berms shall be used for:

- ☐ *A component of a water treatment train*
- ☒ *A temporary ditch check while establishing final landscaping*

Materials: The permeable plastic berm shall be constructed of High Density Polyethylene (HDPE) with a UV inhibitor. The permeable plastic berm shall have 35-40% porosity. The berm shall be a minimum of 8¾" tall.

General: The work shall be performed according to Section 280 of the "Standard Specifications", and the manufacturer's recommendations.

Water Treatment Train:

The permeable plastic berm shall be used in conjunction with the erosion control mat, flocculation powder and other components to form a water treatment train as directed by the Engineer. The permeable plastic berm shall become the property of the Contractor upon the dismantling and removal of the water treatment train.

Temporary Ditch Check:

The permeable plastic berm shall be used as a temporary ditch check in ditch lines where the erosion control blanket has been placed and the seeding operations performed. The permeable plastic berms shall be placed in the locations of the Temporary Ditch Checks and/or as directed by the Engineer. Their installation shall be according to the detail shown on the plans and the manufacturer's recommendations. After the final landscaping has been established to the satisfaction of the Engineer the permeable plastic berm shall be removed by the Contractor. The permeable plastic berm shall become the property of the Contractor upon removal.

Method of Measurement:

Water Treatment Train: The permeable plastic berm will be measured for payment in feet for the actual length used in a water treatment train.

Temporary Ditch Check: The Permeable Plastic Berm will be measured in place and the length calculated in feet for each permeable plastic berm actually installed.

Basis of Payment: This work will be paid for at the contract unit price per foot for PERMEABLE PLASTIC BERM. The unit price shall include all labor, equipment and materials necessary for the installation and removal of the plastic berm regardless of use. When used in a water treatment train the maintenance of this item shall be included as part of the unit price for EROSION CONTROL MAT. When used as a temporary ditch check the maintenance of this item shall be included with and paid for as part of the contract lump sum price for MAINTENANCE OF TEMPORARY EROSION CONTROL SYSTEMS.

XX007031 FRAME AND GRATE, SPECIAL

Description. This work shall consist of installing Type 24 cast iron frame and grates per the specified location on the plans. This work shall be completed in accordance with Section 604 of the Standard Specifications. Any required adjustment rings will be included as part of this pay item and will be completed in accordance with Section 602 of the Standard Specifications.

General Requirements. This work shall be completed in accordance with Section 604 and 602 of the Standard Specifications and Highway Standard 604071-07.

Method of Measurement. This work will be measured for payment in units of each.

Basis of Payment. This work shall be paid for at the contract unit price per each for FRAME AND GRATE, SPECIAL.

RELOCATE EXISTNG PTZ CAMERA

Effective: March 1, 2025

895.07TS

Description.

This work shall consist of removal, storage, and relocation of a PTZ (Pan-Tilt Zoom) camera, mounting brackets, and PTZ operating components located in the existing traffic signal cabinet from existing traffic signal equipment to new traffic signal equipment, to be installed at the same traffic signal installation or another traffic signal installation included within the project limits and scope as directed by the Engineer.

General.

The existing PTZ camera shall be removed and relocated to the new traffic signal installation as shown in the Plans. Any damage sustained to the existing PTZ camera during removal, storage transport and/or reinstallation operations must be repaired or replaced in kind to the satisfaction of the Engineer at Contractor's expense.

All holes drilled into signal poles, mast arms, or posts must have rubber grommets to prevent the chafing of wires.

Basis of Payment.

This work will be paid for at the contract unit price per EACH for RELOCATE EXISTING PTZ CAMERA, which shall be payment in full for disconnecting the existing PTZ camera, packaging it, transporting it and relocating it to the new location as shown in the plans, installing it and placing it into operation to the satisfaction of the Engineer.

XX005266 WOOD DECKING SPECIAL

Description. This work shall consist of the removal and replacement of existing wood decking on a pedestrian bridge.

General. A detailed plan for removal and replacement of the decking must be approved by the Engineer before work begins. The bridge must be closed when work takes place. The Contractor shall notify the Engineer a minimum of 48 hours in advance of closure. The Contractor will mark decking that is to be removed and replaced.

Removal. Old deck boards shall be removed by extracting fasteners (nails, screws, bolts) one at a time using appropriate tools (e.g., nail puller, cat's paw) and prying the boards out gently to avoid damaging underlying joists or stringers. After removal, the exposed supporting structure (joists, stringers, girders) shall be inspected by the Engineer for any damage or decay. The Contractor shall sweep decking, stringers, joists, etc. clean of debris. Materials that are removed shall be disposed of in accordance with Article 202.03 of the Standard Specifications.

Replacement. Replacement boards should be measured and cut to fit, allowing a gap to match existing decking. Wood decking to be fastened with stainless steel screws or as approved by the Engineer. Screw length shall be as approved by the Engineer. All screws shall be recessed a minimum of 1/8" below the deck surface. Screw spacing shall be as directed by the Engineer.

Materials. Wood decking for boardwalk bridges shall be nominal 12' long x 9" wide x 2½" thick timber decking. Wood type shall be southern pine (pressure treated) with a minimum extreme fiber stress in bending of 1200 psi and minimum modulus of elasticity of 1,600,000 psi.

Method of Measurement. This work will be measured for payment, in place, in units of square feet.

Basis of Payment. This work will be paid for at the contract unit price per square foot for WOOD DECKING SPECIAL.

XX009142 PAVEMENT MARKING REMOVAL (SPECIAL)

Effective: January 1, 2017
Revised: May 6, 2022

Description: This work shall consist of removing and disposing of pavement marking tape type IV.

General: This work shall be performed according to Section 703 of the "Standard Specifications" and the following:

The method of removal shall be limited to hand tools. The Contractor shall not use torches and/or water blasters to remove the type IV tape.

This special provision supersedes the Temporary Pavement Marking Removal requirements of Article 703.07.

Method of Measurement: This work will be measured for payment according to Article 703.06 of the "Standard Specifications". Letters and symbols will be measured in place, as the length of 4" tape used to construct the individual letters and symbols.

Basis of Payment: This work will be paid for at the contract unit price per square foot for PAVEMENT MARKING REMOVAL (SPECIAL). The unit price shall include all equipment, materials and labor required to remove and dispose of the pavement marking tape type IV.

IDOT SPECIAL PAY ITEMS FOR ROAD AND BRIDGE CONSTRUCTION

Z0013797 STABILIZED CONSTRUCTION ENTRANCE (LCDOT)

Effective: April 1, 2011

Revised: April 14, 2016

Description: This work shall consist of constructing a stabilized construction entrance, including furnishing, installing, maintaining and removing a stabilized pad of aggregate underlain with filter fabric, as shown on the plans or directed by the Engineer.

Materials: The materials used shall meet the requirements of the following:

Aggregate: The aggregate shall be limited to IDOT Coarse Aggregate Gradations CA-1, CA-2 CA-3, or CA-4.

Filter Fabric: The filter fabric shall be made of synthetic polymers composed of at least 85 percent by weight polypropylene, polyesters, polyamides, polyethylene, polyolefins, or polyvinylidene-chlorides. The geotextile shall be free of any chemical treatment or coating that significantly reduces its porosity. Fibers shall contain stabilizers and/or inhibitors to enhance resistance to ultraviolet lights.

Construction Requirements: The aggregate shall be at least six inches thick. The aggregate shall not be placed until the entrance area has been inspected and approved by the Engineer.

The aggregate shall be dumped and spread into place in approximately horizontal layers. The layer(s) shall not exceed three feet in thickness. The aggregate shall be placed in such a manner as to produce a reasonably homogeneous stable fill that contains no segregated pockets of larger or smaller fragments or large unfilled space caused by bridging of larger fragments. No compaction shall be required beyond that resulting from the placing and spreading operations.

The construction entrance shall have a minimum width of 14 feet and a minimum length of 50 feet.

All surface water flowing or diverted toward the construction entrance shall be piped across the entrance. Any pipe used for this will be considered included in the unit price for STABILIZED CONSTRUCTION ENTRANCE. The stabilized construction entrance shall have positive drainage away from the roadway.

The entrance shall remain in place and be maintained until the disturbed area is stabilized. Any sediment spilled onto public right-of-way(s) shall be removed immediately. All

removed materials shall be disposed of outside the limits of the right-of-way according to Article 202.03 of the "Standard Specifications" and/or as directed by the Engineer.

Construction entrances crossing curb & gutter, sidewalks, HMA shoulders, and/or other roadway appurtenances shall include protection for these items. The cost of such protection shall be included in the unit price for STABILIZED CONSTRUCTION ENTRANCE. If any of these appurtenances are damaged by the Contractor, they shall be repaired or replaced to the Engineer's satisfaction at the Contractor's cost.

Method of Measurement: The Stabilized Construction Entrance will be measured in place and the area computed in square yards.

Basis of Payment: The work will be paid for at the contract unit price per square yard for STABILIZED CONSTRUCTION ENTRANCE. The unit price shall include all material, labor, equipment and any other items required to complete the construction entrance.

Z0013798 CONSTRUCTION LAYOUT (LCDOT)

Effective: January 1, 2007

Revised: May 1, 2020

Description: This work shall consist of furnishing and placing construction layout stakes for the project.

General: The Lake County Division of Transportation (LCDOT) or Consultant on their behalf (LCDOT) will provide adequate reference points to the centerline of survey and benchmarks as shown on the plans and listed herein. Any additional points set by LCDOT will be identified in the field to the Contractor and all field notes will be kept in the office of the Engineer.

The Contractor shall provide the necessary field forces, equipment, and material required to set all the additional stakes for this project. The additional stakes shall include stakes needed to establish offset stakes, reference points, and any other horizontal or vertical controls. The additional stakes will also include any supplementary benchmarks necessary to secure a correct layout of the work. Stakes for line and grade of pavement and/or curb and gutter shall be set at sufficient station intervals (not to exceed 50 feet) to assure substantial conformance to plan lines and grades. The Contractor shall not be required to set additional stakes to locate a utility line which is not included as a pay item in the contract or to determine property lines between private properties.

The Contractor shall be responsible for having the finished work conform to the lines, grades, elevations, and dimensions as shown on the plans. Any inspection or checking of the Contractor's layout by the Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his/her responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work. The Contractor shall exercise care in the preservation of stakes and benchmarks and shall have them reset at his/her expense when any are damaged, lost, displaced, removed or otherwise obliterated.

Responsibilities of LCDOT:

- a) LCDOT will provide adequate reference points to the centerline of all roads and streets except interchange ramps. The centerline of private entrances and short street intersection returns may not be located or referenced.

Locating and referencing the centerline of the survey will consist of establishing and providing coordinates for the alignment points of the centerline(s) e.g. PC's, PT's, and POT's necessary to provide line of sight; and/or traverse points as are necessary to establish said centerlines and provide line of sight.

- b) Bench marks will be established along the project outside of construction lines not exceeding intervals of 1000 feet horizontally and 20 feet vertically.
- c) Stakes set for a) and b) above will be identified in the field to the Contractor.
- d) LCDOT will make random checks of the Contractor's staking to determine if the work is in conformance with the plans. Where the Contractor's work will tie into work that is being or will be done by others, checks will be made to determine if the work is in conformance with the proposed overall grade and horizontal alignment.
- e) LCDOT will set stakes to assist with utility adjustments and/or for building fences along the right of way line by parties other than the Contractor.
- f) LCDOT will make all measurements and take all cross sections from which the various pay items will be measured.
- g) Where the Contractor, in setting construction stakes, discovers discrepancies, LCDOT will check to determine their nature and make whatever revisions are necessary on the plans, including the re-cross sectioning of the area involved. Any additional re-staking required by the Engineer will be the responsibility of the Contractor. Additional re-staking done by the Contractor will be paid for according to Article 109.04 of the "Standard Specifications".
- h) LCDOT will accept responsibility for the accuracy of the initial control points as provided herein.
- i) It is not the responsibility of LCDOT, except as provided herein, to check the correctness of the Contractor's stakes; any apparent errors will be called to the Contractor's attention as soon as discovered and he/she shall be required to make the necessary correction before the stakes are used for construction purposes.
- j) Where the plan quantities for excavation are to be used as the final pay quantities, LCDOT will make sufficient checks to determine if the work has been completed in conformance with the plan cross sections.

Responsibilities of the Contractor:

- a) The Contractor shall establish from the given survey points and bench marks all the control points necessary to construct the individual project elements. The Contractor shall provide the Engineer adequate control in close proximity to each individual element to allow adequate checking of construction operations. This includes, but is not limited to: line and grade stakes, line and grade nails in form work, and/or filed or etched marks in substantially completed construction work.

The Contractor shall not use GPS to stake elevations for hard surfaces e.g., curb and gutter, sidewalk, storm structures, etc.

Prior to staking, the Contractor shall run a check of all the benchmarks and control points provided, to determine if any adjustments are necessary due to frost or isolated damage. The Contractor shall provide any adjustment information to the Engineer.

It is the Contractor's responsibility to tie in centerline control points in order to preserve them during construction operations.

It is the contractor's responsibility to set right-of-way and easement stakes (including changes in right-of-way width and beginning/ending easement stations) prior to the Installation of Perimeter Erosion Barrier or the disturbance of any soil. These stakes shall be set at 100 foot station intervals and maintained throughout the project.

- b) At the completion of the grading operations, the Contractor shall set stakes at 100 foot station intervals along each profile grade line. These stakes will be used for final cross sectioning by the LCDOT.
- c) The Contractor shall locate the right-of-way points for the installation of right-of-way markers. The Contractor shall set all line stakes for the construction of fences by the Contractor.
- d) The Contractor shall provide for re-establishing and monumenting all control points used to complete the work as specified including all PI's, PC's, PT's, and POT's. The type of monumentation used will be Mag nails, iron pipes, RR spikes or another type approved by the Engineer.
- e) All work shall be according to normally accepted self-checking surveying practices. Field notes shall be kept in standard survey field notebooks and electronic staking reports. Copies of the books and electronic reports shall be given to LCDOT at the completion of the project. All notes shall be neat, orderly, and in accepted form.
- f) For highway structure staking, the Contractor shall use diligent care and appropriate accuracy. Points shall be positioned to allow reuse throughout the construction process. Prior to the beginning of construction activities, all structure centerlines and pier lines are to be established by the Contractor and checked by the Engineer. The Contractor shall provide a detailed structure layout drawing showing span dimensions, staking lines, and offset distances.

Basis of Payment: This work will be paid for at the contract lump sum price for CONSTRUCTION LAYOUT. The unit price shall include all equipment, materials and labor required to furnish and place the construction layout stakes.

X6640104 FENCE REMOVAL (LCDOT)

Effective: March 21, 2008

Revised: May 19, 2014

Description: This work shall consist of the removal and disposal of existing fence from the project site.

General: The Contractor shall remove all components of the existing fence including any concrete used to anchor fence posts, bracing, guy wires, posts, and/or gates. All removed materials shall be disposed of outside the limits of the right-of-way according to Article 202.03 of the "Standard Specifications" and/or as directed by the Engineer.

Method of Measurement: This work will be measured for payment in feet, along the top of the existing fence, from center to center of end posts, excluding the length occupied by gates.

Basis of Payment: This work will be paid for at the contract unit price per foot for FENCE REMOVAL. The unit price shall include all equipment, materials and labor required to remove and dispose of the fence.

LUMINAIRE SAFETY CABLE ASSEMBLY

Effective: January 1, 2012

Description: This item shall consist of providing a luminaire safety cable assembly as specified herein and as indicated in the plans.

Materials. Materials shall be according to the following:

Wire Rope. Cables (wire rope) shall be manufactured from Type 304 or Type 316 stainless steel having a maximum carbon content of 0.08 % and shall be a stranded assembly. Cables shall be 3.18 mm (0.125") diameter, 7x19 Class strand core and shall have no strand joints or strand splices.

Cables shall be manufactured and listed for compliance with Federal Specification RR-W-410 and Mil-DTL-83420.

Cable terminals shall be stainless steel compatible with the cable and as recommended by the cable manufacturer. Terminations and clips shall be the same stainless-steel grade as the wire rope they are connected to.

U-Bolts. U-Bolts and associated nuts, lock washers, and mounting plates shall be manufactured from Type 304 or Type 316 stainless steel.

CONSTRUCTION REQUIREMENTS

General. The safety cable assembly shall be installed as indicated in the plan details. One end of the cable assembly shall have a loop fabricated from a stainless steel compression sleeve. The other end of the cable assembly shall be connected with stainless steel wire rope clips as indicated. Slack shall be kept to a minimum to prevent the luminaire from creeping off the end of the mast arm. Unless otherwise indicated in the plans, the luminaire safety cable shall only be used in conjunction with luminaires which are directly above the traveled pavement.

Basis of Payment: This work shall be paid for at the contract price each for **LUMINAIRE SAFETY CABLE ASSEMBLY**, which shall be payment for the work as described herein and as indicated in the plans.

XX009528 ABANDON EXISTING SANITARY SEWER, FILL WITH CLSM

Description. This work shall consist of the abandonment of portions of existing sewer pipes as shown on the plans and as directed by the Engineer to construct the proposed improvements.

Sewers to be abandoned shall be filled with controlled low-strength material (CLSM) to the satisfaction of the Engineer. Pumping access points shall be at the proposed excavation locations.

Basis of Payment. This work shall be measured and paid for per LINEAL FOOT for ABANDON EXISTING SANITARY SEWER, FILL WITH CLSM, measured along the centerline of the pipe, of the size indicated.

SANITARY MANHOLES TO BE ADJUSTED

Description. This work shall consist of adjusting sanitary sewer manholes.

General. This work shall be completed in accordance with applicable portions of Section 602 of the Standard Specifications and the provisions below.

Construction Requirements. The frame shall be set in a full bituminous mastic bed or approved rubber gasket seal. The frame and lid shall be set accurately to the finished elevation so that no subsequent adjustment will be necessary. A chimney sealing system in accordance with ASTM C-923 shall be furnished and installed as per the manufacturer's recommendations.

Adjusting rings shall be in accordance with Section 1042, Article 1043.02 or Article 1043.03 of the Standard Specifications. The minimum thickness for concrete adjusting rings shall be 2".

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE ADJUSTED.

XX004360 SANITARY SEWER BYPASS PUMPING

Description. This Section covers the temporary bypass pumping system and associated accessories including automatic controls to be furnished, installed, and tested as required to accomplish the Work and as specified herein. The temporary bypass pumping system shall provide uninterrupted bypass pumping around the Work area. All piping, fittings, connectors, supports and anchors where required, shall be included under this Section of Work. Under this Section the Contractor shall be required to furnish all items including but not limited to materials, labor, equipment, power, maintenance, expendables/consumables, etc. to implement a temporary bypass pumping system for the purpose of diverting the existing flow around the Work Area for the required duration of the Project. The design, installation and operation of the temporary pumping system shall be the Contractor's sole responsibility.

General - Contractor shall be responsible for the choice of product(s) subject to the review of the Village's Representative. All products selected shall be adequate for the intended purpose and use.

Pumps - Pumps shall be rated for continuous duty and shall be capable of pumping without surging, cavitation, or vibration. The pump shall not overload at any point on the pump operating curve. Rotative components shall be statically and dynamically balanced. The pump shall be suitable for use with raw unscreened sewage and trash. Noise levels produced by the bypass pumps shall not exceed local noise ordinance requirements for residential areas.

Controls - All temporary bypass pumps shall be provided with the necessary automatic stop/start controls for each pumping unit to allow unsupervised/unattended operation. Controls shall also include a high-level warning/start device, which shall be activated upon rising sewage level in the manhole from which bypass pumping is being performed, and simultaneously initiate the start-up of the stand-by pumping unit.

Stand-By Pump(s) - The Contractor shall include one stand-by temporary bypass pump of each size for each location to be maintained on site. Stand-by temporary bypass pumps shall be on-line and shall be piped into the inflow and to the bypass piping so that upon starting the stand-by pump shall take over and pick up the flow. Stand-by temporary bypass pumps shall be isolated from the primary bypass system by valving as required.

Basis of Payment. This work will be paid for at the contract LUMP SUM price for SANITARY SEWER BYPASS PUMPING.

LIGHT POLE FOUNDATION, METAL, SPECIAL

Description. This work shall consist of furnishing and installing a metal helix light pole foundation as shown on the plans.

General. All work related to the installation of the foundation shall be included (potholing for utilities, backfilling, and disposal of surplus excavate material, etc.). Trench backfill shall be paid for separately.

Materials. All materials shall be in accordance with the contract plan drawings and Section 1070.

Construction Requirements. All work shall be installed as shown on the contract plan drawings and in accordance with Section 836 of the Standard Specifications.

The Contractor shall be responsible for coordinating all work.

Measurement and Payment. The work shall be paid for at the contract unit price per each for LIGHT POLE FOUNDATION, METAL, SPECIAL, which shall be payment in full for all work listed herein.

Z0033028 MAINTAIN EXISTING LIGHTING SYSTEM

Description: Effective the date the Contractor's activities (electrical or otherwise) at the project site begin, the Contractor shall be responsible for the proper operation and maintenance of all existing and proposed lighting systems which are part of, or which may be affected by the work until final acceptance or as otherwise determined by the Engineer.

At least one week prior to the beginning of construction of the proposed street lighting system, the contractor shall conduct an inspection of the existing lighting units with a representative of the agency responsible for maintenance. The inspection shall reveal defective lighting items such as cable, mast arms, luminaries, poles, and all other appurtenances that combine for a complete operating unit. The CONTRACTOR shall not be responsible for these items. The CONTRACTOR shall be held responsible for all items remaining defective at the completion of the contract that were not noted in the initial inspection report. Failure to coordinate or perform the initial inspection does not relieve the contractor from this responsibility.

The CONTRACTOR shall become responsible for the maintenance of the existing lighting units on a date mutually agreed upon between the CONTRACTOR and the maintaining agency representative but no later than the beginning of any construction within the limits of this project. If any mobilization or any type of work begins on this project, the CONTRACTOR shall assume complete maintenance at that point and assume all deficiencies at their own expense. This maintenance shall remain in effect until written notice of final acceptance of the proposed lighting system is issued by the ENGINEER. Only after this requirement has been satisfied may the contractor begin work on any existing lighting systems.

Maintenance of Existing Lighting Systems:

Existing lighting systems. Existing lighting systems shall be defined as any lighting system or part of a lighting system in service prior to this contract. The contract drawings indicate the general extent of any existing lighting, but whether indicated or not, it remains the Contractor's responsibility to ascertain the extent of effort required for compliance with these specifications and failure to do so will not be justification for extra payment or reduced responsibilities.

Existing Lighting Systems Requiring Maintenance.

Deerfield Road Lighting System – Partial Maintenance Circuits C3 & C4:

- Ground mounted lighting controller located on the south side of Deerfield Road approximately 1100 feet east of Barclay Boulevard.
- Approximately 11 light poles on south side of Deerfield Road east of controller.

Extent of Maintenance.

Partial Maintenance. Unless otherwise indicated, if the number of circuits affected by the contract is equal to or less than 40% of the total number of circuits in a given controller and the controller is not part of the contract work, the Contractor needs only to maintain the affected circuits. The affected circuits shall be isolated by means of in-line waterproof fuse holders as specified elsewhere and as approved by the Engineer.

Full Maintenance. If the number of circuits affected by the contract is greater than 40% of the total number of circuits in a given controller, or if the controller is modified in any way under the contract work, the Contractor shall maintain the entire controller and all associated circuits (including sign lights).

Maintenance of Proposed Lighting Systems:

Proposed Lighting Systems. Proposed lighting systems shall be defined as any lighting system or part of a lighting system which is to be constructed under this contract.

The Contractor shall be fully responsible for maintenance of all items installed under this contract. Maintenance shall include, but not be limited to, any equipment failures or malfunctions as well as equipment damage either by the motoring public, Contractor operations, or other means. The potential cost of replacing or repairing any malfunctioning or damaged equipment shall be included in the bid price of this item and will not be paid for separately.

Lighting System Maintenance Operations:

The Contractor's responsibility shall include the maintenance of all lighting units (including sign lighting), cable runs and lighting controls. In the case of a pole knockdown or sign light damage caused by normal vehicular traffic, the Contractor shall promptly clear the lighting unit and circuit discontinuity and restore the system to service.

Responsibilities shall also include weekly night-time patrol of the lighting system, with patrol reports filed immediately with the Engineer and with deficiencies corrected within 24 hours of the patrol. Patrol reports shall be presented on standard forms as designated by the Engineer. Uncorrected deficiencies may be designated by the Engineer as necessitating emergency repairs as described elsewhere herein.

The following chart lists the maximum response, service restoration, and permanent repair time the Contractor will be allowed to perform corrective action on specific lighting system equipment.

INCIDENT OR PROBLEM	SERVICE RESPONSE TIME	SERVICE RESTORATION TIME	PERMANENT REPAIR TIME
Control cabinet out	1 hour	4 hours	7 Calendar days
Hanging mast arm	1 hour to clear	n/a	7 Calendar days
Radio problem	1 hour	4 hours	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – Needs to reset breaker	1 hour	4 hours	n/a
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	n/a
INCIDENT OR PROBLEM	SERVICE RESPONSE TIME	SERVICE RESTORATION TIME	PERMANENT REPAIR TIME
Outage of 75% of lights on one tower	1 hour	4 hours	n/a
Outage of light nearest RR crossing approach, Islands and gores	1 hour	4 hours	n/a
Outage (single or multiple) found on night outage survey or reported to EMC	n/a	n/a	7 Calendar days
Navigation light outage	n/a	n/a	24 hours

- **Service Response Time** -- amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location.
- **Service Restoration Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage the undamaged portions of the system are operational.)
- **Permanent Repair Time** – amount of time from initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement.

The contractor shall demonstrate to the satisfaction of the Engineer that the lighting system is fully operational prior to submitting a pay request. Failure to do so will be grounds for denying the pay request. Time in which the lighting systems are not maintained and not operational will not be paid for. Payment shall not be made retroactively for months in which lighting systems were not operational.

Damage caused by the Contractor's operations shall be repaired at no additional cost to the Contract.

Operation of Lighting

The lighting shall be operational every night, dusk to dawn. Duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously. Lighting systems shall not be kept in operation during long daytime periods. The contractor shall demonstrate to the satisfaction of the Engineer that the lighting system is fully operational prior to submitting a pay request. Failure to do so will be grounds for denying the pay request.

Measurement and Basis of Payment: This work shall be paid for at the contract Lump Sum price for MAINTAIN EXISTING LIGHTING SYSTEM which shall be payment in full for all work listed herein or as directed by the Owner.

Z0004552 APPROACH SLAB REMOVAL

Approach slab removal shall be performed in accordance with Section 440 and Article 442.05(a) of the Standard Specifications and the following provisions.

This work includes the satisfactory removal of the concrete pavement, reinforcement, stabilized sub-base and expansion joint material adjacent to the approach pavement, bituminous overlays, and sleeper slabs as shown on plan details. The removed materials shall be disposed of off the right of way.

To the extent possible, the contract documents contain information on the thickness of the existing pavement including subsequent resurfacing(s). In the event the average combined thickness of the existing pavement and overlays in an area to be removed differs from the thickness shown on the plans, the Engineer will adjust the pay quantity, meeting this requirement as indicated by the following chart. The quantities will be increased when the thickness is greater and decreased when the thickness is less.

<u>% Change of Thickness</u>	<u>% Change of Quantity</u>
0 to less than 15	0
15 to less than 20	10
20 to less than 30	15
30 and greater	20

No other compensation will be allowed for variations in thickness from that shown on the plans.

Contract Quantities. The requirements for the use of Contract Quantities shall conform to Article 202.07(a) of the Standard Specifications.

Method of Measurement. Approach Slab Removal will be measured for payment in place, and the area computed in square yards.

Basis of Payment. This work will be paid for at the contract unit price per square yard for APPROACH SLAB REMOVAL. The contract unit price for Approach Slab Removal shall include removing and disposing of the entire approach slab, reinforcement stabilized sub-base and expansion joint material including transition areas as shown on the plans.

Z00566XX STORM SEWER (WATER MAIN REQUIREMENTS) (LCDOT)

Effective: November 1, 2011

Revised: May 10, 2022

Description: This work shall consist of furnishing and constructing storm sewer in areas where the minimum horizontal separation from water main and/or water service lines cannot be maintained. The separation requirements are defined in the “Standard Specifications for Water and Sewer Construction in Illinois”, 8th edition, 2020.

Materials: The storm sewer materials shall be limited to the following:

- Concrete Pressure Pipe: The concrete pressure pipe shall meet the requirements of the latest AWWA Standards C300, C301, and C303. The structural design of pre-stressed concrete cylinder pipe shall be according to the latest addition of AWWA Standard C304.
- Ductile Iron Pipe: The ductile iron pipe shall meet the requirements of ANSI A 21.51 (AWWA C151). The class or thickness design shall be according to ANSI A 21.50 (AWWA C150). The ductile iron pipe shall be seal coated and/or cement lined according to ANSI A 21.4 (AWWA C104). The ductile iron pipe shall have mechanical or rubber (slip seal or push on) joints.
- Plastic Pipe: The plastic pipe may be composed of Polyvinyl Chloride (PVC) or Polyethylene (PE) pipe. The PVC or PE material shall meet the requirements of NSF (National Sanitation Foundation) standard 14 and the AWWA or ASTM designated standard shown in the following table. The dimension ratio shall be less than the maximum value shown in the table below:

AWWA Standard	Material (Material Code)	Dimension Ratio Maximum
C900	PVC	26
C905	PVC	26
C906	PE (PE 3048)	26
	PE (PE 2406)	26
	PE (PE 3406)	
ASTM D 1785	PVC (PVC 1120) PVC (PVC 1220)	26

ASTM D 2241	PVC (PVC 1120) PVC (PVC 1220)	26

- o ASTM D 1785 and ASTM D 2241 PVC pipe shall be rated at 160 psi or greater at 73.4°F.
 - o Additional guidance is available in the Standard Specifications for Water & Sewer Construction in Illinois.
- **Steel Pipe:** The steel water pipe shall meet the requirements of the latest AWWA Standard C200. The structural design shall be according to the latest edition of C200 and AWWA Manual M-11 shall serve as the standard of practice for design and installation.

General: The work shall be performed according to Section 550 of the “Standard Specifications”, “The Standard Specifications for Water and Sewer Construction in Illinois”, 8th edition, 2020 and 35 Illinois Administrative Code 653.119, which requires the storm sewer to be pressure tested (for storm sewers where 10’ horizontal separation from water main is not met) to the maximum expected surcharge pressure before backfilling.

Method of Measurement: Storm Sewer (Water Main Requirements) will be measured for payment in place in feet. The measurement shall be according to Article 550.09 of the “Standard Specifications”.

Basis of Payment: This work will be paid for at the contract unit price per foot for STORM SEWERS (WATER MAIN REQUIREMENTS) of the diameter specified. The unit price shall include all equipment, materials and labor necessary to complete the work as specified. The cost of pressure testing the storm sewer included in the unit price for STORM SEWERS (WATER MAIN REQUIREMENTS).

XX001XXX SANITARY SEWER

Description. This work consists of constructing sanitary sewer or services of the specified diameter at the locations shown on the plans, meeting the material and installation requirements of the latest edition of the “Standard Specifications for Water and Sewer Main Construction in Illinois”, the applicable portions of Section 550 of the Standard Specifications, and LCPW’s Standard Specifications and Standard Drawings.

Pipe materials shall meet the requirements of Section 40 and 41-2.01 of the “Standard Specifications for Water and Sewer Main Construction in Illinois”. Polyvinyl Chloride (PVC) pipe minimum SDR 26 conforming to ASTM 3034 with elastomeric gasketed joints conforming to ASTM D 3212 for pipe up to 14 feet in depth. Polyvinyl Chloride (PVC) pipe minimum SDR 21 conforming to ASTM 2241 with elastomeric gasketed joints conforming to ASTM D 3139 for pipe up to 20 feet in depth. Polyvinyl Chloride (PVC) C-900 pipe minimum DR 18 conforming to AWWA C900 and ASTM D-1784 gasketed joints conforming to ASTM D 3139 for pipe up to 25 feet in depth. Sewer depth shall be measured from existing ground surface to the pipe invert.

Rubber couplings will be required to join pipes of dissimilar materials and when a bell and spigot joint cannot be constructed. All connections between dissimilar pipe material shall utilize a non-shear mission coupling such as MaxAdaptor or Fernco Strongback. Any connection to an existing sanitary sewer main shall utilize a ROMAC STYLE “CB”™ sewer saddle.

Method of Measurement and Basis of Payment. This work will be paid for at the contract unit price per FOOT for SANITARY SEWER, of the diameter specified, and shall include all materials, labor, equipment, and rubber couplings.

Z0067700 STEEL CASINGS

Description. This work shall consist of installing steel casing pipe in open cut trench at the locations as shown on the plans and as directed by the Engineer.

Materials. Steel casing pipe shall have a minimum yield strength not less than 35,000 psi. Steel casing pipe size and piping wall thickness shall be as shown on the Drawings. All casing pipe shall be manufactured of new billet steel, cylindrical, with smooth bituminous coated walls inside and outside. Steel casing pipe shall conform to ASTM A53 Grade B, ASTM A139 Grade B, or pipe fabricated in accordance with AWWA C200 using ASTM A36 steel. Casing pipe minimum wall thickness shall be as required by permit requirements of the agency having local jurisdiction, or the Contractor's method of construction, whichever is greater, but in no case shall it be less than as shown on the Drawings.

Construction Requirements. Steel casing pipe shall be installed in place and shall include excavation, sheeting/bracing, dewatering, pumping, welding, backfilling and compacting all as required for the steel casing pipe installation. During installation of the steel casing pipe and as additional lengths of steel casing pipe are placed end to end, the ends of the steel casing pipe shall be welded together so that the completed casing forms a continuous length.

Measurement and Payment. This work will be measured and paid for at the contract unit price per foot for STEEL CASINGS, of the size specified, which price shall include all labor, equipment, and material necessary to complete the specified work.

X0326490 CABLE GATE ASSEMBLY

Description. This work shall consist of installing 2 wood posts with a cable and sign between the posts.

General. The posts be placed to a depth of 4' and shall extend 42" above the ground. The posts shall be backfilled with limestone screenings or other material as approved by the Engineer.

Materials. Posts shall be 8" in diameter. The wood shall be accordance with Article 1007.09 of the Standard Specifications and shall be treated in accordance with Article 1007.12 of the Standard Specifications.

Cable shall be ½" vinyl-coated galvanized steel wire rope with a yellow, reflective sleeve.

A vinyl sign shall be affixed to the cable that reads "NO VEHICLES BEYOND THIS POINT".

Basis of Payment. This work will paid for at the contract unit price per each for CABLE GATE ASSEMBLY which price shall include all material and labor to complete the work as described above.

Z0062458 TEMPORARY PAVEMENT (VARIABLE DEPTH)

Description. This work shall consist of installing temporary pavement to serve as a transition between existing pavement/driveways and the proposed improvements.

General. This work shall be completed in accordance with Section 406 of the Standard Specifications, the detail in the plans, and as directed by the Engineer. Removal of the temporary pavement will not be paid for separately but shall be included in the cost of the work.

Basis of Payment. This work will be paid for at the contract unit price per ton for TEMPORARY PAVEMENT (VARIABLE DEPTH).

LAKE COUNTY TRAFFIC CONTROL AND PROTECTION

TRAFFIC CONTROL PLAN (L.C.-T- SECTION 700)

Effective 06/01/2012

Traffic Control shall be performed according to the applicable sections of the "Standard Specifications", the "Supplemental Specifications", the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", the "Quality Standard for Work Zone Traffic Control Devices", any special details and Highway Standards as shown on the plans and the special provisions contained herein.

Special attention is called to Articles 105.03(b), 105.05, and 107.09, and to Sections 701, 704, and 782 of the "Standard Specifications", and to the following Highway Standards, Details, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control.

The Contractor shall contact the Engineer at least 72 hours in advance of beginning work.

STANDARDS

701001-02	701006-05	701101-05	701106-02
701201-05	701301-04	701311-03	701321-19
701427-05	701501-06	701502-09	701601-09
701606-10	701611-01	701801-06	701901-11

DETAILS

LC7000	MODIFIED STD 701011 – 2 LANE, 2 WAY, OFF-ROAD OPERATIONS, DAY OPERATIONS ONLY
LC7003	MODIFIED STD 701701 – URBAN LANE CLOSURE, MULTILANE INTERSECTION
LC7004	SIDE ROAD SIGNING
LC7005	TYPICAL LANE CLOSURE, 3 LANE ROAD SECTION
LC7200	DIRECTION INDICATOR BARRICADES
LC7201	TEMPORARY CONSTRUCTION INFORMATION SIGNS
LC7202	SHOULDER CLOSURE AND TAPER FOR CHANGEABLE MESSAGE SIGNS
LC7203	WORK ZONE SPEED LIMIT SIGNING DIAGRAM
TC-10	TRAFFIC CONTROL AND PROTECTION FOR SIDE ROADS, INTERSECTIONS AND DRIVEWAYS)
TC-13	DISTRICT ONE TYPICAL PAVEMENT MARKINGS
TC-16	SHORT-TERM PAVEMENT MARKING LETTERS AND SYMBOLS

SPECIAL PROVISIONS

MAINTENANCE OF ROADWAYS (D1)
PUBLIC CONVENIENCE AND SAFETY (LCDOT)
TEMPORARY INFORMATION SIGNING (D1)
TRAFFIC CONTROL AND PROTECTION, (SPECIAL) (LCDOT)
VEHICLE AND EQUIPMENT WARNING LIGHTS (BDE)
WORK ZONE TRAFFIC CONTROL DEVICES (BDE)
WORK ZONE WIDTH RESTRICTION (BDE)

RECURRING SPECIAL PROVISIONS

LRS3 SPECIAL PROVISION FOR WORK ZONE TRAFFIC CONTROL
SURVEILLANCE

DETOURS

Detours and road closures on County maintained roads within Lake County, Illinois shall be according to the applicable Articles and Sections of the “Standard Specifications”, the “Supplemental Specifications”, the “Illinois Manual on Uniform Traffic Control Devices for Streets and Highways”, the Lake County Division of Transportation’s Detour Procedures and Guidelines, any special details and Highway Standards as shown on the Detour Plan and the Special Provisions contained herein. The LCDOT Detour Procedures and Guidelines are available at:

<https://www.lakecountyil.gov/DocumentCenter/View/16664/LCDOT-Detour-Procedures-and-Guidelines-PDF?bidId=>

X7010216 TRAFFIC CONTROL AND PROTECTION, (SPECIAL)

(L.C.-T- Section 700)

Traffic Control and Protection, (Special) shall meet the requirements of Division 700. Work Zone Traffic Control and Protection, Signing, and Pavement Marking of the "Standard Specifications" and the following:

Description: This item of work shall consist of furnishing, installing, maintaining, replacing, relocating and removing all traffic control devices used for the purpose of regulating, warning or directing traffic during the construction or maintenance of this improvement.

Materials: The materials shall be according to Article 701.02 of the "Standard Specifications" and the following:

Traffic control devices shall include signs and their supports, signals, pavement markings, barricades and their approved weights, channeling devices, warning lights, arrow boards, flaggers, or any other device used for the purpose of regulating, detouring, warning or guiding traffic through or around the construction zone.

General: The work shall according to Section 701 of the "Standard Specifications" except as follows:

Replace the first paragraph of Article 701.04 with the following paragraph:

General. Traffic Control and Protection, (Special) shall be provided as shown on the plans and applicable Highway Standards; as required in these special provisions and the applicable sections of the "Standard Specifications"; and/or as directed by the Engineer.

Add the following lines to the end of the fourth paragraph under Article 701.04:

The Contractor shall dispatch men, materials, and equipment to correct any such deficiencies. The Contractor shall respond to any call from LCDOT concerning any request for improving or correcting traffic control devices and begin making the requested repairs within two hours from the time of notification.

Replace Article 701.10 with the following:

Surveillance. The Contractor shall conduct routine inspections of the work site at a frequency that will allow for the timely replacement of any traffic control device that has become displaced, worn or damaged to the extent that it no longer conforms to the shape, dimensions, color and/or operational requirements of the MUTCD, the Traffic Control Standards, the IDOT Quality Standard For Work Zone Traffic Control Devices, or will no longer present a neat appearance to motorists. A sufficient quantity of replacement devices, based on vulnerability to damage, shall be readily available to meet this requirement.

The Contractor shall ensure that all the traffic control devices he/she installs are operational, functional and effective 24 hours a day, seven days a week, including holidays.

LCDOT uses Road Work Ahead signs in lieu of IDOT's Road Construction Ahead signs. Replace the words "ROAD CONSTRUCTION AHEAD" with "ROAD WORK AHEAD" in Articles 401.14(a) and 701.18(h)(1) in the "Standard Specifications". Road Construction Ahead signs shall be used on Milwaukee Avenue.

Replace Article 701.14(b) with the following:

- (b) Work Zone Speed Limit Signs. The Lake County Division of Transportation will specify whether a project meets the criteria for a Work Zone Speed Limit. When specified, the work zone speed limit signs shall be installed as shown on the LCDOT detail LC7203, Work Zone Speed Limit Signing Diagram, at a maximum of 20 feet lateral distance of the locations shown on the plans. Failure to install and maintain the required number of signs at the proper sign spacing shall result in an immediate traffic control deficiency.

All permanent "SPEED LIMIT" signs located within the work zone shall be removed or covered. If the speed limit sign is to be covered, it shall be done in a manner that no part of the legend shall be visible in any lighting condition. This work shall be completed by the Contractor after the method of covering the speed limit signs has been approved by the Engineer.

The work zone speed limit signs and the end work zone speed limit signs in advance of and at the end of the lane closure(s) shall be used for the duration of the closure(s).

The work zone speed limit signs will be removed when roadway conditions return to normal or when the construction project is inactive for more than 30 days.

The Contractor shall install work zone speed limit signs in accordance with the actual sequence of onsite operations. For LCDOT projects with noncontiguous roadway

sections, the 30 day inactivity provision shall apply independently to each roadway section. In the event the Contractor elects to complete a contiguous section of roadway in separate sections, the 30 day inactivity provision shall apply to each separate section. The removal and reinstallation of work zone speed limit signs due to project site and/or roadway section inactivity will not be paid for separately but shall be included in the lump sum pay item TRAFFIC CONTROL AND PROTECTION, (SPECIAL).

Add the following to Article 701.14:

(c) Temporary Construction Information Signs. When indicated in the traffic control plan or as directed by the Engineer the Contractor shall furnish, install, maintain, relocate, and remove for various stages of construction Temporary Construction Information Signs.

Temporary Construction Information Signs may include:

Driveway	White Legend on Green Background
Caution – New Lanes Open	Black Legend on Orange Background

The temporary construction information signs shall be installed , as shown on LCDOT LC7201, Temporary Constructions Information Signs, at locations shown on the traffic control plan and/or as directed by the Engineer.

Replace Article 701.15(b) with the following:

Type I, II, and III Barricades. Type II barricades shall be used at all locations that call for Type I, or Type II barricades.

Type II barricades are used to channelize traffic; delineate unattended obstacles, patches, excavations, drop-offs, and other hazards; and as check barricades

Any drop off greater than 3 inches, but less than 6 inches, located within 8 feet of the pavement edge shall be protected by Type II barricades equipped with mono-directional steady burn lights. The barricades shall be placed at a spacing of 100 feet center to center. For any drop off within 8 feet of the pavement edge that exceeds 6 inches, the Type II barricades equipped with mono-directional steady burn lights shall be placed at a spacing of 50 feet center to center. Barricades that must be placed in excavated areas shall have leg extensions installed so that the top of the barricade meets the height requirements of IDOT Standard 701901.

Check barricades shall be placed in work areas perpendicular to traffic every 1,000 feet, at one per lane and one per shoulder, to prevent motorists from using work

areas as a traveled way. Two additional check barricades shall be placed in advance of each patch excavation or any other hazard in the work area. The first will be placed at the edge of the open traffic lane and the second centered on the closed lane. Check barricades shall be Type II and equipped with flashing amber light.

Type III barricades are used to close traffic lanes and to close roads.

Add the following paragraph to Article 701.15(e):

The direction indicator barricades shall meet the requirements for Type II barricades as stated in this special provision. The top panel, which faces traffic, shall be as shown on IDOT Highway Standard 701901. The top panel, facing away from traffic shall have a 12 inch x 24 inch orange and white diagonal panel. The bottom panels shall be 8 inches x 24 inches with orange and white diagonal sheeting, as shown on the LCDOT Detail LC7200, Direction Indicator Barricades.

Add the following paragraphs to Article 701.15(j):

The Changeable Message Sign (PCMS) shall be compatible and fully functional with LCDOT's Transportation Management Center (TMC) PASSAGE PCMS Control Software. A list of approved PCMS's manufacturers and traffic control vendors is available upon request from the LCDOT. The PCMS shall be tested to show that it can be sufficiently controlled by LCDOT's NTCIP compliant software. If the PCMS has not been previously tested or approved by either the Illinois State Toll Highway Authority (ISTHA) or LCDOT then the PCMS will need to be tested and certified by the Delcan Corporation at the Contractor's expense.

Lake County Division of Transportation (PASSAGE)
Software Developer:
Delcan
650 East Algonquin Road, Suite 101
Schaumburg, IL 60173

Should a Traffic Incident Management (TIM) event or other County/State declared Emergency Management event occur, the PCMS may be temporarily diverted from use on the work site by the Lake County TMC for the duration of the incident. If the PCMS needs to be moved from the limits of the work site to an offsite location to better facilitate the use of the PCMS during the incident, the Contractor will be compensated for the labor and equipment required to move the PCMS to the designated location and back, according to Article 109.04 (b) of the "Standard Specifications". In order to facilitate the movement of the PCMS in a timely manner, the LCDOT may use County Forces to move the PCMS to the designated location and/or back, at no additional cost to the Contractor.

When the sign(s) are displaying messages, they shall be considered a traffic control device. At all other times when no message is displayed, they shall be considered nonoperating equipment and parked according to Article 701.11 of the "Standard Specifications".

Changeable message signs will be paid at the contract unit price per day for each sign according to Article 701.20 of the "Standard Specifications".

Replace Article 701.17(c)(1) with the following:

(1) Prime or Tack Coat. "FRESH OIL" signs (W21-2) shall be used when the prime or tack coat is applied to pavement that is open to traffic. The signs shall remain in place until tracking of the prime or tack ceases. These signs shall be erected a minimum of 500 feet preceding the start of the prime and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. These signs are excluded from the time requirements of Article 701.04 of the "Standard Specifications" as modified by this special provision (above). Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

Replace Article 701.17(c)(2) with the following:

(2) Cold Milling. "ROUGH GROOVED SURFACE" signs (W8-I107) shall be used when the road has been cold milled and is open to traffic. The signs shall remain in place until the milled surface condition no longer exists. These signs shall be erected a minimum of 500 feet preceding the start of the milled pavement and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

Add the following Article 701.17(c):

(6) Area Reflective Crack Control Treatment Fabric. "SLIPPERY WHEN WET" signs (W8-5) shall be used when crack control fabric is applied to pavement that is open to traffic. These signs shall remain in place until the binder course is laid. The signs shall be erected a minimum of 500 feet preceding the start of the crack control treatment and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. These signs are excluded from the time requirements of Article 701.04 of the "Standard Specifications" as modified by this special provision (above). Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

- (7) Longitudinal Joint Sealant. "SLIPPERY WHEN WET" signs (W8-5) shall be used when longitudinal joint sealant is applied to pavement that is open to traffic. These signs shall remain in place until the binder course is laid. The signs shall be erected a minimum of 500 feet preceding the start of the joint sealant treatment and on all side roads within the posted area. The signs on the side roads shall be posted a minimum of 200 feet from the mainline pavement. These signs are excluded from the time requirements of Article 701.04 of the "Standard Specifications" as modified by this special provision (above). Non-compliance with the provisions of this section, by the Contractor, shall result in an immediate traffic control deficiency deduction. All signs shall have an amber flashing light attached.

Replace Article 701.18(b)(2)g, with the following:

- g. Detection. Microwave Vehicle Sensors shall be installed as directed by the Engineer. The LCDOT shall approve the proposed microwave vehicle sensor before the Contractor may furnish or install it. The Contractor shall install, wire and adjust the alignment of the sensor according to the manufacturer's recommendations and requirements. The Engineer shall approve the installation. An alternate method of detection may be used if it has been demonstrated and approved by the Department.

The microwave vehicle sensor shall meet the following requirements:

- Detection Range: Adjustable to 60 feet
- Detection Angle: Adjustable, horizontal and vertical
- Detection Pattern: 16 degree beam width minimum [at 50 feet the pattern shall be approximately 15.5 feet wide]
- Mounting: Heavy-duty bracket, predrilled and slotted for pole mounting
- LED Indicator Light: For detection verification

Add the following paragraphs to Article 701.18(h)(1):

Whenever a lane is closed to traffic using IDOT standard 701601, 701606, or 701701, the pavement width transition sign (W4-2R or W4-2L) shall be used in lieu of the "WORKERS" sign (W21-1 or W21-1a)

Whenever any vehicle, equipment, workers or their activities infringe on the shoulder or within 15 feet of the traveled way, and the traveled way remains unobstructed, then the applicable Traffic Control Standard shall be 701006, 701011, 701101, or 701701. The "SHOULDER WORK AHEAD" sign (W21-5(0)-48) shall be used in lieu of the "WORKERS" sign (W21-1 or W-21-1a).

Add the following to Article 701.18:

IDOT standard 701331. When IDOT standard 701331 is specified on two-lane, two-way roadways, a "LANE SHIFT AHEAD" sign shall be added 500 feet in advance of W1-3 or W1-4 sign. The Road Work sign (W20-1) shall be extended to a total of 1500' from the start of the lane shift.

Method of Measurement: The requirements of Article 701.19 of the "Standard Specifications" will not apply to this work. These items of work will be measured on a lump sum basis for furnishing, installing, maintaining, replacing, relocating and removing traffic control devices required as shown on the plans, detailed in the special provisions and/or as directed by the Engineer and the following:

Temporary traffic signals required for Standards 701316 and 701321 will be measured for payment as each, where each is defined as the entire traffic signal system at a bridge regardless of the number of signal heads.

Temporary rumble strips will be measured as each, where each is defined as a 25 foot length installation.

Basis of Payment: The requirements of Article 701.20 of the "Standard Specifications" will not apply to this work. This work will be paid for at the contract unit price per lump sum for TRAFFIC CONTROL AND PROTECTION, (SPECIAL). The unit price shall include all labor, materials, transportation, and incidentals necessary to furnish, install, maintain, replace, relocate and remove all traffic control devices indicated shown on the plans, detailed in the specifications and/or as directed by the Engineer.

Changeable message signs shown on an IDOT Standard or LCDOT Detail will not be paid for separately but shall be considered as included in the lump sum unit price for TRAFFIC CONTROL AND PROTECTION, (SPECIAL).

Changeable message signs listed separately, i.e. included in the Summary of Quantities, will be paid for at the contract unit price per calendar day for each sign as CHANGEABLE MESSAGE SIGN.

Temporary signals required for IDOT Standards 701316 and 701321 will be paid for separately at the contract unit price per each for TEMPORARY BRIDGE TRAFFIC SIGNALS.

Temporary concrete barrier will be measured and paid for according to Section 704 of the "Standard Specifications".

Temporary impact attenuators and temporary bridge rail will be paid for separately.

Temporary rumble strips will be paid for at the contract unit price per each for TEMPORARY RUMBLE STRIPS.

Temporary Raised Reflective Pavement Markers shall be paid for at the contract unit price per each for TEMPORARY RAISED REFLECTIVE PAVEMENT MARKERS.

Temporary Pavement Marking Letters and Symbols of the material specified will be paid for at the contract unit price per square foot. Temporary Pavement Marking – Line of the width and material specified will be paid for at the contract unit price per foot.

The salvage value of materials removed shall be reflected in the bid price for this item.

Any delays or inconveniences incurred by the Contractor while complying with these requirements shall be considered as part of TRAFFIC CONTROL AND PROTECTION (SPECIAL) and no additional compensation will be allowed.

Any traffic control devices required by the Engineer to implement the Traffic Control Plan as shown in the plans and specifications of the contract shall be considered included in the pay item TRAFFIC CONTROL AND PROTECTION (SPECIAL).

If the Engineer requires additional work involving a substantial change of location, and/or work which differs in design, and/or work requiring a change in the type of construction, as stated in Article 104.02(d) of the "Standard Specifications", the changes including standards and/or the designs, , will be made available to the Contractor at least one week in advance of the change in traffic control. Payment for any additional traffic control required for the reasons listed above will be in accordance with Article 109.04 of the "Standard Specifications".

Revisions in the phasing of construction or maintenance operations, requested by the Contractor, may require traffic control to be installed according to standards and/or designs other than those included in the plans. The Contractor shall submit revisions or modifications to the traffic control plan shown in the contract to the Engineer for approval. No additional payment will be made for a Contractor requested modification.

In the event the sum total of all work items for which traffic control and protection is required is increased or decreased by more than ten percent, the contract bid price for TRAFFIC CONTROL AND PROTECTION will be adjusted as follows:

$$\text{Adjusted Contract Price} = 0.25P + 0.75P [1 \pm (X - 0.1)]$$

P = the contract price for TRAFFIC CONTROL AND PROTECTION (SPECIAL)

$$X = \frac{\text{Difference between original and final value of work for which traffic control and protection is required.}}{\text{Original value of work for which traffic control and protection is required.}}$$

The value of the work items used in calculating the increase and decrease will include only items that have been added to or deducted from the contract under Article 104.02 of the "Standard Specifications" and only items that require the use of TRAFFIC CONTROL AND PROTECTION (SPECIAL).

In the event LCDOT cancels or alters any portion of the contract that result in the elimination or incompleteness of any portion of the work, payment for partially completed work will be made according to Article 104.02 of the "Standard Specifications".

IDOT D1 SPECIAL PROVISIONS

MAINTENANCE OF ROADWAYS (D1)

Effective: September 30, 1985

Revised: November 1, 1996

Beginning on the date that work begins on this project, the Contractor shall assume responsibility for normal maintenance of all existing roadways within the limits of the improvement. This normal maintenance shall include all repair work deemed necessary by the Engineer, but shall not include snow removal operations. Traffic control and protection for maintenance of roadways will be provided by the Contractor as required by the Engineer.

If items of work have not been provided in the contract, or otherwise specified for payment, such items, including the accompanying traffic control and protection required by the Engineer, will be paid for in accordance with Article 109.04 of the Standard Specifications.

TEMPORARY INFORMATION SIGNING

Effective: November 13, 1996

Revised: January 29, 2020

Description.

This work shall consist of furnishing, installing, maintaining, relocating for various states of construction and eventually removing temporary informational signs. Included in this item may be ground mount signs, skid mount signs, truss mount signs, bridge mount signs, and overlay sign panels which cover portions of existing signs.

Materials.

Materials shall be according to the following Articles of Section 1000 - Materials:

	<u>Item</u>	<u>Article/Section</u>
a.)	Sign Base (Note 1)	1090
b.)	Sign Face (Note 2)	1091
c.)	Sign Legends	1091
d.)	Sign Supports	1093
e.)	Overlay Panels (Note 3)	1090.02

Note 1. The Contractor may use 5/8 inch (16 mm) instead of 3/4 inch (19 mm) thick plywood.

Note 2. The sign face material shall be in accordance with the Department's Fabrication of Highway Signs Policy.

Note 3. The overlay panels shall be 0.08 inch (2 mm) thick.

GENERAL CONSTRUCTION REQUIREMENTS

Installation.

The sign sizes and legend sizes shall be verified by the Contractor prior to fabrication.

Signs which are placed along the roadway and/or within the construction zone shall be installed according to the requirements of Article 701.14 and Article 720.04. The signs shall be 7 ft (2.1 m) above the near edge of the pavement and shall be a minimum of 2 ft (600 mm) beyond the edge of the paved shoulder. A minimum of two (2) posts shall be used.

The attachment of temporary signs to existing bridges, sign structures or sign panels shall be approved by the Engineer. Any damage to the existing signs and/or structures due to the Contractor's operations shall be repaired or signs replaced, as determined by the Engineer, at the Contractor's expense.

Method of Measurement.

This work shall be measured for payment in square feet (square meters) edge to edge (horizontally and vertically).

All hardware, posts or skids, supports, bases for ground mounted signs, connections, which are required for mounting these signs will be included as part of this pay item.

Basis Of Payment.

This work shall be paid for at the contract unit price per square foot (square meter) for TEMPORARY INFORMATION SIGNING.

STATUS OF UTILITIES

Effective January 13, 2026

Utility companies and/or municipal owners located within the construction limits of this project have provided the following information regarding their facilities and the proposed improvements. The tables below contain a description of specific conflicts to be resolved and/or facilities which will require some action on the part of the Department's contractor to proceed with work. Each table entry includes an identification of the action necessary and, if applicable, the estimated duration required for the resolution.

UTILITIES TO BE ADJUSTED

Conflicts noted below have been identified by following the suggested staging plan included in the contract. The company has been notified of all conflicts and will be required to obtain the necessary permits to complete their work; in some instances, resolution will be a function of the construction staging. The responsible agency must relocate, or complete new installations as noted below; this work has been deemed necessary to be complete for the Department's contractor to then work in the stage under which the item has been listed.

Pre-Stage

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	DURATION OF TIME
Deerfield Road: 100+64.20 to 101+05.95 LT	Telephone line	Conflict with drainage structure	AT&T	180
Milwaukee Avenue: 74+28.37 to 74+90.26 RT	Fiber Optic	Conflict with drainage structure	AT&T	180
Deerfield Road: 104+20.06 to 104+77.07 LT	Telephone line	Conflict with road widening	AT&T	180
Deerfield Road: 104+11.81 to 107+90.70 LT	Telephone line	Conflict with road widening	AT&T	180
Deerfield Road: 104+20.81 to 107+90.91 LT	Fiber Optic	Conflict with road widening	AT&T	180
Deerfield Road: 110+14.59 to 111+16.04 LT	Fiber Optic	Conflict with drainage structure	AT&T	180
Deerfield Road: 110+16.5 to 111+18.76 LT	Telephone line	Conflict with road widening	AT&T	180
Deerfield Road: 110+14.47 to 111+15.99 LT	Telephone line	Conflict with road widening	AT&T	180
Deerfield Road: 111+67.10 to 111+90.48 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 111+67.12 to 112+22.38 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 112+12.19 to 112+22.38 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 111+67.55 to 112+26.33 LT	Fiber Optic	Conflict with road widening	AT&T	180
Deerfield Road: 113+09.18 to 113+84.58 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 115+94.53 to 116+43.76 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 115+94.51 to 116+43.76 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 117+38.14 to 117+54.35 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 118+46.10 to 118+66.16 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 126+28.77 to 126+65.13 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 127+38.89 to 127+76.98 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 128+36.37 to 132+02.72 LT	Telephone line	Conflict with drainage structure	AT&T	180

Deerfield Road: 133+71.88 to 134+09.46 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 134+40.52 to 134+67.17 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 137+40.86 to 137+55.29 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 142+38.63 to 142+69.10 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 144+65.23 to 145+00.21 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 145+88.84 to 146+10.96 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 150+68.87 to 157+50.25 LT	Telephone line	Conflict with culvert conflict	AT&T	180
Deerfield Road: 162+05.51 to 162+34.37 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 164+27.28 to 164+61.67 LT	Telephone line	Conflict with drainage structure	AT&T	180
Portwine Road: 299+26.07 to 299+48.56 RT	Fiber Optic	Conflict with road widening	AT&T	180
Deerfield Road: 169+33.31 to 169+67.63 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 171+87.89 to 172+21.78 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 178+03.30 to 178+32.02 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 182+88.25 to 183+12.36 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 185+33.34 to 185+74.68 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 189+64.05 to 189+91.21 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 190+84.08 to 195+59.72 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 197+28.75 to 197+52.41 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 198+91.17 to 199+21.81 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 201+30.31 to 201+70.25 LT	Telephone line	Conflict with drainage structure	AT&T	180
Deerfield Road: 204+71.24 to 205+19.53 LT	Telephone line	Conflict with drainage structure	AT&T	180

Milwaukee Avenue: 72+54.27 to 73+25.32 LT	Fiber Optic	Conflict with drainage structure	Buffalo Grove	180
Milwaukee Avenue: 73+18.59 to 73+74.01 RT	Fiber Optic	Conflict with drainage structure	Buffalo Grove	180
Deerfield Road: 151+15.33 to 151+37.09 RT	CTV	Conflict with drainage structure	Comcast	180
Deerfield Road: 94+49.32 to 94+82.67 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 95+35.83 to 95+78.90 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 96.04.49 to 96+21.73 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 97+30.31 to 97+39.75 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 97+82.33 to 98+01.93 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 98+88.56 to 99+45.70 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 100+53.26 to 100+99.81 LT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 100+55.84 to 101+09.54 LT	Underground electric line	Conflict with road widening	COMED	180
Deerfield Road: 100+50.54 to 101+20.65 LT	Underground electric line	Conflict with road widening	COMED	180
Deerfield Road: 101+12 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 101+31 LT	Utility Pole	Conflict with road widening	COMED	180
Deerfield Road: 101+59 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 102.13 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 102.18 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 104+09 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 105+43 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 106+99 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 108+39 LT	Utility pole	Conflict with road widening	COMED	180

Deerfield Road: 110+03 LT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 110+05.40 to 111+14.64 LT	Underground electric line	Conflict with road widening	COMED	180
Deerfield Road: 112+11 LT	Utility pole	Conflict with grading for sidewalk/road	COMED	180
Deerfield Road: 114+07 LT	Utility pole	Conflict with grading for sidewalk/road	Comed	180
Deerfield Road: 115+66 LT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 117+14 LT	Utility pole	Conflict with grading for sidewalk/road	COMED	180
Deerfield Road: 118+95 LT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 120+02.13 to 120+02.13 RT	Electric Meter	Conflict with drainage structure	COMED	180
Deerfield Road: 120+02.85 to 120+61.89 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 120+21 LT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 124+67 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 124+69 LT	Utility pole	Conflict with retaining wall	COMED	180
Deerfield Road: 125+70 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 126+62 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 128+05 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 128+06 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 129+85 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 129+88 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 132+89 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 131+71 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 134+09 RT	Utility pole	Conflict with grading for road structure	COMED	180

Deerfield Road: 135+11 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 136+39 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 138+45 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 139+64 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 140+79 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 142+70 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 144+63 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 146+33 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 148+08 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 149+46 RT	Utility pole	Conflict with multi use path	COMED	180
Deerfield Road: 150+92.86 to 151+37.39 RT	Underground electric line	Conflict with drainage structure	Comed	180
Deerfield Road: 152+91 RT	Utility pole	Conflict with multi use path	COMED	180
Deerfield Road: 154+88 RT	Utility pole	Conflict with multi use path	COMED	180
Deerfield Road: 156+23 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 156+92 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 158+92 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 161+01/69 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 162+95 RT	Utility pole	Conflict with multi use path	COMED	180
Deerfield Road: 165+17 RT	Utility pole	Conflict with multi use path	COMED	180
Deerfield Road: 166+70 RT	Utility pole	Conflict with road widening	COMED	180
Portwine Road: 299+43.31 to 299+53.16 LT	Underground electric line	Conflict with drainage structure	COMED	180

Portwine Road: 299+55.73 to 299+75.75 LT	Underground electric line	Conflict with drainage structure	COMED	180
Portwine Road: 297+97 RT	Utility pole	Conflict with grading for road structure	COMED	180
Portwine Road: 295+97 RT	Utility pole	Conflict with grading for road structure	COMED	180
Portwine Road: 301+31 RT	Utility pole	Conflict with grading for road structure	COMED	180
Portwine Road: 302+56 RT	Utility pole	Conflict with grading for road structure	COMED	180
Portwine Road: 303+41 LT	Utility pole	Conflict with road widening	COMED	180
Portwine Road: 304+19 RT	Utility pole	Conflict with grading for road structure	COMED	180
Deerfield Road: 167+45 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 167+74.79 to 168+11.24 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 167+67.01 to 167+93.14 LT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 168+20 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 168+87 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 169+31.87 to 169+57.50 LT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 170+25 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 171+65 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 173+80 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 175+90 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 175+91 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 178+04 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 179+84 RT	Utility pole	Conflict with road grading	COMED	180
Deerfield Road: 181+45 RT	Utility pole	Conflict with road grading	COMED	180
Deerfield Road: 183+24 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 184+96 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 188+42 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 190+15 RT	Utility pole	Conflict with ditch	COMED	180

Deerfield Road: 190+16 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 191+89 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 193+62 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 193+62 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 193+71 LT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 195+34 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 197+10 RT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 198+89 RT	Utility pole	Conflict with road	COMED	180
Deerfield Road: 199+25 LT	Utility pole	Conflict with ditch	COMED	180
Deerfield Road: 200+66 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 201+98 LT	Utility pole	Conflict with multi use path	COMED	180
Deerfield Road: 202+17 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 203+53 RT	Utility pole	Conflict with road widening	COMED	180
Deerfield Road: 204+85.68 to 205+10.96 RT	Underground electric line	Conflict with drainage structure	COMED	180
Deerfield Road: 204+89 RT	Utility pole	Conflict with road grading	COMED	180
Deerfield Road: 205+18 RT	Utility pole	Conflict with sidewalk	COMED	180
Deerfield Road: 206+58 RT	Utility pole	Conflict with road grading	COMED	180
Saunders Road: 419+43.59 to 419+52.00 LT	Underground electric line	Conflict with drainage structure	COMED	180
Saunders Road: 418+84.24 to 419+62.87 RT	Fiber Optic	Conflict with drainage structure	LCDOT	180
Deerfield Road: 98+58.60 to 99+45.65 RT	Fiber Optic	Conflict with drainage structure	Lumen	180
Milwaukee Avenue: 73+48.06 to 73+20.21 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Milwaukee Avenue: 73+19.51 to 73+47.35 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 99+11.42 to 99+50.33 RT	Fiber Optic	Conflict with retaining wall	Lumen	180
Deerfield Road: 110+14.59 to 111+16.04 LT	Fiber Optic	Conflict with drainage structure	Lumen	180

Deerfield Road: 111+69.37 to 112+25.05 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 113+70.62 to 113+90.00 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 116+02.59 to 116+31.55 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 119+10.70 to 119+38.80 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 120+50.39 to 120+99.57 LT	Fiber Optic	Conflict with retaining wall	Lumen	180
Deerfield Road: 129+41.27 to 129+77.18 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 131+29.17 to 131+76.63 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 134+00.00 to 136+00.00 LT	Fiber Optic	Conflict with retaining wall	Lumen	180
Deerfield Road: 139+47.61 to 139+78.70 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 140+58.21 to 140+80.07 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 148+62.28 to 148+99.44 LT	Fiber Optic	Conflict with culvert conflict	Lumen	180
Deerfield Road: 153+85.25 to 154+22.46 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 156+47.51 to 156+78.23 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 159+86.47 to 160+10.99 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 159+87.34 to 160+10.99 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 161+86.21 to 162+09.76 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 164+28.93 to 164+87.89 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 165+05.43 to 165+38.26 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 169+26.22 to 169+47.82 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 174+84.14 to 175+25.06 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 181+00.01 to 181+32.95 LT	Fiber Optic	Conflict with drainage structure	Lumen	180

Deerfield Road: 182+68.30 to 183+18.06 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 185+33.34 to 185+74.68 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 187+27.97 to 187+66.98 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 189+66.61 to 189+88.81 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 190+93.73 to 191+39.76 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 193+00.78 to 196+88.16 LT	Fiber Optic	Conflict with culvert conflict	Lumen	180
Deerfield Road: 197+15.35 to 197+47.54 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 203+85.45 to 204+16.27 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Deerfield Road: 204+74.07 to 205+04.85 LT	Fiber Optic	Conflict with drainage structure	Lumen	180
Milwaukee Avenue: 74+28.31 to 74+90.52 RT	Fiber Optic	Conflict with drainage structure	not labelled	180
Deerfield Road: 100+61.71 to 101+18.60 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 103+81.19 to 104+18.01 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 105+23.65 to 107+81.15 LT	Gas Line	Conflict with road widening	NSG	180
Deerfield Road: 111+67.12 to 112+22.38 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 113+70.63 to 113+88.04 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 115+92.55 to 116+73.68 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 117+07.24 to 117+36.84 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 118+39.96 to 118+77.70 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 126+28.36 to 126+64.59 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 131+32.73 to 131+61.36 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 134+30.66 to 134+60.76 LT	Gas Line	Conflict with drainage structure	NSG	180

Deerfield Road: 136+40.41 to 136+62.82 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 137+36.65 to 137+60.21 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 140+58.21 to 140+80.07 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 142+38.63 to 142+69.10 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 144+65.23 to 145+00.21 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 145+88.84 to 146+10.96 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 151+04.35 to 151+36.89 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 152+93.21 to 153+17.37 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 153+86.94 to 154+17.41 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 154+81.66 to 155+11.60 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 155+82.49 to 156+06.52 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 159+94.34 to 160+14.53 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 162+03.32 to 162+38.59 RT	Gas Line	Conflict with drainage structure	NSG	180
Portwine Road: 299+15.81 to 299+58.85 C	Gas Line	Conflict with road widening	NSG	180
Portwine Road: 302+20.66 to 302+55.72 RT	Gas Line	Conflict with drainage structure	NSG	180
Portwine Road: 304+18.01 to 304+52.68 RT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 169+31.51 to 169+57.57 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 172+80.49 to 175+15.31 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 175+48.52 to 175+81.46 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 178+10.65 to 178+10.65 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 182+77.19 to 183+12.69 LT	Gas Line	Conflict with drainage structure	NSG	180

Deerfield Road: 185+33.34 to 185+74.68 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 187+27.97 to 187+66.98 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 189+66.61 to 189+88.81 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 190+95.47 to 193+14.99 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 193+79.31 to 193+99.21 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 194+38.57 to 194+59.48 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 194+91.47 to 195+10.12 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 197+37.81 to 197+51.75 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 201+30.31 to 201+70.25 LT	Gas Line	Conflict with drainage structure	NSG	180
Deerfield Road: 205+98.04 to 206+08.66 RT	Gas Line	Conflict with drainage structure	NSG	180
Saunders Road: 418+84.56 to 419+66.79 RT	Gas Line	Conflict with drainage structure	NSG	180
Saunders Road: 419+38.28 to 419+54.26 LT	Gas Line	Conflict with drainage structure	NSG	180
Milwaukee Avenue: 72+61.06 to 72+94.36 RT	Fiber Optic	Conflict with drainage structure	Verizon	180
Milwaukee Avenue: 73+16.01 to 73+40.63 RT	Fiber Optic	Conflict with drainage structure	Verizon	180
Milwaukee Avenue: 74+24.15 to 75+08.32 RT	Fiber Optic	Conflict with drainage structure	Verizon	180
Milwaukee Avenue: 70+66.45 to 70+98.44 RT	Fiber Optic	Conflict with drainage structure	Verizon	180
Milwaukee Avenue: 74+24.15 to 75+07.63 RT	Fiber Optic	Conflict with drainage structure	Verizon	180
Milwaukee Avenue: 72+61.06 to 72+94.36 RT	Fiber Optic	Conflict with drainage structure	Zayo	180
Milwaukee Avenue: 73+17.98 to 73+67.92 RT	Fiber Optic	Conflict with drainage structure	Zayo	180
Milwaukee Avenue: 74+44.14 to 75+56.89 RT	Fiber Optic	Conflict with drainage structure	Zayo	180

Stage 1

No conflicts to be resolved

Stage 2

No conflicts to be resolved

Pre-Stage: 180 Days Total Installation

Stage 1: 0 Days Total Installation

Stage 2: 0 Days Total Installation

The following contact information is what was used during the preparation of the plans as provided by the Agency/Company responsible for resolution of the conflict.

Agency/Company Responsible to Resolve Conflict	Name of contact	Phone	E-mail address
AT&T Distribution	Jamel McGinnis		jm548w@att.com g05256@att.com
AT&T LNS	Tim Lapointe	(281) 352-3631	tl0695@att.com th3913@att.com
Comcast	Martha Gieras Ted Wyman	(224) 229-5862	martha_gieras@cable.comcast.com Ted_Wyman@comcast.com
ComEd	Lisa Argast	(708) 277-8511	Lisa.argast@exeloncorp.com
Lake County Public Works	Brittany Albrecht Sloan	(847) 377-7133 (847) 377-7500	pwengineeringgroup@lakecountyil.gov
Lumen	Ben Pacocha	(877) 253-8353	Ben.pacocha@lumen.com relocations@lumen.com
North Shore Gas	Jay Hammer	(847) 263-4678	jay.hammer@northshoregasdelivery.com NSG-Engineering-Design@northshoregasdelivery.com
TDS Telecom	Matt Schulte	(262) 754-3063	TDSTelecomOSP@tdstelecom.com matt.schulte@tdstelecom.com
Verizon			investigations@verizon.com
Vernon Township	Todd Gedville	(847)634-4600	todd@vernontownship.com
Village of Buffalo Grove	Briget Schwab	(847) 459-2545	bfschwab@vbq.org
Village of Deerfield	Bob Phillips	(847) 317-2490	rphillips@deerfield.il.us
Village of Lake Zurich	Mike Brown	(847) 540-1696	Mike.Brown@LakeZurich.org

Village of Riverwoods	Carissa Smith	(847) 478-9700	csmith@gha-engineers.com
Vinakom Communications	Issam Messali	(847) 592-5785	issam.m@vinakom.com
Zayo Fiber Solutions			https://zayo811.com

UTILITIES TO BE WATCHED AND PROTECTED

The areas of concern noted below have been identified by following the suggested staging plan included for the contract. The information provided is not a comprehensive list of all remaining utilities, but those which during coordination were identified as ones which might require the Department's contractor to take into consideration when making the determination of the means and methods that would be required to construct the proposed improvement. In some instances, the contractor will be responsible to notify the owner in advance of the work to take place so necessary staffing on the owner's part can be secured.

Pre-Stage

NONE

Stage 1

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER
Year 1 – Stage 4	Gas Main	Gas main attached to underside of Deerfield Road bridge over Des Plaines River	North Shore Gas
Year 1 – Stage 4	Fiber Optic	Conduit attached to underside of Deerfield Road bridge over Des Plaines River	AT&T

Stage 2

NONE

No facilities requiring extra consideration

The following contact information is what was used during the preparation of the plans as provided by the owner of the facility.

Agency/Company Responsible to Resolve Conflict	Name of contact	Phone	E-mail address
AT&T Distribution	Jamel McGinnis		jm548w@att.com g05256@att.com
AT&T LNS	Tim Lapointe	(281) 352-3631	tl0695@att.com th3913@att.com
Comcast	Martha Gieras Ted Wyman	(224) 229-5862	martha_gieras@cable.comcast.com Ted_Wyman@comcast.com
ComEd	Lisa Argast	(708) 277-8511	Lisa.argast@exeloncorp.com
Lake County Public Works	Brittany Albrecht Sloan	(847) 377-7133 (847) 377-7500	pwengineeringgroup@lakecountyil.gov
Lumen	Ben Pacocha	(877) 253-8353	Ben.pacocha@lumen.com relocations@lumen.com
North Shore Gas	Jay Hammer	(847) 263-4678	jay.hammer@northshoregasdelivery.com NSG-Engineering-Design@northshoregasdelivery.com
TDS Telecom	Matt Schulte	(262) 754-3063	TDSTelecomOSP@tdstelecom.com matt.schulte@tdstelecom.com
Verizon			investigations@verizon.com
Vernon Township	Todd Gedville	(847)634-4600	todd@vernontownship.com
Village of Buffalo Grove	Briget Schwab	(847) 459-2545	bfschwab@vbg.org
Village of Deerfield	Bob Phillips	(847) 317-2490	rphillips@deerfield.il.us
Village of Lake Zurich	Mike Brown	(847) 540-1696	Mike.Brown@LakeZurich.org
Village of Riverwoods	Carissa Smith	(847) 478-9700	csmith@gha-engineers.com
Vinakom Communications	Issam Messali	(847) 592-5785	issam.m@vinakom.com
Zayo Fiber Solutions			https://zayo811.com

The above represents the best information available to the Department and is included for the convenience of the bidder. The days required for conflict resolution should be considered in the bid as this information has also been factored into the timeline identified for the project when setting the completion date. The applicable portions of the Standard Specifications for Road and Bridge Construction shall apply.

Estimated duration of time provided above for the first conflicts identified will begin on the date of the executed contract regardless of the status of the utility relocations. The responsible agencies will be working toward resolving subsequent conflicts in conjunction with contractor activities in the number of days noted.

The estimated relocation duration must be part of the progress schedule submitted by the contractor. A utility kickoff meeting will be scheduled between the Department, the Department's contractor, and the utility companies when necessary.

The contractor is responsible for contacting JULIE (or DIGGER within the City of Chicago) prior to any excavation work. Please note that IDOT electrical facilities are not part of the one-call locating services, such as JULIE or DIGGER.

If the contract requires the services of an electrical contractor, it is the contractor's responsibility, at their own expense, to locate existing IDOT and/or local agency electrical facilities before commencing work. For contracts that do not require an electrical contractor, the contractor may request one free locate of IDOT electrical facilities by contacting the Department's Electrical Maintenance Contractor and/or the appropriate local agency electrical maintenance contractor. Additional locate requests will be at the contractor's expense.

For work on or near IDOT ROW on contracts without an electrical contractor, the Department's Electrical Maintenance Contractor must be notified at least 72 hours in advance of the work by calling 773-287-7600 or emailing dispatch@meade100.com to arrange for the locating of underground electrical facilities.

Please note, the marking of underground facilities does not absolve the contractor of their responsibility to repair or replace any facilities damaged during construction at their expense.

TEMPORARY PAVEMENT (D1)

Effective: March 1, 2003

Revised: April 10, 2008

Description. This work shall consist of constructing a temporary pavement at the locations shown on the plans or as directed by the engineer.

The contractor shall use either Portland cement concrete according to Sections 353 and 354 of the Standard Specifications or HMA according to Sections 355, 356, 406 of the Standard Specifications, and other applicable HMA special provisions as contained herein. The HMA mixtures to be used shall be specified in the plans. The thickness of the Temporary Pavement shall be as described in the plans. The contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans.

Articles 355.08 and 406.11 of the Standard Specifications shall not apply.

The removal of the Temporary Pavement, if required, shall conform to Section 440 of the Standard Specification.

Method of Measurement. Temporary pavement will be measured in place and the area computed in square yards (square meters).

Basis of Payment. This work will be paid for at the contract unit price per square yard (square meter) for TEMPORARY PAVEMENT and TEMPORARY PAVEMENT (INTERSTATE).

Removal of temporary pavement will be paid for at the contract unit price per square yard (square meter) for PAVEMENT REMOVAL.

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS (D1)

Effective: April 1, 2001

Revised: January 2, 2007

Revise Article 402.10 of the Standard Specifications to read:

“402.10 For Temporary Access. The contractor shall construct and maintain aggregate surface course for temporary access to private entrances, commercial entrances and roads according to Article 402.07 and as directed by the Engineer.

The aggregate surface course shall be constructed to the dimensions and grades specified below, except as modified by the plans or as directed by the Engineer.

- (a) Private Entrance. The minimum width shall be 12 ft (3.6 m). The minimum compacted thickness shall be 6 in. (150 mm). The maximum grade shall be eight percent, except as required to match the existing grade.
- (b) Commercial Entrance. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The maximum grade shall be six percent, except as required to match the existing grade.
- (c) Road. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The grade and elevation shall be the same as the removed pavement, except as required to meet the grade of any new pavement constructed.

Maintaining the temporary access shall include relocating and/or regrading the aggregate surface coarse for any operation that may disturb or remove the temporary access. The same type and gradation of material used to construct the temporary access shall be used to maintain it.

When use of the temporary access is discontinued, the aggregate shall be removed and utilized in the permanent construction or disposed of according to Article 202.03.”

Add the following to Article 402.12 of the Standard Specifications:

“Aggregate surface course for temporary access will be measured for payment as each for every private entrance, commercial entrance or road constructed for the purpose of temporary access. If a residential drive, commercial entrance, or road is to be constructed under multiple stages, the aggregate needed to construct the second or subsequent stages will not be measured for payment but shall be included in the cost per each of the type specified.”

Revise the second paragraph of Article 402.13 of the Standard Specifications to read:

“Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS (PRIVATE ENTRANCE), TEMPORARY ACCESS (COMMERCIAL ENTRANCE) or TEMPORARY ACCESS (ROAD).

Partial payment of the each amount bid for temporary access, of the type specified, will be paid according to the following schedule:

- (a) Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.
- (b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access.”

MINERALIZED CARBON DIOXIDE CONCRETE (D-1)

Effective: January 1, 2026

Description. This work shall consist of the proportioning, mixing, placement, curing, and evaluation testing of portland cement concrete that utilizes an admixture which promotes carbon dioxide (CO₂) mineralization or an equivalent effect at the Contractor's option.

Materials. Materials shall be according to the following.

<u>Item</u>	<u>Article/Section</u>
(a) Portland Cement Concrete (Note 1)	1020
(b) Concrete Admixtures (Note 2)	1021

Note 1: Concrete shall meet the requirements of Class SI concrete used for the construction of curb and gutter, driveways, sidewalks and other applications as allowed by the Engineer. However, the mix design cement content shall be reduced by 3 to 6 % and an admixture which promotes CO₂ mineralization, or an equivalent effect shall utilized.

Note 2: The admixture which promotes CO₂ mineralization, or an equivalent effect shall be food grade quality from a nearby supplier. In addition, it shall, at a minimum, be according to AASHTO M 194 , Type S (specific performance). The Department also reserves the right to require other testing, as determined by the Engineer, to show evidence of specific performance characteristics. Testing according to AASHTO M 194 and other testing if required by the Engineer shall be by an independent laboratory accredited by AASHTO re:sourse for Portland Cement Concrete. Test data required to be submitted to AASHTO Product Eval and Audit according to Article 1021.01 and other testing data, if required by the Engineer, shall be submitted to the Department. The independent accredited lab report shall show the results of physical tests conducted no more than five years prior to the time of submittal.

Mix Design Verification and Evaluation. The mineralized CO₂ concrete mix design will be verified by the Engineer. Verification of a mix design shall in no manner be construed as acceptance of any mixture produced.

Equipment. Equipment shall be according to applicable portions of Sections 420, 424, 483, and 606; except special equipment needed for production of mineralized CO₂ concrete shall be approved by the Engineer.

Construction Requirements. Construction requirements shall be according to applicable portions of Sections 420, 424, 483, and 606.

The placement locations for the mineralized CO₂ concrete shall be according to the plans or as directed by the Engineer.

The same mixture proportions shall be used for the entire project, unless otherwise stated in the project documents. If during the project there is a change in the type or source of the cement, finely divided minerals, aggregates, or CO₂ mineralization admixture; the mixing shall be suspended, and a new mix design shall be developed, and re-verified.

The cost of this work shall be included in the contract unit price of the PCC pay item involved.

HOT-MIX ASPHALT BINDER AND SURFACE COURSE (D1)

Effective: November 1, 2019

Revised: April 1, 2026

Add the following to the end of Article 406.06(c) of the Standard Specifications:

“The amount of HMA binder course placed shall be limited to that which can be surfaced during the same construction season.”

Revise the fifteenth through eighteenth paragraphs of Article 406.14 of the Standard Specifications to read:

“The mixture used in constructing acceptable HMA test strips will be paid for at the contract unit price. Unacceptable HMA test strips shall be removed and replaced at no additional cost to the Department.”

Revise Article 1004.03(c) to read:

“(c) Gradation. The coarse aggregate gradations shall be as listed in the following table.

Use	Size/Application	Gradation No.
Class A-1, A-2, & A-3	3/8 in. (10 mm) Seal	CA 16 or CA 20
Class A-1	1/2 in. (13 mm) Seal	CA 15
Class A-2 & A-3	Cover Coat	CA 14
HMA High ESAL	IL-19.0; Stabilized Subbase IL-19.0	CA 11 ^{1/}
	SMA 12.5 ^{2/}	CA 13 ^{4/} , CA 14, or CA 16
	SMA 9.5 ^{2/}	CA 13 ^{3/4/} or CA 16 ^{3/}
	IL-9.5	CA 16, CM 13 ^{4/}
	IL-9.5FG	CA 16
HMA Low ESAL	IL-19.0L	CA 11 ^{1/}
	IL-9.5L	CA 16

1/ CA 16 or CA 13 may be blended with the CA 11.

2/ The coarse aggregates used shall be capable of being combined with the fine aggregates and mineral filler to meet the approved mix design and the mix requirements noted herein.

3/ The specified coarse aggregate gradations may be blended.

4/ CA 13 shall be 100 percent passing the 1/2 in. (12.5mm) sieve.”

Revise Article 1004.03(e) of the Standard Specifications to read:

“(e) Absorption. For SMA the coarse aggregate shall also have water absorption ≤ 2.0 percent.”

Revise the “High ESAL” portion of the table in Article 1030.01 to read:

“High ESAL	Binder Courses	IL-19.0, IL-9.5, IL-9.5FG, IL-4.75, SMA 12.5, SMA 9.5 Stabilized Subbase IL-19.0
	Surface Courses	IL-9.5, IL-9.5FG, SMA 12.5, SMA 9.5”

Revise Note 2. and add Note 6 to Article 1030.02 of the Standard Specifications to read:

“Item	Article/Section
(g)Performance Graded Asphalt Binder (Note 6)	1032
(h)	Fibers (Note 2)

Note 2. A stabilizing additive such as cellulose or mineral fiber shall be added to the SMA mixture according to Illinois Modified AASHTO M 325. The stabilizing additive shall meet the Fiber Quality Requirements listed in Illinois Modified AASHTO M 325. Prior to approval and use of fibers, the Contractor shall submit a notarized certification by the producer of these materials stating they meet these requirements. Reclaimed Asphalt Shingles (RAS) may be used in Stone Matrix Asphalt (SMA) mixtures designed with an SBA polymer modifier as a fiber additive if the mix design with RAS included meets AASHTO T305 requirements. The RAS shall be from a certified source that produces either Type I or Type 2. Material shall meet requirements noted herein and the actual dosage rate will be determined by the Engineer.

Note 6. The asphalt binder shall be an SBS PG 76-28 when the SMA is used on a full-depth asphalt pavement and SBS PG 76-22 when used as an overlay, except where modified herein. The asphalt binder shall be a SBS PG 76-22 for IL-4.75, except where modified herein..”

Revise table in Article 1030.05(a) of the Standard Specifications to read:

"MIXTURE COMPOSITION (% PASSING)" ^{1/}												
Sieve Size	IL-19.0 mm		SMA 12.5		SMA 9.5		IL-9.5mm		IL-9.5FG		IL-4.75 mm	
	min	max	min	max	min	max	min	max	min	max	min	max
1 1/2 in. (37.5 mm)												
1 in. (25 mm)		100										
3/4 in. (19 mm)	90	100		100								
1/2 in. (12.5 mm)	75	89	80	100		100		100		100		100
3/8 in. (9.5 mm)				65	90	100	90	100	90	100		100
#4 (4.75 mm)	40	60	20	30	36	50	34	69	60	75 ^{6/}	90	100
#8 (2.36 mm)	20	42	16	24 ^{4/}	16	32 ^{4/}	34 ^{5/}	52 ^{2/}	45	60 ^{6/}	70	90
#16 (1.18 mm)	15	30					10	32	25	40	50	65
#30 (600 µm)			12	16	12	18			15	30		
#50 (300 µm)	6	15					4	15	8	15	15	30
#100 (150 µm)	4	9					3	10	6	10	10	18
#200 (75 µm)	3.0	6.0	7.0	9.0 ^{3/}	7.5	9.5 ^{3/}	4.0	6.0	4.0	6.5	7.0	9.0 ^{3/}
#635 (20 µm)			≤ 3.0		≤ 3.0							
Ratio Dust/Asphalt Binder		1.0		1.5		1.5		1.0		1.0		1.0

1/ Based on percent of total aggregate weight.

2/ The mixture composition shall not exceed 44 percent passing the #8 (2.36 mm) sieve for surface courses with Ndesign = 90.

3/ Additional minus No. 200 (0.075 mm) material required by the mix design shall be mineral filler, unless otherwise approved by the Engineer.

4/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above the percentage stated on the table.

- 5/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted below 34 percent.
- 6/ When the mixture is used as a binder, the maximum shall be increased by 0.5 percent passing.”

Revise Article 1030.05(b) of the Standard Specifications to read:

- (b) Volumetric Requirements. The target value for the air voids of the HMA shall be 4.0 percent, for IL-4.75 and SMA mixtures it shall be 3.5 percent and for Stabilized Subbase it shall be 3.0 percent at the design number of gyrations. The voids in the mineral aggregate (VMA) and voids filled with asphalt binder (VFA) of the HMA design shall be based on the nominal maximum size of the aggregate in the mix and shall conform to the following requirements.

	Voids in the Mineral Aggregate (VMA), % Minimum for Ndesign				
Mix Design	30	50	70	80	90
IL-19.0		13.5	13.5		13.5
IL-9.5		15.0	15.0		
IL-9.5FG		15.0	15.0		
IL-4.75 ^{1/}		18.5			
SMA-12.5 ^{1/2/5/}				17.0 ^{3/} /16.0 ^{4/}	
SMA-9.5 ^{1/2/5/}				17.0 ^{3/} /16.0 ^{4/}	
IL-19.0L	13.5				
IL-9.5L	15.0				

- 1/ Maximum draindown shall be 0.3 percent according to Illinois Modified AASHTO T 305.
- 2/ The draindown shall be determined at the JMF asphalt binder content at the mixing temperature plus 30°F.
- 3/ Applies when specific gravity of coarse aggregate is ≥ 2.760 .
- 4/ Applies when specific gravity of coarse aggregate is < 2.760 .
- 5/ For surface course, the coarse aggregate can be crushed steel slag, crystalline crushed stone or crushed sandstone. For binder course, coarse aggregate shall be crushed stone (dolomite), crushed gravel, crystalline crushed stone, or crushed sandstone”

Revise the last paragraph of Article 1102.01 (a) (5) of the Standard Specifications to read:

“IL-4.75 and Stone Matrix Asphalt (SMA) mixtures which contain aggregate having absorptions greater than or equal to 2.0 percent, or which contain steel slag sand, shall have minimum surge bin storage plus haul time of 1.5 hours.”

Revise the first and second paragraphs of Articles 1030.06(c)(2) of the Standard Specifications to read:

“(2) Personnel. The Contractor shall provide a QC Manager who shall have overall responsibility and authority for quality control. This individual shall maintain active certification as a Hot-Mix Asphalt Level II technician.

In addition to the QC Manager, the Contractor shall provide sufficient personnel to perform the required visual inspections, sampling, testing, and documentation in a timely manner. Mix designs shall be developed by personnel with an active certification as a Hot-Mix Asphalt Level III technician. Technicians performing mix design testing and plant sampling/testing shall maintain active certification as a Hot-Mix Asphalt Level I technician. The Contractor may provide a technician trainee who has successfully completed the Department’s “Hot-Mix Asphalt Trainee Course” to assist in the activities completed by a Hot-Mix Asphalt Level I technician for a period of one year after the course completion date. The Contractor may also provide a Gradation Technician who has successfully completed the Department’s “Gradation Technician Course” to run gradation tests only under the supervision of a Hot-Mix Asphalt Level II Technician. The Contractor shall provide a Hot-Mix Asphalt Density Tester who has successfully completed the Department’s “Nuclear Density Testing” course to run all nuclear density tests on the job site.”

Add Article 1030.06(d)(3) to the Standard Specifications to read:

“(3) The Contractor shall take possession of any Department unused backup or dispute resolution HMA mixture samples or density specimens upon notification by the Engineer. The Contractor shall collect the HMA mixture samples or density specimens from the location designated by the Engineer and may add these materials to RAP stockpiles according to Section 1031.”

Revise the second paragraph of Articles 1030.07(a)(11) and 1030.08(a)(9) of the Standard Specifications to read:

“When establishing the target density, the HMA maximum theoretical specific gravity

(Gmm) will be based on the running average of four available Department test results for that project. If less than four Gmm test results are available, an average of all available Department test results for that project will be used. The initial Gmm will be the last available Department test result from a QMP project. If there is no available Department test result from a QMP project, the Department mix design verification test result will be used as the initial Gmm.”

Revise the Quality Control Limits table in Article 1030.09(c) to read:

CONTROL LIMITS						
Parameter	IL-19.0, IL-9.5, IL-9.5FG, IL-19.0L, IL-9.5L		SMA-12.5, SMA-9.5		IL-4.75	
	Individual Test	Moving Avg. of 4	Individual Test	Moving Avg. of 4	Individual Test	Moving Avg. of 4
% Passing: ^{1/}						
1/2 in. (12.5 mm)	± 6 %	± 4 %	± 6 %	± 4 %		
3/8 in. (9.5mm)			± 4 %	± 3 %		
# 4 (4.75 mm)	± 5 %	± 4 %	± 5 %	± 4 %		
# 8 (2.36 mm)	± 5 %	± 3 %	± 4 %	± 2 %		
# 16 (1.18 mm)			± 4 %	± 2 %	± 4 %	± 3 %
# 30 (600 µm)	± 4 %	± 2.5 %	± 4 %	± 2.5 %		
Total Dust Content # 200 (75 µm)	± 1.5 %	± 1.0 %			± 1.5 %	± 1.0 %
Asphalt Binder Content	± 0.3 %	± 0.2 %	± 0.2 %	± 0.1 %	± 0.3 %	± 0.2 %
Air Voids ^{2/}	± 1.2 %	± 1.0 %	± 1.2 %	± 1.0 %	± 1.2 %	± 1.0 %
Field VMA ^{3/}	-0.7 %	-0.5 %	-0.7 %	-0.5 %	-0.7 %	-0.5 %

1/ Based on washed ignition oven or solvent extraction gradation.

2/ The air voids target shall be 3.2 to 4.8 percent.

3/ Allowable limit below minimum design VMA requirement.

Revise Article 1030.09(g)(1) of the Supplemental Specifications with the following:

“(1) The Contractor shall sample approximately 200 lb (91 kg) of mix as required for the

Department's random mixture verification tests according to Article 1030.09(h)(1)."

Revise Article 1030.09(g)(2) of the Standard Specifications to read:

"(2) The Contractor shall complete split verification sample tests listed in the Limits of Precision table in Article 1030.09(h)(1)."

Revise the second sentence of Article 1030.09(h)(1) of the Supplemental Specifications with the following:

"The random verification mixture sampling interval will be a maximum of 3,000 tons (2,720 metric tons). The Engineer will randomly identify one sample per interval, with a minimum of one sample per mix. If the remaining mix quantity is 600 tons (544 metric tons) or less, the quantity will be combined with the previous interval in the Engineer's random sample identification. If the required tonnage of a mixture for a single pay item is less than 250 tons (225 metric tons) in total, the Engineer will waive mixture verification sampling and testing."

Revise the third paragraph of Article 1030.09(h)(1) of the Standard Specifications to read:

"If comparisons of the mixture verification test results are outside the above limits of precision, the Department will verify the results by testing the retained split sample. The retest results will replace all the original results."

In the Supplemental Specifications, replace the revision for the end of the third paragraph of Article 1030.09(h)(2) with the following:

"When establishing the target density, the HMA maximum theoretical specific gravity (Gmm) will be the Department mix design verification test result."

Add after third sentence of Article 1030.09(b) to read:

"If the Contractor and Engineer agree the nuclear density test method is not appropriate for the mixture, cores shall be taken at random locations determined according to the QC/QA document "Determination of Random Density Test Site Locations". Core densities shall be determined using the Illinois Modified AASHTO T 166 or T 275 procedure."

Revise Table 1 and Note 4/ of Table 1 in Article 406.07(a) of the Standard Specifications to read:

	Breakdown/Intermediate Roller (one of the following)	Final Roller (one or more of the following)	Density Requirement
IL-9.5, IL-9.5FG, IL-19.0 ^{1/}	V _D , P, T _B , 3W, O _T , O _B	V _S , T _B , T _F , O _T	As specified in Section 1030
IL-4.75 and SMA ^{3/ 4/}	T _B , 3W, O _T	T _F , 3W	As specified in Section 1030
Mixtures on Bridge Decks ^{2/}	T _B	T _F	As specified in Articles 582.05 and 582.06.

“4/ The Contractor shall provide a minimum of two steel-wheeled tandem rollers (T_B), and/or three-wheel (3W) rollers for breakdown, except one of the (T_B) or (3W) rollers shall be 84 inches (2.14 m) wide and a weight of 315 pound per linear inch (PLI) (5.63 kg/mm) and one of the (T_B) or (3W) rollers can be substituted for an oscillatory roller (O_T). T_F rollers shall be a minimum of 280 lb/in. (50 N/mm). The 3W and T_B rollers shall be operated at a uniform speed not to exceed 3 mph (5 km/h), with the drive roll for T_B rollers nearest the paver and maintain an effective rolling distance of not more than 150 ft (45 m) behind the paver.”

Add the following after the fourth paragraph of Article 406.13 (b):

“The plan quantities of SMA mixtures shall be adjusted using the actual approved binder and surface Mix Design’s G_{mb}.”

Revise first paragraph of Article 1030.10 of the Standard Specifications to read:

“A test strip of 300 ton (275 metric tons), except for SMA mixtures it will be 400 ton (363 metric ton), will be required for each mixture on each contract at the beginning of HMA production for each construction year according to the Manual of Test Procedures for Materials “Hot Mix Asphalt Test Strip Procedures”. At the request of the Producer, the Engineer may waive the test strip if previous construction during the current construction year has demonstrated the constructability of the mix using Department test results.”

Revise fourth paragraph of Article 1030.10 of the Standard Specifications to read:

“When a test strip is constructed, the Contractor shall collect and split the mixture according to the document “Hot-Mix Asphalt Test Strip Procedures”. The Engineer, or a representative, shall deliver split sample to the District Laboratory for verification testing.

The Contractor shall complete mixture tests stated in Article 1030.09(a). Mixture sampled shall include enough material for the Department to conduct mixture tests detailed in Article 1030.09(a) and in the document "Hot-Mix Asphalt Mixture Design Verification Procedure" Section 3.3. The mixture test results shall meet the requirements of Articles 1030.05(b) and 1030.05(d), except Hamburg wheel tests will only be conducted on High ESAL mixtures during production. To be considered acceptable to remain in place, the Department's mixture test results shall meet the acceptable limits stated in Article 1030.09(i)(1). In addition, no visible pavement distress such as, but not limited to, segregation, excessive coarse aggregate fracturing outside of growth curves, excessive dust balls, or flushing shall be present as determined by the Engineer."

FRICTION AGGREGATE (D1)

Effective: January 1, 2011

Revised: December 1, 2021

Revise Article 1004.03(a) of the Standard Specifications to read:

“1004.03 Coarse Aggregate for Hot-Mix Asphalt (HMA). The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate for HMA shall be according to the following table.

Use	Mixture	Aggregates Allowed
Class A	Seal or Cover	<u>Allowed Alone or in Combination</u> ^{5/} : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA Low ESAL	Stabilized Subbase or Shoulders	<u>Allowed Alone or in Combination</u> ^{5/} : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag ^{1/} Crushed Concrete

Use	Mixture	Aggregates Allowed	
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L SMA Binder	<u>Allowed Alone or in Combination</u> ^{5/6/} : Crushed Gravel Carbonate Crushed Stone ^{2/} Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete ^{3/}	
HMA High ESAL Low ESAL	C Surface and Binder IL-9.5 IL-9.5FG or IL-9.5L	<u>Allowed Alone or in Combination</u> ^{5/} : Crushed Gravel Carbonate Crushed Stone ^{2/} Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag ^{4/} Crushed Concrete ^{3/}	
HMA High ESAL	D Surface and Binder IL-9.5 or IL-9.5FG	<u>Allowed Alone or in Combination</u> ^{5/} : Crushed Gravel Carbonate Crushed Stone (other than Limestone) ^{2/} Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag ^{4/}	
		<u>Other Combinations Allowed:</u>	
		<i>Up to...</i>	<i>With...</i>
		25% Limestone	Dolomite
		50% Limestone	Any Mixture D aggregate other than Dolomite
		75% Limestone	Crushed Slag (ACBF) or Crushed Sandstone

Use	Mixture	Aggregates Allowed	
HMA High ESAL	E Surface IL-9.5 SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> ^{5/} _{6/} ;	
		Crushed Gravel Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		<u>Other Combinations Allowed:</u>	
		<i>Up to...</i>	<i>With...</i>
		50% Dolomite ^{2/}	Any Mixture E aggregate
HMA High ESAL	F Surface IL-9.5 SMA Ndesign 80 Surface	75% Dolomite ^{2/}	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel ^{2/}	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag
		<u>Other Combinations Allowed:</u>	

Use	Mixture	Aggregates Allowed	
		<i>Up to...</i>	<i>With...</i>
		50% Crushed Gravel ^{2/} or Dolomite ^{2/}	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

- 1/ Crushed steel slag allowed in shoulder surface only.
- 2/ Carbonate crushed stone (limestone) and/or crushed gravel shall not be used in SMA Ndesign 80.
- 3/ Crushed concrete will not be permitted in SMA mixes.
- 4/ Crushed steel slag shall not be used as binder.
- 5/ When combinations of aggregates are used, the blend percent measurements shall be by volume."
- 6/ Combining different types of aggregate will not be permitted in SMA Ndesign 80."

HOT-MIX ASPHALT – MIXTURE DESIGN VERIFICATION AND PRODUCTION (D1)

Effective: January 1, 2019

Revised: January 1, 2026

Add to Article 1030.05 (d)(3) of the Standard Specifications to read:

“ During mixture design, prepared samples shall be submitted to the District laboratory by the Contractor for verification testing. The required testing, number and size of prepared samples submitted, shall be according to the following tables.

High ESAL – Required Samples for Verification Testing	
Mixture	Hamburg Wheel and I-FIT Testing ^{1/ 2/}
Binder	total of 3 - 160 mm tall bricks
Surface	total of 4 - 160 mm tall bricks

Low ESAL – Required Samples for Verification Testing	
Mixture	I-FIT Testing ^{1/ 2/}
Binder	1 - 160 mm tall brick
Surface	2 - 160 mm tall bricks

1/ The compacted gyratory bricks for Hamburg wheel and I-FIT testing shall be 7.5 ± 0.5 percent air voids.

2/ If the Contractor does not possess the equipment to prepare the 160 mm tall brick(s), twice as many 115 mm tall compacted gyratory bricks will be acceptable.

In the Supplemental Specifications, replace the addition of the paragraph between the third and fourth paragraphs of Article 1030.10 with the following:

“When a test strip is not required, each HMA mixture shall still be sampled on the first day of production: I-FIT and Hamburg wheel testing for High ESAL; I-FIT testing for Low ESAL. Within two working days after sampling the mixture, the Contractor shall deliver gyratory cylinders to the District laboratory for Department verification testing. The High ESAL mixture test results shall meet the requirements of Articles 1030.05(d)(3) and 1030.05(d)(4). The Low ESAL mixture test results shall meet the requirements of Article 1030.05(d)(4). The required number and size of prepared samples submitted for the

Hamburg wheel and I-FIT testing shall be according to the “High ESAL - Required Samples for Verification Testing” table in Article 1030.05(d)(3) above.”

Replace the eleventh paragraph of Article 1030.10 of the Standard Specifications with the following:

“If an initial Hamburg wheel or I-FIT test fails to meet the requirements of Article 1030.05(d), the Department will verify the results by testing the retained gyratory cylinders. Upon notification by the Engineer of a Hamburg wheel or I-FIT test failure on the retained gyratory cylinders, the Contractor shall substitute an approved mix design, submit a new mix design for mix verification testing according to Article 1030.05(d), or pave 250 tons with or without an adjustment and resample for Department Hamburg wheel and I-FIT testing as directed by the Engineer. Paving may continue as long as all other mixture criteria is being met. If Hamburg wheel or I-FIT tests on the resampled HMA fail, production of the affected mixture shall cease and the Contractor shall substitute an approved mix design or submit a new mix design for mix verification testing according to Article 1030.05(d).”

Add the following to the end of Article 1030.10 of the Standard Specifications to read:

“Mixture sampled during first day of production shall include approximately 60 lb (27 kg) of additional material for the Department to conduct Hamburg wheel testing and approximately 80 lb (36 kg) of additional material for the Department to conduct I-FIT testing. Within two working days after sampling, the Contractor shall deliver prepared samples to the District laboratory for verification testing. The required number and size of prepared samples submitted for the Hamburg wheel and I-FIT testing shall be according to the “High ESAL - Required Samples for Verification Testing” table in Article 1030.05(d)(3) above.”

GENERAL ELECTRICAL REQUIREMENTS (D1)

Effective: July 1, 2025

This special provision replaces Articles 801.01 – 801.07, 801.09 – 801-16 of the Standard Specifications.

Definition. Codes, standards, and industry specifications cited for electrical work shall be by definition the latest adopted version thereof, unless indicated otherwise.

Materials shall include electrical equipment, fittings, devices, motors, appliances, fixtures, apparatus, all hardware and appurtenances, and the like, used as part of, or in connection with, electrical installation.

Standards of Installation. Materials shall be installed according to the manufacturer's recommendations, the NEC, OSHA, the NESC, and AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

All like materials shall be from the same manufacturer. Listed and labeled materials shall be used whenever possible. The listing shall be according to UL or an approved equivalent.

Safety and Protection. Safety and protection requirements shall be as follows.

Safety. Electrical systems shall not be left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc. which contain wiring, either energized or non-energized, shall be closed or shall have covers in place and be locked when possible, during nonworking hours.

Protection. Electrical raceway or duct openings shall be capped or otherwise sealed from the entrance of water and dirt. Wiring shall be protected from mechanical injury.

Equipment Grounding Conductor. All electrical systems, materials, and appurtenances shall be grounded. Good ground continuity throughout the electrical system shall be assured, even though every detail of the requirements is not specified or shown. Electrical circuits shall have a continuous insulated equipment grounding conductor. When metallic conduit is used, it shall be bonded to the equipment grounding conductor, but shall not be used as the equipment grounding conductor.

Detector loop lead-in circuits, circuits under 50 volts, and runs of fiber optic cable will not require an equipment grounding conductor.

Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point. After the connection is completed, the paint system shall be repaired to the satisfaction of the Engineer.

Bonding of all boxes and other metallic enclosures throughout the wiring system to the equipment grounding conductor shall be made using a splice and pigtail connection. Mechanical connectors shall have a serrated washer at the contact surface.

All connections to structural steel or fencing shall be made with exothermic welds. Care shall be taken not to weaken load carrying members. Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate a mechanical connection. The epoxy coating shall be repaired to the satisfaction of the Engineer. Where connections are made to insulated conductors, the connection shall be wrapped with at least four layers of electrical tape extended 6 in. (150 mm) onto the conductor insulation.

Submittals. At the preconstruction meeting, the Contractor shall submit a written listing of manufacturers for all major electrical and mechanical items. The list of manufacturers shall be binding, except by written request from the Contractor and approval by the Engineer. The request shall include acceptable reasons and documentation for the change.

Within 30 calendar days after contract execution, the Contractor shall submit, for approval, through the method as directed in the pre-construction meeting. Submittals for the materials for each individual pay item shall be complete in every respect. Submittals which include multiple pay items shall have all submittal material for each item or group of items covered by a particular specification, grouped together and the applicable pay item identified. Various submittals shall, when taken together, form a complete coordinated package. A partial submittal will be returned without review unless prior written permission is obtained from the Engineer.

Submittals shall be provided for all items used, temporary and permanent, for review and approval.

Equipment which will be owned and maintained by a local agency other than the State shall be reviewed and approved by that agency prior to submittal to the State. The submittal to the State shall include any comments made by the local agency.

Each PDF document must be a vector format PDF from the originating supplier or program and not scanned images.

The submittal must clearly identify the specific model number or catalog number of the item being proposed. Submittals must be the Manufacturers current published information. Out of date submittal material will be grounds for rejection.

The submittal shall be properly identified by Contractor, Pay Item Number, route, section, county, and contract number.
Example:

Contractor: Contractor Name Pay Item: X0327607 Route: I-00 Section: 2013-xxx-yzx County: Cook Contract: 12Z34

The Contractor shall have reviewed the submittal material and affixed the Contractor's stamp of approval, with date and signature, for each individual item prior to submittal. The Contractor's approval stamp shall be the first page of the submittal.

Illegible print, incompleteness, inaccuracy, or lack of coordination will be grounds for rejection.

Items from multiple disciplines shall not be combined on a single submittal and transmittal. Items for lighting, signals, surveillance, and CCTV must be in separate submittals since they may be reviewed by various personnel in various locations.

The Department may provide a list of pay items broken out by discipline upon request for a particular contract. In general, the disciplines are as follows:

Discipline	Typical Items
ITS	CCTV CCTV structures Communication vaults Fiber optic Fiber optic duct Network equipment
Lighting	Breakaway devices Light poles Light tower Lighting cables Lighting controllers Luminaires Unit duct
Pump Station	All pump station equipment
Signing	Signing
Surveillance	Loop cables Detector equipment & associated structures Ramp metering & associated structures Wireless pavement sensors and assoc. structures Radar detection Data Probing Handholes Dynamic Message Signs (DMS)

Discipline	Typical Items
Traffic Signal	Controllers/Cabinets Handholes Illuminated signs Pedestrian Push Buttons Signal Cable Signal Detectors Signal Heads Signal Loop Cable Signal Modules Signal Structures
Local Roads Lighting	Same as lighting
Local Roads Traffic Signal	Same as traffic signal
Discipline with the predominate amount of work in contract or ask Engineer.	Raceways Electric cables Junction boxes

The Engineer will review the submittals for conformance with the design concept of the project according to Article 105.04 and the following. The Engineer will stamp the drawings indicating their status as “Approved”, “Approved as Noted”, “Disapproved”, “Incomplete”, or “Information Only”. Since the Engineer’s review is for conformance with the design concept only, it shall be the Contractor’s responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, or layout drawings by the Engineer’s approval thereof. The Contractor shall still be in full compliance with contract and specification requirements.

All submitted items reviewed and marked “Disapproved”, “Incomplete” or “Approved as Noted” shall be resubmitted by the Contractor in their entirety, unless otherwise indicated within the submittal comments.

Work shall not begin until the Engineer has approved the submittal. Material installed prior to approval by the Engineer, will be subject to removal and replacement at no additional cost to the Department.

Certifications. When certifications are specified and are available prior to material manufacture, the certification shall be included in the submittal information. When specified and only available after manufacture, the submittal shall include a statement of intent to furnish certification. All certificates shall be complete with all appropriate test dates and data.

Authorized Project Delay. See Article 801.08

Maintenance transfer and Preconstruction Inspection:

General. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall request a maintenance transfer and preconstruction site inspection, to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any electrical systems (lighting, ITS, Pump Station, Surveillance, and traffic control systems) which may be affected by the work. The request for the maintenance transfer and preconstruction inspection shall be made no less than fourteen (14) calendar days prior to the desired inspection date. The maintenance transfer and preconstruction inspection shall:

Establish the procedures for formal transfer of maintenance responsibility required for the construction period.

Establish the approximate location and operating condition of the electrical systems which may be affected by the work.

Marking of Existing Cable Systems. The party responsible for maintenance of any existing electrical systems at the project site will, at the Contractor's request, mark and/or stake, once per location, all underground cable routes owned or maintained by the State. A project may involve multiple "locations" where separated electrical systems are involved (i.e. different controllers). The markings shall be taken to have a horizontal tolerance of at least 1 foot (304.8 mm) to either side. The request for the cable locations and marking shall be made at the same time the request for the maintenance transfer and preconstruction inspection is made. The Contractor shall exercise extreme caution where existing buried cable runs are involved. The markings of existing systems are made strictly for assistance to the Contractor and this does not relieve the Contractor of responsibility for the repair or replacement of any cable run damaged in the course of his work, as specified elsewhere herein. Note that the contractor shall be entitled to only one request for location marking of existing systems and that multiple requests may only be honored at the contractor's expense. No locates will be made after maintenance is transferred unless it is at the contractor's expense.

Condition of Existing Systems. The Contractor shall conduct an inventory of all existing electrical system equipment within the project limits, which may be affected by the work, making note of any parts which are found broken or missing, defective or malfunctioning. Megger and load readings shall be taken for all existing circuits which will remain in place or be modified. If a circuit is to be taken out in its entirety, then readings do not have to be taken. The inventory and test data shall be reviewed with and approved by the Engineer and a record of the inventory shall be submitted to the Engineer for the record. Without such a record, all systems transferred to the Contractor for maintenance during construction shall be returned at the end of construction in complete, fully operating condition."

Maintenance and Responsibility During Construction.

Lighting Operation and Maintenance Responsibility. The scope of work shall include the assumption of responsibility for the continuing operation and maintenance of the existing, proposed, temporary, sign and navigation lighting, or other lighting systems and all appurtenances affected by the work as specified elsewhere herein. Maintenance of lighting systems is specified elsewhere and will be paid for separately.

The proposed lighting system must be operational prior to opening the roadway to traffic unless temporary lighting exists which is designed and installed to properly illuminate the roadway.

Electrical Infrastructure During Construction. The scope of work shall include locating and marking the proposed underground infrastructure installed in this contract.

Energy and Demand Charges. The payment of basic energy and demand charges by the electric utility for existing lighting which remains in service will continue as a responsibility of the Owner, unless otherwise indicated. Unless otherwise indicated or required by the Engineer duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously at the Owner's expense and lighting systems shall not be kept in operation during long daytime periods at the Owner's expense. Upon written authorization from the Engineer to place a proposed new lighting system in service, whether the system has passed final acceptance or not, (such as to allow temporary lighting to be removed), the Owner will accept responsibility for energy and demand charges for such lighting, effective the date of authorization. All other energy and demand payments to the utility shall be the responsibility of the Contractor until final acceptance.

Damage to Electrical Systems. Should damage occur to any existing electrical systems through the Contractor's operations, the Engineer will designate the repairs as emergency or non-emergency in nature.

Emergency repairs shall be made by the Contractor, or as determined by the Engineer, the Department, or its agent. Non-emergency repairs shall be performed by the Contractor within six working days following discovery or notification. All repairs shall be performed in an expeditious manner to assure all electrical systems are operational as soon as possible. The repairs shall be performed at no additional cost to the Department.

Lighting. An outage will be considered an emergency when three or more lights on a circuit or three successive lights are not operational. Knocked down materials, which result in a danger to the motoring public, will be considered an emergency repair.

Temporary aerial multi-conductor cable, with grounded messenger cable, will be permitted if it does not interfere with traffic or other operations, and if the Engineer determines it does not require unacceptable modification to existing installations.

Marking Proposed Locations. The Contractor shall mark or stake the proposed locations of all poles, cabinets, junction boxes, pull boxes, handholes, cable routes, pavement crossings, and other items pertinent to the work. A proposed location inspection by the Engineer shall be requested prior to any excavation, construction, or installation work after all proposed installation locations are marked. Any work installed without location approval is subject to corrective action at no additional cost to the Department.

Inspection of electrical work. Inspection of electrical work shall be according to Article 105.12 and the following.

Before any splice, tap, or electrical connection is covered in handholes, junction boxes, light poles, or other enclosures, the Contractor shall notify and make available such wiring for the Engineer's inspection.

Testing.

General. Before final inspection, the electrical work shall be tested. Tests may be made progressively as parts of the work are completed or may be made when the work is complete. Tests shall be made in the presence of the Engineer. Items which fail to test satisfactorily shall be repaired or replaced. Tests shall include checks of control operation, system voltages, cable insulation, and ground resistance and continuity.

The forms for recording test readings will be available from the Engineer in electronic format. The Contractor shall provide the Engineer with a written report of all test data including the following:

- Voltage Tests
- Amperage Tests
- Insulation Resistance Tests
- Continuity tests
- Resistance of Grounding Electrodes
- Detector Loop Tests

Lighting systems. The following tests shall be made.

- (1) Voltage Measurements. Voltages in the cabinet from phase to phase and phase to neutral, at no load and at full load, shall be measured and recorded. Voltage readings at the last termination of each circuit shall be measured and recorded.
- (2) Insulation Resistance. Insulation resistance to ground of each circuit at the cabinet shall be measured and recorded with all loads disconnected. Prior to

performance of the insulation resistance test, the Contractor shall remove all fuses within all light pole bases on a circuit to segregate the luminaire loads.

On tests of new cable runs, the readings shall exceed 50 megohms for phase and neutral conductors with a connected load over 20A and shall exceed 100 megohms for conductors with a connected load of 20A or less.

On tests of cable runs which include cables which were existing in service prior to this contract, the resistance readings shall be the same or better than the readings recorded at the maintenance transfer at the beginning of the contract. Measurements shall be taken with a megohm meter approved by the Engineer.

- (3) Loads. The current of each circuit, phase main, and neutral shall be measured and recorded. The Engineer may direct reasonable circuit rearrangement. The current readings shall be within ten percent of the connected load based on material ratings.
- (4) Ground Continuity. Resistance of the system ground as taken from the farthest extension of each circuit run from the controller (i.e. check of equipment ground continuity for each circuit) shall be measured and recorded. Readings shall not exceed 2.0 ohms, regardless of the length of the circuit.
- (5) Resistance of Grounding Electrodes. Resistance to ground of all grounding electrodes shall be measured and recorded. Measurements shall be made with a ground tester during dry soil conditions as approved by the Engineer. Resistance to ground shall not exceed 10 ohms.

Surveillance. The following tests shall be made in addition to the lighting system test above.

- (1) Detector Loops. Before and after permanently securing the loop in the pavement, the resistance, inductance, resistance to ground, and quality factor for each loop and lead-in circuit shall be tested.
- (2) The loop and lead-in circuit shall have an inductance between 20 and 2500 microhenries.
- (3) The resistance to ground shall be a minimum of 50 megohms under any conditions of weather or moisture.
- (4) The continuity test of the loop and loop lead-in shall not have a resistance greater than two (2) ohms
- (5) The quality factor (Q) shall be 5 or greater.

Loops which fail to test satisfactorily shall be repaired or replaced.

Telecommunication Cable. Once the telecommunication cable is installed complete with all cable terminations complete the Contractor shall request an end-to-end test. The Contractor shall request the end-to-end test at least 7 days in advance to the TSC Engineer. Any lane closures and/or any other safety measures that need to be taken shall be provided for by the Contractor and shall be considered incidental to the cost of this item. The type of test performed shall be an end-to-end test with Halcyon type equipment transmitting and receiving at each end of the cable. Each pair shall be tested, and the results shall be recorded and submitted to the Engineer. If any results don't fall within the requirements set forth in (REA) PE-39, the Contractor shall correct and re-test that cable pair. Traffic Systems will tolerate only one pair out of every 100 pair of cable that doesn't meet or exceed specifications set forth in (REA) PE-39.

Wireless In-Pavement Detection Systems shall be tested in accordance with the approved testing procedures provided in the catalog cut submittal.

Fiber Optic Systems.

The Contractor shall submit detailed test procedures for approval by the Engineer. All fibers (terminated and un-terminated) shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter with an optical source. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

Fibers which are not to be terminated shall be tested with a temporary fusion spliced pigtail fiber. **Mechanical splice or bare fiber adapters are not acceptable.**

The Contractor shall provide the date, time and location of any tests required by this specification to the Engineer at least 5 working (7 calendar) days before performing the test. Included with the notification shall be a record drawing of the installed fiber optic cable system. The drawings shall indicate actual installed routing of the cable, the locations of splices, and locations of cable slack with slack quantities identified.

Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers for continuity, events above 0.1 dB, and total attenuation of the cable. The test procedure shall be as follows:

A Certified Technician utilizing an Optical Time Domain Reflectometer (OTDR) and Optical Source/Power Meter shall conduct the installation test. The test equipment used shall have been calibrated within the last two years. Documentation shall be provided. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

A fiber ring or fiber box shall be used to connect the OTDR to the fiber optic cable under test at both the launch and receive ends. The tests shall be conducted at 1310 and 1550 nm for all fibers.

All testing shall be witnessed by the IDOT Engineer, and a copy of the test results (CD ROM or USB Drive) shall be submitted on the same day of the test. Hardcopies shall be submitted as described herein with copies on CD ROM or USB Drive.

At the completion of the test, the Contractor shall provide copies of the documentation of the test results to the Project Engineer. The test documentation shall be submitted as two bound copies and three CD ROM, or USB drive copies, and shall include the following:

Cable & Fiber Identification:

- Cable ID
- Cable Location - beginning and end point
- Fiber ID, including tube and fiber color
- Wavelength
- Pulse width (OTDR)
- Refractory index (OTDR)
- Operator Name
- Date & Time
- Setup Parameters
- Range (OTDR)
- Scale (OTDR)
- Setup Option chosen to pass OTDR "dead zone"

Test Results shall include:

- OTDR Test results
- Total Fiber Trace
- Splice Loss/Gain
- Events > 0.10 dB
- Measured Length (Cable Marking)
- Total Length (OTDR)
- Optical Source/Power Meter Total Attenuation (dB/km)

Sample Power Meter Tabulation:

Power Meter Measurements (dB)					
Location	Fiber No.		A to B	B to A	Bidirectional Average

A	B		Cable Length (km)	1310 nm	1550 nm	1310 nm	1550 nm	1310 nm	1550 nm
		1							
		2							
Maximum Loss									
Minimum Loss									

The OTDR test results file format must be Bellcore/Telcordia compliant according to GR-196-CORE Issue 2, OTDR Data Standard, GR 196, Revision 1.0, GR 196, Revision 1.1, GR 196, Revision 2.0 (SR-4731) in a “.SOR” file format. A copy of the test equipment manufacture’s software to read the test files, OTDR and power, shall be provided to the Department. These results shall also be provided in tabular form, see sample below:

Sample OTDR Summary				
Cable Designation:	<i>TCF-IK-03</i>	OTDR Location:	<i>Pump Sta. 67</i>	Date: <i>1/1/00</i>
Fiber Number	Event Type	Event Location	Event Loss (dB)	
			1310 nm	1550 nm
<i>1</i>	<i>Splice</i>	<i>23500 Ft.</i>	<i>.082</i>	<i>.078</i>
<i>1</i>	<i>Splice</i>	<i>29000 Ft.</i>	<i>.075</i>	<i>.063</i>
<i>2</i>	<i>Splice</i>	<i>29000 Ft.</i>	<i>.091</i>	<i>.082</i>
<i>3</i>	<i>Splice</i>	<i>26000 Ft.</i>	<i>.072</i>	<i>.061</i>
<i>3</i>	<i>Bend</i>	<i>27000 Ft.</i>	<i>.010</i>	<i>.009</i>

The following shall be the criteria for the acceptance of the cable:

Upon completing all splicing operations for a cable span, the Contractor shall measure the mean bi-directional loss at each splice using an Optical Time Domain Reflectometer.

When splices are made between identical cables (same manufacturer and cable type) the average optical loss of each splice shall not exceed 0.10 dB. The average is determined by measuring the splice loss in both directions with an OTDR, adding the two readings, and dividing by two. Testing should be performed for both the 1310 and 1550 nm wavelengths. No individual splice loss measured in a single direction shall exceed 0.15 dB.

When splices are made between cables containing fibers of different mode field diameters, the average optical loss of each splice shall not exceed 0.50 dB. The average is determined by measuring the splice loss in both directions with an OTDR, adding the two readings, and dividing by two. Testing should be performed

for both the 1310 and 1550 nm wavelengths. No individual splice loss measured in a single direction shall exceed 0.6 dB.

The Contractor shall measure the end-to-end attenuation of each fiber, from connector to connector, using an optical power meter and source. This loss shall be measured at from both directions and shall not exceed 0.5 dB per installed kilometer of single mode cable. Measurements shall be made at both 1300 and 1550 nm for single mode cable.

For multimode cable, power meter measurements shall be made at 850 and 1300 nm. The end-to-end attenuation shall not exceed 3.8 dB/installed kilometers at 850nm or 1.8 dB per installed kilometer at 1300nm for multimode fibers.

If the total loss exceeds these specifications, the Contractor shall replace or repair the cable run at the no additional cost to the state, both labor and materials. Elevated attenuation due to exceeding the pulling tension, or any other installation operation, during installation shall require the replacement of the cable run at no additional cost to the State, including labor and materials.

All test results shall be furnished to the Engineer seven working days before the date the inspection is scheduled.

Contract Guarantee. The Contractor shall provide a written guarantee for all electrical work provided under the contract for a period of six months after the date of acceptance with the following warranties and guarantees.

- (a) The manufacturer's standard written warranty for each piece of electrical material or apparatus furnished under the contract. The warranty for light emitting diode (LED) modules, including the maintained minimum luminance, shall cover a minimum of 120 months from the date of delivery.
- (b) The Contractor's written guarantee that, for a period of six months after the date of final acceptance of the work, all necessary repairs to or replacement of said warranted material or apparatus for reasons not proven to have been caused by negligence on the part of the user or acts of a third party shall be made by the Contractor at no additional cost to the Department.
- (c) The Contractor's written guarantee for satisfactory operation of all electrical systems furnished and constructed under the contract for a period of six months after final acceptance of the work.

The warranty for an uninterruptable power supply (UPS) shall cover a minimum of two years from date the equipment is placed in operation; however, the batteries of the UPS shall be warranted for full replacement for a minimum of five years.

Record Drawings. Alterations and additions to the electrical installation made during the execution of the work shall be made on the PDF copy of the as-Let documents using a PDF editor. Hand drawn notations or markups and scanned plans are not acceptable. These drawings shall be updated daily and shall be available for inspection by the Engineer during the work. The record drawings shall include the following:

- Cover Sheet
- The Electrical Maintenance Contract Management System (EMCMS) location designation, i.e. "L", "TS", "S", "A" number.
- Summary of Quantities, electrical items only
- Legends, Schedules, and Notes
- Plan Sheets
- Final fiber assignment tables
- Pertinent Details
- Single Line Diagrams; electrical, communications, surveillance and fiber optic.
- Other useful information useful to locate and maintain the systems.

Any modifications to the details shall be indicated. Final quantities used shall be indicated on the Summary of Quantities. **Foundation depths used shall also be listed.**

As part of the record drawings, the Contractor shall inventory all materials, new or existing, on the project and record information on inventory sheets provided by the Engineer.

The inventory shall include:

- Location of Equipment, including rack, chassis, slot as applicable.
- Designation of Equipment
- Equipment manufacturer
- Equipment model number
- Equipment Version Number
- Equipment Configuration
 - o Addressing, IP or other
 - o Settings, hardware or programming
- Equipment Serial Number

The following electronic inventory forms are available from the Engineer:

- Lighting Controller Inventory
- Lighting Inventory
- Light Tower Inspection Checklist
- ITS Location Inventory

The information shall be entered in the forms; handwritten entries will not be acceptable; except for signatures. Electronic file shall also be included in the documentation.

When the work is complete, and seven days before the request for a final inspection, the set of contract drawings, marked "**RECORD DRAWINGS**", shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor's supervising Engineer or Electrician. The record drawings shall be submitted in PDF format via a mutually agreed to electronic format for review and approval.

In addition to the record drawings, PDF copies of the final catalog cuts which have been Approved and Approved as Noted with applicable follow-up shall be submitted along with the record drawings. **The PDF files shall clearly indicate either by filename or PDF table of contents (bookmarks) the respective pay item number.** Specific part or model numbers of items which have been selected shall be clearly visible.

If the Electric Service is new or modified, documentation as required in the Electric Utility Service Connection shall be submitted.

During the Final Inspection, the Contractor shall provide three sets of electronically produced drawings in a moisture proof pouch to be kept on the inside door of the controller cabinet or other location approved by the Engineer. These drawings shall show the final as-built circuit orientation(s) of the project in the form of a single line diagram with all equipment designations and clearly identified.

Final documentation shall be submitted as a complete submittal package, i.e. record drawings, test results, inventory, etc. shall be submitted at the same time. Partial piecemeal submittals will be rejected without review.

A total of three hardcopies and two CD-ROMs or USB Drives of the final documentation shall be submitted. The identical material shall also be submitted in the same manner as the catalog cut submittals utilizing the following final documentation pay item numbers:

Pay Code	Description	Discipline
FDLRD000	Record Drawings - Lighting	Lighting
FDSRD000	Record Drawings - Surveillance	Surveillance
FDTRD000	Record Drawings - Traffic Signal	Traffic Signal
FDIRD000	Record Drawings - ITS	ITS
FDLCC000	Catalog Cuts - Lighting	Lighting
FDSCC000	Catalog Cuts – Surveillance	Surveillance
FDTCC000	Catalog Cuts – Traffic Signal	Traffic Signal
FDICC000	Catalog Cuts - ITS	ITS

FDLWL000	Warranty - Lighting	Lighting
FDSWL000	Warranty - Surveillance	Surveillance
FDTWL000	Warranty - Traffic Signal	Traffic Signal
FDIWL000	Warranty - ITS	ITS
FDLTR000	Test Results - Lighting	Lighting
FDSTR000	Test Results - Surveillance	Surveillance
FDTTR000	Test Results - Traffic Signal	Traffic Signal
FDITR000	Test Results - ITS	ITS
FDLINV00	Inventory - Lighting	Lighting
FDSINV00	Inventory - Surveillance	Surveillance
FDTINV00	Inventory - Traffic Signal	Traffic Signal
FDIINV00	Inventory - ITS	ITS
FDLGPS00	GPS - Lighting	Lighting
FDSGPS00	GPS - Surveillance	Surveillance
FDTGPS00	GPS - Traffic Signal	Traffic Signal
FDIGPS00	GPS - ITS	ITS
FDLES00	Electric Service - Lighting	Lighting
FDSES00	Electric Service - Surveillance	Surveillance
FDTES00	Electric Service - Traffic Signal	Traffic Signal
FDIES00	Electric Service - ITS	ITS

Record Drawings shall include Marked up plans, controller info, Electric Service Info, Equipment Settings, Manuals, Wiring Diagrams for each discipline.

Test results shall be all electrical test results, fiber optic OTDR, and Fiber Optic power meter as applicable for each discipline.

GPS Documentation. In addition to the specified record drawings, the Contactor shall record GPS coordinates of the following electrical components being installed, modified or being affected in other ways by this contract:

- All light poles and light towers.
- Handholes and vaults.
- Junction Boxes
- Conduit roadway crossings.
- Controllers.
- Control Buildings.
- Structures with electrical connections, i.e. DMS, lighted signs.
- Electric Service locations.
- CCTV Camera installations.
- Roadway Surveillance installations.

- Fiber Optic Splice Locations.
- Fiber Optic Cables. Coordinates shall be recorded along each fiber optic cable route every 200 feet.
- Fiber Optic Utility Markers
- All fiber optic slack locations shall be identified with quantity of slack cable included. When sequential cable markings are available, those markings shall be documented as cable marking into enclosure and marking out of enclosure.
- All wireless in-pavement vehicle detectors

Datum to be used shall be North American 1983.

Data shall be provided electronically. The electronic format shall be compatible with MS Excel. **Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places.** Each coordinate shall have the following information:

1. District
2. Description of item
3. Designation
4. Use
5. Approximate station
6. Contract Number
7. Date
8. Owner
9. Latitude
10. Longitude
11. Comments

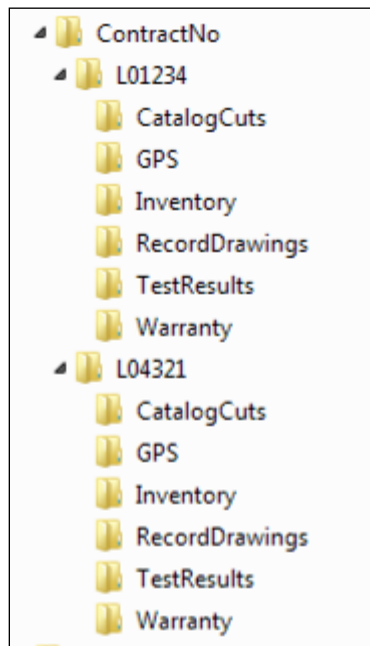
A spreadsheet template will be available from the Engineer for use by the Contractor.

Accuracy. Data collected is to be mapping grade. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have minimum 5 meter accuracy after post processing.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years.”

The documents on the CD ROM, or USB Drive shall be organized by the Electrical Maintenance Contract Management System (EMCMS) location designation. If multiple EMCMS locations are within the contract, separate folders shall be utilized for each location as follows:



Extraneous information not pertaining to the specific EMCMS location shall not be included in that particular folder and sub-folder.

The inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.

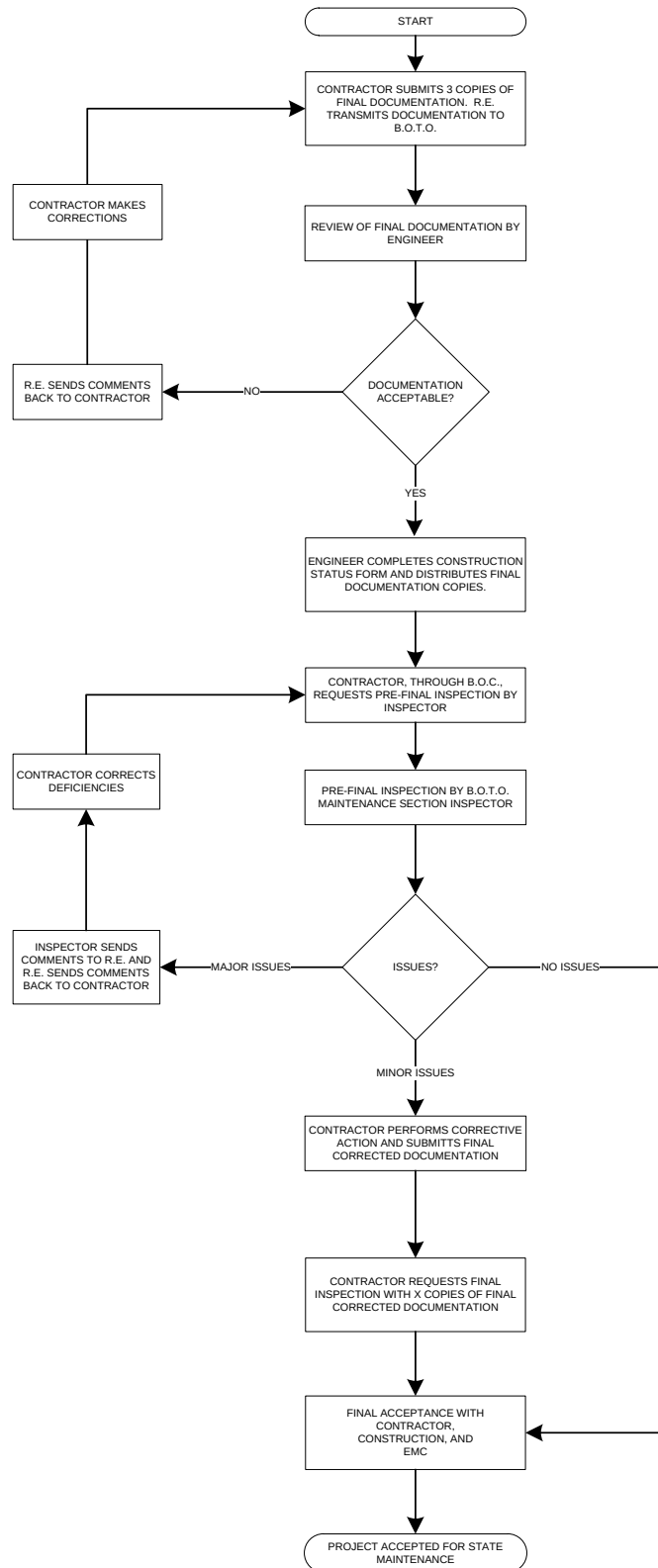
The Final Acceptance Documentation Checklist shall be completed and is contained elsewhere herein.

If CD's are used they shall be labeled as illustrated in the CD Label Template contained herein.

Acceptance. Acceptance of electrical work will be given at the time when the Department assumes the responsibility to protect and maintain the work according to Article 107.30 or at the time of final inspection.

When the electrical work is complete, tested, and fully operational, the Contractor shall schedule an inspection for acceptance with the Engineer no less than seven working days prior to the desired inspection date. The Contractor shall furnish the necessary labor and equipment to make the inspection.

A written record of the test readings taken by the Contractor according to Article 801.13 shall be furnished to the Engineer seven working days before the date the inspection is scheduled. Inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.



Final Acceptance Documentation Checklist

LOCATION	
Route	Common Name
Limits	Section
Contract #	County
Controller Designation(s)	EMC Database Location Number(s)

ITEM	Contractor (Verify)	Resident Engineer (Verify)
Record Drawings		
-Three hardcopies (11" x 17")	☐	☐
-PDFs as required elsewhere	☐	☐
Field Inspection Tests		
-Voltage	☐	☐
-Amperage	☐	☐
-Cable Insulation Resistance	☐	☐
-Continuity	☐	☐
-Controller Ground Rod Resistance	☐	☐
(Three Hardcopies & PDFs as required)	☐	☐
GPS Coordinates		
-Excel file	☐	☐
(Check Special Provisions, Excel file required.)		
Job Warranty Letter		
(Three Hardcopies & PDFs as required)	☐	☐
Catalog Cut Submittals		
-Approved & Approved as Noted	☐	☐
(PDFs as required)		
Lighting Inventory Form		
(Three Hardcopies & PDFs as required)	☐	☐
Lighting Controller Inventory Form		
(Three Hardcopies & PDFs as required)	☐	☐
Electric Service Documentation		
(Three Hardcopies & PDFs as required)	☐	☐

Light Tower Inspection Form (If applicable, Three Hardcopies & PDFs as required)	☐	☐

Three Hardcopies & PDFs as required shall be submitted for all items above. If a CD ROM is used it shall be labeled as shown in the example contained herein.

General Notes:

Record Drawings – The record drawings should contain contract cover sheet, summary of quantities showing all lighting pay item sheets, proposed lighting plans and lighting detail sheets. Submit hardcopies shall be 11" x 17" size. Temporary lighting plans and removal lighting plans should not be part of the set.

Field Inspection Tests – Testing should be done for proposed cables. Testing shall be per standard specifications. Forms shall be neatly filled out.

GPS Coordinates – Check special provisions "General Electrical Requirements". Submit electronic "EXCEL" file.

Job Warranty Letter – See standard specifications.

Cutsheet Submittal – See special provisions "General Electrical Requirements". Scan Approved and Approved as Noted cutsheets.

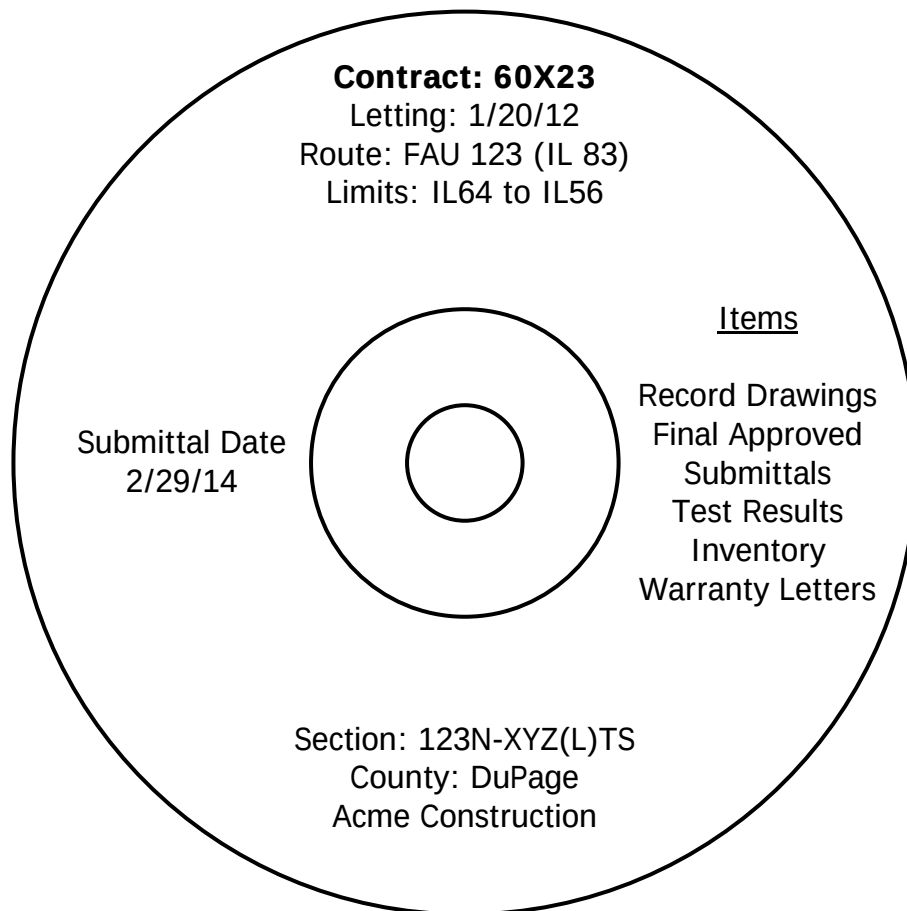
Lighting Inventory Form – Inventory form should include only proposed light poles, proposed light towers, proposed combination (traffic/light pole) lighting and proposed underpass luminaires.

Lighting Controller Inventory Form – Form should be filled out for only proposed lighting controllers.

Light Tower Safety Inspection Form – Form should be filled out for each proposed light tower.

CD LABEL FORMAT TEMPLATE.

Label must be printed; hand written labels are unacceptable and will be rejected.



UNIT DUCT

Effective: January 1, 2012

Revise the first paragraph of Article 810.04 to read:

“The unit duct shall be installed at a minimum depth of 30-inches (760 mm) unless otherwise directed by the Engineer.”

Revise Article 1088.01(c) to read:

“(c) Coilable Nonmetallic Conduit.

General:

The duct shall be a plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The duct shall be a plastic duct which is intended for underground use and can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance.

The duct shall be made of high density polyethylene which shall meet the requirements of ASTM D 2447, for schedule 40. The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade P33. The wall thickness shall be in accordance with Table 2 for ASTM D 2447.

The duct shall be UL Listed per 651-B for continuous length HDPE coiled conduit. The duct shall also comply with NEC Article 354.100 and 354.120.

Submittal information shall demonstrate compliance with the details of these requirements.

Dimensions:

Duct dimensions shall conform to the standards listed in ASTM D2447. Submittal information shall demonstrate compliance with these requirements.

Nominal Size		Nominal I.D.		Nominal O.D.		Minimum Wall	
mm	in	mm	in	mm	in	mm	in
31.75	1.25	35.05	1.380	42.16	1.660	3.556 +0.51	0.140 +0.020
38.1	1.50	40.89	1.610	48.26	1.900	3.683 +0.51	0.145 +0.020

Nominal Size		Pulled Tensile	
mm	in	N	lbs
31.75	1.25	3322	747
38.1	1.50	3972	893

Marking:

As specified in NEMA Standard Publication No. TC-7, the duct shall be clearly and durably marked at least every 3.05 meters (10 feet) with the material designation (HDPE for high density polyethylene), nominal size of the duct and the name and/or trademark of the manufacturer.

Performance Tests:

Polyethylene Duct testing procedures and test results shall meet the requirements of UL 651. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct. Duct crush test results shall meet or exceed the following requirements:

Duct Diameter		Min. force required to deform sample 50%	
mm	in	N	lbs
35	1.25	4937	1110
41	1.5	4559	1025

WIRE AND CABLE (D1)

Effective: January 1, 2012

Add the following to the first paragraph of Article 1066.02(a):

“The cable shall be rated at a minimum of 90°C dry and 75°C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals.”

Revise the Aerial Electric Cable Properties table of Article 1066.03(a)(3) to read:

Aerial Electric Cable Properties

Phase Conductor		Messenger wire			
Size AWG	Stranding	Average Insulation Thickness		Minimum Size AWG	Stranding
		mm	mils		
6	7	1.1	(45)	6	6/1
4	7	1.1	(45)	4	6/1
2	7	1.1	(45)	2	6/1
1/0	19	1.5	(60)	1/0	6/1
2/0	19	1.5	(60)	2/0	6/1
3/0	19	1.5	(60)	3/0	6/1
4/0	19	1.5	(60)	4/0	6/1

Add the following to Article 1066.03(b) of the Standard Specifications:

“Cable sized No. 2 AWG and smaller shall be U.L. listed Type RHH/RHW and may be Type RHH/RHW/USE. Cable sized larger than No. 2 AWG shall be U.L. listed Type RHH/RHW/USE.”

Revise Article 1066.04 to read:

“Aerial Cable Assembly. The aerial cable shall be an assembly of insulated aluminum conductors according to Section 1066.02 and 1066.03. Unless otherwise indicated, the cable assembly shall be composed of three insulated conductors and a steel reinforced bare aluminum conductor (ACSR) to be used as the ground conductor. Unless otherwise indicated, the code word designation of this cable assembly is “Palomino”. The steel reinforced aluminum conductor shall conform to ASTM B-232. The cable shall be assembled according to ANSI/ICEA S-76-474.”

Revise the second paragraph of Article 1066.05 to read:

“The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing.”

TRAFFIC SIGNAL SPECIAL PROVISIONS

DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)

TRAFFIC SIGNAL GENERAL REQUIREMENTS (IDOT) –

Effective: May 22, 2002

Revised: April 1, 2026

800.01TS

These Traffic Signal Special Provisions and the "District One Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations.

All material furnished shall be new unless otherwise noted herein. Traffic signal construction and maintenance work shall be performed by personnel holding current International Municipal Signal Association (IMSA)/Illinois Public Service Institute (IPSI) Traffic Signal Technician Level II certification. A copy of the certification shall be immediately available upon request of the Engineer. The work to be done under the Contract consists of furnishing, installing, and maintaining all traffic signal work and items as specified in the plans and as specified herein in a manner acceptable and approved by the Engineer.

Definitions of Terms.

Add the following to Section 101 of the Standard Specifications:

101.56 Manufacturer. Company that sells a particular type of product directly to the Contractor or the Vendor.

101.57 Vendor. Company that supplies, represents, and provides technical support for IDOT District One approved traffic signal controllers and other related equipment. The Vendor shall be located within IDOT District One and shall:

- (1) Be full service with on-site facilities to assemble, test and troubleshoot traffic signal controllers and cabinet assemblies.
- (2) Maintain an inventory of IDOT District One approved controllers and cabinets.
- (3) Be staffed with permanent sales and technical personnel able to provide traffic signal controller and cabinet expertise and support.

- (4) Have technical staff that hold current IMSA/IPSI Traffic Signal Technician Level III certification and shall attend traffic signal turn-ons as well as cabinet and/or controller modifications.

Submittals.

Revise Article 801.05 of the Standard Specifications to read:

“All material approval requests shall be submitted electronically following District guidelines unless directed otherwise by the Engineer. Submittal requirements shall include, but not limited to the following:

- (1) All material approval requests shall be made prior to or no later than the date of the preconstruction meeting. A list of major traffic signal items can be found in Article 801.05. Material or equipment which is similar or identical shall be the product of the same manufacturer, unless necessary for system continuity. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.
- (2) Product data and shop drawings shall be assembled by pay item. Only the top sheet of each pay item submittal will be stamped by the Department with the review status, except shop drawings for mast arm pole assemblies and the like will be stamped with the review status on each sheet.
- (3) Original manufacturer published product data and shop drawing sheets with legible dimensions and details shall be submitted for review.
- (4) When hard copy submittals are necessary, four (4) complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials shall be submitted. For hard copy or electronic submittals, the descriptive literature and technical data shall be adequate for determining whether the materials meet the requirements of the plans and specifications. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
- (5) When hard copy submittals are necessary for structural elements, four (4) complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials shall be submitted.
- (6) Partial or incomplete submittals will be returned without review.

- (7) Certain non-standard mast arm poles and special structural elements will require additional review from IDOT's Central Office. Examples include ornamental/decorative, non-standard length mast arm pole assemblies and monotube structures.
- (8) The Contract number or Permit number, project location/limits, and corresponding pay code number must be on each sheet of correspondence, material approval, and mast arm poles and assemblies drawings.
- (9) Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections and/or tests of material shall be complete with all test data, dates, and times.
- (10) After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or 'Incomplete'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with Contract and specification requirements.
- (11) The Contractor shall secure approved materials in a timely manner to assure construction schedules are not delayed.
- (12) All submitted items reviewed and marked 'APPROVED AS NOTED', 'DISAPPROVED', or 'INCOMPLETE' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify Contract compliance at no additional cost to the Contract.
- (13) Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.
- (14) The Contractor shall not order major equipment such as mast arm assemblies prior to Engineer approval of the Contractor marked proposed traffic signal

equipment locations to assure proper placement of Contract required traffic signal displays, push buttons and other facilities. Field adjustments may require changes in proposed mast arm length and other coordination.

(15) Revised cabinet wiring diagrams shall be submitted whenever any wiring modifications are made to the traffic signal cabinet.”

Marking Proposed Locations.

Revise “Marking Proposed Locations for Highway Lighting System” of Article 801.09 to read “Marking Proposed Locations for Highway Lighting System and Traffic Signals.”

Add the following to Article 801.09 of the Standard Specifications:

“It shall be the Contractor's responsibility to verify all dimensions and conditions existing in the field prior to ordering materials and beginning construction. This shall include locating the mast arm foundations and verifying the mast arms lengths.”

Inspection of Electrical Systems.

Add the following to Article 801.10 of the Standard Specifications:

- (c) All cabinets, including temporary traffic signal cabinets, shall be assembled by an approved Vendor in District One. The Department reserves the right to request any controller and cabinet to be tested at the Vendor's facility prior to field installation at no extra cost to the Contract.

Maintenance and Responsibility of Traffic Signal and Flashing Beacon Installations.

Replace Article 801.11(b) of the Standard Specifications to read:

- (b) Traffic Signals and Flashing Beacons. The Contractor shall be responsible for maintaining the traffic signal/flashing beacon installation in proper operating condition.

(1) General.

- a. The Contractor must notify the Area Traffic Signal Maintenance and Operations Engineer of their intent to begin any physical construction work on the Contract or any portion thereof. This notification must be made a minimum of seven (7) working days prior to the start of construction to allow sufficient time for inspection of the existing traffic signal installation(s) and transfer of maintenance to the Contractor. The Department will attempt to fulfill the Contractor's inspection date request(s); however, workload and other conditions may prevent the Department from accommodating specific dates or

times. The Contractor shall not be entitled to any other compensation if the requested inspection date(s) cannot be scheduled by the Department.

- b. Full maintenance responsibility shall start upon the successful completion of a maintenance transfer inspection, or as directed by the Engineer. If the Contractor begins any physical work on the Contract or any portion thereof prior to a traffic signal inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection. The Contractor will become responsible for repairing or replacing all equipment that is not operating properly or is damaged at the time of transfer at no cost to the owner of the traffic signal equipment. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection, otherwise the traffic signal installation will not be accepted.
- c. All traffic signals within the limits of the Contract or those which have the item "MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION," "TEMPORARY TRAFFIC SIGNAL INSTALLATION", "TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION", "TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION", and/or "MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION" shall become the full responsibility of the Contractor. Maintenance responsibility shall end upon issuance of final acceptance by the Engineer.
- d. The Contractor shall have electricians with IMSA/IPSI Traffic Signal Technician Level II certification on staff to provide signal maintenance. A copy of the certification shall be immediately available upon request by the Engineer.
- e. This item shall include maintenance of all traffic signal equipment and other connected and related equipment such as flashing beacons, emergency vehicle preemption (EVP) equipment, master controllers, network switches, uninterruptable power supply (UPS) and batteries, pan-tilt-zoom (PTZ) cameras, vehicle detection, handholes, lighted signs, telephone service installations, cellular modems, radios, communication cables, and other traffic signal equipment. All conduit and related equipment to adjacent intersections shall be maintained to the far back handhole, or as directed by the Engineer. If adjacent intersections are part of Contract work, then maintenance of all conduit and related equipment shall be included in this item.

- f. Regional transit, County, and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as network switches and transit signal priority (TSP, SCP, and BRT) servers, radios, and other devices, where maintenance shall be coordinated with the owner.
- g. Maintenance shall not include automatic traffic enforcement equipment such as red light enforcement cameras, detectors, or peripheral equipment. This equipment is operated and maintained by others and shall be deactivated while on Contractor maintenance.
- h. The energy charges for the operation of the traffic signal installation shall be paid for by the Contractor.

(2) Maintenance.

- a. The Contractor shall inspect all traffic signal equipment and appurtenances every two (2) weeks to ensure they are functioning properly. Signal heads shall be properly adjusted, including plumb, and tightly mounted. All controller cabinets, signal posts, and controller pedestals shall be tight on their foundations and in alignment. Deficient equipment shall be repaired or replaced as necessary. The Contractor shall check signal system communications and phone lines to assure proper operation. This item includes, as routine maintenance, all portions of EVP equipment. The Contractor shall always maintain enough materials and equipment in stock to provide effective temporary and permanent repairs. The Contractor shall supply a detailed maintenance log monthly that includes dates, locations, names of electricians performing the required checks and inspections, and any other information requested by the Engineer. The Contractor shall attend any additional inspections as requested by the Engineer. The Contractor shall check the controllers, relays, and detectors after receiving complaints or calls to ascertain that they are functioning properly and make all necessary repairs and replacement.
- b. The Contractor is advised that the existing and/or temporary traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation which exceeds fifteen (15) minutes must have prior approval from the Engineer. Approval to shut down the

traffic signal installation will only be granted during the period extending from 9:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.

- c. The Contractor shall provide immediate corrective action when any part(s) of the signal fail to function properly. Two far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected or otherwise removed from normal operation, and power is available, the Contractor shall place the traffic signal installation in flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall install cones on all lane lines at the stop bar on each approach, R1-1 (36 in. minimum) "STOP" signs at the stop bar on each approach on the right side and on raised medians (where applicable), and black on fluorescent orange "SIGNALS OUT AHEAD" warning signs followed by fluorescent orange W3-1 symbolic stop ahead warning signs on all approaches to the intersection.
- d. Temporary replacement of a damaged or knocked down mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals is not permitted.
- e. The Contractor shall provide the Engineer with two (2) 24-hour telephone numbers for the maintenance of the traffic signal installation and for emergency calls by the Engineer.
- f. Traffic signal equipment which is lost, damaged, or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of the Standard Specifications and these special provisions.
- g. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals and other equipment noted herein. The Contractor shall respond to all emergency calls from the Department or others within one (1) hour after notification and

provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new equipment meeting current District One traffic signal specifications. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional cost to the Contract. The Contractor may institute action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition, or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the Department's Electrical Maintenance Contractor perform the maintenance work. The Contractor shall be responsible for all of the Department's Electrical Maintenance Contractor's costs and liquidated damages of \$1,000 per day per occurrence. The Department's Electrical Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the Electrical Maintenance Contractor to inspect the traffic signal installation that has been transferred to the Contractor for maintenance. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection, otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed. The Department may inspect any signaling device on the Department's highway system at any time without notification. The Contractor shall not install padlocks on traffic signal cabinets or otherwise restrict the Department's access to the cabinet or controller.

- h. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

- i. The Contractor shall be responsible to clear snow, ice, dirt, debris, vegetation, temporary fence, or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.
- j. The Contractor shall maintain the traffic signal in normal operation during any loss of utility or battery backup power. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power shall not be paid for separately but shall be included in the Contract.

(3) Basis of Payment. This work will be paid for at the Contract unit price per each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION, TEMPORARY TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION, or TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION. Each location will be paid for separately. Maintenance of a flashing beacon shall be paid for at the Contract unit price for MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION. Each flashing beacon will be paid for separately.

Damage to Traffic Signal System.

Add the following to Article 801.12(b) of the Standard Specifications:

“Any traffic signal control equipment that is damaged and non-repairable or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection. Repair or replace any equipment damaged within the time shown in the table below:

ITEM	RESPONSE TIME	SERVICE RESTORATION	PERMANENT REPAIR (calendar days)
Cabinet	1 hour	24 hours	21 days
Controllers and Peripheral Equipment	1 hour	4 hours	21 days
System Detector Loop	1 hour	N/A	7 days
All Other Detectors	1 hour	N/A	21 days
Signal Head and Lenses	1 hour	4 hours	7 days
Aviation Red Beacon	1 hour	4 hours	7 days

Mast Arm Assembly and Pole	1 hour	4 hours	7 days
Traffic Signal Post	1 hour	4 hours	7 days
Cable and Conduit	1 hour	4 hours	7 days
Interconnect and Telemetry	1 hour	4 hours	7 days
Graffiti Removal	N/A	N/A	7 days
Misalignment of Signal Heads	1 hour	4 hours	4 hours
Closed Loop Monitoring System	1 hour	24 hours	14 days
Post and Poles Plumb Vertically	N/A	N/A	21 days
Controller, Post & Pole Foundations	N/A	N/A	21 days
Complaints, Calls, Controller or System Alarms, Timing, Phasing, Programming	1 hour	4 hours	N/A
Patrol Truck Deficiencies	N/A	24 hours	24 hours
Signal Heads Visibility	1 day	2 days	14 days

Temporary replacement of a damaged or knocked down mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Replacement of any equipment for any reason shall be reported to the Area Traffic Signal Maintenance and Operations Engineer in writing within 24 hours. Permanent and temporary replacement of the controller and/or cabinet shall require inspection and testing by the Vendor.

Automatic Traffic Enforcement equipment, such as red light enforcement cameras, detectors, and peripheral equipment, that is damaged or not operating properly from any cause, shall be the responsibility of the municipality or the automatic traffic enforcement company per Permit agreement.”

Traffic Signal Inspection (TURN-ON).

Revise Article 801.15(b) of the Standard Specifications to read:

“Turn-on. It is the intent to have all electric work completed and equipment field tested by the Contractor and/or Vendor prior to the Department’s “turn-on” field inspection. If in the event the Engineer determines work is not complete and the inspection will require more than two (2) hours to complete, the inspection shall be canceled, and the Contractor will be required to reschedule at another date. The maintenance of the traffic signals will not be accepted until all punch list work is corrected and re-inspected.

When the Contractor requests a turn-on and inspection of the completed traffic signal installation(s), the request must be made to the Area Traffic Signal Maintenance and Operations Engineer a minimum of seven (7) working days prior to the time of the requested inspection. The Department will attempt to fulfill the

Contractor's turn-on and inspection date request(s); however, workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested turn-on and inspection date(s) cannot be scheduled by the Department. The Department will not grant a field inspection until written or electronic notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. The Contractor must invite local fire department personnel to the turn-on when emergency vehicle preemption (EVP) is included in the project. When the Contract includes the item RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM, OPTIMIZE TRAFFIC SIGNAL SYSTEM, and/or TEMPORARY TRAFFIC SIGNAL TIMING, the Contractor must notify the SCAT Consultant of the turn-on/detour implementation schedule, as well as stage changes and phase changes during construction.

The Contractor must have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and turn-on of the traffic signal installation. The Contractor shall be responsible to provide a police officer to assist with traffic control at the time of testing.

The Contractor shall provide a representative from the Vendor who is knowledgeable of the cabinet design and controller functions to attend the traffic signal inspection for both permanent and temporary traffic signal turn-ons.

Upon demonstration that the signals are operating and all work is completed in accordance with the Contract and to the satisfaction of the Engineer, the Engineer will then allow the signals to be placed in continuous operation. The signals shall continue to be maintained by the Contractor until final acceptance.

The Department requires the following Final Project Documentation from the Contractor at traffic signal turn-ons in electronic format in addition to hard copies where noted. An electronic media device shall be submitted with separate folders corresponding to each numbered title below. The electronic media device shall be labeled with date, project location, company, and Contract or Permit number. Electronic record drawings and material approvals shall be submitted prior to traffic signal turn-on for review by the Department as described in the Record Drawings section herein.

Final Project Documentation:

- (1) Record Drawings. Electronically produced signal plans of record with field revisions marked in red. Two (2) hard copies of 11 in. x 17 in. record drawings shall also be provided.

- (2) Field Testing. Written notification from the Contractor and the Vendor of satisfactory field testing with corresponding material performance measurements, such as for detector loops and fiber optic systems (see Article 801.13).
- (3) Material Approvals. Material approval documentation.
- (4) Manuals. Operation and service manuals of the signal controller and associated control equipment.
- (5) Cabinet Wiring Diagram and Cable Logs. Five (5) hard copies of 11 in. x 17 in. cabinet wiring diagrams shall be provided along with electronic PDF and DGN files of the cabinet wiring diagram. Five (5) hard copies of the cable logs and electronic Excel files shall be provided with cable #, number of conductors and spares, connected device/signal head and intersection location.
- (6) Warrantees and Guarantees. All manufacturer and Contractor warrantees and guarantees required by Article 801.14.
- (7) GPS Coordinates. GPS coordinates of traffic signal equipment as described in the Record Drawings section herein.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn-on", completeness of the required documentation, and successful operation during a minimum 72 hour "burn-in" period following activation of traffic signal equipment. If approved, traffic signal acceptance shall be verbal at the final inspection followed by written correspondence from the Engineer. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until Departmental acceptance is granted.

All equipment and/or parts to keep the traffic signal installation operating shall be furnished by the Contractor. No spare traffic signal equipment is available from the Department.

All punch list work shall be completed within two (2) weeks after the turn-on. The Contractor shall notify the Area Traffic Signal Maintenance and Operations Engineer to schedule an inspection of all punch list work. Failure to meet these time constraints shall result in liquidated damage charges of \$500 per month per incident.

All cost of work and materials required to comply with the requirements herein shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the requirements herein shall be subject to removal and disposal at the Contractor's expense."

Record Drawings.

The requirements listed for Electrical Installation shall apply for Traffic Signal Installations in Article 801.16. Revise the second and third paragraphs of Article 801.16 of the Standard Specifications to read:

"When the work is complete, and seven (7) days before the request for a final inspection, electronic Contract drawings, stamped "RECORD DRAWINGS", shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor's supervising Engineer or electrician. The record drawings shall be submitted in PDF format. If the Contract consists of multiple intersections, each intersection shall be saved as an individual PDF file with TS# and location name in its file name.

In addition to the record drawings, copies of the final material approvals which have been Approved or Approved as Noted shall be submitted in PDF format. The PDF files shall clearly indicate the pay item either by filename or PDF Table of Contents referencing the respective pay item number for multi-item PDF files. Specific part or model numbers of items which have been selected shall be clearly visible.

The Contractor shall provide two (2) 11 in. x 17 in. hard copies of electronically produced final record drawings to be kept inside each traffic signal cabinet within project limits."

Add the following to Article 801.16 of the Standard Specifications:

"In addition to the specified record drawings, the Contractor shall record GPS coordinates of the following traffic signal components being installed, modified or being affected in other ways by the Contract:

- All Mast Arm Poles and Posts
- Traffic Signal Wood Poles
- Railroad Bungalow
- UPS
- Handholes
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV/PTZ Camera installations

Datum to be used shall be North American 1983.

Data shall be provided in electronic format and shall be in .csv format. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. Each coordinate shall have the following information:

- File shall be named: TSXXX_YY-MM-DD.csv (i.e. TS22157_24-01-01.csv)
- Each intersection shall have its own file
- Row 1 should have the location name (i.e. IL 31 @ Klausen)
- Row 2 is blank
- Row 3 is the headers for the columns
- Row 4 starts the data
- Column A (Date) – should be in the following format: MM/DD/YYYY
- Column B (Item) – as shown in the table below
- Column C (Description) – as shown in the table below
- Column D and E (GPS Data) – should be in decimal form

Examples:

Date	Item	Description	Latitude	Longitude
01/01/2024	MP (Mast Arm Pole)	NEQ, NB, Dual, Combination Pole	41.580493	-87.793378
01/01/2024	HH (Handhole)	Heavy Duty, Fiber, Intersection, Double	41.558532	-87.792571
01/01/2024	ES (Electrical Service)	Ground mount, Pole mount	41.765532	-87.543571
01/01/2024	CC (Controller Cabinet)		41.602248	-87.794053
01/01/2024	PTZ (PTZ)	NEQ extension pole	41.593434	-87.769876
01/01/2024	POST (Post)		41.651848	-87.762053
01/01/2024	MCC (Master Controller Cabinet)		41.584593	-87.793378
01/01/2024	COMC (Communication Cabinet)		41.584600	-87.793432
01/01/2024	BBS (Battery Backup System)		41.558532	-87.792571

Data collection can be made as construction progresses or can be collected after all items are installed. If the data is unacceptable, the Contractor shall make corrections to the data collection equipment and/or process and resubmit the data for review and approval as specified.

Data shall have a minimum 1 ft accuracy after post processing.”

Restoration of Work Area.

Add the following article to Section 801 of the Standard Specifications:

“801.17 Restoration of Work Area. Restoration of the traffic signal work area shall be included in the related pay items such as foundation, conduit, handhole, underground raceways, detector loop installation or replacement, etc. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be replaced in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded. All brick pavers disturbed in the work area shall be restored to their original configuration as directed by the Engineer. All damaged brick pavers shall be replaced with a comparable material approved by the Engineer.

Exposed holes created from removal or relocation of traffic signal equipment shall be sealed using a zinc-plated fender washer with toggle bolt.

Restoration of the work area shall be included in the Contract without any extra compensation allowed to the Contractor.

Removal, Disposal, and Salvage of Existing Traffic Signal Equipment.

The removal, disposal, and/or salvage of existing traffic signal equipment shall become the property of the Contractor unless specific equipment is requested to be kept or sent to IDOT Spare Parts by the Engineer. Any equipment not kept by the Department shall be disposed of by the Contractor outside the State's right-of-way, unless otherwise noted. No additional compensation shall be provided to the Contractor for removal, disposal, Spare Parts delivery, or salvage expense for the work in the Contract.”

Bagging Signal Heads.

Light tan colored traffic and pedestrian signal reusable covers shall be used to cover dark/un-energized signal sections, visors, and retroreflective backplates. Covers shall be made of outdoor fabric with urethane coating for repelling water, have elastic fully sewn around the cover ends for a tight fit over the visor, and have a minimum of two (2) straps with buckles to secure the cover to the backplate. A center mesh strip allows viewing without removal for signal status testing purposes. Covers shall include a message indicating the signal is not in service. Pedestrian pushbuttons that are not in service shall be covered with a durable material such as described above or burlap that is secured in a weather-resistant manner. The entire housing, including the pedestrian sign, shall also be covered on the front side.

Turn-on of New Traffic Signal Installations.

The following only applies to new traffic signals at previously unsignalized locations.

The signal responsibility shall begin at the start of signal construction and shall end upon issuance of final acceptance by the Engineer. New traffic signal heads and

indications may not be installed more than two (2) weeks (14 calendar days) prior to the scheduled turn-on of the traffic signal to avoid motorist confusion caused by the presence of new signal heads, even if properly covered. Unenergized signal indications shall be bagged until one (1) hour prior to the scheduled turn-on per the Bagging Signal Heads section above.

New stop bars and crosswalks on approaches that did not previously have stop control shall NOT be installed until the day of the traffic signal turn-on.

A Portable Changeable Message Sign (PCMS) must be placed two (2) weeks prior to the scheduled new traffic signal turn-on for all approaches to the intersection with the following messages:



where “MMM” and “##” are the 3-character month abbreviation and day of the scheduled turn-on, respectively.

On the day of the turn-on, change messages to read:



The PCMS must remain in place for two (2) weeks following the day of the turn-on.

Conflicting Stop signs shall be removed immediately at the time of the traffic signal turn-on.

Locating Underground Facilities.

Revise Section 803 to the Standard Specifications to read:

“IDOT traffic signal facilities are not part of any of the one-call locating service such as J.U.L.I.E or Digger. If the Contract requires the maintenance services of an Electrical Contractor, the Contractor shall be responsible at their own expense for locating all existing IDOT electrical facilities, including but not limited to interconnect conduit and handholes, prior to performing any work. A maintenance transfer is required prior to any locating work. If this Contract does not require the maintenance services of an Electrical Contractor, the Contractor may request one free locate for existing IDOT electrical facilities from the District One Electrical Maintenance Contractor prior to the start of any work. Additional requests will be at the expense of the Contractor. The location of underground traffic facilities does

not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities, locally owned equipment, and leased enforcement camera system facilities, the local Counties or Municipalities may need to be contacted: in the City of Chicago contact Digger at (312) 744-7000, and for all other locations contact J.U.L.I.E. at 1-800-892-0123 or 811.

The Contractor shall take whatever precautions to protect the electric cable or electric conductors in conduit from damage during location and construction operations. If the wiring is damaged, the Contractor shall replace the entire length of cable or conductors in conduit, in a manner satisfactory to the Engineer. Splicing below grade will not be permitted.

In the event the repairs are not made by the Contractor, the Contractor shall reimburse the Department for such repairs within sixty (60) days of receiving written notification of said damage. Otherwise, the cost of such repairs will be deducted from monies due or which will become due the Contractor under the terms of the Contract.”

Grounding of Traffic Signal Systems

Revise Section 806 of the Standard Specifications to read:

“All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. This work shall be in accordance with IDOT’s District One Traffic Signal Design Details.

The grounding electrode system shall include a ground rod installed with each traffic signal controller concrete foundation and all mast arm and post concrete foundations. An additional ground rod will be required at locations where measured resistance exceeds 25 ohms. Ground rods are included in the applicable concrete foundation or service installation pay item and will not be paid for separately.

Testing shall be according to Article 801.13 (a) (4) and (5).

- (a) The grounded conductor (neutral conductor) shall be white color coded. This conductor shall be bonded to the equipment grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.
- (b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications:

- (1) Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.
- (2) Equipment grounding conductors shall be bonded, using a UL Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A UL listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations, including spare or empty conduits and conduit protruding from handhole walls.
- (3) All metallic and non-metallic raceways, including spare or empty raceways, shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in circuits, circuits under 50 V and/or fiber optic cable will not be required to include an equipment grounding conductor.
- (4) Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.
- (c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, UL listed pressure connectors, and UL listed clamps."

**COILABLE NON-METALLIC CONDUIT (IDOT) – DEERFIELD ROAD AT IL 21/US45
(MILWAUKEE AVENUE)**

Effective: May 22, 2002
Revised: July 1, 2015
810.01TS

Description.

This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC).

General.

The CNC installation shall be in accordance with Sections 810 and 811 of the Standard Specifications except for the following:

Add the following to Article 810.03 of the Standard Specifications:

CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes.

Add the following to Article 811.03 of the Standard Specifications:

On temporary traffic signal installations with detector loops, CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways from the saw-cut to 10 feet (3m) up the wood pole, unless otherwise shown on the plans

Basis of Payment.

All installations of CNC for loop detection shall be included in the contract and not paid for separately.

**LED SIGNAL FACE, LENS COVER (IDOT) – DEERFIELD ROAD AT IL 21/US45
(MILWAUKEE AVENUE)**

Effective: July 1, 2021
Revised: March 1, 2025
880.03TS

Description.

This work shall consist of furnishing and installing a signal lens cover with the purpose or preventing snow buildup on and around a signal lens allowing for clear indication during inclement weather.

This item shall fit over a 12 in. signal head lens and shall include the clear lens cover, attachment collar, and any clips or fasteners necessary to fit it flush. The cover must be installed in accordance with the Manufacturer's instructions and in a manner that prevents dust, debris, or moisture buildup on the inside of the lens cover that could affect the signal indication visibility. All mounting hardware including screws used for lens cover installation must be stainless steel. Lens covers shall be installed on all red signal head indications.

The snow resistant signal head lens cover must be warrantied for a period of three (3) years from final inspection and must be free from material and workmanship defects.

Basis of Payment.

This work shall be paid for at the Contract unit price each for LED SIGNAL FACE, LENS COVER, the price of which shall include the cost for all work and material described herein and includes furnishing, installing, and all mounting hardware necessary for a fully operational snow resistant signal head lens cover.

DETECTOR LOOP (IDOT) – DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)

Effective: May 22, 2002
Revised: March 1, 2024
886.01TS

Procedure.

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall mark the proposed loop locations and contact the Area Traffic Signal Maintenance and Operations Engineer to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the pouring of the Portland cement concrete surface using the same notification process as above.

Installation.

Revise Article 886.04 of the Standard Specifications to read:

“Loop detectors shall be installed according to the requirements of the “District One Standard Traffic Signal Design Details.” Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut (homerun on preformed detector loops) unless directed otherwise by the Engineer or as shown on the plans.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a waterproof tag secured to each wire with nylon ties.

Resistance to ground shall be a minimum of 500 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries.

- (a) Type I. All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement, curb, and handhole shall be cut with a 1/4 in. (6.3 mm) deep x 4 in. (100 mm) saw cut to mark the location of each loop cable.
- (b) Loop sealant shall be two-component thixotropic chemically cured polyurethane from an approved Vendor. The sealant shall be installed 1/8 in.

(3 mm) below the pavement surface. If installed above the surface, the excess shall be removed immediately.

(c) Preformed. This work shall consist of furnishing and installing a rubberized or cross-linked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:

(1) Preformed detector loops shall be installed in the sub-base under the Portland cement concrete pavement. Loop lead-ins shall be extended to a temporary protective enclosure near the proposed handhole location. The protective enclosure shall provide sufficient protection from other construction activities and may be buried for additional protection.

(2) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. CNC, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.

(3) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using a minimum 5/8 in. (16 mm) outside diameter, minimum 3/8 in. (9.5 mm) inside diameter Class A oil resistant synthetic cord reinforced hydraulic hose with 250 psi (1,720 kPa) internal pressure rating or a similarly sized XLPE cable jacket. The hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to ensure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. For XLPE jacketed preformed loops, all splice connections shall be soldered, sealed, and tested before being sealed in a high impact glass impregnated plastic splice enclosure. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application

specific. Homerun wire pairs shall be twisted a minimum of eight turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to ensure complete moisture blockage and further protect the wire. The preformed loops shall be constructed to allow a minimum of 6-1/2 ft of extra cable in the handhole.”

Method of Measurement.

Add the following to Article 886.05 of the Standard Specifications:

“Preformed detector loops will be measured along the detector loop embedded in the pavement rather than the actual length of the wire. Detector loop measurements shall include the saw cut and the length of the detector loop wire to the edge of pavement. The detector loop wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. CNC, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.”

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I or PREFORMED DETECTOR LOOP as specified in the plans, which price shall be payment in full for furnishing and installing the detector loop and all related connections for proper operation.

**CABLE REMOVAL FROM CONDUIT (IDOT) – DEERFIELD ROAD AT IL 21/US45
(MILWAUKEE AVENUE)**

Effective: April 1, 2026
895.08TS

This work shall consist of removing or removing and reinstalling existing fiber optic cable in accordance with Section 895 of the Standard Specifications with the following modifications.

Add the following to Article 895.05:

- (f) Fiber Optic Cable from Conduit. An existing fiber optic cable shall be removed, as directed by the Engineer, from a conduit.

Revise Article 895.06 to read:

895.06 Removal and Reinstallation. This work shall consist of removing an existing electric cable or fiber optic cable from a conduit and then reinstalling it in an existing or a new conduit. When a new conduit is constructed as part of the work the existing electric and/or fiber cable shall be reinstalled in the new conduit unless directed otherwise by the Engineer.

Electric cable shall be reinstalled in accordance with Article 873.03 of the Standard Specifications.

Fiber optic cable shall be removed and reinstalled by a qualified contractor in accordance with Article 871.03 of the Standard Specifications and reinstalled in accordance with Article 871.04 of Standard Specifications.

The reinstalled cable shall be tested in compliance with the fiber optic cable special provisions.

Any damage sustained to the existing electrical and/or fiber optic cable during removal, storage and/or reinstallation operations shall require the existing electric cable and/or fiber optic cable be replaced in kind to the satisfaction of the Engineer at the Contractor's expense. Any replacement cable must meet the material and construction requirements of the current Standard Specifications and the special provisions for Electric Cable, Fiber Optic Cable, Splice Fiber in Cabinet and Terminate Fiber in Cabinet.

Revise the first paragraph of Article 895.07 to read:

895.07 Method of Measurement. Removal of electric cable and fiber optic cable will be measured for payment in place in feet. Removal and reinstallation of existing

fiber optic cable will be measured for payment in feet from point to point horizontally of the conduit the fiber is being removed from. No vertical rises or slack shall count in the measurement. If two or more cables in a conduit are to be removed, or removed and reinstalled, each cable will be measured for payment separately.

Revise the sixth paragraph of Article 895.08 to read:

Removal of an existing electric cable or fiber optic cable will be paid for at the contract unit price per foot for REMOVE ELECTRIC CABLE FROM CONDUIT.

Add the following paragraph after the seventh paragraph of Article 895.08:

Removing and reinstalling the fiber optic cable will be paid for at the contract unit price per foot for REMOVE AND REINSTALL FIBER OPTIC CABLE FROM CONDUIT.

**FULL-ACTUATED CONTROLLER AND CABINET(IDOT) – DEERFIELD ROAD AT IL
21/US45 (MILWAUKEE AVENUE)**

Effective: January 1, 2002
Revised: April 1, 2026
857.02TS

Description.

This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications, as modified herein, including malfunction management unit, load switches and flasher relays, and all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "_____" brand traffic actuated solid state controller.

Materials.

Add the following to Article 857.02 of the Standard Specifications:

“Controllers shall be Econolite Cobalt or Eagle/Yunex M60 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved Vendors will be allowed. The controller shall be of the most recent approved model and software version supplied by the Vendor at the time of the traffic signal TURN-ON unless specified otherwise on the plans or these specifications. A removable controller data key shall also be provided. Individual load switches shall be provided for each vehicle, pedestrian, and overlap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

For integration into an Advanced Traffic Management System (ATMS) such as Centrac, Tactics, or TransSuite, the controller shall have the latest version of approved NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing communications.”

Revise Article 1074.03 (a) (5) paragraph “b.” to read:

“Thermostatically Controlled Exhaust Fans. The cabinet shall be equipped with two (2) thermostatically controlled exhaust fans. Each fan shall have a minimum air delivery capacity of 100 cfm (2.8 cu m/min) and shall be mounted on self-lubricating ball bearings. The thermostat control shall be adjustable between 91 and 113 °F (33 and 45 °C) and shall be set to turn the fan on at 95 °F (35 °C).”

Add the following to Article 1074.03 of the Standard Specifications:

(a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.

Revise the second sentence in Article 1074.03 (b) (1) paragraph “a” to read:

“The malfunction management unit shall have a minimum of 16 fully programmable channels.”

Add the following to Article 1074.03 of the Standard Specifications:

(a) (1) Optionally, a “Type 4.5/Type IV Stretched” cabinet shall be provided. This cabinet has the same dimensions as a Type IV cabinet with an additional height. Additionally, it shall include a front and rear door with double, vented overhangs for protection from water intrusion.

shall (a) (2) a. The gaskets shall be permanently bonded to the cabinet. The gaskets include a polyester film to prevent the gaskets from sticking to the cabinet surface.

(a) (2) e. A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. The cabinet door opening shall be a minimum of 80 percent of the front surface of the cabinet. A stiffener plate shall be welded across the inside of the main door to prevent flexing.

(a) (2) f. The top of the cabinet shall incorporate a 1 in. slope towards the rear to prevent rain accumulation.

(b) (5) Cabinets – Provide 1/8 in. (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.

(b) (6) Controller Harness – Provide a TS2 Type 2 “A” wired harness in addition to the TS2 Type 1 harness.

(b) (7) Surge Protection – Shall be a 120 VAC Single phase Modular filter Plug-in type, supplied from an approved Vendor.

(b) (8) BIU – shall be secured by mechanical means.

(b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.

(b) (10) Switch Guards – All switches shall be guarded.

(b) (11) Heating – One (1) 800 W, thermostatically controlled, electric heater with automatic fan function.

(b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out

drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a door switch. The LED Panels shall be provided from an approved Vendor.

- (b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1-1/2 in. (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lb (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 in. (610mm) wide.
- (b) (14) Plan & Wiring Diagrams – 12 in. x 15 in. (305mm x 406mm) moisture sealed container attached to door.
- (b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle preemption and sixteen channels (16) of vehicular operation.
- (b) (16) Field Wiring Labels – All field wiring shall be labeled.
- (b) (17) Field Wiring Termination – Approved channel lugs required.
- (b) (18) Power Panel – Provide a nonconductive shield.
- (b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 A.
- (b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.
- (b) (21) Insulation - minimum half inch polystyrene rigid board insulation with a minimum R-3 thermal resistance attached to the top of cabinet on the interior side.

Installation.

Add the following to the second paragraph of Article 857.03 of the Standard Specifications:

“All existing multiconductor cable to be reinstalled shall be cut back to expose individual conductors beneath the outer jacket. Individual conductors shall be stripped and trained as necessary for a complete professional and efficient installation.”

Basis of Payment.

This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV STRETCHED CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET; FULL-ACTUATED CONTROLLER AND TYPE IV STRETCHED CABINET, SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET (SPECIAL).

ACCESSIBLE PEDESTRIAN SIGNALS (IDOT) – DEERFIELD ROAD AT ALL SIGNALIZED INTERSECTION

Effective: April 1, 2003
Revised: April 1, 2026
888.02TS

Description. This work consists of furnishing and installing accessible pedestrian signals (APS). Each APS consists of an interactive vibrotactile pedestrian push-button with a speaker, informational sign, light emitting diode (LED) indicator light, solid-state electronic control board, power supply, wiring, and mounting hardware. The APS must meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Add the following to Article 888.03 of the Standard Specifications:

“A mounting bracket and/or extension must be used to assure proper orientation and accessibility where needed. The bracket and/or extension is included in the cost of the pedestrian push-button. The Contractor is not allowed to install a push-button assembly with the sign below the push-button to meet mounting requirements.”

Add the following to Article 1074.02 of the Standard Specifications:

“Stations must be designed to be mounted to a post, mast arm pole or wood pole. The station must be aluminum and must accept a 3 in. round push-button assembly and a regulatory pedestrian instruction sign according to MUTCD sign series R10-3e 9 in. x 15 in. sign with arrow(s) for a countdown pedestrian signal. Stations must be powder coated yellow with a black push-button and a stainless steel tactile arrow on the push-button.”

Electrical Requirements. The APS must operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS must contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications. A push-button locator tone must sound at each push-button and must be deactivated during the associated walk indication and when associated traffic signals are in flashing mode. Push-button locator tones must have a duration of 0.15 seconds or less and must repeat at 1 second intervals. Each actuation of the push-button must be accompanied by the speech message “Wait”. Locator tones must be audible 6 to 12 ft from the push-buttons.

In addition, a speech push-button information message must be provided by the APS push-button during the Don't Walk interval by pressing and holding the push-button for 1 second. This verbal message must be modeled after: "Wait to cross [Street Name] at [Street Name]".

If multiple accessible pedestrian push-buttons are placed less than 10 ft apart or placed on the same pole, the audible walk indications must be a speech message. This speech message must sound throughout the Walk interval only. Where multiple accessible pedestrian push-buttons are separated by 10 ft or more, the Walk indication must be an audible percussive tone. The percussive tone must repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz. Percussive tones must be uniform at all stations at the intersection and must not change for different directions.

At locations with an equestrian push-button style installation, the APS push-buttons must use speech messages only and must emit the audible message from the bottom mounted push-button only.

The common street name must be used and not the route number of the street unless there is no common street name. Locations without a street name (ex: private benefit driveways, shopping plaza entrances, etc.) must use the general term "Driveway" as a street name for that leg. The speech message must be modeled after: "[Street Name]. Walk Sign is on to cross [Street Name]." For signalized intersections utilizing exclusive pedestrian phasing, the verbal message must be "Walk sign is on for all crossings". Speech walk messages should not contain any additional information, except they should include designations such as "Street" or "Avenue" where this information is necessary to avoid ambiguity at a particular location.

Automatic volume adjustments in response to ambient traffic sound level must be provided up to a maximum volume of 100 dB. Locator tones and speech messages must be no more than 5 dB louder than ambient sound. Locator tones and speech messages must be programmed at the same volume; one must not be significantly louder than the other and must be adjusted as directed by the Engineer.

Railroad Preemption.

At locations interconnected to a railroad crossing, APS push-buttons must be capable of receiving a railroad preemption similar to a traffic signal controller and must be hard wired to the railroad preemption relay inside the traffic signal cabinet. A shelf mount control unit must be provided and installed inside the cabinet capable of receiving and transmitting the railroad preemption to all the push-buttons.

At railroad intersections, all APS push-buttons must use speech messages only and must follow the below speech models.

During Don't Walk: "Wait to cross [Street Name] at [Street Name]. Caution, Walk time shortened when train approaches." – this does not repeat, plays only once with every push-button press.

During Walk: "[Street Name]. Walk sign is on to cross [Street Name]." – this repeats as many times as possible during Walk interval only.

During Railroad preemption: All push-buttons simultaneously state "Train Approaching." – this message must be stated two (2) times.

At locations with emergency vehicle preemption (EVP), no additional speech message will be provided during preemption.

Locations with Corner Islands or Center Medians

At locations with corner islands, push-buttons must follow the requirements as specified herein regarding the use of a percussive tone vs. a speech message. When push-buttons are closer than 10 ft apart, the speech message must follow the format specified herein for the main street crossing. The speech message must follow the below speech models.

Crossing of the right turn lane to or from corner island:

"Wait to cross [Street Name] right turn lane at [Street Name]" and
"[Street Name] right turn lane. Walk sign is on to cross [Street Name] right turn lane".

Crossing to refuge island or center median where second push-button actuation is required:

"Wait to cross [Street Name] at [Street Name] to [island/median] with additional push-button" and
"[Street Name]. Walk sign is on to cross [Street Name] to [island/median] with additional push-button".

The appropriate wording shall be used depending if the destination is a corner island or center median.

Pedestrian Push-button. Pedestrian push-buttons must be at least 2 in. (50 mm) in diameter or width. The force required to activate the push-button must be no greater than 3.5 lb (15.5 N).

A red LED must be located on or near the push-button which, when activated, acknowledges the pedestrian's request to cross the street.

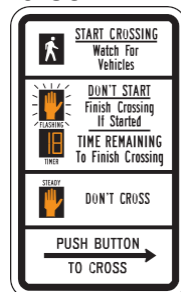
APS push-button systems that utilize any wireless technology to place calls or communicate with the traffic signal controller, including Bluetooth technology, is not allowed. A central control unit must be provided and installed in the traffic signal cabinet with the latest available firmware. Push-buttons must be connected directly to the central control unit in the traffic signal cabinet using only 2 wires. All push-buttons must be capable of placing a pedestrian call request into the controller and must be hard wired. APS push-buttons must be a direct replacement of existing standard push-buttons and must be weather resistant with a minimum warranty of five (5) years.

APS push-buttons must be compatible with one another and easily replaceable on future replacements or maintenance repairs. Multiple model variations will not be allowed.

All APS push-buttons must come with speech messages pre-programmed for each particular intersection regardless of their location or distance of separation. Final field adjustments, including the use of percussive tones or speech messages, must be completed once push-buttons are installed in the final location. All push-buttons must be programmed with the appropriate parameters and settings as directed by the Engineer. These settings must be standard for all push-buttons and will vary based on the manufacturer. Access to push-button settings must be provided via an application either through wired, wireless or Bluetooth connection. Push-button information, settings and access instructions must all be provided in a weatherproof pouch and safely stored inside each traffic signal cabinet.

The Contractor must remove any existing pedestrian isolation boards, field wire terminals and any wires to the board when easily accessible. If the pedestrian isolation board has been installed from the factory on the back panel of the cabinet, the Contractor is to disconnect the power to the isolation board and any wires while leaving the board mounted. This work is included in the cost of APS and will not be paid for separately.

Signage. A sign must be located immediately above the pedestrian push-button and parallel to the crosswalk controlled by the push-button. The sign must conform to the following standard MUTCD design: R10-3e.



R10-3e

Tactile Arrow. A tactile arrow, pointing in the direction of travel controlled by a push-button, must be provided on the push-button.

Center medians on divided highways with a single push-button must have a dual tactile arrow on the push-button.

Vibrotactile Feature. The push-button must pulse when depressed and must vibrate continuously throughout the Walk interval.

Basis of Payment. This work will be paid for at the contract unit price per each for ACCESSIBLE PEDESTRIAN SIGNALS and includes furnishing, installation, mounting hardware, extension brackets, and programming of the push-button.

**REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT (DEERFIELD ROAD AT IL
21/US45 (MILWAUKEE AVENUE)**

Effective: May 22, 2002
Revised: April 1, 2026
895.02TS

Add the following to Article 895.05 of the Standard Specifications:

“The traffic signal equipment which is to be removed and is to become the property of the Contractor unless specific equipment is requested to be kept or sent to IDOT Spare Parts by the Engineer. Any equipment not kept by the Department shall be disposed of outside the right-of-way at the Contractor’s expense.

All equipment to be returned to the State shall be delivered by the Contractor to the State's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the State's Electrical Maintenance Contractor to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within thirty (30) days of removing it from the traffic signal installation. The Contractor shall provide one hard copy and one electronic file of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. The Contractor shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned according to these requirements, it will be rejected by the State's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until approval by the Department. A delivery receipt will be signed by the State's Electrical Maintenance Contractor indicating the items have been returned.

The Contractor shall safely store and arrange for pick up or delivery of all equipment to be returned to agencies other than the State. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment which is lost, damaged, or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.”

TRAFFIC SIGNAL POST (DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE))

Effective: May 22, 2002
Revised: March 1, 2025
875.01TS

Revise Article 1077.01 (c) of the Standard Specifications to read:

- (c) Anchor Rods. The anchor rods shall be a minimum of 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and trapezoidal washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

Revise the first sentence of Article 1077.01 (d) of the Standard Specifications to read:

All steel posts and bases shall be hot dipped galvanized steel according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)
PEDESTRIAN SIGNAL POST

Effective: January 1, 2020

Revised:
875.02TS

Description.

This work shall consist of furnishing and installing a metal pedestrian signal post. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

Materials.

- a. General. The pedestrian signal post shall be designed to support the traffic signal loading shown on the plans. The design and fabrication shall be according to the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, as published by AASHTO.
- b. Post. The post shall be made of steel or aluminum and have an outside diameter of 4 1/2 in. The post shall be threaded for assembly to the base. Aluminum posts shall be according to the specifications for Schedule 80 aluminum pipe. Steel posts shall be according to the specifications for Schedule 40 steel pipe.
- c. Base. The base of a steel post shall be cast iron. The base of an aluminum post shall be aluminum. The base shall be threaded for the attachment to the threaded post. The base shall be approximately 10 in. high and 6 3/4 in. square at the bottom. The bottom of the base shall be designed to accept four 5/8 in. diameter anchor rods evenly spaced in a 6 in. diameter circle. The base shall be true to pattern, with sharp clean cutting ornamentation, and equipped with access doors for cable handling. The door shall be fastened to the base with stainless steel screws. A grounding lug shall be provided inside the base.
- d. Anchor Rods. The anchor rods shall be 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and trapezoidal washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

The aluminum post and base shall be drilled at the third points around the diameter and 1/4 in. by 2 in. stainless steel bolts shall be inserted to prevent the post from turning and wobbling.

- e. Finish. The steel post, steel post cap and the cast iron base shall be hot-dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions. If the post and the base are threaded after the galvanization, the bare exposed metal shall be immediately cleaned to remove all cutting solvents and oils, and then spray painted with two coats of an approved galvanized paint.

The aluminum post shall have a natural finish, 100 grit or finer.

Installation.

The pedestrian signal post shall be erected plumb, securely bolted to a concrete foundation, and grounded to a ground rod according to the details shown on the plans. No more than 3/4 in. of the post threads shall protrude above the base.

A post cap shall be furnished and installed on the top of the post. The post cap shall match the material of the post. The Contractor shall apply an anti-seize paste compound on all nuts and bolts prior to assembly.

Prior to the assembly, the Contractor shall apply two additional coats of galvanized paint on the threads of the post and the base. The Contractor shall use a fabric post tightener to screw the post to the base.

Basis of Payment.

This work will be paid for at the contract unit price per each for PEDESTRIAN SIGNAL POST, of the length specified.

**MAST ARM ASSEMBLY AND POLE (DEERFIELD ROAD AT IL 21/US45
(MILWAUKEE AVENUE)**

Effective: May 22, 2002

Revised: July 01, 2015

877.01TS

Revise the second sentence of Article 1077.03 (a)(3) of the Standard Specifications to read:

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer.

Add the following to Article 1077.03 (a)(3) of the Standard Specifications:

If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

CONCRETE FOUNDATIONS (DEERFIELD ROAD AT IL 21/US45 (MILWAUKEE AVENUE)

Effective: May 22, 2002

Revised: March 1, 2024

878.01TS

Add the following to Article 878.03 of the Standard Specifications:

“All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. at the threaded end.

Depending on the foundation type, the top of foundation shall be between 1 in. and 6 in. above finished grade or as directed by the Engineer.

No foundation is to be poured until the Resident Engineer gives their approval as to the depth of the foundation.”

Add the following to the first paragraph of Article 878.05 of the Standard Specifications:

“The concrete apron in front of the cabinet and UPS shall be included in this pay item.”

Revise the first paragraph of Article 878.05 of the Standard Specifications to read:

“Basis of Payment. This work will be paid for at the Contract unit price per foot (meter) of depth of CONCRETE FOUNDATION of the type specified, or CONCRETE FOUNDATION, TYPE A 12-INCH DIAMETER for pedestrian post concrete foundations.”

TRAFFIC SIGNAL GENERAL REQUIREMENTS - LCDOT

Effective: October 15, 2016

Revised: January 1, 2023

LC800.01

All work and equipment performed and installed under this Contract shall be governed by and shall comply with:

SPECIFICATION	ADOPTED/DATED
The State of Illinois “Standard Specifications for Road and Bridge Construction” referred to as “Standard Specifications”	January 1, 2022
The State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways," referred to as “MUTCD”	February 2026
The National Electrical Code referred to as “NEC”	2023 Edition
The National Electrical Manufacturers Association (All publications for traffic control items) referred to as “NEMA”	All applicable current documents published prior to Contract Letting Date
The International Municipal Signal Association ("Official Wire & Cable Specifications Manual,") referred to as “IMSA”	All applicable current documents published prior to Contract Letting Date
The Institute of Transportation Engineers ATC Version 6 Standard	January 12, 2018
AASHTO “Standard Specifications” LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals	2015 Edition & 2017 Interim Revisions
Supplemental Specifications and Recurring Special Provisions	January 1, 2026

The project Special Provisions supplement the above specifications, manuals, and codes. In case of conflict with any part or parts of said documents, the project Special Provisions shall take precedence and shall govern.

The following terms and acronyms are used:

IDOT	Illinois Department of Transportation
District 1	IDOT District 1
LCDOT	The Lake County Division of Transportation
Traffic Engineer	The LCDOT Traffic Engineer or designee
PASSAGE	Lake County's ITS System
PASSAGE Consultant	Parsons Transportation Group

The intent of these Special Provisions is to prescribe the materials and construction methods commonly used in traffic signal installations. All material furnished shall be new. The locations and the details of all installations shall be indicated on the plans or as directed by the Engineer.

All traffic signal work related to the traffic signal cabinet shall be performed with at least one electrician holding a current IMSA Traffic Signal Technician Level 2 certification present on site and actively overseeing and directing the work, unless approved in advance by the Traffic Engineer.

The work performed under this Contract shall consist of furnishing and installing all traffic signal work as shown on the plans and as specified herein in a manner acceptable and approved by the Resident Engineer.

Definitions of Terms.

Add the following to Section 101 of the Standard Specifications:

101.56 Vendor. Company that sells a particular type of product directly to the Contractor or the Equipment Supplier.

101.57 Equipment Supplier. Company that supplies, represents, and provides technical support for District 1 approved traffic signal controllers and other related equipment. The Equipment Supplier shall be located within District 1 and shall:

- a. Be full service with on-site facilities to assemble, test and trouble-shoot traffic signal controllers and cabinet assemblies.
- b. Maintain an inventory of District 1 approved controllers and cabinets.
- c. Be staffed with permanent sales and technical personnel able to provide traffic signal controller and cabinet expertise and support.
- d. Technical staff shall attend traffic signal "turn-on" and inspection with a minimum 14 calendar day notice.

SUBMITTALS

Revise Article 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted electronically. The submittal shall be by email, and shall include a cover letter and one PDF file with all pay items for the project.

General requirements include:

- a. All material approval requests shall be submitted within 7 calendar days after the preconstruction meeting. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.
- b. Product data and shop drawings shall be arranged by pay item. Pages of the submittal should be numbered.
- c. When hard copy submittals are necessary for another agency, four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials will be submitted, in addition to the electronic copy required above. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
- d. When hard copy submittals are necessary for structural elements, four complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials, shall be submitted, in addition to the electronic copy required above.
- e. Partial or incomplete submittals will be returned without review.
- f. Certain non-standard mast arm poles and structures will require additional review from IDOT's Bureau of Bridges and Structures. Examples include special mast arms and non-standard length mast arm pole assemblies. The Contractor shall account for the additional review time in their schedule.
- g. The County Section Number, permit number, or IDOT contract number, project location/limits and corresponding pay code number shall be on each sheet of correspondence, catalog cuts and mast arm poles and assemblies drawings.
- h. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall include all test data, dates, and times.
- i. The Contractor shall secure approved materials in a timely manner to assure

construction schedules are not delayed.

- j. After the Traffic Engineer reviews the submittals for conformance with the design concept of the project, the drawings will be stamped indicating their status as 'APPROVED', 'APPROVED AS CORRECTED', 'NOT APPROVED', or 'RESUBMIT'. Review schedule will be according to Article 801.05(b). Since the Traffic Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Traffic Engineer's approval thereof.
- k. For contracts let through the Illinois Department of Transportation, the Contractor shall forward all stamped submittals to IDOT's Bureau of Local Roads and Streets upon completion of the review and approval process by LCDOT.
- l. All submitted items reviewed and marked 'APPROVED AS CORRECTED', 'NOT APPROVED', or 'RESUBMIT' shall be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify Contract compliance at no additional cost to the contract.
- m. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Resident Engineer. In general, substitutions will not be acceptable. Requests for substitutions shall demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Resident Engineer.
- n. The Contractor shall not order major equipment (i.e., mast arm assemblies) prior to Resident Engineer approval of the Contractor marked proposed traffic signal equipment locations to assure proper placement of Contract required traffic signal displays, push buttons and other facilities. Field adjustments may require changes in proposed mast arm length and other coordination.

MARKING PROPOSED LOCATIONS

Revise "Marking Proposed Locations for Highway Lighting System" of Article 801.09 to read "Marking Proposed Locations for Highway Lighting System and Traffic Signals."

Add the following to Article 801.09 of the Standard Specifications:

It shall be the Contractor's responsibility to verify all dimensions and conditions existing in the field prior to ordering materials and beginning construction. This shall include locating the mast arm foundations and verifying the mast arms lengths.

INSPECTION OF ELECTRICAL SYSTEMS

Add the following to Article 801.10 of the "Standard Specifications":

- (c) All cabinets, including temporary traffic signal cabinets, shall be assembled by an approved Equipment Supplier in District 1. LCDOT reserves the right to request that any controller and cabinet be tested at a District 1 approved Equipment Supplier's facility prior to field installation. Such testing will be at no extra cost to the contract. All permanent or temporary "railroad interconnected" controllers and cabinets, shall be new, built, tested and approved by the controller Equipment Supplier, in the Equipment Supplier's District 1 approved facility, prior to field installation. The Equipment Supplier shall provide the technical equipment and assistance as required by the Traffic Engineer to fully test this equipment.

LIQUIDATED DAMAGES FOR UNTIMELY WORK

A primary concern of LCDOT is to maintain a safe and efficient roadway for the public. Therefore, the Contractor shall proceed with the traffic signal work as soon as conditions and project staging permit. If in the opinion of the Traffic Engineer construction conditions are suitable for traffic signal work, and the Contractor has not yet begun the traffic signal work, the Resident Engineer shall notify the Contractor to proceed. The Contractor shall begin the traffic signal work within seven calendar days after notification to proceed. The Contractor shall continue to prosecute the traffic signal work until completion, or until he can no longer proceed due to conditions beyond their control. The Contractor shall notify the Resident Engineer of any conditions impeding and/or delaying their prosecution of the work. Failure by the Contractor to proceed with the traffic signal work as specified herein shall result in liquidated damages of **\$500.00** per calendar day per occurrence.

For projects involving detector loop installations or replacement, the following additional conditions apply. If in the opinion of the Traffic Engineer, construction conditions are suitable for loop installation(s), the Resident Engineer shall notify the Contractor to proceed. The detector loops shall be installed and fully operational within 14 calendar days following notification to proceed by the Resident Engineer. This 14-day period shall be in effect throughout the entire year, including the off season, regardless of the Contractor's working day status. Failure by the Contractor to complete the loop installation(s) within the specified timeframe shall result in liquidated damages in the amount of **\$500.00** per calendar day, per intersection.

MAINTENANCE AND RESPONSIBILITY

Revise Article 801.11 of the "Standard Specifications" to read:

- a. Existing traffic signal installations and/or any electrical facilities at locations included in this Contract may be altered or reconstructed totally or partially as part of the work on this contract. The Contractor is hereby advised that all traffic control equipment presently installed at these locations may be the property of the County of Lake, State of Illinois, Department of Transportation, Division of Highways, County, Transit Agency, Private Developer, or the Municipality in which it is located. Once the Contractor has begun any work on any portion of the project, all traffic signals within the limits of this Contract that have the pay item MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION, TEMPORARY TRAFFIC SIGNAL INSTALLATION, and/or MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION, shall become the full responsibility of the Contractor. The Contractor shall supply the Resident Engineer and the County's Traffic Signal Maintenance Contractor one 24-hour emergency contact name and telephone number. The Contractor shall provide sufficient qualified personnel to respond to all notifications of malfunctions on a round-the-clock basis (24 hours a day, 7 days a week). The Contractor is required to keep a time and date log of all maintenance items, including the time of the initial report, the response time, and the time of final permanent repair. The Contractor shall provide this information to the Resident Engineer, upon request.
- b. When the project has a pay item for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION, TEMPORARY TRAFFIC SIGNAL INSTALLATION, and/or MAINTENANCE OF EXISTING FLASHING BEACON INSTALLATION, the Contractor shall notify the Traffic Engineer at **(847) 377-7000** of their intent to begin any physical construction work on the project. This notification shall be a minimum of ten calendar days prior to the start of construction to allow sufficient time for an inspection of the existing traffic signal installation(s) and the transfer of maintenance to the Contractor. If work is started prior to the inspection, maintenance of the traffic signal installation(s) will be immediately transferred to the Contractor without an inspection. The Contractor shall then become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs to or the replacement of damaged equipment shall meet the approval of the Traffic Engineer at the time of final inspection or the traffic signal installation will not be accepted.
- c. Automatic Traffic Enforcement equipment including red lighting running and railroad crossing camera systems are owned and operated by others. The Contractor shall not be responsible for maintaining this equipment. This equipment shall be de-activated while the traffic signal is on Contractor maintenance. The Contractor shall notify the municipality of the equipment de-activation.

- d. LCDOT, regional transit, IDOT, and other agencies may also have equipment connected to existing traffic signal or peripheral equipment including PTZ cameras, switches, transit signal priority (TSP and BRT) servers and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.
- e. For contracts that include pay items for milling or pavement patching that may result in destruction of loop detectors, but do not include installation or modification of the traffic signals, maintenance transfers are not required. These contracts do require a notification of intent to work and an inspection. A minimum of ten calendar days prior to the loop removal, the Contractor shall notify the Traffic Engineer at **(847) 377-7000**, at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection.
- f. The Contractor is advised that the existing and/or temporary traffic signal installation shall remain in operation during all construction stages, except for the most unavoidable down time. Any plan to shut down the traffic signal installation for a period exceeding 15 minutes shall receive prior approval from the Traffic Engineer. Approval to shut down the traffic signal installation will only be granted during the hours of 9:00 A.M. to 3:00 P.M. on weekdays. Shutdowns will not be allowed during inclement weather, weekends or holiday periods.
- g. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals. Any inquiry, complaint or request by LCDOT, the County's Traffic Signal Maintenance Contractor or the public, shall be investigated and repairs started. The Contractor shall restore service and complete permanent repairs according to the following Repair Timetable. Failure to provide this service will result in liquidated damages of **\$500** per calendar day per occurrence. The Traffic Engineer reserves the right to assign any work not completed within this timeframe to the County's Traffic Signal Maintenance Contractor. All costs associated with the completion of the uncompleted repair shall be the responsibility of the Contractor. Failure to pay these costs to the Traffic Signal Maintenance Contractor within one month after the incident will result in additional liquidated damages of \$500 per month per occurrence. Unpaid bills will be deducted from the cost of the Contract. County personnel, the County's Traffic Signal Maintenance Contractor, and the County's PASSAGE Consultant may inspect any signaling device on LCDOT's highway system at any time without notification.
- h. Any proposed activity in the vicinity of a highway-rail grade crossing shall adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the

crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

- i. At signals where the Contractor is responsible for maintenance, including temporary traffic signals and newly constructed traffic signals that are not yet accepted by the County, the Contractor shall be responsible for clearing snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment in compliance with the REPAIR TIMETABLE. Two clearly visible signal indications of all colors and arrows are required to be maintained at all time.
- j. In the event of power loss at locations where the Contractor is responsible for maintenance, including temporary traffic signals and newly constructed traffic signals that are not yet accepted by the County, the Contractor shall be responsible for working with Lake County personnel to make connections of portable County-supplied generators at the maintained location, as directed by the Traffic or Resident Engineer.

Immediately after performing any work related to a signal maintenance item (troubleshooting, temporary repair, permanent repair, etc.) the Contractor shall contact the Lake County PASSAGE Transportation Management Center (TMC) at **(847) 377-7000**.

All items shall be repaired within the time frame described in the Repair Timetable. The times listed are noncumulative. Any repairs not specifically covered in the Repair Timetable, or described elsewhere, shall be completed within a time frame matching the most similar line item in the Repair Timetable.

REPAIR TIMETABLE
(non cumulative)

ITEM	<u>RESPONSE TIME</u>	<u>SERVICE RESTORATION</u>	<u>PERMANENT REPAIRS</u>
KNOCKDOWNS/FAILURE/DAMAGE:			
Cabinet	1 hr	24 hrs	2 wks
Controller (Local or Master)	1 hr	24 hrs	2 wks
Adaptive Control Hardware	1 hr	24 hrs	3 wks
Detector Loop/Magnetometer	1 hr	n.a.	2 wks
Loop Detector/Amplifier	1 hr	4 hrs	2 wks
Video Detection Camera	1 hr	4 hrs	2 wks
PTZ Camera	2 hrs	48 hrs	2 wks
Detector Interface Card/Mini Hub	1 hr	4 hrs	2 wks
Modem	2 hrs	NWD	2 wks
Load Switch	1 hr	2 hrs	2 hrs
Signal Head/Lenses	1 hr	2 hrs	NWD
Pole/Mast Arm	1 hr	2 hrs	ENG
Cabling/Conduit	1 hr	4 hrs	ENG
Interconnect/Communication	1 hr	NWD	ENG
Graffiti/Advertising	NWD	NWD	NWD
Telemetry, Electrical	1 hr	2 hrs	NWD
Ethernet Switches/Video Encoders	1 hr	48 hrs	2 wks
Highway Advisory Radio (HAR)	1 hr	48 hrs	2 wks
Indicators/switches/LEDs/displays	NWD	n.a.	2 wks
Snow/Ice/Debris/Other Obstructions	1 hr	2 hrs	NWD
Outages not covered elsewhere	1 hr	2 hrs	NWD
Filter/Cleanliness/fans/thermostat	NWD	NWD	n.a.
Misalignment (conflicting)	1 hr	2 hrs	NWD
Misalignment (non-conflicting)	2 hrs	4 hrs	NWD
COMPLAINTS/CALLS/ALARMS:			
Timing/Phasing/Programming	1 hr	2 hrs	ENG
Coordination Alarm/Cycle Fail	NWD	ENG	ENG
Controller Alarm/Status Change	1 hr	NWD	1 wk
Detector Alarm/Status change	NWD	NWD	ENG
UPS	1 hr	2 hrs	2 wks
CMU Flash/Local Flash	1 hr	2 hrs	1 wk
Door Open/Maint. Req.	1 hr	4 hrs	NWD

LEGEND: hr=hour, hrs=hours, NWD=next week day, days=calendar days,
ENG=acceptable to Traffic Engineer, wk=week, wks=weeks, n.a.=not
applicable

MODIFICATION OF IDOT SPECIAL PROVISION REQUIREMENTS

When IDOT Special Provisions for traffic signal items are included in an LCDOT Contract or Permit project, the following modifications shall apply to the noted Special Provisions.

Contact Information: The Contractor shall utilize the LCDOT contact information for LCDOT projects in place of the personnel, phone numbers, and directives provided in the following District 1 Special Provisions when they are included in the Contract:

800.02TS Optimize Signal System
800.03TS Re-Optimize Signal System
805.01TS Electric Service Installation
886.01TS Detector Loop
890.01TS Temporary Traffic Signal Installation
890.02TS Temporary Traffic Signal Timing

All references in the above special provisions to Traffic Signal Engineer, Area Traffic Signal Engineer, Area Traffic Signal Maintenance and Operations Engineer, Bureau of Traffic Operations, Traffic Operations Engineer, State, State's Traffic Signal Maintenance Contractor, and State's Electrical Maintenance Contractor shall be replaced with the LCDOT Traffic Engineer and the phone number shall be **847-377-7000**. Submittals, requests for reviews, scheduling of appointments, and requests for materials and information shall be directed to the LCDOT Traffic Engineer instead of IDOT, District 1, or the State's Maintenance Contractor.

Traffic Signal Timing Consultant Requirements: Add the following paragraph to the following District 1 Special Provisions:

800.02TS Optimize Signal System
800.03TS Re-Optimize Signal System
890.02TS Temporary Traffic Signal Timing

All work shall be based upon the LCDOT Countywide Synchro model. The Consultant shall contact the Traffic Engineer at **847-377-7000** to acquire the required portion of the countywide model to be updated for the particular project. Upon completion of the project, the Consultant shall provide LCDOT with the revised and updated files for inclusion into the Countywide Synchro Model. Graphics displays for LCDOT's traffic signal systems do not need to be furnished to LCDOT.

Pedestrian Pushbutton Station Requirements: Add the following paragraph to the following District 1 Special Provision:

888.01 TS Pedestrian Push Button

The pedestrian push button signs shall be retroreflective R10-3, 9"x12" signs displaying the "Push Button For" legend with the Walking Man symbol and arrow, unless shown otherwise in the plans. The pedestrian push button station shall be natural, unfinished aluminum with rounded corners sized to accommodate the 9"x12" sign.

DAMAGE TO TRAFFIC SIGNAL SYSTEM

Revise Article 801.12(b) of the "Standard Specifications" to read:

Any traffic control equipment damaged or not operating properly from any cause whatsoever shall be repaired and/or replaced. All inoperable components shall be replaced with new equipment meeting the special provisions or the current LCDOT requirements. The Contractor shall provide replacement components at no additional cost to the Contract and/or owner of the traffic signal system. Final repairs or replacement of damaged equipment shall meet the approval of the Traffic Engineer prior to or at the time of final inspection; otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed, unless approved by the Traffic Engineer.

Temporary replacement of damaged or knocked down mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Traffic Engineer.

Automatic Traffic Enforcement equipment, including Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause whatsoever, shall be the responsibility of the municipality or the Automatic Traffic Enforcement company per Permit agreement.

VIDEO AND NETWORK SYSTEM REQUIREMENTS

For all projects including installation or relocation of video and/or network equipment, the Contractor shall contact the TMC at **847-377-7000** after installation to confirm proper operation of the equipment within the PASSAGE system. This includes confirming that the camera horizon is properly adjusted, camera lens is clear, network settings are correct and all devices are communicating correctly with the TMC. For equipment requiring an IP address or other LCDOT assigned parameters, the Contractor should request the information from the TMC a minimum of one week in advance of the traffic signal "turn-on." The Contractor shall be responsible for making any changes necessary to the camera mounting, aiming, and/or equipment programming to meet the PASSAGE requirements and/or to operate the equipment to the satisfaction of the Traffic Engineer. Contacting the TMC for confirmation of equipment operation does not constitute an installation review and does not relieve the Contractor of the responsibility to correct deficiencies identified at the "turn-on." The cost of meeting these requirements shall be included in the associated pay item and no

additional compensation shall be made. Calls to the TMC shall be made according to the PASSAGE System Support section of this special provision.

TRAFFIC SIGNAL INSPECTION ("TURN-ON")

Revise Article 801.15(b) of the "Standard Specifications" to read:

It is LCDOT's intent to have all electric work completed and the equipment field-tested by the Equipment Supplier, prior to LCDOT's "turn-on" field inspection. The Contractor shall have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and "turn-on" of the traffic signal installation. In the event the Traffic Engineer determines that the work is not complete and that the inspection will require more than two hours to complete, the inspection may be cancelled and the Contractor will be required to reschedule at another date.

The Contractor may request a "turn-on" and inspection of the completed traffic signal installation at each separate location. This request shall be made to the Traffic Engineer at **(847) 377-7000** a minimum of ten calendar days prior to the time of the requested inspection. When the Contract includes the pay item RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM, OPTIMIZE TRAFFIC SIGNAL SYSTEM, or TEMPORARY TRAFFIC SIGNAL TIMINGS, the Contractor shall notify the Signal Coordination and Timing (SCAT) Consultant of the "turn-on"/detour implementation schedule, as well as stage changes and signal phase changes during construction. The SCAT Consultant shall be in attendance at each temporary and permanent traffic signal "turn-on."

The Contractor shall provide a representative from the Equipment Supplier's office to attend the traffic signal inspection for both permanent and temporary traffic signal "turn-ons." Signal indications being tested shall match the lane configurations and markings at the intersection. If any conflicting signal indications are visible to motorist or pedestrians while testing, the Contractor shall be responsible to provide police officer(s) to direct traffic.

Upon demonstration that the signals are operating properly according to the Contract and to the satisfaction of the Traffic Engineer, the Traffic Engineer will allow the signals to be placed in continuous operation. The Traffic Engineer will inspect the traffic signal installation, with the assistance of the Contractor, and provide a written "punch-list" of deficient items requiring completion. The Contractor shall complete all "punch-list" work within 30 calendar days of notification. If this work is not completed within 30 days, LCDOT reserves the right to have the work completed by others at the Contractor's expense. This cost will be in addition to Liquidated Damages for Untimely Work.

The Contractor shall furnish all equipment and/or parts to keep the traffic signal installation operating. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until LCDOT acceptance is granted.

When the Contractor has completed the "punch-list" work, he/she shall contact the Traffic Engineer to schedule a follow-up inspection of the traffic signal installation. If the Traffic Engineer determines that any "punch-list" items have not been completed, he may cancel the inspection, and the Contractor will need to reschedule.

It is possible that during any follow-up inspections of the traffic signal installation, deficient items may be identified that were not identified at the "turn-on" inspection, or included in the initial "punch-list". The Traffic Engineer shall advise the Contractor of any such items, and it shall be the Contractor's responsibility to complete these items prior to acceptance of the traffic signal.

Acceptance of the traffic signal by LCDOT shall be based on the inspection results and successful operation during a minimum 72-hour "burn-in" period following activation of the traffic signal and related equipment. Therefore, due to the required "burn-in" period, acceptance of the traffic signal shall not occur at the time of the "turn-on." Upon notification by the Contractor that all noted deficiencies have been corrected, and after the "burn-in" period, the Traffic Engineer shall perform an acceptance inspection of the traffic signal installation. If approved, the traffic signal acceptance shall be given verbally at the inspection, followed by written correspondence from the Traffic Engineer. The Agency that is responsible for the maintenance of each traffic signal installation will assume the traffic signal maintenance upon acceptance by the Traffic Engineer.

LCDOT requires the following Final Project Documentation from the Contractor prior to acceptance of the traffic signal. The documentation shall be provided in hard copy and electronic format as indicated below.

1. One copy (11"x17") and one electronic PDF file of as-built signal plans with field revisions marked in red.
2. One copy of the operation and service manuals for the signal controller and the associated control equipment.
3. Five copies (11"x17") and one electronic PDF file of the cabinet wiring diagrams.
4. Five copies and one electronic PDF file of the traffic signal installation cable log.
5. All manufacturer and Contractor warranties and guarantees required by Article 801.14 of the Standard Specifications.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements will be subject to removal and disposal at the Contractor's expense.

LOCATING UNDERGROUND FACILITIES

Revise Section 803 of the "Standard Specifications" to read:

Once the Contractor has taken maintenance of an existing County facility or has constructed underground facilities, they are responsible for locating the facilities according the J.U.L.I.E. requirements at no additional cost to the Contract.

Contractor requests for equipment locates will be granted only once prior to the start of construction. Additional requests shall be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any item(s) damaged during the construction, at his/her own expense.

Locate requests shall be directed to LCDOT's Traffic Signal Maintenance Contractor or to the LCDOT Traffic Engineering Department at **(847) 377-7000**.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities call J.U.L.I.E. at **1-800-892-0123**. The location of some utilities may require contacting other Agencies or Municipalities.

The Contractor should note that IDOT does not participate in J.U.L.I.E. Underground work that is proposed to take place within IDOT right-of-way requires the Contractor to contact IDOT for the procedures involved in locating their facilities.

RESTORATION OF WORK AREA

Add to Section 801 of the "Standard Specifications":

Restoration of the traffic signal work area shall be included in the related pay item including foundation, conduit, handhole, trench and backfill, etc. and no extra compensation shall be allowed. All roadway surfaces including shoulders, medians, sidewalks, pavement, etc. shall be restored to match the previously existing conditions. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded, according to Section 250 and Section 252 of the Standard Specifications respectively, except that Phosphorus fertilizer nutrient shall not be used on Lake County Highways or within Lake County right-of-way, and a knitted straw mat shall be applied to seeded areas, according to Article 1081.10 (b) of the Standard Specifications. Areas in front of residences are to restored within two weeks of the completion of work causing the disturbance regardless of the duration of the project remaining. The traffic signal work area includes any area where the Contractor or their subcontractors perform work to install, repair, or maintain County owned traffic, lighting, or PASSAGE equipment, regardless of the presence of an actual traffic signal.

CABINET NEATNESS AND WIRING

The Contractor shall ensure that all wiring and peripheral equipment in any new traffic signal cabinet is in a neat and orderly fashion that is acceptable to the Traffic Engineer. This applies to controller cabinets, master cabinets, railroad cabinets, communication cabinets, electrical service cabinets, or any other new cabinet called for in the project plans.

All conduit entrances into the cabinet shall be sealed with a pliable waterproof material. Electrical cables inside the cabinet shall be neatly trained along the base and back of the cabinet. Each conductor shall be connected individually to the proper terminal. The spare conductors shall be bound into a neat bundle. All cables, including those for signals, vehicle detection, pushbuttons, emergency vehicle preemption, video transmission, and communication shall be neatly arranged and bundled within the cabinet to the satisfaction of the Traffic Engineer. Each cable shall be marked with an identification number which corresponds to the number and description on the cabinet cable log.

When modernizing or modifying an existing cabinet, the new cables being installed shall be trained, bundled, and labeled to the satisfaction of the Traffic Engineer. When working inside an existing cabinet, the Contractor shall minimize disturbance to existing cables and cabinet wiring. Any existing cables and cabinet wiring disturbed by the Contractor shall be re-trained, bundled, and/or labeled to the satisfaction of the Traffic Engineer.

Unless indicated elsewhere in the plans and specs, all equipment in the cabinet shall be wired through the UPS except lighted street name signs and luminaires.

Components with Ethernet capabilities shall be connected to the Switch or other communications equipment in the cabinet as directed by the Traffic Engineer. All equipment, materials, labor and hardware, including Ethernet patch cables, required to provide cabinet neatness and wiring to the satisfaction of the Traffic Engineer shall be included in the applicable pay item for FULL ACTUATED CONTROLLER AND TYPE IV CABINET SPECIAL, FULL-ACTUATED CONTROLLER IN EXISTING CABINET, and/or MODIFY EXISTING CONTROLLER.

The County shall not accept maintenance of the traffic signal installations until the requirements of this specification are satisfied.

EQUIPMENT SUPPLIER AND VENDOR REPRESENTATION

The Traffic Engineer reserves the right to request a representative of the Equipment Supplier and/or Vendor be present at the activation of new traffic equipment. The traffic equipment may include signal heads, cabinets, controllers, amplifiers, preemption, detection, monitoring, communication/transmission, fiber-optic/telemetry, radio, microwave, infrared, illuminated signs, streetlights, push buttons, lighted crosswalks, uninterruptable power supplies, adaptive, counters, and any other new equipment being installed and activated. The representative shall be a qualified technician trained in the

proper installation and operation of the equipment being installed under the Contract or permit.

The Traffic Engineer reserves the right to cancel the “turn-on,” transfer, or other scheduled activity if, in their opinion, knowledgeable personnel from the Equipment Supplier or Vendor are not present. Rescheduling, and any associated costs, shall be the responsibility of the Contractor, and shall be subject to availability of LCDOT Traffic staff.

This provision is in addition to the requirement contained herein that the Contractor provide a representative from the Equipment Supplier to attend the traffic signal inspection for both permanent and temporary traffic signal “turn-on”.

Any costs associated with Equipment Supplier and/or Vendor representation shall be included in the unit price of the associated traffic equipment being activated. Any unforeseen costs incurred by the Contractor to provide this representation shall not be the responsibility of the County.

INTERRUPTION OF COMMUNICATION

The interruption of communication with County equipment shall be kept to an absolute minimum. Communication includes controller telemetry, video transmission, camera control signals, Highway Advisory Radio, wireless interconnect, telephone (POTS/ISDN/DSL), high speed Internet, cellular modem, or any other County communication equipment. This provision applies to cable types including copper, multimode fiber optic, singlemode fiber optic, telephone cables, Ethernet cables, or any other cable used by the County to monitor and maintain its various signal and ITS equipment.

The Contractor shall plan ahead, and shall stage their construction work accordingly, so that he/she can interrupt communication, and then restore communication, with as little down time as possible. For example, when a section of existing interconnect is being relocated, the new handholes and conduits should be installed prior to disconnecting the interconnect cable. The interconnect cable can then be disconnected, pulled out of the existing conduit, pulled through the new conduit, and re-connected. In addition, when an existing fiber optic cable is to be re-used, the Contractor shall be prepared to immediately replace any fiber splices and/or terminations that become damaged.

Prior to disconnecting any LCDOT communication link, the Contractor shall contact the Traffic Engineer for approval of their planned construction method.

PASSAGE SYSTEM SUPPORT

The LCDOT PASSAGE TMC staff are available to provide a limited amount of technical support to the Contractor between the hours of 8:00 AM and 4:30 PM. The Contractor may request the TMC staff provide configuration information, settings, and testing support, and other items approved by the Traffic Engineer. Due to the primary

responsibility of PASSAGE staff to maintain traffic flow in Lake County during peak hours, requests that require LCDOT support after 4:30 PM may not be honored until the next business day. Extensions to the Contract working days or completion date will not be authorized solely due to requests for support that do not meet these requirements.

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM

Effective: May 22, 2002

Revised: November 1, 2023

800.03TS

Description.

This work shall consist of re-optimizing a traffic signal system according to the following Levels of work.

LEVEL I applies when improvements are made to an existing signalized intersection within an existing traffic signal system. The purpose of this work is to integrate the improvements to the subject intersection into the signal system while minimizing the impacts to the existing system operation. This type of work would be commonly associated with the addition of signal phases, pedestrian phases, or improvements that do not affect the capacity at an intersection.

LEVEL II applies when improvements are made to an existing signalized intersection within an existing traffic signal system and detailed analysis of the intersection operation is desired by the engineer, or when a new signalized or existing signalized intersection is being added to an existing system, but optimization of the entire system is not required. The purpose of this work is to optimize the subject intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the Traffic Responsive Program (TRP).

For the purposes of re-optimization work, an intersection shall include all traffic movements operated by the subject controller and cabinet.

After the signal improvements are completed, the signal shall be re-optimized as specified by an approved Consultant who has previous experience in optimizing traffic signal systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4734 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, timing patterns, and SCAT Report may be obtained from the Department, if available and as appropriate. The Consultant shall confer with the Area Traffic Signal Maintenance and Operations Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
 - a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
 - b. Proposed signal timing plan for the modified intersection(s) shall be forwarded to IDOT for review prior to implementation.
 - c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations. The consultant shall respond to IDOT comments and public complaints for a minimum period of six (6) months from date of timing plan implementation.
2. The following deliverable shall be provided for LEVEL I Re-Optimization.
 - a. Consultant shall furnish to IDOT a cover letter describing the extent of the re-optimization work performed.

(b) LEVEL II Re-Optimization

1. In addition to the requirements described in the LEVEL I Re-Optimization above, the following tasks are associated with LEVEL II Re-Optimization.
 - a. Traffic counts shall be taken at the subject intersection(s) after the traffic signals are approved for operation by the Area Traffic Signal Maintenance and Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday and on a Saturday and/or Sunday, as directed by the Engineer, to account for special traffic generators such as shopping centers, educational institutes and special event facilities. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.
 - b. The intersections shall be re-addressed and all system detectors reassigned as necessary according to the current standard practice of District One. System detector quantities and locations shall be assessed for optimal performance. The Department shall be notified of any proposed changes.

- c. TRP operation shall be evaluated to verify proper pattern selection and lack of oscillation and a report of the operation shall be provided to IDOT.
2. The following deliverables shall be provided for LEVEL II Re-Optimization.
- a. Consultant shall provide to IDOT one (1) USB flash drive for the optimized system containing the following:
 - (1) Electronic copy of the technical memorandum in PDF format
 - (2) Revised Synchro (or other appropriate, approved optimization software) files including the new signal and the rest of the signals in the system
 - (3) Traffic counts conducted at the subject intersection(s)

The flash drive shall be labeled with the IDOT system number and master location (if applicable), as well as the submittal date and the consultant logo.

- b. The technical memorandum shall include the following elements:
 - (1) Brief description of the project
 - (2) Analysis output from Synchro (or other appropriate, approved optimization software file)
 - (3) Traffic counts conducted at the subject intersection(s)

Basis of Payment.

This work shall be paid for at the contract unit price each for RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL I or RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL II, which price shall be payment in full for performing all work described herein per intersection. Following completion of the timings and submittal of the specified deliverables, 100 percent of the bid price will be paid. Each intersection will be paid for separately.

XX006052 SANITARY SEWER REMOVAL (SPECIAL)

Description: This work consists of the removal and disposal of asbestos-cement (Transite) sanitary sewer owned by the Lake County Public Works Department (LCPWD). All work shall be done in accordance with the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), and as outlined herein.

The work involved in the removal and disposal of friable or non-friable asbestos done prior to executing any sanitary sewer work shall be performed by a qualified Contractor or Sub-Contractor. The Contractor shall provide a shipping manifest to the Engineer for the disposal of all asbestos containing material wastes.

The work shall include sawcutting, and removal and disposal of existing pavement; protection, repair or replacement of utilities; excavation; removal and disposal of waste excavated material; trench dewatering, including erosion and sedimentation control; watertight connections to existing pipes or structures; installation of pipe; bracing, bedding and covering of pipe; granular trench backfill material at pipe crossing and below all pavement; and cleanup. Trench Backfill material shall be per Section 208 of the SSRBC.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. All other permits required by other federal, state, or local agencies for carrying on the work will be the responsibility of the Contractor. Copies of these permits must be sent to the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the agencies listed below at least 10 days prior to commencement of any asbestos removal or demolition activity.

- A. Asbestos Demolition/Renovation Coordinator Illinois Environmental Protection Agency Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217)785-1743
- B. U. S. Environmental Protection Agency Air Compliance Branch
77 W. Jackson Blvd.
Chicago, Illinois 60604
Attention: Asbestos Coordinator

Notices must be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent

Submittals: All submittals and notices shall be made to the Engineer except where otherwise specified herein.

Submittals that shall be made prior to start of work:

Submittals required under Asbestos Abatement Experience.

Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.

Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.

Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.

Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).

Information about vehicles and equipment utilized for transport of material designated for disposal shall be submitted. This should include methods for restricting loose fibers from being released during travel.

Submit a list of penalties, including liquidated damages, incurred through noncompliance with asbestos abatement project specifications.

Submit a project specific Health and Safety plan for the removal operations. The Health and Safety Plan must be approved and signed by sub-contractor and Contractor personnel and shall be provided to the Engineer prior to commencing site work activities. The Contractor shall be and remain liable for compliance by its employees, agents and subcontractors with the Contractor's Health and Safety Plan and procedures for the site and shall hold Engineer and Department harmless from all claims, damages, suits, losses and expenses in any way arising from non-compliance with the Health and Safety Plan.

The Health and Safety Plan shall address personal protection from asbestos fiber releases during asbestos abatement.

Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan must be submitted to the Engineer prior to the start of work.

Submit proof of written notification and compliance with Paragraph "Notifications."

Submittals that shall be made upon completion of abatement work:

Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;

Submit daily copies of work site entry logbooks with information on worker and visitor access;

Submit logs documenting filter changes on respirators. HEPA vacuums, negative pressure ventilation units, and other engineering controls; and

Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance: The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.

The Contractor shall document current Workmen's Compensation Insurance coverage. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience: Prior to start of work, the Contractor shall supply evidence that they have been qualified with the State of Illinois and that they have been included on the Illinois Department of Public Health's list of approved Contractors for asbestos abatement.

Personnel Experience: For Superintendent, the Contractor shall supply evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion must be provided to the Engineer prior to the start of work.

Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact,

phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.

The superintendent shall be thoroughly familiar with and experienced at asbestos abatement, characterization, bulking, transportation, and disposal activities and other related work, and shall be familiar with and shall enforce the use of all applicable safety procedures and equipment. The Supervisor shall be knowledgeable of, and enforce, all applicable, USEPA, IEPA, and OSHA requirements and guidelines.

For Workers involved in the Removal of Friable and Nonfriable Asbestos the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion must be provided to all employees who will be working on this project.

Workers shall be familiar with and experienced at asbestos abatement, characterization, bulking, transportation, and disposal activities and other related work; and Asbestos Workers shall be familiar with the use of applicable safety procedures and equipment.

Abatement Air Monitoring: The Contractor shall comply with the following:

Personal Monitoring: All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted in accordance with 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits will be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.

Contained Work Areas for Removal of Friable Asbestos

Area samples shall be collected for the department within the work area daily. A minimum of one sample shall be taken outside of the abatement area removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

Air Monitoring Professional: All air sampling will be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional must submit documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 – “Sampling and Evaluating Airborne Asbestos Dust”.

Air Sampling will be conducted in accordance with NIOSH Method 7400. The results of these tests will be provided to the Engineer within 24 hours of the collection of air samples.

Method of Measurement and Basis of Payment. The work shall be measured and paid for per LINEAL FOOT for SANITARY SEWER REMOVAL (SPECIAL), measured

along the centerline of the pipe, of the size indicated. This item shall cover the removal of all material types of sanitary sewer, and include backfill (Trench Backfill as necessary).

XX400216 LAYER II (DATALINK) SWITCH (LCDOT)

Effective: October 1, 2016
Revised: August 1, 2025
LC801.01

Description: This work shall consist of furnishing and installing a Layer II (Datalink) Switch used to transmit data from one traffic signal cabinet to another traffic signal cabinet containing a Layer II switch or a Layer III (Network) switch.

Materials: The Layer II (Datalink) Switch shall be one of the following approved models and shall include all required SFP modules.

- Cisco IE-3100-82TC-E Industrial Ethernet Switch
- Antaira LMX-1202G-SFP-T

The PASSAGE integration consultant shall configure and integrate the Layer II switch into the County's communication network.

General: The Layer II switch and its power supply shall be installed on either a standard DIN rail or an equipment mounting channel inside the cabinet. The power supply shall connect to the cabinet's power source, either hard-wired or plugged into an available outlet, as determined by the electrical infrastructure inside the traffic signal cabinet.

Basis of Payment: This item will be paid for at the contract unit price each for LAYER II (DATALINK) SWITCH. The unit price shall include all equipment, materials, and labor required to furnish and install the switch, including all necessary connectors, cables, fiber optic jumpers, hardware, software, and other peripheral equipment required to place the switch in operation to the satisfaction of the Traffic Engineer.

X1400326 RECTANGULAR RAPID FLASHING BEACON ASSEMBLY
(COMPLETE) (LCDOT)

Effective: June 1, 2018
Revised: May 1, 2026
LC801.20

Description: This work shall consist of furnishing and installing the Rectangular Rapid Flashing Beacon (RRFB) Assembly complete with RRFB indications; power supply; traffic signal post; foundation; pedestrian push button; warning signs and plaques; controller and cabinet; and wireless communication equipment as shown on the plans and/or as specified by the Engineer. All equipment and hardware required to mount the RRFB and associated equipment to the assembly shall be included in the unit cost of this item.

Materials: All components shall be manufactured and assembled as a complete system and consist of the following:

Rectangular Rapid Flashing Beacon: Each RRFB assembly shall satisfy the 11th Edition of the Manual on Uniform Traffic Control Devices (MUTCD), Chapter 4L, including the unit size, mounting location, flash pattern, and operational parameters unless modified herein by this special provision. A single RRFB light bar shall consist of two LED-array indications, each at least 5 inches wide by at least 2 inches high, with a minimum spacing between the two indications of at least 7 inches, and a far-side indicator mounted on the end. Each RRFB Assembly (Complete) shall include two light bars, one mounted on either side of the traffic signal post. The RRFB shall be visible at least 1,000 feet in advance of the crossing during the day. If the RRFB indications are so bright that they cause excessive glare at nighttime, an automatic signal dimming device may be used to reduce the brilliance of the RRFB at night. The flash duration shall be adjustable in 1-second increments. The RRFB shall have an operating temperature meeting NEMA specifications.

Power Supply: The installation may be either of an external power supply or solar powered.

- A. External Power Supply: If used, the external power supply shall meet the following sections of the "Standard Specifications" and the LCDOT Traffic Signal Special Provisions except as modified herein:
 - Section 805, Electrical Service Installation-Traffic Signals
 - Section 806, Grounding
 - Section 810, Underground Raceways
 - Section 870, Multi-Conductor Power Cable
 - Section 873, Electric Cable
- B. Solar Power Supply: If used, the solar power supply shall be easy to

install, fully self-contained, weather-resistant, corrosion-resistant, and vandal-resistant, with a UV-resistant solar panel. The batteries shall be sealed, maintenance-free, and field-replaceable independently of other components. The battery pack shall have a minimum rated lifespan of three years. The power supply system shall have the capacity to operate the RRFB for 30 days at a normal use of 400 activations of 30 seconds per day without solar charging. The RRFB shall have an automatic light control to provide useful light during extreme conditions that prevent charging for an extended period of time. The manufacturer shall provide documentation for each installation consisting of solar power calculations to verify load, duty cycle, and battery capacity based on location.

The solar panel shall be installed at the highest point on the assembly structure, or as directed by the Engineer, and away from the travelled way. The solar panel shall be installed at an angle specified by the manufacturer facing due south, with a full unobstructed solar exposure for optimum performance of the system, or as directed by the Engineer.

Controller: The RRFB controller shall meet the requirements of Section 858 of the “Standard Specifications” and the LCDOT Traffic Signal Special Provisions except where modified herein:

- A. Power Options: The controller unit shall be available in both solar-powered and AC-powered options.
- B. Controller to Controller Communication: At each location, all installed RRFB assemblies shall communicate wirelessly using an unlicensed radio band and shall comply with FCC requirements. This communication shall ensure that all RRFB indications at the location start and stop simultaneously. The vendor representative shall field test the equipment prior to placing the units in operation. Up to 10 optional RF channels shall be available to allow multiple RRFB Systems to operate within close proximity of each other.
- C. Timing: The controller shall provide the full programmed timing upon all push button activations.

Traffic Signal Post: The traffic signal post shall meet the requirements of Section 875 of the “Standard Specifications” and the LCDOT Traffic Signal Special Provisions for traffic signal post or traffic signal post, special, as shown on the plans.

Foundation: The traffic signal post foundation may be either concrete or metal.

- A. Concrete Foundation: If used, the concrete foundation shall meet the requirements of Section 878 of the “Standard Specifications” and the LCDOT Traffic Signal Special Provisions.
- B. Light Pole Foundation Metal: If used, the metal foundation shall meet the

requirements of Section 836 of the "Standard Specifications".

Pedestrian Push Button: The pedestrian push button shall be an Audible Information Device (AID) and shall meet the requirements of the LCDOT Special Provision for Accessible Pedestrian Signal (APS). Upon activation, the AID shall play an audible speech message, "Warning lights are flashing", twice. The AID shall not use vibrotactile or percussive indications.

Beacon Flashing Requirements: When activated, the RRFB shall flash in accordance with the 11th Edition of the MUTCD, Section 4L.03, Paragraphs 06 through 08. The RRFB shall be rated for Class I light intensity output according to the Society of Automotive Engineers (SAE) Standard J595 with a 15-year life expectancy.

Signs: Each RRFB assembly shall include two crossing signs, two diagonal downward-pointing arrow plaques, mounted back-to-back, and an R10-25 push button sign mounted above the pedestrian push button. All signs shall be fabricated and mounted according to LCDOT Standard Detail LC8502, Rectangular Rapid Flashing Beacon (RRFB) System. All signs shall meet the latest requirements of the MUTCD. The signs shall have brackets and sign channels that are equal to and completely interchangeable with those used by the LCDOT Sign Shop. The Signfix Aluminum Channel Framing System is currently recommended, but other brands of mounting hardware are acceptable based on the County's approval.

Warranty: All materials shall be warranted for three years from the date of acceptance or turn on by the LCDOT Traffic Department.

Installation: The RRFB Assembly (Complete) shall be installed strictly according to the manufacturer's recommendations, the applicable portions of the "Standard Specifications" and the LCDOT Traffic Signal Special Provision as modified herein, as shown on the Plans, and/or as directed by the Engineer.

The final elevation and location of the beacons shall be approved by the Engineer prior to the Contractor beginning work.

Basis of Payment: This work will be paid at the contract unit price for each RECTANGULAR RAPID FLASHING BEACON ASSEMBLY (COMPLETE). The unit price shall include all labor, equipment, materials and documentation required to furnish and install the RRFB assembly complete with power supply; traffic signal post; foundation; pedestrian push button; warning signs and plaques; controller and cabinet; wireless communication equipment; and mounting hardware.

SERVICE INSTALLATION (TRAFFIC SIGNALS)

Effective: May 22, 2002

Revised: March 1, 2024

805.01TS

Revise Section 805 of the Standard Specifications to read:

Description.

This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

General.

The electric service installation shall be the electric service disconnecting means and it shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of Contract preparation. The Contractor must request in writing for service and/or service modification within ten (10) days of Contract award and must follow-up with the electric utility to assure all necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the Contractor and utility company to the Engineer and Area Traffic Signal Maintenance and Operations Engineer. The service agreement and sketch shall be submitted for signature to the IDOT's Traffic Operations Programs Engineer.

Materials.

General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.

Enclosures.

Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080 in. (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14 in. (350 mm) high, 9 in. (225 mm) wide and 8 in. (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the Vendor.

Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125 in. (3.175 mm) thick, the top 0.250 in. (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075 in. (1.91 mm) thick hinge bolted to the cabinet with stainless steel carriage bolts and nylock nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40 in. (1000 mm) high, 16 in. (400 mm) wide and 15 in. (375 mm) in depth is required. The cabinet shall be mounted upon a Type A concrete foundation as indicated on the plans. The foundation is paid for separately.

All enclosures shall include a green external power indicator LED light with circuitry as shown in the Electrical Service-Panel Diagram detail sheet. For pole mounted service enclosures, the power indicator light shall be mounted as shown in the detail. For ground mounted enclosures, the power indicator light shall be mounted on the side of the enclosure most visible from the major roadway.

Electric Utility Meter Housing and Riser. The electric meter housing and meter socket shall be supplied and installed by the Contractor. The Contractor is to coordinate the work to be performed and the materials required with the utility company to make the final connection at the power source. Electric utility required risers, weather/service head, and any other materials necessary for connection shall also be included in the pay item. Materials shall be in accordance with the electric utility's requirements. For ground-mounted service, the electric utility meter housing shall be mounted to the enclosure. The meter shall be supplied by the utility company.

Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120 V load circuit by the means MOV and thermal fusing technology. The response time shall be < 5 ns and operate within a range of -40°C to +85°C. The surge protector shall be UL 1449 Listed.

Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 V circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 A, 120 V and the auxiliary circuit breakers shall be rated 10 A, 120 V.

Fuses and Fuseholders. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 VAC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage.

Ground and Neutral Bus Bars. A single copper ground and neutral bus bar, mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.

Utility Services Connection. The Contractor shall notify the utility company marketing representative a minimum of thirty (30) working days prior to the anticipated date of hook-up. This 30-day advance notification will begin only after the utility company marketing representative has received service charge payments from the Contractor. Prior to contacting the utility company marketing representative for service connection, the service installation controller cabinet and cable must be installed for inspection by the utility company.

Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10 ft (3.0m) in length, and 3/4 in. (20mm) in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the Contract.

Installation.

General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the Engineer prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.

Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.

Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment.

The service installation shall be paid for at the Contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The CONCRETE FOUNDATION, TYPE A, which includes the ground rod, shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4 in. (20mm) grounding conduit, ground rod, and pole mount assembly. Any charges by the utility companies shall be approved by the

Engineer and paid for as an addition to the Contract according to Article 109.05 of the Standard Specifications.

UNDERGROUND RACEWAYS

Effective: May 22, 2002

Revised: March 1, 2024

810.02TS

Revise Article 810.04 of the Standard Specifications to read:

“Installation. All underground conduits shall have a minimum depth of 30 in. (700 mm) below the finished grade and shall be installed to avoid existing and proposed utilities within the project limits.”

Add the following to Article 810.04 of the Standard Specifications:

“All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans.”

All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum of 1 ft (300 mm) or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped.

The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap.

The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 1/8 in. (3 mm) thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring.”

HANDHOLES

Effective: January 01, 2002

Revised: November 1, 2023

814.01TS

Description.

Add the following to Section 814 of the Standard Specifications:

All conduits shall enter the handhole at a depth of 30 in. (762 mm) except for the conduits for detector loops when the handhole is less than 5 ft (1.52 m) from the detector loop. All conduit ends should be sealed with a waterproof sealant to prevent the entrance of contaminants into the handhole.

Steel cable hooks shall be epoxy coated and must meet the specifications set forth in 1006.10. Hooks shall be a minimum of 5/8 in. (16 mm) diameter with 90-degree bend and extend into the handhole at least 6 in. (152 mm). Hooks shall be placed a minimum of 12 in. (305 mm) below the lid or lower if additional space is required.

Precast round handholes shall not be used unless called out on the plans.

The cover of the handhole frame shall be labeled "Traffic Signals" with legible raised letters. Only handholes serving IDOT traffic signal equipment shall have this label. Handhole covers for Red Light Running Cameras shall be labeled "RLRC".

Revise the third paragraph of Article 814.03 of the Standard Specifications to read:

"Handholes shall be constructed as shown on the plans and shall be cast-in-place or precast concrete units. Heavy duty handholes shall be either cast-in-place or precast concrete units."

Revise Article 814.03(c) of the Standard Specifications to read:

"Precast Concrete. Precast concrete handholes shall be fabricated according to Article 1042.17. Where a handhole is contiguous to a sidewalk, preformed joint filler of 1/2 in. (13 mm) thickness shall be placed between the handhole and the sidewalk."

Add the following to Section 814 of the Standard Specifications:

Cast-In-Place Handholes.

All cast-in-place handholes shall be concrete with minimum inside dimensions of 21-1/2 in. (546 mm). Frames and lid openings shall match this dimension.

For grounding purposes, the handhole frame shall have provisions for a 7/16 in. (11 mm) diameter stainless steel bolt cast into the frame. The covers shall have a stainless steel threaded stint extended from the eye hook assembly for the purpose of attaching the grounding conductor to the handhole cover.

The minimum wall thickness for heavy duty hand holes shall be 1 ft (305mm).

Precast Round Handholes.

All precast handholes shall be concrete with an inside diameter of 30 in. (762mm). Frames and covers shall have a minimum opening of 26 in. (660mm) and no larger than the inside diameter of the handhole.

For grounding purposes, the handhole frame shall have provisions for a 7/16 in. (11 mm) diameter stainless steel bolt cast into the frame. For the purpose of attaching the grounding conductor to the handhole cover, the covers shall either have a 7/16 in. (11 mm) diameter stainless steel bolt cast into the cover or a stainless steel threaded stint extended from an eye hook assembly. A hole may be drilled for the bolt if one cannot be cast into the frame or cover. The head of the bolt shall be flush or lower than the top surface of the cover.

The minimum wall thickness for precast heavy duty hand holes shall be 6 in. (152 mm).

Precast round handholes shall be only produced by an approved precast vendor.

FIBER OPTIC TRACER CABLE

Effective: May 22, 2002

Revised: November 1, 2023

817.02TS

The cable shall meet the requirements of Section 817 of the Standard Specifications, except for the following:

Add the following to Article 817.03 of the Standard Specifications:

“In order to trace the fiber optic cable after installation, the tracer cable shall be installed in the same conduit as the fiber optic cable in locations shown on the plans. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a barrier type terminal strip mounted on the side wall of the controller cabinet. The barrier type terminal strip and tracer cable shall be clearly marked and identified. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable will be allowed to be spliced at handholes only. The tracer cable splice shall use a Western Union Splice soldered with resin core flux and shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. All exposed surfaces of the solder shall be smooth. The splice shall be covered with a black shrink tube meeting UL 224 guidelines, Type V and rated 600V, minimum length 4 in. (100 mm) and with a minimum 1 in. (25 mm) coverage over the XLP insulation, underwater grade.”

Revise Article 817.05 of the Standard Specifications to read:

“Basis of Payment. The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C per foot (meter), which price shall include all associated labor and material for installation.”

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION (LCDOT)

Effective: October 1, 2016

Revised:

LC850.01

Description: This work shall consist of maintaining an existing traffic signal installation that has been designated to remain in operation during construction.

General: This work will be performed according to Section 850 of the “Standard Specifications” and the following:

Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the contract or any portion thereof.

The Contractor shall have electricians on staff with IMSA Level II certification to provide signal maintenance.

This item shall include maintenance of all traffic signal equipment at the intersection, including cameras, emergency vehicle pre-emption equipment, traffic counters, detection equipment, traffic signal control equipment, terminal servers, media converters, transit signal priority equipment, flashing beacons, uninterruptable power supply (UPS) and batteries, handholes, lighted signs, radios, modems, master controllers, telephone service installations, communication equipment, communication cables, conduits to adjacent intersections, and other traffic signal equipment.

Video encoders, layer II and layer III switches will be maintained by the County’s PASSAGE Consultant. The Contractor shall provide cabinet access to the PASSAGE Consultant as necessary to maintain communications on the PASSAGE network. Power supplies for encoders and switches shall be furnished by LCDOT. Any electrical work necessary to troubleshoot or replace power supplies shall be performed by the Contractor.

The Contractor will not be required to pay the energy charges for the operation of the existing traffic signal installation.

Maintenance will not include Automatic Traffic Enforcement equipment, e.g. red light enforcement cameras, detectors, or peripheral equipment. This equipment is operated and maintained by the local municipality and should be de-activated while the traffic signal is on Contractor maintenance.

The Contractor shall check all controllers every month, which will include opening the cabinet door and visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. This item includes all portions of

the emergency vehicle pre-emption system. The Contractor shall not clear equipment log buffers. The Contractor shall at all times maintain in stock a sufficient amount of materials and equipment to provide effective temporary and permanent repairs.

The Contractor shall provide immediate corrective action when any part of the system fails to function properly. Two far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash **RED** for all directions unless a different indication has been specified by the Traffic Engineer. When the signal is flashing **RED** or when the power is out, the Contractor shall be required to place at least 1 STOP sign (R1-1-36) meeting MUTCD requirements at each approach of the intersection as a temporary means of regulating traffic according to the Repair Timetable in the project special provisions. At approaches where a yellow flashing indication is directed by the Traffic Engineer, STOP signs will not be required. The Contractor shall maintain a sufficient number of STOP signs for all the signals under the Contractor's maintenance and have enough spare STOP signs in stock at all times to replace those which may be damaged or stolen.

The Contractor shall provide the Engineer with a 24-hour telephone number for traffic signal maintenance. The Contractor, or his representative, shall be available on a 24-hour basis to respond to emergency calls by the Engineer, Traffic Engineer or other parties.

Traffic signal equipment which is lost or not returned to the County for any reason shall be replaced with new equipment meeting the requirements of the project special provisions and "Standard Specifications", or in the absence of applicable specifications, meeting the requirements of the Traffic Engineer.

The Contractor shall respond to all emergency calls from the County or others according to the Repair Timetable and provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the County. The Contractor may initiate action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition or if the Engineer or Traffic Engineer cannot contact the Contractor's designated personnel, the Traffic Engineer shall have the County's Traffic Signal Maintenance Contractor perform the required maintenance work. The County's Traffic Signal Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within 30 days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the County's Traffic Signal Maintenance Contractor to open the

cabinet and review the operation of the existing traffic signal installation that has been transferred to the Contractor for maintenance.

The Traffic Engineer may require the Contractor to transfer maintenance of a signal back to the County's Traffic Signal Maintenance Contractor (or other electrical contractor) for a short time. This may become necessary due to other signal projects in the area, or if the County needs to perform work at the signal. Any costs incurred by the Contractor for maintenance transfer inspections of this type shall be included in cost of pay item MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

Any proposed activity in the vicinity of a highway-rail grade crossing shall adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Traffic Engineer.

Basis of Payment: This work shall be paid for at the Contract unit price each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION. Each intersection will be paid for separately.

UNINTERRUPTABLE POWER SUPPLY, SPECIAL

Effective: January 1, 2013
Revised: March 1, 2024
862.01TS

This work shall be in accordance with section 862 of the Standard Specification except as modified herein.

Add the following to Article 862.01 of the Standard Specifications:

“The UPS shall have the power capacity to provide normal operation of a signalized intersection that utilizes all LED type signal head optics for a minimum of six (6) hours.”

Add the following to Article 862.02 of the Standard Specifications:

“Materials shall be according to Article 1074.04 as modified in UNINTERRUPTABLE POWER SUPPLY, SPECIAL.”

Add the following to Article 862.03 of the Standard Specifications:

“The UPS shall additionally include, but not be limited to, a battery cabinet, where applicable. For Super P and Super R cabinets, the battery cabinet is integrated to the traffic signal cabinet and shall be included in the cost for the traffic signal cabinet of the size and type indicated on the plans.”

Revise Article 862.04 of the Standard Specifications to read:

Installation.

When a UPS is installed at an existing traffic signal cabinet, the UPS cabinet shall partially rest on the lip of the existing controller cabinet foundation and be secured to the existing controller cabinet by means of at least four (4) stainless steel bolts. The UPS cabinet shall be completely enclosed with the bottom and back constructed of the same material as the cabinet.

When a UPS is installed at a new signal cabinet and foundation, it shall be mounted as shown on the plans.

At locations where UPS is installed and an emergency vehicle priority system is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the Contract. A concrete apron shall be

provided and be in accordance with Articles 424 and 202 of the Standard Specifications. The concrete apron shall also follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet.

For a ground mounted UPS, the UPS shall be mounted on its own Type A concrete foundation which will be paid for separately. A concrete apron shall be provided with a dimension of 36 in. in front of the UPS cabinet, 5 in. deep, and a width sized appropriately to the width of the concrete foundation. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the UPS including the addition of alarms.

Materials.

Revise Article 1074.04(a)(1) of the Standard Specifications to read:

“The UPS shall be line interactive or double conversion and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection(s) normal traffic signal operating load. The UPS must be able to maintain the intersection’s normal operating load plus 20 percent of the intersection’s normal operating load. When installed at a railroad-interconnected intersection, the UPS must maintain the railroad preemption load, plus 20 percent of the railroad preemption-operating load. The total connected traffic signal load shall not exceed the published ratings for the UPS. The UPS shall provide a minimum of six (6) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 1000 W active output capacity, with 86 percent minimum inverter efficiency).”

Revise the first paragraph of Article 1074.04(a)(3) of the Standard Specifications to read:

“The UPS shall have a minimum of four (4) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.”

Revise Article 1074.04(a)(17) of the Standard Specifications to read:

“When the intersection is in battery backup mode, the UPS shall bypass all internal cabinet lights, ventilation fans, cabinet heaters, service receptacles, luminaires, any lighted street name signs, any automated enforcement equipment and any other devices directed by the Engineer.”

Revise Article 1074.04(b)(2) paragraph “b.” of the Standard Specifications to read:

“Batteries, inverter/charger and power transfer relay shall be housed in a separate NEMA Type 3R cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125 in. thick and have a natural mill finish.”

Revise Article 1074.04(b)(2) paragraph “c.” of the Standard Specifications to read:

“No more than three (3) batteries shall be mounted on individual shelves for a cabinet housing six batteries and no more than four (4) batteries per shelf for a cabinet housing eight batteries.”

Revise Article 1074.04(b)(2) paragraph “e.” of the Standard Specifications to read:

“The battery cabinet housing shall have the following nominal outside dimensions: a width of 25 in. (785 mm), a depth of 16 in. (440 mm), and a height of 41 to 48 in. (1.1 to 1.3 m). Clearance between shelves shall be a minimum of 10 in. (250 mm).”

Revise Article 1074.04(b)(2) paragraph “g.” of the Standard Specifications to read:

“The door shall open to the entire cabinet, have a neoprene gasket, an Aluminum continuous piano hinge with stainless steel pin, and a three point locking system. The door shall be equipped with a two position doorstop, one a 90° and one at 120°. The cabinet shall be provided with a main door lock which shall operate with a traffic industry conventional No. 2 key. Provisions for padlocking the door shall be provided.”

Add the following to Article 1074.04(b)(2) of the Standard Specifications:

- j. The battery cabinet shall have provisions for an external generator connection.

Add the following to Article 1074.04(c) of the Standard Specifications:

- (8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.
- (9) The UPS shall include standard RS-232 and internal Ethernet interface.
- (10) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate. Access to the generator inlet shall be from a

secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

- (11) The bypass switch shall include an internal power transfer relay that allows removal of the battery back-up unit, while the traffic signal is connected to utility power, without impacting normal traffic signal operation.

Revise Article 1074.04(d)(3) of the Standard Specifications to read:

“All batteries supplied in the UPS shall be either gel cell or AGM type, deep cycle, completely sealed, prismatic lead calcium based, silver alloy, valve regulated lead acid (VRLA) requiring no maintenance. All batteries in a UPS installation shall be the same type; mixing of gel cell and AGM types within a UPS installation is not permitted.”

Revise Article 1074.04(d)(4) of the Standard Specifications to read:

“Batteries shall be certified by the manufacturer to operate over a temperature range of -13°F to 160 °F (-25°C to 71 °C) for gel cell batteries and -40°F to 140°F (-40°C to 60 °C) for AGM type batteries.”

Add the following to Article 1074.04(d) of the Standard Specifications:

- (9) The UPS shall consist of an even number of batteries that are capable of maintaining normal operation of the signalized intersection for a minimum of six (6) hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of four (4) batteries shall be provided.

- (10) Battery heater mats shall be provided when gel cell type batteries are supplied.

Add the following to Article 1074.04 of the Standard Specifications:

- (e) Warranty. The warranty for an uninterruptable power supply (UPS) and batteries (full replacement) shall cover a minimum of five (5) years from date the equipment is placed in operation.
- (f) Installation. Bypass switch shall completely disconnect the traffic signal cabinet from the utility provider.
- (g) The UPS shall be set-up to run the traffic signal continuously without going to a red flashing condition when switched to battery power unless otherwise directed by the Engineer. The Contractor shall confirm set-up with the Engineer. The continuous operation mode when switched to battery may

require modification to unit connections and these modifications are included in the unit price for this item.

Revise Article 862.04 of the Standard Specifications to read:

Basis of Payment.

This work will be paid for at the Contract unit price per each for UNINTERRUPTABLE POWER SUPPLY, SPECIAL, UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED, or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL. Replacement of emergency vehicle priority system confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, SPECIAL, UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED, or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item. The concrete apron and earth excavation required shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item.

X8710074 UNDERGROUND FIBER OPTIC SPLICE CLOSURE, WATERTIGHT

This work shall consist of furnishing and installing a watertight fiber optic splice enclosure in a handhole as shown on the plans and/or as directed by the Traffic Engineer.

The fiber optic splice enclosure shall be a single-ended, round, mid-size closure with 6 cable entry ports, 6 cable attachments included, no splice trays installed at the factory, standard size slack basket, 3 ground feed-through lugs, and a valve for flash testing.

All splices shall be secured in splice trays within the fiber optic splice enclosure, and all individual splice trays shall be labeled.

The Contractor shall prepare the fibers, seal, and install the enclosure in accordance with the enclosure and cable manufacturer's recommended guidelines and installation practices.

After the underground fiber optic splice enclosure has been sealed and made watertight, the contractor shall secure the splice enclosure to the side of the handhole using cable support brackets. All cables shall be properly dressed and secured to rails or racks within the handhole. No cables or enclosures shall lie on the floor of the handhole. Care shall be taken not to crush or kink the fiber optic cable.

Basis of Payment This work shall be paid for at the contract unit price per each for UNDERGROUND FIBER OPTIC SPLICE CLOSURE, WATERTIGHT. The unit price shall include all equipment; materials; watertight enclosure; fiber optic splice trays; support brackets, and labor required to install the fiber optic splice enclosure at the location shown on the plans. The fusion splices inside the enclosure shall be paid for separately as part of FIBER OPTIC CABLE, PRE- TERMINATED FIBER OPTIC CABLE, or SPLICE FIBER OPTIC CABLE.

LUMINAIRE SHIELD

Effective: May 1, 2024

Description: This item shall consist of providing a luminaire shield as specified herein and as indicated in the plans.

Materials. Materials shall be according to the following:

The shield shall be made of aluminum and compatible with luminaire it is to be installed on.

The shield shall limit the light directed to the sides and above/below the luminaire, and the house side shield is intended to limit the light directed directly behind the luminaire.

The shield shall be installable in 4 different positions: 0°, 90°, 180°, and 270°.

CONSTRUCTION REQUIREMENTS

General. The shield shall be installed as instructed by the manufacturer and indicated in the plan details.

Basis of Payment: This work shall be paid for at the contract price each for LUMINAIRE SHIELD, which shall be payment for the work as described herein and as indicated in the plans.

ELECTRIC CABLE (IDOT)

Effective: May 22, 2002

Revised: July 1, 2015

873.01TS

Delete “or stranded, and No. 12 or” from the last sentence of Article 1076.04 (a) of the Standard Specifications.

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

ELECTRIC CABLE (LCDOT)

Effective: October 1, 2016

Revised: October 1, 2017

LC873.01

Description: This work shall consist of furnishing and installing an electric cable of the type, size and number of conductors specified.

Materials: The electric cable shall meet the requirements of Article 1076.04 of the "Standard Specifications" and the following:

- Signal Cable: The conductors for signal cable shall be limited to No. 14 AWG solid copper.
- Service Cable: The service cable may be either single or multiple conductor cable.
- The electric service cable shall have an XLP jacket.
- All other cable jackets shall be polyvinyl chloride, meeting the requirements of IMSA 19-1 or IMSA 20-1.
- The jacket color for signal cable shall be black.
- The jacket color for lead-in and communications cable shall be gray.
- All cabling between the signal cabinet and the signal heads shall be solid copper, not multi-stranded.
- Heat shrink splices shall be used according to the District 1 "Standard Traffic Signal Design Details" as shown on the plans.

General: This work shall be performed according to Section 873 of the "Standard Specifications".

Method of Measurement: Electric Cable will be measured for payment in feet according to Article 873.05 of the "Standard Specifications".

Basis of Payment: This work will be paid for at the contract unit price per foot for ELECTRIC CABLE, of the method of installation (IN TRENCH, IN CONDUIT, or AERIAL SUSPENDED), of the type, size and number of conductors or pairs specified.

UNDERGROUND NON-METALLIC CONDUIT

Effective: July 16, 2025
Revised: March 26, 2026
LC810.01

This work shall consist of furnishing, installing, splicing, and sealing an underground non-metallic conduit (duct) of the type and size specified herein and/or as shown in the plans.

The duct and fittings shall meet the requirements of Article 1088.01(c) of the Standard Specifications, except as modified herein. The duct shall be designed for direct burial. The 1-inch duct shall have a nominal 1.315-inch O.D. with a supported bend radius of 13 inches, an unsupported bend radius of 26 inches, and a safe working load of 1078 lbs. The 2-inch duct shall have a nominal 2.375-inch O.D. with a supported bend radius of 24 inches, an unsupported bend radius of 48 inches, and a safe working load of 3515 lbs.

The duct shall be free from holes, blisters, inclusions, cracks, or other imperfections that would affect the performance or serviceability of the product. The duct shall be constructed of clean, virgin grade, high-density polyethylene (HDPE), which conforms to ASTM D3350-98a, Type III, Category 5, Class B or C and Grade P- 34 per ASTM D1248-84 or equivalent.

The duct shall be smooth on the outside and have a co-extruded permanent layer of Silicore (or approved equivalent) to provide a permanent low friction boundary layer between the duct and the fiber optic cable.

All ducts shall have a minimum sustained air pressure of 300 PSI, and a minimum burst pressure of 475 PSI. Fittings shall be mechanical or glued splices that preserve the smooth surface inside the duct and provide a watertight seal. Fittings shall provide a minimum of 75% of the rated tensile (pull) strength of the duct.

The duct shall be installed according to Section 810 of the Standard Specifications, in accordance with manufacturer's specifications, and as specified herein.

The duct shall be installed in the ground at a depth no less than 48 inches, rising to 30 inches at handhole locations, unless otherwise directed by the Engineer. Lubricants used shall be compatible with the duct. All duct entering handholes shall be terminated 3 inches past the inside walls of the handhole and sealed with an approved duct sealant. The duct shall be always sealed during and after construction utilizing caps approved by the duct manufacturer.

After installation of all necessary cables, all duct ends shall be sealed using an engineer-approved spray foam sealant.

Required bends, sweeps, fittings, sealant, and any parts necessary to complete the installation shall be included in the cost of the duct and will not be paid for separately.

The Contractor shall locate all handholes and the duct every 100' feet using a GPS device accurate to the nearest foot. Submittal can be in CSV format or Shapefiles.

Basis of Payment: This work will be paid for at the contract unit price per foot for UNDERGROUND NON-METALLIC CONDUIT of the type and size specified.

EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C

Effective: January 1, 2013

Revised: July 1, 2015

873.03TS

This work shall consist of furnishing and installing lead-in cable for light detectors installed at existing and/or proposed traffic signal installations as part of an emergency vehicle priority system. The work includes installation of the lead-in cables in existing and/or new conduit. The electric cable shall be shielded and have (3) stranded conductors, colored blue, orange, and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the vendor of the Emergency Vehicle Priority System Equipment.

Basis of Payment.

This work will be paid for at the contract unit price per foot for EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

RELOCATE EXISTING RADIO INTERCONNECT SYSTEM

Description.

This work shall consist of removal, storage, and relocation of an existing radio interconnect antenna, mounting brackets, and any operating components located in the existing traffic signal cabinet from existing traffic signal equipment to the temporary traffic signal equipment as indicated in the plans.

General.

The existing radio interconnect equipment shall be removed and relocated to the temporary traffic signal installation as shown in the Plans. Any damage sustained to the existing radio interconnect during removal, storage transport and/or reinstallation operations must be repaired or replaced in kind to the satisfaction of the Engineer at Contractor's expense.

The existing radio interconnect system shall be installed so that the interconnect is fully operational, to the satisfaction of the Engineer. When the temporary traffic signal is removed, the radio interconnect system shall be removed by the contractor and returned as indicated in the plans.

Basis of Payment.

This work will be paid for at the contract unit price per EACH for RELOCATE EXISTING RADIO INTERCONNECT SYSTEM, which shall be payment in full for disconnecting the existing radio interconnect system and relocating it to the temporary traffic signal installation as shown in the plans, installing it and placing it into operation to the satisfaction of the Engineer.

**LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED
LED SIGNAL HEAD**

Effective: May 22, 2002
Revised: March 1, 2025
880.01TS

Materials.

Add the following to Section 1078 of the Standard Specifications:

“LED modules proposed for use and not previously approved by IDOT District One will require independent testing for compliance to current VTCSH-ITE standards for the product and be Intertek ETL Verified. This would include modules from new Vendors and new models from IDOT District One approved Vendors.

The proposed independent testing facility shall be approved by IDOT District One. Independent testing must include a minimum of two (2) randomly selected modules of each type of module (i.e. ball, arrow, pedestrian, etc.) used in the District and include as a minimum Luminous Intensity and Chromaticity tests. However, complete module performance verification testing may be required by the Engineer to assure the accuracy of the Vendor's published data and previous test results. An IDOT representative will select sample modules from the local warehouse and mark the modules for testing. Independent test results shall meet current ITE standards and vendor's published data. Any module failures shall require retesting of the module type. All costs associated with the selection of sample modules, testing, reporting, and retesting, if applicable, shall be the responsibility of the LED module Vendor and not be a cost to this Contract.

All signal heads shall provide 12 in. (300 mm) displays with glossy yellow or black polycarbonate housings. All head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all signals heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints and shall be visible to the inspector at the signal turn-on. Post top mounting collars are required on all posts and shall be constructed of the same material as the brackets.

The LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship or material defects. LED signal modules which exhibit luminous intensities less than the minimum values specified in Table 1 of the ITE Vehicle Traffic Control Signal Heads: Light Emitting Diode

(LED) Circular Signal Supplement (June 27, 2005) [VTCSH], or applicable successor ITE specifications, or show signs of entrance of moisture or contaminants, shall be replaced or repaired. The Vendor's written warranty for the LED signal modules shall be dated, signed by a Vendor's representative, and included in the product submittal to the State. See Article 801.14 of the Standard Specifications for warranty information.

(a) Physical and Mechanical Requirements

- (1) Modules can be manufactured under this specification for the following faces:
 - a. 12 in. (300 mm) circular, multi-section
 - b. 12 in. (300 mm) arrow, multi-section
- (2) The maximum weight of a module shall be 4 lb (1.8 kg).
- (3) Each module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.) and shall be weatherproof after installation and connection.
- (4) The lens of the module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face. Polymeric lens shall provide a surface coating or chemical surface treatment applied to provide abrasion resistance. The lens of the module shall be integral to the unit, convex with a smooth outer surface and made of plastic. The lens shall have a textured surface to reduce glare.
- (5) The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.
- (6) Each module shall have a symbol of the type of module (i.e. circle, arrow, etc.) in the color of the module. The symbol shall be 1 in. (25.4 mm) in diameter. Additionally, the color shall be written out in 1/2 in. (12.7mm) letters next to the symbol.

(b) Photometric Requirements

- (1) The LEDs utilized in the modules shall be AlInGaP technology for red and InGaP for green and amber indications and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40 °C to 74 °C.

(c) Electrical

- (1) Maximum power consumption for LED modules as per the tables in Article 1078.01.
- (2) Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.
- (3) The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).
- (4) When a current of 20 mA AC or less is applied to the unit, the voltage read across the two leads shall be 15 VAC or less.
- (5) The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.
- (6) LED arrows shall be wired such that a loss or the failure of one or more LEDs will not result in the loss of the entire module.

(d) Retrofit Traffic Signal Module

The following specification requirements apply to the Retrofit module only. All general specifications apply unless specifically superseded in this section.

- (1) Retrofit modules can be manufactured under this specification for the following faces:
 - a. 12 in. (300 mm) circular, multi-section
 - b. 12 in. (300 mm) arrow, multi-section
- (2) Each Retrofit module shall be designed to be installed in the doorframe of a standard traffic signal housing. The Retrofit module shall be sealed in the doorframe with a one-piece EPDM (ethylene propylene rubber) gasket.
- (3) The maximum weight of a Retrofit module shall be 4 lb (1.8 kg).
- (4) Each Retrofit module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.) and shall be weatherproof after installation and connection.
- (5) Electrical conductors for modules, including Retrofit modules, shall be 39-2/5 in. (1 m) in length, with quick disconnect terminals attached.

- (6) The lens of the Retrofit module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.
- (e) The following specification requirements apply to the 12 in. (300 mm) arrow module only. All general specifications apply unless specifically superseded in this section.
 - (1) The arrow module shall meet specifications stated in Section 9.01 of the Equipment and Material Standards of the Institute of Transportation Engineers (November 1998) [ITE Standards], Chapter 2 (Vehicle Traffic Control Signal Heads) or applicable successor ITE specifications for arrow indications.
 - (2) The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.
- (f) The following specification requirement applies to the 12 in. (300 mm) programmed visibility (PV) module only. All general specifications apply unless specifically superseded in this section.
 - (1) The LED module shall be a module designed and constructed to be installed in a programmed visibility (PV) signal housing without modification to the housing.

Delete the fourth paragraph of Article 880.03 of the Standard Specifications. Refer to the "Bagging Signal Heads" section of the District 1 Traffic Signal Special Provision 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS."

Basis of Payment.

Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

"The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition."

Revise the second paragraph of Article 880.04 of the Standard Specifications to read:

If the work consists of retrofitting an existing polycarbonate traffic signal head with light emitting diodes (LEDs), it will be paid for as a SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for removal of the existing module, furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition. The type specified will indicate the number of signal faces, the number of signal sections in each signal face and the method of mounting.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

Effective: May 22, 2002

Revised: March 1, 2024

881.01TS

Add the following to the third paragraph of Article 881.03 of the Standard Specifications:

“No mixing of different types of pedestrian traffic signals or displays shall be permitted.”

Delete the fourth paragraph of Article 881.03 of the Standard Specifications. Refer to the “Bagging Signal Heads” section of the District 1 Traffic Signal Special Provision 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS.

Add the following to Article 881.03 of the Standard Specifications:

“Pedestrian Countdown Signal Heads shall be 16 in. (406mm) x 18 in. (457mm) single units with glossy yellow or black polycarbonate housings. All pedestrian head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on.

Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. “Egg Crate” type sun shields are not permitted. Numerals shall measure 9 in. (229mm) in height and easily identified from a distance of 120 ft (36.6m).”

Materials.

Add the following to Article 1078.02 of the Standard Specifications:

“The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to “0” and turn off when the steady Upraised Hand (symbolizing Don’t Walk) signal turns on. The module shall not have user accessible switches or controls for modification of cycle.

At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.

The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.

If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.

If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.

The next cycle following the preemption event shall use the correct, initially programmed values.

If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.

The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.

The countdown numerals shall be two (2) "7 segment" digits forming the time display utilizing two rows of LEDs.

The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, "Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules," or applicable successor ITE specifications, except as modified herein.

The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

In the event of a power outage, light output from the LED modules shall cease instantaneously.

The LEDs utilized in the modules shall be AlInGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and GaN technology for Lunar White (Walking Person) indications.

The individual LEDs shall be wired such that a loss or the failure of one or more LED will not result in the loss of the entire module.

See Article 801.14 of the Standard Specifications for warranty information.”

Basis of Payment.

Add the following to the first paragraph of Article 881.04 of the Standard Specifications:

“The price shall include furnishing the equipment described above, all mounting hardware, and installing them in satisfactory operating condition.”

Add the following to Article 881.04 of the Standard Specifications:

“If the work consists of retrofitting an existing polycarbonate pedestrian signal head and pedestrian countdown signal head with light emitting diodes (LEDs), it will be paid for as a PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition.”

TRAFFIC SIGNAL BACKPLATE

Effective: May 22, 2002

Revised: March 1, 2026

882.01TS

Revise the first paragraph of Article 1078.03 of the Standard Specifications to read:

“The traffic signal backplate shall be made of composite laminated aluminum or ABS plastic (vacuum formed). The composite laminated aluminum shall have a nominal thickness of 0.080 in. (2.0 mm) with a nominal 0.01 in. (0.3 mm) aluminum skin on both sheet sides and shall have a minimum tensile strength of 4,300 psi at 73 °F (30,000 kPa at 23 °C). The vacuum formed ABS plastic backplate shall have a nominal thickness of 1/8 in. (3 mm), a nominal 1/2 in. (13 mm) deep back flange on all inside and outside edges, and a minimum tensile strength of 4,300 psi at 73 °F (30,000 kPa at 23 °C).”

Revise the first sentence of the second paragraph of Article 1078.03 of the Standard Specifications to read:

“The backplate shall be composed of one or two pieces.”

Delete the third paragraph of Article 1078.03 of the Standard Specifications.

Revise the fourth paragraph of Article 1078.03 of the Standard Specifications to read:

“The traffic signal backplate shall be louvered to provide openings (louvers) to allow wind to penetrate and reduce wind loading.

XX005723 VIDEO DETECTION SYSTEM COMPLETE INTERSECTION (LCDOT)

Effective: October 1, 2016

Revised: July 1, 2025

LC801.03

Description: This work shall consist of furnishing and installing a system that monitors vehicles on a roadway via the processing of video images and that provides detector outputs to a traffic signal controller. This work shall consist of furnishing and installing video cameras, cables, video processors, a controller interface unit, and a remote communication module to operate the video vehicle detection system at one signalized intersection.

Materials: The Video Detection System Complete Intersection shall be one of the following systems:

- Econolite Autoscope Vision
- Iteris Vantage Next or Vector

All the cables from the detection cameras to the traffic signal cabinet and within the traffic signal cabinet itself shall be included in the cost of this item.

Surge protection and grounding shall be provided to protect the video detection cameras and components located in the traffic signal cabinet.

The system shall include software that allows for remote modification of camera settings and detection zones directly from LCDOT. This software shall be provided at no additional cost.

The system shall have anonymous FTP capabilities disabled by the vendor/equipment supplier or provide a feature for the user to disable the functionality through the standard internal menu.

Installation: Video detection cameras shall be mounted in a manner that provides optimal field of view for accurate vehicle detection. The mounting location shall be coordinated during the design phase to ensure compatibility with the signal infrastructure.

Acceptable mounting methods include an adjustable mounting bracket affixed to the signal mast arm, a mounting bracket installed on top of the luminaire arm, or, where overhead utilities or other obstructions impair visibility, a J-hook style mounting bracket installed below the luminaire arm.

The final mounting location and method shall be subject to the approval of the Traffic Engineer and shall comply with manufacturer's recommendations.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent the chafing of wires.

If the Video Detection System Complete Intersection will be connected to the Gigabit Ethernet network, it shall communicate over 10/100 Base T Ethernet to a Layer II (Datalink) Switch and/or a Layer III (Network) Switch. Layer II and Layer III switches shall be installed as shown on the plans.

The Video Detection System Complete Intersection shall be warrantied, free from material and workmanship defects for a period of three years from final acceptance.

Basis of Payment: This item will be paid for at the contract unit price per each for VIDEO DETECTION SYSTEM COMPLETE INTERSECTION. The unit price shall include all associated equipment, hardware, cables, materials and labor required to install the system at one signalized intersection and in operation to the satisfaction of the Traffic Engineer. All mounting brackets shall be included in the cost of VIDEO DETECTION SYSTEM COMPLETE INTERSECTION. If required, the LAYER II (DATALINK) SWITCH and/or the LAYER III (NETWORK) SWITCH will be paid for separately.

EMERGENCY VEHICLE PRIORITY SYSTEM

Effective: May 22, 2002

Revised: July 1, 2015

887.01TS

Revise Section 887 of the Standard Specifications to read:

It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle pre-emption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency.

All new installations shall be equipped with Confirmation Beacons as shown on the "District One Standard Traffic Signal Design Details." The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

All light operated systems shall include security and transit preemption software and operate at a uniform rate of 14.035 Hz $\pm$ 0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the EMERGENCY VEHICLE PRIORITY SYSTEM.

Basis of Payment.

The work shall be paid for at the contract unit price each for furnishing and installing LIGHT DETECTOR and LIGHT DETECTOR AMPLIFIER. Furnishing and installing the confirmation beacon shall be included in the cost of the Light Detector. Any required modifications to the traffic signal controller shall be included in the cost of the LIGHT DETECTOR AMPLIFIER. The preemption detector amplifier shall be paid for on a basis of (1) one each per intersection controller and shall provide operation for all movements required in the pre-emption phase sequence.

TEMPORARY TRAFFIC SIGNAL INSTALLATION

Effective: May 22, 2002

Revised: March 1, 2025

890.01TS

Revise Section 890 of the Standard Specifications to read:

Description.

This work shall consist of furnishing, installing, maintaining, and removing a temporary traffic signal installation as shown on the plans, including but not limited to temporary signal heads, emergency vehicle priority systems, interconnect, vehicle detectors, uninterruptable power supply, and signing. When temporary traffic signals will be operating within a traffic signal system, the equipment shall be compatible with the current operating requirements of the system. For integration into an Advanced Traffic Management System (ATMS) such as Centrac, Tactics, or TransSuite, the controller shall have the latest version of approved NTCIP software installed.

General.

Only an approved controller Vendor will be allowed to assemble a temporary traffic signal and railroad traffic signal cabinet. Traffic signal inspection and TURN-ON shall be according to 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS special provision.

Construction Requirements.

(a) Controllers. Only controllers supplied by one of the District approved Vendors will be approved for use at temporary signal locations. All controllers used for temporary traffic signals shall be fully actuated NEMA microprocessor based with RS232 data entry ports compatible with existing monitoring software approved by IDOT District 1, installed in NEMA TS2 cabinets with 8 phase back panels, capable of supplying 255 seconds of cycle length and individual phase length settings up to 99 seconds. On projects with one lane open and two-way traffic flow, such as bridge deck repairs, the temporary signal controller shall be capable of providing an adjustable all red clearance setting of up to 250 seconds in length. All controllers used for temporary traffic signals shall meet or exceed the requirements of Section 857 of the Standard Specifications with regards to internal time base coordination and preemption. All railroad interconnected temporary controllers and cabinets shall be new and shall satisfy the requirements of Article 857.02 of the Standard Specifications and as modified herein. On projects with multiple temporary traffic signal installations, all controllers shall be the same Manufacturer brand and model number with the latest version software installed at the time of the signal TURN-ON, or as specified in the Contract.

- (b) Cabinets. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved Vendors will be approved for use at temporary traffic signal locations. All control equipment for the temporary traffic signal(s) shall be furnished by the Contractor unless otherwise stated in the Contract. All temporary traffic signal cabinets shall have a closed bottom. The bottom shall be sealed along the entire perimeter of the cabinet base to ensure a water, dust, animal, and insect-proof seal. The bottom shall provide a minimum of two (2) 4 in. (100 mm) diameter holes to run the electric cables through. The 4 in. (100 mm) diameter holes shall have a bushing installed to protect the electric cables and shall be sealed after the electric cables are installed.
- (c) Grounding. Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 806 of the Standard Specifications and shall meet the requirements of the "Grounding of Traffic Signal Systems" section of 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS special provision.
- (d) Traffic Signal Heads. All traffic signal sections shall be 12 in. (300 mm). Pedestrian signal sections shall be 16 in. (406mm) x 18 in. (457mm). All signal heads shall be furnished with tunnel visors unless otherwise specified in the contract. Traffic signal sections shall be Light Emitting Diode (LED) with expandable view, unless otherwise approved by the Engineer. Pedestrian signal heads shall be LED Pedestrian Countdown Signal Heads. The temporary traffic signal heads shall be placed as indicated on the temporary traffic signal plan or as directed by the Engineer. If no traffic staging is in place or will not be staged on the day of the turn on, the temporary traffic signal shall have the signal head displays, signal head placements and controller phasing match the existing traffic signal or shall be as directed by the Engineer. The Contractor shall furnish enough extra cable length to relocate heads to any position on the span wire or at locations illustrated on the plans for construction staging. The temporary traffic signal shall remain in operation during all signal head relocations. Each temporary traffic signal head shall have its own cable from the controller cabinet to the signal head.
- (e) Interconnect.
 - (1) Temporary traffic signal interconnect shall be provided using fiber optic cable or wireless interconnect technology as specified in the Contract. If the Contract specifies fiber optic cable to be used for temporary interconnect, the Contractor may request, in writing, to substitute the fiber optic temporary interconnect with a wireless interconnect. The Contractor must provide assurances that the radio device will operate properly at all times and during all construction staging. If approved for use by the

Engineer, the Contractor shall submit marked-up traffic signal plans indicating locations of radios and antennas and installation details. If wireless interconnect is used, and in the opinion of the Engineer it is not viable, or if it fails during testing or operations, the Contractor shall be responsible for installing all necessary poles, fiber optic cable, and other infrastructure for providing temporary fiber optic interconnect at no cost to the Contract.

- (2) The existing system interconnect and phone lines are to be maintained as part of the Temporary Traffic Signal Installation specified for on the plan. If the existing traffic signal has a cellular modem, the modem shall be temporarily relocated to the temporary signal and then back to the existing or proposed cabinet at the end of the contract unless the contract specifies otherwise. The temporary signal cabinet shall have an antenna supplied by the Contractor. Any existing network switches shall be temporarily relocated to the temporary signal and relocated back to the existing cabinet at the end of construction if a new switch is not being installed. Any existing pan-tilt-zoom (PTZ) cameras shall be temporarily relocated to the temporary signal. The interconnect, including any required fiber splices and terminations, shall be installed into the temporary controller cabinet as per the notes or details on the plans. All labor and equipment required to install and maintain the existing interconnect as part of the Temporary Traffic Signal Installation shall be included in the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION. The temporary traffic signal interconnect shall maintain interconnect communications throughout the entire signal system for the duration of the project.
- (3) Temporary wireless interconnect for closed-loop systems. The radio interconnect system shall be compatible with Eagle/Yunex or Econolite controller closed loop systems. This work shall include all temporary wireless interconnect components at the adjacent existing traffic signal(s) to provide a completely operational closed loop system. This work shall include all materials, labor and testing to provide the completely operational closed loop system as shown on the plans. The radio interconnect system shall include the following components:
 - a. Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio
 - b. Software for Radio Configuration (Configure Frequency and Hopping Patterns)
 - c. Antennas (Omni Directional or Yagi Directional)

- d. Antenna Cables, LMR400, Low Loss. Maximum 100 ft from controller cabinet to antenna
- e. Brackets, Mounting Hardware, and Accessories Required for Installation
- f. RS232 Data Cable for Connection from the radio to the local or master controller
- g. All other components required for a fully functional radio interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the radio interconnect system components shall be included in the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION.

The radio interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed or existing master controller and telemetry module shall be configured for use with the radio interconnect at a minimum rate of 9600 baud.

The radio interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance with the Vendor's recommendations.

Temporary wireless interconnect for Advanced Traffic Management Systems. The radio interconnect system shall be compatible with an ATMS.

- (f) Emergency Vehicle Preemption. All emergency vehicle preemption equipment (light detectors, light detector amplifiers, confirmation beacons, etc.) as shown on the temporary traffic signal plans shall be provided by the Contractor. It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle preemption equipment to be installed prior to the Contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency. All light operated systems shall operate at a uniform rate of 14.035 hz $\pm$ 0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District. All labor and material required to install and maintain the Emergency Vehicle Preemption

installation shall be included in the item TEMPORARY TRAFFIC SIGNAL INSTALLATION.

- (g) Vehicle Detection. All temporary traffic signal installations shall have vehicular detection installed at all approaches of the intersection and as directed by the Engineer. Video vehicle detection systems shall be approved by IDOT prior to the Contractor furnishing and installing. The Contractor shall install, wire, and adjust the alignment of the video vehicle detection system in accordance to the Manufacturer's recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. The Vendor shall be present and assist the contractor in setting up the video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item TEMPORARY TRAFFIC SIGNAL INSTALLATION.
- (h) Pedestrian push-buttons. Pedestrian push-buttons shall be provided for all pedestrian signal heads/phases or as directed by the Engineer. Accessible Pedestrian Signal (APS) buttons shall be installed at any location where they currently exist. All push-buttons shall be latching and have MUTCD R10-3e signs with proper arrows.
- (i) Uninterruptable Power Supply. All temporary traffic signal installations shall have an Uninterruptable Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic signal cabinet and shall be according to the applicable portions of Section 862 of the Standard Specifications and as modified in the current District One Traffic Signal Special Provision 862.01TS UNINTERRUPTABLE POWER SUPPLY, SPECIAL.
- (j) Signs. All existing signs shall be removed from existing poles and relocated to the temporary signal. If new mast arm assembly and pole(s) and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost. Any signs that are required for the temporary traffic signal shall be provided as shown on the plans or as directed by the Engineer. Relocation, removing, bagging and installing signs for the various construction stages shall be provided as shown on the plans or as directed by the Engineer. If Illuminated Street Name Signs exist, they shall be taken down and stored by the Contractor, and the Contractor shall furnish reflectorized street name signs on the temporary traffic signal installation.
- (k) Energy Charges. The electrical utility energy charges for the operation of the temporary traffic signal installation shall be paid for by others if the installation replaces an existing signal. Otherwise, charges shall be paid for under 109.05 of the Standard Specifications.

(l) Maintenance.

- (1) Maintenance shall meet the requirements of the Standard Specifications and the "Maintenance and Responsibility of Traffic Signal and Flashing Beacon Installations" section of the current District One Traffic Signal Special Provision 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS.
 - (2) Maintenance of temporary signals and of the existing signals shall be included in the cost of the TEMPORARY TRAFFIC SIGNAL INSTALLATION pay item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as they begin any physical work on the Contract or any portion thereof.
 - (3) The temporary signal responsibility shall begin at the start of temporary signal construction and shall end with the removal of the signal as directed by the Engineer.
- (m) Temporary Traffic Signals for Bridge Projects. Temporary Traffic Signals for bridge projects shall follow the State Standards, Standard Specifications, Special Provisions and any plans for Bridge Temporary Traffic Signals included in the Contract. The installation shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification. In addition, all electric cable shall be aerially suspended at a minimum height of 18 ft (5.5m) on temporary wood poles (Class 5 or better) of 45 ft (13.7 m) minimum height. The signal heads shall be span wire mounted or bracket mounted to the wood pole or as directed by the Engineer. The Controller cabinet shall be mounted to the wood pole as shown in the plans, or as directed by the Engineer. A video vehicle detection system may be used in place of detector loops as approved by the Engineer or as shown in the Contract.
- (n) Temporary Portable Traffic Signal for Bridge Projects.
- (1) The controller and cabinet shall be NEMA type designed for NEMA TS2 Type 1 operation. Controller and LED signal displays shall meet the applicable Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION special provision.
 - (2) Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.

(3) General.

- a. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of twelve (12) days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.
- b. All signal heads located over the travel lane shall be mounted at a minimum height of 17 ft (5 m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 ft (2.5 m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.
- c. The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.
- d. As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with other approved methods of vehicle detection and traffic actuation.
- e. All portable traffic signal units shall be interconnected using hardwire communication cable. Radio communication equipment may be used only with the approval of the Engineer. If radio communication is used, a site analysis shall be completed to ensure that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.
- f. The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV and other applicable portions of the currently adopted version of the Manual on Uniform Traffic Control Devices (MUTCD) and the Illinois MUTCD. The signal system shall be designed to continuously operate over an ambient temperature range between -30°F (-34°C) and 120°F (48°C). When not being utilized to inform and direct traffic, portable signals shall be treated as non-operating equipment according to Article 701.11.

Basis of Payment.

This work shall be paid for at the Contract unit price each for TEMPORARY TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNALS, or TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION, the price of which shall include all costs for the modifications required for traffic staging, changes in signal phasing as required in the Contract plans, video vehicle detection systems, any maintenance or adjustment to the video vehicle detection system, the temporary wireless interconnect system, temporary fiber optic interconnect system, all material required, the installation and complete removal of the temporary traffic signal, and any changes required by the Engineer. Each location will be paid for separately.

TEMPORARY TRAFFIC SIGNAL TIMING - LCDOT

Effective: June 1, 2020

Revised: November 15, 2022

LC890.02

Description: This work shall consist of developing and maintaining appropriate traffic signal timings for the specified intersection for the duration of the temporary signalized condition, as well as impact to existing traffic signal timings caused by detours or other temporary conditions.

General: All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in traffic signal optimization. The Contractor shall contact the Traffic Signal Engineer at (847) 377-7474 for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMING.

- a) Consultant shall attend the temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings.
- b) Consultant shall be responsible for making fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
- c) Consultant shall document the observation of traffic signal operations in the field and report the information to the Traffic Signal Engineer on a monthly basis. In addition to the monthly report, all traffic signal timing modifications shall be documented and reported to the Traffic Signal Engineer within 24 hours after implementation.
- d) Automated Traffic Signal Performance Measures (ATSPMs) from LCDOT's ATSPM system shall be used in creating timing plans and fine-tuning adjustments and shall be documented in the monthly report. The Consultant shall contact the LCDOT at 847-377-7474 to acquire access to LCDOT's ATSPM system.
- e) Consultant shall provide consultation and adjust timings for all construction stage changes, temporary traffic signal phase changes, and any other conditions affecting timing and phasing, including lane closures, detours, and other construction activities. The timing adjustments can be done on-site or remotely if communication exists at the time of change.
- f) Consultant shall make timing adjustments based on guidance or public concerns from the Lake County Transportation Management Center or Traffic Signal Engineer. Each time the Consultant is contacted, they shall respond within 24

hours and provide a detailed response, with any corrected measures, to the Traffic Signal Engineer within 72 hours.

- g) If new traffic signal timings are not required under the OPTIMIZE TRAFFIC SIGNAL SYSTEM (LCDOT) pay item or RE- OPTIMIZE TRAFFIC SIGNAL SYSTEM (LCDOT) pay item, return original timing plan once construction is complete.

Basis of Payment: The work shall be paid for at the contract unit price per each intersection for TEMPORARY TRAFFIC SIGNAL TIMING, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on and/or detour implemented, 25 percent of the bid price will be paid. The remaining 75 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or detour.

X1400215 REMOTE CONTROLLED VIDEO SYSTEM

General: This work shall consist of furnishing and installing an IP based remote-controlled video system at a location designated by the Traffic Engineer. The work shall include a color camera, dome assembly, all mounting hardware, connectors, cables, power injectors, and related equipment necessary to complete the installation according to the manufacturer's specifications. For this specification the term "camera" is defined as one of the specified camera models, housed in a dome assembly, with pan-tilt-zoom (PTZ) capability

Materials: The camera shall be one of the following approved models:

- SIQURA PD900
- AXIS Q6075-E
- BOSCH AUTODOME 7100i (IR)

The Contractor shall furnish the required number of power injectors for the camera make and model selected, including operation of the camera heater, as well as all required mounting hardware, connectors, patch cables, and power supplies.

The system shall have anonymous FTP (file transfer protocol) capabilities disabled by the vendor/equipment supplier or provide a feature for the user to disable the functionality through the standard internal menu.

Installation: The camera shall be installed as shown on the plans, either on the luminaire arm near the luminaire, or on the combination mast arm assembly pole, angled toward the center of the intersection using a mounting bracket compatible with the camera and procured from one of the approved camera manufacturers. When installed on the pole, the camera shall be mounted to provide a minimum of 12 inches clear space between face of the pole and the camera housing. When installed on the luminaire arm, the camera shall be installed with a 30-degree tilt-adjustable bracket. The camera and any external hardware and housing shall be installed with stainless steel straps.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent the chafing of wires.

The Contractor shall contact the Traffic Engineer prior to installing the camera and associated wiring, to receive final approval on the camera location.

If the Remote Controlled Video System will be connected to the Gigabit Ethernet network, then a Layer II (Datalink) Switch and/or a Layer III (Network) Switch shall be required. Layer II and Layer III switches shall be installed as shown on the plans.

The Contractor shall contact the Transportation Management Center to obtain the initial configuration settings (IP addresses, etc.) necessary to establish proper communication between the camera and the Lake County Network. The Contractor shall program the camera with the configuration settings provided by the TMC, and connect the camera to the appropriate communication equipment (Layer II Switch, cell modem, etc.). Only after the Contractor has established communication will the TMC staff be available to assist with additional camera configuration and programming.

The camera shall be warrantied, free from material and workmanship defects for a period of three years from the date the camera is activated.

Basis of Payment: This item will be paid for at the contract unit price per each for REMOTE CONTROLLED VIDEO SYSTEM. The unit price shall include all associated equipment, hardware, cables, materials and labor required to install the complete system in place and in operation to the satisfaction of the Traffic Engineer.

The OUTDOOR RATED NETWORK cable from the traffic signal cabinet to the camera will be paid for separately. If required, the LAYER II (DATALINK) SWITCH and/or the LAYER III (NETWORK) SWITCH will be paid for separately.

RELOCATE EXISTING SWITCH (SPECIAL)

Effective: October 1, 2016

Revised: March 1, 2019

LC801.06

Description: This work shall consist of the removal, storage, and relocation of an existing Layer II or Layer III switch and associated power supply, from one traffic signal, ITS, or communications cabinet to another cabinet.

General: The switch shall be removed and relocated as shown on the plans and/or as directed by the Traffic Engineer. Any damage sustained by the switch during the removal, storage, transport, and/or reinstallation operations shall be repaired or replaced in kind by the County's PASSAGE Consultant to the satisfaction of the Traffic Engineer at the Contractor's expense.

Basis of Payment: This item will be paid for at the Contract unit price each for RELOCATE EXISTING SWITCH (SPECIAL). The unit price shall include all equipment, materials and labor required to disconnect the existing switch; package and store it; transport it; install the switch in the new location; and in operation to the satisfaction of the Traffic Engineer. The unit price shall also include the all equipment, materials and labor required to disconnect the existing switch power supply and all fiber optic jumper cables; package and store them; transport them; install the power supply and all fiber optic jumper cables necessary for proper operation in the new location; and in operation to the satisfaction of the Traffic Engineer.

X1400238 LUMINAIRE, LED, SPECIAL

Description: This work consists of furnishing all materials, equipment, and labor necessary to install Light-Emitting Diode (LED) roadway luminaires as shown on the plans, according to the applicable requirements of Sections 202, 821, and 842 of the "Standard Specifications", and as specified herein and the following:

- All luminaires at the intersection shall be activated by a common photocell installed in the controller cabinet.

General: The luminaire shall be assembled in the continental U.S.A. and shall be assembled by and manufactured by the same Manufacturer. Quick connect/disconnect plugs shall be supplied between the discrete electrical components within the luminaire such as the driver, surge protection device, and optical assembly for easy removal. The quick connect/disconnect plugs shall be operable without the use of tools and while wearing insulated gloves. The luminaire shall be in compliance with ANSI C136.37. LED light source(s) and driver(s) shall comply with the material requirements of the Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU.

The luminaire shall be a horizontal mount, LED roadway luminaire. The luminaire finish shall be black polyester powder coat paint to match the signal equipment color.

The luminaire shall be designed to be incorporated into a lighting system with an expected 30-year lifetime. The luminaire Manufacturer shall have a minimum of 20 years' experience manufacturing High Intensity Discharge (HID) roadway luminaires and shall have a minimum of 5 years' experience manufacturing LED roadway luminaires.

Pole wiring shall be provided with the luminaire. Included with the pole wiring shall be a surge arrester and fusing located in the handhole. Wire shall be trained within the pole so as to avoid abrasion or damage to the insulation.

Pole wire shall be extended through the pole, pole grommet, luminaire ring, and any associated arm and tenon. The pole wire shall be terminated in a manner that avoids sharp kinks, pinching, pressure on the insulation, or any other arrangement prone to damaging insulation value and producing poor megger test results. Wires shall be trained away from heat sources within the luminaire. Wires shall be terminated so all strands are extended to the full depth of the terminal lug with the insulation removed far enough so it abuts against the shoulder of the lug, but is not compressed as the lug is tightened.

The housing shall be designed to ensure maximum heat dissipation and to prevent the accumulation of water, ice, dirt and debris. A passive cooling method with no moving or rotating parts shall be employed for heat management. The effective projected area of the luminaire shall not exceed 1.4 sq. ft. The total weight of the luminaire(s) and

accessories shall not exceed 75 pounds. Wiring within the electrical enclosure shall be rated at 600 V, 221 °F (105 °C) or higher.

Finish. Painted or finished luminaire surfaces exposed to the environment, shall exceed a rating of six according to ASTM D1654 after 1000 hours of ASTM B117 testing. The coating shall exhibit no greater than 30 % reduction of gloss according to ASTM D523, after 500 hours of ASTM G154 Cycle 6 QUV® accelerated weathering testing.

Attachment. The luminaire shall slip-fit on a mounting arm with a 2 in (5 cm) diameter tenon (2.375 in (6 cm) outer diameter), and shall have a barrier to limit the amount of insertion.

Receptacle. The luminaire shall include a fully prewired, 7-pin twist lock ANSI C136.41 compliant receptacle. Unused pins shall be connected as directed by the Manufacturer and as approved by the Engineer. A shorting cap shall be provided with the luminaire.

Vibration Characteristics. All luminaires shall pass ANSI C136.31 requirements. Roadway luminaires mounted on a bridge and high mast luminaires shall be rated for “3G” peak acceleration. Vibration testing shall be run using the same luminaire in all three axes.

Labels and Decals. All luminaires shall have external labels in compliance with the latest version of ANSI C136.15 and internal labels in compliance with the latest version of ANSI C136.22.

The luminaire shall be listed for wet locations by a Nationally Recognized Testing Laboratory (NRTL) as defined by OSHA and shall be in compliance with UL 8750 and UL 1598. It shall be identified as such by the holographic UL tag/sticker on the inside of the luminaire.

Hardware. All external fasteners shall be stainless steel. All hardware shall have corrosion resistance.

The LED optical assembly, consisting of LED packages, shall have a minimum Ingress Protection rating of IP65 according to ANSI C136.25-2013. Circuiting shall be designed to minimize the impact of individual LED failures on the operation of the other LEDs.

The optical assembly shall utilize high brightness, long life, minimum 70 color rendering index (CRI), 4,000 K color temperature (+/-300 K) LEDs binned according to ANSI C78.377. Lenses shall be UV-stabilized acrylic or glass. Provisions for house-side shielding shall be provided when specified.

Lumen depreciation at 50,000 hours of operation shall not exceed 15% of initial lumen output at the specified LED drive current and an ambient temperature of 77 °F (25 °C).

The LED luminaires shall have a minimum efficacy of 100 lumens per watt and have a relative delivered lumens of 11,000.

Luminaires shall be tested according to IES LM-79. The laboratory performing this test shall hold accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) under NIST. Submitted reports shall have a backlight, upright, and glare (BUG) rating according to IESNA TM-15 including a luminaire classification system graph with both the recorded lumen value and percent lumens by zone.

Lumen maintenance shall be measured for the LEDs according to LM-80, or when available for the luminaires according to LM-84. The LM-80 report shall be based on a minimum of 6,000 hours, yet 10,000 hour reports shall be provided for luminaires where those tests have been completed.

Thermal testing shall be provided according to UL 1598. The luminaire shall start and operate in the ambient temperature range specified. The maximum rated case temperature of the driver, LEDs, and other internal components shall not be exceeded when the luminaire is operated in the ambient temperature range specified.

Mechanical design of protruding external surfaces such as heat sink fins shall facilitate hose-down cleaning and discourage debris accumulation. Testing shall be submitted when available to show the maximum rated case temperature of the driver, LEDs, and other internal components are not exceeded when the luminaire is operated with the heat sink filled with debris.

Complete point-by-point luminance and veiling luminance calculations as well as listings of all indicated averages and ratios as applicable shall be provided according to IES RP-8 recommendations. Lighting calculations shall be performed using AGI32 software with calculations performed to two decimal places (i.e. x.xx cd/m²). Calculation results shall demonstrate that the submitted luminaire meets the lighting metrics specified in the project Luminaire Performance Tables (see exhibit B). Scotopic or mesopic factors will not be allowed.

The LEDs shall have long term lumen maintenance documented according to IESNA TM-21, or when available for the luminaires according to IESNA TM-28. The submitted calculations shall incorporate an in situ temperature measurement test (ISTMT) and LM-80 data with TM-21 inputs and reports according to the TM-21 calculator, or when available ISTMT and LM-84 data with TM-28 inputs and reports according to the TM-28 calculator. Ambient temperature shall be 77 °F (25 °C).

The driver for the luminaire shall be integral to the unit with related components readily removable for replacement.

Circuit Protection: Shall tolerate indefinitely open and short circuit output conditions without damage.

Ingress Protection. IP66 rating.

Input Voltage: Shall be suitable for operation over a range of 120 to 277 volts as required by the system operating voltage.

Operating Temperature: Operating ambient temperature range of -40 to 104 °F (-40 to 40 °C).

Driver Life: Life time of 100,000 hours at 77 °F (25 °C) ambient.

Safety/UL. Listed under UL 1310 or UL 1012.

Power Factor: Shall maintain a power factor of 0.9 or higher and total harmonic distortion of less than 20 % at 50% load across the full supply voltage range.

Driver efficiency: Minimum efficiency of 90% at maximum load and a minimum efficiency of 85% for the driver operating at 50% power with driver efficiency defined as output power divided by input power.

Electrical Interference: Shall meet the Electromagnetic Compatibility (EMC) requirements for Class A digital devices included in the FCC Rules and Regulations, Title 47, Part 15.

Thermal Fold Back: The driver shall reduce the current to the LED module if the driver is overheating due to abnormal conditions.

Dimming: 0-10 V dimming capability.

Leakage current: Compliance with safety standards according to IEC 61347-1 and UL 1012.

The Surge Protection Device (SPD) shall be labeled as Type 4 in accordance to UL 1449 and be an integral part of the luminaire. It shall provide a minimum system protection level of 10 kV, 10 kA. To protect for a 10 kV, 10 kA surge the required clamping voltage of the external Metal Oxide Varistor (MOV) or other SPD shall be lower than 1 kV at 8 kA {(10 kV-2 kV)/1 ohm=8 kA}.

The entire luminaire and all of its component parts shall be covered by a 10 year warranty.

The Contractor shall submit, for approval, an electronic version of all associated luminaire IES files, AGi32 files and the TM-21 calculator spreadsheet with inputs and reports

associated with the project luminaires. The Contractor shall also provide an electronic version of each of the following Manufacturer's product data for each type of luminaire.

- 1) Descriptive literature and catalogue cuts for luminaire, LED package, driver, surge protection devices, fuses, and pole wire.
- 2) LED drive current, total luminaire input wattage and total luminaire current at the system operating voltage or voltage range and ambient temperature of 77 °F (25 °C).
- 3) Luminaire efficacy expressed in lumens per watt (lpw) per luminaire.
- 4) Initial delivered lumens at the specified color temperature, drive current and ambient temperature.
- 5) Computer photometric calculation reports.
- 6) TM-15 BUG rating report.
- 7) Documentation of Manufacturers experience and certification that luminaires were assembled in the U.S.A.
- 8) Supporting documentation of compliance with ANSI standards as well as listing requirements.
- 9) Supporting documentation of laboratory accreditations and certifications for specified testing.
- 10) Thermal testing documents.
- 11) IES LM-79, LM-80 (or LM-84) and TM-21 (or TM-28) reports.
- 12) Salt spray (fog) test reports and certification.
- 13) Vibration characteristics test reports and certification.
- 14) IP test reports.
- 15) Manufacturer written warranty.
- 16) Luminaire installation, maintenance, and washing instructions.

Luminaire sampling and testing requirements shall be in accordance with Article 1067(h) of the Standard Specifications.

Examine all luminaires delivered to the jobsite prior to installation to ensure all specification requirements and Shop Drawing comments have been incorporated by the Manufacturer. Deficient luminaires shall not be installed and the Engineer shall be notified immediately.

Luminaires shall be adjusted with the use of a level placed along the fixture housing or other means approved by the manufacturer to make sure they are installed with their optics set to deliver optimum designed light levels on the roadway. Any dirt or film on LEDs and/or the optical assembly shall be thoroughly removed using cleaning methods approved by the manufacturer.

Basis of Payment: This work will be paid for at the contract unit price per each for LUMINAIRE, LED, SPECIAL. The unit price shall include all labor, equipment and material necessary to perform the work specified herein. Restoration work required in

areas disturbed by operation of installing luminaire shall be included in LUMINAIRE, LED, SPECIAL. The photocell in the signal cabinet shall be paid for in FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL or MODIFY EXISTING CONTROLLER CABINET.

FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL

Effective: October 1, 2016

Revised: March 19, 2021

LC857.01

Description: This work shall consist of furnishing and installing a full-actuated controller and type IV cabinet at locations shown on the plans and/or as designated by the Traffic Engineer.

General: This work shall be performed according to Sections 857 and 863 of the "Standard Specifications" and the following:

At US 45-IL 21 and Deerfield Road, the controller shall be EAGLE and shall not be operating with NTCIP. For intersections owned and maintained by LCDOT, the controller shall conform to ITE ATC Version 6. The controller shall be the latest model available that is compatible with "Centracs" software, currently in use by LCDOT. The controller software compatibility requirements are based upon the controller's location in the communication system, and shall be as shown on the plans. The controller shall have the latest version of NTCIP software compatible with "Centracs" installed, and be equipped with advanced display, 2 Ethernet ports minimum and a removable data key to save the controller database.

The cabinet shall be designed for NEMA TS2 Type 1 operation. The cabinet shall be pre-wired for a minimum of eight phases of vehicular; four phases of pedestrian; and four phases of overlap operation. Individual load switches shall be provided for each vehicle, pedestrian and right turn overlap phase.

- **Cabinets:** Controller cabinets shall have a footprint of approximately 44 inches wide by 26 inches deep. Type IV cabinets shall be 65 inches high, and shall provide a third shelf for mounting additional equipment. The cabinets shall be fabricated of 1/8" thick unpainted aluminum alloy 5052-H32. The surface shall be smooth and free of marks and scratches. All external hardware shall be stainless steel.
- **Cabinet Doors:** The cabinet shall include front and rear doors of NEMA type 3R construction with a cellular neoprene gasket that is rain tight. The top of the cabinet shall overhang the front and rear of the cabinet, or there shall be a drip cap to prevent water infiltration into the door frame channel. The door hinges shall be continuous 14-gauge stainless steel and shall be secured with 1/4-20 stainless steel carriage bolts. The standard equipment shall include a three-point locking system that secures the door at the top, bottom and center. A corbin lock with two keys shall also be furnished. The door shall be equipped with a two-position doorstop, one at 90° and one at 120°.

- **Controller Harness:** The cabinet shall include a TS2 Type 2 "A" harness in addition to the TS2 Type 1 harness.
- **Surge Protection:** The cabinet shall have a 120VAC Single Phase Modular filter Plug-in type, supplied from an approved vendor.
- **BIU:** The BIU shall be secured by mechanical means.
- **Switch Guards:** All switches shall include switch guards.
- **Back Panel:** The back panel wiring shall be securely covered with a piece of Plexiglas. The Plexiglas shall have a minimum thickness 1/8-inch.
- **Heating:** The cabinet shall include one 200-watt, thermostatically-controlled, electric heater.
- **Lighting:** The cabinet shall include four LED light assemblies along the top and sides of the cabinet. The LED panels shall be controlled by a door switch. The LED Panels shall be provided from an approved vendor.
- **Plan & Wiring Diagrams:** The cabinet shall include a 12" x 15" moisture sealed container attached to door for plan and wiring diagrams.
- **Pull-out Drawer:** The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1½ inch deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one complete set of cabinet prints and manuals. This drawer shall support 50 pounds in weight when fully extended. The drawer shall open and close smoothly. The drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches wide.
- **Detector Racks:** The cabinet shall include a full-size rack fully wired to support one BIU, sixteen channels of vehicle detection, and four channels of EVP.
- **Field Wiring Labels:** All field wiring shall be labeled.
- **Field Wiring Termination:** Approved channel lugs shall be required for all filed wiring termination.
- **Power Supply:** The power supply shall include a nonconductive shield.
- **Circuit Breaker:** The signal circuit breaker shall be sized for the proposed load. The signal circuit breaker shall be rated a minimum of 30 amps.
- **Police Door:** The controller shall include wiring and termination for a plug-in manual phase advance switch.
- **Railroad Pre-Emption Test Switch:** A railroad pre-emption test switch shall be provided from an approved vendor.
- **Malfunction Management Unit (MMU):** The cabinet shall include a 16 Channel, LCD display, IP addressable (Ethernet) MMU. The MMU shall be connected to the Ethernet switch with a CAT 5e cable, and configured for proper communication.
- **Door Alarm:** The front and rear doors shall be equipped with switches wired to the traffic signal controller alarm 1 input for logging and reporting of a door open condition.
- **Photocell:** Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay and shall operate a contactor sized for the signs and lights shown on the

plans. The photocell shall be installed under the front lip of the cabinet in a drilled hole. A manufacturer's warranty of six years shall be provided for the photocell. Photocell power consumption shall be no greater than 1 watt at 120V. The photocell and contactor shall be wired to operate all internally illuminated street name signs and combination street lights at the intersection. The photocell and contactor shall be wired so that the fixtures are not operational when the signal operates under battery or generator power. The photocell and contactor shall be configured so that light fixtures and signs will be energized if the photocell fails.

The full-actuated controller shall be warrantied, free from material and workmanship defects for a period of three years from final acceptance.

Basis of Payment: This item will be paid for at the Contract unit price per each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL. The unit price shall include all equipment, materials and labor required to furnish and install the cabinet and controller, complete with necessary connections and equipment for proper operation.

FIBER OPTIC CABLE

Effective: October 1, 2016

Revised: June 27, 2025

LC871.01

Description: This work shall consist of furnishing and installing all accessories required and fiber optic cable of the type, size, and number of fibers specified.

Materials: The Fiber Optic Cable shall meet the requirements of Article 1076.02 of the "Standard Specifications" and the following:

The Fiber Optic Cable may be gel filled or have an approved water blocking tape.

General: This work shall be performed according to Section 871 of the "Standard Specifications" and the following:

This work shall consist of furnishing and installing fiber optic cable in conduit with all accessories and connectors. The cable shall be of the type, size, and the number of fibers specified with a maximum of twelve fibers per buffer tube. The work includes making all fiber splices and terminations to the proposed fiber optic cable as indicated on the plans and/or as directed by the Traffic Engineer.

The distribution enclosure shall be wall-mountable with capacity for four closet connector housing panels per enclosure and up to eight 0.2-inch or four 0.4-inch reduced length splice trays. The enclosure dimensions shall not exceed 13.5" x 8.5" x 4.5". The enclosure shall be capable of accommodating the required number of fibers. The distribution enclosure shall be included in the cost of FIBER OPTIC CABLE of the type, size, and number of fibers specified, including connections to any existing cables. All fibers being terminated shall be connected to the distribution enclosure and labeled at the connector and also at the enclosure bulkhead. The label shall include the direction and also the fiber number (e.g. S1, S2, N11, N12).

All splices and terminations on the installed fiber optic cable shall be included in the cost of the fiber optic cable, including the splicing of the installed fiber optic cable to any existing fiber optic cable. Splice trays and connector bulkheads required for the installed fiber optic cable shall be included in the cost of FIBER OPTIC CABLE of the type, size, and number of fibers specified.

All terminations and splices required only on existing fiber optic cable shall be paid for separately according to the pay item TERMINATE FIBER OPTIC CABLE or SPLICE FIBER OPTIC CABLE.

A minimum of 13 feet of slack cable shall be provided for the controller cabinet. The controller cabinet slack cable shall be stored as directed by the Traffic Engineer.

The quality of the fiber optic cable, including all splices and terminations, shall be verified by testing and documentation according to Article 801.13(d) of the "Standard Specifications", to the satisfaction of the Traffic Engineer.

Multimode: When multimode fiber is required, the Contractor shall coordinate with the equipment supplier, and shall terminate as many multimode fibers as are necessary to establish proper communications between new and/or existing signal controllers and/or video transmission equipment. In addition, the Contractor shall terminate four unused multimode fibers and attach them to the distribution enclosure. All multimode terminations shall be ST compatible connectors with ceramic ferrules.

Singlemode: The Contractor shall splice and/or terminate the number of singlemode fibers shown on the project plans, if any, according to the following requirements:

Singlemode Fiber Terminations: All singlemode fiber terminations shall utilize prefabricated, factory-terminated (SC compatible with ceramic ferrules) pigtails fusion spliced to bare fibers. The prefabricated pigtails shall have all of their fibers color coded to match the singlemode fibers in the fiber optic cable. Connector bulkheads shall be the proper type for the fiber enclosure at the location and shall be properly secured to the enclosure.

Singlemode Fiber Splices: All splices shall be made using a fusion splicer that automatically positions the fibers using a system of light injection and detection. The Contractor shall provide all equipment and consumable supplies.

Splices shall be secured in fiber optic splice trays within fiber optic distribution enclosures. All fusion splices shall be secured on aluminum splice trays capable of accommodating the required number of fusion splices, including necessary splice holders and a compatible splice tray cover. The tray dimensions shall not exceed 7.5" x 4.1" x 0.45" and shall be mounted within the enclosure using suitable hardware that allows removal for maintenance purposes without the use of tools. All individual splice trays shall be labelled.

All optical fibers shall be spliced to provide continuous runs. Splices shall only be allowed in equipment cabinets except where otherwise shown on the plans.

Basis of Payment: The work shall be paid for at the contract unit price per foot for FIBER OPTIC CABLE of the type, size, and number of fibers specified. The unit price shall include distribution enclosure(s), all connectors, pigtails, splice trays, connector bulkheads, testing and documentation, and the required number of fiber splices and terminations shown on the plans. Additional fiber terminations and/or splices required by

the Traffic Engineer, (not included in this item), shall be paid for as TERMINATE FIBER OPTIC CABLE and/or SPLICE FIBER OPTIC CABLE.

X1400102 OUTDOOR RATED NETWORK CABLE (LCDOT)

Effective: October 1, 2016

Revised: August 1, 2024

LC873.02

Description: This work shall consist of furnishing and installing a network cable from the traffic signal cabinet to the associated field device as shown on the plans.

Materials: The outdoor rated network cable shall be a black Category 5e or Category 6, meeting the TIA/EIA 568-B.2 telecommunication standards. The cable shall be composed of 24 AWG solid bare copper conductors, twisted pairs, polyolefin insulation, inner LLPE jacket, overall shield (100% coverage), 24 AWG stranded TC drain wire, industrial grade sunlight- and oil-resistant LLPE jacket. The cable shall be capable of performing from -40 °F to 160 °F.

Each end of the cable shall be terminated with an RJ-45 connector installed according to the TIA/EIA 568B standard. The drain wire at the cabinet end shall be terminated with a ring lug and attached to a suitable ground point.

General: The work shall be performed according to the applicable portions of Section 873 of the "Standard Specifications", and details as shown on the plans.

Basis of Payment: This work will be paid for at the contract unit price per foot for OUTDOOR RATED NETWORK CABLE. The unit price shall include all equipment, materials and labor required to furnish and install the cable, and making all connections necessary for proper operation. The unit price shall also include furnishing and installing the RJ-45 connectors, ring terminals and grounding the cable.

NETWORK SWITCH ACCESS

Description.

This item must consist of furnishing and installation of various network switches as shown in the plan. The network switches consist of Access, Distribution and Core Switch.

Materials. Materials must be according to the following:

A. General Requirements:

1. Management and Support Capabilities. Must include the following:
 - a. support full-duplex Ethernet
 - b. be capable Layer 2 LAN Base services
 - c. have American Standard Code for Information Interchange (ASCII) based configuration files for offline editing and bulk configuration
 - d. be managed using Simple Network Management Protocol (SNMP) Version 3.
 - e. be able to use Secure File Transfer Protocol (SFTP) to transfer configuration file to and from a central server.
 - f. be compliant with IEEE 802.1 and 802.3. Specifically, the switch must comply with the following IEEE 802.1 standards: (a) IEEE 802.1D - Media Access Control (MAC) Bridges, including Rapid Spanning Tree Protocol (RSTP). (b) IEEE 802.1Q - Virtual Local Area Network (VLAN) tagging and Multiple Spanning Tree Protocol (MSTP). (c) IEEE 802.1X (Port Based Network Access Protocol).
 - g. perform multicast filtering using Internet Group Management Protocol (IGMP) snooping.
 - h. support Address Resolution Protocol (ARP)
 - i. Need to have TACACS/RADIUS access via SSH
 - j. Need to support CDP protocol for neighbor reporting/discovery
 - k. Support for MAB security (ISE)
2. Power Requirements:
 - a. Input Voltage to Power Supply Modules: 100 to 240 VAC
 - b. Capable of using Redundant Power Supplies
 - c. Must use Manufacturer approved power supply.
3. Must utilize Single Mode Fiber Small Form-Factor Plug (SFP) Modules that have the following:
 - a. Minimum performance of 1Gbps
 - b. From the manufacturer of the switch.

- c. See plans for distance, type and quantity requirements
- 4. All ports must have Diagnostic light-emitting diodes (LED). These indicators must include link, activity, and power LEDs.
- 5. Must include a 1-year hardware support agreement and license (contract type SNT)

B. Additional Requirements for Distribution and Core Switches:

- 1. Switches must support the following Layer 3 capabilities:
 - a. Support of Enhanced Interior Gateway Routing Protocol (EIGRP).
 - b. Support of Border Gateway Protocol (BGP).
 - c. Internet Protocol Version 4 (IPv4);
 - d. Internet Protocol Version 6 (IPv6);
 - e. Open Shortest Path First (OSPF);
 - f. Generic Routing Encapsulation (GRE);
 - g. Inter-VLAN Internet Protocol (IP) routing for full Layer 3 routing between two or more VLANs;
 - h. Virtual Router Redundancy Protocol (VRRP);
 - i. IP multicast routing utilizing Protocol Independent Multicast (PIM) and Internet Group Management Protocol, Version 2 (IGMPv2).
 - j. Support for PIM sparse mode (PIM-SM) and PIM dense mode (PIM-DM);
 - k. Security utilizing Access Control Lists (ACLs).

C. Switch Types:

- 1. Access Switch:
 - a. Must include:
 - 1. **General Requirements.**
 - 2. the following port types or better:
 - 10/100/1000 Mbps copper Ethernet ports, RJ-45 connector
 - FE/GE SFP ports
 - b. Environmental Requirements:
 - 1. Operating Temperature: -34° to +70°C
 - 2. Humidity: 0 to 95% (non-condensing)
 - 3. IEC/EN/EN61000-4-2 (Electro Static Discharge), 8kV air/6kV contact
 - 4. IEC/EN 61000-4-3 (Radiated Immunity, 10 V/m 80-2000MHz, 3V/m 2000-2700MHz)

5. IEC/EN 61000-4-4 (Fast Transients - 2kV DC power, 2kV data line, 4kv earth)
6. IEC/EN 61000-4-5 (Surge 2 kV/1 kV DC power, 2 kV shielded and unshielded data line)
7. IEC/EN 61000-4-6 (Conducted Immunity, 10 V/emf 0.15-80MHz)
8. IEC/EN 61000-4-8 (Power Frequency Magnetic Field Immunity 30A/m 60 sec, 300A/m 3 sec)
9. IEC/EN 61000-4-9 (Pulse Magnetic Field Immunity 300A/m)
10. IEC/EN 61000-4-29 (Voltage Dips Immunity)
11. IEC 60068-2-27 (Operational Shock: 30G 11ms, half sine)
12. IEC 60068-2-27 (Non-Operational Shock 65-80G, trapezoidal)
13. IEC 60068-2-6, IEC 60068-2-64 (Operational Vibration)
14. EC 60068-2-6, IEC 60068-2-64, IEC 60068-2-47 (Non-operational Vibration)

2. Distribution Switch:

- a. Must include:
 1. **General Requirements.**
 2. **Additional Requirements for Distribution and Core Switches**
 3. The following port types or better:
 - 10/100/1000 Mbps copper Ethernet ports, RJ-45 connector
 - FE/GE SFP ports
- b. Environmental Requirements:
 1. Operating Temperature: -40° to +75°C
 2. Operate in a cabinet enclosure
 3. Humidity: 5 to 95% (non-condensing)
 4. CISPR 24 / CISPR 35
 5. EN55024 / EN55035
 6. KN 35
 7. EN 61000-4-2 Electro Static Discharge (air – 15kV, contact – 8kV)
 8. EN 61000-4-3 Radiated RF (10V/m UTP, 20V/m STP)
 9. EN 61000-4-4 Electromagnetic Fast Transients (4kV)
 10. EN 61000-4-5 Surge (2KV/1KV Power, 4KV STP)
 11. EN 61000-4-6 Conducted RF (10Vrms UTP)
 12. EN 61000-4-8 Power Frequency Magnetic Field (1000A/m)
 13. EN 61000-4-10 Damped Oscillatory Magnetic Field (100 A/m)
 14. EN 61000-4-16 Conducted CM Disturbances (30V, Cont/ 300V, 1 sec)
 15. EN 61000-4-17 Ripple Immunity DC Power (10%)

16. EN 61000-4-18 Damped Oscillatory Wave (2.5kV, 1MHz)
17. EN-61000-4-29 DC Voltage Dips and Interruptions
18. ANSI/ISA 12.12.01 (Class1, Div2 A-D)
19. EN 60079-0, -15 ATEX certificate (Class 1, Zone2 A-D)
20. EC 60079-0, 15 (report only)
21. UL 60079-0, 15
22. IEC 60068-2-27 (operational shock, 50G, 3ms, half sine)
23. IEC 60068-2-27 (non-operational shock, 65-80G, 9ms, trapezoidal)
24. IEC 60068-2-6 (vibration-sinusiodal, 5Hz-150Hz)

3. Core Switch:

- a. Must include:
 1. **General Requirements.**
 2. **Additional Requirements for Distribution and Core Switches**
 3. Network Port Requirements:
 - 48x 1/10/25G Gigabit Ethernet SFP ports
 - 4x 40/100G Uplink
 - Or better
- b. Environmental requirements:
 1. Operating Temperature: -5°C to +35°C (23° to 95° F)
 2. Relative humidity operating: 10 to 85% (noncondensing)
 3. Must be installed in a temperature-controlled environment.

Configuration.

Thirty (30) days prior to the installation of the network switches, The Contractor must deliver the switches, for configuration, to Lake County Division of Transportation, located at 600 W. Winchester Road, Libertyville, IL.

The switches must be delivered with markings on the box indicating the cabinet the item will be installed in per the plans. LCDOT will provide final network label on the switch.

After the switch is configured, the Contractor must coordinate an appointment to pick up the switches from LCDOT and install it.

Installation.

Access and Distribution Switches are to be installed in cabinets identified in the plans. Core Switches are only to be installed in temperature-controlled environments identified in the plans.

Documentation.

In addition to the initial submittal(s) prior to procurement, the Contractor must provide installation and operation manuals, documentation of exact equipment model and serial numbers, software/firmware version numbers, location installed in PDF formats on flash drive or via electronic delivery.

Basis of Payment.

This work will be paid for at the contract price per each for NETWORK SWITCH ACCESS, the price of which shall include all equipment, materials, and labor required to furnish, and install the switch, including all necessary connectors, cables, fiber optic jumpers, hardware, software and other peripheral equipment required to place the switch in operation to the satisfaction of the Engineer.

TRAFFIC SIGNAL POST (SPECIAL)

Effective: October 1, 2016

Revised:

LC875.01

Description: This work shall consist of furnishing and installing a metal traffic signal post at locations shown on the plans and/or as directed by the Traffic Engineer.

Materials: The traffic signal post shall meet the requirements of Article 1077.01 of the "Standard Specifications" and the following:

The traffic signal post shall be made of extruded aluminum, 16 feet in height, unless otherwise shown on the plans. The base shall be cast aluminum.

The traffic signal post and associated base shall be manufactured and/or supplied by Beacon, Sternberg Vintage Lighting, Union Metal, or Valmont, according to the following:

- Round, straight (non-tapered), 5-inch diameter, 12-flat fluted post.
- A ball center cap for the top of the post, instead of a tenon.
- The base section of the post shall be approximately 43 inches tall.

Manufacturer designations for TRAFFIC SIGNAL POST (SPECIAL) include the following:

- Beacon (MainStreet Series (100SJ)) base
- Sternberg (Hamilton Series (5400D)) base
- Union Metal
- Valmont

The traffic signal post and associated base shall be assembled and any exposed steel hardware shall be hot-dipped galvanized and powder-coated black by the supplier/manufacturer, as described below or by a pre-approved alternative finishing method. Cast aluminum base covers shall be powder-coated black by the supplier/manufacturer, as described below or by a pre-approved alternative finishing method.

Powder-Coated Finish: All galvanized and aluminum exterior surfaces shall be coated with chip resistive epoxy resin primer applied via electrostatic spray equipment. The primer is to be applied at a minimum dry film thickness (DFT) of 3.0 mils with a minimum DFT of 6.0 mils applied to the lower 8 feet of the pole. The primer coat shall be energy absorptive, and capable of achieving a rating of 10A under testing according to the American Society for Testing and Materials (ASTM) Procedure D3170, Standard Test Method for Chipping Resistance of Coatings. The primed surfaces shall then be coated

with a black semi-gloss TGIC Super Durable Polyester topcoat to a minimum dry film thickness of 3.0 mils. The topcoat shall meet the requirements of the American Architectural Manufacturer's Association (AAMA) 2604 test for color and gloss retention properties.

The manufacturer shall warranty the finish of all components for a period of at least five years from the date of shipment. The Contractor shall provide a copy of the warranty to the Traffic Engineer, upon request.

General: This work shall be performed according to Section 875 of the "Standard Specifications" and the following:

All chips, scrapes, scratches, etc., in the paint shall be touched-up by the Contractor according to the manufacturer's recommendations, with matching paint supplied by the manufacturer.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent the chafing of wires.

Pedestrian pushbutton stations shall be mounted to mast arm base covers according to the following:

- The top and bottom of the station shall be secured by drilling, tapping, and installing a 3/8-inch stainless steel threaded bolt, lock washer, and hex nut. Do not use self-tapping screws.
- Spacers made of 3/4-inch aluminum conduit shall be installed behind the pushbutton station, to level and plumb the station.

Basis of Payment: This work will be paid for at the contract unit price per each for TRAFFIC SIGNAL POST (SPECIAL) of the length specified.

STEEL MAST ARM ASSEMBLY AND POLE (SPECIAL)

STEEL COMBINATION MAST ARM ASSEMBLY AND POLE (SPECIAL)

Effective: October 1, 2016

Revised:

LC877.01

Description: This work shall consist of furnishing and installing a steel mast arm assembly and pole or steel combination mast arm assembly and pole at locations shown on the plans and/or as directed by the Traffic Engineer.

Materials: The steel mast arm assembly and pole and steel combination mast arm assembly and pole shall meet the requirements of Article 1077.03 of the "Standard Specifications" and the following:

Steel mast arm assembly and pole and steel combination mast arm assembly and pole shall be manufactured and/or supplied by Sternberg Vintage Lighting, Union Metal, or Valmont, according to the following:

- Round, tapered, 16-sharp fluted pole.
- Round, tapered, smooth, standard-curved, flange-connected, traffic signal mast arm

The two-piece mast arm base cover shall be cast aluminum and shall be manufactured and/or supplied by the same company as the mast arm assembly and pole. Manufacturer designations for the two-piece mast arm base cover to be used with (SPECIAL) MAST ARM ASSEMBLIES include the following:

- Sternberg (Hamilton 6401SS)
- Union Metal
- Valmont (Lake County AC1 base cover)

All mast arms, mast arm poles, luminaire arms, and any exposed steel hardware shall be hot-dipped galvanized and then powder-coated black by the supplier/manufacturer, as described below or by a pre-approved alternative finishing method. Cast aluminum base covers shall be powder-coated black by the supplier/manufacturer, as described below or by a pre-approved alternative finishing method.

Powder-Coated Finish: All galvanized and aluminum exterior surfaces shall be coated with chip resistive epoxy resin primer applied via electrostatic spray equipment. The primer is to be applied at a minimum dry film thickness (DFT) of 3.0 mils with a minimum DFT of 6.0 mils applied to the lower 8 feet of the pole. The primer coat shall be energy absorptive, and capable of achieving a rating of 10A under testing according to the American Society for Testing and Materials (ASTM) Procedure D3170, Standard Test Method for Chipping Resistance of Coatings. The primed surfaces shall then be coated with a black semi-gloss TGIC Super Durable Polyester topcoat to a minimum dry film

thickness of 3.0 mils. The topcoat shall meet the requirements of the American Architectural Manufacturer's Association (AAMA) 2604 test for color and gloss retention properties.

The manufacturer shall warranty the finish of all components for a period of at least five years from the date of shipment. The Contractor shall provide a copy of the warranty to the Traffic Engineer, upon request.

General: This work shall be performed according to Section 877 of the "Standard Specifications" and the following:

All chips, scrapes, scratches, etc., in the paint shall be touched-up by the Contractor according to the manufacturer's recommendations, with matching paint supplied by the manufacturer.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent the chafing of wires.

Stainless steel mesh screening shall be stainless steel banded to the anchor bolts, with a minimum 2-inch lap, to enclose the void between the top of the foundation and the base plate. The mesh screening shall have ¼-inch maximum opening and a minimum wire diameter of AWG NO. 16. The screening shall not be installed until the Traffic Engineer has inspected the leveling nuts at the Traffic Signal "Turn-On".

All base covers shall fit tightly around the poles, with little or no gap at the top of the base cover. Two-piece base covers shall fit together tightly, with little or no gap between the two pieces. All base covers shall fit securely on top of the foundation and shall not easily move or wobble. All base covers shall have an access hand hole, with a removable cover, and a minimum opening size of 200 square inches.

Pedestrian pushbutton stations shall be mounted to mast arm base covers according to the following:

- The top and bottom of the station shall be secured by drilling, tapping, and installing a 3/8-inch stainless steel threaded bolt, lock washer, and hex nut. Do not use self-tapping screws.
- Spacers made of 3/4-inch aluminum conduit shall be installed behind the pushbutton station, to level and plumb the station.

Luminaire arms shall be steel, 20 feet in length, tapered, monotube style, with an AASHTO 2001 wrap-around, gusset style connection.

luminaires shall be installed at a minimum mounting height of 45 feet unless indicated otherwise on the plans, and shall be paid for separately.

Basis of Payment: This work will be paid for at the contract unit price per each for STEEL MAST ARM ASSEMBLY AND POLE (SPECIAL) or STEEL COMBINATION MAST ARM ASSEMBLY AND POLE (SPECIAL), of the signal arm length specified.

CONCRETE FOUNDATION (LCDOT)

Effective: October 1, 2016

Revised: August 14, 2024

LC878.01

Description: This work shall consist of constructing a concrete foundation for a traffic signal post, controller base, or mast arm at locations shown on the plans and/or as directed by the Traffic Engineer.

General: This work shall be performed according to Section 878 of the "Standard Specifications" and the following:

All anchor bolts shall be according to Article 1006.09 of the "Standard Specifications", except all anchor bolts shall be hot dipped galvanized the full length of the anchor bolt including the hook.

Concrete Foundations, Type A for Traffic Signal Posts shall be constructed according to the latest version of IDOT Standard 878001, and the following:

Concrete Foundations, Type A for Traffic Signal Posts shall provide anchor bolts with the bolt pattern specified within the District 1 "Standard Traffic Signal Design Details" as shown on the plans. All Type A foundations shall be a minimum of 48 inches deep.

Concrete Foundations, Type C (Special) for Traffic Signal Cabinets with Uninterruptable Power Supply (UPS / Battery Back-Up) cabinet installations shall be constructed according to the latest version of IDOT Standard 878001, except as modified herein. The constructed foundation shall be a minimum of 48 inches long by 31 inches wide, and shall have a minimum depth of 48 inches. An integral concrete pad foundation for the UPS cabinet shall be constructed a minimum of 31 inches long by 20 inches wide by 10 inches deep. The UPS cabinet pad foundation shall be integral to the side of the signal cabinet foundation and shall be constructed on the same side as the signal cabinet power panel. Anchor bolts shall be provided and spaced according to the cabinet manufacturer's specifications. The conduits shall be the number and size as shown in the plans and placed at minimum depth of 30 inches. An L-Shaped concrete apron shall be constructed along the entire front of the signal cabinet foundation, the entire side of the UPS cabinet foundation, and the entire front of the UPS cabinet foundation. This concrete apron shall be a minimum of 36 inches wide by five inches deep. Perpendicular grooves shall be installed in each direction in the concrete apron according to Article 424.06 of the "Standard Specifications", beginning at the interior corner of the L shaped apron.

Concrete Foundations, Type D for Traffic Signal Cabinets shall be constructed according to the latest version of IDOT Standard 878001, except as modified herein. The constructed foundation shall be a minimum of 48 inches long by 31 inches wide, and shall

have a minimum depth of 48 inches. Anchor bolts shall be provided and spaced according to the cabinet manufacturer's specifications. The conduits shall be the number and size as shown in the plans and placed at minimum depth of 30 inches. The concrete apron at the signal cabinet shall be constructed a minimum of 36 inches wide by 48 inches long by five inches deep.

Concrete Foundations, Type E for Mast Arm and Combination Mast Arm Poles shall be constructed according to the latest version of IDOT Standard 878001. The foundation shall be 15 feet deep, except when deeper foundations are called for in IDOT Standard 878001. The Engineer shall approve the foundation excavation prior to placing any concrete.

Basis of Payment: This work will be paid for at the contract unit price per foot of depth for CONCRETE FOUNDATION, of the type specified.

LED INTERNALLY ILLUMINATED STREET NAME SIGN

Effective: May 22, 2002

Revised: July 1, 2021

891.02TS

Description.

This work shall consist of furnishing and installing a LED internally illuminated street name sign.

Materials.

The illuminated street name sign shall be as follows.

(a) Description.

The LEDs shall be white in color. The LED internally illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. White translucent Type ZZ reflective sheeting sign faces with the street name applied in transparent green shall be installed on the street sign acrylic panels which shall be affixed to the interior of the sign enclosure. Sheeting material shall be of one continuous piece. Paneling shall not be allowed. Hinged door(s) shall be provided for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

(b) Environmental Requirements.

The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50°C (-40 to +122°F) for storage in the ambient temperature range of -40 to +75°C (-40 to +167°F).

(c) General Construction.

1. The LED components, power supply, and wiring harness shall be arranged as to allow for maintenance, up to and including the replacement of all three components. The LED Light Engine shall be mounted in the top and/or bottom of the sign housing and no components of the light source shall sit between the sign faces.
2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI C136.31-2001 standards.

(d) Mechanical Construction.

1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum with the maximum sign dimensions of 30" in height, 96"

in length, 10.75" in depth (including the drip edge) and shall not weight more than 110 pounds. All housing corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal.

2. The sign doors shall be continuous TIG welded along the two corners with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full length stainless steel hinge. The sign shall also be fabricated in a way to ensure that no components fall out while a technician is opening or working inside the sign enclosure. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by an appropriate number of quarter-turn fasteners to form a watertight seal between the door and the housing.
3. The sign face shall be constructed of .125" white translucent polycarbonate or acrylic. Sign legend shall be according to D1 Mast Arm Mounted Street Name Sign detail and MUTCD. The sign face legend background shall consist of translucent Type ZZ white reflective sheeting and transparent green film applied to the front of the sign face. The legend shall be framed by a white border. A logo symbol and/or name of the community may be included with approval of the Engineer.
4. All fasteners and hardware shall be corrosion resistant stainless steel. No special tools shall be required for routine maintenance.
5. All wiring shall be secured by insulated wire compression nuts or barrier type terminal blocks.
6. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and shall provide a weather tight seal.
7. A photoelectric switch shall be mounted inside control cabinet to control lighting functions for day and night display. Each sign shall be individually fused.
8. Brackets and Mounting: LED internally illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets unless indicated otherwise in the plans. A 72" stainless steel safety cable shall be included and installed with each mounting bracket.

(e) Electrical.

1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.

2. The LED Light Engine shall operate from a 60 +/- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +/- 10%.
3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage and at a temperature of +25°C (+77°F), shall not exceed 20%.
4. The LED Light Engine shall be cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed 120 Watts. The signs shall be installed such that they are not energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptible power supply (UPS).

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m².
2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.
3. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

(g) Quality Assurance.

The LED Light Engine shall be manufactured in accordance with a vendor quality assurance (QA) program. The production QA shall include statistically controlled routine tests to ensure minimum performance levels of the LED Light Engine build to meet this specification. QA process and test result documentations shall be kept on file for a minimum period of seven (7) years. The LED Light Engine that does not satisfy the production QA testing performance requirements shall not be labeled, advertised, or sold as conforming to these specifications. Each LED Light Engine shall be identified by a manufacturer's serial number for warranty purposes. LED Light Engines shall be replaced or repaired if they fail to function as intended due to workmanship or material defects within the first sixty (60) months from the date of acceptance. LED Light Engines that exhibit luminous intensities less than the minimum value specified in Photometric Section within the first thirty-six (36) months from the date of acceptance shall be replaced or repaired.

Installation.

The sign shall be located on a steel traffic signal mast arm no further than 8-feet from the center of the pole to the center of the sign at a height of between 16 to 18-feet above

traveled pavement. Mounting hardware shall be from an approved vendor, utilizing stainless steel components.

Basis of Payment.

This work will be paid for at the contract unit price each for LED INTERNALLY ILLUMINATED STREET NAME SIGN, of the length as specified in the contract plans which shall be payment in full for furnishing and installing the LED internally illuminated street name sign, complete with circuitry and mounting hardware including photo cell, circuit breaker, fusing, relay, connections and cabling as shown on the plans for proper operation and installation.

The Illuminated street name sign cable will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, STREET NAME SIGN, NO. 14 3C, TYPE SOOW, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

XX006926 ILLUMINATED STREET NAME SIGN

Effective: October 1, 2016

Revised: July 15, 2017

LC891.01

Description: This work shall consist of furnishing a street name sign which is internally illuminated with light emitting diodes, and installing the sign on a traffic signal mast arm or span wire.

Materials: The LED Street Name Sign shall be one of the following approved models:

- Southern Manufacturing Clean Profile
- Temple Edge-Lit Razor
- Traffic Signs, Inc. ULTRASlim

The Contractor shall furnish the required mounting hardware.

ASTM Type IX/IDOT Type ZZ retroreflective sign sheeting shall be used for all sign legend and background surfaces.

All exterior metal surfaces of the sign housing shall be powder coated black by the supplier/manufacturer.

The electrical sign components shall be UL Listed and the light emitting diodes shall have a documented life span of 60,000 hours to 70% of the initial brightness. The sign faces shall display a minimum of 400 Lux when measured at any point and the lighting shall be spread evenly across each face of the sign.

The manufacturer shall warranty the entire sign, including all components, for a period of at least five years from the date of installation. The Contractor shall provide a copy of the warranty to the Traffic Engineer upon request.

Installation: The LED Street Name Sign shall be installed as shown on the plans, suspended from the mast arm unless a different mounting is called for, using a mounting bracket compatible with the sign model and manufacture.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent the chafing of wires.

The signs shall not be energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power source (UPS).

All signs at the intersection shall be activated by a common photocell installed in the controller cabinet.

General: The sign shall be mounted on the mast arm three feet to the right of the furthest right signal head, unless indicated otherwise in the plans, as viewed by the approaching traffic.

The Manufacturer/Vendor shall supply shop drawings of the fixtures, sign, sign message and mounting hardware for approval. All hardware used to install the sign shall be according to the manufacturer's recommendations.

Basis of Payment: This work will be paid for at the contract unit price per each for ILLUMINATED STREET NAME SIGN, of the size specified. The unit price shall include all associated equipment; hardware; wiring; connections; materials and labor required to furnish and install the sign and place it in operation to the satisfaction of the Traffic Engineer. The #14 2/C cable from the signal cabinet to the sign shall be paid for separately. The photocell in the signal cabinet shall be paid for in FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL or MODIFY EXISTING CONTROLLER CABINET.

89502375 REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

Effective: July 15, 2017

Revised: July 20, 2022

LC895.01

Add the following to Article 895.05(a) of the Standard Specifications:

The traffic signal equipment which is to be removed and is to become the property of the Contractor shall be disposed of outside the right-of-way at the Contractor's expense.

All equipment to be returned to the Lake County Division of Transportation (LCDOT) shall be delivered by the Contractor to the LCDOT. The Contractor shall contact the LCDOT Traffic Signal Engineer at 847-377-7000 to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within 30 days of removing it from the traffic signal installation. The Contractor shall provide one hard copy and one electronic file of a list of equipment that is to remain the property of the LCDOT, including model and serial numbers, where applicable. The Contractor shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned according to these requirements, it will be rejected by the LCDOT. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until the acceptance of a receipt drawn by the LCDOT Traffic Signal Engineer indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up or delivery of all equipment to be returned to agencies other than the LCDOT. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment which is lost or not returned to the LCDOT for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.

For all traffic signal posts or mast arms to remain, all vacated holes remaining in existing posts or mast arms shall be plugged with a kneadable, two-part epoxy putty. The putty shall cure in two hours or less and, when dried, the putty shall be sandable and paintable. It shall be capable of withstanding up to 500 degree Fahrenheit temperatures, with minimum tensile strength of 6000 psi and compressive strength of 18 psi. Products that include asbestos are prohibited.

The epoxy putty shall be applied to each vacated hole according to manufacturer's recommendations. The putty shall be shaped and smoothed, and excess putty shall be removed before it hardens. After the putty is fully hardened, it shall be sanded, cleaned, and painted to match the traffic signal post or mast arm.

Basis of Payment: This work shall be paid for at the contract unit price each per signalized intersection for REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT. The unit price shall include removal of all equipment designated on the plans, and its delivery to LCDOT or disposal outside the right-of-way according to Article 202.03 of the Standard Specifications. The unit price shall include all equipment, labor and material required to remove, transport, deliver and/or dispose of the designated traffic signal equipment. The unit price shall also include the plugging of all holes in existing mast arms and traffic signal posts with epoxy putty, as described herein, to the satisfaction of the Traffic Engineer.

REMOVE EXISTING DOUBLE HANDHOLE

Description. This work shall consist of the removal of existing double handholes.

General. This work shall be completed in accordance with Article 895.05(b) of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price per each for REMOVE EXISTING DOUBLE HANDHOLE.

XX008293 CURB WALL (SPECIAL)

Description. This work shall consist of constructing reinforced concrete curb.

General. This work shall be completed in accordance with Sections 508 and 606 of the Standard Specifications, the details in the plans, and this special provision. All reinforcement bars shall be epoxy coated. Reinforcement bars will not be paid for separately but shall be included in the cost of the work.

Method of Measurement. Curb wall (special) will be measured for payment in square feet. The curb will be measured from the top of sidewalk to the top of curb for the length of the curb.

Basis of Payment. This work will be paid for at the contract unit price per square foot for CURB WALL (SPECIAL).

X4240460 PORTLAND CEMENT CONCRETE SIDEWALK 8 INCH, SPECIAL

Description. This work shall consist of constructing reinforced concrete sidewalk on a prepared subgrade.

General. This work shall be completed in accordance with Sections 424 and 508 of the Standard Specifications, the details in the plans, and this special provision. All reinforcement bars shall be epoxy coated. Reinforcement bars will not be paid for separately but shall be included in the cost of the work. Subbase will be paid for separately.

Basis of Payment. This work will be paid for at the contract unit price per square foot for PORTLAND CEMENT CONCRETE SIDEWALK 8 INCH, SPECIAL.

PARKING BLOCKS

Description. This work shall consist of furnishing and installing parking blocks.

General. This work shall be completed in accordance with this special provision and the details in the plans.

Construction. The Contractor shall install the parking blocks after the pavement markings are placed. The Contractor shall drill holes into the HMA pavement and install 2-1" diameter steel pins that are 18" in length to stabilize the parking blocks.

Basis of Payment. This work shall be paid for at the contract unit price per each for PARKING BLOCKS.

REMOVE EXISTING PARKING BLOCKS

Description. This work shall consist of the removal and disposal of precast concrete parking blocks.

Construction. The Contractor shall remove parking blocks (and steel securing pins) at locations as shown in the plans and as directed by the Engineer. The parking blocks and pins shall be disposed of in accordance with Article 202.03 of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price each for REMOVE EXISTING PARKING BLOCKS.

MECHANICAL TECHNICAL SPECIFICATIONS

<u>Section</u>	<u>Title</u>
01 33 00	Equipment Submittals
01 91 58	Facility Startup
02 41 52	Demolition
03 10 00	Concrete Formwork
03 20 00	Concrete Reinforcement
03 25 00	Concrete Accessories
03 30 00	Cast-in-Place Concrete
03 41 00	Precast Concrete Structures
26 00 10	General Provisions for Electrical Work
26 00 20	Basic Electrical Materials and Methods
26 05 19	Low-Voltage Electrical Conductors and Cables
26 05 23	Control-Voltage Electrical Conductors and Cables
26 05 26	Grounding and Bonding of Electrical Systems
26 05 29	Hangers and Supports for Electrical Systems
26 05 33	Raceways and Boxes for Electrical Systems
26 05 53	Identification for Electrical Systems
26 24 19	Motor Control Center
26 27 16	Electrical Cabinets and Enclosures
26 29 20	Pump Control Panel
26 29 23	Variable Frequency Drive
26 32 13	Engine Generator
26 36 00	Automatic Transfer Switch
26 56 00	Site Lighting
26 60 20	Electric Service and Distribution
27 51 25	SCADA System
31 20 00	Earth Excavation
31 23 19	Dewatering
32 39 14	Bollard
33 05 50	General Provisions for Mechanical Work
33 41 00	Utility Piping
33 42 00	Pumps and Accessories
33 43 00	Temporary Bypass Pumping System

SECTION 01 33 00

EQUIPMENT SUBMITTALS

PART 1- GENERAL

1.01 SCOPE

- A. This Section establishes minimum requirements and procedures for Equipment Submittals made by the Contractor for materials and equipment provided for under the Work of this Contract. Specific details for additional drawings, data and information to be submitted shall be in accordance with the applicable requirements of other Sections of these Specifications.
- B. Acceptable Manufacturers and Equipment Suppliers for various items of equipment are specified in respective Sections of these Contract Documents. These proprietary items have been submitted to Bureau of Local Roads and Streets for approval for sole sourcing to align with LCPW's standardization and quality control. All items shall be BABA (Build America, Buy America) and AIS (American Iron and Steel) compliant. Certain specified items are required.

1.02 SUBMITTAL SCHEDULE

At the preconstruction conference meeting, the Contractor shall, within 10 days after receiving the Notice to Proceed, prepare and submit for review a detailed list of all the submittals which he/she proposes to make to meet the requirements stated herein and those cited in other Sections of the Contract Documents including the dates on which he/she proposes to make such submittals. The list shall include Working Drawings, Field Detail Drawings, Project Record Documents, Quality Control Procedures, and all other items for which a submittal is required. The list shall include identifying references for each item to relate it to the specific item of the Contract Documents.

With each revision or certification of the Construction Schedule, the Contractor shall either revise this schedule of submittals and submit it for review or certify that the previously furnished schedule is still in effect.

After the Submittal Schedule is reviewed by the Owner's Representative, it shall become the basis for the submittal of all items by the Contractor.

1.03 SUBMITTAL REQUIREMENTS

A. General

The Contractor shall furnish for review his/her Submittals as outlined herein and in the Specifications. Submittals shall confirm compliance with the requirements of the Contract Documents. Submittals of equipment drawings shall be made prior to the fabrication of the equipment. The sequence of submission shall be such that information is available for review of each Submittal when it is received. All Submittals furnished formally shall bear an approval stamp or a certification. The stamp or certification shall be signed by an authorized representative of the Contractor. The Contractor's stamp or certification on any Submittals shall constitute a representation to the Owner that the Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or that he/she assumes full responsibility for doing so, and that he/she has reviewed and coordinated each Submittal with the requirements of the Contract Documents. Before submitting any drawings for review, the Contractor shall obtain approval of the list of drawings he/she proposes to submit, showing sequence of submittal and submittal dates. All drawings shall be submitted in accordance with the Submittal Schedule as previously specified herein.

- B. All submittals shall be addressed to the Owner or as otherwise directed by the Owner.

C. Outline Drawings

The Contractor shall submit outline drawings of the equipment to be furnished together with estimated weights, operating forces, external forces, anchoring details, and sufficient overall dimensions, to facilitate preparation of final designs of the structures into which the equipment is to be incorporated.

D. Wiring Diagrams

The Contractor shall submit complete schematic and full-line wiring diagrams for all furnished equipment. The Contractor shall furnish drawings of switch developments for all instrument and control switches and internal connection diagrams for all instruments, relays, regulators, and other devices. One print of each wiring diagram will be returned on which will be marked the wire notations and cable numbers for outgoing circuits where this information is not otherwise available to the Contractor. The Contractor

shall add this information to his/her drawings. Adequate space shall be allowed on the wiring diagrams to accomplish this.

E. Detail Drawings and Erection Drawing

Before proceeding with fabrication or manufacture of the material and equipment designed and furnished by the Contractor, the Contractor shall submit the designs, design computations (when requested), apparatus ratings, detailed specifications, general assembly drawings, sufficient subassembly drawings, details, and control and wiring diagrams to demonstrate fully that all parts will conform to the provisions and intent of the Contract Documents and to the requirements of their installations, operations, and maintenance. These drawings shall substantially conform to the Proposal and Contract Drawings and shall show all necessary dimensions; all field joints and subassemblies in which the Contractor proposes to ship the equipment; locations and sizes of auxiliary connections for oil, grease, water and air; and the terminal boxes and wire sizes for electrical circuits. Before proceeding with fabrication or purchase, the Contractor shall submit shop drawings and/or catalog cuts as appropriate of items designed but not detailed on the Contract Drawings including, but not limited to structural steel and metal frames, covers, and gratings.

F. Field Detail Drawings

Layout drawings for any and all embedded components of the equipment such as but not limited to, piping, conduit, anchor bolts/plates, thimbles, etc. shall be submitted. These drawings shall be based on the Contract Drawings and shall contain sufficient detail for construction in the field.

G. Review of Drawings

1. Four print copies on durable paper with dark lines on a white background and one durable paper type reproducible shall be furnished of each drawing submitted. All drawings submitted shall, insofar as practicable, be of one standard size, measuring approximately 24 x 36 inches. The Contractor's drawings shall have a blank area of 4 x 4 inches adjacent to the drawing title block for the review stamp of the Owner's Representative. The Contractor shall verify by inspection of sample reproductions that good legible reproductions can be obtained from the reproducible before submittal.
2. Within 14 days of receipt of shop drawings or manufacturer's data, the Owner's Representative will return one copy of each drawing

and/or data sheet marked to indicate the result of the Owner's Representative's review, as follows:

- a. "REVIEWED" - Revision of drawing or data will not be required.
 - b. "REVIEWED WITH CORRECTIONS" - Contractor shall revise the drawings or data and shall submit four print copies and one reproducible copy for Owner's Representative's records.
 - c. "REVISE AND RESUBMIT" - Contractor shall revise the drawing or data and shall resubmit the revised drawing or data to the Owner's Representative for review.
 - d. "REJECTED" - Drawings are non-conforming and do not meet intent of Specifications.
3. Copies marked "REVIEWED" or "REVIEWED WITH CORRECTIONS" authorize the Contractor to proceed with construction or fabrication covered by those drawings or data sheets with corrections, if any, incorporated.
 4. Review will not relieve the Contractor of responsibility for conformity to the Contract Documents and correct detail and fit of parts when installed.
 5. If minor revisions are made after a drawing has been returned to the Contractor marked "REVIEWED", the Contractor shall furnish without delay one print copy and one reproducible copy subsequent to each revision. No major revision affecting the design shall be made after a drawing has been marked "REVIEWED" without resubmitting the drawing.
 6. When prints of drawings have been marked "REVIEWED WITH CORRECTIONS" or "REVISE AND RESUBMIT" the Contractor shall make the necessary corrections and submit four print copies and one paper-type reproducible. Every revision shall be shown by number, date, and subject in a revision block, and in addition, each revised drawing shall have its latest revision clearly indicated. Submitted drawings which do not illustrate these indications will be considered non-conforming.
 7. The applicable parts of the requirements of the above paragraphs with reference to the drawings shall apply equally to design data,

catalog cuts, illustrations, printed specifications, draft reports or any other submittals furnished for review.

8. The Contractor shall make any changes in the designs which are necessary to make the equipment conform to the provisions and intent of the Contract Documents, without additional cost to the Owner.
9. Should an error be found in a Contractor's drawing during the erection of structures or installation of equipment, the correction, including any field changes found necessary, shall be noted on the drawing, and it shall be resubmitted for review, and recorded as outlined above.
10. Resubmittal of Drawings and Data: Contractor shall accept full responsibility for the completeness of each resubmittal. Contractor shall verify that all corrected data and additional information previously requested by Engineer are provided on the resubmittal.

When corrected copies are resubmitted, Contractor shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by Engineer on previous submissions.

Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal.

If more than one resubmission is required because of failure of Contractor to provide all previously requested corrected data or additional information, Contractor shall reimburse Owner for the charges of Engineer for review of the additional resubmissions. This does not include initial submittal data such as shop tests and field tests which are submitted after initial submittal.

Resubmittals shall be made within 30 days of the date of the letter returning the material to be modified or corrected, unless within 14 days Contractor submits an acceptable request for an extension of the stipulated time period, listing the reasons the resubmittal cannot be completed within that time.

Any need for more than one resubmission, or any other delay in obtaining Engineer's review of submittals, will not entitle Contractor to extension of the Contract Times unless delay of the Work is directly caused by a change in the Work authorized by a Change Order or by failure of Engineer to review any submittal within the submittal review period specified herein and to return the submittal to Contractor.

H. Record Drawings

Prior to completion of the Work under the Contract Documents, the Contractor shall furnish one complete set of full-size permanent reproducible copies of approved quality and type and 3 full size sets of prints of all Contractor's drawings and equipment as finally built, including any field changes. Contractor shall also submit Record Drawings in Portable Document Format (PDF) on a read/write CD or DVD or current technology readable/writable media. Record Drawings shall be signed and sealed by a licensed surveyor or engineer.

I. Operating and Maintenance Instructions

1. Three sets of detailed operating and maintenance instruction manuals and two CD's containing PDF's which shall include reduced-size copies of applicable drawings, applicable parts lists and catalogs covering all equipment furnished and which may be needed or useful in operation, maintenance, repairs, dismantling or assembling, and for repair and identification of parts for ordering replacements, shall be furnished as specified.
2. Furnish operation and maintenance manuals for the various types of equipment and systems, as required by the Contract Documents. Unless otherwise indicated, a separate manual shall be furnished for each piece of equipment and/or system. The manual shall include complete information necessary to operate, maintain and repair the equipment and/or system and shall include the following specific requirements:
 - a. Table of contents and index.
 - b. Brief description of the equipment/system and principal components.

- c. Starting and stopping procedures both normal and emergency.
 - d. Installation, maintenance and overhaul instructions which shall include detailed assembly drawings with parts list and numbers, and recommended spare parts list with recommended quantity, manufacturer's price, suppliers address and telephone number.
 - e. Recommended schedule for servicing including technical data sheets that indicate weights and types of oil, grease or other lubricants recommended for use and their application procedures.
 - f. One copy of each component wiring diagram and the system wiring diagram showing wire size and identification.
 - g. One approved copy of each submittal with any changes made during construction properly noted including test certificates, characteristic curves, factory and field test results.
 - h. For electrical systems include dimensioned installation drawings, single line diagrams, control diagrams, wiring and connection diagrams, list of material for contactors, relays and controls, outline drawings showing relays and controls, outline drawings showing relays, meters, controls and indication equipment mounted on the equipment or inside cubicles, control and protective schematics and recommended relay settings.
3. Submittal Requirements: Three preliminary copies of manuals and one set of PDF's shall be submitted no later than the date of shipment of equipment, and installation shall not begin until they are accepted by the Owner's Representative. Three approved copies and one set of PDF's of complete manuals shall be delivered to the Owner's Representative prior to Owner's Representative inspections and tests.

J. Language

All drawings, design data, reports, instructions, catalogs, illustrations, and printed specifications shall be submitted in English.

K. System of Units of Measurement

All units of measurement used shall be in the U.S. Customary System.

PART 2- PRODUCTS

Refer to Paragraph 1.03, Submittal Requirements, of this Section.

PART 3- EXECUTION

Refer to Paragraph 1.02, Submittal Schedule, of this Section.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 01 91 58

FACILITY STARTUP

PART 1- GENERAL

1.01 SUMMARY

- A. This Section describes the Contractor's general equipment requirements for facility start-up.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01, 26 and 33 of these CSI Specifications.
 - 2. Section 801 of the Standard Specifications.

1.02 SUBMITTALS

- A. Submit a detailed plan and schedule for start-up of each facility at least seven (7) days prior to the scheduled start-up of each facility.
 - 1. Coordinate with all manufacturers.

PART 2- PRODUCTS

Not applicable to this Section.

PART 3- EXECUTION

3.01 CONTRACTOR'S REQUIREMENTS

- A. Provide the services of a qualified and experienced factory employed field service engineer from each equipment manufacturer:
 - 1. Ascertain that equipment has been installed in accordance with the manufacturer's recommended procedures.
 - 2. Ascertain that equipment is operational and ready for start-up.
 - 3. Make necessary repairs, corrections, and/or modifications prior to the scheduled start-up.
- B. Coordinate efforts of equipment field service engineers with construction activities.

- C. Perform the above services at least two weeks prior to the scheduled start-up.
- D. Perform the facility start-up procedures in the presence of the Village and Engineer.
- E. Complete the Start-Up Form provided by equipment manufacturer.

END OF SECTION

SECTION 02 41 52

DEMOLITION

PART 1- GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Demolition and removal of equipment and site improvements.
2. Abandoning in-place and removing below-grade construction.
3. Disconnecting, capping or sealing, abandoning in-place and removing site utilities.
4. Salvaging items for reuse by Owner.

B. Related Sections:

1. Division 31 for site clearing and removal of above- and below-grade site improvements not part of demolition.

1.03 DEFINITIONS

- A. **Remove:** Detach items from existing construction and legally dispose of them in accordance with Standard Specification Section 202.03 off-site unless indicated to be removed and salvaged.
- B. **Remove and Salvage:** Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner. Include fasteners or brackets needed for reattachment elsewhere.

1.04 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets,

and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 SUBMITTALS

- A. Qualification Data: For qualified refrigerant recovery technician.
- B. Proposed Protection Measures: Submit informational report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.
- C. Schedule of Building Demolition Activities: Indicate the following:
 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
 2. Temporary interruption of utility services.
 3. Shutoff and capping or re-routing of utility services.
- D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- E. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations.
- F. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- G. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present, was recovered, and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.06 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
- D. Predemolition Conference: Conduct conference at project site.
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structures.
 - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review and finalize protection requirements.
 - 5. Review procedures for noise control and dust control.
 - 6. Review procedures for protection of adjacent buildings.
 - 7. Review items to be salvaged and returned to Owner.

1.07 PROJECT CONDITIONS

- A. Buildings and/or rooms/sections within building(s), to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings and/or rooms/section within building(s), immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

- C. Owner assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 2. Before building demolition, Owner will remove the following items:
 - a. As directed by Owner.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. On-site storage or sale of removed items or materials is not permitted.

1.08 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.

PART 2- PRODUCTS

2.01 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Division 31.

PART 3- EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

- C. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
- D. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

- A. Refrigerant: Remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction before starting demolition.
- B. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
 - 1. Owner will arrange to shut off indicated utilities when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 4. Cut off pipe or conduit a minimum of 24 inches (610 mm) below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
- C. Existing Utilities: Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.
- D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of demolition.

E. Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.03 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated.

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.04 DEMOLITION, GENERAL

- A. General: Demolish indicated building(s), rooms/sections within building(s), and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 2. Maintain fire watch during and for at least 4 hours after flame cutting operations.
 3. Maintain adequate ventilation when using cutting torches.
 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Engineering Surveys: During demolition, perform surveys to detect hazards that may result from building demolition activities.
- C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

D. Explosives: Use of explosives is not permitted.

3.05 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Salvage: Items to be removed and salvaged are indicated on Drawings.

D. Below-Grade Construction:

1. Where indicated on the plans or as required for construction, Contractor shall abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.
2. Demolish foundation walls and other below-grade construction that are within footprint of new construction and extending 5 feet outside footprint indicated for new construction. Abandon below-grade construction outside this area.
3. Remove below-grade construction, including basements, foundation walls, and footings to 5 feet below grade or as indicated on the plans.

E. Existing Utilities:

1. Where indicated on the plans or as required for construction, Contractor shall abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
2. Demolish existing utilities and below-grade utility structures that are within 5 feet outside footprint indicated for new construction. Abandon utilities outside this area.
3. Fill abandoned utility structures with controlled low strength concrete material (flowable fill) satisfactory soil materials according to backfill requirements in Division 31.

4. Piping: Disconnect piping at unions, flanges, valves, or fittings.
5. Wiring Ducts: Disassemble into unit lengths and remove plug-in and disconnecting devices.

3.06 DEMOLITION BY EXPLOSIVES

- A. Explosives: Explosives are not permitted on or near the project site.

3.07 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with controlled low strength concrete material (flowable fill).
- C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.08 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.09 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction and in accordance with Standard Specification Section 202.03.
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.11 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

- 1. Clean roadways of debris caused by debris transport.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X3400002; Demolition of Existing Pump Station

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
 - C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 3 10 00

CONCRETE FORMWORK

PART 1- GENERAL

1.01 SECTION INCLUDES

- A. General formwork.
- B. Forms and coatings.
- C. Form ties and accessories.

1.02 RESPONSIBILITY

- A. The Contractor shall be solely responsible for the ability of formwork to produce members of the size, shape, and exterior finish required, for the structural adequacy of the forms to carry construction loads without excessive deflection, and for the safe use of forms in connection with completion of the concrete work. The Contractor shall be responsible for any injury or damage arising from inadequate forms or from premature removal of formwork.
- B. Submittals
 - 1. Samples and Certifications
 - 2. Samples and certifications shall be submitted in accordance with Section 01 33 00.
- C. Referenced Standards: Formwork design, construction, and removal shall conform to ACI 301, Standard Specifications for Structural Concrete.

PART 2- PRODUCTS

2.01 FORMWORK

- A. Form Ties: Form ties shall be a water sealing snap-in type or tapered thru bolt type. The large end of tapered thru bolt ties shall be on the interior side of the wall.
- B. Plywood Forms and Liners: Plywood forms and liners shall be minimum grade B-B High Density Overlay Concrete Form Panels, Class I.

- C. Lumber: Formwork lumber shall be straight and clean. All nails shall be withdrawn and surfaces in contact with concrete shall be thoroughly cleaned before reuse.
- D. Metal Forms: Metal forms shall be fabricated from carbon steel sheets conforming to ASTM A569.

PART 3- EXECUTION

3.01 PREPARATIONS

- A. Fastening Devices for Other Work: Coordinate with other trades and properly place and locate in position all necessary dowels, bolts, anchors, anchor slots, inserts, sleeves, openings, hangers, metal ties and other fastening devices required for attachment and support of adjacent work. Securely anchor all embedded items.

3.02 FORMWORK REQUIREMENTS

- A. General:
 - 1. Formwork shall comply with ACI 347 and to shape, lines and dimensions of the members as indicated on the Drawings. Joints in forms shall be horizontal or vertical. Forms shall be properly braced or tied to maintain position and shape under all dead and live loads and to prevent leakage. Forms shall be assembled so their removal will not damage the concrete. Tolerances for formed surfaces shall follow the lasted edition of ACI 301.
 - 2. Lumber formwork may be used for surfaces which will not be exposed to view. Use plywood or metal forms for exposed surfaces.
 - 3. Provide temporary openings at the base of forms greater than 4 feet high, if necessary, to facilitate cleaning and inspection immediately before depositing concrete.
 - 4. All external corners of concrete exposed to view shall be chamfered by using 3/4 inch by 3/4 inch by 45-degree wood stripping, except as otherwise indicated on the Drawings.
- B. Grade A Forms
 - 1. Unless otherwise indicated, Grade A forms shall be used for all exposed concrete.

2. Grade A forms shall consist of steel forms lined with 3/16-inch-thick tempered hardboard or 1/4-inch-thick plywood, or by using plywood forms.
3. Full sized sheets shall be used wherever possible. The edges of all sheets shall be straightened to insure tight, close fitting joints. Bulges or depressions more than 1/8 inch in 4 feet will not be permitted. Open joints which would permit leakage shall be sufficient cause for rejection of forms. Other tolerances shall be as allowed by ACI 347.

C. Grade B Forms

1. Use lumber, plywood or metal forms. All joints shall be solidly backed, aligned and made leakproof.
2. Unless otherwise indicated, Grade B Forms are intended for use where concrete will not be exposed to view, such as below grade, below normal liquid levels in water-retaining structures, or inside manholes, boxes, vaults, etc.

D. Surface Treatment of Formwork: The inside surface of lumber forms shall be soaked with clean water prior to placing concrete. All other forms shall be treated with an approved form oil or lacquer. If oil is used, all excess oil shall be wiped off.

E. Inspection of Formwork: Concrete shall not be placed until the forms have been inspected by the OWNER to assure surfaces in conformance with the Drawings and Specifications.

F. Removal of Forms: Forms shall be removed in accordance with requirements of ACI 318, without damaging the concrete. Leave shoring in place until concrete will safely support its own weight plus any live loads that may be placed upon it.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 3 20 00

CONCRETE REINFORCEMENT

PART 1- GENERAL

1.01 SECTION INCLUDES

- A. Provision of all reinforcement.

1.02 SUBMITTALS

- A. Certifications: Certifications for reinforcement shall be submitted in accordance with Section 01 33 00.
- B. Shop Drawings: Submit checked reinforcement steel shop drawings in accordance with Section 01 33 00. Shop drawings shall be prepared in accordance with ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures. Drawings shall indicate bending diagrams, shapes, dimensions, clearances, splicing and lap lengths, accessories, and installation notes.

PART 2- PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcement Bars: Reinforcement bars shall be ASTM A706, Grade 60 deformed bars, except as otherwise indicated.
- B. Smooth Dowels: Smooth dowels shall be ASTM A615, Grade 60 plain bars.
- C. Threaded Dowels: Threaded dowels shall be ASTM A36.
- D. Welded Wire Reinforcement: Welded wire reinforcement shall conform to ASTM A185. Where welded wire reinforcement is shown but not sized on Drawings, use 6" x 6" x W2.9 x W2.9 WWF.
- E. Accessories: Accessories for proper installation of reinforcement shall conform to CRSI "Manual of Standard Practice for Reinforced Concrete Construction". All bar supports at exposed surfaces shall be Class 1- Plastic Protected.

- F. Reinforcement Fabrication: Reinforcement fabrication shall conform to ACI 315 and ACI 318, and approved shop drawings.
- G. Mechanical Splices: Mechanical splices of reinforcing bars shall be made with exothermic reaction connections. Splices shall develop 125% of the specified yield strength of the reinforcing bar.

PART 3- EXECUTION

3.01 PREPARATIONS

- A. Vapor Barrier: On porous subgrade or beddings, provide vapor barrier as specified in Section 03 30 00.
- B. Fastening Devices for Other Work: Coordinate with other trades and properly place and locate in position all necessary reinforcement, dowels, bolts, anchors, anchor slots, inserts, hangers, metal ties, and other fastening devices required for attachment and support to adjacent work. Securely anchor all fixtures and embedded items.

3.02 REINFORCEMENT

- A. General:
 - 1. The placement of reinforcing steel shall conform to "Placing Reinforcing Bars", as published by the Concrete Reinforcing Steel Institute except as noted.
 - 2. Reinforcement shall be inspected and approved by the OWNER before enclosing forms are erected and shall be rechecked immediately prior to depositing concrete.
- B. Splices, Laps, and Dowels:
 - 1. Provide continuous reinforcement or dowels through construction joints. The use of inserts in lieu of dowels shall be subject to the ENGINEER'S approval. One half of reinforcement shall be discontinued across control joints unless otherwise indicated. All reinforcement shall be discontinued across expansion joints, except for sleeved or greased dowels, if indicated.
 - 2. Splice laps shall be as indicated on the Drawings. Dowels shall be of the same size as the largest bar to which they lap, unless otherwise indicated.

3. Clean all concrete, dirt and foreign substances from reinforcing bars by sand blasting or by other methods approved by ENGINEER prior to making a mechanical exothermic reaction splice. Manufacturer's representative shall provide on-site instruction to contractor's personnel and Owner's representative on proper installation procedures. Manufacturer's representative shall observe initial splices made by contractor to insure proper technique and performance of the product. He shall make additional visits to the site as may be requested by the Owner to inspect completed work. Contractor shall only use personnel who have received instructions from manufacturer's representative to perform the work.

C. Fabric Reinforcement for Slabs

1. Fabric reinforcement for slabs shall be overlapped at splices not less than the spacing of the cross wires plus 2 inches. Fabric shall extend to within 4 inches of concrete edges.
2. Unless otherwise shown, place reinforcement 2 inches below the top of the finished slab. Mesh shall either be sandwiched between two layers of fresh concrete or supported on mesh supports. Supports that may puncture the vapor barrier, if any, shall not be used.

D. Reinforcement for Formed Concrete

1. Secure steel reinforcement to maintain proper position during concrete placement. Concrete protection for reinforcement shall conform to ACI 318, except as otherwise indicated on the Drawings.
2. Provide Z bars and bar supports at 4-foot on centers each way in wall, columns, etc. pours to maintain proper position.

PART 4— MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 3 25 00

CONCRETE ACCESSORIES

PART 1- GENERAL

1.01 SECTION INCLUDES

- A. Construction joints.
- B. Anchors and inserts.
- C. Water stops.

1.02 SUBMITTALS

- A. Samples and Certifications: Samples and certifications for all materials herein shall be submitted in accordance with Section 01 33 00.

PART 2- PRODUCTS

2.01 JOINT FILLERS

- A. Joint fillers shall be products of a reputable manufacturer.
- B. Preformed Sponge Rubber Joint Filler: Preformed sponge rubber joint filler shall conform to ASTM D1752, Type I.
- C. Preformed Cork Joint Filler: Preformed cork joint filler shall conform to ASTM D1752, Type II.
- D. Preformed Bituminous Fiber Joint Filler: Preformed bituminous fiber joint filler shall be non-extruding type conforming to ASTM D1751.
- E. Control Joint Strips: Control joint strips shall have a minimum depth of 25 percent of slab thickness and a minimum thickness of 1/8 inch.

2.02 JOINT SEALANTS

- A. Sealants for joints shall be as indicated under Execution.
- B. Water stop:
 - 1. Water stop shall be virgin polyvinyl chloride (PVC) and shall be dense, homogeneous and uniform. Holes and imperfections shall be cause for rejection.
 - 2. Water stops for construction joints shall be 6 inches by 3/16-inch minimum split water stop or 6 inches by 3/16 inch minimum with hollow center bulb. Water stops for expansion joints shall be 9 inches by 3/8 inch with 3/4-inch hollow center bulb. Multiple rib type of water stop is required. Where size and type of water stop are not indicated, 6 inches by 3/16 inch minimum with hollow center bulb shall be used.
 - 3. Provide prefabricated tees, crosses, and other configurations as required for all intersections of water stop.
- C. Bentonite Waterproofing Strip: A 1" x 3/4" strip of water stop.

PART 3- EXECUTION

3.01 PREPARATION

- A. Remove existing concrete and provide openings for installation of new work as indicated on Drawings. Repair all damage to existing work caused by concrete removal.

3.02 CONSTRUCTION JOINTS

- A. General
 - 1. Arrange construction joint bulkheads to allow concrete to be placed between construction joints in one continuous operation.
 - 2. Provide construction joints with shear transfer keyways and water stops as indicated. Unless otherwise indicated on the Drawings, spacing of construction joints for walls shall not exceed 60 feet.
 - 3. Erect bulkheads where shown on the Drawings. Bulkheads shall be at right angles to the main reinforcement and shall produce a tongue and grooved joint of the configuration indicated on the Drawings. Install water stop as indicated.
 - 4. Obtain the OWNER'S approval if it becomes necessary to eliminate or relocate construction joints shown on the Drawings.

5. Tops of edge forms, bulkheads and screeds shall be set to the finished elevations and to provide uniform pitch to drains as indicated on Drawings.
- B. Horizontal Joints: Provide methods of achieving a leakproof joint. No horizontal construction joints will be permitted in slabs, beams, or girders.
- C. Vertical Joints: Joints in reinforced slabs, beams, and girders shall be perpendicular to the axis or plane of the members joined.
- D. Expansion Joints: General: Provide expansion joints and water stops where indicated. Joint fillers shall be placed on each side of water stops.
- E. Interior Horizontal Joints: Unless otherwise indicated, provide preformed sponge rubber or preformed cork filler. Allow for installation of two component traffic grade polyurethane sealant in compliance with Section 07900.
- F. Exterior Horizontal Joints: For drives, pavements, parking areas, walks and slabs on grade, provide preformed non-extruding asphalt strip or bituminous fiber joint filler set 1/8-inch below finished surface unless otherwise indicated. Tool concrete edges on each side of joint. No sealant is required.
- G. Interior and Exterior Vertical Joints: Unless otherwise indicated, provide preformed sponge rubber or cork filler with allowance for installation of two-component polysulfide sealant.
- H. Submerged Horizontal and Vertical Joints: Unless otherwise indicated, provide preformed sponge rubber or cork filler with allowance for installation of two component polyurethane or two-part polysulfide sealant as required. Contractor shall submit sealant manufacturer's recommendation that his product is suitable for this application.

3.03 WATERSTOPS

- A. Provide continuous water stops.
- B. Embed approximately half of the water stop on each side of the joint. Field splice and join PVC water stop with heat sealing butt joints.
- C. All splices and joints shall be in accordance with the manufacturer's recommendations to produce a water-tight joint. Lap splices will not be permitted. Support and protect the water stop during construction. Repair or replace all damaged water stop.

PART 4— MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 3 30 00

CAST-IN-PLACE CONCRETE

PART 1- GENERAL

1.01 SUMMARY

A. Section Includes:

1. Concrete mixtures.
2. Mixing.
3. Transporting.
4. Placement schedule.
5. Depositing and consolidating.
6. Slab finishing.
7. Curing.
8. Formed surface finishing.

B. Pump Station Items Covered by this Section:

1. Pump Control Panel Reinforced PCC Equipment Pad
2. Natural Gas Standby Generator Reinforced PCC Equipment Pad

1.02 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Samples and Certifications: Samples and certifications shall be submitted in accordance with Section 01 33 00. Unless otherwise indicated, submit certifications for all products and samples as may be specifically requested by Engineer.

C. Product Data: Submit manufacturer's literature for all products proposed for the work.

D. Delivery Tickets: Submit delivery tickets in accordance with ASTM C94 for each batch of ready-mixed concrete. Information on the ticket shall include class of concrete, water content, time of loading, truck number, admixtures, and quantity.

E. Mix Design:

1. At least 35 days prior to placing of concrete, Contractor shall provide mix design to Owner in order to perform laboratory testing on the proposed mix proportions and samples of proposed materials. The laboratory will prepare a detailed report of the 7-day and 28-day compressive strength, slump, and air-entrainment of the concrete mix submitted. The strength determination for each class of concrete will be based on not less than three concrete specimens of each age.
2. The laboratory will employ techniques to adjust for mechanical vibrators and any special devices or equipment to be used for the work. Contractor shall inform Owner and the Testing Laboratory of proposed techniques and devices.

F. Cast-in-Place Design Calculations:

1. Cast-in-place concrete structures may serve as acceptable alternatives to structures identified as pre-cast concrete structures; however, Contractor must submit the following information:
 - a. Design Calculations: Design calculations demonstrating the structural adequacy of the cast-in-place structure for the intended purpose of the structure. Design calculations must be stamped and signed by a structural engineer licensed to practice in the state of Illinois.
 - b. Detailed Shop Drawings: Shop drawings of the cast-in-place structure showing concrete and opening dimensions, rebar size, rebar spacing, rebar clearance, and all construction control, and expansion joints.
 - c. Product Data: Product data for all miscellaneous concrete accessories to be incorporated into the structure.
 - d. Placement Schedule: Submit a concrete placement schedule showing the pouring sequence and location of construction and contraction joints not indicated on the Drawings to the maximum extents possible.

1.03 QUALITY CONTROL

- A. Materials and Methods: Materials and methods of mixing and placing concrete shall conform to ACI 318, Building Code Requirements for Reinforced Concrete.

B. Laboratory Tests:

1. Owner will retain the services of testing laboratory and submit reports in accordance with Section 01 33 00 – Submittal Procedures. All additional tests required because concrete fails to meet Specifications will be deducted from payments due Contractor.
2. Contractor shall provide all necessary labor and devices to obtain samples and provide field curing.
3. As directed by the Engineer, the testing laboratory will provide for inspection of the concrete batch plant to see that the concrete is properly mixed, and that the consistency of mix is being controlled.
4. The laboratory will immediately submit two copies of laboratory reports on all strength tests to the Engineer, the local building authority, if required, the concrete Contractor, and the supplier. Reports will be made on a form acceptable to the Engineer and will indicate delivery ticket numbers, strength, slump, air entrainment, admixtures, concrete temperature, pour location, date, age, and remarks on properties changes.

C. Compressive Strength Tests: Sample specimens for strength tests of Class A concrete shall be taken not less than once a day, nor less than once for each 50 cubic yards of concrete placed, nor less than once for each 5000 square feet of surface area for slabs and/or walls. Five specimens shall be secured in accordance with ASTM C172. Three specimens will be laboratory-cured in accordance with ASTM C31. The other two shall be cured entirely under field conditions. Compressive strength tests will be made at the age of 7 days on one field-cured and one laboratory-cured specimen. Compressive strength tests will be made at the age of 28 days on one field-cured and two laboratory-cured specimens. All tests will follow ASTM C39.

D. Enforcement of Strength Requirements:

1. For Class A Concrete, the average of any five consecutive compressive strength test results on laboratory-cured specimens shall be greater than the specified strength. Not more than one of the five test results shall be less than the specified strength. No individual laboratory cured strength test result shall fall below the specified strength by more than 400 psi. Each strength test result will be the average of two laboratory cured cylinders from the same sample test at 28 days.
2. If more than one of the laboratory-cured specimens is below the

specified strength, or if the strengths of field-cured specimens are more than 10% below the strength of the corresponding laboratory- cured specimens, the Engineer will determine the appropriate corrective measures to be provided at Contractor's expense.

- E. Slump Tests: Tests for slump will be made when directed by the Engineer in accordance with ASTM C143. Excessive slump is cause for rejection of concrete prior to placement.
- F. Air Entrainment Tests: At least two air content tests will be made each day, and when change in consistency of the concrete mix is noted. The air content tests will be made in accordance with ASTM C138, C173, C231, or AASHTO T152.
- G. Adverse Weather Conditions:
 - 1. Comply with ACI 305 or 306 for hot or cold weather concreting.
 - 2. Do not mix salt, chemicals, or other foreign materials with the concrete to prevent freezing without approval of the Engineer. Maintain the temperature of concrete above 50 degrees F for 5 days after placement. When high early strength portland cement concrete is used, the temperature shall not be less than 70 degrees F for 2 days or 50 degrees F for 3 days. Transition the concrete to the outside temperature at a rate of 1°F each hour for the first 24 hours and 2 degrees F each hour thereafter.
 - 3. In no case shall the temperature of concrete exceed 90 degrees F at the time of placement. If insulated forms are used, the temperature of the concrete mixture shall not exceed 80°F at time of placement.
 - 4. If the Engineer determines that heat of hydration may cause excessive concrete temperatures and subsequent detrimental effects, the concrete mixture shall not exceed 60°F at time of placement for critical pours.

PART 2- PRODUCTS

2.01 CONCRETE MATERIALS

- A. Water: Water shall be clean and potable.
- B. Cement: Portland cement shall be in accordance with Section 1001 of the Standard Specifications.
- C. Pozzolon: Pozzolons shall conform to ASTM C618 and shall have a loss of

ignition less than three percent.

D. Aggregate:

1. Fine and coarse aggregate shall be clean, hard, natural, or manufactured material conforming to ASTM C33.
2. The nominal maximum size of the aggregate shall not be larger than one-fifth of the narrowest dimension between forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars or pre tensioning tendons. Coordinate with maximum aggregate sizes specified hereafter for classes of concrete. These limitations may be waived if, in the judgment of the Engineer, workability and methods of consolidation are such that the concrete can be placed without honeycomb or void.

E. Admixtures:

1. Admixtures shall conform to ASTM C260 (air entrainment) or C494 (chemical admixtures) and shall be products of a reputable manufacturer.

2.02 MISCELLANEOUS MATERIALS

- A. Vapor Barrier: Vapor barrier shall be polyethylene film 0.01 inches thick and shall conform to Product Standard PS-17.
- B. Curing and Sealing Compound: Curing compound shall be a colorless liquid acrylic formulated to comply with ASTM C309, Type 1, Class B. All interior floor slabs shall be cured and sealed with a colorless liquid acrylic formulated to comply with ASTM C309, Type 1, Class B and with ASTM C1315, Type 1, Class B.
- C. Membrane Curing Compound: Membrane curing compound shall conform to ASTM C309, Type 1 or Type 1-D. Type 1-D compound shall only be used for P.C.C. pavement.
- D. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- E. Moisture Retaining Cover: One of the following, complying with ASTM C 171:

1. Waterproof paper
2. Polyethylene film
3. Polyethylene-coated burlap

- F. Silicon Water Repellent: Silicon water repellent shall be a 5% Silicon Solution complying with Fed. Spec. SS-W-110.
- G. Hardener: Hardener shall be a colorless fluosilicate-based solution of chemically active hardening agents.

2.03 BONDING COMPOUND, GROUT, AND MORTAR MIXTURES

- A. Epoxy Bonding Compound: Epoxy bonding compound for joining new to existing concrete shall be from a reputable manufacturer and approved by the Engineer.
- B. Non-Epoxy Bonding Compound: Non-epoxy bonding compound for joining new to existing concrete where bonding compound cannot be placed immediately prior to pouring of new concrete from a reputable manufacturer and approved by the Engineer. Re wettable bonding compound shall be protected from all sources of moisture prior to pouring new concrete.
- C. Cement Grout: Mix 1-part cement and 1-part sand with water to a thick paint consistency. Add white cement to match color of adjacent concrete. Sand shall pass a No. 18 sieve.
- D. Non-Shrink Grout: Non-shrink grout shall be a premixed, nonferrous, cementitious mixture with a 28-day strength of at least 6000 psi. Grout shall not shrink. Mixtures to be placed in excess of 1-inch thickness may include 3/8-inch pea gravel.
- E. Expansive Grout: Expansive grout shall be a premixed, nonferrous, cementitious mixture with a minimum 28-day strength of 3500 psi. Air entraining content shall be as recommended by the manufacturer. Grout shall expand no more than .10% nor less than .03%.
- F. Epoxy Grout:
1. The two components of epoxy bonding compound shall be mixed in compliance with the manufacturer's instructions. If permitted by the manufacturer the epoxy bonding compound may be combined with approximately 1-1/2 parts of oven-dry sand to 1 part of the bonding compound, by volume. Mixing of trial batches may be necessary to determine the best proportions.

2. The sand for epoxy grout shall meet the following gradation and shall be oven-dry:

Sieve Size	No. 8	No. 50	No. 100
% Passing	100	30+15	5+5

- G. Patching Mortar: Mix 1-part portland cement to 3 parts fine aggregate. Add white cement to match color of adjacent surface. Provide test patch for approval by Owner prior to patching on exposed concrete. Mix with minimum amount of water necessary.

2.04 CONCRETE MIXTURES

A. General:

1. Concrete not indicated otherwise shall be Class A concrete.
2. The proportions of cement, aggregate, and water shall be selected by Contractor in accordance with ACI 318 to provide a plastic and workable mix. Coarse aggregate shall be limited to prevent harshness and honeycombing. Coarse aggregate size shall not be greater than the maxima listed for the various classes of concrete and as previously specified under aggregate.

- B. Class A Concrete: Class A structural concrete shall have a 28-day strength of 4000 psi, shall contain not less than 564 pounds cementitious material per cubic yard, shall have a water-cement plus pozzolon ratio of not more than 0.45, and shall contain 4 percent to 6 percent entrained air, by volume, except interior slabs subject to abrasion shall not contain more than 3 percent entrained air. If a pozzolon is used, it shall not exceed 140 pounds per cubic yard of concrete. In addition, Class A concrete shall contain a water-reducing, densifying admixture and have a maximum slump of 4 inches. The maximum aggregate size for concrete for columns, beams, and formed slabs shall be 1 inch. The maximum aggregate size for other concrete construction shall be 1-1/2 inches.

- C. Class B Concrete: Class B lean concrete shall have a 28-day strength of 2500 psi, it shall contain not less than 420 pounds of cementitious material per cubic yard of concrete, shall have a water-cement plus pozzolon ratio of not more than 0.71, and shall have a 5-inch maximum slump. The maximum aggregate size shall be 2 inches. If a pozzolon is used, it shall not exceed 100 pounds per cubic yard of concrete. D. Class B Concrete: Class B lean concrete shall have a 28-day strength of 2500 psi, it shall contain not less than 420 pounds of cementitious material per cubic yard of concrete, shall have a water-cement plus pozzolon ratio of not more

than 0.71, and shall have a 5-inch maximum slump. The maximum aggregate size shall be 2 inches. If a pozzolon is used, it shall not exceed 100 pounds per cubic yard of concrete.

- D. Class C Concrete: Class C concrete shall have a 28-day strength of 3,000 psi and shall contain 4-6% of entrained air by volume. The mixture shall contain not less than 470 pounds of cementitious material per cubic yard of concrete and shall have a water-cement plus pozzolon ratio of not more than 0.55 (6-1/4 gallons per bag of cement). Maximum aggregate size shall be 2 inches, and the maximum slump shall be 4 inches. If a pozzolon is used, it shall not exceed 115 pounds per cubic yard of concrete.
- E. Class D Concrete: Class D concrete shall have a 28-day strength of 3,000 psi and shall contain 4-6% entrained air by volume. Maximum aggregate size shall be 3/8-inch pea gravel, and the maximum slump shall be 4 inches.
- F. Controlled Low Strength Material (CLSM): CLSM shall conform to the Illinois Department of Transportation Special Provision for controlled low strength material, latest revision.
- G. Admixtures:
 - 1. Water-reducing densifying admixture added to Class A concrete shall reduce the water-cement ratio while maintaining slump and compressive strength. Use as manufacturer recommends.
 - 2. Other admixtures may be proposed by Contractor or requested by the Engineer and shall be provided at no additional cost to Owner. Subject to approval, admixtures may be used for the following:
 - a. To increase slump up to 50% while maintaining compressive strength and water-cement ratio.
 - b. To retard set during hot weather.
 - c. To retard set at the surface to expose aggregate.
- H. Calcium chloride, admixtures containing calcium chloride, or admixtures not approved in writing by the Engineer are prohibited.

PART 3- EXECUTION

3.01 PREPARATION

- A. Subgrade Preparation: The subgrade and/or bedding shall be compacted and free of frost. If placement is allowed at temperatures below freezing, provide temporary heat and protection as required to remove all frost. Saturate the subgrade approximately 8 hours before placement and sprinkle ahead of the placement of concrete in areas where vapor barrier is not used. Remove all standing water, ice, mud, and foreign matter before concrete is deposited. Mud slabs shall be provided where necessary to obtain a dry and stable working platform for placement of slabs.
- B. Vapor Barrier: On porous subgrade or beddings, or where indicated on the Drawings, provide vapor barrier. Lay vapor barrier sheets with 6-inch edge laps and tape or seal with mastic. Stretch and weight edges and laps to maintain their positions until concrete is placed. Coordinate with placement of reinforcement specified in Section 03 20 00.
- C. Batching:
1. Materials for concrete shall be proportioned according to the approved design mix and batched using either automatic or manually operated batching equipment. If manual operation is employed, fine and coarse aggregates and bulk cement shall be measured separately by weight. Proportioning aggregates for fractional bags of cement will not be permitted unless the cement is weighed for each batch. Weighing equipment shall be arranged to permit compensation for changes in weight of moisture contained in the aggregate and shall be accurate to within 1 percent of the net load being weighed. The scale beam shall indicate at least the last 100 pounds of each aggregate required for the batch.
 2. Water shall be measured to within 1 pint of the total amount required per batch. Admixtures shall be measured by weight or volume to an accuracy of 3 percent.
- D. Mixing and Transporting Concrete:
1. Concrete shall be ready-mixed or job-mixed at Contractor's option. Ready-mixed concrete shall be mixed and delivered to the project in accordance with ASTM C94. Job-mixed concrete shall be in accordance with the requirements of ACI 318.
 2. Concrete shall be in its final position within one hour after the water and aggregate have been added to the cement, except that in cool weather (50°F or less), the Engineer may authorize a lapsed time of up to one- and one-half hours.
 3. Concrete shall be transported from the mixer to place of final deposit

in such manner to prevent separation or loss of ingredients.

4. General Concrete and Grout Placement Schedule:

All structural concrete	Class A Concrete
Mud slabs, thrust blocks, etc.	Class B Concrete
Flow channels in manholes and structures, steep slopes, and massive fill configurations	Class C Concrete
Bedding under structural steel bearing plates	Non-shrink Grout
Equipment installation and leveling or expansive grouting	Non-Shrink Grout
Heavy vibrating equipment	Epoxy Grout
Post and anchors installation	Epoxy Grout

3.02 DEPOSITING CONCRETE

A. General:

1. Concrete shall be placed in accordance with the requirements of ACI 318 and within 10 feet of its final position. Place concrete only during normal working hours unless the Engineer is notified at least 24 hours in advance. Concrete shall not be placed until the Engineer has approved the formwork, reinforcement, and embedded items and debris has been removed.
2. Whenever new concrete is to be placed against existing surfaces, roughen and clean the surface to improve bond and apply bonding compound in accordance with the manufacturer's recommendations.
3. Maximum height of free-fall during placement of concrete shall not exceed 4 feet. Where free-fall would exceed allowed maximum height, use "elephant trunks", tremies, chutes, belt conveyors or similar aids to place concrete.

B. Depositing Formed Concrete:

1. Except for beams, columns, or other deep structural monolithic members, place concrete in level layers no more than 24 inches deep. To prevent cold joints between layers, each successive layer

shall be placed and consolidated before the preceding layer has taken its initial set. Place concrete in a continuous operation until the section is complete.

2. Concrete shall be directly placed in its final position, shall not be spaded, moved with vibrators, or permitted to fall over rods, spacers, reinforcement, or other embedded items. Any mortar coating which is more than two hours old shall be removed from items to be embedded. Hoppers with trunks, tremies, and/or other means of placement shall be used as necessary.

C. Stopping and Resuming Concrete Placement:

1. Whenever a wall pour is stopped at an intermediate height, the exposed surfaces of the joint shall be made straight and level.
2. Before depositing new concrete against concrete that has hardened, retighten forms and remove foreign matter and laitance. Previously cast surfaces shall be coated with bonding compound.

D. Depositing Slabs and Flatwork:

1. Provide runways and chutes to discharge concrete close to final position to minimize spreading and segregation.
2. Place slabs-on-grade for equipment using formed construction joints. Maximum size of pour shall be 40 feet each way for slabs with wire mesh reinforcement and 40 feet each way for slabs with bar reinforcement. Allow 24 hours between pours of adjacent slabs. Provide joints as specified or shown.
3. Structural concrete slabs shall be of one course monolithic construction.

E. Consolidating Formed Concrete

1. Thoroughly compact all concrete with internal vibrators having a minimum frequency of 8000 vibrations per minute and sufficient amplitude and/or hand spading or rodding immediately after depositing, taking care to prevent any movement of the forms or reinforcement. Vibrate adjacent to water stops and bulkheads to obtain a continuous bond and eliminate surface defects.
2. Vertically insert and withdraw vibrators to consolidate each lift, partially penetrating the previous lift. Do not drag the vibrator nor allow it to come in contact with reinforcement or formwork. Do not attempt to laterally move concrete with the vibrators.

3.03 FINISHING SLABS AND FLATWORK

A. Finish Schedule:

1. Unless otherwise indicated, provide the following slab finishes:

<u>Description</u>	<u>Concrete Finish</u>
Depressed setting beds for tile	Float
Class B and Class C concrete surfaces	Float
Submerged slabs and tank slab toppings	1 troweling
Resilient tile or carpet floor covering	2 trowelings
Seamless flooring	3 trowelings
Painted floors	3 trowelings
Exposed slabs	3 trowelings & sealer
Steps, stair landings	Non-slip aggregate
Ramps, walks, and pavement	Float & broom finish

B. Concrete Tolerances:

1. Concrete shall be within 1/4-inch of a 10-foot straightedge in all directions except where slabs are dished for drains. Deviations from the elevation indicated shall not exceed 1/4-inch.
2. Slabs sloped for drainage shall not have depressions which retain water.

C. Screeding:

1. Immediately after placement, screed concrete with straightedges or power strike offs. Do not use roller screeds or vibrating screeds.
2. Stakes for wet screeds shall be driven down flush with subgrade or pulled out as work progresses to avoid disturbing screeded concrete.
3. For drains in level slabs, form a 5-foot diameter depression approximately 1/2-inch below the adjacent slab surface.
4. Unless otherwise indicated on the Drawings, slabs sloped for drainage shall be uniformly pitched toward the drains at 1/8-inch per foot. Form a dished depression at drains unless otherwise indicated.

D. Darbying: Immediately after screeding, darby surface with wood or magnesium darby to eliminate ridges and to fill in voids left by screeding.

E. Float Finish:

1. Float concrete using magnesium or aluminum hand floats or power floats after the concrete has stiffened to a point where only a 1/4-inch indentation can be imparted by normal foot pressure.

2. Float finish shall result in a uniform, smooth, granular texture. After floating, check slab tolerances with 10-foot straightedge. Fill low spots with fresh concrete; do not sprinkle with dry cement.

F. Trowel Finish:

1. Where scheduled, or indicated, trowel with steel trowels after floating.
2. Initial troweling shall be done either by power or by hand with the trowel blade kept as flat as possible against concrete surface to prevent washboard or chatter effect.
3. Second troweling may be done by power if three trowelings are scheduled. If two trowelings are specified, second troweling shall be done by hand.
4. Third troweling shall be done by hand and shall continue until the concrete is consolidated to a uniform, smooth, dense surface free of trowel marks and irregularities.
5. Allow sufficient time between successive trowelings to allow the concrete to become harder. Each successive troweling shall be done with trowels that are progressively smaller and are tipped more to increase compaction of the concrete surface.

G. Broom Finish: Broom at right angles to direction of traffic to give a non-skid finish. Use a fine, soft-bristled broom for pedestrian ramps and walks, and a coarse, hard-bristled broom for vehicular pavement.

H. Hardened Finish: Where indicated, apply 3 coats of floor hardener in accordance with manufacturer's printed directions. Use the quantity recommended by the manufacturer. The surface shall be clean and dry before the hardener is applied. Upon completion, leave concrete surfaces clean and without discoloration or traces of excess hardener. Concrete surfaces to be hardened shall be wet cured with an absorptive or moisture retaining cover.

I. Non-Slip Finish: Incorporate non-slip aggregate in the surface of flatwork in accordance with the manufacturer's directions and at a uniform rate of not less than 50 pounds per 100 square feet. Aggregate shall be applied immediately after floating the surface and embedded flush with the surface. The surface shall be given at least two trowelings.

J. Control Joints: Control joints for non-structural slabs shall consist of partial depth plastic strips set flush with finished surface or 1/8-inch wide joints cut with a diamond saw. Control joints shall be one- quarter to one-third the

depth of the slab unless otherwise indicated.

- K. Saw joints as soon as concrete has hardened sufficiently so aggregate will not be dislodged but before shrinkage stresses develop cracks. Sawn joints shall be filled with joint sealant in accordance with Section 032500.

3.04 PROTECTION AND CURING

- A. General: Comply with ACI 305 and 306 for protecting and curing concrete in hot and cold weather. Fresh concrete shall be protected from rain. Cure all concrete for a minimum period of 7 days (3 days for high early strength concrete) after placing. Provide coverings or curing compound for conventional concrete that is less than 7 days old when forms are removed.

- B. Flatwork:

- 1. Immediately after finishing, begin curing by covering with constantly saturated moisture retaining fabrics, impervious sheeting, or membrane curing compounds. Surfaces shall be thoroughly wetted with a fine spray before they are covered with sheeting.
 - 2. Sheeting shall provide complete surface coverage with all joints lapped at least 4 inches and shall be placed and secured in a manner that will not mar or damage the concrete surface.

- C. Membrane Curing Compounds:

- 1. Apply compound in accordance with manufacturer's recommendations. Apply by spraying in a two-coat continuous operation. Apply the coats at right angles to each other with coverage of 200 square feet per gallon per coat. Begin application not later than 4 hours after finishing of the surface. The application shall result in an uninterrupted adherent film free of defects.
 - 2. On surfaces scheduled to receive sealants, paint, seamless flooring, or other adhesive bonded finishes, either the membrane curing compound shall be compatible with the bonding agent or the curing compound shall be removed by sandblasting, acid etching or grinding, to the satisfaction of the installer of the finish surfacing. Bonded surfaces that fail to adhere to the concrete shall be removed and replaced at no additional cost to Owner.

3.05 DEFECTIVE CONCRETE

- A. All concrete not formed as indicated on the Drawings within tolerances specified in ACI 347 shall be removed and replaced.

- B. Concrete requiring structural repairs shall either be replaced or, with prior written approval of the Engineer regarding materials, methods and procedures, may be repaired with epoxy grout.
- C. Concrete that has a defective surface shall be patched or replaced. If patching does not restore the quality and appearance of the surface, the defective concrete shall be replaced.
- D. Temperature and shrinkage cracks which develop prior to final acceptance of the work shall be repaired. Contractor shall propose repair methods to be approved by Engineer.

3.06 FINISHING FORMED CONCRETE

A. Patching:

- 1. After inspection by Engineer, patch tie holes and defective areas. Where necessary, chip out defective areas to a minimum depth of 1 inch. Wet the area to be patched and the surrounding 6 inches to prevent absorption of water from the patching mortar and/or apply a brush coat of bonding compound or cement grout immediately prior to patching with mortar.
- 2. Thoroughly compact patching mortar into place and screed, leaving the patch slightly higher than the surrounding surface. For holes passing entirely through the wall use a plunger grout gun to force the mortar through the wall, starting at the back face. Leave undisturbed for a period of one to two hours to permit initial shrinkage before final finishing. The patch shall be finished to match the texture and appearance of the adjoining surface.
- 3. If form ties are removed completely from wall, place rubber seal in center at wall and epoxy grout under pressure from both sides. All patching shall be cured for three days and then inspected for shrinkage cracks. Excessive cracking shall warrant complete removal and replacement of the patch.

- B. Ordinary Finish: The finish resulting directly from formwork shall be used for all surfaces which will be hidden from view by earth, submergence in water, or hidden by subsequent construction or coatings, except as otherwise indicated. Patch as specified.

C. Smooth Finish:

1. Unless otherwise indicated on the Drawings, smooth finish shall be provided for all interior and exterior cast-in-place concrete surfaces permanently exposed to view. Smooth finish shall be produced by using Grade A formwork and the following finish operations.
2. After patching as specified, grind joint marks and fins smooth using a fine carborundum or abrasive stone with clean water. Remove all oil stains by scrubbing the surface with stiff bristle brushes and a 5 to 10 percent muriatic acid solution. After the stains are removed, rinse the surface thoroughly with clean water.

D. Rubbed Finish:

1. Where specifically indicated on the Drawings, produce a rubbed finish on exterior and interior cast-in-place concrete surfaces permanently exposed to view. Do not provide rubbed finish where waterproofing coating is required.
2. Rubbed finish shall be produced by using Grade A formwork and the following finishing operations. As soon as possible after casting and immediately after patching, wet surfaces and grind with a No. 16 carborundum stone or a mechanical finisher to produce a smooth dense surface free from stains, pits, fins, and irregularities. After grinding, dampen the concrete and paint the entire surface with cement grout. Vigorously work the cement grout into the surface with a cork float or other suitable float. When the grout has set to the point that it will not be pulled out of holes or depressions, the entire surface shall be finished with a sponge rubber float to remove all excess grout.
3. After thorough drying remove all loose grout by scrubbing the surface with a dry burlap or carpet float. Complete the entire rubbed finish for any one area the day it is started. The rubbing operation for any one area shall proceed continuously in an irregular patchwork fashion to eliminate linear horizontal or vertical overlaps.
4. After all rubbed areas are finished once, allow at least 24 hours for the grout to set and perform the rubbing operation, without grinding, a second time.

E. Silicone Water Repellent:

1. Silicone water repellent shall be provided on all permanently

exposed concrete surfaces of water retaining structures and where indicated elsewhere. Do not provide silicone water repellent where waterproofing coating is required.

2. Clean all surfaces as required to remove all dirt or stains before applying the water repellent. Apply by spray at the rate of not less than 1 gallon per 125 square feet per coat and in accordance with the manufacturer's recommendations. Apply only to dry surfaces and at temperatures above 40 degrees F. Protect adjacent work from spatter by masking or other suitable methods. Immediately remove any misplaced material from glass and other work using cloths and the proper solvent.

3.07 MISCELLANEOUS CONCRETE WORK

- A. Concrete Stairs and Steps: Use Class A concrete. Provide non-slip nosings for treads and landings, as specified in Division 5. Remove the forms as soon as the concrete develops sufficient strength. Provide non-slip aggregate treads and landings and rubbed finish on exposed vertical surfaces.
- B. Equipment Pads and Supports: Provide concrete equipment pads and supports as indicated and conforming to approved shop drawings. Fastening devices and accessories shall be located by templates or setting diagrams furnished by the manufacturer. Use Class A concrete with rubbed finish on exposed vertical surfaces.
- C. Correcting Slab Tolerances: Slabs exceeding specified tolerances shall have high spots ground down and low spots filled with epoxy resin floor leveler. Epoxy resin shall be applied in strict accordance with the manufacturer's printed instruction.

3.08 CLEAN-UP

- A. All concrete floor construction shall have the surfaces thoroughly scrubbed and cleaned with clear water. Cleaning shall be done immediately before application of finish flooring or coating. After cleaning, the slabs shall be protected until they are accepted for floor finishing work.
- B. Clean all surfaces affected by the Concrete Work. No extraneous concrete or discoloration shall be left on any construction.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0335700; Pump Station General Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 3 41 00

PRECAST CONCRETE STRUCTURES

PART 1- GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Wet Well
 - 2. Valve Vault
 - 3. Flow Meter Vault
 - 4. Pig Launch Vault

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Wet Well, Valve Vault, Flow Meter Vault and Pig Launch Vault: Include plans, elevations, sections, details, frames, grates, access hatches, covers, design calculations, and concrete design-mix reports.

PART 2- PRODUCTS

2.01 WET WELL, VALVE VAULT, FLOW METER VAULT AND PIG LAUNCH VAULT

- 1. Description: ASTM C 478 and C 913 precast, reinforced concrete, size and depth indicated on Drawings, with provision for sealant joints.
- 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
- 3. Base Section: 10-inch minimum thickness for floor slab and 8-inch minimum thickness for walls and base riser section, and separate

- base slab or base section with integral floor.
- 4. Riser Sections: 8-inch minimum wall thickness, and lengths to provide depth indicated.
- 5. Top Section: flat-slab-top type with hatches cast in slab, 10-inch minimum thickness.
- 6. Joint Sealant: ASTM C 990 bitumen or butyl rubber.
- 7. Resilient Pipe Connectors: ASTM C 923 cast into manhole walls, for each pipe connection.
- 8. Steps: PVC coated cast iron.
- 9. Adjusting Rings: As required, maximum for Owner's standard.
- 10. Grade Rings: As required, maximum per Owner's standard.
- 11. Coatings: See 2.04 Coatings of this section.

2.02 ACCESS HATCHES

- A. Description: This Section covers access hatches and related accessories to be furnished and installed as shown on the Drawings and as specified herein.
- B. Manufacturers: Access hatches from a reputable manufacturer and approved by the Engineer.
- C. Submittals: Submittals shall include but not be limited to the following:
 - 1. Submit drawings showing details of construction, sizes, location, finishes, and installation.
 - 2. Submit manufacturer's data indicating compliance with the particular requirements of these Specifications and with the Drawings.
- D. Design Load: access hatches shall be rated for H-20 loading. Hatch size shall be sized to accommodate the removal/access of the equipment. Hatches shall be constructed of aluminum with stainless steel hardware and fasteners and shall be padlockable within a flush mount cavity. Hatches shall be equipped with steel safety grating hinged on one side, padlockable and painted with corrosion resistant coating.
- E. Safety Grates: Safety grate shall be a hinged and lockable aluminum or painted steel grating panel that is easily installed beneath the access hatch(es) and attached to the access hatch(es) frame. The safety grate provides additional protection against fall through accidents when the cover is left in the open position. The unit is lockable with an Owner supplied padlock and incorporates a spring assisted lifting handle that positions the handle near the slab level when the existing access cover is in the open

position. The safety grate incorporates a T-316 stainless steel hold open arm with aluminum latch and with T-316 stainless steel mounting hardware. Safety grating shall have a min load rating of 300 psf. Safety grating shall have orange powder-coating finish.

2.03 CONCRETE

- A. General: Precast concrete according to ACI 318, ACI 350/350R and the following:
 - 1. Cement: ASTM C 150, Type II.
 - 2. Fine Aggregate: ASTM C 33, sand.
 - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
 - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
 - 3. Concrete Additives: Conshield HD anti-microbial additive
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
 - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
 - a. Invert Slope: 1 percent through manhole.
 - 2. Benches: Concrete, sloped to drain into channel.
 - a. Slope: 4 percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
 - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

2.04 COATINGS

A. Exterior Below Grade Concrete Structures

1. Surface Preparation: Allow new concrete to cure 28 days. All surfaces shall be free of oils, dirt, form release agents and any other contamination and shall be coated with bituminous water proofing.

PART 3- EXECUTION

3.01 STRUCTURE INSTALLATION

- A. General: Install structures, complete with appurtenances and accessories indicated.
- B. Install precast concrete sections with sealants according to ASTM C 891.
- C. Where specific construction is not indicated, follow manufacturer's written instructions.
- D. Set flat-top slab with hatches to elevations indicated.

3.02 ACCESS HATCH INSTALLATION

- A. Install access hatches in accordance with the manufacturer's written instructions and as shown on the Drawings. Frames shall be set in concrete per manufacturer's recommendations and full coverage below and around frame.
- B. Adjust hardware after installation for proper operation and to operate easily without binding. Touch-up marred finishes in accordance with manufacturer's recommended procedures. Replace units which cannot be restored to factory-finish appearance. Remove and replace items of equipment which are warped, bowed, or otherwise damaged.

3.03 CONNECTIONS

- A. Make connections to existing piping and underground manholes.

2. Make connections to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
 - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
 - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
2. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.04 IDENTIFICATION

- A. Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
 1. Use warning tape or detectable warning tape over ferrous piping.
 2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.05 FIELD QUALITY CONTROL

- A. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 1. Do not enclose, cover, or put into service before inspection and review.
 2. Test completed piping systems according to requirements of authorities having jurisdiction.
 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
 4. Submit separate report for each test.
 5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

- a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
 - b. Option: Test plastic piping according to ASTM F 1417.'
 - c. Option: Test concrete piping according to ASTM C 924.
 - 6. Force-Main Storm Drainage Piping: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than 150 psig.
 - a. Ductile-Iron Piping: Test according to AWWA C600, "Hydraulic Testing" Section.
 - b. PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.
 - B. Leaks and loss in test pressure constitute defects that must be repaired.
 - C. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.
- 3.06 CLEANING
- A. Clean interior of piping of dirt and superfluous materials. Flush with water.
- PART 4- MEASUREMENT AND PAYMENT
- 4.01 MEASUREMENT
- A. Measurement will not be made for the Work specified in this Section.
- 4.02 PAYMENT
- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Items, in the Schedule of prices:

X0335700; Pump Station General Work
 - B. This price shall be full compensation for furnishing and installing all materials; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.

- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain.
- D. Access hatches shall not be paid for separately. The cost shall be included in the cost of the individual structures in which they are installed.

END OF SECTION

PRECAST CONCRETE BOX CULVERT 12' X 5' (SPECIAL):

Description. This work shall be performed in accordance with Section 540 of the Standard Specifications and the following provisions. This work consists of furnishing and installing a precast concrete box culvert at locations designated on plan details.

Construction Requirements. The standard 12'x5' box culvert sections shall be precast per IDOT and ASTM 1577 requirements. Following curing of the initial casting, a cast-in-place concrete ledge shall be formed and poured along the length of each culvert section at locations shown in the plan. Cast in place concrete shall be in accordance with Section 540 for cast in place concrete culverts. The cast in place ledge shall be doweled into the precast units as detailed in the plan or in a manner approved by the Engineer. Cast in place installation may be completed in the field in a manner approved by the Engineer.

Method of Measurement. This work will be measured for payment in place, in feet.

Basis of Payment. This work will be paid for at the contract unit price per foot for PRECAST CONCRETE BOX CULVERT 12'x5' (SPECIAL), which price shall include all materials, equipment, and labor needed to furnish and install both the precast culvert and the cast in place components.

SECTION 26 00 10

GENERAL PROVISIONS FOR ELECTRICAL WORK

PART 1- GENERAL

1.01 SCOPE

- A. This Section describes the general provisions for the Work to be performed under Division 26 - Electrical, of this Contract as well as Division 33 - Utilities, where applicable. The Contractor shall comply with these general provisions and shall perform all Work in accordance with the Specifications contained in this Section, as supplemented by Specification in related Sections, and as shown on the Drawings. Related mechanical work shall be performed in accordance with the applicable provisions of Division 33.
- B. The following specifies the minimum general requirements by which the Contractor shall furnish, fabricate, deliver, erect, install, connect and test electrical materials, equipment and systems specified in the respective Sections of Division 26 and shown on the Drawings, so as to constitute a complete and operating electrical installation.
- C. The Contractor shall provide all necessary coordination between the suppliers of the specified equipment so as to provide a well-designed and satisfactory operating facility to the Owner. The Contractor is advised that these Specifications are not indented to cover every and all details of the Work. In case(s) where details related to the specified Work are not covered by these Specifications, it shall be the responsibility of the Contractor to include and execute such coordination and Work at no additional cost to the Owner.
- D. Items of equipment furnished and installed as a part of the Work under other Sections of the Specifications shall be connected and wired as a part of the Work under this Section.
- E. All operating limits of electrical apparatus whether furnished under this Section or in other Sections of the Specifications shall be adjusted in the field to meet the operating conditions reviewed by the Owner's Representative and as required. This shall include settings of all overcurrent and trip devices, limit switches, timers, and control device adjustments, etc.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers and Equipment Supplier

1. As shown on the Drawings and/or as specified hereinafter in subsequent Sections.
2. Acceptable manufacturers for various items of equipment are specified in respective Sections of these Contract Documents. For convenience of designation in the Contract Documents, certain equipment, articles, materials, and processes are designated by manufacturer trade name or catalog name and number. The burden of proof as to comparative quality and suitability of alternatives shall be upon Contractor. Specified items are preferred. After acceptance of Bid, no substitutions will be allowed, except as stated in the Bid. (Exception: Where Specifications indicate "No Substitutions Allowed" Contractor shall provide the designated manufacturers equipment without exception.)

B. Applicable Standards

1. All electrical work furnished and installed under this Section shall be in strict compliance with the ordinances and bylaws of the Owner, State and/or any other political subdivision thereof governing the installation of the electrical work on this Project. In the absence of other more stringent authority, the electrical work shall conform to the requirements of the National Electrical Code.
2. The Contractor shall conform to the latest safety standards as required by the Occupational Safety and Health Administration (OSHA) in all Work performed. In addition, all equipment and materials shall meet all applicable OSHA requirements.
3. All equipment shall be U.L. rated.

1.03 SUBMITTALS

- A. The Contractor shall comply with the requirements specified in Section 01 33 00 - Equipment Submittals, and as specified herein.
- B. The Contractor shall not install any electrical work for any item of equipment specified under this or other Sections of the Contract until shop drawings of such equipment, reviewed by the Owner's Representative, are made available to him/her. Any such Work installed by the Contractor prior to the

Owner's Representative review will be the responsibility of the Contractor and any modification of the electrical work necessary to meet the equipment requirements shall be made without additional compensation.

- C. Before fabrication and assembly of equipment, submit the following:
1. Front and rear elevations showing dimensions and the arrangement for each cubicle.
 2. Plan and section views, including dimensions and mounting details.
 3. Details of bus, connections, terminals, etc., including the complete ground bus arrangement and enclosure ground connections.
 4. Single line diagram of equipment and control schematic diagram.
 5. Wiring Diagrams:
 - a. Connection diagrams for the wiring of equipment in each cubicle.
 - b. Interconnection diagrams for the wiring to equipment in other cubicles. Clearly identify the terminal block points for the external wiring to be routed in or out of the cubicles. Provide adequate space on the wiring diagrams for additions (by the Contractor) or cable and wire designations for that external wiring to be routed in or out of the cubicles at the terminal block.
 6. Bill of Material.
 7. Factory test procedures and protocols.
- D. Prior to shipment of the equipment, submit for record and distribution:
1. All drawings as finally reviewed and corrected.
 2. Recommended storage instructions.
 3. Installation instructions and operating and maintenance manuals.
 4. Spare parts bulletins.
 5. Factory test reports (certified).
 6. Booklet on maintenance procedures for circuit breakers and other equipment.
 7. Field test procedures and protocols.
- E. After final installation of the equipment the Contractor shall deliver a complete set of reproducible shop drawings of (including schematics, internal point-to-point and interconnecting) diagrams for all equipment and panels showing Work "as installed".

1.04 WARRANTY

All equipment (electrical and/or mechanical) specified by these Specifications shall be warrantied and shall be provided with such warranties covering all parts and labor for a period of one (1) year from the date of Final Acceptance.

PART 2- PRODUCTS

2.01 GENERAL

A. Standard Products

The equipment furnished shall be standard products in production by reputable companies regularly engaged in the manufacture of high-quality equipment of the type specified. Similar equipment shall have been in satisfactory and successful operation for a period of at least two years. All parts of the specified equipment shall be so designed as to be especially adapted for the service required and shall be proportioned, enclosed, or guarded as to have ample and liberal strength and stability to withstand, without damage, the stresses to which they may be subjected during erection or operation. The component parts of duplicate items shall be fabricated on a principle of interchangeability to facilitate ready replacement.

B. Materials

All material incorporated in the equipment shall be new and of first-class quality, free from injurious defects and imperfections, and of the classifications and grades designated. Materials not specifically designated herein shall be subject to the review of the Engineer and shall be suitable for the purpose intended.

2.02 RATINGS

The sizes, ratings, capacities, and performance characteristics of various specified items of equipment and devices are based on currently available standard products, which are available through United States manufacturers. In no case shall the size, rating, capacity or performance characteristic be less than that specified unless approved in writing by the Owner. Ratings and performance characteristics, where applicable, of

various devices and items of equipment are specified in respective Sections of these Specifications. All electrical equipment shall be UL listed.

2.03 DETAILS OF CONSTRUCTION

- A. Electrical work shall meet requirements of these Specification, product manufacturer's instructions, recommended tolerances and recommended procedures, and as indicated by final reviewed submittals for the Work.
- B. Materials shall be of size and thickness indicated. If not indicated, size and thickness shall be selected to provide strength and durability in finished Work for intended application. Work to dimensions indicated, using proven fabrication details.
- C. Product finishes, surfaces and edges shall be smooth and free of marks, burrs, seams, roughness and like defects or conditions.
- D. Other electrical-mechanical product construction details shall be in accordance with the best engineering practices, applicable code requirements and as specified and/or other Sections of these Specifications.

PART 3- EXECUTION

3.00 GENERAL

- A. The Contract Drawings indicate the general details necessary for the complete electrical installation. It shall be the Contractor's responsibility to install all electrical work in a neat and workmanlike manner. The Contractor shall cooperate with others to permit the installation of all of the work without interferences. If changes become necessary to avoid interference between the Work installed under various Sections, the Contractor shall submit to the Owner's Representative, for review, the proposed changes and upon review by the Owner's Representative, proceed with the installation of such changes without additional cost to the Owner.
- B. The Contractor shall maintain at the site a set of black line prints on which shall be accurately shown the actual installation of all Work done under Division 26 and any variation from the Contract Drawings as reviewed by the Owner's Representative including changes in sizes, locations, and dimensions shall be indicated thereon. At the conclusion of the Work, the Contractor shall furnish record drawings in accordance with the General Conditions and as specified herein.

3.01 FACTORY TEST AND INSPECTION

- A. All equipment shall be shop-assembled and tested in the manufacturer's shop in accordance with recognized standard practices. Factory tests and inspections shall be conducted to verify that the equipment is operating satisfactorily and in compliance with the Specifications.

3.02 INSTALLATION AND TESTING

- A. General: Examine the areas and conditions under which electrical work is to be installed or performed and remedy any conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.
- B. Existing Facilities: Verify existence, location, and operation of existing electrical facilities to be abandoned, removed, altered, modified and/or temporarily relocated to allow activities during construction of the Work.
- C. Install electrical work. Meet requirements of these Specifications, product manufacturer's instructions, recommended tolerances, and recommended procedures and as indicated by final reviewed submittals for the Work.

3.03 PAINTING

- A. All specified equipment shall be shop-primed and painted in accordance with manufacturer's standard finish.
- B. The Contractor shall be responsible for coordination of the compatibility between manufacturer's standard finish and the field paint specified.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs for such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 00 20

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1- GENERAL

1.01 SCOPE

In accordance with the Specifications contained in this Section and as shown on the Drawings, the Contractor shall furnish and install complete, and test, where specified, unless otherwise indicated, the following items of electrical material, equipment and systems for a complete operating electrical installation.

1. Electrical Conduit
2. Electric Outlets/Switches/Devices & Accessories
3. Electrical Motors & Accessories
4. Wire and Cable
5. Electrical Panel(s)/MCC's/Instrumentation
6. Grounding System

PART 2- PRODUCT

2.01 GENERAL

All equipment shall be new and shall be essentially standard products of the manufacturers regularly engaged in the production of the type of equipment specified herein. Like items shall be the product of a single manufacturer.

2.02 RATINGS/SIZES

All work shall conform to applicable provisions of the Standard Specifications, local codes and Special Provisions as specified herein and as shown on the Plans.

2.03 DETAILS OF CONSTRUCTION

- A. All permanent foundation materials such as anchor bolts, either embedded in the concrete or required for anchoring, shall be furnished with the equipment. Approved types of expansion anchors may be used where practicable for small equipment.

- B. Each item of manufactured equipment furnished under these Specifications shall have a permanent nameplate affixed thereto in a readily visible place, showing the serial number, the name and address of the manufacturer, rated capacity, speed, electrical characteristics, and other pertinent data, as applicable. Nameplates of distributing agents only, will not be acceptable.
- C. Control panels shall be furnished with the equipment complete with terminal blocks, wiring, and other miscellaneous devices as indicated or required by the intended operation of the equipment or by the Drawings or Specifications. The equipment shall include all auxiliary and accessory devices, such as auxiliary transformers, auxiliary relays, protective devices, and resistors, whether or not they are expressly specified or indicated on the Drawings. Adequate provisions shall be made to accommodate, support, and connect cables to the terminal blocks or point of attachment. The Contractor shall locate and arrange his/her terminal blocks so that the external cable connections can be made in a neat and proper fashion. Shielded cables shall be grounded at the panel end only and shall be terminated on terminal blocks. The shield terminations shall be subject to review.
- D. Control wiring in Control panels shall be Type THHN/THWN stranded copper conductors, #14 AWG minimum size, 600-V. Class D stranded wire shall be used for wiring across hinged joints. Wiring shall be neatly arranged, properly supported, and terminated at terminal blocks. At least 20% extra terminals shall be provided at each group of blocks. Control circuits and power circuits shall be completely separated by use of divided cubicles or barriers. Terminal blocks shall be 600-V furnished with covers and marking strips showing the wire designation on the wiring diagrams or as designated by the Owner's Representative. Not more than 2 wires shall be connected to any one terminal screw. Terminals shall be suitable for a maximum external conductor size of #8 AWG.
- E. The surfaces of the panel shall be bonderized (or otherwise treated so as to be substantially corrosion-resistant), primed and finished with 2 coats of the manufacturer's standard gray baked enamel applied in accordance with the manufacturer's directions. The interior surfaces shall be finished and painted in accordance with the standard practice of the equipment manufacturer. All surfaces to be painted shall be thoroughly cleaned, and all oil film and loose scale shall be removed before applying the first coat of paint. The color of the paint will be determined by the Owner. One gallon of finish paint used shall be furnished for touching up damaged surfaces after installation.

- F. Each meter, instrument, operating device, control switch, panel and circuit shall have a nameplate with engraved circuit designation mounted in a clearly visible location. If any of the foregoing devices do not have apparatus designation thereon that is visible from the front, a nameplate with engraved apparatus designation shall also be furnished. Nameplates shall be uniform in shape, size, finish and lettering and be made of laminated black and white micarta or clear plastic material with lettering embossed on the back side and filled-in with opaque paint. The width and depth of the lettering shall be so designed as to be legible from reasonable angles of observation. A typical nameplate sample shall be submitted to the Owner's Representative for review.
- G. The Contractor shall size, furnish and install all pads and anchorages required for electrical equipment. The necessary excavation, backfilling, concrete and reinforcing steel shall conform to the requirements of applicable codes and other Sections of these Specifications. The Contractor shall furnish and install all the anchor bolts, pipe sleeves, brackets, leveling and setting plates, etc. when and where required.

PART 3- EXECUTION

3.01 INSTALLATION

The methods of installation of Contractor-furnished equipment and materials are described in subsequent Sections and shall in general be in accordance with the manufacturer's standard procedure and recognized engineering practices.

3.02 TESTS

- A. All electrical equipment, materials, and supplies shall have passed adequate routine factory tests. Field tests shall be made by qualified personnel, having thorough experience in previous jobs of similar scope, approved by the Owner. Field tests shall be made on electrical equipment or on each electrical installation or system as specified below, or as required to establish satisfactory operations and conformance with these Specifications. The tests shall be witnessed by the Owner's Representative. The Contractor shall give the Owner's Representative two weeks' notice in advance of the tests. The Contractor shall furnish all apparatus, materials, labor, and facilities for performing the required tests. Corrections for any defects shall be made by and at the expense of the Contractor to the satisfaction of the Owner's Representative. The Contractor shall submit test methods and a list of test equipment to be used for conducting these tests subject to the review of the Owner's Representative. Records of all tests

made shall be kept by the Contractor and furnished to the Owner's Representative in triplicate, no later than 7 calendar days after each test is completed.

- B. Control circuits shall be tested prior to operational testing with the control circuits energized but with the controlled equipment disconnected or otherwise made inoperable. The control systems shall be checked for proper operation by actuating each contact which initiates a control operation, and then following the control sequence through the affiliated devices to ascertain that correct results are obtained with each condition of interlocking. The actuating of contacts as required to initiate an operation and to set up interlocking conditions shall be accomplished manually or by simulated operating conditions, whichever is applicable. At this time, adjustments shall be made as required to temperature switches, thermostats, pressure switches, flow switches, position switches, limit switches, auxiliary relays, timers and all other automatic control, interlocking and annunciation devices.
- C. After the individual items of wiring and equipment have been tested and proved satisfactory and the preliminary control tests have been completed, the equipment shall be further tested for satisfactory operation under normal operating conditions. The equipment shall be lubricated, balanced, aligned, adjusted and operated through sufficient sequences and for a sufficient length of time to establish, to the satisfaction of the Owner, that the equipment, including all safety and limit devices, has been correctly installed and operates properly.
- D. Specific tests to be performed in addition to the above tests are given in the Sections in which the equipment or system installation is specified.

3.03 PAINTING

See Paragraph 2.03, E of this Section.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs for such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES

PART 1- GENERAL

1.01 SUMMARY

- A. Provide low-voltage electrical power conductors and cables as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.02 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

PART 2- PRODUCTS

2.01 GENERAL

- A. Comply with the following standards:
 - 1. UL 83 and ICEA S-61-402 for thermoplastic insulated wire and cable.
 - 2. UL 44, ICEA S-19-81 and ICEA S-66-524 for rubber or rubber-like and cross-linked thermosetting polyethylene insulated wire and cable.
- B. Provide copper wire only.
- C. No underground splices allowed unless approved by the Owner or Engineer.

2.02 WIRE AND CABLE IN RACEWAY

- A. Power, light, and control conductors:

1. Insulation: Rated for 600 volts.
 - a. Use dual rated type THHN/THWN in temperature-controlled cabinet locations.
 - b. Use Type XHHW-2 or XLP TYPE USE-2 in underground locations unheated areas and unheated concrete structures.
2. Use stranded wire for control conductors.

2.03 JOINTS, TAPS, SPLICES, AND TERMINATIONS

- A. Conductors No. 10 AWG and smaller: Use twist type insulated wire nut solderless connectors.
- B. Conductors No. 8 AWG and larger: Use solderless compression type connectors of type that will not loosen under vibration or normal strains.
- C. Control and instrumentation conductors: Use crimp type spade connectors where control wires are connected to screw terminals of equipment.
- D. Joints, taps, and splices located in enclosures subject to moisture: Use watertight splice kits.

2.04 UNIT DUCT

Description. This work shall consist of furnishing and installing preassembled cable in coilaible nonmetallic conduit (unit duct), complete with all splicing, identifications, and terminations. The unit duct shall be UL Listed and in accordance with NEC Article 354.

2.05 PERMANENT WIRE MARKERS

- A. Provide type-on, self-laminating vinyl, heat shrink polyolefin or nylon clip-sleeve, alpha-numeric, permanent wire markers.
 1. Use fine-line, black, permanent ink pens where field marking is necessary.
 2. Cloth tags are not acceptable.

2.06 COLOR CODING

- A. Provide color coded wires per NFPA 79 exterior of the control cabinet (refer to table below) and UL508A for interior control cabinet wiring.

AC Conductor	120/208/240 V AC	277/480 V AC
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	White / Gray stripe
Equipment Grounds	Green	Green

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install wiring system in accordance with manufacturer's recommendations.
- B. Install wire and cable in conduit unless otherwise shown on the Drawings.
- C. Trench and backfill for direct burial cables:
1. Install cable in PVC coated rigid steel conduit under and 1-foot beyond all driveways and other pavement, and within a radius of 5 feet from all structures, trees, obstacles, etc.
 2. Provide suitable bracing for cable to withstand movement due to settlement where cable crosses a previous or new excavation.
 3. Seal all conduit entrances with watertight cable-conduit seals to prevent entrance of water into underground structures and caulk opposite end of conduit where conductors enter junction box, panel or electrical enclosure.
- D. Install warning tape along and above direct buried cable.
1. Use red plastic, 6-inch-wide tape.
 2. Imprinted "CAUTION - ELECTRIC CABLE BELOW".
 3. Bury approximately 1-foot below surface before final backfilling.
- E. Maintain barrier or conduit separation between power conductors and instrumentation conductors to avoid magnetic interaction where such conductors enter and pass-through same manhole, handhole, casing pipe, box, or enclosure.

- F. Provide individual wiring compartments or barrier for separation between intrinsically safe and non-intrinsically safe conductors inside enclosures.
- G. The unit duct shall be installed directly from the reels on which the unit duct was shipped, in continuous spans without splicing the duct or cables.

Where unit duct passes through handholes or pull boxes, the polyethylene duct shall be cut open and the continuous, uncut and unspliced conductors exposed and looped within the handhole or pull box. The ends of the polyethylene duct must be sealed with duct sealant and mounted in the handhole to prevent entrance of moisture or contaminants.

When the unit duct is to be pulled, the pulling apparatus shall be attached to the duct and not to the cables. The pulling tension on the duct shall not exceed 550 lb. (2.4 kN).

Unit duct extended to future light pole locations shall be of a length sufficient for cable splices to be withdrawn a minimum of 18 in. (450 mm) out of pole handholes. The duct of the unit duct assembly shall extend a minimum of 12 in. (300 mm) into enclosure bases. Coordinate with existing Owner light/poles.

Unit duct is only to be used for the future light pole location feeder. See plans for locations. The unit duct shall be an assembly of insulated conductors which are factory pre-installed in a coilable nonmetallic conduit. The polyethylene duct shall be extruded directly over the cable at the factory in long continuous lengths. The unit duct shall be according to NEC Article 354.

3.02 WIRE AND CABLE IDENTIFICATION

- A. Install permanent wire markers on wire and cable in junction boxes, pull boxes, wireways, and wiring gutters of panels. Markers to identify wire or cable number.
- B. Provide schedule identifying various power and lighting conductors from power source to equipment or device served.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 05 23

CONTROL-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES

PART 1- GENERAL

1.01 SUMMARY

- A. Provide control-voltage wires, cables, and connectors as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Applicable provisions of Division 01 - General Requirements shall govern work of this specification
 - 2. Section 26 00 00 - General Electric Requirements.
 - 3. Section 26 00 10 - General Provisions for Electrical Work.
 - 4. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

1.02 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.
- B. Comply with Underwriters Laboratory (UL) and Insulated Cable Engineers Association (ICEA):
 - 1. UL 83 and ICEA S-61-402 for thermoplastic insulated wire and cable.
 - 2. UL 44, ICEA S-19-81 and ICEA S-66-524 for rubber or rubber-like and cross-linked thermosetting polyethylene insulated wire and cable.

PART 2- PRODUCTS

2.01 GENERAL

- A. Acceptable Manufacturers:
 - 1. Products from a reputable manufacturer and in accordance with

Section 26 00 10 - General Provisions for Electrical Work.

- B. Provide tinned copper wire only.

2.02 WIRE AND CABLE

- A. Shielded instrumentation cable and low voltage control cable:

1. Conductors: No. 18 (twisted for signal cables, stranded for low voltage control cable) AWG tinned copper (min.), or as shown on plans.
2. Jacket: Polyvinyl chloride or FEP (minimum for cables installed indoors), color coded, rated for 300 volts, minimum.
3. Insulation: Cables installed underground, and above grade outdoors shall have XLP insulation, color coded, rated for direct burial and 600 volts. Insulations shall also be sunlight resistant.
4. Shielding: Aluminum polyester, 100 percent coverage. Includes AWG tinned copper drain wire.
5. Provide Owner and Engineer approved substitution, copper instrumentation cable systems.
6. UL Listed for use.
7. Provide shielded instrumentation cable suitable for flooded burial and freeze/thaw conditions where installed in duct banks, underground conduits, or conduits in and on unheated structures.

B. Data cables:

1. Verify unique cable requirements of individual data systems shown on Drawings with Systems Integrator.
2. Provide Owner and Engineer approved copper data cable systems equal to the following:
 - a. DeviceNet Applications:
 - (1) No. 3083A CPE (Thick).
 - (2) No. 3085A CPE (Thin).
 - (3) No. 3082A PVC (Thick).
 - (4) No. 3084A PVC (Thin).
 - b. ControlNet Applications:
 - (1) No. 3092A RG-6 PVC Quad shield coax suitable for outdoor.
 - (2) No. 3093A RG-6 FEP Quad shield coax, plenum, suitable for outdoor & burial.
 - c. E/IP application:
 - (1) No. 7933A Cat 5e – 2 pair, bonded, shielded.
 - (2) No. 7929A Cat 5e – 4 pair, bonded, stranded, shielded.
 - (3) No. 7937A Cat 5e – 4 pair, bonded, shielded, burial.
 - d. Profibus DP Applications:
 - (1) No. 3079A 22AWG 300V Twinax.
 - (2) No. 3079E 22AWG 300V Twinax, Flex Version.
 - e. Modbus application:
 - (1) No. 8777 22 AWG, 3 pair modem drop cable.
3. Provide data cable suitable for flooded burial and freeze/thaw conditions where installed in duct banks, underground conduits, or conduits in and on unheated structures.
4. Provide data cables UL listed for intended use.

2.03 PERMANENT WIRE MARKERS

- A. Provide type-on, self-laminating vinyl, heat shrink polyolefin or nylon clip-sleeve, alpha-numeric, permanent wire markers.
1. Use fine-line, black, permanent ink pens where field marking is necessary.
 2. Cloth tags are not acceptable.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install wiring system in accordance with manufacturer's recommendations.
- B. Install wire and cable in conduit unless otherwise shown on the Drawings.
- C. Maintain barrier or conduit separation between power conductors and instrumentation conductors to avoid magnetic interaction where such conductors enter and pass-through same manhole, handhole, casing pipe, box, or enclosure.
- D. Run instrumentation conductors into control cabinets only if terminated therein. Maintain separation of power and instrumentation conductors inside cabinets.
- E. Provide individual wiring compartments or barrier for separation between intrinsically safe and non-intrinsically safe conductors inside enclosures.

3.02 WIRE AND CABLE IDENTIFICATION

- A. Install permanent wire markers on wire and cable in junction boxes, pull boxes, wireways, and wiring gutters of panels. Markers to identify wire or cable number.
- B. Provide schedule identifying various control and instrumentation circuit conductors based on equipment tag numbers.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING OF ELECTRICAL SYSTEMS

PART 1- GENERAL

1.01 SUMMARY

- A. Provide grounding and bonding as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.02 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.
 - 3. Utility company providing electrical service.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

PART 2- PRODUCTS

2.01 GENERAL

- A. Ground clamp fittings, connections, and joints (inside cabinet only):
 - 1. Provide interlocking listed clamp fabricated from high strength corrosion- resistant metal.
 - 2. Use high strength silicon bronze U-bolt, nuts, and lock washers.
 - 3. Exothermic reactions required for all ground rod connections.
- B. Ground rods:
 - 1. Provide copper or copper-clad steel core.
 - 2. Use 5/8-inch diameter minimum and 10-foot long.

3. Three rods minimum per station.
 4. Provide one GCR (Ground Connection Receptacle, or Grounding junction box) receptacle per station. Refer to mounting detail on drawings.
- C. Ground wires:
1. Use copper wire only.
 2. Size as shown on the Drawings.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Grounding electrode system:
1. Attach ground wire to enclosures where available.
- B. Main and supplemental grounding electrode conductors:
1. Install triad ground rod system per plans.
 2. Install concrete encased ground system per plans.
- C. Install properly terminated equipment grounding conductor in all flexible conduits.
- D. Drive ground rod to a depth that allows for physical protection and concealment below finished floor or grade. Leave approximately 4 inches of each rod exposed for inspection prior to concealment.
- E. Make connections to ground rods with a exothermic reaction process. For inside the control cabinet: utilize a listed and approved ground clamp.

3.02 FIELD QUALITY CONTROL

- A. Perform and record resistance-to-earth measurements witnessed by Engineer with all grounding electrode conductors.
1. Isolate ground under test from other grounds.
 2. Measure in normally dry conditions not less than 48 hours after rainfall.
 3. Measure at each ground rod and other ground connections when applicable.
- B. Maximum D.C. resistance allowable is 5 ohms. Submit test signed report to Owner and the engineer for review.

- C. Use the three-point method of measurement, unless specified otherwise.

PART 4- MEASUREMENT AND PAYMENT

1.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1- GENERAL

1.01 SUMMARY

- A. Provide hangers and supports as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.02 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

PART 2- PRODUCTS

2.01 GENERAL

- A. Provide zinc galvanized, cadmium plated steel, or malleable iron supporting devices.
- B. Provide factory PVC-coated metal supports, clamps, and hardware when PVC-coated, galvanized rigid steel conduit is used.
 - 1. Comply with Section 26 05 33.
- C. Provide supports, clamps and hardware for nonmetallic conduit system.

2.02 SUPPORTING STRUCTURES

- A. Provide rack supports of steel channels with adequate feet for secure mounting. Provide steel support channels with a zinc coating, hot dipped galvanized per ASTM A123 or A153.Uni-strut.

2.03 MOUNTING PANELS

- A. Provide adequately braced and sized equipment mounting panels where required to mount equipment.

2.04 CONDUIT SUPPORTS

- A. Provide one-hole or two-hole conduit straps as required.

2.05 TRANSFORMER MOUNTING BRACKETS

- A. Provide mounting brackets fabricated of galvanized steel channel section designed to support size of transformer.

2.06 CORD GRIPS (Kellems)

- A. Shall be stainless steel, closed mesh, of the diameter to suit the cord diameter being supported.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install supporting devices in accordance with manufacturer's recommendations.
- B. Do not use perforated hanger iron.

PART 4- MEASUREMENT AND PAYMENT

- 4.01 Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1- GENERAL

1.01 SCOPE

This Section covers the general provision for furnishing and installing all conduits, related boxes and fittings, and associated accessories as required for the electrical power, control, annunciation, instrumentation, communication, and lighting systems as shown on the Drawings and as specified herein. All necessary hardware including, but not limited to screws, bolts, hangers, concrete inserts, clamps, locknuts, bushings, sealing bushings, couplings, pulling-in irons, identification tags, etc. shall be included.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

Shall be from a reputable manufacturer and approved by the Engineer.

B. Applicable Standards

All Work shall conform to the applicable provisions of the codes, standards, and Specifications, as specified herein, and the following:

<u>Name</u>	<u>Abbreviation</u>
Specifications for Rigid Steel Conduit, Zinc Coated	ANSI C80.1
Specifications for Fittings for Rigid Metal Conduit and Electrical Metallic Tubing	ANSI C80.4
Conduit Fittings and Accessories	NEMA FB-1
Outlet Boxes and Fittings	UL-514
National Electrical Code	NEC

1.03 SUBMITTALS

- A. The Contractor shall submit to the Owner's Representative for review drawings, product specifications and descriptions, together with operating and maintenance instructions, specified in Section 01 33 00 of all equipment furnished.
- B. As part of the Record Drawings submitted, the Contractor shall submit a conduit schedule at the completion of the Project. The conduit schedule shall contain, as a minimum, the following information for each run of conduit.
 - 1. Conduit designation.
 - 2. Conduit type and size.
 - 3. Routing: the routing shall identify the equipment (from-to) connected at the conduit termination.
 - 4. Description of cables installed in the conduit including function of cables.

PART 2- PRODUCTS

2.01 GENERAL

Electrical conduit and related fittings shall be U.L. listed. The conduit inside diameter shall have a smooth finish to facilitate fishing and/or pulling of wires and cables. Where flexible conduits are used, they shall be of the liquid tight type.

2.02 SIZE REQUIREMENTS

Conduits smaller than 3/4-inch diameter shall not be allowed. Conduit sizes shall be as shown on the Drawings. In cases where conduit sizes are not shown on the Drawings, the minimum size shall be in accordance with the applicable provisions of NEC.

2.03 DETAILS OF CONSTRUCTION

- A. Rigid Metal Conduit and Fittings
 - 1. Rigid metal conduit shall be heavy wall, hot-dip galvanized steel. Thin wall conduits and metallic tubing are not acceptable unless specifically shown on the Drawing or specified for use in other Sections of these Specifications.

2. Metal conduit fittings and covers shall be galvanized or sherardized iron or malleable iron castings with gaskets as required. Composition or rubber gaskets shall be provided where required to prevent entrance of moisture.
3. Rigid metal conduit expansion joint fittings shall consist of standard manufactured products, designed so as to prevent damage to the cables and equipped with approved means of providing electrical continuity of the conduit run. Expansion joint fittings shall permit a small amount of transverse movement as well as longitudinal movement. All couplings and fitting joints shall be of the threaded type.
4. Aluminum shall not be used either for conduits, fittings, pull boxes, junction boxes, or any other electrical device, unless otherwise specifically shown on the Drawings.

B. Flexible Liquid-Tight Conduit

1. The conduit shall consist of an interlocked galvanized steel core and a liquid tight cover made of polyvinyl chloride synthetic resin. A ground bonding conductor shall be included.

C. Electrical Metallic Tubing (EMT) and Related Fittings

Electrical metallic tubing shall comply with FS WW-C-563 and ANSI C80.3. EMT fittings shall comply with FS W-F-408. EMT shall be provided only as shown on the Drawings or as otherwise specified in other Sections of these Specifications. Couplings, connectors and other fittings for EMT shall be cadmium or zinc plated steel, or cadmium plated malleable iron and shall be raintight, compression type.

D. Rigid Nonmetallic Conduit

1. Rigid nonmetallic conduit shall be of the polyvinyl chloride (PVC) type, Schedule 40 as shown on the Drawings, and shall be in accordance with the applicable requirements of NEC.
2. The conduit, fittings and accessories shall be manufactured from polyvinyl chloride complying with ASTM D1784 and shall comply with all the applicable requirements of NEMA Publication No. TC2, UL 651 for EPC-40-PVC and N.E.C. Article 347.
3. Fittings and accessories for the electrical plastic conduit shall comply with all applicable requirements of NEMA Publication No. TC3.
4. The solvent cement used to join the conduit and fittings shall meet the requirements of ASTM D2564.

E. Junction, Outlet, Terminal, and Pull Boxes and Covers

Junction, outlet, and pull boxes and covers shall be constructed of stainless steel, painted aluminum, sheet steel or cast-metal as shown on the Drawings. Covers shall be secured with screws, except for boxes 16 inches or larger which shall have piano hinged covers with quarter turn screws, or as otherwise specified. Gaskets shall be provided for all boxes and be padlockable. Terminal boxes shall be furnished with UL listed terminal blocks as required and as indicated on the Drawings for the wire sizes indicated.

F. Handholes

1. Handholes and covers shall be made of precast polymer concrete reinforced with fiberglass. Enclosures, boxes and covers are required to conform to all test provisions of the most current ANSI/SCTE 77 "Specification for Underground Enclosure Integrity" for a minimum Tier 15 rating, or as otherwise indicated on the Drawings. When multiple "Tiers" are specified, the boxes must physically accommodate and structurally support compatible covers while possessing the highest Tier rating. All covers are required to have the Tier level rating embossed on the surface. In no assembly can the cover design load exceed the design load of the box. All components in an assembly (box and cover) are manufactured using matched surface tooling. Handholes (including box and cover) shall be UL listed.
2. Handholes shall be as indicated on the Drawings and shall be stackable straight wall enclosures, provided with skid resistant, 2-bolt lids, engraved with specified logo. Handholes shall be provided with stainless steel hardware and cable racks/hooks.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

Routine factory testing and inspection shall be performed in accordance with the requirements of the applicable standard.

3.02 INSTALLATION AND TESTING

A. General

Any and all excavation, trenching, coring, backfilling, incidental concreting (not part of a structure in which conduits are embedded) and/or concreting

required for duct banks, etc. as required for the installation of Electrical Conduit shall be performed by the Contractor at the Contractor's expense. Installation of all raceway conduits and fittings shall be in accordance with these Specifications, manufacturer's recommendations, applicable standards, codes and regulations, and best engineering practices.

B. Installation of Rigid Steel Conduit

1. Installation of all conduits, boxed fittings, and accessories shall conform to the requirements of the "National Electrical Code", insofar as this is applicable. During installation, precaution shall be taken to protect the conduits and conduit threads from mechanical injury. The ends of conduits shall be sealed in an approved manner during installation whenever the work is interrupted. Runs shall be sealed upon completion by the use of caps and discs or plugs. The seals shall be maintained, except during inspection and tests, until the conductors are pulled in. Conduits shall be inspected before conductors are installed and thoroughly cleaned of water and dirt by means of compressed air, swabs or other approved methods. Conduits shall be checked for freedom from obstructions by pulling a wooded mandrel of the proper size through the conduit. All boxes and fittings shall be kept closed and free from dirt, moisture, and debris.
2. Each run of conduit between boxes or equipment shall be electrically continuous. Threads shall conform to ANSI-B2.1 standard for taper pipe threads. Conduits shall be cut square, ends reamed and threads cut with approved dies. Running or non-tapered threads will not be permitted. Conduits entering slip holes in boxes shall be secured with a locknut on each side at the box wall and terminated with bushings.
3. Threaded conduit joints shall be made watertight by use of red lead and oil, white lead and oil, or other approved compounds. Threaded joint compound shall be electrically conductive.
4. Exposed conduit shall be 3/4-inch IPS or larger and shall run in straight lines parallel to walls, beams or columns. Required offsets shall be accomplished by use of uniform offsets, bends, conduit fittings, or standard boxes. Where conduits are grouped, the offsets shall be made in a manner which will present a uniform and symmetrical appearance.
5. Conduits shall be supported as required by NEC. Capped conduit and conduit terminating in boxes or fittings shall be supported as close to the terminal as possible but in no case farther than 3 feet from the terminal. Galvanized clamps, U-bolts, and J-bolts shall be used to fasten conduits. Boxes and equipment housings shall be

supported independently of the conduits. Conduits and boxes shall not be fastened directly to concrete but shall be spaced away by means of one-inch galvanized metal channels or spacers. Machine screws or bolts set in concrete inserts or cinch anchors shall be used for securing clamps and boxes to concrete or to steel supporting channels. The use of explosive-driven anchors for securing clamps, supports, and boxes to concrete will not be permitted, except in such cases where special permission has been obtained in writing from the Owner.

6. Exposed conduits inside building shall run supported on walls or on trapezes away from wall.
7. Conduit embedded in concrete shall be one inch or larger, unless otherwise shown on the Drawings. Embedded conduit shall be sloped towards drain points and shall be rigidly supported and braced to avoid shifting during placement of concrete. Embedded conduit runs parallel to concrete surfaces shall be located behind the reinforcing steel except at terminal connections to outlets or junction boxes. Conduit extending out of concrete walls, floors, or beams shall be at right angles to the surface.
8. Minimum spacing of conduits embedded in concrete shall be as required by N.E.C. for proper conductor heat dissipation. The minimum spacing shall be maintained except where approaching and entering a box or panel. Conduit spacing shall also permit the flow of concrete between them.
9. Conduits embedded in concrete and terminating at motors or other equipment mounted on concrete bases shall be brought up to the equipment within the concrete base wherever possible.
10. All conduit boxes shall be so located that covers and openings are easily accessible. They shall be installed parallel with building lines, and where embedded shall be flush with the surface of the finished floor, wall, or ceiling. The Contractor shall remove and reset all boxes not properly installed or shifted out of line during concreting, whenever required or directed.
11. Conduits shall have long-sweep field bends wherever possible but shall in no case have smaller radii bends than are allowed by NEC or as recommended by the manufacturer whichever is the most stringent. All field bends shall be manufactured bends or made with a bending machine or other approved device. Field bends shall not reduce the internal diameter of the conduit or injure the protective coatings. The bend shall be free of kinks, indentations, or flattened surfaces. Heat shall not be applied. Standard bends shall be used where conduits turn out of the concrete, at the conduit terminations, and at electrical equipment. Where conduits enter switchgear cubicles or other enclosures, they shall be located by template.

12. Where conduits cross expansion joints or contraction joints, they shall be installed perpendicular to the plane of the joint and shall have expansion fittings. Expansion fittings shall be as follows:
 - a. Expansion fittings for exposed conduit shall have external bonding jumpers for ground continuity and shall be from a reputable manufacturer.
 - b. Expansion fittings embedded in concrete shall be expansion deflection type consisting of molded neoprene sleeves with bonding jumpers passing through separate waterproof compartments, and two silicon bronze couplings. They shall permit a 3/4-inch expansion and contraction and a 3/4-inch deflection without deformation.
13. All conduits shall be installed as shown on the Drawings, with the exact location and routing to be determined in the field as required.
14. Cable runs shall be segregated so that no two of the following types of cable occupy the same conduit:
 - a) 480-V power cable.
 - b) 240/120-V, AC, miscellaneous lighting and receptacle circuit cable; plug-in type.
 - c) 240/120-V, AC, power and control cable.
 - d) Low voltage or current, DC, control cable.
 - e) Instrumentation cable.
15. Conduits penetrating walls, ceilings and floors of buildings and/or structures shall be sealed as shown on the Drawings. Sealing of conduit ID shall be by combination seal/drain fittings where shown on the Drawings. Sealing of conduit OD shall be by means of conduit sleeve and sealing compound. Sealing compound shall be of a type approved for the conditions and use.

C. Installation of Flexible Liquid-Tight Conduits

1. Flexible liquid-tight conduits shall be used for connection to motors and to any other equipment subject to vibration. Liquid-tight fittings and connectors shall be used in conjunction with the liquid-tight flexible conduit installation.
2. Flexible liquid-tight conduit lengths shall not exceed 6 feet.

D. Installation of EMT Conduits and Fittings

1. Installation of EMT shall conform to the applicable requirements of rigid steel conduits as previously specified.
2. EMT conduits shall be connected to the outlet boxes and panelboards by means of "gland" type connectors. Couplings between conduits shall be "gland" couplings. Conduits shall enter all couplings and connectors the full distance required and shall be securely held in place by a tightening of a "Locking Nut".
3. EMT shall not be embedded in concrete, used in hazardous locations where explosion-proof equipment is required, or buried in earth. Indentor or set screw type fittings shall not be used.

E. Installation of Rigid Nonmetallic (PVC) Conduits

1. Installation of rigid nonmetallic (PVC) conduit shall conform to applicable requirements of installation of rigid steel conduits as previously specified. Installation of rigid nonmetallic (PVC) conduit shall be as shown on the Drawings and shall be in accordance with the manufacturer's recommended procedures.
2. Installation shall meet the requirements of N.E.C. Article 347 Part A.
3. The conduit shall be cut square. All burrs shall be removed from the inside and outside of the conduit.
4. Bending:
 - a) Bending of the conduit shall be made so that the conduit will not be injured, and the internal diameter of the conduit will not be effectively reduced. Bends shall be made with a standard PVC pipe bending equipment.
 - b) The conduit section shall be heated evenly over the entire length of the bend. The use of torches or other flame-type devices will not be allowed. Sections showing evidence of scorching or discoloration shall not be acceptable for use on the project.
 - c) The radius of the bend shall not be less than that shown in Table 346-10 of the National Electric Code.
5. Joints:
 - a) All joints shall be test mated without forcing. The socket depth of the fitting shall be marked on the outside of the conduit

- without scratching or damaging the surface. The conduit should enter the fitting for the full depth of the socket depth.
- b) Before applying cement, the surfaces to be joined shall be wiped clean and free of dirt, oil, grease or moisture. The solvent cement shall be applied to the conduit and fittings quickly, consistent with good workmanship. Under conditions of high humidity, a second full coating of cement shall be applied to the conduit before insertion.
 - c) Immediately after applying the coat of cement to the conduit and fittings, the conduit shall be inserted into the fitting socket until it bottoms at the fitting shoulder. The conduit shall be turned 1/4 turn during insertion to distribute the cement evenly. Excess cement shall be wiped away from the outside of the joint.
 - d) Newly assembled joints shall be handled carefully until the cement has gone through the set period. The recommended set periods are related to temperature as follows:

60 to 100 degrees F:	30 minutes
40 to 60 degrees F:	1 hour
20 to 40 degrees F:	2 hours
0 to 20 degrees F:	4 hours

6. Conduit Encased in Concrete:

- a) Underground concrete-encased conduit shall be supported on plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common duct bank shall be not less than 3 inches. Concrete cover overall shall not be less than 3 inches all around the encased run. Space below the conduit, and concrete fill shall be assured. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. When pouring concrete, the concrete shall be deflected or diverted during placement to minimize the possible damage to or movement of the conduits.
- b) Conduit encased in concrete shall have steel reinforcing where installed below roadway or other paved vehicle areas (including shoulder) and the reinforcement shall extend not less than 5 feet additional from the edge of pavement unless otherwise indicated. Steel reinforcement shall not be less than No. 4 bars at corners and otherwise spaced on 12-inch

centers, tied with No. 4 bars on 12-inch centers. Reinforcement shall be provided as shown on the Drawings.

7. Expansion Fittings

- a) Expansion fittings shall be provided for all runs crossing structural expansion joints.
- b) Expansion fittings, as specified herein, shall be installed in all raceway runs crossing structural expansion joints. Unless otherwise indicated or approved by the Owner's Representative expansion fittings shall include an 8-inch expansion fitting plus a deflection fitting allowing not less than a 3/4-inch deflection in any direction. The drawings shall be examined to determine complete extent of expansion joints.
- c) Concrete shall be formed around the expansion fittings in a manner to permit their movement as specified.

3.03 PAINTING

Not applicable in this Section.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.

- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1- GENERAL

1.01 SUMMARY

- A. Provide identification for electrical systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

PART 2- PRODUCTS

2.01 NAMEPLATES AND TAGS

- A. Provide nameplates or tags for identification of cabinets, panels, panel components, and field mounted devices with the following requirements.
 - 1. Engraved laminated plastic.
 - 2. White or black letters on background of opposite color. Match and coordinate color of nameplate or tag background with other panels.
- B. Panel nameplates to have 1/2-inch-high letter engraving.
- C. Device and component nameplates or tags to have 3/16-inch-high letter engraving.
- D. Engravings include the following:
 - 1. Alpha-numeric number.
 - 2. Descriptive title.
 - 3. Range, where applicable.
 - 4. Engineering units, where applicable.
- E. Arc-Flash hazard warning shall be determined by the contractor and labeled in the field according to NEC Article 110.16

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install nameplates and tags on enclosures, panel mounted components, and field mounted devices.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for the Work specified in this Section. All costs of such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 27 16

ELECTRICAL CABINETS AND ENCLOSURES

PART 1- GENERAL

1.01 SUMMARY

- A. Provide intermediate pump cable junction box as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.02 SUBMITTALS

- A. Submit shop drawings including the following:
 - 1. Scaled drawings showing dimensions, front view, side view, vertical and horizontal sections, and layout of all equipment inside cabinet and enclosure.
 - 2. Manufacturer's detailed specifications.
 - 3. Door hardware details.

1.03 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.
 - 3. Completed Cabinet must be UL listed.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

PART 2- PRODUCTS

2.01 EXTERIOR ELECTRICAL ENCLOSURES: PUMP CABLE JUNCTION BOX

- A. Provide custom-fabricated, free-standing exterior electrical equipment enclosures as follows:
1. Combination NEMA Type 4X construction: Designed for outdoor use, with permanently attached door gaskets and drip-shield over door openings.
 2. Constructed from minimum 14-gauge stainless steel with brushed finish.
 3. Seams continuously welded and ground smooth, no holes or knockouts.
 4. Stiffeners welded to back of enclosure to maintain flatness and increase rigidity.
 5. Sloped top to prevent water accumulation and ice formation on top surface.
 - a. Slope from front edge to rear edge of enclosure.
 6. Front access openings with formed edges, one set of formed dual doors (one door overlapping the other without a fixed-in-place mullion in the center of the opening), and/or one formed single door as shown on the Drawings.
 - a. Access openings and doors arranged to provide clear, unobstructed access to all equipment inside enclosure.
 - b. Width of any door not to exceed 36 inches.
 - c. Stiffener welded to each door to prevent twisting and misalignment.
 7. Restraint mechanism on each door to prevent movement of open door in windy conditions.
 - a. Restraint mechanism to automatically deploy when door is fully opened (100 degrees swing) and must be manually released in order to close door.
 8. Three-point latching system on each single and overlapping door with nylon rollers and oil-tight, weather resistant pad-lockable handle.
 9. Concealed, heavy gauge continuous door hinges with stainless steel pin.
 10. Interior lugs and terminal strips as required.

11. Copper ground bus bonded to interior sub-panel and to enclosure.
12. Flexible copper bonding jumper (braided strap or stranded wire) connected to enclosure and each door and/or hinged inner panel on which current- carrying devices are mounted.

B. Acceptable Manufacturers

1. Shall be from a reputable manufacturer.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install cabinets and enclosures in accordance with manufacturer's recommendations.
- B. Caulk all field punched or drilled openings with silicone sealing compound to maintain leak-proof integrity of exterior surfaces.
- C. Level and plumb intermediate junction box on metal bracing and attach to reinforced concrete base.
- D. Adjust doors and door hardware as required for correct alignment and ease of operation.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.

- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 29 20

PUMP CONTROL PANEL

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers the pump control panel, together with related accessories to be furnished, installed, and tested as specified herein and as shown on the Drawings. The installation of the pump control panel shall include all conduits, wires, grounding connections and accessories required for a complete installation. All related fittings, connectors, supports and anchors, where required, but not specifically provided for in these Specifications shall be included under this Section of Work.

B. Related Work

1. Other Sections as specified herein.

1.02 QUALITY ASSURANCE

A. Applicable Manufacturers

1. Shall be from a reputable manufacturer and approved by the Engineer.

B. Applicable Standards

The pump control panel shall conform to the applicable requirements of NEMA standards, U.L. Standard No. 508, and to the requirements of the National Electrical Code.

C. Coordination

Instrument and control systems shall be designed and coordinated for proper operation with related equipment and materials furnished by other suppliers under other Sections of these Specifications, and where applicable, to related existing equipment. All instruments and control devices shall be applied in full conformity with the drawings, specifications,

engineering data, instructions, and recommendations of the instrument or device manufacturer and the related equipment manufacturer.

Review of drawings submitted prior to the final determination of related equipment shall not relieve the Contractor from supplying systems in full compliance with the specific requirements of the related equipment.

Related equipment and materials may include, but will not be limited to, pump controls, variable frequency drives, conduit, cable, and piping as described/specified in other Sections of these Specifications all as associated with this Project.

Installation drawings shall be prepared for interconnecting wiring and piping between the related equipment and the equipment furnished under this Section. All interconnecting wiring shall be appropriate for the service and shall result in a properly functioning system.

Coordination with other sub-contractors and/or Owner designated contractors, together with the Owner's IT staff, and supervision of installation shall be provided by the Contractor as required during construction.

1.03

SUBMITTALS

The Contractor shall submit to the Owner's Representative for review detailed shop drawings, product specifications, and descriptions including control schematic diagrams, wiring connection diagrams, complete rating and short circuit ratings together with installation instructions, operating and maintenance manuals, and field check-out, start-up and testing procedures specified in Section 01 33 00 for all equipment furnished.

1.04

RESPONSIBILITY

Contractor shall coordinate with Owner's System Integrator to provide a complete pump control system compatible with the Owner's existing SCADA system. The lift station shall be an addressable facility that will be incorporated into the Owner's existing SCADA system as specified in Section 27 51 25.

PART 2- LIFT STATION CONTROL DETAILS

2.01 SYSTEM OPERATION

The lift station shall operate as a conventional pump down installation. The level management system shall consist of (1) submersible transducer as the primary level management system and (5) mechanical floats as the backup level management system. The system operation shall be by means of a pump control panel, with an automatic alternator to alternate the pumps each "on" cycle.

A submersible transducer shall measure the water level within the wet well. As the water level rises within the wet well, reaching the "low flow lead pump on" elevation, the pump controller shall energize and start the low flow lead pump. Once the water level lowers within the wet well, reaching the "low flow pumps off" elevation, the pump controller shall de-energize and stop the low flow lead pump. The pump controller shall then send a signal upon de-energizing the lead pump so that the lag pump will activate upon the next operation. If the water level continues to rise within the wet well, reaching the "low flow lag pump on" elevation, while the lead pump is operating, then the pump controller shall energize the lag pump until the water level lowers within the wet well. If the water level continues to rise beyond that and reaches the "high flow lead pump on/low flow pump interrupt", the low flow pumps shall be de-activated and the high flow lead pump shall be energized until the water level lowers down to the "high flow pumps off elevation". The alternating relay shall send a signal upon the pump stopping so that the high flow lag pump shall start upon the next operation. If the water level continues to rise within the wet wells, reaching the "high flow lag pump on" elevation while high flow lead pump is operating then the controller shall energize the high flow lag pump, allowing the water level to recede down to the "high flow pumps off" elevation. If the water level continues to rise beyond the "high flow lag pump on" elevation while both high flow pumps are operating, reaching the "high level (alarm)" elevation, then a high-water level alarm shall be sent to the owners, indicating that there is a high water level in wet well. Both the low flow pumps and high flow pumps shall not operate simultaneously. If the water level lowers within the wet well below the "low flow pumps off" elevation, reaching the "low level (alarm)" elevation, a low water level alarm shall be sent to the owners and indicating that there is a low water level in the wet well and any pump operating shall be de-energized.

During normal operation of the low flow pumps the pump controller shall have a counter mechanism to interrupt the normal operation of the low flow

pumps and allow the water level in the wet well to fill to the "high flow lead pump on" level, activating one of the main pumps in a "flush" mode twice per 24-hour period.

Pumps shall operate in HAND mode regardless of water level or level alarms.

PART 3- PRODUCTS

3.01 GENERAL

- A. Pump Control Panel Enclosure shall be steel fabricated, NEMA 4X, of compact design and size and shall be provided to house electrical equipment and devices as shown on the Drawings and as specified herein, for the automatic control and operation of the submersible pumps. The pump control panel shall be housed in a NEMA 4X stainless steel enclosure suitable for mounting as shown on the Drawings. Inner panel shall be provided with hinged door with a latching style main disconnect switch to prevent the enclosure door from being opened while power is on. All pilot lights, switches, ETM's (Elapsed Time Meters), and Human Machine Interface (HMI) shall be face mounted on outer panel door. The pump control panel shall include all control logic, wiring, etc., as required to make up a completed operational control system as required for the multi-pump installation. All devices shall be prewired and tested as an assembly prior to shipment and shall be delivered to site ready for installation to the extent possible. Additional details of the pump control panel shall be as follows:
1. NEMA 4X steel cabinet containing one main disconnecting switch, hand-off-auto selector switches, selector switches for operating pump utilizing Variable Frequency Drive (VFD) operation or constant starter, motor running time meters and red, green and amber indicating lights, to identify when pumps are idle, in operation, or tripped on overload, control transformer with primary and secondary fuses, control breaker, terminal block, condensation protection heater, Programmable Logic Controller (PLC), HMI, Uninterruptible Power Supply (UPS), signal optical isolators, radio, and ethernet switch. Auxiliary relay contacts shall be provided as required for control and/or alarm points shown on the Drawings.
 2. Power supply to the pump control system shall be as shown on the Drawings. All components mounted in the cabinet shall be wired to outgoing terminals and wiring shall be properly numbered to identify connections shown on the manufacturer's wiring diagram. Control voltage shall be 120 Volt AC.

3. The Pump Control Panel shall include provisions as required for the herein specified Level Management System including the level transducer(s) for primary control, and the floats as a back-up system.
 4. The Pump Control Panel shall be mounted at the location shown on the Drawings together with related accessory panels and devices as specified in subsequent Sections of these Specifications.
- B. Starters and Breakers. Starters and breakers shall be provided for the respective pumping units that are being controlled. Starters shall be provided and selectable to operate each pump using a VFD or direct line starter.
- C. Selector Switches and Pilot Lights. Unless otherwise specified all selector, switches and pilot lights shall be full size, 110-volt, LED type with push-to-test feature, with replaceable LED lamp and lens.
- D. Pilot Devices, Nameplates & Wiring. All pilot devices shall be labeled with engraved plastic laminated nameplates describing the service for which they are intended. All back panel mounted items shall also be labeled for ease of identification during service. All wiring shall be numbered and of size 14 AWG minimum for control and 12 AWG minimum for power.
- E. Hand-Off-Auto Selector Switch. HOA's shall be provided for each of the submersible pumps. When in the "Auto" position the pumps shall be controlled by the Pump Controller. When in the "Off" position the pumps shall be disconnected from the power source. When in the "Hand" position the pumps shall operate regardless of the liquid level in the wet-well. Separate running time meters shall also be provided for each pump.'
- F. Reset Buttons: Reset buttons shall be provided for each of the submersible pumps to reset pump fail, overload, and thermal fail trips.
- G. A red alarm strobe light shall be provided for remote mounting on the exterior of the main building for indication of a common alarm condition.
- H. Surge arrestor: The control system shall be supplied with a lightning and surge arrestor wired into each leg of the electrical service.
- I. Phase protection: The control panel shall provide phase failure protection for the pumping units.
- J. Receptacle: A 15A GFI receptacle shall be mounted on the face of the enclosure for operator convenience.

- K. Spare Terminal Blocks: Ten spare terminal blocks shall be provided in the pump control panel for future use.

3.02 RATING & OPERATIONAL REQUIREMENTS

- A. The pump control panel shall be rated as shown on the Drawings. Additional performance requirements and ratings, where applicable, of various electrical devices are specified herein.
- B. The pump control panel shall interface with SCADA and other related instrumentation and control equipment as specified in Section 27 51 25.

3.03 DETAILS OF CONSTRUCTION

- A. Level Transducer (Primary Control): The transducer shall be a submersible hydrostatic level instrument designed to continuously translate sensed level to an electric signal for system control. The sensing element shall be of the isolated diaphragm type using a silicon pressure cell with standard output of 4-20 mA. The unit shall be housed in a sealed, 316 stainless steel housing. The transducer shall be supported, as approved by the Engineer. The transducer shall be protected by a connectivity lighting protector. The transducer shall meet or exceed the following requirements:

Accuracy (of full transducer span):	$\pm 1\%$
Temperature Drift (of full transducer span):	$\pm 3\%$
Operating Temp. Range:	-20°C to +60°C

- B. Direct Acting Float Switches (Backup Control): Direct acting float switches shall be provided as a backup to the submersible transducer as the primary level sensing device complete with stainless steel chain and stainless-steel brackets. Backup Float Control shall only be selectable via a panel switch and not engage automatically. The floats shall sense water levels as required by the Drawings. The float switches shall be of the enclosed mechanical micro-switch type which closes or opens its contacts when float rises 1.00" or 3° above a horizontal position. The switch rating shall be 10 amps at 120-V, 60 Hz. The cable shall be Neoprene Type SO. Each float located in the lift station wet well shall be provided with sufficient length of cable to allow a direct connection to the power distribution blocks located in the pump cable junction box without field splicing. Float switches shall be provided in the number and at the locations shown on the Drawings for pump controls and/or alarms.

- C. Pilot Lights: Pilot lights shall be provided to indicate the following conditions:
1. Power Normal
 2. Generator Power On
 3. Generator Fault
 4. Common Alarm
 5. High Level
 6. Low Level
 7. Transducer Level Mode
 8. Float Mode
 9. Pump 1 Running
 10. Pump 1 Overload (starter)
 11. Pump 1 Seal Fail
 12. Pump 1 Thermal Fail
 13. Pump 2 Running
 14. Pump 2 Overload (starter)
 15. Pump 2 Seal Fail
 16. Pump 2 Thermal Fail
 17. Pump 3 Overload (starter)
 18. Pump 3 Seal Fail
 19. Pump 3 Thermal Fail
 20. Pump 3 VFD Fault
 21. Pump 4 Overload (starter)
 22. Pump 4 Seal Fail
 23. Pump 4 Thermal Fail
 24. Pump 4 VFD Fault
- D. Miscellaneous Notes: Separate individual mechanical switches shall be provided to separately control power to the PLC, HMI, UPS, radio, and ethernet switch.
- E. Area Electrical Classification: Class I, Division 2, Group D (as indicated on the Drawings) for the wet well only.
- F. Transducer and Float Mounting Bracket: A transducer and float mounting bracket shall be provided. The bracket shall be a Float Switch Hook Mounting Bracket. Mounting bracket shall include stainless steel chain for suspension of the transducer and floats in the wet well and to facilitate transducer removal for inspection. Mounting bracket shall be fabricated from stainless steel.
- G. Power and Monitoring Cable: The power cable shall be sized to the IEC standards and shall be of sufficient length to reach the junction box without

the need of any splices. The motor cable shall be a screened cable and sized and installed according to IEC requirement.

PART 4- EXECUTION

4.01 FACTORY TEST AND INSPECTION

Each item of equipment shall be shop-assembled and tested in accordance with the manufacturer's standard procedure. Monitoring and control devices shall be functionally tested to verify correct operation and that all parts function properly. Contractor will coordinate with Owner SCADA Integrator to program and test the pump control panel before it is delivered to site.

4.02 INSTALLATION AND TESTING

- A. The equipment shall be installed as shown on the Drawings and in accordance with the manufacturer's instructions and recommended best practices. All necessary fittings, connectors, supports, anchors and other items required for installation and testing shall be furnished. All items of equipment shall be operated, adjusted, calibrated, and tested for proper performance in accordance with the manufacturer's recommended test procedure.
- B. All equipment and components shall be tested by operating them a reasonable number of times to demonstrate their proper and safe installation and operation. To determine what constitutes a safe and proper installation, these Specifications, manufacturer's recommendations, guidelines set by NEC, IEEE, ANSI, OSHA, et. al. shall be the norm.
- C. Operational test for all power, control and HMI equipment shall be performed to verify correctness of operation, connections, and interconnections with other equipment.
- D. All motor operated equipment shall be tested by applying rated voltage and operating the controlling equipment (HOA, HMI, level switches, etc.) to insure their proper interconnection and compliance with the requirements for the operation of the equipment. After this has been verified, motor starters shall be operated manually to operate each motor at its rated load. Data to be taken for each motor shall include, but not be limited to, terminal voltage (one per phase), and full load amperes.

4.03 PAINTING

All equipment specified in this Section shall be shop-painted with the manufacturer's standard finish unless otherwise shown on the Drawings. All equipment specified in this Section shall be "touch-up" field painted as required.

PART 5- MEASUREMENT AND PAYMENT

5.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

5.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Items, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 29 23

VARIABLE FREQUENCY DRIVE

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers the variable frequency drive to be furnished, installed, connected and tested as shown on the Drawings and as specified herein. All related accessories where required, but not specifically provided for by the Specifications shall be included under this Section of Work.

B. Related Work

1. Other Sections as specified herein.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. Shall be from a reputable manufacturer and approved by the Engineer.

B. Applicable Standards

All Work shall conform to the applicable provisions of the codes, standards, and Specifications, as specified herein, and the following:

<u>Name</u>	<u>Abbreviation</u>
Underwriters Laboratories	UL
National Electrical Manufacturers Association	NEMA
National Electrical Code	NEC
Institute of Electrical & Electronic Engineers	IEEE-519

1.03 SUBMITTALS

The Contractor shall submit to the Owner's Representative for review drawings, product specifications and description including control schematic diagrams, wiring connection diagrams, complete rating, and

short circuit ratings, together with installation instructions, operating and maintenance manuals, and field check-out, start-up and testing procedures, as well as factory test and field protocols all as specified and in accordance with the applicable provisions of Section 01 33 00 for all equipment furnished.

1.04 RESPONSIBILITY

The herein specified variable frequency drive equipment, together with the pumping units as specified in related Sections of these Specifications, shall be furnished by a “single-sources” equipment supplier who has been regularly engaged in the representation/production of the specified equipment for a minimum of five (5) years, so there is one source of supply and responsibility.

PART 2- PRODUCT

2.01 GENERAL

- A. The variable frequency drive units designated **VFD-1** and **VFD-2** shall be of the solid-state, microprocessor-based, adjustable frequency type and shall be furnished complete with frequency inverter, full speed contactors, variable speed contactors, fault detection circuits and all necessary sensing and control relays, contacts and other related devices so as to provide a variable speed pumping control system for the operation as specified herein. Variable frequency drive units shall be installed as shown on the Drawings.
- B. Incoming power feed distortion shall be minimized, and as a minimum a 3% impedance line reactor shall be provided to limit harmonic distortion. Distortion shall not exceed those limits established by IEEE 519.

2.02 RATING AND OPERATIONAL REQUIREMENTS

- A. The variable frequency drive units shall be rated for converting 480 Volt (+10%, -10%), 3-phase, 60 Hz power supply to adjustable frequency and voltage, as required to drive motor(s) for the horsepower applications shown on the Drawings. The output frequency and voltage of the variable frequency drive units shall be adjustable and shall maintain a constant voltage to frequency ratio throughout the base range of operation. Short circuit interrupting capacity shall be a minimum of 65,000 amps, unless otherwise indicated on the Drawings.

- B. Each variable frequency drive unit shall be dedicated to drive the respective pumping unit as shown on the Drawings. If the motor HP rating changes based on equipment selected, the VFD shall be sized to handle the new equipment. Variable frequency drive (VFD) units shall be compatible with motors being driven by VFD's. VFD's shall be provided for the following motor horsepower ratings:

<u>Pump Designation</u>	<u>VFD Designation</u>	<u>Motor HP Rating</u>
P-3	VFD-1	105 HP
P-4	VFD-2	105 HP

- C. VFD's shall be provided with adequate provisions to interface with SCADA and other related instrumentation and control equipment as required.

2.03 DETAILS OF CONSTRUCTION

- A. Each motor shall be driven by a separate and independent variable frequency type drive. The Variable Frequency Drives (VFD) shall be designed using all solid-state equipment and shall be specifically designed to optimize system frequency.
- B. Drives shall be microprocessor based, pulse width modulated, adjustable torque drives. Drives shall utilize a fixed diode rectifier for conversion of emergency and utility power to direct current for powering the inverter. The direct current circuit shall include a filter choke for reduction of power line harmonic distortion and power factor displacement. The inverter shall use insulated gate bi-polar transistors for DC to AC conversion. Input line fuses and metal oxide varistors shall be included for equipment protection.
- C. Displacement power factor shall be maintained at no less than 98 percent of unity. Drive efficiency shall be greater than 97 percent.
- D. Drives utilizing actively switched rectifier components to convert line power to direct current are not acceptable.
- E. Enclosure shall be NEMA 1, indoor with an operating temperature range of 0 to 113 degrees F and arranged for mounting as shown on the Drawings.
- F. Microprocessor controller shall include a 2-line, 20-character operator interface display and seven button keypad. The display and keypad shall allow set up, command and status indication with English statement readout.

- G. Required microprocessor control functions shall include all inputs and outputs indicated on the Drawings including but not limited to the following:

Motor Overload Trip (I²T)
Overcurrent Trip Limit
Slow Regulated Current Limit
Fast Regulated Current Limit
Overvoltage Trip Limit
Undervoltage Trip Limit
Overtemperature Limit
Ground Fault Protection
Programmable Analog Signal Inputs (2)
Programmable Analog Signal Outputs (2)
Programmable Digital Switch Inputs (6)
Programmable Digital Form C Outputs (3)
Kilowatt-Hour Display
Running Time Display
Acceleration Ramp Time
Deceleration Ramp Time
Automatic Volts/Hertz Optimization
Critical Frequency Lockout Bands (5)
Setpoint Control

- H. Interlocks shall be provided to prevent system short circuiting and/or back feeding a VFD.
I. Auxiliary bypass contacts are to be provided for the VFD's.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

Each variable frequency drive unit shall be shop-assembled and tested in accordance with the manufacturer's standard procedure. Factory testing shall as a minimum include diagnostic testing to demonstrate that the unit functions as specified. Monitoring and control devices shall be functionally tested to verify correct operation and that all parts function properly. The Contractor shall notify the Owner's Representative 48 hours prior to factory testing so that such tests may be witnessed.

3.02 INSTALLATION AND TESTING

- A. The equipment shall be installed as shown on the Drawings and in accordance with the manufacturer's instructions and recommended best practice. All necessary shims, grout, anchor bolts and other items required for installation and testing shall be furnished. All items of equipment shall be operated, adjusted, and tested for proper performance in accordance with the manufacturer's recommended procedure. Testing of the equipment herein specified shall conform to the applicable requirements of Section 26 00 10. In addition, the equipment manufacturer shall provide the services of factory-trained field supervisory personnel for a period of not less than one (1) working day during which time the supervisory personnel shall perform all necessary coordination to check-out, start-up and place the equipment into operation as well as instruct Owner personnel in the control and operation of the equipment.

3.03 PAINING

- A. All equipment specified in this Section shall be shop-painted with the manufacturer's standard finish. All equipment specified in this Section shall be field painted as directed by the Owner.
- B. The Contractor shall be responsible for coordination of compatibility between the manufacturer's standard finish and any field-painting required.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Items, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.

- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 32 13

ENGINE GENERATOR

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers the **natural gas**-powered engine generator to be furnished, installed and tested as shown on the Drawings and as specified herein. All piping, valves and accessories where required, not otherwise specifically provided for in these Specifications, shall be included under this Section of Work.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. Generator shall be from a reputable manufacturer and approved by the Engineer.
2. All other items: As specified herein.

B. Applicable Standards

All Work shall conform to the applicable provisions of codes, standards and specifications, as specified herein, and the following:

<u>Name</u>	<u>Abbreviation</u>
National Fire Protection Association	NFPA
National Electrical Code	NEC
Institute of Electrical & Electronic Engineers	IEEE

1.03 SUBMITTALS

The Contractor shall submit to the Owner's Representative for review drawings, product specifications and description, including control schematic diagrams, wiring connection diagrams together with certified performance test curves of similar generating units, instruction manuals, detailed installation drawings and instructions including anchorages,

operating and maintenance manuals and field check-out, start-up and testing procedures as specified in Section 01 33 00 for all equipment furnished.

1.04 RESPONSIBILITY

The intent of these Specifications is that the herein specified engine generator, together with the automatic transfer switch (ATS) specified in Section 26 36 00 be supplied by manufacturers regularly engaged in the production of engine-generator sets, automatic transfer switches, and associated controls, and so that the ATS conforms with features which may be specific to the engine generator.

PART 2- PRODUCT

2.01 GENERAL

- A. The engine generator unit shall consist of a **natural gas** fuel type engine directly coupled to an electric generator designed for indoor service and shall include all necessary switchgear, controls and mechanical-electrical accessories. The engine generator unit shall be delivered to site ready for installation with engine, generator and auxiliaries mounted on a common base, and shall be furnished with all piping and wiring installed between miscellaneous components of the assembly to provide for a complete and self-contained packaged type unit. The engine generator shall provide standby electrical power service and shall consist of:
1. Engine driven electric generating set.
 2. An engine start-stop control system mounted on the generator set.
 3. An automatic load transfer control to provide automatic starting and stopping of the engine and switching of the load. (Automatic transfer switch shall be in accordance with the requirements of Section 26 36 00.)
 4. Accessories as specified.
- B. All materials and equipment shall conform to the Specifications listed below and shall be equal to the products listed below by brand name and catalog number. Identification symbols and nomenclature, where used in this Section, are the same as those shown on the Drawings. Paragraphs of these Specifications describing the requirements for a single item of equipment shall apply equally to all identical items of equipment to be furnished.

- C. All rotating parts of the equipment shall operate throughout the required range without objectionable noise or vibration.
- D. Major items to be furnished with the engine generator shall include, but not be limited to, the following:
 - 1. Engine; to operate on **natural gas** source.
 - 2. Load sensing hydraulic governor.
 - 3. Automatic over speed protection.
 - 4. Synchronous generator.
 - 5. Excitation system.
 - 6. Continuous fuel level sensor.
 - 7. Engine generator control panel including the following:
 - a) Manual start-stop-run switch
 - b) Oil pressure gauge
 - c) Coolant temperature gauge
 - d) DC battery charger ammeter
 - e) Running time meter
 - f) AC ammeter
 - g) AC voltmeter
 - h) Frequency meter
 - i) Voltage adjust rheostat
 - j) Phase selector switch
 - k) Control panel fuse
 - l) Engine monitor system
 - m) Low oil pressure indicator light
 - n) High coolant temperature indicator light
 - o) Low coolant level indicator light
 - p) Over crank indicator light
 - q) Overspeed indicator light
 - r) Test and reset switch
 - s) Safety shutdowns for:
 - Low oil pressure
 - High coolant temperature
 - Low coolant level
 - Overspeed
 - 8. Starting devices and related equipment including the following:
 - a) 12-volt batteries
 - b) Float type battery charge system
 - c) Voltage regulator

- d) 12-volt motor starter
 - e) Crank limiter
 - f) Battery racks and cables
-
- 9. Engine air intake filter.
 - 10. Engine-driven lubricating and cooling oil pump(s).
 - 11. Engine-driven cooling water pump(s).
 - 12. Not used.
 - 13. Lubricating oil cooler and filter.
 - 14. Water cooled radiator with engine-driven fan.
 - 15. Critical exhaust silencer and expansion joint.
 - 16. Engine exhaust piping.
 - 17. Jacket water thermostatic control valve.
 - 18. Engine jacket water heaters; 120 V, single phase.
 - 19. Engine water temperature relays.
 - 20. Engine oil pressure relays.
 - 21. Engine failure automatic shutdown devices.
 - 22. Structural steel base for engine, generator and radiator.
 - 23. Vibration isolators.
 - 24. All related piping, factory engineered and mounted.
 - 25. Anchor bolts for all equipment as required.
 - 26. Generator output thermal-magnetic circuit breaker rated as shown on the Drawings.
 - 27. Natural gas fuel supply piping and valves as required and as shown on the Drawings all in accordance with NFPA 58
 - 28. Insulation for silencer and all exhaust piping components
 - 29. Engine generator sound attenuated, weatherproof unit enclosure.

2.02 RATING AND OPERATIONAL DESIGN REQUIREMENTS

A. General

The engine generator will be operated at an approximate altitude of 640 feet above mean sea level (USGS) with an ambient temperature range between -20- and 104-degrees Fahrenheit.

B. Rating

The rated output of the engine generator shall not be less than **250 kW** (rated capacity), **at 480 volt**, solidly grounded neutral 3-phase, 60Hz, and 0.8 power factor. Rated unit speed shall not exceed 1800 rpm.

C. Sound

Noise level of engine generator unit when fully loaded shall not exceed **75 dBA at 23 feet**.

D. Critical Speeds

The engine, generator and exciter shall be designed as a complete integrated unit and shall be free from harmful critical speeds and torsional vibrations within the operating range of speed and capacity. The engine, generator and exciter shall safely withstand 125% of rated speed.

E. Winterizing

The engine generator shall be fully winterized and shall be provided with all necessary cold weather starting devices and aids as specified herein and/or as required. Radiator anti-freeze shall be sufficient to allow unit operation at an ambient temperature equal to **-40°F**. Anti-freeze shall be environmentally safe.

F. System Operation

The engine generator shall be designed to be installed as shown on the Drawings and shall be equipped to operate as follows:

1. For local manual starting and loading.
2. For automatic starting and stopping and loading of connected loads.
3. For manual unloading and stopping.

The engine generator shall be furnished with the engine and generator protective devices specified herein, which shall provide unattended stand-by power, and upon occurrence of a fault, shall stop and lock the unit out of operation until the fault is cleared.

G. Operating Conditions

1. Connected Loads: The engine generator shall be designed to automatically start and continuously operate the connected loads as shown on the Drawings and as specified herein. The maximum voltage dip shall not exceed 20 percent during the starting of any load.
2. Load Starting Sequence. The load starting sequence shall be as follows:

- a) Connected loads shall be started after the automatic transfer switch transfers to the emergency position. All loads could be connected when the main generator breaker closes.
- b) After several seconds have elapsed the connected motor loads shall be sequentially started. An interval of several seconds shall be maintained between starting successive loads during sequential starting. Sequential starting shall be as follows:
 - Miscellaneous Resistive Loads (10 kW)
 - Two (2) 105 HP Submersible Pumps, each Across the Line (ATL)
- c) Sequential starting of the motor loads shall be accomplished by means of a time delay relay furnished and installed in each of the motor starters or programmable logic in the PLC.

2.03 DETAILS OF CONSTRUCTION

A. Engine

The engine shall be of the general-purpose, stationary, **natural gas** fired, internal-combustion, water-cooled, 4-cycle, in-line or V-type with replaceable cylinder liners or individually cast cylinders. Jacket water heater shall be provided. The engine shall be water-cooled through the use of a radiator mounted on the common base which will require no external water supply other than make-up water. The engine may be either normally aspirated or furnished with a turbocharger. Turbocharger units shall be of the low noise level type and shall be essentially silent under full-load operating conditions. Except where otherwise specified, the engine shall be a standard product of the manufacturer and shall be of a type, design, and form that has had at least 5 years of satisfactory service without substantial change prior to the opening of bids. The engine-driven pumps and devices shall be suited for and have the capacities required to function properly as described herein. Rated load operation of the generator at rated power factor shall require not more than 100% of the maximum horsepower which the engine can develop at synchronous speed when operating with its auxiliaries connected, including its fan. The maximum horsepower referred to is the maximum brake horsepower which the engine will develop and maintain at synchronous speed and using **natural gas**. The engine

shall operate without overheating or suffering mechanical damage when operating under the conditions specified herein.

B. Engine Auxiliaries

1. Governor. The governor shall be an isochronous, hydraulically operated type with manual adjustment of load limit, speed setting, and speed droop. Speed droop shall be adjustable from 0 to 5% of rated full load speed. There shall be no hunting under constant load. There shall be no sustained oscillations of speed or power output following load change. The governor shall be provided with means for shutdown. Auxiliary contacts shall be provided for remote operation of intake and exhaust louver motor starters when the engine is running and shut down.
2. Oil Filters. Filters for lubricating oil shall be furnished and shall be of the disposable cartridge type.
3. Lubricating Oil Cooler. A lubricating oil cooler shall be provided of adequate size to assure proper cooling. The design shall permit easy cleaning. Mounting brackets or frame as required shall be included.
4. Fuel System: All fuel system piping sized as required for proper fuel flow to the engine shall be provided including flexible fuel lines.
5. Air Intake Filters. The air intake filters shall be of the engine-mounted, dry type.
6. Exhaust Silencer. The exhaust silencer shall be of the high degree silencing (critical) type. The silencer shall be suitable for outdoor application and shall be of sufficient size to effectively silence the engine exhaust with a minimum amount of back pressure. The silencer shall be mounted such that its weight is not supported by the engine. A flexible seamless stainless-steel connection and rain cap shall be provided. All necessary piping, flanges, exhaust condensation traps, insulation and special equipment for proper installation as required for code compliance as well as for pipe expansion and contraction shall be provided. All components shall be properly sized to assure operation without excessive back pressure when installed.
7. Expansion Joint. Flexible, stainless steel expansion joint with fittings shall be furnished for the air exhaust. The length of the flexible joint shall be in accordance with the manufacturer's recommendations.

8. Gauge Board Instrument Panel and Gauges. Instrument panel shall include the following minimum number of items: oil pressure gauge, rpm indicator, water temperature gauge, and 24 VDC engine running time meter.
9. Radiator. The radiator shall be rated for 110°F or 125°F ambient temperature and shall be a heavy-duty type with all brass water passages and fins. It shall be mounted on the engine subbase. Air flow direction shall be from the engine to the radiator.
10. Thermometers. Thermometers shall be furnished for indicating jacket water temperatures and may be either of the remote bulb or of the digital type.
11. Safety Devices.
 - a) The engine shall be equipped with safety devices to shut down the engine in the event of engine overspeed, high cooling water temperature, low cooling water level, low lubricating oil pressure, or operation of generator protective relaying. The safety devices shall require manual resetting before the engine can be restarted.
 - b) Separate normally open alarm switches actuated by engine overspeed, high cooling water temperature, low lubricating oil pressure, and low cooling water level, shall be furnished. These shall be set to operate well ahead of the shut-down devices and shall be connected to the annunciator hereinafter described.
 - c) Means shall be provided to delay operation of the low lubricating oil pressure device until the engine has been started and brought up to full speed.
 - d) The engine overspeed shutdown device shall operate independently of the governor and shall act to shut down the unit when engine speeds exceed 110 percent of normal operating speed.
 - e) Engine RPM shall be monitored by an independent permanent magnet sensor. If there is a failure in this circuit, the engine shall shutdown immediately and illuminate a Loss of RPM Sensor shutdown.
 - f) The engine generator unit shall be provided with running contacts, such that if the ATS specified in Section 26 36 00 is in the emergency position and the engine generator unit is not running (after a time delay), then unit failure shall alarm.

12. **Battery and Battery Charger.** The battery shall be a 12-volt, heavy duty lead-acid, sealed-in-plastic type, complete with floor or unit mounted battery rack and intercell connectors. Whether the battery is floor or unit mounted, it shall be furnished with connecting cable harness. The battery capacity shall be as recommended by the engine manufacturer to provide the cranking requirements specified herein and shall be adequate for at least 5 successive starting attempts. The battery charger shall be adequate to recharge the depleted battery fully in no more than 24 hours and shall automatically control the rate of charge. The battery charger shall be a full-wave, silicon diode rectifier type operating from 120V, single-phase, 60-Hz and shall be fully insulated from the AC system by a transformer. The charger shall be so designed that it will not be damaged and will not trip its circuit breaker during engine cranking. Provide regulated constant voltage static temperature compensated Battery charger rated 10 Amps minimum, DC charging Ammeter; Regulator shall taper to trickle for fully charged battery and shall be automatically disconnected from the battery during cranking.
13. **Base Plate.** The engine, generator, and radiator assembly complete shall be mounted on a common rigid base plate. The base plate shall have integrally cast, or suitably fabricated, drilled lugs to receive the vibration eliminator fasteners and shall incorporate lifting and jacking pads. Lifting eyes shall be provided for unit handling. The vibration eliminator fasteners shall be spring type and adjustable for leveling and equalizing loads. Power conduits stub up area(s) shall be provided as required, when necessary.
14. **Starting System.** The starting system shall be of the electric motor type and shall be furnished complete with all necessary or related accessory equipment. The system shall be furnished with an over-cranking cutout which shall lock out the starting controls after five starting attempts, each of 10 seconds duration with 10-second rest periods between start attempts. The cutout shall require manual reset. Separate normally open alarm switch shall be furnished and shall be connected to the annunciator specified herein.
15. **Automatic cycle cranking** to allow five, ten to fifteen second cranking cycles with ten to fifteen second reset period between cranking attempts. Cranking shall lock out and light an indicator after five attempts. It shall reset automatically if engine starts or manually if engine does not start after five attempts. No thermal devices will be permitted.

16. Exercise timer with minimum operation of fifteen minutes once per week.
- C. Generator: The generator shall be of the rotating-field, open, single bearing bracket type direct-connected to the engine. It shall have continuous type damper windings. Insulation shall be NEMA Class F, or better. The maximum allowable temperature rise (limited to NEMA Class F), the continuous rating based on that temperature rise, and the generator construction, shall conform to the latest issues of NEMA Publication No. MG-1, and NEMA publication No. MG-2, both entitled "Motors and Generators". A terminal box for connection to conduit for the main leads shall be furnished.
- D. Excitation System
1. General. The excitation system shall be either the brushless type or static type, with optional use of a series boost network as specified below. The excitation system shall have sufficient output to give the generator output performance characteristics as follows: the generator terminal voltage shall be automatically regulated within a band of $\pm 1\frac{1}{2}\%$ of rated voltage from no-load to full-load and from full-load to no-load. The instantaneous voltage dip shall not exceed 20% upon starting any of the previously specified individual loads. A manual voltage adjusting rheostat shall be furnished.
 2. Brushless System. The brushless excitation system shall include an alternator-rectifier main exciter and permanent magnet pilot exciter, both driven from the generator shaft, together with a static regulator power amplifier, automatic static voltage regulator, and necessary sensing transformers. The rotating rectifier circuits shall be fuse protected with means for detecting blown fuses while in operation. Redundant diodes shall be included to prevent generator outage upon the failure of several diodes per phase.
 3. Static System. Power for the static system shall be obtained from the generator starter. A power transformer shall be furnished with reactors and rectifier to supply DC to the generator field through brushes and collectors. Means shall be furnished to discharge the generator field on shutdown. An automatic static type voltage regulator shall be furnished with single phase sensing transformers.
- E. Space Heaters. Space heaters shall be provided in the generator, exciter and all enclosures to prevent condensation. The heaters shall be suitable for 120V, single-phase, 60 Hz and shall be continuously energized when the unit is not running. The heaters shall be automatically disconnected

when the unit is started. The construction of the heater enclosures shall be such as to assure effective circulation to eliminate pockets of hot air.

F. Electrical Control Cubicle

1. General: All electrical devices and controls shall be mounted in the EMCP (Electronic Modular Control Panel) cubicle. The following controls shall be grouped together in the cubicle for the operator control.

- 1 - Voltage adjusting rheostat for voltage regulator.
- 1 - AC ammeter.
- 1 - Ammeter switch.
- 2 - AC voltmeters, 0-600 V (running)
- 1 - Voltmeter switch.
- 1 - Speed adjusting switch.

In addition, the following electrical equipment shall be mounted in the cubicle:

- 1 - Generator voltage regulator or static exciter regulator.
- 1 - Generator circuit breaker.
- 1 - Annunciator.
- All - Protective relays.
- All - Transformers.
- All - Remaining electrical devices.

2. Details of Construction: The electrical control cubicle herein specified may be provided as a generator mounted cubicle. The manufacturer shall be responsible for all coordination required for its installation, including associated wiring and cabling. Control cubicle construction features shall be equal to the herein specified requirements and subject to the review of the Owner's Representative. The electrical control cubicle shall be of welded steel construction with structural steel frame supports and steel panels. A hinged front panel shall provide access to the interior. Clamping blocks shall be provided for support of incoming cables. All specified equipment shall be installed and wired complete in the factory. Wiring for external connections shall be extended to terminal blocks with marking strips. Marking shall be as approved by the Engineer. Twenty-five percent spare terminal points shall be furnished.

- G. Protective Relays. As provided by manufacturer's standard recommendation.
- H. Annunciator. The annunciator shall be of the LED type with one lamp for each trouble point specified below and suitably identified. The annunciator shall be provided with an audible alarm bell. The audible alarm bell shall be provided with a silencer, which shall de-activate the alarm bell only; annunciation shall remain until trouble point is cleared. The annunciator shall be provided with one common alarm to an existing auto dialer. The following trouble points annunciated on the generator control panel shall be included:
1. High jacket water temperature.
 2. Low cooling water level.
 3. Low oil pressure.
 4. Not used.
 5. Overspeed.
 6. Over cranking cutout.
 7. Protective relay operation.
- I. Nameplates. Nameplates shall be furnished for all devices.
- J. Circuit Breaker.
1. General: One generator circuit breaker of the molded case type shall be provided. The breaker shall be 3-pole, 600-V, stationary type, having a continuous rating **600 AMP**, and interrupting rating of 65,000A, symmetrical at the required voltage.
 2. Mounting: The breaker shall be factory wired to line terminals and shall be enclosed in a steel cubicle. The cubicle shall be generator mounted.
 3. Control: Means shall be provided for manually tripping the breaker without opening the cubicle door, and for manually closing the breaker by means of a lever.
- K. Louvers: Louvers/dampers shall be provided for intake and discharge of combustion and cooling air. Both intake and discharge dampers shall be equipped with insect screens. Louvers and dampers shall be sized to provide adequate airflow to the fully loaded generator set, limit restriction of the airflow as required by the generator set manufacturer, and to minimize the chance of water ingestion with excessive airflows.
- L. Wiring: Internal wiring shall be completed in accordance with the National Electrical Code, and good practice. The Contractor shall make connections

from the appropriate controlling device. Conduits shall be stubbed-out for these external connections, but conductors shall be a continuous length pulled back to the controlling device and terminated therein by Contractor. Conduit under the floor or stubbed for field connections shall be rigid type with threaded connections. Minimum size conduit shall not be less than 3/4-inch. Conductors shall be type XHHW-2, appropriately rated and shall be in accordance with the applicable requirements of Section 26 05 19.

- M. Concrete Slab: The Contractor shall provide a structurally reinforced concrete slab in accordance with these Specifications and as shown on the Drawings, to support the packaged engine generator and enclosure. Dimensions of the concrete slab shall be as shown on the Drawings. Exact dimensions shall be determined after submittal of shop drawings by the manufacturer. The concrete equipment pad shall be arranged for electrical conduit entry to the generator as required.

2.04 NATURAL GAS SERVICE PIPING

- A. The Contractor is responsible for furnishing and installing piping, fittings, dry fuel filter, regulators, drip legs, etc. located downstream of the gas utility supplied meter and manual shutoff, for natural gas engine generators.
- B. The piping and regulator shall be sized for the full load fuel consumption of the generator unit.
- C. The Contractor shall provide black, hot-dipped galvanized, threaded SCH 40, electric-resistant, welded Grade B pipe, meeting ASTM A53/A 53M requirements.
- D. Pipe fittings shall be ASME B16.3 threaded, Class 150 rated, malleable iron. The fittings shall be UL/FM listed.
- E. Manual shut-off valves shall be of the lubricating, plug valve type meeting ANSI Class 125 requirements or bronze ball valves that are UL listed shut-off valve. Valves shall be rated for a minimum 150psi working pressure and be threaded in accordance with ASME B1.20.3 requirements. Valves shall be provided with tamperproof operating screws. No handles shall be provided, unless otherwise directed.
- F. A large capacity cast iron regulator for use with engines shall be provided. The regulator shall be rated for a 2 lb. natural gas service and provided with an internal relief valve. The orifice size shall be no larger than required at the maximum pressure inlet.

- G. A stainless steel, corrugated hose and braid, threaded flexible connector shall be furnished and installed between the service piping and generator unit. The flexible connector shall be sized to match the service piping diameter.
- H. Contractor shall prime and paint above grade natural gas piping with a rust resistant, industrial grade , acrylic, based coating.
- I. Natural gas piping shall be mounted and supported by galvanized steel unistrut with pipe/conduit support clamps. Piping shall not be directly attached and supported by concrete generator pads.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

- A. General: The complete engine generator and related accessories shall be shop assembled, inspected and tested in accordance with the manufacturer's standard procedures and as specified herein. Monitoring and control devices shall be functionally tested to verify correct operation and that all parts function properly. The Contractor shall provide certified factory test results to the Owner's Representative for review. No shipment shall be made until the factory test results have been reviewed to the satisfaction of the Owner's Representative. The Contractor shall notify the Owner's Representative one week prior to factory testing so that such tests may be witnessed. All consumables required for factory testing shall be provided by the manufacturer.
- B. Engine Tests. The operation of the engine shall be observed and checked over a range of loads between zero and 100%. Pertinent fuel, air, lubricant, and coolant pressures and temperatures, exhaust temperatures, fuel consumption, power output, and engine setting data shall be taken and recorded for the various test runs. Compression, firing, and indicator diagrams shall be taken to demonstrate satisfactory pressure range and balance. The results of the tests shall be submitted as a report. All fuel, lubricating oil, and all facilities and supplies required for the engine tests in the factory shall be furnished by the manufacturer. Rated load operation of the generator at rated power factor shall require not more than 100% of the maximum horsepower which the engine can develop at synchronous speed when the engine is operating with all auxiliaries connected, including fan. The engine shall operate satisfactorily without overheating or suffering mechanical damage when operating under the conditions specified herein.

- C. Generator and Exciter Tests. The generator and exciter shall be given the standard commercial test in accordance with IEEE and NEMA Standards and shall include the following:
1. Resistance of armature and field windings
 2. Polarity of armature and field coils
 3. Insulation resistance of field coils
 4. Insulation resistance of armature coils before and after high potential test, including polarization index.
 5. Dielectric test of windings
 6. Measurement of air gap by gauge
- D. Auxiliary Equipment. All engine generator auxiliary equipment shall be given adequate routine factory tests.

3.02 INSTALLATION AND TESTING

- A The equipment shall be installed in accordance with the manufacturer's instructions and recommended best practices. The equipment shall be installed as shown on the Drawings. After the equipment has been installed, all items of equipment shall be operated, adjusted, and tested for proper performance in accordance with the manufacturer's recommended test procedure and under the supervision of the equipment manufacturer's field supervisory personnel.
- B. The generator manufacturer shall provide all necessary items such as but not limited to supports, anchors, embedded stud bolts, nuts and bolts, vibration isolators, etc. as required for the installation of the engine generator and associated accessories.
- C. After the equipment has been made ready for operation, the Contractor shall field test the generator. The Contractor shall furnish the services of a factory representative who shall provide final checkout of the entire installation covered by the Contract Documents and supervise the initial start-up and test. The tests shall include load, phase sequence, and utility power tests. Load Tests of the generator shall include its operation to start and run continuously on motor load as previously specified under Paragraph 2.02F. Field testing shall include a simulated power failure.

The loads shall be operated continuously for a period of not less than 30 minutes or as otherwise mutually agreed upon between Owner, Owner's Representative and Contractor.

Any and all consumables, including diesel fuel, required during testing shall be provided by the Contractor at no additional cost to the Owner.

During the test run, all gauge and instrument readings shall be recorded, and observation shall be made to determine that the installation has been made properly and that there is no undue noise, vibration, or overheating. The resistance of the generator insulation between windings and from windings to ground shall be measured with a megger at the beginning and end of the test run. Any corrections or adjustments required to secure satisfactory operation shall be made by the Contractor at no additional expense to the Owner.

- D. The engine generator equipment manufacturer shall provide the services of factory-trained field supervisory personnel who shall perform all necessary coordination to check-out, start-up and place into operation the herein specified equipment together with equipment specified in 26 36 00, Automatic Transfer Switch, as well as instruct Owner personnel in its control and operation.

3.03 PAINTING

- A. All equipment specified in this Section shall be shop-painted and may be shop-painted with the manufacturer's standard finish. All equipment specified in this Section shall be field painted as directed by the Owner.
- B. The Contractor shall be responsible for coordination of the compatibility between the manufacturer's standard finish and any field painting required and the field-paint specified. Contractor shall provide to the Owner one gallon of touch-up paint of each color for the herein specified equipment at the conclusion of the project.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Items, in the Schedule of Prices:

X0783500; Pump Station Mechanical Work
- B. This price shall be full compensation for furnishing all materials; and for all

preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings.

- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 36 00

AUTOMATIC TRANSFER SWITCH

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers the automatic transfer switches to be furnished, installed and tested as shown in the Drawings and as specified herein. All related accessories where required, but not specifically provided for in these Specifications, shall be included under this Section of Work.

B. Related Work

1. Sections 26 32 13, 26 00 10, 26 00 20, 26 05 19 and 26 05 33.
2. Other sections as specified herein.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. ATS shall be from a reputable manufacturer and approved by the Engineer.

B. Applicable Standards

All Work shall conform to the applicable provision of the codes, standards and Specifications, as specified herein and the following:

<u>Name</u>	<u>Abbreviation</u>
National Electrical Code	NEC
National Electrical Manufacturers Association	NEMA
Underwriters Laboratories	UL 1008

1.03 SUBMITTALS

The Contractor shall submit to the Owner's Representative for review drawings, product specifications and descriptions including control schematic diagrams, wiring connection diagrams, complete ratings, short circuit ratings together with certified test performed on similar equipment;

installation instructions, operating and maintenance manuals, and field check-out, start-up and testing procedures specified in 26 36 00 for all equipment furnished.

1.04 RESPONSIBILITY

Contractor shall comply with requirements of Section 26 32 13, Paragraph 1.04.

PART 2- PRODUCT

2.01 GENERAL

- A. The automatic transfer switch designated ATS shall be furnished complete with all necessary sensing relays for each phase of the normal power sources and the standby power source plus all necessary control relays and contacts to transfer the load from the normal power source to the standby power source. Sensing and control logic shall be solid state and mounted on plug-in printed circuit boards. Printed circuit boards shall be keyed to prevent incorrect installation. Interfacing relays shall be industrial control grade plug in type with dust covers. The ATS shall be provided with normal and emergency switch position contacts for use in signaling "normal" or "emergency" status.
- B. The automatic transfer switch shall be listed by Underwriter's Laboratory, Standard 1008.
- C. ATS shall be installed in a NEMA 1 enclosure as shown on the Drawings and mounted within the Pump Control Panel Enclosure.

2.02 RATING AND OPERATION

The automatic transfer switch designated ATS shall be rated for normal and emergency sources and shall have full 600 V insulation on all main contacts and current carrying parts. The automatic transfer switch shall be 3 poles, with overlapping neutral switching contacts and shall be rated **600A** continuous current for use on a 480-V, 4 wire, and shall be capable of withstanding 30,000A, interrupting/fault close rms, symmetrical three phase short circuit current for 3 cycles without contact damage or contact separation.

2.03 DETAILS OF CONSTRUCTION

A. Construction

Automatic transfer switch shall be 3-pole, with overlapping neutral contacts, double throw, operated by a single quick-make/quick-break energized mechanism or by motor driven common pivot arm. Normal and emergency contacts shall be mechanically interlocked by the operating linkage when in the open or closed position. All parts of the mechanical driving system and mechanical interlocks shall be electrically isolated and at ground potential.

B. Load Transfer

There shall be three normal line voltage sensing relays and sequencing controls such that a loss of power in the normal incoming power line below 75% of rated voltage, loss of phase, or voltage imbalance condition of the normal feed will initiate change over to the alternative (secondary) power source, after an adjustable time delay to ignore momentary outages. Upon proper voltage level from the alternative (secondary) power source, the load shall be transferred to the secondary power source. (Load transfer in less than 3 seconds not acceptable.) Upon restoration of normal voltage on the normal incoming power line, the transfer panel, after an adjustable time delay, shall transfer load back to Normal Line.

C. Current Carrying Contacts, Coils and Relays

Current carrying contacts, coils and relays shall be readily accessible from the front for maintenance and inspection as individual units. Replacement of any part shall not require removal of the switch panel from the enclosure or disconnecting the operating linkage or power conductors.

D. Indicating Lights

Indicating lights shall be identified with nameplates mounted on the front of the cabinet door.

E. Test Switch

Test switch shall be provided to simulate normal power failure.

F. Inphase Monitoring

Bidirectional Inphase Transfer System to control transfer operation between live sources. Shall provide variable transfer initiation which limits motor inrush current to magnitude or normal starting current ignoring unequal source voltages and wave shape distortion from solid state-controlled loads. Operation shall be over a frequency difference range of ± 2.0 Hz. If voltage of the source carrying load drops below 70%, the inphase function shall be automatically bypassed.

G. Accessories

Accessories shall be provided as follows:

1. Mounted green and red pilot lights for indicating switch in normal and emergency positions, including fuses and auxiliary contacts.
2. Individually mounted amber pilot lights for indicating when normal and emergency source voltages are available, including fuses and auxiliary contacts.
3. One N.O. (normally open) auxiliary contact which closes when an abnormal condition is detected on the normal source feed and/or the normal source is de-energized. Contact shall alarm the annunciator specified in Section 27 51 25.
4. Ground Bus.
5. Overlapping neutral transfer contacts. The neutral of the normal and emergency power sources shall be connected together only during the transfer and re-transfer operation and remain connected together until power contacts close on the source to which transfer, or re-transfer is being made.
6. Two position test switches. Maintained contact for auto and momentary contact for test.
7. Adjustable close differential relays.
8. Adjustable time delay to emergency to delay transfer to emergency for 0-5 minutes.
9. Adjustable time delay on restoration to delay retransfer to normal for 0-30 minutes.
10. Adjustable time delay to override momentary normal source outages to delay all transfer switch signals for 0.5 to 10 seconds.
11. N.O. (normally open) auxiliary contact for initiating change over to alternative (secondary) power source. Contact shall close upon loss of normal power. The contact shall remain closed until such time as normal power is restored and the automatic transfer switch has transferred back to the normal position.
12. Terminal boards for control wiring connection.
13. Exercise timer with minimum 30 minutes (adjustable) once per week.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

Each item of equipment shall be shop-assembled and tested in accordance with the manufacturer's standard procedure. Monitor and control devices shall be functionally tested to verify correct operation and that all parts function properly.

3.02 INSTALLATION AND TESTING

- A. The Contractor shall install the equipment as shown on the Drawings in accordance with the manufacturer's recommendations. The Contractor shall adjust and calibrate the equipment after all connections are made.
- B. All equipment and components shall be tested by operating them a reasonable number of times to demonstrate their proper and safe installation and operation. To determine what constitutes a safe and proper installation, these Specifications, manufacturer's recommendations, guidelines set by NEC, IEEE, ANSI, OSHA, etc. shall be the norm.
- C. Operational tests shall be performed to verify correctness of operation, connections, and interconnections with other equipment.
- D. After the equipment has been made ready for operation, the Contractor shall perform field test on the automatic transfer switch. The Contractor shall furnish the services of a factory representative who shall provide final checkout of the entire installation covered by these Contract Documents and supervise the initial start-up and test of the automatic transfer switch. The tests shall include load, phase sequence, and utility power tests. Field testing shall include a simulated power failure and load transfer.
- E. The loads shall be operated continuously for a period of not less than 30 minutes or as otherwise mutually agreed upon between Owner, Owner's Representative and Contractor.

3.03 PAINTING

- A. All equipment specified in this Section shall be shop-painted with the manufacturer's standard finish. All equipment specified in this Section shall be field painted as directed by the Owner.

- B. The Contractor shall be responsible for coordination of the compatibility between the manufacturer's standard finish and the field-paint specified.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Items, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing all materials; and for all preparation; and for all labor, equipment, and tools necessary for the Work as required by the Specifications and Drawings.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 56 00

SITE LIGHTING

PART 1- GENERAL

1.01 SUMMARY

Provide site lighting as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, General Specifications, and Division 01 - General Requirements of these Specifications.

References:

1. (Reserved).

1.02 SUBMITTALS

A. Shop Drawing Submittals:

1. Each type of pole, mast arm, and fixture required, including:
 - a. Manufacturer's printed data, including photometric data on lighting fixtures.
 - b. Manufacturer's printed data on pole, base, anchor bolts, and bolt pattern.
 - c. Fixture shop drawings in booklet form with index and a separate sheet for each fixture, assembled in luminaire "type" alphabetical order, with specified fixture, pole, and accessories clearly indicated on each sheet.

B. Operation and Maintenance Manuals – (Reserved).

C. Certificates and Guarantees – (Reserved).

D. Spare Parts – (Reserved).

1.03 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electric Code (NEC).
 - 2. Local codes and ordinances.
- B. Fixtures and poles as specified in lighting fixture schedule establish standard of quality for project as determined by Engineer.
- C. Equivalency of fixtures will be determined by Engineer based upon the following criteria:
 - 1. Efficiency.
 - 2. Photometric data (Efficacy, Distribution).
 - 3. Appearance.
 - 4. Construction.
 - 5. Design compatibility.
 - 6. Manufacturer reliability based upon past performances.
- B. Equivalency of poles will be determined by Engineer based upon the following criteria:
 - 1. Appearance.
 - 2. Construction.
 - 3. Design compatibility.
 - 4. Manufacturer reliability based upon past performances.
- E. Provide fixtures that bear UL label and manufacturer's name.

1.04 DELIVERY, STORAGE, AND HANDLING – (Reserved).

1.05 SITE CONDITIONS – (Reserved).

1.06 MAINTENANCE – (Reserved).

PART 2- PRODUCTS

2.01 SITE LIGHTING

- A. Provide lighting fixtures of type, size, and rating at locations show on the Drawings, complete with, but not necessarily limited to, lamps, lamp

holders, ballast, reflectors, starters, wiring, and any other details required for a complete working installation.

2.02 POLES

- A. Comply with pole requirements contained in description on lighting fixture schedule and notes on the Drawings.

2.03 LIGHT EMITTING DIODE (LED) FIXTURES

- A. The luminaire shall be constructed as detailed in the plans and will be completely solid state with no moving parts or cooling fans and will meet and exceed the following National Standards and Recommended Global Lighting Safety Publications.

1. The Illuminating Engineering Society of North America (IESNA) new Backlight, Uplight, Glare or BUG standards of measurement provides improved performance descriptions and measurements for outdoor LED luminaires. The TM-15 Luminaire Classification System (ICS) for Outdoor Luminaires classifies luminaire photometric performance related to light trespass, sky glow and high angle brightness control.
2. All Solid State Lighting (SSL) should meet the requirements of accepted safety standards through the independent testing of Nationally Recognized Testing Laboratory (NRTL).
3. The manufacturer shall be an Energy Star Partner and Department of Energy SSL Quality Advocate and be committed to upholding program standards through testing and reporting.
4. All products and components shall meet safety certifications through Underwriters Laboratories. Outdoor light fixtures shall be suitable for wet locations.
5. All product and components shall be International Dark-Sky Association (IDA) approved and shall conform to IES Standards Approved Method for Measuring Lumen Depreciation for SSL Light Sources (LM-80) and Guide for Electrical and Photometric Measurement for Solid State Lighting Products (LM-79).

- B. LED attributes and design advantages shall include:

1. Environmentally Friendly (no mercury and no lead).
2. Color Temperatures shall be a maximum of 2700K.
3. Low maintenance and disposal costs.

4. Compatible with Photovoltaic and Lighting Control Systems and Components.
- C. The complete luminaire assembly shall be designed to operate the LED optical assembly for a minimum of 50,000 hours in a 25 degree C environment and longer if the ambient temperatures are less. The manufacturer shall warranty the product for 5 years after shipment to the jobsite and will maintain a sales and service organization to support the product. All LED lighting manufacturers must have at least a 5 year history of manufacturing and supplying LED products.

2.04 WIRING DEVICES & LIGHT CONTROLS

- A. Acceptable Manufacturer:
 1. Devices shall be from a reputable manufacturer and approved by the Engineer.

PART 3- EXECUTION

3.01 INSPECTION

- A. Examine areas and conditions under which fixtures and lighting poles are to be installed and notify Engineer in writing of conditions detrimental to proper and timely completion of work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Poles:
 1. Provide pole foundations in the location shown on the Drawings.
 2. Provide concrete foundations as detailed on the Drawings and as recommended by manufacturer, and as specified in Section 03 30 00.
 3. Anchor pole to concrete foundation as recommended by manufacturer.
 4. Ground metal poles as specified in Section 26 05 26.
 5. Paint metal poles, if required, as specified in Section 09 90 00.
- B. Fixtures:

1. Install and wire fixture heads as recommended by manufacturer.
 2. Verify placement of surface-mounted fixtures to maintain alignment, spacing, layout and general arrangement as shown on the Drawings.
- C. Manual Countdown Timer Controls: Install control unit in single-gang wall switch in Electrical and Controls Cabinet.

3.03 ADJUSTMENT AND CLEANING

- A. Adjust angle of light fixture head, if adjustable, to provide illumination over area intended and thoroughly clean refractor.
- B. Adjust photoelectric controls, if any, to provide correct response to changing light levels.
- C. Align adjustable fixtures after daylight to satisfaction of the Engineer.

3.04 FIELD QUALITY CONTROL

- A. At time of Substantial Completion, replace lamps in lighting fixtures observed to be noticeably dimmed after Contractor's use and testing, as judged by the Engineer.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, and tools, necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.

- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 26 60 20

ELECTRIC SERVICE AND DISTRIBUTION

PART 1- GENERAL

1.01 SUMMARY

- A. Provide electrical service as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. This work shall be performed in accordance with Section 804 of the Standard Specifications.

1.02 QUALITY ASSURANCE

Comply with the following requirements:

- 1. NFPA 70 National Electrical Code (NEC).
- 2. Local codes and ordinances.
- 3. Utility Company providing service (CECHA approved).

PART 2- PRODUCTS

2.01 ELECTRIC POWER SERVICE

- A. The Commonwealth Edison Company will furnish electrical power at 480/277 volts, three (3) phase, four (4) wires, 60 Hertz. The Contractor's responsibility shall be to furnish the secondary voltage conduit and cables from the proposed meter fitting to the secondary bushings of the existing power company transformer. Commonwealth Edison will furnish connectors and make connections for the secondary cables to the transformer. The underground ducts shall be provided and installed as specified in Part 3 of this Section and as shown on the Drawings.
- B. Provide and install arc flash rating stickers on the meter.

2.02 MATERIALS

- A. Comply with applicable sections of these Specifications and Utility Company requirements for all Contractor-furnished conduit, fittings, wire, transformer pad, metering equipment, etc.
- B. Utility Meter Fitting shall be from a reputable manufacturer and approved by the Engineer and ComEd.

PART 3- EXECUTION

3.01 GENERAL

- A. The methods of installation of Contractor furnished equipment and materials are described in related Sections of these Specifications and as shown on the Drawings and shall in general be in accordance with the manufacturer's and/or Commonwealth Edison's standard procedures and recognized engineering practices.
- B. The intent of these Specifications is to provide underground electrical service to the **Deerfield Road Lift Station**. Underground electrical service/conduits/ducts shall be installed in accordance with Commonwealth Edison's requirements.

3.02 INSTALLATION

The Utility Company will provide the following:

- 1. Meter.
 - 2. Connection to transformer.
- B. Contractor to provide the following and all other related electrical work and miscellaneous materials for a complete installation:
 - 1. Metering equipment and termination of service conductors in metering equipment.
 - 2. Conductor, ground rods, fittings, etc. for grounding of transformer.
 - 3. Utility meter fitting.
 - 4. Current transformer cabinet.

3.03 CONTRACTOR RESPONSIBILITY

- A. The contractor will obtain Utility Company's Service Agreement for electrical service.

3.04 OWNER RESPONSIBILITY

- A. Owner will pay directly to Utility Company all installation and/or excess facilities charges, if any, and monthly service charges.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0783300; Pump Station Electrical Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 27 51 25

PUMP STATION SCADA SYSTEM

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers the instrumentation equipment, together with related accessories to be furnished, installed, programmed and tested as shown on the Drawings and as specified herein. All piping, conduits, wiring, fittings, connectors, supports and anchors, where required shall be included under this Section of Work.

B. Related Work

1. Division 26 - Electrical.
2. Other Sections as specified herein.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. SCADA system integration shall be performed by Allan ICS or Wunderlich-Malec as selected by LCPW, hereinafter referred to as the System Integrator.

B. Applicable Standards, Codes and Permits

All Work performed and all materials furnished or otherwise used shall be in accordance with the National Electric Code, the National Electrical Safety Code, and applicable local regulations and ordinances. Where required by applicable codes, materials and equipment shall be listed by Underwriters' Laboratories or other testing organizations acceptable to the governing authority. The Contractor shall, at his/her own expense, arrange for and obtain all necessary permits, inspections, and approvals by the proper authorities in local jurisdiction of such Work.

C. Coordination

Instrument and control systems shall be designed and coordinated for proper operation with related equipment and materials furnished by other suppliers under other Sections of these Specifications, and where applicable, to related existing equipment. All instruments and control devices shall be applied in full conformity with the drawings, specifications, engineering data, instructions, and recommendations of the instrument or device manufacturer and the related equipment manufacturer.

Review of drawings submitted prior to the final determination of related equipment shall not relieve the Contractor from supplying systems in full compliance with the specific requirements of the related equipment.

Related equipment and materials may include, but will not be limited to, pump controls, supervisory control equipment, telemetry, flow meter, conduit, cable, and piping as described/specified in other Sections of these Specifications all as associated with this Project.

Installation drawings shall be prepared for interconnecting wiring and piping between the related equipment and the equipment furnished under this Section. All interconnecting wiring shall be appropriate for the service and shall result in a properly functioning system.

Coordination with other sub-contractors and/or Owner designated contractors, and supervision of installation shall be provided by the Contractor as required during construction.

1.03 SUBMITTALS

The Contractor shall submit to the Owner's Representative for review detailed shop drawings, product specifications and descriptions, including control schematic diagrams, internal wiring diagrams, interconnecting wiring diagrams, together with instruction manuals, installation instructions, operating and maintenance manuals and field check-out, start-up and testing procedures as specified in Section 01 33 00 for all equipment furnished.

1.04 RESPONSIBILITY

Contractor shall be responsible for providing conduit, cable and wire as required to provide communications and integrate the new lift station

including pump controls, VFD, flow meter, generator and ATS into the Owner's existing SCADA system.

Contractor shall provide necessary hardware, software and programming as required and to allow for proposed lift station improvements to be integrated into the existing SCADA system.

PART 2- PRODUCTS

2.01 GENERAL

- A. The pump controls shall communicate with the SCADA system and operate via signals from the SCADA system for visualization, reporting and monitoring by Owner personnel.

2.02 PROPOSED SCADA IMPROVEMENTS

A. General

Contractor shall integrate the new lift station including pump controls, VFD, flow meter, generator and ATS into the Owner's existing SCADA system. SCADA hardware, software and programming shall be provided as required by Owner's System Integrator.

B. Project Scope

Work of the proposed SCADA improvements includes but is not limited to providing acceptable materials and methods for integrating the new lift station including pump controls, VFD, flow meter, generator and ATS into the Owner's existing SCADA system.

The System Integrator shall assume "Unit Responsibility" for the complete SCADA/Communications modifications package. The System Integrator shall be responsible to provide all controls and appurtenances required for a fully functional system. In order to ensure compatibility and overall system function it is the intent of these Specifications that all of the components, specified herein, shall be supplied by a single System Integrator vendor and the equipment software and communications shall be compatible with Owner's existing SCADA system.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

All equipment shall be inspected and tested in the manufacturer's shops to the extent practical. Factory tests and inspections shall be conducted to verify that the equipment is operating satisfactorily. Minimum requirements of such tests and inspections shall be in accordance with the manufacturer's standard practice and/or other recognized procedures. Electrical monitoring and control devices shall be functionally tested to verify correct operation and that all components function properly.

3.02 INSTALLATION AND TESTING

A. General

The equipment shall be installed as shown on the Drawings and in accordance with the manufacturer's instructions and recommended best practices. All necessary fittings, connectors, supports, anchors and other items required for installation and testing shall be furnished. All items of equipment shall be operated, adjusted and tested for proper performance in accordance with the manufacturer's recommended test procedure.

B. Instrumentation Installation

The instrumentation equipment shall be installed by the Contractor or his/her subcontractors. The services of the System Integrator's technical representative shall be provided as necessary to calibrate, test and advise others of procedures for installation, adjustment and operation of equipment, devices, components, etc. all in accordance with the requirements of other Sections of the Specifications. System Supplier shall be responsible for performing any and all software engineering and programming/calibrating required by these Specifications and as directed by the Owner to provide a complete and operational installation. The System Integrator's technical representative shall be factory-trained and shall perform all necessary coordination to check-out, start-up and place into operation the water works facilities as well as instruct Owner personnel in the control and operation of the herein specified equipment.

Installation of instrumentation equipment shall be in accordance with the following:

1. Field Wiring. Field wiring materials and installation shall conform to the requirements of the electrical Sections.
2. Field Piping. Field piping materials and installation shall conform to the requirements of the piping Sections.

3. Field-Mounted Instruments. Instruments shall be mounted so that they may be readily approached and easily serviced and so that all appurtenant devices may be easily operated. Installation details for some instruments are indicated on the Drawings. Unless otherwise indicated on the Drawings, instruments which include local indicators shall be mounted so that the indicator is approximately 5'-0" above the floor. Indicators shall be oriented for ease of viewing. Transmitters shall be mounted on corrosion-resistant pipe supports suitable for floor, wall or bracket mounting.
4. Field Calibration. A technical representative of the System Supplier shall calibrate each instrument and shall provide a written calibration report for each instrument indicating the results and final tuning adjustment settings. Instrument calibration shall be accomplished prior to a checkout of the operation of the system. Field calibration work shall also include any and all necessary software modification required.
5. Systems Check. A technical representative of the System Integrator shall participate in the checkout of the control systems. If interrelated devices furnished by other suppliers, such as valve actuators, and/or motor controls, do not perform properly when placed in service, the technical representative shall use suitable test equipment to introduce a simulated signal to verify or measure signals from those devices as may be required to locate the source of trouble or malfunction. A written report stating the results of such tests shall be furnished, if requested by the Owner's Representative, as necessary to assign responsibility for corrective measures.

C. Customer Training

The coordinating System Integrator shall provide a qualified representative at the job site to train the Owner's personnel in operating and maintaining the equipment. The representative shall be a skilled, factory-trained technician capable of providing services to supervise and inspect the installation and start-up operation of all systems, as well as to instruct Owner's operating personnel in the operation and maintenance of the equipment. The training session shall include a technical explanation of the equipment and an actual hands-on demonstration. The training session shall consist of one full 8-hour working day, and the schedule shall be arranged and coordinated with the Owner.

3.03 PAINTING

All equipment specified in this Section shall be shop painted with the manufacturer's standard finish.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the Contract Unit Price for the below listed Items, in the Schedule of Prices:

X0301028; Pump Station SCADA Equipment

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 31 20 00

EARTH EXCAVATION

PART 1- GENERAL

1.01 DESCRIPTION

This work shall consist of all excavation necessary to complete the work to the line and grade shown on the plans. At the Contractors option, with the review of the Engineer, suitable excavated material may be utilized as fill material in non-structural areas. Excavation and Disposal of material shall be in accordance with Section 202 of the Special Provisions.

Earth Excavation will include all materials encountered including but not limited to the following:

Natural Rock

Bituminous Surface Removal, 1 1/2"

Sanitary and Sewer Structures

Sidewalk and Curb

P.C.C. Driveway Pavement

Bituminous Concrete Driveway Pavement

Excavation for storm sewer items, sanitary items, lighting items including foundations shall be included in the cost of the various items and paid for separately under those items. No undercuts shall be performed without specific direction by the Engineer.

1.02 QUALITY ASSURANCE

Except as modified herein, the work shall conform to Section 202 of the Special Provisions and applicable portions of the Standard Specifications, Sections 202, 204, 205, 211 and 502.

PART 2- PRODUCTS

Not applicable to this Section.

PART 3- EXECUTION

3.01 This Work shall be performed in accordance with Section 202 of the Special Provisions and applicable portions of Sections 202, 204, 205, 211 and 502 of the Standard Specifications.

- A. Earth excavation shall also include structure excavation, topsoil stripping and stockpiling, furnished excavation, embankment, and removal and disposal of unsuitable material, and all incidental construction required.
 - 1. Earth retention systems shall be erected for various subsurface operations. Earth retention method and system design shall be signed and sealed by an Illinois Registered Structural Engineer. Earth retention system shall be temporary sheeting, soldier pile and lagging or other method as selected by Contractor.
 - 2. Furnished excavation shall be placed in accordance with Section 204 of the Standard Specifications to the lines and grades as shown on the Drawings to fill the area around the lift station, fill to subgrade for construction of the pavement and equipment pads, and fill to the lift station finished grade.
 - 3. Topsoil shall be stripped and stockpiled on site in accordance with Section 211 of the Standard Specifications. Topsoil stockpile may be left on site for use in topsoil placement.
 - 4. Removal and disposal of unsuitable material due to undercuts shall be in accordance with Section 202 of the Special Provisions and Standard Specifications. Unsuitable material shall be excess excavated material due to undercuts not used in furnished excavation or embankment fill operations. Contractor shall dispose of unsuitable material and excess earth excavation off site.
 - 5. Demolition of existing site conditions shall include, but not be limited to, removal of existing dry pit lift station, fire hydrant, removal of sidewalk, removal of driveway pavement, removal of existing pump control panel and electrical cabinets and disposal of all materials offsite.
- B. Compaction of the existing subgrade shall be to a minimum of 95 percent of maximum dry density as determined by the Modified Proctor Test – ASTM D 1557. Embankment shall be placed in 9-inch lifts for cohesive soils and 12-inch lifts for granular backfill, with each lift compacted to the specified density prior to the placement of additional embankment. Porous Granular Embankment shall meet 3000 psf bearing in all structural areas.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0335700; Pump Station General Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 31 23 19

DEWATERING (PUMP STATION WORK ONLY)

PART 1- GENERAL

1.01 SUMMARY

A. Section Includes:

1. Groundwater control system.
2. Surface water control system.
3. System operation and maintenance.
4. Water disposal.

B. Related Sections:

1. Section 31 20 00 – Earth Excavation
2. Section 31 25 13 – Erosion Controls

1.02 REFERENCES

A. ASTM International:

1. ASTM C33 - Standard Specification for Concrete Aggregates.

1.03 DEFINITIONS

A. Groundwater Control:

1. Use of pumps and/or subsurface drains to establish a sufficiently lowered groundwater elevation as well as to collect groundwater seepage that would otherwise enter open excavations.
2. Reduction of piezometric pressure within subsurface strata to prevent failure or heaving of excavations.
3. Proper disposal of removed groundwater.

B. Surface Water Control:

1. Diversion of surface waters to prevent runoff from entering open excavations.
2. Removal and proper disposal of surface water within open excavations.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide groundwater and surface water control systems to permit Work to be completed on dry and stable subgrade.
 - 1. Contractor shall provide sufficient dewatering equipment and make satisfactory arrangements for the disposal of water collected or removed during construction without undue interference with other work or damage to surrounding property.
 - 2. Furnish standby equipment stored at Project site and ready for immediate use in the event of failure of dewatering equipment.
- B. Design groundwater and surface water control systems to:
 - 1. Lower and maintain water table within areas of excavation to a minimum of 2 feet below the deepest excavation to permit Work to be completed on dry and stable subgrade.
 - 2. Relieve hydrostatic pressures in confined water bearing strata below excavation to eliminate risk of uplift or other instability of excavation.
 - 3. Prevent surface water runoff from entering excavations.
 - 4. Collect and remove surface water entering excavations.
 - 5. Prevent damage to adjacent properties, buildings, structures, utilities, and facilities from construction operations.
 - 6. Prevent loss of fines, development of quick condition, or softening of foundation subgrade.
 - 7. Maintain stability of sides and bottoms of excavations.
 - 8. Control and prevent erosion and sedimentation.

1.05 SUBMITTALS

- A. The Contractor shall comply with the requirements specified in Section 01 33 00 – Equipment Submittals, and as specified herein.
- B. Water Management Plan: Contractor shall submit a water management plan for groundwater and surface water control systems. The water management plan shall have the following components:
 - 1. Shop Drawings:
 - a. Number and location of all dewatering components and features.
 - b. Location(s) for the discharge of water and measures to be taken to prevent erosion and sedimentation.

2. Design Data:

- a. Indicate design values, analyses, and calculations to support design.
- b. Methods for managing and monitoring groundwater and surface water.
- c. Types of equipment to be utilized.
- d. Description of emergency procedures, including notifications, in the event of dewatering system failure.

C. Field Reports: Test and monitoring reports as specified in Field Quality Control article.

1.06 QUALITY ASSURANCE

- A. Comply with all local, state, and federal regulations pertaining to water discharge and disposal from dewatering operations.

PART 2- PRODUCTS

2.01 DEWATERING EQUIPMENT

- A. Select suitable dewatering equipment to meet specified performance requirements.

PART 3- EXECUTION

3.01 EXAMINATION

- A. Contractor shall call JULIE at least 48 hours prior to commencement of land-disturbing activities to schedule a utility locate. All underground utilities shall be located and marked within the project limits. It is Contractor's responsibility to verify the location of all existing utilities and to report any discrepancies or omissions with the existing utilities shown on the plans to Engineer immediately.
- B. Contractor shall carefully review the Geotechnical Reports (if applicable) prior to commencing dewatering operations.

3.02 PREPARATION

- A. Protect existing adjacent buildings, structures, and improvements from

damage caused by dewatering operations.

- B. Install silt fences and temporary rock check dams where called for by the SWPP Plan.

3.03 GROUNDWATER AND SURFACE WATER CONTROL SYSTEM

- A. Install groundwater and surface water control system in accordance with the Drawings.
- B. Locate system components to allow continuous dewatering operations without interfering with installation of permanent Work and existing public rights-of-way, sidewalks, and adjacent buildings, structures, and improvements.
- C. Provide ditches, berms, and other devices to divert and drain surface water from excavation area.
- D. Remove all surface water and groundwater seepage within excavation.

3.04 FIELD QUALITY CONTROL

- A. After groundwater control system is installed, perform pumping test to determine when selected pumping rate lowers water level in well/sump below pump intake. Adjust pump speed, discharge volume, or both to ensure proper operation of each pump.
- B. Monitor the groundwater discharge for sand content and contamination. Notify Engineer immediately of high sand content or potential contaminants. Monitor the discharge location(s) and areas immediately downstream for erosion and sedimentation and take corrective action if needed.
- C. Submit weekly dewatering system inspection logs for dewatering operations put into service for more than five days. The following information shall be included as a minimum:
 - 1. Location and purpose of dewatering system
 - 2. Date of system installation and date of system inspection
 - 3. Description of discharge quality (presence of sediment, estimated flow rate)
 - 4. Visual inspection for subsidence near temporary dewatering well
 - 5. Visual inspection of dewatering system outlet (erosion, sediment accumulation)

3.05 SYSTEM OPERATION AND MAINTENANCE

- A. Contractor shall bear all responsibility for safely operating groundwater and surface water control systems for the duration of the Work.
- B. Operate groundwater and surface water control systems continuously until backfilling is complete.
- C. Conduct and record daily observations of dewatering systems. Make required repairs and perform scheduled maintenance.
- D. When groundwater and surface water control systems cannot control water within excavation, immediately notify Engineer and stop excavation work.
 - 1. Supplement or modify dewatering systems and provide other remedial measures to control water within excavation.
 - 2. Demonstrate dewatering system operation complies with performance requirements before resuming excavation operations.
- E. Modify groundwater and surface water control systems when operation causes or threatens to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells.
- F. Correct unanticipated pressure conditions affecting dewatering system performance.
- G. Do not discontinue dewatering operations without Engineer's approval.

3.06 WATER DISPOSAL

- A. Discharge water as indicted on the approved Water Management Plan or as otherwise directed by Engineer.

3.07 SYSTEM REMOVAL

- A. Remove dewatering systems after dewatering operations are discontinued.
- B. Repair damage caused by dewatering systems or resulting from failure of systems to protect property.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0335700; Pump Station General Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 32 39 14

BOLLARD

PART 1- GENERAL

1.01 DESCRIPTION

- A. This work shall consist of furnishing and installing cast-in-place concrete bollard, with plastic bollard cover.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

Bollard and base plate shall be supplied by a reputable manufacturer and approved by the Engineer.

B. Applicable Standards

All work shall conform to applicable provisions of the Standard Specifications, local codes, and Special Provisions, as specified herein, and as shown on the plans.

1.03 SUBMITTALS

- A. Follow manufacturer's specifications and installation instructions as required.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Inspect materials upon receipt ensure that the correct materials have been received and that they are in good condition.
- B. If not installing immediately, store units to avoid damage from other construction activities and elements.

PART 2- PRODUCTS

2.02 MATERIALS

- A. Bollards supplied should be free from surface blemishes and defects where exposed to view in the finished installation.

- B. Steel Tube: 6" diameter schedule 40 steel pipe, in accordance with ASTM A500.
- C. Concrete: Steel tube shall be filled with concrete in accordance with Standard Specification Section 1020.
- D. 1/8" Plastic Bollard Cover: Polyethylene Thermoplastic (HDPE) tubes having ultra-violet resistance and anti-static properties, and nominal thickness 0.125 inches. Color shall be OSHA yellow unless otherwise noted. Bollard covers shall be sized for 6" steel pipe diameter and 60-inch height. Surface of sleeve shall be smooth with round top, no ribbed or two-piece systems accepted.

2.03 FABRICATION

- A. After fabrication all units are prepared by removing scale and slag through the sand blasting process.

2.04 FINISHES

- A. All surfaces are primed with rust & corrosion resistant, zinc rich primer with 5,000-hour salt spray performance.
- B. Standard finish, RAL1028 Yellow.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer provided instructions and drawings.
- B. Install concrete

3.02 SITE STORAGE AND PROTECTION

- A. Upon receipt of bollard unit(s) all materials shall be thoroughly inspected to ensure that all parts have been received in good condition.
- B. Store units in a dry location away from possible damage until the time of installation.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Item, in the Schedule of Prices:

X0335700; Pump Station General Work

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 33 05 50

GENERAL PROVISIONS FOR MECHANICAL WORK

PART 1- GENERAL

1.01 SCOPE

- A. This Section describes the general provisions for the Work to be performed under Division 22 – Plumbing, Division 33 - Utilities of this Contract as well as Division 26 - Electrical, where applicable. The Contractor shall comply with these general provisions and shall perform all Work in accordance with the Specifications contained in this Section, as supplemented by Specifications in related Sections, and as shown on the Drawings. Related electrical work shall be performed in accordance with the applicable provisions of Division 26.
- B. The following specifies the minimum general requirements for the furnishing, installation and testing of the materials and equipment. Additional details of items furnished, and installation and testing procedures are specified under individual Sections of the Specifications.
- C. The Contractor shall provide all necessary coordination between the suppliers of the specified equipment so as to provide a well-designed and satisfactory operating facility to the Owner. The Contractor is advised that these Specifications are not intended to cover every and all details of the Work. In case(s) where details related to the specified Work are not covered by these Specifications, it shall be the responsibility of the Contractor to include and execute such coordination and Work at no additional cost to the Owner.

1.02 QUALITY ASSURANCE

- A. **Acceptable Manufacturers and Equipment Suppliers.**

Acceptable manufacturers for various items of equipment are specified in respective Sections of these Contract Documents. For convenience of designation in the Contract Documents, certain equipment, articles, materials, and processes are designated by manufacturer trade name or catalog name and number.

B. Applicable Standards

Systems as installed by the Contractor shall be in accordance with all applicable Specifications included in these Contract Documents and shall conform to State, Federal and/or Local codes and regulations. Any conflicts between Drawings or Specifications or applicable codes regulations and/or authorities having jurisdiction, shall be brought immediately to the Owner's attention. In such cases, the more stringent requirements or design practices shall govern and shall be complied with, without any extra cost to the Owner.

C. Field Verification

The Contractor shall verify field conditions, measurements and dimensions so as to assure that all items of equipment shall fit properly and be suitable for the field conditions.

D. Proposed Substitute Equipment

Comply with requirements of Section 01 33 00.

1.03 SUBMITTALS

A. General

The Contractor shall comply with the requirements specified in Section 01 33 00 - Submittals, and as specified herein.

B. Materials

1. The Contractor shall submit lists of material, equipment, apparatus, and accessories intended for use.
2. The Contractor shall include with all submittals all physical and performance data, including materials, manufacturer's names, model numbers, weights, sizes, capacities, temperatures, pressures, flow rates, performance curves, electrical ratings, finishes, colors, dimensions, accessories, and all other data required to completely describe the equipment and to indicate compliance with the Specifications.

C. Shop Drawings and Testing Procedures

1. The Contractor shall submit for review dimensioned outline shop drawings showing the general arrangement of the equipment to be furnished, in accordance with the specified submittal schedule, and/or as otherwise specified herein.
2. Before proceeding with the manufacture of the equipment, the Contractor shall submit for review general assembly shop drawings, subassembly shop drawings, detail shop drawings, calculations, design data, catalog cuts and similar engineering documents required to demonstrate fully that all parts will conform to the provisions and intent of the Specifications and to the requirements of their installation, operation, and maintenance. These shop drawings shall show all necessary dimensions and fabrication details, including the design of welded and bolted joint connections, tolerances of fits and clearances, and all field joints and subassemblies in which the Contractor proposes to ship the equipment. Design criteria, calculations, and detailed specifications shall be submitted for the design of all major components and for other features or details when requested.
3. All submittals by the Contractor shall be certified by the respective equipment manufacturer.
4. The Contractor shall submit complete full-line wiring diagrams covering all equipment furnished. The Contractor shall furnish shop drawings of switch developments for all instrument and control switches and internal connection diagrams for all instruments, relays, regulators, etc. The Owner's Representative will return one print of each wiring diagram on which will be marked the wire notations and cable numbers for outgoing circuits where this information is not otherwise available to the Contractor. The Contractor shall add this information to his shop drawings. Adequate space shall be allowed on the wiring diagrams to accomplish this.
5. Shop drawings shall include electrical devices, accessories and wiring furnished as component parts of mechanical equipment and shall show arrangement and dimensions.
6. The Contractor shall prepare and submit shop drawings for all work areas, indicating solutions to space problems and coordination with requirements in other Sections. These shop drawings, as a requirement of this Division, shall indicate superimposed items of all Divisions and Sections involved in congested areas, including, but not limited to, piping, structural work, electrical work and ceiling work.
7. Protocol of all shop and field-testing procedures shall be submitted. In addition, and prior to conducting testing activities at the site, the

Contractor shall prepare a test program, showing the sequence of work required for specified tests. This program shall be in the form of a plan drawing to the extent practical and shall be exclusive of all other plans and schedules required under this Contract. This program shall be supplemental by sketches, text, bar diagrams, showing the sequence of work required for testing.

D. Operating and Maintenance Manuals

1. Upon completion of the Work, the Contractor shall furnish to the Owner six (6) complete sets of operating instructions, maintenance instructions, parts lists, and all other bulletins and brochures pertinent to the operation and maintenance of the mechanical equipment and systems provided.
2. The operating and maintenance manuals shall be bound in durable binders, labeled to correspond with all mechanical systems shown or specified, and indexed into sections such as, but not limited to, the following:
 - a) A chart tabulating all types of pipe and pipe fittings, valves and piping specialties installed in each system.
 - b) Manufacturer's brochures, including names, addresses and telephone numbers, for all items installed in each system. Identify items by item number shown on the Contract Documents. Reference the manufacturer's part or model number and the system in which it is installed.
 - c) All major equipment such as pumps, valves, compressors and related equipment, including shop drawings.
 - d) Lubrication charts for equipment requiring lubrication, listing each item of equipment, proper lubricant and dates lubricated, and a lubrication schedule.
 - e) List of consumable items, parts, and supplies, with applicable price lists.

E. Certificates

At the completion of the construction, the Contractor shall submit to the Owner's Representative for review, written certification that all mechanical systems have been tested, and that the installation and performance of these systems conform to the requirements of the Specifications.

1.04 WARRANTY

All specified equipment shall be warrantied and shall be provided with such warranties covering all parts and labor for a period of one (1) year from the date of Final Acceptance unless otherwise specified in subsequent Sections of these Specifications.

PART 2- PRODUCTS

2.01 GENERAL

A. Standard Products

The equipment furnished shall be standard products in production by reputable companies regularly engaged in the manufacture of high-quality equipment of the type specified. Similar equipment shall have been in satisfactory and successful operation for a period of at least two years. All parts of the specified equipment shall be so designed as to be especially adapted for the service required and shall be proportioned, enclosed, or guarded as to have ample and liberal strength and stability to withstand, without damage, the stresses to which they may be subjected during erection or operation. The component parts of duplicate items shall be fabricated on a principle of interchangeability to facilitate ready replacement.

B. Materials

All materials incorporated in the equipment shall be new and of first-class quality, free from injurious defects and imperfections, and of the classifications and grades designated. Materials not specifically designated herein shall be subject to the review of the Owner's Representative and shall be suitable for the purpose intended.

2.02 RATINGS

The sizes, ratings, capacities, and performance characteristics of various specified items of equipment and devices are based on currently available standard products, which are available through United States manufacturers and/or suppliers. In no case shall the size, rating, capacity or performance characteristic be less than that specified unless approved in writing by the Owner. Ratings and performance characteristics, where applicable, of various devices and items of equipment are specified in respective Sections of these Specifications. All electrical components of mechanical equipment shall be UL rated.

2.03 DETAILS OF CONSTRUCTION

A. Nameplates

Each item of manufactured equipment furnished under the Specifications shall have a permanent nameplate affixed thereto in a readily visible place, showing the serial number, the name and address of the manufacturer, rated capacity, speed, electrical characteristics, and other pertinent data, as applicable and as specified herein after. Nameplates of distributing agents alone will not be acceptable.

B. Samples

The Contractor shall furnish to the Owner's Representative for review, when requested or required by the Specifications, samples of all materials and finishes to be used in the execution of the Work. Such samples shall be submitted before the Work is commenced and in ample time to permit examination thereof. All materials furnished and finishes applied shall be fully equal to the reviewed samples found to be acceptable.

C. Loose Parts

All loose parts, spare parts, fasteners, anchor bolts and other non-attached pieces shall be properly tagged. A loose parts list shall accompany the equipment to identify loose parts.

D. Lifting Provisions

Equipment shall be equipped with adequate provisions for lifting, such as, lifting lugs, threaded holes for removable eyebolts, holes for sling passage, etc. to facilitate initial placement and future moving. All items such as, but not limited to, lifting beams, slings and other devices necessary for handling during placement and/or removal of the equipment shall be provided by the Contractor and shall remain the property of the Owner.

E. Anchor Bolts

Anchor bolts, nuts and washers shall be adequate for the intended use. Each anchor bolt shall be furnished with all required flat washers, lock washers and nuts. Anchor bolts shall be furnished by the Contractor as a part of each piece of equipment.

F. Spare Parts

As specified in subsequent Sections of these Specifications.

G. Guards

All rotating equipment such as but not limited to belt and chain drives, exposed gearing and shafting and flywheels, clutches, fan blades, stub shafts, couplings, etc. shall be completely guarded from all directions. Guards shall enclose the top, bottom ends, front and back of the drive assembly to prevent access to the danger zone during equipment operation. All guards shall be checked for proper running clearances and adjusted as required.

2.04 RELATED ELECTRICAL FEATURES OF MECHANICAL EQUIPMENT

A. General

Electrical equipment shall conform to NEC, UL, ANSI, and NEMA Standards. The installed equipment shall conform to ANSI-C1, "National Electrical Code", considering the atmospheric and climatic conditions and the elevation at the project site.

B. Wiring and Conduit

Wiring of the control panels and component parts shall be in accordance with the applicable requirements of Division 26.

PART 3- EXECUTION

3.00 FABRICATION AND WORKMANSHIP

A. General

Like parts and spare parts shall be interchangeable wherever possible. Surface finish of machined parts shall be adequate for their functional requirements. Machining of fits on renewable parts shall be accurate and to specified dimensions so that replacements made to drawing sizes may be readily installed. All work shall be done by workers skilled in their various trades and completed in a thorough manner following the best modern practices.

During erection the Contractor shall take the necessary precautions to prevent foreign objects or dirt from entering piping or equipment. All openings in equipment shall remain closed and protected during installation until ready for make-up of pipe connections or matching of sectionalized

equipment. Damaged covers shall be repaired or replaced immediately to protect the interior of piping or equipment against weather or other contamination.

B. Electric Welding

1. Minimum Weld Requirements: All welds shall be made continuous. The minimum size of fillet welds shall be 1/4 inch. All butt welds shall be full penetration welds welded from both sides.
2. Preparation of Base Material: Members to be joined by welding shall be cut to shape and size by mechanical means such as shearing, machining, grinding, or by gas or arc cutting, to suit the conditions. Design of welded joints and selection of weld filler metal shall allow thorough penetration and good fusion of the weld with the base metal. The edges of surfaces to be welded shall be sound metal free of visible defects, such as lamination or defects caused by cutting operations, and free from rust, oil, grease, and other foreign matter.
3. Weld Finish: Welds shall in general be treated so that they will display good appearance and a surface suitable for painting. Structure welds shall be ground and blended to avoid stress raisers. All welds which required nondestructive examinations shall be dressed by chipping and grinding as required for good interpretation by the selected weld examination methods.
4. Welding Qualifications: The qualification of welding procedures, welders, and welding operators for all welding including weld repairs, shall conform to the AWS D1.1, "Structural Welding Code". Contractor shall furnish the facilities, all equipment, materials and other articles required to perform qualification tests of his welders and welding operators. Certificates of welders' qualifications shall be submitted when requested.
5. Technique of Welding: The technique of welding, the appearance and quality of the welds, and the methods used in correcting defective work shall conform to the AWS D1.1, "Structural Welding Code". Special care shall be taken to avoid undercuts along the seams or warping of the structure. If undercuts appear along the welds, they shall be filled using a small diameter electrode of the same composition as the original electrode.

C. Fabrication of Structural Steel

1. If straightening is necessary, it shall be done by methods that will not injure the metal. Sharp kinks or bends will be cause for rejection of the material. Shearing and cutting shall be carefully performed, and all portions of the Work which will be exposed to view after completion shall be neatly finished.
2. Design and fabrication of structural parts shall conform to the applicable provisions of the AISC "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings", of the AISC "Code of Standard Practice for Steel Buildings and Bridges".

D. Machine Work

1. General: All tolerances, allowances, and gauges for metal fits between plain (non-threaded) cylindrical parts shall conform to ANSI-B4.1, "Preferred Limits and Fits for Cylindrical Parts", for the class of fit as shown or otherwise required. Sufficient machining stock shall be allowed on parts to be machined to insure true surfaces of solid materials. Finished contact or bearing surfaces shall be true and exact to secure full contact. Journal and sliding surfaces shall be polished, and all surfaces shall be finished with sufficient smoothness and accuracy to ensure proper operation when assembled. All drilled holes for bolts which are intended to match other drilled holes shall be accurately located and drilled from templates. No machining shall be done on working surfaces of "Lubrite" bushings or washers.
2. Finished Surfaces: All surfaces that are indicated on the Drawings or those that require machining for their intended function, or those that are usually machined according to good workshop practice shall be machined. Surface finish qualities shall be adequate for the intended use and shall be indicated on the Contractor's drawings and shall be in accordance with ANSI-B46.1, "Surface Texture". Compliance with specified surface will be determined by sense of feel and by visual inspection of the Work compared to standard roughness specimens, in accordance with the provisions of ANSI B46.1.
3. Unfinished Surfaces: So far as practicable, all Work shall be laid out to secure proper matching of adjoining unfinished surfaces. Where there is a large discrepancy between adjoining unfinished surfaces they shall be chipped and ground smooth, or machined, to secure proper alignment. Unfinished surfaces shall be true to the lines and dimensions shown on the Drawings and shall be chipped or ground free of all projections and rough spots. Depressions or holes not affecting the strength or usefulness of the parts may be filled in an approved manner. Corrosion resistant steel seal plates shall have all

surfaces thoroughly cleaned and those in contact with seals shall have a smooth and even surface.

4. Pins and Pin Holes: Pin holes shall be bored true to gauges, smooth and straight, and at right angles to the axis of the member. The boring shall be done after the member is securely fastened in position.

5. Protection of Machined Surfaces:

- a. Machine-finished surfaces shall be thoroughly cleaned of foreign matter. Finished surfaces of large parts and other delicate surfaces shall be protected with wooden pads or other suitable means. Unassembled pins and bolts shall be oiled and wrapped with moisture resistant paper or protected by other means in keeping with good engineering practice.
- b. Finished surfaces of ferrous metals to be in bolted contact shall be washed with a rust inhibitor and given one thin coat of Tung oil.

- E. Lubrication

Solvents shall not be used on self-lubricating bearings. Before assembly all bearing surfaces, journals, and grease and oil grooves shall be carefully cleaned and lubricated with an approved oil or grease. After assembly each lubricating system shall be flushed and filled with an approved lubricant in accordance with the equipment manufacturer's written recommendations. "Lubrite" bearings shall not be greased and shall be assembled dry according to the manufacturer's instructions.

3.01 FACTORY TEST AND INSPECTION

- A. Test of Materials. All materials or parts used in the equipment shall be tested, unless otherwise directed, in conformity with applicable methods prescribed by the ASTM, or such other organization as may be specifically required, and in general accordance with the best commercial methods. When requested, tests shall be made in the presence of the Owner's Representative. Stocked material may be used, provided evidence is furnished to the Owner's Representative to show that such material meets the requirements specified herein, in which case tests on stocked materials may be waived.

- B. Test Certificates. Certified material test reports shall be furnished in triplicate to the Owner's Representative as soon as possible after the tests are made. The test certificate shall identify the component for which the material is to be used and shall contain all information necessary to verify compliance with the Specifications.
- C. Shop Assembly and Tests. The shop assemblies and tests specified for the various items of equipment shall be conducted. The completed shop inspection forms shall be signed by the Contractor or his representative. Copies of all shop inspection records shall be furnished to the Owner's Representative. No equipment shall be shipped from the manufacturer's shops until it has been inspected. Prior to the major shop assemblies and tests the Contractor shall submit an outline of the procedures and test he plans to demonstrate fulfillment of the requirements specified. Where witnessing of shop testing is required by these Contract Documents, the Contractor shall give sufficient notification to the Owner's Representative (as specified) so that such factory testing may be witnessed. Costs which may be incurred by the Owner's Representative directly related to witnessing of shop tests (such as travel and lodging) will be the responsibility of the Owner. All other costs related to shop testing shall be considered incidental to the items of Work to which they pertain and shall be included in the lump sum price of the specified equipment.

3.02 INSTALLATION AND TESTING

- A. Receiving, Handling and Storage. The Contractor shall be responsible for the receiving, handling and storing of all materials and equipment required for the Work. Installation and maintenance instructions shall accompany all equipment delivered to site. All materials and equipment shall be stored to protect them from the weather and injury prior to installation. Damaged materials and equipment shall not be installed.
- B. Installation. The equipment shall be installed as shown on the Drawings and in accordance with the manufacturer's instructions and recommended best practices. All equipment shall be installed in a neat, accurate and workmanlike manner. Equipment shall be set level, true to line, at correct elevation and in proper orientation as shown on the Drawings. Equipment set on concrete foundations shall be properly grouted (with non-shrink grout) in such a manner to eliminate any voids which may be present under the base. Where shims are used and where shims are not removed after the grout sets, care shall be taken to totally cover any exposed surface areas which may result in a void. All necessary shims, grout, anchor bolts, and other items required for installation shall be furnished by the Contractor. In addition, certain anchor bolts when supplied by equipment suppliers shall

be installed by the Contractor. The Contractor shall inspect all materials and equipment delivered to the site to assure compliance with the associated reviewed shop drawings. If the Contractor discovers any defect in material or equipment, he shall notify the Owner's Representative immediately. Any Work performed by the Contractor after such discovery, until authorized in writing by the Owner's Representative, will be done at the Contractor's risk and the cost of correcting such work shall be borne by the Contractor. In addition, any material or equipment installed by the Contractor prior to the completion of the Owner's Representative's review, will be done at the Contractor's risk and the cost of correcting such work shall be borne by the Contractor. Where trenching, excavation, backfilling and/or concreting is required for the equipment installation the Contractor shall perform such activities in accordance with the applicable requirements of IDOT Standard Specifications.

- C. Adjustments/Alignment/Leveling. The Contractor shall perform all adjustment, fitting, cleaning and calibration of components to be incorporated into the Work to assure correct operation and workmanlike installation. As minimum requirements the Contractor shall provide/comply with the following:
1. Mild carbon steel leveling plates or smooth-troweled surfaces shall be provided at all anchor bolts in concrete bases as required for leveling.
 2. All equipment, unless furnished with leveling screws or otherwise specified, shall be leveled with stainless steel shims at each anchor bolt, shim on both sides of each bolt, and at intermediate points as required to prevent distortion of the equipment. Shims shall have square cut edges, not trimmed or sheared, and shall be of varying thickness to minimize the number of shims required.
 3. Rotating mechanical equipment shall be set, leveled, aligned, and inspected with precision tools such as steel straight edge, dial indicator, graduated levels, transit, etc. The alignment shall be accomplished prior to making-up any piping flange connections. After units have been aligned, the piping flange bolts shall be tightened. Sufficient alignment checks shall be made to verify that there is no load or strain on the installed equipment and that the drive shaft and the driven shaft are within the manufacturer's specified tolerances for alignment.
 4. Electric motors shall be checked for correct direction of rotation prior to connection to driven equipment.

- D. Field Testing. All necessary piping, pipe closures, gates, meters, valves, and other test equipment required for testing shall be furnished by the Contractor. All items of equipment shall be operated, adjusted and tested for proper performance in accordance with the manufacturer's recommended test procedure, and as otherwise specified herein. Before final grouting of equipment is done, after alignment is completed, and before any final performance tests are made, the Contractor shall notify the Owner's Representative so that such alignment may be inspected, and tests may be witnessed by the Owner's Representative.

The Contractor shall then test, operate and calibrate as necessary to demonstrate proper performance of the equipment in the presence of the Owner's Representative. Should it become necessary for any items of equipment to be retested, the Contractor shall perform all necessary Work, including removal, repair or replacing, reinstallation and retesting of the defective equipment. The Contractor will not be reimbursed for the cost of such Work associated with the retesting of defective equipment, if the defect was due to the Contractor's negligence or lack of workmanship.

- E. Maintenance and Operation of Equipment and Materials. All equipment and appurtenances installed shall be provided with proper oil and lubricants by the Contractor before being placed in operation. All permanent equipment furnished under these Specifications shall be properly maintained and operated by the Contractor until the Work is accepted by the Owner.
- F. Field Check-Out and Start-Up Procedure. The Contractor shall complete all new Work to the maximum extent possible before making actual tie-in and final connection to existing systems. Tie-ins requiring cutting and patching shall be performed in accordance with applicable requirements, best recommended procedures and as specified herein. No tie-in shall be made until authorized by the Owner. The Contractor shall advise the Owner in sufficient time (minimum 24 hours) to arrange for proper coordination with Existing Systems and scheduled cut-ins and tie-ins.

3.03 PAINTING

- A. All equipment shall be shop-primed and painted with manufacturer's standard finish. All equipment specified in this Section to be field painted shall be painted in accordance with the applicable requirements of subsequent Sections of these Specifications.
- B. The Contractor shall be responsible for coordination of the compatibility between the manufacturer's standard finish and field-paint specified.

PART 4- MEASUREMENT AND PAYMENT

Separate measurement or payment will not be made for Work specified in this Section. All costs for such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 33 41 00

UTILITY PIPING

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers pipe, fittings, valves, flap gates and appurtenances, including pipe sleeves/casings, concrete inserts/thrust blocks, and hangers/anchors/supports, to be furnished, installed and tested as shown on the Drawings and as specified herein. All piping, fittings, and appurtenances including but not limited to valves, flanges, sleeve couplings, pipe hangers/anchors/supports, and guides, where required, and special supports, not otherwise specifically provided for in these Specifications, but necessary to complete the various systems, shall be included under this Section of Work. Work included in this Section shall also include all components necessary to make the connections to the existing water distribution piping as shown on the Drawings.

B. Related Work

1. Sections 33 05 50 and 33 43 00.
2. Other Sections as specified herein.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. Piping: Comply with ANSI/AWWA and/or ASTM material Specification.
2. Valves: Shall be from a reputable manufacturer and approved by the Engineer and Owner.
3. Mechanical Joint Restraint: Shall be from a reputable manufacturer and approved by the Engineer and Owner.

B. Applicable Standards

All Work related to the design, fabrication and installation of the equipment and materials to be provided or Work to be performed under this Section shall conform to the applicable requirements of Standard Specifications, latest edition, for Water and Sewer Main Construction in Illinois together with ANSI/AWWA and/or ASTM standards, Specifications and requirements as specified herein. Where conflicts occur between codes, standards and Specifications, the more stringent shall apply.

1.03 SUBMITTALS

A. Other than Piping

The Contractor shall submit to the Owner's Representative for review outline drawings, product specifications and description, including control schematic diagrams, wiring connection diagrams, together with instruction manuals, installation instructions, operating and maintenance manuals and field check-out, start-up and testing procedures as specified in Section 01 33 00 for all equipment furnished.

B. Piping

A certified report of chemical analysis and physical test shall be provided to the Owner's Representative for review.

Note: The piping Drawings included with these Specifications are not intended to show all piping details. The intent of the Drawings is to illustrate the conceptual layout, alignment/routing, pipe sizes and selected details. Preparation of detailed shop piping drawings shall be the responsibility of the Contractor. The Contractor shall prepare and submit such shop drawings to the Owner's Representative to review. These shop drawings shall illustrate plans and elevations of pipe routings, showing all clearances, pipe sizes, field connection details, existing utilities, location of all expansion joints (when required), piping and equipment supports and piping specialties, valves, pipe fittings, and all appurtenances related to each individual piping system.

PART 2- PRODUCTS

2.01 GENERAL

- A. All piping and pipe fittings used in the various piping systems shall be of the indicated size and conform to the requirements shown on the Drawings. All materials and equipment shall be in accordance with the appropriate requirement specified herein and shall be equal to the products listed below by brand name and catalog number, as applicable. Identification symbols and nomenclature where used in this Section are the same as those shown on the Drawings.
- B. All pipe and fitting shall be plainly stamped, marked or color coded to an acceptable standard as to weight, class, and type thereof, and the manufacturer's trademark or name.

2.02 MINIMUM REQUIREMENTS AND RATINGS

- A. Minimum thickness class for ductile iron pipe shall be not less than Class 52, unless otherwise shown on the Drawings.
- B. Other ratings and performance requirements, where applicable, of related equipment and accessories shall be as specified hereinafter.

2.03 DETAILS OF CONSTRUCTION

- A. Ductile Iron Pipe (DIP) - shall be centrifugally cast in metal or sand lined molds and shall conform to ANSI A21.51/AWWA C 151. Minimum thickness class shall be Class 52 for all sizes unless otherwise shown on the Drawings. Pipe joints shall be push-on type and conform to ANSI A21.11/AWWA C 111 unless otherwise shown or noted on the Drawings. Each length of pipe shall be marked to show manufacturer's name or trademark, pipe class, year of manufacture conforming to ANSI A 21.51/AWWA C 151.
- B. Mechanical Joint Fittings - shall be mechanical joint and iron or ductile iron conforming to ANSI A 21.53/AWWA C 153 and ANSI A21.4/AWWA C 104. Restrained joints may be used instead of mechanical joints. Thrust blocking shall be provided for all fittings. Fittings not covered under AWWA C153 shall comply with AWWA C110. Fittings shall have the same linings and coatings as the pipe.
- C. Flanged Piping and Joints - Flanged piping and joints where required on the Drawings shall comply with AWWA C115 and AWWA C110, respectively. Flanges shall conform to ANSI B16.1. Flange gaskets shall be full face type, rubber composition. Gasket thickness shall be 1/16-inch for pipe 10 inches and less and 1/8-inch for larger pipe. Flange assembly bolts shall be standard hexagonal head carbon steel machine bolts with heavy, hot

pressed, hexagon nuts, ANSI B18.2. Threads shall conform to ANSI B1.1, coarse thread series, Class 2 fit. Bolt length shall be such that after joints are made up the bolts shall protrude through the nut, but not more than 2-inch. Bolts for use in submerged/wetted service shall be stainless steel.

- D. Bolts, Studs, Tie Rods, Nuts and Washers - All bolts, studs, tie rods and nuts for all pipe, valves and accessories shall be low carbon steel and have American National form right-hand machine cut threads which shall conform with ANSI B1.1, "Screw Threads", Coarse Thread Series, Class 2 Fit, unless otherwise specified.

Bolt heads and nuts shall be semi-finished and shall conform with ANSI B18.2, "Wrench-Head Bolts and Nuts and Wrench Openings", Heavy Series, unless otherwise specified. All nuts shall be hexagonal in shape.

All low carbon steel bolts for flange joints and bolts for restrained joints shall conform with ASTM A307, Grade B.

The Contractor shall provide bolts conforming to AWWA C111 for all flanged and mechanical joints for compact fittings. The bolt threads shall be lengthened according to AWWA C153 to allow for proper nut installation.

- E. Gaskets - for mechanical joints and push-on joints shall conform to ANSI A 21.11/AWWA C 111.
- F. Coatings & Linings - all iron or ductile iron pipe and fittings shall have a standard thickness cement mortar lining as specified in ANSI A 21.4/AWWA C 104 and an outside coating (for direct buried pipe) as specified in ANSI A 21.51/AWWA C 151.
- G. Interior Piping, Valves, Misc. Steel
1. Surface Preparation: Steel - SSPC SP-10, Cast & Ductile Iron - NAPF 500-03-04 & NAPF 500-03-05
- H. Sleeve Couplings - Couplings of the sleeve type shall be provided to accommodate pipe sizes as shown on the Drawings. Couplings shall be Dresser Style 38 without pipe stops, with plain grade synthetic rubber gasket. Coupling type shall be for use with piping materials as shown on the Drawings.
- I. Pipe Sleeves - Shall be of the steel fabricated type with integral water stop and shall be provided at locations shown on the Drawings. Pipe sleeve may be plastic when used only for concrete form work.

- J. Pipe Seals - Pipe seals for piping penetrating walls ceilings or floors, shall be of the type which seals the annular space around the outside of the pipe and the sleeve which the pipe passes through. The seal shall consist of individual links which interlock by nut and bolt to form a belt, and upon tightening of bolts, individual links shall expand to form a watertight seal. The sealing element shall be synthetic rubber material selected for temperatures ranging from -40°F to 250°F. The seal shall be for use with the piping materials as shown on the Drawings.
- K. Pipe Hangers and Supports - Shall be standard products as approved by the Engineer and Owner, or other as specified or as shown on the Drawings, in combination with fabricated hot-dipped galvanized steel or stainless-steel brackets or formed concrete pedestals as required to meet job conditions. Contractor shall be responsible for selection and placement of supports.
- L. Flexible Connector shall be capable of four-way movement so as to absorb vibration, adjust alignments and allow for expansions and contractions in piping. Flexible connectors shall be flanged with flexible body constructed of neoprene and nylon. Flanges shall be plate steel cadmium plated and threaded. Tie rods shall be provided. Flexible connectors shall be provided where shown on the Drawings.
- M. Polyvinylchloride Pipe (PVC) - shall conform to ASTM D3034 Type PSM (4"-15"), ASTM F679 (18"-48") and CSAB182.2 (PS46, 4"-21"). Minimum thickness class shall be as shown on the Drawings. Pipe joints shall be integral bell type and conform to ASTM D3212 unless otherwise shown or noted on the Drawings with gaskets that conform to ASTM F477. Each length of pipe shall be marked to show manufacturer's name or trademark, pipe class, year of manufacture conforming to ANSI A 21.51/AWWA C 151.
- N. Forcemain Piping (Certa-Lok PVC or equal) – products delivered under this specification shall be manufactured only from water distribution pipe and couplings conforming to AWWA C900. The restrained pipe system shall also meet all short and long term pressure test requirements of AWWA C900. Pipe, couplings and locking splines shall be completely non-metallic to eliminate corrosion problems.

Pipe and couplings shall be made from unplasticized PVC compounds having a minimum cell classification of 12454, as defined in ASTM D 1784. The compound shall qualify for a Hydrostatic Design Basis (HDB) of 4000 psi for water at 73.4°F, in accordance with the requirements of ASTM D 2837.

Restrained joint PVC products shall have been tested and approved by Underwriters Laboratories for continuous use at rated pressures as follows:

Pipe Size	4"	6"	8"	10"	12"
DR18	UL listed for Underground Restrained Joint Water Mains				
DR14	UL listed for Underground Restrained Joint Water Mains			UL listed for Conventional Underground Water Mains Installed with Thrust Blocks	

Note: All approvals shown are for a locking-joint system suitable for directional drilling.

Copies of agency approval reports or product listings shall be provided to the Engineer. Products intended for contact with potable water shall be evaluated, tested and certified for conformance with NSF 61 by an acceptable certifying organization.

Nominal outside diameters and wall thicknesses of restrained joint pipe shall conform to the requirements of AWWA C900. Restrained joint pipe shall be furnished in 4", 6", 8", 10" and 12" sizes, in Class 235 (DR18) and Class 305 (DR14). Pipe shall be furnished in standard lengths of 20 feet. Piping shall be green colored for wastewater.

Pipe shall be joined using non-metallic couplings to form an integral system for maximum reliability and interchangeability. High-strength, flexible thermoplastic splines shall be inserted into mating, precision machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading.

Couplings shall be designed for use at or above the pressure class of the pipe with which they are utilized and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F 477. Joints shall be designed to meet the zero leakage test requirements of ASTM D 3139.

- O. Flow Meter: Contractor shall furnish and install inline flow meter on forcemain. Flow meter shall be as approved by the Engineer. Flow meter shall be installed in precast concrete meter manhole furnished and installed by Contractor. Sensor converter shall be remote mounted inside pump control panel enclosure and shall be compatible with Owner's SCADA system. Conduits between flow meter vault and control building shall be

furnished and installed by Contractor in quantity and size as shown on the Drawings.

2.04 RELATED ACCESSORIES

- A. Swing Flex Check Valve shall be from a reputable manufacturer and approved by the Engineer and Owner.
1. The check valves shall be suitable for cold working pressures up to 250 psig (1725 kPa), in water, wastewater, abrasive, and slurry service.
 2. The check valves shall be of the full flow body type, with a domed access cover and only one moving part, the flexible disc.
 3. The valves shall be designed, manufactured, tested and certified to American Water Works Association Standard ANSI/AWWA C508.
 4. The valves shall have flanges with drilling to ANSI B16.1, Class 125.
 5. The valve body shall be full flow equal to nominal pipe diameter at all points through the valve. The seating surface shall be on a 45 degree angle to minimize disc travel. A threaded port with pipe plug shall be provided on the bottom of the valve to allow for field installation of a backflow actuator or oil cushion device without special tools or removing the valve from the line.
 6. The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domed in shape to provide flushing action over the disc for operating in lines containing high solids content. A threaded port with pipe plug shall be provided in the access cover to allow for field installation of a mechanical, disc position indicator.
 7. The disc shall be of one-piece construction, precision molded with an integral O-ring type sealing surface and reinforced with alloy steel. Non-Slam closing characteristics shall be provided through a short 35 degree disc stroke and a memory disc return action to provide a cracking pressure of 0.25 psig.
 8. The valve disc shall be cycle tested 1,000,000 times in accordance with ANSI/AWWA C508 and show no signs of wear, cracking, or distortion to the valve disc or seat and shall remain drop tight at both high and low pressures.
 9. The valve body and cover shall be constructed of ASTM A536 Grade 65-45-12 ductile iron or ASTM A126 class B gray iron for 30 in. (800mm) and larger.

10. The disc shall be precision molded Buna-N (NBR), ASTM D2000-BG.
 11. A screw-type backflow actuator shall be provided to allow opening of the valve during no-flow conditions. Buna-N seals shall be used to seal the stainless steel stem in a Lead-Free bronze bushing. The backflow device shall be of the rising-stem type to indicate position. A stainless steel T-handle shall be provided for ease of operation.
- B. Eccentric Plug Valve shall be from a reputable manufacturer and approved by the Engineer and Owner.
1. Provide non-lubricated eccentric action type plug valves designed for a minimum water working pressure of 150 psi.
 2. Provide ASTM Standard A536 ductile iron or A126 Class B cast iron bodies.
 3. Provide plugs of ductile iron.
 4. Provide resilient plug facings of Chloroprene or Buna-N.
 5. Provide seats with a minimum 1/8-inch thick welded-in overlay of not less than 90 percent nickel content on all surfaces contacting the plug face on 3-inch size and larger valves.
 6. Provide 316 stainless steel bearings with grit excluders protecting the upper and lower bearings.
 - a. Provide sintered, oil-impregnated permanently lubricated type 316 stainless steel per ASTM A743 Grade CF8M.
 7. Provide bolted bonnets on all valves and adjustable packing and packing glands which are accessible without disassembly of the valve or actuator on 4-inch size and larger valves.
 8. Open all plug valves by rotating operator counter-clockwise.
 9. Provide rectangular port and plug design.
 10. Provide valve pressure rating as follows and establish by hydrostatic test as specified by ANSI B16.1.
 - a. Drip-tight shutoff up to full pressure rating.
 - b. Drip-tight shutoff to full valve rating with pressure in either direction.
 - c. Pressures: 175 psi for valves through 12-inch. 150 psi for valves 14 through 54-inch.

d. Conduct a hydrostatic and seat test on every valve. Provide ANSI Class 125 standard flanged ends for valves installed in flanged piping with face-to-face dimensions meeting AWWA C517. Provide mechanical joint ends for valves installed in underground piping. Unless otherwise shown on the Drawings, provide 2-inch square operating nuts for operation by removable wrenches for 4-inch through 6-inch size valves.

11. Provide two removable operating levers in each building, tunnel, and valve vault for each size of lever operated valve specified in the area. Unless otherwise shown on the Drawings, provide enclosed worm gear type actuator with handwheel or crank for 8-inch size and larger valves.

a. Equip gear actuators with valve position indicator and adjustable stop to set closing torque with shaft and quadrant supported on permanently lubricated bronze bearings.

1) Provide zinc plated or 18-8 stainless steel exposed nuts, bolts, springs, and washers on non-submerged valves and actuators.

2) Provide outboard seals to prevent grease leakage from the gear unit.

12. Equip valves and gear actuators for underground or submerged installation with seals on all shafts and gaskets on the covers to prevent entry of water.

a. Provide totally enclosed actuator mounting brackets with gasket seals.

b. Provide 18-8 or 300 series stainless steel exposed nuts, bolts, springs, and washers on submerged and underground valves and actuators. 4-inch size and larger valves:

1) Provide port area at least 80 percent of full pipe area.

C. Air/Vacuum Valve shall be automatic float operated valves designed to exhaust large quantities of air during the filling (pumping) cycle and to admit air as needed to prevent vacuum conditions when the pumps are off. The Combination Air Vacuum Valve shall also be designed to release accumulated air from a piping system while the system is in operation and under pressure. Combination Air Vacuum Valve shall be designed for use in raw sewage applications. All materials of construction shall be corrosion resistant. Internal components shall be either 316 stainless steel or composite. Air Valve body assembly shall be reinforced Nylon. Seats shall be EPDM. Combination Air Vacuum Valve release valve body shall be threaded with NPT inlets and outlets. The body inlet connection shall be

hexagonal for a wrench connection. The valve shall have additional NPT connections for the addition of gauges, testing, flushing and draining. Pressure rating shall be 150 psi minimum. Air release valves shall be installed with a stainless steel full ported ball valve and stainless steel pipe nipple on the valve inlet. Discharge piping shall be PVC Schedule 80 routed back to the wet well. Valve size shall be 2-inch NPT. Air release valves shall be A.R.I. Model D-025.

- D. Auxiliary Gate Valve see Special Provision "Gate Valve in Box" for specification.
- E. Odor Control System shall be a 2050-200 as manufactured by Wager Company, furnished with Wager Media canisters. Odor Control System shall be connected to the 6" vent pipe from the wet well.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

Each item of the equipment shall be shop-assembled and tested in accordance with the manufacturer's standard procedure. Monitoring and control devices shall be functionally tested to verify correct operation and that all component parts function properly.

3.02 INSTALLATION AND TESTING

- A. General: The piping shall be installed as shown on the Drawings. Where changes in the pipe routing are required, the Contractor shall submit a drawing showing the proposed change to the Owner's Representative for review.

The Contractor shall provide all tools, labor and equipment necessary for the safe and expeditious installation of all piping and appurtenances as shown on the Drawings and specified herein, including fusion welding machines.

The Contractor shall inspect pipe and appurtenances prior to installation and promptly remove damaged or unsuitable materials and provide with new and unused materials.

- B. Size, Location and Alignment: The Contractor shall be responsible for all checking and conforming to size, location, alignment, and for flange drilling of all existing piping and equipment as required for making proper piping connections. All piping shall be arranged and aligned as far as practicable, in accordance with the Drawings. All risers and drops shall be installed

plumb and true. Piping shall not interfere with access to valves or equipment and shall not obstruct passageways. Piping shall be installed to provide working clearance for operation and maintenance. Modifications to arrangement of piping systems may be required, subject to the review of the Owner's Representative, to suit field conditions or to avoid interference with existing or new work of other trades. The Contractor shall furnish all offsets, additional fittings, etc., as required to meet all requirements of installation conditions whether detailed on the Drawings or not.

- C. Piping Workmanship: Pipe shall be cut accurately by the Contractor to dimensions established at the site and shall be worked into place without springing or forcing. Cut sections of pipe shall be cut using pipe cutters to provide a square plain end. Where location is not exactly shown by detailed dimensions, pipe shall be installed to occupy minimum space. Piping shall be run parallel with the lines of the building, unless otherwise distinctly shown or noted on the Drawings.
- D. Installation: Installation shall generally be made in accordance with the Standard Specifications for Water and Sewer Main Construction in Illinois, and in accordance with manufacturer's recommendations and procedures.
- E. PVC Pipe Installation:
 - 1. Install pipe by direction boring methods. Install PVC pipe by pulling the pipe into place.
 - a. Provide winch systems designed to protect structures, provide directional stability, and pull pipe from insertion point to exit point without causing damage to the pipe being inserted.
 - b. Insert pipe in a continuous operation from point to point.
 - c. Provide lubricants as specified by pipe manufacturer to avoid stressing of pipe beyond its elastic limit during insertion.
 - d. Provide silencers, mufflers, or other devices required to reduce noise from compressors and other equipment to meet limits as outlined by Owner's local ordinances.
 - 2. Provide equipment and procedures in strict compliance with the pipe manufacturer's recommendations.
 - 3. Provide pipe insertion pits necessary for complete installation of pipe.
 - a. In general, position pits in the least disruptive location whenever possible.

- b. Provide all traffic control, barricades, flagmen, and other items at insertion pit areas as necessary to complete the work.
 - c. Provide tight sheeting at insertion pits to keep pit to the minimum size necessary to do the work. Remove sheeting when work is completed.
- F. Hydrostatic Testing: Pressure piping and related fittings and valves shall be hydrostatically tested at not less than 150% of the design working pressure. Tests shall be witnessed by the Owners Representative. Duration of test shall be at least two (2) hours. Minimum requirements for test methods and procedures shall be as follows:
 - 1. All hydrotesting of pipes shall be done with water provided by the Contractor. All equipment necessary for complete hydrotesting, such as hoses, auxiliary piping, pumps, compressors, meters, plugs, blinds, etc. shall be supplied by the Contractor. The Contractor shall also furnish all labor and supervision as necessary for testing and inspection. Contractor shall submit a schedule for hydrotesting to the Owner's Representative for review.
 - 2. Test pressure for hydrostatic tests shall be held for a minimum total time of 2 hours or longer as required with no noticeable loss in pressure while all joints are visually inspected for leaks. After pressure is applied, pressurizing device must be disconnected or isolated from the system during inspection period. There shall be no allowable leakage and defects shall be corrected immediately. Testing shall be repeated after defects have been corrected until a successful test has been accomplished.
 - 3. During hydrostatic pressure testing locally mounted indicating pressure gauges, where test pressure would exceed their scale range, shall be isolated or removed prior to testing. If removed, branch lines shall be plugged. All lines that are to be insulated shall be tested, cleaned, and flushed prior to installation of insulation. All equipment shall be isolated from the system during testing of piping system. All air shall be vented from the system prior to application of test pressure for hydrostatic tests.
- G. Cleaning and Adjustment: At the completion of the Work, all parts of the installations shall be thoroughly cleaned. All equipment, pipe, valves, and fittings shall be cleaned of grease, welding metal, slag, metal cuttings, and sludge which may have accumulated by operation of the systems for testing. Any discoloration or other damage to parts of the buildings, their finish, or furnishings due to the Contractor's failure to properly clean the piping systems shall be repaired by the Contractor without cost to the

Owner. Special care shall be exercised to remove all metal particles from the piping system to assure no damage to valves and other operating mechanisms.

3.03 PAINTING

All equipment specified in this Section shall be shop painted with the manufacturer's standard finish.

PART 4- BASIS OF MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the Contract Unit Price for the below listed Items, in the Schedule of Prices:

X5631212; Sanitary Forcemain, 12"
X5631212; Connection to Existing Force Main 12"
X0783500; Pump Station Mechanical Work

B. This price shall be full compensation for furnishing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings.

C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 32 42 00

PUMPS AND ACCESSORIES

PART 1 - GENERAL

1.01 SCOPE

A. Description

This Section covers the wastewater submersible pumps and associated accessories, to be furnished, installed and tested as shown on the Drawings and as specified herein. All piping, fittings, supports and anchors where required, shall be included under this Section of Work.

B. Related Work

1. Section 03 30 00 – Cast-in-Place Concrete.
2. Section 03 41 00 – Precast Structural Concrete.
3. Section 26 00 10 – General Provisions for Electrical Work.
4. Section 26 00 20 – Basic Electrical Materials and Methods.
5. Section 26 05 10 – Low Voltage Electrical Power Conductors.
6. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
7. Section 26 05 33 – Raceways and Boxes for Electrical Systems.
8. Section 33 05 50 – General Provisions for Mechanical Work.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. Pumps and accessories shall be from a reputable manufacturer and approved by the Engineer and Owner.

B. Applicable Standards

All Work shall conform to the applicable provisions of the codes, standards, and Specifications, as specified herein, and the following:

<u>Name</u>	<u>Abbreviation</u>
National Electric Code	NEC
National Electrical Mfr. Assoc.	NEMA
Underwriters Laboratory	UL
Institute of Electrical & Electronic Engrs.	IEEE
American Water Works Association	AWWA

1.03 American Society for Testing & Materials ASTM
SUBMITTALS

The Contractor shall submit to the Engineer for review drawings, product specifications and description, including control schematic diagrams, wiring connection diagrams together with certified performance test curves of similar pumping units, instruction manuals, installation instructions, operating and maintenance manuals and field check-out, start-up and testing procedures of all equipment furnished.

1.04 RESPONSIBILITY

The herein specified equipment shall be furnished by a "single-source" equipment supplier who has been regularly engaged in the representation/production of the specified equipment for a minimum of five (5) years.

1.05 WARRANTY

The herein specified equipment and materials shall be warrantied per the manufacturer.

PART 2- PRODUCT

2.01 GENERAL

- A. Identification symbols and nomenclature where used in this Section are the same as those shown on the Drawings. Paragraphs of these Specifications describing the requirements for a single item of equipment shall apply equally to all identical items of equipment to be furnished.
- B. The submersible pumps designated P-1, P-2, P-3, P-4 and P-5 shall be of the electric submersible type, complete with close-coupled motor, and neoprene-jacketed power cable, all suitable for continuous submergence. The pumping units shall be provided with a guiding system to facilitate removal and shall be arranged for suction and discharge as shown on the Drawings. The pump shall be of a type designed to fit into the space available with proper regard to suction condition, accessibility and handling limitations. The pump shall be suitable for continuous and/or intermittent operation, and for operation after long periods of idleness. P-5 shall be supplied to LCPW as a backup in case of failure of P-3 or P-4.

- C. Each pump shall be provided with the necessary piping as shown on the Drawings included but not limited to discharge elbow of the self-engaging type, riser discharge piping, stainless steel guiding system and fittings.
- D. Pumping units shall be housed in proposed reinforced concrete wet well. The concrete structures shall be provided with aluminum hinged hatch covers to facilitate accessing each pumping unit.
- E. Electric pumps shall be furnished complete with close-coupled, electric motor drives of the submersible type. Motors shall be as specified herein.
- F. All rotating parts of the equipment shall operate throughout the required range without objectionable noise or vibration. Pump speed shall not exceed **1800 rpm** or as rated by the manufacturer.
- G. Cables and conduits shall enter the electrical panel(s) and cubicle(s) as shown on the Drawings. Adequate provisions shall be made to the panel(s) and cubicle(s) for such cable and conduit entry.
- H. The pumps shall be adequately designed to meet the requirements and intent of these Specifications with proper regard for space, operating conditions, and limiting dimensions shown on the Drawings, and shall conform to the best engineering practices. Items or devices not specifically called for in these Specifications, but which are required to provide a complete and successfully operating pumping installation and/or which may be required or otherwise found desirable to stabilize, reduce noise/vibration/pressure fluctuations or otherwise provide satisfactory operation shall be provided by the Contractor. The pumps shall be adequately designed to withstand forces due to reversed flows generated upon shutdown when the discharge piping empties.

2.02 REQUIREMENTS

Each submersible pump shall be equipped with a **3 HP** for the Low Flow Pumps and **105 HP** for the High Flow Pumps submersible electric motor connected for operation on **480-volt**, 3 phase, 60 hertz, 4 wire service, with **50 feet** of submersible cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and have P-MSHA Approval.

2.03 PUMP DESIGN CONFIGURATION

The pumps shall be supplied with a mating cast iron discharge connection and be capable of delivering:

Low Flow Pumps: 215 gpm @ 23 ft TDH
High Flow Pumps: 1550 gpm @ 166 ft TDH

The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with 30 feet of stainless-steel lifting chain. The working load of the lifting system shall be 50% greater than the pump unit weight.

2.04 PUMP CONSTRUCTION

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

2.05 COOLING SYSTEM

Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

2.06 CABLE ENTRY SEAL

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary, using the same entry seal. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top.

2.07

MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber containing the terminal board, shall be hermetically sealed from the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. The motor and the pump shall be produced by the same manufacturer.

The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

2.08 BEARINGS

The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two-row angular contact bearing to compensate for axial thrust and radial forces. Single row lower bearings are not acceptable. The minimum L_{10} bearing life shall be 50,000 hours at any usable portion of the pump curve.

2.09 MECHANICAL SEAL

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide seal ring.

Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal

system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

Where a seal cavity is present in the seal chamber, the area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

Seal lubricant shall be FDA Approved, nontoxic.

2.10 PUMP SHAFT

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The shaft shall be stainless steel – ASTM A479 S43100-T.

If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the oil housing and above. Therefore, the use of stainless-steel sleeves will not be considered equal to stainless steel shafts.

2.11 IMPELLER

The impeller shall be cast of ASTM A-48, Class 35B gray iron, dynamically balanced, semi-open, multi-vane, back-swept, non-clog design. The impeller vane leading edges shall be mechanically self-cleaned upon each rotation as they pass across a spiral groove located on a replaceable insert ring.

The impeller shall have vanes hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of sludge and rag-laden wastewater.

2.12 VOLUTE / SUCTION COVER

The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The

spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall have a guide pin integral to the casting and shall be cast of ASTM A-48, Class 35B gray iron and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

2.13 PROTECTION

All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125°C (260°F), stop the motor and activate an alarm.

A leakage sensor shall be provided to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote.

The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

2.14 MODIFICATIONS

1. Explosion-proof.

2.15 PUMP RATINGS AND PERFORMANCE

A. Rating

The pump shall be capable of operating between the maximum/minimum limits as shown on the Drawings. The specified rating of the pumps shall be as follows:

Pumps P-1 and P-2:

Duty Point: 215 gpm @ 23 ft. TDH

Pumps P-3, P-4 and P-5:

Duty Point: 1550 gpm @ 166 ft. TDH

The pumps shall deliver the rated quantity at the rated total discharge head without exceeding the nameplate rating of the motor considering a 1.15 service factor: Non-overloading throughout entire operating range without employing service factor. The total pump head shown on the Drawings

include the static head, velocity head, and all piping entrance, exit and frictional losses but are exclusive of any pump losses.

B. Performance

The pump manufacturer shall furnish a statement of overall efficiency which shall be guaranteed at rated capacity and rated head. The efficiency of each pump when operating between the specified rated head and the maximum TDH limit shall be as near its peak as practicable. The pump and motor shall operate in dynamic balance as a unit without undue vibration or noise. Vibration amplitude of pump and motor unit shall be less than allowable by the Hydraulic Institute Standards.

C. Fluid Pumped

The pumps will handle wastewater consisting of normal flows collected by the sewer system. As a minimum, the pump shall be designed to pass a 3-inch size sphere. The wastewater temperature may vary between 40°F and 80°F, approximately.

D. Operation

Pumps shall be started and stopped upon rising and/or falling water levels in accordance with the applicable requirement as shown on the Drawings. Starting and stopping water levels shall be independently field adjustable without having to enter the lift station wet well via PLC programming.

E. Slide Away Coupling

A slide away coupling shall be provided for each pump to allow the pump to be installed or removed without requiring personnel to enter the wet well. The coupling shall consist of a discharge elbow securely fastened to the floor of the wet well, a movable bracket that bolts to the pump discharge flange and mates with the discharge elbow, and a guiding system to guide the pump and movable bracket from the discharge elbow to the access cover in the top of the wet well. Mating of the movable bracket to the discharge elbow shall be accomplished by a linear downward motion.

F. Guide System

The guiding system shall consist of stainless-steel components of the sizes and lengths as required by the installation and as shown on the Drawings. Guiding system shall terminate on the discharge elbow and a bracket

attached to the wet well access hatch cover. None of the pump weight shall bear on the guiding system.

G. Carrier Guide Bracket

A sliding guide bracket shall be attached to the pump. The sliding carrier guide bracket shall be fabricated from steel and protected with a corrosion resistant coating or shall be a stainless-steel fabrication. The carrier shall be mounted on the pump, so lifting is done from the carrier. Fasteners shall be 300 series stainless steel.

H. Discharge Base Elbow

A discharge elbow shall be furnished for each pump. The discharge base elbow shall be attached to the lift station wet well floor. The discharge elbow shall include guiding system supports which hold the guides at the bottom. All fasteners shall be 300 series stainless steel.

I. Piping and Valves

Individual discharge pipelines shall be provided for each pump as shown on the Drawings. The piping shall be ductile iron in accordance with applicable requirements of Section 33 41 00 and shall be arranged for standard 125 lb. flanged end connections to facilitate easy removal. Piping shall include all necessary elbows, tees, fittings, flanges, couplings, gaskets, fasteners, etc. as shown on the Drawings.

J. Sump Pump

1. Pumps shall be submersible 120/240-volt, single phase, level controlled, 0.5 horsepower, of stainless steel or cast-iron construction designed for raw sewage applications. Pumps shall have non-clogging stainless steel vortex impellers and shall be capable of passing a 5/8" solid. Pumps discharge shall be NPT female thread for 1- 1/2 or 2-inch pipe connection (1 – 1/2 inch pumps shall be provided with adapter to 2" discharge pipe. Pump motor rating shall not exceed 10.5 amps at 120-volts. Pumps shall be cable of lifting water at least 25' vertically and shall be rated for 30 gallons per minute (minimum) at 20-feet TDH and 60 gallons per minute at 15-feet TDH. Contractor shall provide non-corrosive stainless steel brackets or supports as necessary to maintain the pump in acceptable position during pump operation and when pump is removed and reinstalled from the basin. Sump pump shall be Zoeller Model 137/139.

2. Sump Pump Assembly Piping shall be Schedule 80, PVC and shall include PCV isolation valve and PVC check valve and shall discharge to the wet well. Pump discharge piping shall be provided with union couplings to allow for easy removal.

PART 3- EXECUTION

3.01 FACTORY TEST AND INSPECTION

- A. Each item of the equipment shall be shop-assembled and tested to verify that all parts function properly and that no interference occurs between moving parts. Rotating elements of the pumping unit shall be statically and dynamically balanced. Certified performance test curves from identical equipment showing capacity, total head, electrical input power, and the overall pump and motor efficiencies shall be submitted to the Engineer.
- B. Monitoring and control devices shall be functionally tested to verify correct operation and that all parts function properly.

3.02 INSTALLATION AND TESTING

- A. The equipment shall be installed as shown on the Drawings and in accordance with the manufacturer's instructions and recommended best practices. All necessary shims, grout, lubrication, anchor bolts, and other items required for installation and testing shall be furnished. All items of equipment shall be operated, adjusted, and tested for proper performance in accordance with the manufacturer's recommended test procedure.
- B. The Contractor shall provide all necessary items such as but not limited to supports, anchors, incidental concrete/grouting, embedded stud bolts, nuts and bolts, etc. as required for the installation of the wastewater pumps and accessories.
- C. Testing shall include but not be limited to the following:
 - 1. The pump shall be visually inspected to confirm that it is built in accordance with the Specification as to HP, voltage, phase and hertz.
 - 2. The motor and seal housing chambers shall be hi-potted to test for moisture content and/or insulation defects.
 - 3. Pump shall be checked for proper rotation.
 - 4. Discharge piping shall be attached, the pump submerged in water and amp readings shall be taken in each leg to check for an imbalanced stator winding. If there is a significant difference in readings, the stator windings shall be checked with a bridge to determine if an unbalanced resistance exists. If so, the stator shall be replaced.

- D. The pumping equipment manufacturer shall provide the services of factory trained field supervisory personnel who shall perform all necessary coordination to check-out, start-up and place into operation the herein specified equipment as well as instruct Owner personnel in its control and operation.

3.03 PAINTING

- A. All equipment specified in this Section shall be shop painted with the manufacturer's standard finish. For submersible pumps this finish shall consist of as a minimum an epoxy paint system. All equipment specified in this Section shall be field painted per Owner's direction.
- B. The Contractor shall be responsible for coordination of the compatibility between the manufacturer's standard finish and field-painting.

PART 4- MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made as part of the Contract Lump Sum Price for the below listed Items, in the Schedule of Prices:

X0783500; Pump Station Mechanical Work
- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings. Payment for excavation and backfill required for installation shall be included in the prices bid for these Items as they pertain.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

SECTION 33 43 00

TEMPORARY BYPASS PUMPING SYSTEM

PART 1- GENERAL

1.01 SCOPE

A. Description

This Section covers the temporary bypass pumping system and associated accessories including automatic controls to be furnished, installed, and tested as required to accomplish the Work and as specified herein. The temporary bypass pumping system shall provide uninterrupted bypass pumping around the Work area. All piping, fittings, connectors, supports and anchors where required, shall be included under this Section of Work. Under this Section the Contractor shall be required to furnish all items including but not limited to materials, labor, equipment, power, maintenance, expendables/ consumables, etc. to implement a temporary bypass pumping system for the purpose of diverting the existing flow around the Work Area for the required duration of the Project. The design, installation and operation of the temporary pumping system shall be the Contractor's sole responsibility.

Note: Installation of temporary bypass pumping/ piping/electrical feed or alternative power source, shall be supplied to provide an adequate temporary bypass operation which is required prior to performing any renovation work in the existing lift station wet well.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

1. Pumps: Shall be from a reputable manufacturer and approved by the Engineer.
2. Other items: As specified herein.

B. Applicable Standards

All Work shall conform to the applicable provisions of the codes, standards, and Specifications, as specified herein, and the requirements of regulatory agencies having jurisdiction.

1.03 SUBMITTALS

- A. The Contractor shall prepare a description of the proposed bypass pumping system (including means of tie-in(s) to the existing system) and submit it for Village's Representative's review.
- B. The Contractor shall submit to the Village's Representative for review drawings, product specifications, including control and operational requirements of the proposed bypass pumping units, in accordance with the applicable requirements of Section 01 33 00 of all temporary equipment proposed.
- C. The Contractor shall also submit details of the temporary electrical feed/alternative power source and temporary discharge piping arrangement necessary for the temporary bypass pumping installation.
- D. The Contractor shall submit to the Village's Representative detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows as well as a phasing schedule detailing the total duration of time required for the bypass pumping operation. This plan must be specific and complete, including but not limited to such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure that a)existing flows shall be maintained; and that b) proper protection of the existing facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions as specified herein. No construction shall begin until all provisions and requirements have been reviewed by the Village's Representative.
- E. Note: Village's Representative review of bypass pumping scheme and related submittals shall in no way be construed as creating any obligation on the Village's Representative for same.

1.04 PROJECT/SITE CONDITIONS & SPECIAL PRECAUTIONS

- A. General. The herein specified temporary bypass pumping equipment shall be installed and placed into temporary operation to maintain sanitary sewer flows at all times. Temporary electrical feed or alternative power source and discharge piping shall be provided by the Contractor to accommodate the temporary operation. Contractor shall assume all risks associated with the temporary bypass pumping operation.

- B. Verification by Contractor. The temporary bypass pumping capacity shall be verified by the Contractor.
- C. Maintenance of Flow. The Contractor shall be fully aware that maintaining sewer flows is critical and imperative; **sanitary sewer flows must be maintained at all times.**
- C. Responsibility. The Contractor shall be responsible for all things necessary for proper operation of the complete temporary bypass pumping system, which includes, but is not limited to, pump, driver, controls and appropriate pipe connections during the construction period, as required to safely convey and maintain peak sewer flows past the Work area. The Contractor shall be solely responsible for the choice of product(s) and equipment; for the design, installation, and maintenance & operation during the course of Work; as well as "means and methods" of performing the Work; and subsequent removal of temporary bypass pumping systems and their safety and conformity with local codes, regulations and these Specifications. All product(s), equipment and "means and methods" selected shall be adequate for the intended use/application. Review by Village's Representative does not relieve Contractor from compliance with the requirements specified herein.

PART 2- PRODUCT

2.01 GENERAL

- A. General - Contractor shall be responsible for the choice of product(s) subject to the review of the Village's Representative. All products selected shall be adequate for the intended purpose and use.
- B. Pumps - Pumps shall be rated for continuous duty and shall be capable of pumping without surging, cavitation, or vibration. The pump shall not overload at any point on the pump operating curve. Rotative components shall be statically and dynamically balanced. The pump shall be suitable for use with raw unscreened sewage and trash. Noise levels produced by the bypass pumps shall not exceed local noise ordinance requirements for residential areas.
- C. Controls - All temporary bypass pumps shall be provided with the necessary automatic stop/start controls for each pumping unit to allow unsupervised/unattended operation. Controls shall also include a high-level warning/start device, which shall be activated upon rising sewage level in the manhole from which bypass pumping is being performed, and simultaneously initiate the start-up of the stand-by pumping unit.

- D. Stand-By Pump(s) - The Contractor shall include one stand-by temporary bypass pump of each size for each location to be maintained on site. Stand-by temporary bypass pumps shall be on-line and shall be piped into the inflow and to the bypass piping so that upon starting the stand-by pump shall take over and pick up the flow. Stand-by temporary bypass pumps shall be isolated from the primary bypass system by valving as required.

PART 3- EXECUTION

3.01 SHOP TESTS AND INSPECTIONS

Each item of the equipment shall be shop-checked and given routine tests to verify that all parts function properly and that no interference occurs between moving parts. Rotating elements of the pumping unit shall be properly balanced. Monitoring and control devices shall be functionally tested to verify correct operation and that all parts function properly.

3.02 FIELD INSTALLATION/TESTING AND MAINTENANCE

A. General.

1. The equipment shall be installed as required and in accordance with recommended best practices. All necessary shims, grout, lubrication, anchor bolts, and other items required for installation and testing shall be furnished including but not limited to oil, fuel, grease, tools, and spare parts that may be required to maintain the operation of the temporary bypass pumping system throughout the construction period. The Contractor shall be solely responsible for maintaining the temporary pumps and appurtenances. All items of equipment shall be operated, adjusted, and tested for proper performance.
2. Prior to placing the temporary bypass pumping system into operation, field testing shall be conducted to verify that the pumping unit(s) are adequate for the service intended.

- B. The temporary bypass pumping system shall be placed into operational service and shall operate satisfactorily for a minimum of 24 hours prior to performing any renovation work in/at the existing lift station, and/or taking existing pumping units out of service. Bypass pumping units shall remain on site, in operational condition, ready for stand-by service for at least 48 hours after the installation of the pumps specified in Section 33 42 00 has been completed.

C. Tests and Inspections.

1. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Contractor shall provide the Village's Representative 24 hours' notice prior to testing so that such testing may be witnessed by the Village's Representatives.
2. Contractor shall inspect the bypass pumping system at least every eight (8) hours during Bypass Pumping Operations or as otherwise required to ensure that the system is operating correctly. Provide inspection report to Village at each inspection.

D. Maintenance Service and Spare Parts.

1. The Contractor shall insure that the temporary pumping system is properly maintained, and a responsible operator shall be available and on site at all times when pumps are operating.
2. Spare parts for pumps and piping shall be kept on site as required.
3. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

PART 4- MEASUREMENT AND PAYMENT

.01 MEASUREMENT

This work will be measured for payment on a lump sum basis.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the Contract Unit Price for the below listed Items, in the Schedule of Prices:

X1200068; Force Main Bypass Pumping

- B. This price shall be full compensation for furnishing and installing all materials; and for all preparation; and for all labor, equipment, tools, and incidentals necessary for the Work as required by the Specifications and Drawings.
- C. Payment will not be made for any other items except as listed above. All other costs associated with such Work shall be considered incidental and shall be included in the prices bid for the various items to which they pertain in the Schedule of Prices.

END OF SECTION

PAVEMENT CORE INFORMATION

Core or Boring No.	Station of Boring	Total HMA Thickness (nearest ¼ inch)	Total Concrete Base (PCC) Thickness (nearest ¼ inch)	Total subbase Thickness (nearest 1 inch)	Total Thickness (nearest ¼ inch)
DEERFIELD ROAD					
C-101	94+04	-	9.75	7.00	16.75
C-102	101+48	3.50	8.25	18.00	29.75
C-103	109+12	14.75	-	3.00	17.75
C-104	116+50	14.25	-	-	14.25
C-105	124+05	7.75	8.25	-	16.00
C-106	129+02	10.25	6.00	-	16.25
C-107	137+15	7.75	7.50	3.00	18.25
C-108	144+07	7.25	7.00	-	14.25
C-109	151+03	15.50	-	-	15.50
C-110	159+48	13.50	-	-	13.50
C-111	166+04	4.00	8.00	2.00	14.00
C-112	174+50	3.50	-	-	3.50
C-113	182+06	12.50	-	-	12.50
C-114	189+02	8.00	6.50	-	14.50
C-115	196+02	7.00	6.00	-	13.00
C-116	204+08	16.50	-	-	16.50
PORTWINE ROAD					
C-117	295+36	12.50	-	6.00	18.50
C-118	299+06	11.25	-	-	11.25
C-119	301+06	13.75	-	-	13.75
C-120	304+07	12.75	-	5.00	17.75
SAUNDERS ROAD					
C-121	413+09	16.75	-	-	16.75
C-122	418+08	15.75	-	6.00	21.75
MILWAUKEE AVENUE					
C-123	-	5.25	8.75	8.00	22.00
C-124	-	3.50	9.50	6.00	19.00

AVAILABLE REPORTS

☐ No project specific reports were prepared.

When applicable, the following checked reports and record information is available for Bidders' reference upon request:

- ☐ Record structural plans
- ☒ Preliminary Site Investigation (IDOT) (PSI)
- ☒ Preliminary Site Investigation (Local) (PSI)
- ☒ Preliminary Environmental Site Assessment (PESA)
- ☒ Soils/Geotechnical Report
- ☒ Boring Logs
- ☒ Pavement Cores
- ☐ Location Drainage Study (LDS)
- ☐ Hydraulic Report
- ☐ Noise Analysis
- ☐ Other:

Those seeking these reports should request access from:
Matt Huffman, P.E. CBBEL, (mhuffman@cbbel.com)
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Rd. Rosemont, IL 60018
847-823-0500
Availability: Monday – Friday from 8:00 – 4:30

**IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL
PROVISION**

Effective: August 1, 2012 Revised: February 2, 2017

In addition to the Contractor's equal employment opportunity (EEO) affirmative action efforts undertaken as required by this Contract, the Contractor is encouraged to participate in the incentive program described below to provide additional on-the-job training to certified graduates of the IDOT pre-apprenticeship training program, as outlined in this Special Provision.

IDOT funds, and various Illinois community colleges operate, pre-apprenticeship training programs throughout the State to provide training and skill-improvement opportunities to promote the increased employment of minority groups, disadvantaged persons and women in all aspects of the highway construction industry. The intent of this IDOT Pre-Apprenticeship Training Program Graduate (TPG) special provision (Special Provision) is to place these certified program graduates on the project site for this Contract in order to provide the graduates with meaningful on-the-job training. Pursuant to this Special Provision, the Contractor must make every reasonable effort to recruit and employ certified TPG trainees to the extent such individuals are available within a practicable distance of the project site.

Specifically, participation of the Contractor or its subcontractor in the Program entitles the participant to reimbursement for graduates' hourly wages at \$15.00 per hour per utilized TPG trainee, subject to the terms of this Special Provision. Reimbursement payment will be made even though the Contractor or subcontractor may also receive additional training program funds from other non-IDOT sources for other non-TPG trainees on the Contract, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving reimbursement from another entity through another program, such as IDOT through the TPG program. With regard to any IDOT funded construction training program other than TPG, however, additional reimbursement for other IDOT programs will not be made beyond the TPG Program described in this Special Provision when the TPG Program is utilized.

No payment will be made to the Contractor if the Contractor or subcontractor fails to provide the required on-site training to TPG trainees, as solely determined by IDOT. A TPG trainee must begin training on the project as soon as the start of work that utilizes the relevant trade skill and the TPG trainee must remain on the project site through completion of the Contract, so long as training opportunities continue to exist in the relevant work classification. Should a TPG trainee's employment end in advance of the completion of the Contract, the Contractor must promptly notify the IDOT District EEO Officer for the Contract that the TPG's involvement in the Contract has ended. The Contractor must supply a written report for the reason the TPG trainee involvement terminated, the hours completed by the TPG trainee on the Contract, and the number of

hours for which the incentive payment provided under this Special Provision will be, or has been claimed for the separated TPG trainee.

Finally, the Contractor must maintain all records it creates as a result of participation in the Program on the Contract, and furnish periodic written reports to the IDOT District EEO Officer that document its contractual performance under and compliance with this Special Provision. Finally, through participation in the Program and reimbursement of wages, the Contractor is not relieved of, and IDOT has not waived, the requirements of any federal or state labor or employment law applicable to TPG workers, including compliance with the Illinois Prevailing Wage Act.

METHOD OF MEASUREMENT: The unit of measurement is in hours.

BASIS OF PAYMENT: This work will be paid for at the contract unit price of \$15.00 per hour for each utilized certified TPG Program trainee (TRAINEES TRAINING PROGRAM GRADUATE). The estimated total number of hours, unit price, and total price must be included in the schedule of prices for the Contract submitted by Contractor prior to beginning work. The initial number of TPG trainees for which the incentive is available for this contract is 2.

The Department has contracted with several educational institutions to provide screening, tutoring and pre-training to individuals interested in working as a TPG trainee in various areas of common construction trade work. Only individuals who have successfully completed a Pre- Apprenticeship Training Program at these IDOT approved institutions are eligible to be TPG trainees. To obtain a list of institutions that can connect the Contractor with eligible TPG trainees, the Contractor may contact: HCCTP TPG Program Coordinator, Office of Business and Workforce Diversity (IDOT OBWD), Room 319, Illinois Department of Transportation, 2300 S. Dirksen Parkway, Springfield, Illinois 62764. Prior to commencing construction with the utilization of a TPG trainee, the Contractor must submit documentation to the IDOT District EEO Officer for the Contract that provides the names and contact information of the TPG trainee(s) to be trained in each selected work classification, proof that that the TPG trainee(s) has successfully completed a Pre-Apprenticeship Training Program, proof that the TPG is in an Apprenticeship Training Program approved by the U.S. Department of Labor Bureau of Apprenticeship Training, and the start date for training in each of the applicable work classifications.

To receive payment, the Contractor must provide training opportunities aimed at developing a full journeyworker in the type of trade or job classification involved. During the course of performance of the Contract, the Contractor may seek approval from the IDOT District EEO Officer to employ additional eligible TPG trainees. In the event the Contractor subcontracts a portion of the contracted work, it must determine how many, if any, of the TPGs will be trained by the subcontractor. Though a subcontractor may conduct training, the Contractor retains the responsibility for meeting all requirements

imposed by this Special Provision. The Contractor must also include this Special Provision in any subcontract where payment for contracted work performed by a TPG trainee will be passed on to a subcontractor.

Training through the Program is intended to move TPGs toward journeyman status, which is the primary objective of this Special Provision. Accordingly, the Contractor must make every effort to enroll TPG trainees by recruitment through the Program participant educational institutions to the extent eligible TPGs are available within a reasonable geographic area of the project. The Contractor is responsible for demonstrating, through documentation, the recruitment efforts it has undertaken prior to the determination by IDOT whether the Contractor is in compliance with this Special Provision, and therefore, entitled to the Training Program Graduate reimbursement of \$15.00 per hour.

Notwithstanding the on-the-job training requirement of this TPG Special Provision, some minimal off-site training is permissible as long as the offsite training is an integral part of the work of the contract, and does not compromise or conflict with the required on-site training that is central to the purpose of the Program. No individual may be employed as a TPG trainee in any work classification in which he/she has previously successfully completed a training program leading to journeyman status in any trade, or in which he/she has worked at a journeyman level or higher.

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
INSURANCE

Effective: February 1, 2007
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27:

Lake County Division of Transportation

Village of Riverwoods

Village of Buffalo Grove

Village of Deerfield

Lake County Department of Public Works

Lake County Forest Preserve District

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

State of Illinois
DEPARTMENT OF TRANSPORTATION
Bureau of Local Roads & Streets
SPECIAL PROVISION
FOR
LOCAL QUALITY ASSURANCE/ QUALITY MANAGEMENT QC/QA
Effective: January 1, 2022

Replace the first five paragraphs of Article 1030.06 of the Standard Specifications with the following:

“1030.06 Quality Management Program. The Quality Management Program (QMP) will be Quality Control / Quality Assurance (QC/QA) according to the following.”

Delete Article 1030.06(d)(1) of the Standard Specifications.

Revise Article 1030.09(g)(3) of the Standard Specifications to read:

“(3) If core testing is the density verification method, the Contractor shall provide personnel and equipment to collect density verification cores for the Engineer. Core locations will be determined by the Engineer following the document “Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations” at density verification intervals defined in Article 1030.09(b). After the Engineer identifies a density verification location and prior to opening to traffic, the Contractor shall cut a 4 in. (100 mm) diameter core. With the approval of the Engineer, the cores may be cut at a later time.”

Revise Article 1030.09(h)(2) of the Standard Specifications to read:

“(2) After final rolling and prior to paving subsequent lifts, the Engineer will identify the random density verification test locations. Cores or nuclear density gauge testing will be used for density verification. The method used for density verification will be as selected below.

Density Verification Method	
☒	Cores
☐	Nuclear Density Gauge (Correlated when paving ≥ 3,000 tons per mixture)

Density verification test locations will be determined according to the document “Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations”. The density testing interval for paving wider than or equal to 3 ft (1 m) will be 0.5 miles (800 m) for lift thicknesses of 3 in. (75 mm) or less and 0.2 miles (320 m) for lift thicknesses greater than 3 in. (75 mm). The density testing interval for paving less than 3 ft (1 m) wide will be 1 mile (1,600 m). If a day’s paving will be less than the prescribed density testing interval, the length of the day’s paving will be the interval for that day. The density testing interval for mixtures used for patching will be 50 patches with a minimum of one test per mixture per project.

If core testing is the density verification method, the Engineer will witness the Contractor coring, and secure and take possession of all density samples at the

density verification locations. The Engineer will test the cores collected by the Contractor for density according to Illinois Modified AASHTO T 166 or AASHTO T 275.

If nuclear density gauge testing is the density verification method, the Engineer will conduct nuclear density gauge tests. The Engineer will follow the density testing procedure detailed in the document "Illinois Modified ASTM D 2950, Standard Test Method for Density of Bituminous Concrete In-Place by Nuclear Method".

A density verification test will be the result of a single core or the average of the nuclear density tests at one location. The results of each density test must be within acceptable limits. The Engineer will promptly notify the Contractor of observed deficiencies."

Revise the seventh paragraph and all subsequent paragraphs in Section D. of the document "Hot-Mix Asphalt QC/QA Initial Daily Plant and Random Samples" to read:

"Mixtures shall be sampled from the truck at the plant by the Contractor following the same procedure used to collect QC mixture samples (Section A). This process will be witnessed by the Engineer who will take custody of the verification sample. Each sample bag with a verification mixture sample will be secured by the Engineer using a locking ID tag. Sample boxes containing the verification mixture sample will be sealed/taped by the Engineer using a security ID label."



Storm Water Pollution Prevention Plan

Route	Marked Route	Section Number
Deerfield Road	CH 11 (FAU1257)	15-00038-07-WR
Project Number	County	Contract Number
2NEO(590)	Lake	61K62

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Permittee Signature & Date

Shane Schneider, County Eng 6/4/24

SWPPP Notes

Preparing BDE 2342 (Storm Water Pollution Prevention Plan)

Guidance on preparing each section of BDE 2342 (Storm Water Pollution Prevention Plan) is found in Chapter 41 of the IDOT Bureau of Design and Environment (BDE) Manual, please consult this chapter during SWPPP preparation. Please note that the Illinois Environmental Protection Agency (IEPA) has 30 days to review the Notice of Intent (NOI) prior to project approval and any deficiencies can result in construction delays.

The Notice of Intent contains the following documents:

- BDE 2342 (Storm Water Pollution Prevention Plan)
- BDE 2342 A (Contractor Certification Statement)
- Erosion and Sediment Control Plan (See Section 63-4.09 of the BDE Manual)

Non-applicable information

If any section of the SWPPP is not applicable put "N/A" in box rather than leaving blank.

National Pollutant Discharge Elimination System (NPDES) Compliance

Description of Work: This work shall consist of those efforts necessary for compliance with the requirements of the Clean Water Act, Section 402 (NPDES), and the Illinois Environment Protection Act. This provision also provides the background information needed to comply with ILR10 and ILR40 permits for this project.

NPDES COMPLIANCE REQUIREMENTS

Part I: Site Description

1. Describe the project location; include latitude and longitude, section, town, and range.

The project involves work along existing Deerfield Road from Milwaukee Avenue (IL 21/US 45) to Saunders/Riverwoods Road (from approximately STA 93+49 to STA 206+57), Lake County, Illinois (Latitude: N 42° 10' 3"; Longitude: W 87° 53' 49"); Sections: 25,26,35,36; Township: 43N; Range: 11E of the Third Principal Meridian & Sections: 30,31; Township: 43N; Range: 12E of the Third Principal Meridian.

2. Describe the nature of the construction activity or demolition work.

The work to be performed under this contract consists of the reconstruction of a two-mile section of Deerfield Road. The existing roadway is one lane in each direction with open drainage ditches. The proposed improvements include a third lane (flush median), curb & gutter, drainage improvements, Des Plaines River bridge rehabilitation, multi-use path, utility relocations, proposed forcemain & lift station, installation of retaining walls, parking lot reconstruction/resurfacing, auxiliary lane additions at two signalized intersections and through lane/auxiliary lane additions at one intersection. Work will be completed in three stages, plus a pre-stage (installation of temporary drainage & temporary pavement, and basin excavation) and post-stage (bridge rehabilitation). In-stream work is proposed at Thorngate Creek. No in-stream work is proposed at the Des Plaines River. Work to include installation/maintenance of erosion & sediment control (ESC) practices with each applicable stage of construction, final stabilization, removal of temporary ESC measures, and all incidental & collateral work necessary to complete the project as shown on the plans and described in the special provisions.

3. Describe the intended sequence of major activities which disturb soils for major portions of the site (e.g. clearing, grubbing, excavation, grading, on-site or off-site stockpiling of soils, on-site or off-site storage of materials).

See General Notes; Typical Sections; Existing Conditions & Removal Plans; Maintenance of Traffic Plans (including General Notes and Typical Sections); Erosion and Sediment Control Plans (including Notes and Details); Drainage Plan & Profile Sheets (including Notes and Details); and Pavement Marking, Signing, and Landscaping Plans.

4. The total area of the construction site is estimated to be 35 acres.

5. The total area of the site estimated to be disturbed by excavation, grading or other activities is 31 acres.

6. Determine an estimate of the runoff coefficient of the site after construction activities are completed.

C = 0.69

7. Provide the existing information describing the potential erosivity of the soil at discharge locations at the project site.

Based on the Soil Survey of Lake County, the soils located at the discharge locations throughout the project corridor vary, including both hydric and non-hydric silty loam soils. Classified by the Lake County Natural Resources Conservation Service, the hydric soils located at the discharge locations include Sawmill Silty Clay Loam (1107A) soil and Pella Silty Clay Loam (153A) soil. All other soils located at discharge locations not classified as hydric, including Grays silt loam (698B), Bowes silt loam (792A), Fox silt loam (327B), and Wauconda and Frankfort silt loam (981A), still possessed soil characteristics indicative of hydric soil conditions and supported by the presence of hydrophytic vegetation. The existing discharge locations are limited in potential erosivity. The discharge locations include closed conduit storm sewers, roadside ditches, and drainage swales all directly discharging to a wetland/waterway. Based on the soil's K factor, potential for erosion at the discharge locations is anticipated to be minimal under normal circumstances along with the implementation of Best Management Practices.

8. Erosion and Sediment Control Plan (Graphic Plan) is included in the contract. ☒ Yes ☐ No

9. List all soils found within project boundaries; include map until name, slope information, and erosivity.

- 153A - Pella silty clay loam, 0 to 2% slopes (K factor = 0.24 - low susceptibility of soil erosion)
- 228A/B - Nappanee silt loam, 0 to 4% slopes (K factor = 0.43 to 0.49 - high susceptibility of soil erosion)
- 228C2 - Nappanee silty clay loam, 4 to 6% slopes, eroded (K factor = 0.37 - moderate susceptibility of soil erosion)
- 232A - Ashkum silty clay loam, 0 to 2% slopes (K factor = 0.20 - low susceptibility of soil erosion)

- 320A/B - Frankfort silt loam, 0 to 4% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 325A/B - Dresden silt loam, 0 to 4% slopes (K factor = 0.32 - moderate susceptibility of soil erosion)
- 327B - Fox silt loam, 2 to 4% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 442A - Mundelein silt loam, 0 to 2% slopes (K factor = 0.28 - moderate susceptibility of soil erosion)
- 523A - Dunham silty clay loam, 0 to 2% slopes (K factor = 0.28 - moderate susceptibility of soil erosion)
- 526A - Grundelein silt loam, 0 to 2% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 557A - Millstream silt loam, 0 to 2% slopes (K factor = 0.32 - moderate susceptibility of soil erosion)
- 696A/B - Zurich silt loam, 0 to 4% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 697A - Wauconda silt loam, 0 to 2% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 698B - Grays silt loam, 2 to 4% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 792A - Bowes silt loam, 0 to 2% slopes (K factor = 0.32 - moderate susceptibility of soil erosion)
- 830 - Landfills, 2 to 7% slopes (K factor = not available)
- 981A - Wauconda & Frankfort silt loams, 0 to 2% slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 1107A - Sawmill silty clay loam, undrained, cool, 0 to 2% slopes, frequently flooded (K factor = 0.37 - moderate susceptibility of soil erosion)

* K factor = soil erodibility factor

10. List of all MS4 permittees in the area of this project

Illinois Department of Transportation (IDOT), Lake County Division of Transportation (LCDOT), Village of Buffalo Grove, Village of Deerfield, Village of Riverwoods

Note: For sites discharging to an MS4, a separate map identifying the location of the construction site and the location where the MS4 discharges to surface water must be included.

Part II: Waters of the US

1. List the nearest named receiving water(s) and ultimate receiving waters.

Receiving waters- Des Plaines River (AUID IL_G-36), Thorngate Creek (AUID not available), and Aptakisic Creek (AUID IL_GZC); Ultimate receiving water: Des Plaines River

2. Are wetlands present in the project area? ☒ Yes ☐ No

If yes, describe the areal extent of the wetland acreage at the site.

Eighteen (18) wetland/waters of the US areas, nine (9) detention areas, and one (1) rain garden were identified along the Deerfield Road project corridor. Total wetland/waters of the US area = 7.50+ ac (Wetland/Waters #1 = 2.90+ ac; Wetland #13 = 0.05 ac; Wetland #14 = 0.03 ac; Wetland #15 = 0.67+ ac; Wetland #16 = 0.04 ac; Wetland/Waters #17 = 0.81+ ac; Wetland #18 = 0.05 ac; Wetland/Waters #19 = 0.01+ ac; Wetland/Waters #20 = 0.03+ ac; Wetland #26 = 0.09 ac; Wetland #27 = 0.25 ac; Wetland #31 = 0.27+ ac; Wetland/Waters #32 = 0.01 ac; Wetland #33 = 2.03+ ac; Wetland #34 = 0.01 ac; Wetland/Waters #35 = 0.01 ac; Wetland #36 = 0.10+ ac; Wetland #37 = 0.14+ ac). The project requires ±0.48 acre of permanent wetland/waters impact (including impacts at Detention Area #24 - an Isolated Waters of Lake County) and ±0.02 ac of temporary impact at Thorngate Creek (Wetland/Waters #17). Wetland/waters of the US impacts associated with this project have been authorized by the US Army Corps of Engineers (USACE) under Nationwide Permit 14 #LRC-2011-00290 dated 06/03/2026 and will be coordinated with Local and State Agencies, as necessary.

3. Natural buffers:

For any storm water discharges from construction activities within 50 feet of a Waters of the United States, except for activities for water-dependent structures authorized by a Section 404 permit, the following shall apply:

(i) A 50-foot undisturbed natural buffer between the construction activity and the Waters of the United States has been provided

☐ Yes ☒ No; and/or

(ii) Additional erosion and sediment controls within that area has been provided

☒ Yes ☐ No; and Describe: Refer to Erosion Control Plans and Section X below.

Part III. Water Quality

1. Water Quality Standards

As determined by the Illinois Pollution Control Board, Illinois waters have defined numeric limits of pollutants under the umbrella term "Water Quality Standards." In the following table are commonly used chemicals/practices used on a construction site. These chemicals if spilled into a waterway, could potentially contribute to a violation of a Water Quality Standard. If other chemicals that could contribute a violation of a Water Quality Standard, add as needed.

☒ Fertilizer (check as appropriate)	☒ Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
☒ Nitrogen	☒ Waste water for concrete washout station
☐ Phosphorus, and/or	☐ Coal tar Pitch Emulsion
☒ Potassium	☐ Other (Specify) _____
☒ Herbicide	☐ Other (Specify) _____

Table 1: Common chemicals/potential pollutants used during construction

If no boxes are checked in Table 1 above, check the following box:

- ☐ There are no chemicals on site that will exceed a Water Quality Standards if spilled.

If any boxes are checked in Table 1 above, check the following box:

There are chemicals on site that if spilled could potentially cause an exceedance of a Water Quality Standard. The Department shall implement Pollution Prevention/Good Housekeeping Practices as described in the Department's ILR40 Discharge for Small

- ☒ Municipal Separate Storm Sewer Systems (MS4) reiterated below and Part VIII. Unexpected Regulated Substances/Chemical Spill Procedures:

Pollution Prevention:

The Department will design, and the contractor shall, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants from construction activities. At a minimum, such measures must be designed, installed, implemented and maintained to:

- (a) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.
- (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, chemical storage tanks, deicing material storage facilities and temporary stockpiles, detergents, sanitary waste, and other materials present on the site exposed to precipitation and to storm water.
- (c) Minimize the discharge of pollutants from spills, leaks and vehicle and equipment maintenance and repair activities and implement chemical spill and leak prevention and response procedures;
- (d) Minimize the exposure of fuel, oil, hydraulic fluids, other petroleum products, and other chemicals by storing in covered areas or containment areas. Any chemical container with a storage of 55 gallons or more must be stored a minimum of 50 feet from receiving waters, constructed or natural site drainage features, and storm drain inlets. If infeasible due to site constraints, store containers as far away as the site permits and document in your SWPPP the specific reasons why the 50-foot setback is infeasible and how the containers will be stored.
- (e) The contractor is to provide regular inspection of their construction activities and Best Management Practices (BMPs). Based on inspection findings, the contractor shall determine if repair, replacement, or maintenance measures are necessary in order to ensure the structural integrity, proper function, and treatment effectiveness of structural storm water BMPs. Necessary maintenance shall be completed as soon as conditions allow to prevent or reduce the discharge of pollutants to storm water or as ordered by the Engineer. The Engineer shall conduct inspections required in Section XI Inspections, and report to the contractor deficiencies noted. These Department conducted inspections do not relieve the contractor from their responsibility to inspect their operations and perform timely maintenance; and
- (f) In addition, all IDOT projects are screened for Regulated Substances as described in Section 27-3 of the BDE Manual and implemented via Section 669: Removal and Disposal of Regulated substances in the Standard Specifications for Road and Bridge Construction.

Approved alterations to the Department's provided SWPPP, including those necessary to protect Contractor Borrow, Use and Waste areas, shall be designed, installed, implemented and maintained by the Contractor in accordance with IDOT Standard Specifications Section 280.

2. 303(d) Impaired Waterways

Does the project area have any 303(d) impaired waterways with the following impairments?

- suspended solids
- turbidity, and or
- siltation

☒ Yes ☐ No

If yes, list the name(s) of the listed water body and the impairment(s)

303(d) waterbody	Impairments(s)
Des Plaines River (AUID IL_G-36)	Impairment causes include fecal coliform, mercury, phosphorus, polychlorinated biphenyls (PCBs), and unknown causes.

In addition, It is paramount that the project does not increase the level of the impairment(s) described above. Discuss which BMPs will be implemented to reduce the risk of impairment increase

To reduce the risk of impairment increase, BMPs implemented in close proximity to the Des Plaines River to include an erosion control blanket, inlet filters, a double perimeter erosion barrier, temporary ditch checks, and protection of existing vegetation. Phosphorous fertilizer nutrient shall not be used on Lake County highways. Additionally, vegetation removal, soil exposure, and staging construction activities will be coordinated as necessary to minimize idle, disturbed soils adjacent to buffer areas and wetlands/surface waters.

3. Total Maximum Daily Load (TMDL)

Does the project include any receiving waters with a TMDL for sediment, total suspended solids, turbidity or siltation? ☐ Yes ☒ No

If yes, List TMDL waterbodies below and describe associated TMDL

TMDL waterbody	TMDL

Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL

Not applicable- receiving bodies of water do not have a TMDL

If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation

Not applicable- receiving bodies of water do not have a TMDL

Part IV. Temporary Erosion and Sediment Controls

Stabilization efforts must be initiated within 1 working day of cessation of construction activity and completed within 14 days. Areas must be stabilized if they will not be disturbed for at least 14 calendar days. Exceptions to this time frame include:

- Where the initiation of stabilization measures is precluded by snow cover, stabilization measures must be initiated as soon as practicable,
- On areas where construction activities have temporarily ceased and will resume after 14 days, a temporary stabilization method can be used (temporary stabilization techniques must be described), and
- Stabilization is not required for exit points at linear utility construction site that are used only episodically and for very short durations over the life of the project, provided other exit point controls are implemented to minimize sediment track-out.

Additionally, a record must be kept with the SWPPP throughout construction of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated.

At a minimum, controls must be coordinated, installed and maintained to:

1. Minimize the amount of soil exposed during construction activity.
2. Minimize the disturbance of steep slopes.
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible.
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

Note: For practices below, consult relevant design criteria in Chapter 41 of the BDE Manual and maintenance criteria in Erosion and Sediment Control Field Guide for Construction.

1. Erosion Control:

The following are erosion control practices which may be used on a project (place a check by each practice that will be utilized on the project, add additional practices as needed):

☐ Mulch	☒ Preservation of existing vegetation
☒ Erosion Control Blanket	☐ Temporary Turf Cover Mixture (Class 7)
☐ Turf Reinforcement Mat	☒ Permanent seeding (Class 1-6)
☐ Sodding	☒ Other (Specify) <u>Temporary Erosion Control Seeding</u>
☐ Geotextile fabric	☒ Other (Specify) <u>Tree Protection</u>
	☐ Other (Specify) _____

2. Sediment Control:

The following sediment control devices will be implemented on this project:

☒ Ditch Checks	☒ Perimeter Erosion Barrier
☒ Inlet and Pipe protection	☐ Rolled Excelsior
☐ Hay or Straw bales	☐ Silt Filter Fence
☐ Above grade inlet filters (fitted)	☐ Urethane foam/geotextiles
☐ Above grade inlet filters (non-fitted)	☐ Other (Specify) _____
☒ Inlet filters	☐ Other (Specify) _____
	☐ Other (Specify) _____

3. Structural Practices:

Provide below is a description of structural practices that will be implemented:

☐ Aggregate Ditch	☒ Stabilized Construction Exits
☐ Articulated Block Revetment Mat	☐ Stabilized Trench Flow
☐ Barrier (Permanent)	☐ Sediment Basin
☐ Concrete Revetment Mats	☒ Retaining Walls
☒ Dewatering Filtering	☐ Riprap
☐ Gabions	☒ Storm Drain Inlet Protection
☒ In-Stream or Wetland Work	☐ Slope Walls
☐ Level Spreaders	☐ Sediment Trap
☐ Paved Ditch	☐ Other (Specify) _____
☐ Permanent Check Dams	☐ Other (Specify) _____
☐ Precast Block Revetment Mat	☐ Other (Specify) _____
☒ Rock Outlet Protection	☐ Other (Specify) _____

4. Polymer Flocculants

Design guidance for polymer flocculants is available in Chapter 41 of the BDE Manual. In addition, Polymer Flocculants may only be used by district Special Provision.

If polymer flocculants are used for this project, the following must be adhered to and described below:

- Identify the use of all polymer flocculants at the site.
- Dosage of treatment chemicals shall be identified along with any information from any Material Safety Data Sheet.
- Describe the location of all storage areas for chemicals.
- Include any information from the manufacturer's specifications.
- Treatment chemicals must be stored in areas where they will not be exposed to precipitation.
- The SWPPP must describe procedures for use of treatment chemicals and staff responsible for use/application of treatment chemicals must be trained on the established procedures.

Polymer flocculants or treatment controls are not proposed at this time. However, if during construction activities, it is determined that polymer flocculants or treatment chemicals are necessary to maintain permit compliance, the SWPPP shall be updated. The Contractor must obtain approval from the Engineer prior to the use of any proposed polymer flocculants or treatment chemicals.

Part V. Other Conditions

1. Dewatering

Will dewatering be required for this project? ☒ Yes ☐ No

If yes, the following applies:

- Dewatering discharges shall be routed through a sediment control (e.g., sediment trap or basin, pumped water filter bag) designed to minimize discharges with visual turbidity;
- The discharge shall not include visible floating solids or foam;
- The discharge must not cause the formation of a visible sheen on the water surface, or visible oily deposits on the bottom or shoreline of the receiving water. An oil-water separator or suitable filtration device shall be used to treat oil, grease, or other similar products if dewatering water is found to or expected to contain these materials;
- To the extent feasible, use well-vegetated (e.g., grassy or wooded), upland areas of the site to infiltrate dewatering water before discharge;
- You are prohibited from using receiving waters as part of the treatment area;
- To minimize dewatering-related erosion and related sediment discharges, use stable, erosion-resistant surfaces (e.g., well-vegetated grassy areas, clean filler stone, geotextile underlayment) to discharge from dewatering controls. Do not place dewatering controls, such as pumped water filter bags, on steep slopes (15% or greater in grade);
- Backwash water (water used to backwash/clean any filters used as part of storm water treatment) must be properly treated or hauled off-site for disposal;
- Dewatering treatment devices shall be properly maintained; and
- See Part XI (Inspections) for inspection requirement.

Part VI. Permanent (i.e., Post-Construction) Storm Water Management Controls

Provided below is a description of measures that may be installed during the construction process to control volume and therefore the amount pollutants in storm water runoff that can occur after construction operations have been completed.

Practices may include but are not limited to the following:

- Aggregate ditch checks;
- bioswales,
- detention pond(s),
- infiltration trench;
- retention pond(s),
- open vegetated swales and natural depressions,
- treatment train (sequential system which combine several practices).
- Velocity dissipation devices (See Structural Practices above)

Describe these practices below

- Proposed Des Plaines River detention/compensatory storage basin.
- Proposed Thorngate Creek detention/compensatory storage basin.
- Proposed inline detention storm sewer & box culvert.
- Tree preservation, permanent seeding (installed with erosion control blanket), and wetland/waters buffer shall be used as a permanent erosion control measure.
- Velocity dissipation device/rock outlet protection.

Part VII. Additional Practices Incorporated From Local Ordinance(s)

In some instances, an additional practice from a local ordinance may be included in the project. If so, describe below (Note: the Department is not subject to local ordinances)

Lake County Watershed Development Ordinance (WDO) Permit, See Lake County Stormwater Management Commission Soil Erosion and Sediment Control Construction Notes

Part VIII. Unexpected Regulated Substances/Chemical Spill Procedures

When Unexpected Regulated Substances or chemical spills occur, Article 107.19 of the Standard Specifications for Road and Bridge Construction shall apply. In addition, it is the contractor's responsibility to notify the Engineer in the event of a chemical spill into a ditch or waterway, the Engineer will then notify appropriate IEPA and IEMA personnel for the appropriate cleanup procedures.

Part IX. Contractor Required Submittals

Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342A.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:

- Approximate duration of the project, including each stage of the project
- Rainy season, dry season, and winter shutdown dates
- Temporary stabilization measures to be employed by contract phases
- Mobilization time-frame
- Mass clearing and grubbing/roadside clearing dates

- Deployment of Erosion Control Practices
- Deployment of Sediment Control Practices (including stabilized construction entrances and exits to be used and how they will be maintained)
- Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
- Paving, saw-cutting, and any other pavement related operations
- Major planned stockpiling operation
- Time frame for other significant long-term operations or activities that may plan non-storm water discharges as dewatering, grinding, etc.
- Permanent stabilization activities for each area of the project

2. During the pre-construction meeting, the Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:

- Temporary Ditch Checks - Identify what type and the source of Temporary Ditch Checks that will be installed as part of the project. The installation details will then be included with the SWPPP.
- Vehicle Entrances and Exits - Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
- Material Delivery, Storage and Use- Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project. Specifically, any chemical stored in a 55 gallon drum provided by the contractor.
- Stockpile Management - Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal - Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control - Discuss steps that will be taken in the event of a material spill.
- Concrete Residuals and Washout Wastes - Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management - Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Fueling - Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance - Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering Activities - Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.

Additional measures indicated in the plan

Dust suppression shall be used to control dust and airborne dirt generated by the Contractor's construction activities. Dust control (if necessary) shall follow IDOT Standard Specifications.

Part X. Maintenance

It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications. However, when requested by the Contractor, the Resident Engineer will provide general maintenance guides (e.g., IDOT Erosion and Sediment Control Field Guide) to the Contractor for the practices associated with this project. Any damage or undermining shall be repaired immediately.

For Inlet Protection: Where there is evidence of sediment accumulation adjacent to the inlet protection measure, the deposited sediment must be removed by the following business day.

Below, describe procedures to maintain in good and effective operating conditions

All controls shall be maintained in good working order by the General Contractor or Subcontractor. If repair is warranted, it shall be completed as soon as possible. New control measures needed or controls needing repair

or modification as a result of an inspection shall be implemented as soon as practical, but no later than seven (7) calendar days following the inspection. Requests for repairs to existing controls or new control measures requested by a Regulatory Agency shall be initiated within 24 hours.

- A 50-ft undisturbed, natural buffer will be provided where practicable and feasible. When not feasible, Waters of the US and on site wetlands will be protected by Best Management Practices (BMPs) as discussed in this Storm Water Pollution Prevention Plan (SWPPP) and as shown on the Erosion Control Plan including perimeter erosion barrier (including a double row of perimeter erosion barrier),inlet filters, inlet protection, temporary ditch checks, and erosion control blankets. Additionally, vegetation removal, soil exposure, and staging construction activities will be coordinated as necessary to minimize idle, disturbed soils adjacent to buffer areas and wetlands/surface waters.

- Inlet Protection: Remove sediment from inlet filter baskets when basket is 25% full or 50% of the fabric pores are covered with silt. Clean filter if standing water is present longer than one hour after a rain event. Clean sediment or replace silt fence when sediment accumulates to one-third the height of the fabric. Where there is evidence of sediment accumulation adjacent to the inlet protection device, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible. Remove trash accumulated around or on top of the inlet protection device. When filter is removed for cleaning, replace fabric if any tear is present.

- Outlet Protection/Riprap: Restore dislodged protection and correct erosion that may occur. Remedy deficient areas prone to increased erosion immediately to prevent greater deficiencies.

- Perimeter Erosion Barrier (PEB): Repair tears, gaps or undermining. Restore leaning/displaced PEB and ensure taut/functional/secure. Repair/replace any missing/broken stakes or damaged sections of PEB immediately. Clean PEB if sediment reaches one-half to one-third of the effective height of the barrier, or as directed by the Engineer (varies per type of PEB). Remove PEB once final stabilization is established. Repair PEB if undermining occurs anywhere along its entire length.

- Temporary Ditch Checks: Remove sediment from upstream side of ditch checks when sediment has reached 50% of height of structure. Repair or replace ditch checks whenever tears, splits, unraveling or compressed excelsior is apparent. Replace torn fabric mat that may allow water to undermine ditch check. Remove debris (garbage, crop residue, etc.) when observed. Reestablish the flow over the center of the ditch check. Water or sediment going around the ditch check indicates incorrect installation, device needs lengthening, or the selected device is inappropriate for site conditions. Remove ditch checks once all upslope areas are stabilized and seed or otherwise stabilize temporary ditch check areas.

- Erosion Control Blanket: Repair damage due to water running beneath the blanket and restore blanket when displacement occurs. Reseeding may be necessary. Replace all displaced blanket and re-staple.

- Seeding: Reapply seed if stabilization hasn't been achieved. Apply erosion control blanket (or alternative approved by Engineer) to hold seed in place if seed has been washed away or found to be concentrated in ditch bottoms. Restore rills as quickly as possible on slopes steeper than 4:1 (H:V) to prevent sheet flow from becoming concentrated flow patterns. Mow, if necessary, to promote seed soil contact when excessive weed development occurs. Supplement seed if weather conditions (extreme heat or cold) are not conducive to germination.

- Protection of Existing Vegetation: Tree and stump removal to be completed by the Contractor. Replace damaged vegetation with similar species as directed by the Engineer. Restore areas disturbed, disrupted or damaged by the Contractor to pre-construction conditions or better at no additional expense to the contract. Trim any cuts, skins, scrapes or bruises to the bark of the vegetation and utilize local nursery accepted procedures to seal damaged bark. Prune all tree branches broken, severed or damaged during construction. Cut all limbs and branches, one-half inch or greater in diameter, at the base of the damage, flush with the adjacent limb or tree trunk. Smoothly cut, perpendicular to the root, all cut, broken, or severed (during

construction) roots 1-inch or greater in diameter. Cover roots exposed during excavation with moist earth and/or backfill immediately to prevent roots from drying.

- **Temporary Stabilized Construction Entrances:** Replenish stone or replace exit if vehicles continue to track sediment onto the roadway from the construction site. Any sediment reaching a public or private roadway shall be removed before the end of the work day or sooner if directed by the Engineer. Track out shall be removed by sweeping or shoveling these surfaces (or by using other similarly effective means of sediment removal approved by the Engineer). Hosing or sweeping tracked out sediment into any storm water conveyance, storm drain inlet, or waters of the US is prohibited (unless the feature is connected to a sediment basin/trap or similarly effective control). Ensure culverts (if provided) are free from damage; repair or replace as needed.
- **Stockpile Management:** Repair and/or replace perimeter controls and stabilization measures when stockpile material has potential to be discharged or leave the limits of the protection. Remove all off-tracked material by sweeping or other methods. Update the SWPPP any time a stockpile location has been removed, relocated, added or required maintenance. During summer months, stockpiles should be watered to maintain the cover crop.
- **Dewatering:** Ensure proper operation and compliance with permits or water quality standards. Remove accumulated sediment from the flow area. Dispose of sediment in accordance with all applicable laws and regulations. Remove and replace dewatering bags (if used) when half full of sediment or when discharge rate is impractical. Immediately stop discharge if receiving areas show signs of cloudy water, erosion, sediment accumulation, formation of a visible sheen on the water surface, or visible oily deposits on the bottom of the receiving water. Dewatering discharge shall be inspected daily in accordance with the NPDES ILR10 Permit.
- **Temporary Concrete Washout:** Do not discharge wastewater into the environment (Note: Acidity, not particulates, is environmentally detrimental). Facilitate evaporation of low volume washout water. Clean and remove any discharges within 24 hours of discovery. If effluent cannot be removed prior to anticipated rainfall event, place and secure a non-collapsing, non-water collecting cover over the washout facility to prevent accumulation and precipitation overflow. Replace damaged liner immediately. Remove washout when no longer needed and restore disturbed areas to original condition. Properly dispose of solidified concrete waste.
- **Material Delivery and Storage:** Document the various types of materials delivered and their storage locations in the SWPPP. Update the SWPPP any time significant changes occur to material storage or handling locations and when they have been removed. Clean-up spills immediately. Remove empty containers.
- **Solid Waste Management:** Designate a waste collection area(s) and identify them in the SWPPP. Inspect inlets, outfalls, and drainageways for litter, debris, containers, etc. Observe the construction site for improper waste disposal. Update the SWPPP any time the trash management plan significantly changes. Correct items discarded outside of designated areas.
- **Vehicle & Equipment Fueling, Cleaning, and Maintenance:** Clean-up spills immediately. Contractor must provide documentation that spills were cleaned, materials disposed of, and impacts mitigated. Update the SWPPP when designated location has been removed, relocated, added or requires maintenance. In the event of a spill into a storm drain, waterway or onto a paved surface, the owner of the fuel must immediately take action to contain the spill. Once contained, clean-up the spill. As an initial step, this may involve collecting any bulk material and placing it in a secure container for later disposal. Follow-up cleaning will also be required to remove residues from paved or other hard surfaces.
- **Portable Restroom Facilities:** Maintain in accordance with applicable laws to prevent unsanitary conditions. Check for leaks and remove and replace as needed.

Additional information can be found in the IDOT Erosion and Sediment Control Field Guide and the Illinois Urban Manual.

Part XI. Inspections

Qualified personnel shall inspect disturbed areas of the construction site that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm or by the end of the following business or workday that is 0.50 inches or greater or equivalent snowmelt (except as allowed for Frozen Conditions).

In addition, all areas where storm water typically flows within the site should be inspected periodically to check for evidence of pollutants entering the drainage system, as well as all locations where stabilization measures have been implemented to ensure they are operating correctly.

Inspections shall be documented on the form BC 2259 (Storm Water Pollution Prevention Plan Erosion Control Inspection Report).

The Erosion and Sediment Control Field Guide for Construction Inspection shall be consulted as needed.

Dewatering

For site(s) discharging dewatering water, an inspection during the discharge shall be done once per day on which the discharge occurs and record the following in a report within 24 hours of completing the Inspection:

- The inspection date;
- Names and titles of personnel performing the inspection;
- Approximate times that the dewatering discharge began and ended on the day of inspection;
- Estimates of the rate (in gallons per day) of discharge on the day of inspection;
- Whether or not any of the following indications of pollutant discharge were observed at the point of discharge: a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.

Frozen Conditions

Inspections may be reduced to once per month when all construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities resume, either temporarily or continuously, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

Flooding or unsafe conditions

Areas that are inaccessible during required inspections due to flooding or other unsafe conditions must be inspected within 72 hours of becoming accessible.

Part XII. Incidence of Noncompliance (ION)

The Department shall notify the appropriate Agency Field Operations Section office by email as described on the IEPA ION form, within 24 hours of any incidence of noncompliance for any violation of the storm water pollution prevention plan observed during any inspection conducted, or for violations of any condition of this permit.

The Department shall complete and submit within 5 days an "Incidence of Noncompliance" (ION) report for any violation of the storm water pollution prevention plan observed during any Inspection conducted, or for violations of any condition of this permit. Submission shall be on forms provided by the IEPA and include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. Corrective actions must be undertaken immediately to address the identified non-compliance issue(s).

Illinois EPA
2520 W. Iles Ave./P.O. Box 19276
Springfield, IL 62794-9276

Please note that if these are delivered via FedEx or UPS, these carriers cannot deliver to our P.O. Box and this number must be excluded from the mailing address.

Part XIII. Corrective Actions

Corrective actions must be taken when:

- A storm water control needs repair or replacement;
- A storm water control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly;
- Discharges are causing an exceedance of applicable water quality standards; or
- A prohibited discharge has occurred.

Corrective Actions must be completed as soon as possible and documented within 7 days in an Inspection Report or report of noncompliance. If it is infeasible to complete the installation or repair within 7 calendar days, it must be documented in the records why it is infeasible to complete the installation or repair within the 7 day time-frame and document the schedule for installing the storm water control(s) and making it operational as soon as feasible after the 7-day time-frame.. In the event that maintenance is required for the same storm water control at the same location three or more times, the control must be repaired in a manner that prevents continued failure to the extent feasible, and it must be documented the condition and how it was repaired in the records. Alternatively, it must be documented why the specific re-occurrence of this same issue must continue to be addressed as a routine maintenance fix.

Part XIV. Retention of Records

The Department must retain copies of the SWPPP and all reports and notices required by this permit, records of all data used to complete the NOI to be covered by this permit, and the Agency Notice of Permit Coverage letter for at least three years from the date that the permit coverage expires or is terminated. the permittee must retain a copy of the SWPPP and any revisions to the SWPPP required by this permit at the construction site from the date of project initiation to the date of final stabilization. Any manuals or other documents referenced in the SWPPP must also be retained at the construction site.

Part XV. Failure to Comply

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the contractor (See Article 105.03 Conformity with Contract)

Part XVI. Keeping the SWPPP (“plan”) Current

IDOT shall amend the plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to Waters of the United States and which has not otherwise been addressed in the plan or if the plan proves to be ineffective in eliminating or significantly minimizing sediment and/or pollutants identified under paragraph Part II. Water Quality or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with construction site activity.

In addition, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the plan. Amendments to the plan may be reviewed by the IEPA the same manner as the SWPPP and Erosion and Sediment Control Plan (ESCP) submitted as part of the Notice of Intent (NOI). The SWPPP and site map must be modified within 7 days for any changes to construction plans, storm water controls or other activities at the site that are no longer accurately reflected in the SWPPP.

In addition, the NOI shall be modified using the CDX system for any substantial modifications to the project such as:

- address changes
- new contractors
- area coverage
- additional discharges to Waters of the United States, or
- other substantial modifications (e.g. addition of dewatering activities).

The notice of intent shall be modified within 30 days of the modification to the project.

Part XVII: Notifications

In addition to the NOI submitted to IEPA, all MS4 permittees identified in Part I. Site Description shall receive a copy of the NOI.

Part XVIII. Notice of Termination

Where a site has completed final stabilization and all storm water discharges from construction activities that are authorized by this permit are eliminated, the permittee must submit a completed Notice of Termination (NOT) that is signed in accordance with ILR10 permit.

Method of Measurement: NPDES Compliance shall not be measured for payment separately. Measurement for payment for Temporary Erosion and Sediment Control shall be in accordance with Section 280 or as otherwise provided in the contract. Permanent BMPs necessary to comply with this provision shall be measured for payment in accordance with their respective provisions in the contract.

Basis of Payment: NPDES Compliance shall not be paid for separately. Payment for Temporary Erosion and Sediment Control shall be in accordance with Section 280 or as otherwise provided in the contract. Permanent BMPs necessary to comply with this provision shall be paid for in accordance with their respective payment provisions in the contract.



Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Uncontaminated Soil Certification
by Licensed Professional Engineer or Licensed Professional Geologist
for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation LPC-663

Revised in accordance with 35 Ill. Adm. Code 1100, as
amended by PCB R2012-009 (eff. Aug. 27, 2012)

This certification form is to be used by professional engineers and professional geologists to certify, pursuant to 35 Ill. Adm. Code 1100.205(a)(1)(B), that soil (i) is uncontaminated soil and (ii) is within a pH range of 6.26 to 9.0. If you have questions about this form, please telephone the Bureau of Land Permit Section at 217/524-3300.

This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: FAU 1257 (Deerfield Road) Office Phone Number, if available: _____

Physical Site Location (address, including number and street):

2001-2055 N. Milwaukee Avenue (ISGS #3488V-7)

City: Riverwoods State: IL Zip Code: 60015

County: Lake Township: Vernon

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 42.16991 Longitude: - 87.92175

(Decimal Degrees)

(-Decimal Degrees)

Identify how the lat/long data were determined:

☐ GPS ☒ Map Interpolation ☐ Photo Interpolation ☐ Survey ☐ Other

IEPA Site Number(s), if assigned: BOL: _____ BOW: _____ BOA: _____

Approximate Start Date (mm/dd/yyyy): _____ Approximate End Date (mm/dd/yyyy): _____

Estimated Volume of debris (cu. Yd.): 7

II. Owner/Operator Information for Source Site

Site Owner

Name: Illinois Department of Transportation

Street Address: 201 West Center Court

PO Box: _____

City: Schaumburg State: IL

Zip Code: 60196-1096 Phone: 847-705-4122

Contact: Jeffrey Williams

Email, if available: Jeffrey.Williams@illinois.gov

Site Operator

Name: Illinois Department of Transportation

Street Address: 201 West Center Court

PO Box: _____

City: Schaumburg State: IL

Zip Code: 60196-1096 Phone: 847-705-4122

Contact: Jeffrey Williams

Email, if available: Jeffrey.Williams@illinois.gov

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms Management Center.

Uncontaminated Soil Certification

III. Basis for Certification and Attachments

For each item listed below, reference the attachments to this form that provide the required information.

- a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located 35 Ill. Adm. Code 1100.610(a)]:

Location 3488V-07-B01 was sampled within the construction zone at ISGS #3488V-7 (The Shoppes of Riverwoods). Refer to PSI Report for ISGS #3488V-7 (The Shoppes of Riverwoods) for site ISGS #3488V-7 (The Shoppes of Riverwoods).

- b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0, including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201 (g), 1100.205(a), 1100.610]:

See attached data summary table and associated laboratory data package 500-249379-1.

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist

I, Thomas C. Campbell, P.E. (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

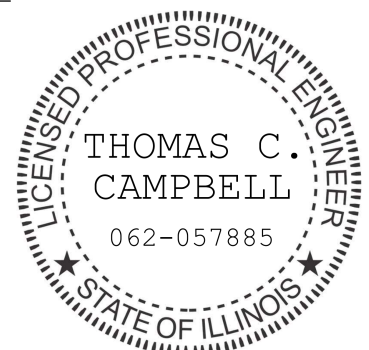
Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name: WSP USA
 Street Address: 115 W Washington St. Suite 1270S
 City: Indianapolis State: IN Zip Code: 46204
 Phone: (317) 972-1706

Thomas C. Campbell, P.E.
 Printed Name:


 Licensed Professional Engineer or
 Licensed Professional Geologist Signature:

01/15/2025
 Date:



Expires 11/30/2025

P.E or L.P.G. Seal:



Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Uncontaminated Soil Certification by Licensed Professional Engineer or Licensed Professional Geologist for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation LPC-663

Revised in accordance with 35 Ill. Adm. Code 1100, as
amended by PCB R2012-009 (eff. Aug. 27, 2012)

This certification form is to be used by professional engineers and professional geologists to certify, pursuant to 35 Ill. Adm. Code 1100.205(a)(1)(B), that soil (i) is uncontaminated soil and (ii) is within a pH range of 6.26 to 9.0. If you have questions about this form, please telephone the Bureau of Land Permit Section at 217/524-3300.

This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: FAU 1257 (Deerfield Road) Office Phone Number, if available: _____

Physical Site Location (address, including number and street):

1550 Deerfield Parkway (ISGS #3488V-8)

City: Buffalo Grove State: IL Zip Code: 60089

County: Lake Township: Vernon

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 42.16921 Longitude: -87.92409

(Decimal Degrees)

(-Decimal Degrees)

Identify how the lat/long data were determined:

☐ GPS ☒ Map Interpolation ☐ Photo Interpolation ☐ Survey ☐ Other

IEPA Site Number(s), if assigned: BOL: 0314185062 BOW: _____ BOA: _____

Approximate Start Date (mm/dd/yyyy): _____ Approximate End Date (mm/dd/yyyy): _____

Estimated Volume of debris (cu. Yd.): 150

II. Owner/Operator Information for Source Site

Site Owner

Name: Illinois Department of Transportation

Street Address: 201 West Center Court

PO Box: _____

City: Schaumburg State: IL

Zip Code: 60196-1096 Phone: 847-705-4122

Contact: Jeffrey Williams

Email, if available: Jeffrey.Williams@illinois.gov

Site Operator

Name: Illinois Department of Transportation

Street Address: 201 West Center Court

PO Box: _____

City: Schaumburg State: IL

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This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms Management Center.

Uncontaminated Soil Certification**III. Basis for Certification and Attachments**

For each item listed below, reference the attachments to this form that provide the required information.

- a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located 35 Ill. Adm. Code 1100.610(a)]:

Location 3488V-08-B01 was sampled within the construction zone at ISGS #3488V-8 (Woodman's). Refer to PSI Report for ISGS #3488V-8 (Woodman's) for site ISGS #3488V-8 (Woodman's).

- b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0, including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201 (g), 1100.205(a), 1100.610]:

See attached data summary table and associated laboratory data package 500-249379-1.

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist

I, Thomas C. Campbell, P.E. (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name: WSP USA
Street Address: 115 W Washington St. Suite 1270S
City: Indianapolis State: IN Zip Code: 46204
Phone: (317) 972-1706

Thomas C. Campbell, P.E.

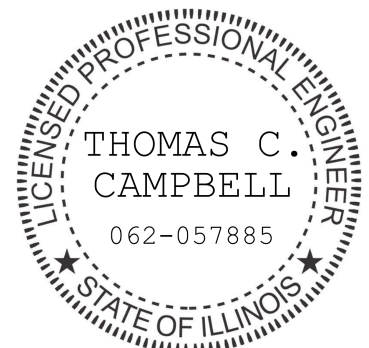
Printed Name:



Licensed Professional Engineer or
Licensed Professional Geologist Signature:

01/15/2025

Date:



Expires 11/30/2025



Illinois Environmental Protection Agency

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This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: Deerfield Road Improvements PSI Office Phone Number, if available: _____

Physical Site Location (address, including number and street):

Deerfield Rd from 530' west of Milwaukee Ave to Saunders Rd, Portwine Rd, Saunders Rd, and Thorngate Creek (see attached)

City: Buffalo Grove, Riverwoods State: IL Zip Code: 60123

County: Lake Township: West Deerfield

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 42.16759 Longitude: - 87.89912

(Decimal Degrees)

(-Decimal Degrees)

Identify how the lat/long data were determined:

☐ GPS ☒ Map Interpolation ☐ Photo Interpolation ☐ Survey ☐ Other

Approximate center of Project Area using Google Earth (decimal degrees)

IEPA Site Number(s), if assigned: BOL: _____ BOW: _____ BOA: _____

Approximate Start Date (mm/dd/yyyy): _____ Approximate End Date (mm/dd/yyyy): _____

Estimated Volume of debris (cu. Yd.): _____

II. Owner/Operator Information for Source Site

Site Owner

Name: Lake County Division of Transportation

Street Address: 600 W. Winchester Road

PO Box: _____

City: Libertyville State: IL

Zip Code: 60048 Phone: 847-377-7447

Contact: Chuck Gleason - LCDOT Project Manager

Email, if available: cgleason@lakecountyil.gov

Site Operator

Name: _____

Street Address: _____

PO Box: _____

City: _____ State: _____

Zip Code: _____ Phone: _____

Contact: _____

Email, if available: _____

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms Management Center.

Uncontaminated Soil Certification**III. Basis for Certification and Attachments**

For each item listed below, reference the attachments to this form that provide the required information.

- a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located 35 Ill. Adm. Code 1100.610(a)]:

Thirty-three (33) potentially impacted properties (PIPs) identified from the database review, historical aerial photographs, or site visits with 2022 PESA and 2026 PESA Validation. A total of 45 soil borings were advanced within the Project Area in November 2025. Soil borings were advanced to provide coverage of proposed excavation areas and to characterize soil.

- b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0, including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201 (g), 1100.205(a), 1100.610]:

Borings were analyzed for one or more of: VOCs; SVOCs; TAL metals (minus Al); TCLP; SPLP; & soil pH. Areas corresponding to each boring achieved the MACs, including soil pH for CCDD disposal, except for nine (9) CCDD Exclusion Areas (as outlined in the narrative). Refer to attached narrative and lab report 25-101817, 25-10819, 25-10573 and 25-10552R2 for details.

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist

I, Jeremy J. Reynolds, P.G. (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name: GZA Illinois, Inc.

Street Address: 1301 West 22nd Street, Suite 510

City: Oak Brook State: IL Zip Code: 60523

Phone: 630-684-4406

Jeremy J. Reynolds, P.G.

Printed Name:



Licensed Professional Engineer or
Licensed Professional Geologist Signature:

Feb 13, 2026

Date:



P.E or L.P.G. Seal:

STATE OF



ILLINOIS

Permit No.: DIL-24-005

Department of Transportation

Division of Highways
2300 South Dirksen Parkway
Springfield, IL 62764

REGULATED FLOODWAY CONSTRUCTION PERMIT RIVERS, LAKES, AND STREAMS ACT "615 ILCS 5"

PERMISSION IS HEREBY GRANTED TO: Lake County Department of Transportation

FOR CONSTRUCTION OF: Deerfield Road Bridge Replacement and Widening over Des Plaines River. Proposed Bridge Replacement and Widening will be a 3 Span Steel Bridge with a Span Lengths of 67.5, 85', and 67.5'. Back-to-Back Abutment Length of 225', and Clear Roadway Width of 42.5. The proposed bridge location is in Section 26/35, Township 43N, Range 11 East of the 3rd P.M. as part of Section 15-00038-07-WR, Structure Number 049-0174.

IN ACCORDANCE WITH THE Application and Plan
DATED November 19, 2024 AND MADE A PART HEREOF, AND SUBJECT TO THE
TERMS SHOWN ON THE BACK HEREOF AND THE SPECIAL CONDITIONS ATTACHED
HERETO AS EXHIBIT.

EXAMINED AND APPROVED

A handwritten signature in blue ink, appearing to read "Jose L. [unclear]", with "IR" written to the right.

REGIONAL ENGINEER/CENTRAL BUREAU CHIEF

11/19/2024

DATE

(a) This permit is granted in accordance with Rivers, Lakes And Streams Act "615 ILCS 5".

(b) This permit does not convey title to the permittee or recognize title of the permittee to any submerged or other lands, and furthermore, does not convey, lease or provide any right or rights of occupancy or use of the public or private property on which the project or any part thereof will be located, or otherwise grant to the permittee any right or interest in or to the property, whether the property is owned or possessed by the State of Illinois or by any private or public party or parties.

(c) This permittee does not release the permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.

(d) This permit does not relieve the permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity; and if the permittee is required by law to obtain approval from any federal agency to do the work, this permit is not effective until the federal approval is obtained.

(e) The permittee shall, at his own expense, remove all temporary piling, cofferdams, false work, and material incidental to the construction of the project, from floodway, river, stream or lake in which the work is done. If the permittee fails to remove such structures or materials, the state may have removal made at the expense of the permittee. If future need for public navigation or public interest of any character, by the state or federal government, necessitates changes in any part of the structure or structures, such changes shall be made by and at the expense of the permittee or his successors as required by the Department of Transportation or other properly constituted agency, within sixty (60) days from receipt of written notice of the necessity from the Department or other agency, unless a longer period of time is specifically authorized.

(f) The execution and details of the work authorized shall be subject to the supervision and approval of the Department. Department personnel shall have right of access to accomplish this purpose.

(g) Starting work on the construction authorized will be considered full acceptance by the permittee of the terms and conditions of the permit.

(h) The Department in issuing this permit has relied upon the statements and representations made by the permittee; if any statement or representation made by the permittee is found to be false, the permit may be revoked at the option of the Department; and when a permit is revoked all rights of the permittee under the permit are voided.

(i) If the project authorized by this permit is located in or along Lake Michigan or a meandered lake, the permittee and his successors shall make no claim whatsoever to any interest in any accretions caused by the project.

(j) In issuing this permit, the Department does not approve the adequacy of the design or structural strength or the structure or improvement.

(k) Noncompliance with the conditions stated herein will make this permit void.

(l) If the work permitted is not initiated on or before six years from the date of issuance as shown on the front of this form, this permit shall be void.



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, CHICAGO DISTRICT
231 SOUTH LA SALLE STREET, SUITE 1500
CHICAGO IL 60604-1437

June 3, 2026

Regulatory Branch (LRC-2011-00290)

SUBJECT: Nationwide Permit Authorization for the Deerfield Road Improvement Project impacting 0.375 Acres of Waters of the U.S. in the Village of Riverwoods, Lake County, Illinois

Chuck Gleason
Lake County Division of Transportation
600 West Winchester Road
Libertyville, Illinois 60048

Dear Mr. Gleason:

The U.S. Army Corps of Engineers, Chicago District, has completed its review of your pre-construction notification for the above referenced project, dated June 21, 2024 for authorization under the Nationwide Permit (NWP) Number 14 – Linear Transportation Projects, submitted on your behalf by Christopher B Burke Engineering, Ltd. This office has verified that your proposed activity complies with the terms and conditions of the NWP.

This determination covers only your project as described above and in the approved project plans titled, "Deerfield Road Reconstruction Wetland Impact Evaluation", dated April 16, 2024 prepared by Lake County DOT. Caution must be taken to prevent construction materials and activities from impacting waters of the United States beyond the scope of this authorization. If the design, location, or purpose of the project is changed, it is recommended that you contact this office to determine the need for further authorization.

The subject activity may be performed without further authorization from this office provided that the activity complies with the NWP terms and general conditions, the regional conditions for Illinois, the special conditions listed below, and the Section 401 Water Quality Certification ("WQC") conditions added by the Illinois Environmental Protection Agency ("IEPA"). The NWP Program terms, general conditions, and regional conditions are listed in the enclosed NWP Summary. The WQC conditions are listed in the enclosed Fact Sheet.

Specifically, we wish to draw your attention to General Condition 21, which requires permittees to notify our office immediately in the event of discovery of previously unknown human remains, Native American cultural items, or archaeological artifacts; and a term of the NWP program, which states that NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

In addition to the general, regional, and water quality conditions of this permit verification, the following special conditions also apply to this verification:

1. This authorization is contingent upon implementing and maintaining soil erosion and sediment controls in a serviceable condition throughout the duration of the project. You shall comply with the Lake County Stormwater Management Commission (LCSMC)'s written and verbal recommendations regarding the soil erosion and sediment control (SESC) plan and the installation and maintenance requirements of the SESC practices on-site.

a. You shall schedule a preconstruction meeting with LCSMC to discuss the SESC plan and the installation and maintenance requirements of the SESC practices on the site. You shall contact the LCSMC at least 10 calendar days prior to the preconstruction meeting so that a representative may attend.

b. You shall notify the LCSMC or the LCSMC's designated agent of any changes or modifications to the approved plan set. Field conditions during project construction may require the implementation of additional SESC measures. If you fail to implement corrective measures, this office may require more frequent site inspections to ensure the installed SESC measures are acceptable.

c. Prior to commencement of any in-stream work, you shall submit construction plans and a detailed narrative disclosing the contractor's preferred method of cofferdam and dewatering method to the LCSMC or the LCSMC's designated agent. Work in the waterway shall NOT commence until the LCSMC notifies you, in writing, that the plans have been approved.

2. Work in the waterway should be timed to take place during low or no-flow conditions. Low flow conditions are flow at or below the normal water elevation.

3. The applicant will provide proof of compensatory mitigation credit purchase prior to beginning work on any portion the authorized project. The applicant will purchase 0.64 acres of compensatory wetland mitigation credits and 340 linear feet of compensatory stream mitigation credits to offset impacts authorized by this permit.

Please note that IEPA has issued Section 401 Water Quality Certification for this NWP. The conditions of this WQC are automatically conditions of this NWP verification and are included in the enclosed Fact Sheet. If you have any questions regarding Section 401 certification, please contact IEPA's Division of Water Pollution Control, Permit Section #15, by telephone at (217) 785-6939.

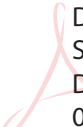
This verification is valid until March 15, 2031 when NWP 14 – Linear Transportation Projects is scheduled to be modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date the NWP is modified, reissued, or revoked, you will have 12 months from the date of the modification, reissuance or revocation to complete the activity under the present terms and conditions. Failure to comply with the general and regional conditions of this NWP, or any project-specific special conditions of this authorization, may result in the suspension or revocation of your authorization.

Once you have completed the authorized activity, please sign and return the enclosed compliance certification as required by general condition 30. If you have any questions, please contact me by telephone at (312) 846-5544, or email at Stasi.F.Brown@usace.army.mil.

Sincerely,

**Stasi
Brown**

Stasi Brown
Senior Project Manager
Regulatory Branch

 Digitally signed by
Stasi Brown
Date: 2026.06.03
08:53:56 -05'00'

Enclosures

Lake County Stormwater Management Commission (Brian Frank)
Christopher B Burke Engineering Ltd (Thomas McCardle)



**PERMIT COMPLIANCE
CERTIFICATION**

Permit Number: LRC-2011-00290

Permittee: Chuck Gleason – Lake County Division of Transportation

Date: June 3, 2026

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of said permit and if applicable, compensatory wetland mitigation was completed in accordance with the approved mitigation plan.¹

PERMITTEE

DATE

Within 30 days after completion of the activity authorized by this permit and any mitigation required by the permit, this certification must be signed and returned to the following address:

Email to: ChicagoRequests@usace.army.mil
Subject: Compliance Certification, LRC-2011-00290

Please note that your permitted activity is subject to compliance inspections by Corps of Engineers representatives. If you fail to comply with this permit, you may be subject to permit suspension, modification, or revocation.

¹ If compensatory mitigation was required as part of your authorization, you are certifying that the mitigation area has been graded and planted in accordance with the approved plan. You are acknowledging that the maintenance and monitoring period will begin after a site inspection by a Corps of Engineers representative or after thirty days of the Corps' receipt of this certification. You agree to comply with all permit terms and conditions, including additional reporting requirements, for the duration of the maintenance and monitoring period.



STORMWATER MANAGEMENT COMMISSION

**WATERSHED DEVELOPMENT PERMIT NUMBER
WDP-26-791
HAS BEEN SECURED**

Project: Deerfield Road Reconstruction

Date Issued: July 8, 2026

Conditions: • See WDP application page 2 for standard permit conditions
• See permit letter for project specific permit conditions

Issued By: Philip Ruiz, P.E., CFM
Principal Permit Engineer

Notice to Contractors and Owners

Post this card at the site, visible from the street and so located as to permit the inspector to record the indicated inspections on the placard. Do not post in the interior of a building.

Inspectors and sheriff's deputies are instructed to stop all work where this permit card is not displayed.

Always mention the Watershed Development Permit number when referring to this project. If this card becomes mislaid or lost please contact Lake County Stormwater Management Commission for a replacement.

Lake County Stormwater Management Commission (847) 377-7700



STORMWATER MANAGEMENT COMMISSION

July 8, 2026

Chuck Gleason
Lake County Division of Transportation
600 West Winchester Road
Libertyville, IL 60048

Subject: SMC Watershed Development Permit #WDP-26-791
Deerfield Road Reconstruction

PERMIT ISSUANCE

Dear Mr. Gleason:

Accompanying this letter is the required Watershed Development Permit for the proposed road improvement. This approval is subject to the conditions on the back of the permit application including the following:

- This permit is being issued prior to receipt of the required \$480 wetland review fee to meet the project schedule.
- Provide prior notification to Tim Cook (of the SMC) of the pre-construction meeting at least 5 calendar days in advance to enable SMC attendance.
- Please note that the erosion control measures indicated on the plans are the minimum requirements. Additional measures may be required, as directed by the engineer, enforcement officer, or other governing agency.
- Please provide SMC with a copy of the NOI application to the IEPA.
- Please coordinate all SE/SC modifications to the plan with the SMC Inspector.
- Discussion at the pre-construction meeting will include:
 - o Notifying the SMC Inspector prior to start of dewatering operations
 - o Designated Erosion Control Inspector (DECI) contact information
 - o Maintenance of sediment and erosion control measures
- The DECI shall provide weekly reports to the SMC Inspector. At a minimum, the reports shall include photographs and evaluation of critical areas, as directed by the SMC Inspector.
- Please be advised that DECI inspections are required until final as-built approval.
- Upon completion, please provide SMC an as-built submittal according to the attached checklist.

- **General Permit #2 Approval:**

It is our determination the project qualifies for isolated wetland impacts approval under SMC's General Permit #2. The project will partially impact five non-high quality Isolated Waters of Lake County (IWLC) totaling 0.055 acre. Since less than 0.10 acre of IWLC will be impacted, no wetland mitigation is required.

Please note the following conditions:

- 1) Minor impacts to Waters of the United States (WOTUS) associated with this project have been authorized under the U.S. Army Corps of Engineers' Nationwide Permit (NWP) 14. You shall comply with the specific conditions of NWP 14 and the general conditions of the NWP program, particularly General Condition 12 – Soil Erosion and Sediment Controls.

This approval is based on the plans entitled:

STATE OF ILLINOIS, DEPARTMENT OF TRANSPORTATION, PLANS FOR PROPOSED FEDERAL AID HIGHWAY, DEERFIELD ROAD (FAU 1257) RECONSTRUCTION, MILWAUKEE AVE TO SAUNDERS RD, SECTION NO.: 15-00038-07-WR, PROJECT 2NE0(590), LAKE COUNTY, JOB NO. C-91-159-16, prepared by Christopher B. Burke Engineering, Ltd., received by SMC June 29, 2026 1019-sheets (Plans Dated 06/28/2026).

Please contact Tim Cook at tcCook@lakecountyil.gov or (847)377-7703 if you have questions or would like to set up the pre-construction meeting.

Sincerely,

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION



Philip Ruiz, P.E., CFM
Principal Permit Engineer



Brian Frank, P.E., CFM
Chief Engineer

Attachment As-built Review Checklist

C: Tim Cook – Lake County SMC
Bill Santelik – Lake County SMC
Edmund Burke – Christopher B. Burke Engineering, Ltd.
Thomas McArdle – Christopher B. Burke Engineering, Ltd.



STORMWATER MANAGEMENT COMMISSION

As-built Review Checklist
(Revised December 2021)

Please provide the following information as indicated when submitting as-built plans for approval. Please ensure that the as-built information is annotated onto the permitted construction plans and is not a stand-alone current conditions exhibit. Plans should be provided in a digital format (PDF).

- ☒ Spot elevations and/or contours for cut and fill areas located in the Regulatory Floodplain.
- ☒ Floodplain cut and fill calculations* based on the as-built survey.
(Benchmark – NAVD88 datum)
- ☒ Spot elevations and contours for all constructed detention and water quality treatment facilities, including:
 - 2-yr and 100-yr water elevation contours
 - Flared end section and restrictor sizes/invert elevations
 - Detailed topography for the emergency overflow spillway
 - Top of berm spot elevations surrounding detention facility
- ☒ Detention volume calculations* and summary (for both the 2-yr and 100-yr events) based on the as-built survey.
- ☒ Storm sewer locations, sizes, inverts and rim elevations. Provide storm sewer network information in a digital file (CAD and/or GIS file).
- ☐ Top of curb elevations at locations of overland flow paths.
- ☐ Overland flow path (swale) as-built cross-section survey (a minimum of two cross-sections, each with at least three points, i.e., one on either bank and one at the invert).
- ☐ Low-floor elevations/lowest adjacent grade elevations for structures adjacent to Regulatory Floodplain, overland flow paths, or detention facilities.
- ☐ Verification of at least 70% vegetative coverage by perennial species, on an aerial basis.
- ☐ Plants comprising a minimum of 50% native vegetation per approved seed/plant list on the permitted plan set.
- ☒ Verification of required native vegetation planted (seed tags, invoices) listing species by scientific name.

* As-built calculations need to be signed, sealed and dated by an Illinois Licensed Professional Engineer.

ACCESSIBLE PEDESTRIAN SIGNALS (APS) (BDE)

Effective: April 1, 2003

Revised: January 1, 2022

Description. This work shall consist of furnishing and installing accessible pedestrian signals (APS). Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid-state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements. The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications. A pushbutton locator tone shall sound at each pushbutton and shall be deactivated during the associated walk indication and when associated traffic signals are in flashing mode. Pushbutton locator tones shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals. Each actuation of the pushbutton shall be accompanied by the speech message "Wait".

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: "Street Name, Walk Sign is on to cross Street Name." For signalized intersections utilizing exclusive pedestrian phasing, the verbal message shall be "Walk sign is on for all crossings". In addition, a speech pushbutton information message shall be provided by actuating the APS pushbutton when the WALK interval is not timing. This verbal message shall be modeled after: "Wait. Wait to cross 'Street Name' at 'Street Name'".

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

At locations with railroad interconnection, an additional speech message stating "Walk time shortened when train approaches" shall be used after the speech walk message. At locations with emergency vehicle preemption, an additional speech message "Walk time shortened when emergency vehicle approaches" shall be used after the speech walk message.

Pedestrian Pushbutton. Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

A red LED shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street.

Signage. A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall conform to one of the following standard MUTCD designs: R10-3, R10-3a, R10-3e, R10-3i, R10-4, and R10-4a.

Tactile Arrow. A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided on the pushbutton.

Vibrotactile Feature. The pushbutton shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Method of Measurement. This work will be measured for payment as each, per pushbutton.

Basis of Payment. This work will be paid for at the contract unit price per each for ACCESSIBLE PEDESTRIAN SIGNALS.

80099

AGGREGATE SUBGRADE IMPROVEMENT (BDE)

Effective: April 1, 2012

Revised: April 1, 2022

Add the following Section to the Standard Specifications:

“SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT

303.01 Description. This work shall consist of constructing an aggregate subgrade improvement (ASI).

303.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate	1004.07
(b) Reclaimed Asphalt Pavement (RAP)	1031.09

303.03 Equipment. The vibratory roller shall be according to Article 1101.01, or as approved by the Engineer. Vibratory machines, such as tampers, shall be used in areas where rollers do not fit.

303.04 Soil Preparation. The minimum immediate bearing value (IBV) of the soil below the improved subgrade shall be according to the Department’s “Subgrade Stability Manual” for the aggregate thickness specified.

303.05 Placing and Compacting. The maximum nominal lift thickness of aggregate gradations CA 2, CA 6, and CA 10 when compacted shall be 9 in. (225 mm). The maximum nominal lift thickness of aggregate gradations CS 1, CS 2, and RR 1 when compacted shall be 24 in. (600 mm).

The top surface of the aggregate subgrade improvement shall consist of a layer of capping aggregate gradations CA 6 or CA 10 that is 3 in. (75 mm) thick after compaction. Capping aggregate will not be required when aggregate subgrade improvement is used as a cubic yard pay item for undercut applications.

Each lift of aggregate shall be compacted to the satisfaction of the Engineer. If the moisture content of the material is such that compaction cannot be obtained, sufficient water shall be added so that satisfactory compaction can be obtained.

303.06 Finishing and Maintenance. The aggregate subgrade improvement shall be finished to the lines, grades, and cross sections shown on the plans, or as directed by the Engineer. The aggregate subgrade improvement shall be maintained in a smooth and compacted condition.

303.07 Method of Measurement. This work will be measured for payment according to Article 311.08.

303.08 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) or ton (metric ton) for AGGREGATE SUBGRADE IMPROVEMENT or at the contract unit price per square yard (square meter) for AGGREGATE SUBGRADE IMPROVEMENT, of the thickness specified.”

Add the following to Section 1004 of the Standard Specifications:

“1004.07 Coarse Aggregate for Aggregate Subgrade Improvement (ASI). The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete. In applications where greater than 24 in. (600 mm) of ASI material is required, gravel may be used below the top 12 in (300 mm) of ASI.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.

(c) Gradation.

(1) The coarse aggregate gradation for total ASI thickness less than or equal to 12 in. (300 mm) shall be CA 2, CA 6, CA 10, or CS 1.

The coarse aggregate gradation for total ASI thickness greater than 12 in. (300 mm) shall be CS 1 or CS 2 as shown below or RR 1 according to Article 1005.01(c).

	COARSE AGGREGATE SUBGRADE GRADATIONS				
Grad No.	Sieve Size and Percent Passing				
	8”	6”	4”	2”	#4
CS 1	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 2		100	80 ± 10	25 ± 15	

	COARSE AGGREGATE SUBGRADE GRADATIONS (Metric)				
Grad No.	Sieve Size and Percent Passing				
	200 mm	150 mm	100 mm	50 mm	4.75 mm
CS 1	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 2		100	80 ± 10	25 ± 15	

(2) Capping aggregate shall be gradation CA 6 or CA 10.”

Add the following to Article 1031.09 of the Standard Specifications:

“(b) RAP in Aggregate Subgrade Improvement (ASI). RAP in ASI shall be according to Articles 1031.01(a), 1031.02(a), 1031.06(a)(1), and 1031.06(a)(2), and the following.

- (1) The testing requirements of Article 1031.03 shall not apply.
- (2) Crushed RAP used for the lower lift may be mechanically blended with aggregate gradations CS 1, CS 2, and RR 1 but it shall be no greater than 40 percent of the total product volume. RAP agglomerations shall be no greater than 4 in. (100 mm).
- (3) For capping aggregate, well graded RAP having 100 percent passing the 1 1/2 in. (38 mm) sieve may be used when aggregate gradations CS 1, CS 2, CA 2, or RR 1 are used in the lower lift. FRAP will not be permitted as capping material.

Blending shall be through calibrated interlocked feeders or a calibrated blending plant such that the prescribed blending percentage is maintained throughout the blending process. The calibration shall have an accuracy of ± 2.0 percent of the actual quantity of material delivered."

80274

BITUMINOUS MATERIALS COST ADJUSTMENTS (BDE)

Effective: November 2, 2006

Revised: August 1, 2017

Description. Bituminous material cost adjustments will be made to provide additional compensation to the Contractor, or credit to the Department, for fluctuations in the cost of bituminous materials when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract.

The adjustments shall apply to permanent and temporary hot-mix asphalt (HMA) mixtures, bituminous surface treatments (cover and seal coats), and preventative maintenance type surface treatments that are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply to bituminous prime coats, tack coats, crack filling/sealing, joint filling/sealing, or extra work paid for at a lump sum price or by force account.

Method of Adjustment. Bituminous materials cost adjustments will be computed as follows.

$$CA = (BPI_P - BPI_L) \times (\%AC_V / 100) \times Q$$

Where: CA = Cost Adjustment, \$.

BPI_P = Bituminous Price Index, as published by the Department for the month the work is performed, \$/ton (\$/metric ton).

BPI_L = Bituminous Price Index, as published by the Department for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price, \$/ton (\$/metric ton).

%AC_V = Percent of virgin Asphalt Cement in the Quantity being adjusted. For HMA mixtures, the % AC_V will be determined from the adjusted job mix formula. For bituminous materials applied, a performance graded or cutback asphalt will be considered to be 100% AC_V and undiluted emulsified asphalt will be considered to be 65% AC_V.

Q = Authorized construction Quantity, tons (metric tons) (see below).

For HMA mixtures measured in square yards: $Q, \text{ tons} = A \times D \times (G_{mb} \times 46.8) / 2000$. For HMA mixtures measured in square meters: $Q, \text{ metric tons} = A \times D \times (G_{mb} \times 1) / 1000$. When computing adjustments for full-depth HMA pavement, separate calculations will be made for the binder and surface courses to account for their different G_{mb} and % AC_V.

For bituminous materials measured in gallons: $Q, \text{ tons} = V \times 8.33 \text{ lb/gal} \times SG / 2000$

For bituminous materials measured in liters: $Q, \text{ metric tons} = V \times 1.0 \text{ kg/L} \times SG / 1000$

Where: A = Area of the HMA mixture, sq yd (sq m).

D = Depth of the HMA mixture, in. (mm).

G_{mb} = Average bulk specific gravity of the mixture, from the approved mix design.

V = Volume of the bituminous material, gal (L).
SG = Specific Gravity of bituminous material as shown on the bill of lading.

Basis of Payment. Bituminous materials cost adjustments may be positive or negative but will only be made when there is a difference between the BPI_L and BPI_P in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(BPI_L - BPI_P) \div BPI_L\} \times 100$$

Bituminous materials cost adjustments will be calculated for each calendar month in which applicable bituminous material is placed; and will be paid or deducted when all other contract requirements for the work placed during the month are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

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CEMENT, FINELY DIVIDED MINERALS, ADMIXTURES, CONCRETE, AND MORTAR (BDE)

Effective: January 1, 2025

Revised: January 1, 2026

Revise the first paragraph of Article 285.05 of the Standard Specifications to read:

“285.05 Fabric Formed Concrete Revetment Mat. The grout shall consist of a mixture of cement, fine aggregate, and water so proportioned and mixed as to provide a pumpable slurry. Fly ash or ground granulated blast furnace (GGBF) slag, and concrete admixtures may be used at the option of the Contractor. The grout shall have an air content of not less than 6.0 percent nor more than 9.0 percent of the volume of the grout. The mix shall obtain a compressive strength of 2500 psi (17,000 kPa) at 28 days according to Article 1020.09.”

Revise Article 302.02 of the Standard Specifications to read:

“302.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Cement	1001
(b) Water	1002
(c) Hydrated Lime	1012.01
(d) By-Product, Hydrated Lime	1012.02
(e) By-Product, Non-Hydrated Lime	1012.03
(f) Lime Slurry	1012.04
(g) Fly Ash	1010
(h) Soil for Soil Modification (Note 1)	1009.01
(i) Bituminous Materials (Note 2)	1032

Note 1. This soil requirement only applies when modifying with lime (slurry or dry).

Note 2. The bituminous materials used for curing shall be emulsified asphalt RS-2, CRS-2, HFE 90, or HFE 150; rapid curing liquid asphalt RC-70; or medium curing liquid asphalt MC-70 or MC-250.”

Revise Article 312.07(c) of the Standard Specifications to read:

“(c) Cement 1001”

Add Article 312.07(i) of the Standard Specifications to read:

“(i) Ground Granulated Blast Furnace (GGBF) Slag 1010”

Revise the first paragraph of Article 312.09 of the Standard Specifications to read:

“312.09 Proportioning and Mix Design. At least 60 days prior to start of placing CAM II, the Contractor shall submit samples of materials to be used in the work for proportioning and testing. The mixture shall contain a minimum of 200 lb (120 kg) of cement per cubic yard (cubic meter). Cement may be replaced with fly ash or ground granulated blast furnace (GGBF) slag according to Article 1020.05(c)(1) or 1020.05(c)(2), respectively, however the minimum cement content in the mixture shall be 170 lbs/cu yd (101 kg/cu m). Blends of coarse and fine aggregates will be permitted, provided the volume of fine aggregate does not exceed the volume of coarse aggregate. The Engineer will determine the proportions of materials for the mixture according to the “Portland Cement Concrete Level III Technician Course” manual. However, the Contractor may substitute their own mix design. Article 1020.05(a) shall apply, and a Level III PCC Technician shall develop the mix design.”

Revise Article 352.02 of the Standard Specifications to read:

“352.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Cement (Note 1)	1001
(b) Soil for Soil-Cement Base Course	1009.03
(c) Water	1002
(d) Bituminous Materials (Note 2)	1032

Note 1. Bulk cement may be used for the traveling mixing plant method if the equipment for handling, weighing, and spreading the cement is approved by the Engineer.

Note 2. The bituminous materials used for curing shall be emulsified asphalt RS-2, CRS-2, HFE 90, or HFE 150; rapid curing liquid asphalt RC-70; or medium curing liquid asphalt MC-70 or MC-250.”

Revise Article 404.02 of the Standard Specifications to read:

“404.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Cement	1001
(b) Water	1002
(c) Fine Aggregate	1003.08
(d) Bituminous Material (Tack Coat)	1032.06
(e) Emulsified Asphalts (Note 1) (Note 2)	1032.06
(f) Fiber Modified Joint Sealer	1050.05
(g) Additives (Note 3)	

Note 1. When used for slurry seal, the emulsified asphalt shall be CQS-1h according to Article 1032.06(b).

Note 2. When used for micro-surfacing, the emulsified asphalt shall be CQS-1hP according to Article 1032.06(e).

Note 3. Additives may be added to the emulsion mix or any of the component materials to provide the control of the quick-traffic properties. They shall be included as part of the mix design and be compatible with the other components of the mix.

Revise the last sentence of the fourth paragraph of Article 404.08 of the Standard Specifications to read:

“When approved by the Engineer, the sealant may be dusted with fine sand, cement, or mineral filler to prevent tracking.”

Revise Note 2 of Article 516.02 of the Standard Specifications to read:

“Note 2. The sand-cement grout mix shall be according to Section 1020 and shall be a 1:1 blend of sand and cement comprised of a Type I, IL, or II cement at 185 lb/cu yd (110 kg/cu m). The maximum water cement ratio shall be sufficient to provide a flowable mixture with a typical slump of 10 in. (250 mm).”

Revise Note 2 of Article 543.02 of the Standard Specifications to read:

“Note 2. The grout mixture shall be 6.50 hundredweight/cu yd (385 kg/cu m) of cement plus fine aggregate and water. Fly ash or ground granulated blast furnace (GGBF) slag may replace a maximum of 5.25 hundredweight/cu yd (310 kg/cu m) of the cement. The water/cement ratio, according to Article 1020.06, shall not exceed 0.60. An air-entraining admixture shall be used to produce an air content, according to Article 1020.08, of not less than 6.0 percent nor more than 9.0 percent of the volume of the grout. The Contractor shall have the option to use a water-reducing or high range water-reducing admixture.”

Revise Article 583.01 of the Standard Specifications to read:

“**583.01 Description.** This work shall consist of placing cement mortar along precast, prestressed concrete bridge deck beams as required for fairing out any unevenness between adjacent deck beams prior to placing of waterproofing membrane and surfacing.”

Revise Article 583.02(a) of the Standard Specifications to read:

“(a) Cement 1001”

Revise the first paragraph of Article 583.03 of the Standard Specifications to read:

“**583.03 General.** This work shall only be performed when the air temperature is 45 °F (7 °C) and rising. The mixture for cement mortar shall consist of three parts sand to one part cement by volume. The amount of water shall be no more than that necessary to produce a workable, plastic mortar.”

Revise Article 606.02(h) of the Standard Specifications to read:

“(h) Fibers (Note 1) 1014”

Revise Note 1 in Article 606.02(h) of the Standard Specifications to read:

“Note 1. Fibers, when required, shall only be used in the concrete mixture for slipform applications.”

Revise the third paragraph in Article 606.10 of the Standard Specifications to read:

“Welded wire fabric shall be 6 x 6 in. (150 x 150 mm) mesh, #4 gauge (5.74 mm), 58 lb (26 kg) per 100 sq ft (9 sq m).”

Revise Article 1001.01(d) of the Standard Specifications to read:

“(d) Rapid Hardening Cement. Rapid hardening cement shall be according to the Bureau of Materials Policy Memorandum “Portland or Blended Cement Acceptance Procedure for Qualified and Non-Qualified Plants”, and ASTM C 1600, Type URH, Type VRH, or Type RH-CAC. It shall be used according to Article 1020.04 or when approved by the Engineer. The Contractor shall submit a report from the manufacturer or an independent lab that contains results for testing according to ASTM C 1600 which shows the cement meets the requirements of either Type URH, Type VRH, or Type RH-CAC. Test data shall be less than 1 year old from the date of submittal.

Revise Article 1001.01(e) of the Standard Specifications to read:

“(e) Other Cements. Other cements shall be according to the Bureau of Materials Policy Memorandum “Portland or Blended Cement Acceptance Procedure for Qualified and Non-Qualified Plants”, and ASTM C 1157 or ASTM C 1600, as applicable. Other cements shall be used according to Article 1020.04 or when approved by the Engineer. For cements according to ASTM C 1157, the Contractor shall submit a report from the manufacturer or an independent lab that contains results of tests which shows the cement meets the requirements Type GU, HE, MS, MH, or LH. For cements according to ASTM C 1600, the Contractor shall submit a report from the manufacturer or an independent lab that contains results of tests which shows the cement meets the requirements Type MRH or GRH. Test data shall be less than 1 year old from the date of submittal.”

Revise Article 1002.02 of the Standard Specifications to read:

“**1002.02 Quality.** Water used with cement in concrete or mortar and water used for curing concrete shall be clean, clear, and free from sugar. In addition, water shall be tested and evaluated for acceptance according to one of the following options.

OPTION 1.

(a) Acceptable limits for acidity and alkalinity when tested according to ITP T 26.

- (1) Acidity -- 0.1 Normal NaOH 2 ml max.*
 - (2) Alkalinity -- 0.1 Normal HCl..... 10 ml max.*
- *To neutralize 200 ml sample.

(b) Acceptable limits for solids when tested according to the following.

- (1) Organic (ITP T 26) 0.02% max.
- (2) Inorganic (ITP T 26)..... 0.30% max.
- (3) Sulfate (SO₄) (ASTM D 516-82) 0.05% max.
- (4) Chloride (ASTM D 512) 0.06% max.

(c) The following tests shall be performed on the water sample and on deionized water. The same cement and sand shall be used for both tests.

- (1) Unsoundness (ASTM C 151).
- (2) Initial and Final Set Time (ASTM C 266).
- (3) Strength (ASTM C 109).

The test results for the water sample shall not deviate from the test results for the deionized water, except as allowed by the precision in the test method.

OPTION 2. Water shall meet the requirements ASTM C 1602 Tables 1 and 2 as outlined in Sections 5.1, 5.2, and 5.4.”

Revise Note 2/ in Article 1003.01(b) of the Standard Specifications to read:

“2/ Applies only to sand. Sand exceeding the colorimetric test standard of 11 (Illinois Modified AASHTO T 21) will be checked for mortar making properties according to Illinois Modified ASTM C 87 and shall develop a compressive strength at the age of 14 days when using Type I, IL, or II cement of not less than 95 percent of the comparable standard.

Revise the second sentence of Article 1003.02(e)(1) of the Standard Specifications to read:

“The test will be performed with Type I, IL, or II portland cement having a total equivalent alkali content (Na₂O + 0.658K₂O) of 0.90 percent or greater.”

Revise the first sentence of the second paragraph of Article 1003.02(e)(3) of the Standard Specifications to read:

“The ASTM C 1293 test shall be performed with Type I, IL, or II portland cement having a total equivalent alkali content (Na₂O + 0.658K₂O) of 0.80 percent or greater.”

Revise the second sentence of Article 1004.02(g)(1) of the Standard Specifications to read:

“The test will be performed with Type I, IL, or II portland cement having a total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) of 0.90 percent or greater.”

Add the following Section to the Standard Specifications.

“SECTION 1014. FIBERS FOR CONCRETE

1014.01 General. Fibers used in concrete shall be Type II or Type III (polyolefin or carbon) according to ASTM C 1116. The testing required for Type II fibers or Type III polyolefin fibers shall be performed by an independent lab a minimum of once every five years, and the test results provided to the Department. Manufacturers of Type III carbon fibers shall provide materials certification documentation not more than 6 years old a minimum of once every 5 years to the Department. The Department will maintain a qualified product list. The method of inclusion of fibers into concrete mixtures shall be according to the manufacturer’s specifications.

At the discretion of the Engineer, the concrete mixture shall be evaluated in a field demonstration for fiber clumping, ease of placement, and ease of finishing. The field demonstration shall consist of a minimum 2 cu yd (1.5 cu m) trial batch placed in a 12 ft x 12 ft (3.6 m x 3.6 m) slab.

1014.02 Concrete Gutter, Curb, Median and Paved Ditch. Fibers shall be Type III. Fibers shall have a minimum length of 1/2 in. (13 mm) and a maximum length of 0.75 in. (19 mm). The maximum dosage rate in the concrete mixture shall not exceed 1.5 lb/cu yd (0.9 kg/cu m). The minimum dosage rate shall be per the manufacturer’s recommendation.

1014.03 Concrete Inlay or Overlay. Fibers shall be Type III. Fibers shall have a minimum length of 1.0 in. (25 mm), a maximum length of 2 1/2 in. (63 mm), and a maximum aspect ratio (length divided by the equivalent diameter of the fiber) of 150. The maximum dosage rate shall not exceed 5.0 lb/cu yd (3.0 kg/cu m). The minimum dosage rate shall be per the manufacturer’s recommendation.

1014.04 Bridge Deck Fly Ash, Ground Granulated Blast Furnace (GGBF) Slag, High Reactivity Metakaolin, or Microsilica (Silica Fume) Concrete Overlay. Fibers shall be Type III. The dosage rate shall be a minimum of 3.0 lb/cu yd (1.8 kg/cu m), unless a field demonstration according to Article 1014.01 indicates that a lower dosage rate is necessary. Based on the results of the field demonstration, the Department has the option to reduce the dosage rate of fibers, but the dosage will not be reduced to less than 2.0 lb / cu yd (1.2 kg/cu m).

1014.05 Bridge Deck Latex Concrete Overlay. Fibers shall be Type II or III. Fibers shall have a minimum length of 0.75 in. (19 mm), a maximum length of 1.75 in. (45 mm), and an aspect ratio (length divided by the equivalent diameter of the fiber) of between 70 and 100. The dosage rate shall be a minimum of 3.0 lb/cu yd (1.8 kg/cu m), unless a field demonstration according to Article 1014.01 indicates that a lower dosage rate is necessary. Based on the results of the field

demonstration, the Department has the option to reduce the dosage rate of fibers, but the dosage will not be reduced to less than 2.0 lb/cu yd (1.2 kg/cu m)."

Add the following Section to the Standard Specifications:

"SECTION 1015. HIGH PERFORMANCE SHOTCRETE

1015.01 Packaged Shotcrete With Aggregate. The packaged shotcrete with aggregate shall be a pre-blended dry combination of materials for the wet-mix shotcrete method according to ASTM C 1480, Type FA or CA, Grade FR, Class I. The fibers shall be Type III according to Article 1014.01. The cement and finely divided minerals in the mixture shall be a minimum 6.65 cwt/cu yd (395 kg/cu m), and the portland cement shall not be below 4.70 cwt/cu yd (279 kg/cu m). Microsilica is required in the mixture and shall be a minimum of 5 percent by weight (mass) of cementitious material, and a maximum of 10 percent. Strength requirements shall be according to ASTM C 1480 except that the strength at 28 days shall be at least 4000 psi (27,500 kPa). Strength testing shall be according to ASTM C 1140. The air content as shot shall be 4.0 – 8.0 percent when tested according to AASHTO T 152, and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm).

The packaged shotcrete shall have a water soluble chloride ion content of less than 0.15% by weight of cementitious material when tested according to ASTM C 1218 or AASHTO T 260.

The testing according to ASTM C 1480, ASTM C 1140, AASHTO 152, and ASTM C 1218 or AASHTO T 260 shall be performed by an independent lab a minimum of once every 5 years, and the test results shall be provided to the Department. The Department will maintain a qualified product list. Batching and mixing shall be per the manufacturer's recommendations.

1015.02 Packaged Shotcrete Without Aggregate. The packaged shotcrete that does not include pre-blended aggregate shall be according to Article 1015.01, except the added aggregate shall be according to Articles 1003.02 and 1004.02. The aggregate gradation shall be according to the manufacturer. The Department will maintain a qualified product list. Batching and mixing shall be per the manufacturer's recommendations."

Revise Section 1017 of the Standard Specifications to read:

"SECTION 1017. PACKAGED, DRY, COMBINED MATERIALS FOR MORTAR AND CONCRETE

1017.01 Mortar. The mortar shall be high-strength according to ASTM C 387 and shall have a minimum 80.0 percent relative dynamic modulus of elasticity when tested according to AASHTO T 161. For prestressed concrete applications, the mortar shall have a water-soluble chloride ion content of less than 0.06 percent by weight of cementitious material when tested according to ASTM C 1218 or AASHTO T 260; and for non-prestressed concrete applications, the water soluble chloride content shall be less than 0.15 percent by weight of cementitious material. The testing according to ASTM C 387, AASHTO T 161, and either ASTM C 1218 or AASHTO T 260 shall be performed by an independent lab a minimum of once every five years, and the test results

shall be provided to the Department. The Department will maintain a qualified product list. Mixing of the high-strength mortar shall be according to the manufacturer's specifications.

1017.02 Concrete. The materials, testing, and preparation of aggregate for the "high slump" packaged concrete mixture shall be according to ASTM C 387. The mixture shall be air entrained, the slump shall be 5-10 in. (125-250 mm), and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). Strength requirements shall be according to ASTM C 387 except that the strength at 28 days shall be at least 4000 psi (27,500 kPa). The "high slump" packaged concrete mixture shall have a water soluble chloride ion content of less than 0.15% by weight of cementitious material when tested according to ASTM C 1218 or AASHTO T 260. The testing according to ASTM C 387, and either ASTM C 1218 or AASHTO T 260 shall be performed by an independent lab a minimum of once every 5 years, and the test results shall be provided to the Department. The Department will maintain a qualified product list. Mixing shall be per the manufacturer's recommendations.

1017.02 Self-Consolidating Concrete. The materials, testing, and preparation of aggregate for the "self-consolidating concrete" packaged concrete mixture shall be according to ASTM C 387. The mixture shall be air entrained, it should be uniformly graded, and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). Strength requirements shall be according to ASTM C 387 except that the strength at 28 days shall be at least 4000 psi (27,500 Pa). Slump flow range shall be 22 in. (550 mm) minimum to 28 in. (700 mm) maximum when tested according to AASHTO T 347. The visual stability index shall be a maximum of 1 when tested according to AASHTO T 351. At the option of the manufacturer, either the J-Ring value shall be a maximum of 2 in. (50 mm) when tested according to AASHTO T 347 or the L-Box blocking ratio shall be a minimum of 80 percent when tested according AASHTO T 419. The hardened visual stability index shall be a maximum of 1 when tested according to AASHTO R 81.

The "self -consolidating concrete" packaged concrete mixture shall have a water soluble chloride ion content of less than 0.15 percent by weight of cementitious material when tested according to ASTM C 1218 or AASHTO T 260.

The testing according to ASTM C 387, AASHTO T 347, AASHTO T 351, AASHTO T 419, AASHTO R 81, ASTM C 1218 and AASHTO T 260 shall be performed by an independent lab a minimum of once every 5 years, and the test results shall be provided to the Department. The Department will maintain a qualified product list. Mixing shall be per the manufacturer's recommendations."

Revise Article 1018.01 of the Standard Specifications to read:

"1018.01 Requirements. The rapid hardening mortar or concrete shall be according to ASTM C 928 and shall have successfully completed and remain current with the AASHTO Product Eval and Audit Rapid Hardening Concrete Patching Materials (RHCP) testing program. R1, R2, or R3 concrete shall be air entrained, the slump shall be 5-10 in. (125-250 mm), and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). For prestressed concrete applications, the mortar or concrete shall have a water-soluble chloride ion content of less than 0.06 percent by weight of cementitious material when tested according to ASTM C 1218 or AASHTO T 260;

and for non-prestressed concrete applications, the water soluble chloride content shall be less than 0.15 percent by weight of cementitious material. The Department will maintain a qualified product list. Mixing of the mortar or concrete shall be according to the manufacturer's specifications..”

Revise Article 1019.02 of the Standard Specifications to read:

“1019.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Cement	1001
(b) Water	1002
(c) Fine Aggregate for Controlled Low-Strength Material (CLSM)	1003.06
(d) Fly Ash	1010
(e) Ground Granulated Blast Furnace (GGBF) Slag.....	1010
(f) Admixtures (Note 1)	

Note 1. The air-entraining admixture may be in powder or liquid form. The air content produced by the admixture shall be 15-25 percent when incorporated into Mix 2 or an equivalent mixture as determined by the Department and tested according to AASHTO T 121 or AASHTO T 152. The testing according to AASHTO T 121 or AASHTO T 152 shall be performed by an independent lab a minimum of once every five years, and the test results shall be provided to the Department. The Department will maintain a qualified product list.”

Revise the third paragraph of Article 1019.04 of the Standard Specifications to read:

“The Engineer will instruct the Contractor to adjust the proportions of the mix design in the field as needed to meet the design criteria, provide adequate flowability, maintain proper solid suspension, or other criteria established by the Engineer.”

Revise Article 1019.05 of the Standard Specifications to read:

“1019.05 Department Mix Design. The Department mix design shall be Mix 1, 2, or 3 and shall be proportioned to yield approximately one cubic yard (cubic meter).

Mix 1	
Cement	50 lb (30 kg)
Fly Ash – Class C or F, and/or GGBF Slag	125 lb (74 kg)
Fine Aggregate – Saturated Surface Dry	2900 lb (1720 kg)
Water	50-65 gal (248-322 L)
Air Content	No air is entrained
Mix 2	
Cement	125 lb (74 kg)

Fine Aggregate – Saturated Surface Dry	2500 lb (1483 kg)
Water	35-50 gal (173-248 L)
Air Content	15-25 %

Mix 3	
Cement	40 lb (24 kg)
Fly Ash – Class C or F, and/or GGBF Slag	125 lb (74 kg)
Fine Aggregate – Saturated Surface Dry	2500 lb (1483 kg)
Water	35-50 gal (179-248 L)
Air Content	15-25 %

Revise Article 1020.04, Table 1, Note (8) of the Standard Specifications to read:

“(8) In addition to the Type III portland cement, 100 lb/cu yd of ground granulated blast-furnace slag and 50 lb/cu yd of microsilica (silica fume) shall be used. For an air temperature greater than 85 °F, the Type III portland cement may be replaced with Type I, IL, or II portland cement.”

Revise Article 1020.04, Table 1 (Metric), Note (8) of the Standard Specifications to read:

“(8) In addition to the Type III portland cement, 60 kg/cu m of ground granulated blast-furnace slag and 30 kg/cu m of microsilica (silica fume) shall be used. For an air temperature greater than 30 °C, the Type III portland cement may be replaced with Type I, IL, or II portland cement.”

Revise Note 9 of Table 1 of Article 1020.04 of the Standard Specifications to read:

“(9) The cement shall be a rapid hardening according to Article 1001.01(d). Minimum or maximum cement factor may be adjusted when approved by the Engineer.”

Revise the second paragraph of Article 1020.05(a) of the Standard Specifications to read:

“For a mix design using a portland-pozzolan cement, portland blast-furnace slag cement, portland-limestone cement, or replacing portland cement with finely divided minerals per Articles 1020.05(c) and 1020.05(d), the Contractor may submit a mix design with a minimum portland cement content less than 400 lbs/cu yd (237 kg/cu m), but not less than 375 lbs/cu yd (222 kg/cu m), if the mix design is shown to have a minimum relative dynamic modulus of elasticity of 80 percent determined according to AASHTO T 161. Testing shall be performed by an independent laboratory accredited by AASHTO re:source for Portland Cement Concrete.”

Revise the first sentence of the first paragraph of Article 1020.05(b) of the Standard Specifications to read:

“Corrosion inhibitors and concrete admixtures shall be according to the qualified product lists.”

Delete the fourth and fifth sentences of the second paragraph of Article 1020.05(b) of the Standard Specifications.

Revise Article 1020.05(b)(5) of the Standard Specifications to read:

“(5) For Class PP-4 concrete, a high range water-reducing admixture, retarder, and/or hydration stabilizer may be used in addition to the air-entraining admixture. The Contractor also has the option to use a water-reducing admixture with the high range water-reducing admixture. An accelerator shall not be used. A mobile portland cement concrete plant shall be used to produce the patching mixture.

For PP-5 concrete, a non-chloride accelerator, high range water-reducing admixture, retarder, hydration stabilizer, and/or air-entraining admixture may be used. The accelerator, high range water-reducing admixture, retarder, hydration stabilizer, and/or air-entraining admixture shall be per the Contractor’s recommendation and dosage. The qualified product list of concrete admixtures shall not apply. A mobile portland cement concrete plant shall be used to produce the patching mixture.”

Revise second paragraph of Article 1020.05(b)(10) of the Standard Specifications to read:

“When calcium nitrite is used, it shall be added at the rate of 4 gal/cu yd (20 L/cu m) and shall be added to the mix immediately after all compatible admixtures have been introduced to the batch. Other corrosion inhibitors shall be added per the manufacturer’s specifications.”

Delete the third paragraph of Article 1020.05(b)(10) of the Standard Specifications.

Revise Article 1020.15(b)(1)c. of the Standard Specifications to read:

“c. The minimum portland cement content in the mixture shall be 375 lbs/cu yd (222 kg/cu m). When the total of organic processing additions, inorganic processing additions, and limestone addition exceed 5.0 percent in the cement, the minimum portland cement content in the mixture shall be 400 lbs/cu yd (237 kg/cu m). For a drilled shaft, foundation, footing, or substructure, the minimum portland cement may be reduced to as low as 330 lbs/cu yd (196 kg/cu m) if the concrete has adequate freeze/thaw durability. The Contractor shall provide freeze/thaw test results according to AASHTO T 161, and the relative dynamic modulus of elasticity of the mix design shall be a minimum of 80 percent. Testing shall be performed by an independent laboratory accredited by AASHTO re:source for Portland Cement Concrete. Freeze/thaw testing will not be required for concrete that will not be exposed to freezing and thawing conditions as determined by the Engineer.”

Revise Article 1021.01 of the Standard Specifications to read:

“1021.01 General. Admixtures shall be furnished in liquid or powder form ready for use. The admixtures shall be delivered in the manufacturer's original containers, bulk tank trucks or such containers or tanks as are acceptable to the Engineer. Delivery shall be accompanied by a ticket which clearly identifies the manufacturer, the date of manufacture, and trade name of the material. Containers shall be readily identifiable as to manufacturer, the date of manufacture, and trade name of the material they contain.

Concrete admixtures shall be on one of the Department's qualified product lists. Unless otherwise noted, admixtures shall have successfully completed and remain current with the AASHTO Product Eval and Audit Concrete Admixture (CADD) testing program. For admixture submittals to the Department; the product brand name, manufacturer name, admixture type or types, an electronic link to the product's technical data sheet, and the NTPEP testing number which contains an electronic link to all test data shall be provided. In addition, a letter shall be submitted certifying that no changes have been made in the formulation of the material since the most current round of tests conducted by AASHTO Product Eval and Audit. After 28 days of testing by AASHTO Product Eval and Audit, air-entraining admixtures may be provisionally approved and used on Departmental projects. For all other admixtures, unless otherwise noted, the time period after which provisionally approved status may be earned is 6 months.

The manufacturer shall include the following in the submittal to the AASHTO Product Eval and Audit CADD testing program: the manufacturing range for specific gravity, the midpoint and manufacturing range for residue by oven drying, and manufacturing range of pH. The submittal shall also include an infrared spectrophotometer trace no more than five years old.

For air-entraining admixtures according to Article 1021.02, the specific gravity allowable manufacturing range established by the manufacturer shall be according to AASHTO M 194. For residue by oven drying and pH, the allowable manufacturing range and test methods shall be according to AASHTO M 194.

For admixtures according to Articles 1021.03, 1021.04, 1021.05, 1021.06, 1021.07, and 1021.08, the pH allowable manufacturing range established by the manufacturer shall be according to ASTM E 70. For specific gravity and residue by oven drying, the allowable manufacturing range and test methods shall be according to AASHTO M 194.

All admixtures, except chloride-based accelerators, shall contain a maximum of 0.3 percent chloride by weight (mass) as determined by an appropriate test method. To verify the test result, the Department will use Illinois Modified AASHTO T 260, Procedure A, Method 1.

Prior to final approval of an admixture, the Engineer reserves the right to request a sample for testing. The test and reference concrete mixtures tested by the Engineer will contain a cement content of 5.65 cwt/cu yd (335 kg/cu m). For freeze-thaw testing, the Department will perform the test according to Illinois Modified AASHTO T 161. The flexural strength test will be performed according to AASHTO T 177. If the Engineer decides to test the admixture, the manufacturer shall submit AASHTO T 197 water content and set time test results on the standard cement used by the Department. The manufacturer may select their lab or an independent lab to perform this testing. The laboratory is not required to be accredited by AASHTO.

Random field samples may be taken by the Department to verify an admixture meets specification. A split sample will be provided to the manufacturer if requested. Admixtures that do not meet specification requirements or an allowable manufacturing range established by the manufacturer shall be replaced with new material.”

Revise Article 1021.03 of the Standard Specifications to read:

“1021.03 Retarding and Water-Reducing Admixtures. The admixture shall be according to the following.

- (a) Retarding admixtures shall be according to AASHTO M 194, Type B (retarding) or Type D (water-reducing and retarding).
- (b) Water-reducing admixtures shall be according to AASHTO M 194, Type A.
- (c) High range water-reducing admixtures shall be according to AASHTO M 194, Type F (high range water-reducing) or Type G (high range water-reducing and retarding).”

Revise Article 1021.05 of the Standard Specifications to read:

“1021.05 Self-Consolidating Admixtures. Self-consolidating admixture systems shall consist of either a high range water-reducing admixture only or a high range water-reducing admixture combined with a separate viscosity modifying admixture. The one or two component admixture system shall be capable of producing a concrete that can flow around reinforcement and consolidate under its own weight without additional effort and without segregation.

High range water-reducing admixtures shall be according to AASHTO M 194, Type F.

Viscosity modifying admixtures shall be according to AASHTO M 194, Type S (specific performance).”

Revise Article 1021.06 of the Standard Specifications to read:

“1021.06 Rheology-Controlling Admixture. Rheology-controlling admixtures shall be capable of producing a concrete mixture with a lower yield stress that will consolidate easier for slipform applications used by the Contractor. Rheology-controlling admixtures shall be according to AASHTO M 194, Type S (specific performance).”

Revise Article 1021.07 of the Standard Specifications to read:

“1021.07 Corrosion Inhibitor. The corrosion inhibitor shall be according to one of the following.

- (a) Calcium Nitrite. Corrosion inhibitors shall contain a minimum 30 percent calcium nitrite by weight (mass) of solution and shall comply with either the requirements of AASHTO

M 194, Type C (accelerating) or the requirements of ASTM C 1582. The corrosion inhibiting performance requirements of ASTM C 1582 shall not apply.

(b) Other Materials. The corrosion inhibitor shall be according to ASTM C 1582.

For submittals requiring testing according to ASTM M 194, Type C (accelerating), the admixture shall meet the requirements of the AASHTO Product Eval and Audit CADD testing program according to Article 1021.01.

For submittals requiring testing according to ASTM C 1582, a report prepared by an independent laboratory accredited by AASHTO re:source for portland cement concrete shall be provided. The report shall show the results of physical tests conducted no more than five years prior to the time of submittal, according to applicable specifications. However, ASTM G 109 test information specified in ASTM C 1582 is not required to be from an independent accredited lab. All other information in ASTM C 1582 shall be from an independent accredited lab. Test data and other information required to be submitted to AASHTO Product Eval and Audit according to Article 1021.01, shall instead be submitted directly to the Department.”

Add Article 1021.08 of the Standard Specifications as follows:

“1021.08 Other Specific Performance Admixtures. Other specific performance admixtures shall, at a minimum, be according to AASHTO M 194, Type S (specific performance). The Department also reserves the right to require other testing, as determined by the Engineer, to show evidence of specific performance characteristics.

Initial testing according to AASHTO M 194 may be conducted under the AASHTO Product Eval and Audit CADD testing program according to Article 1021.01, or by an independent laboratory accredited by AASHTO re:source for Portland Cement Concrete. In either case, test data and other information required to be submitted to AASHTO Product Eval and Audit according to Article 1021.01, shall also be submitted directly to the Department. The independent accredited lab report shall show the results of physical tests conducted no more than five years prior to the time of submittal, according to applicable specifications.”

Add Article 1021.09 of the Standard Specifications as follows:

“1021.09 Latex Admixtures. The latex admixture shall be a uniform, homogeneous, non-toxic, film-forming, polymeric emulsion in water to which all stabilizers have been added at the point of manufacture. The latex admixture shall not contain any chlorides and shall contain 46-49 percent solids.

In lieu of meeting the requirements of Article 1021.01, the Contractor shall submit a manufacturer's certification that the latex emulsion meets the requirements of FHWA Research Report RD-78-35, Chapter VI. The certificate shall include the date of manufacture of the latex admixture, batch or lot number, quantity represented, manufacturer's name, and the location of the manufacturing plant. The latex emulsion shall be sampled and tested in accordance with RD-78-35, Chapter VII, Certification Program.

The latex admixture shall be packaged and stored in containers and storage facilities which will protect the material from freezing and from temperatures above 85°F (30°C). Additionally, the material shall not be stored in direct sunlight and shall be shaded when stored outside of buildings during moderate temperatures.”

Revise Article 1024.01 of the Standard Specifications to read:

“1024.01 Requirements for Grout. The grout shall be proportioned by dry volume, thoroughly mixed, and shall have a minimum temperature of 50 °F (10 °C). Water shall not exceed the minimum needed for placement and finishing.

Materials for the grout shall be according to the following.

Item	Article/Section
(a) Cement	1001
(b) Water	1002
(c) Fine Aggregate	1003.02
(d) Fly Ash	1010
(e) Ground Granulated Blast Furnace (GGBF) Slag.....	1010
(f) Concrete Admixtures	1021”

Revise Note 1 of Article 1024.02 of the Standard Specifications to read:

“Note 1. Nonshrink grout shall be according to ASTM C 1107.

For prestressed concrete applications, the nonshrink grout shall have a water soluble chloride ion content of less than 0.06 percent by weight of cementitious material when tested according to ASTM C 1218 or AASHTO T 260; and for non-prestressed concrete applications, the water soluble chloride ion content shall be less than 0.15 percent by weight of cementitious material. The testing according to ASTM 1107, and either ASTM C 1218 or AASHTO T 260 shall be performed by an independent lab a minimum of once every five years, and the test results shall be provided to the Department. The Department will maintain a qualified product list. Mixing of the nonshrink grout shall be according to the manufacturer’s specifications.”

Revise Article 1029.02 of the Standard Specifications to read:

“1029.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Cement.....	1001
(b) Fly Ash	1010
(c) Ground Granulated Blast Furnace (GGBF) Slag	1010
(d) Water.....	1002
(e) Fine Aggregate.....	1003
(f) Concrete Admixtures	1021

(g) Foaming Agent (Note 1)

Note 1. The manufacturer shall submit infrared spectrophotometer trace and test results indicating the foaming agent meets the requirements of ASTM C 869 in order to be on the Department's qualified product list. Submitted data/results shall not be more than five years old."

Revise the second paragraph of Article 1103.03(a)(4) the Standard Specifications to read:

"The dispenser system shall provide a visual indication that the liquid admixture is actually entering the batch, such as via a transparent or translucent section of tubing or by independent check with an integrated secondary metering device. If approved by the Engineer, an alternate indicator may be used for admixtures dosed at rates of 25 oz/cwt (1630 mL/100 kg) or greater, such as accelerating admixtures, corrosion inhibitors, and viscosity modifying admixtures."

Revise Article 1103.04 of the Standard Specifications to read:

"1103.04 Mobile Portland Cement Concrete Plants. The mobile concrete plant shall be according to AASHTO M 241 and the Bureau of Materials Policy Memorandum "Approval of Volumetric Mobile Mixers for Concrete". The mixer shall be capable of carrying sufficient unmixed materials to produce not less than 6 cu yd (4.6 cu m) of concrete."

Revise the first two sections of Check Sheet #11 "Subsealing of Concrete Pavements" of the Recurring Special Provisions to read:

"Description. This work shall consist of filling voids beneath rigid and composite pavements with cement grout.

Materials. Materials shall be according to the following Articles/Sections of the Standard Specifications:

Item	Article/Section
(a) Cement	1001
(b) Water	1002
(c) Fly Ash	1010
(d) Ground Granulated Blast Furnace (GGBF) Slag.....	1010
(e) Admixtures	1021
(f) Packaged Rapid Hardening Mortar or Concrete	1018"

Revise the Materials section of Check Sheet #28 "Portland Cement Concrete Inlay or Overlay" of the Recurring Special Provisions to read:

"Materials. Materials shall be according to the following Articles/Sections of the Standard Specifications.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) Fibers for Concrete.....	1014
(c) Protective Coat.....	1023.01

Note 1. Class PV concrete shall be used, except the cement factor for central mixed concrete shall be 6.05 cwt/cu yd (360 kg/cu m). A cement factor reduction according to Article 1020.05(b)(8) of the Standard Specifications will be permitted. CA 5 shall not be used and CA 7 may only be used for overlays that are a minimum of 4.5 in. (113 mm) thick. The Class PV concrete shall have a minimum flexural strength of 550 psi (3800 kPa) or a minimum compressive strength of 3000 psi (20,700 kPa) at 14 days.”

80460

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017

Revised: April 1, 2019

Revise Article 107.40(b) of the Standard Specifications to read:

“(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows.

- (1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.
- (2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.
- (3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days.”

Revise Article 107.40(c) of the Standard Specifications to read:

“(c) Payment. Payment for Minor, Major, and Reduced Rate of Production Delays will be made as follows.

- (1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

- (2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the

Contractor's yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

- (3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven calendar days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Payment for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be determined according to Article 109.13."

Revise Article 108.04(b) of the Standard Specifications to read:

"(b) No working day will be charged under the following conditions.

- (1) When adverse weather prevents work on the controlling item.
- (2) When job conditions due to recent weather prevent work on the controlling item.
- (3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.
- (4) When delays caused by utility or railroad adjustments prevent work on the controlling item.
- (5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.
- (6) When any condition over which the Contractor has no control prevents work on the controlling item."

Revise Article 109.09(f) of the Standard Specifications to read:

- "(f) Basis of Payment. After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead

other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

The above Basis of Payment is an essential element of the contract and the claim cost recovery of the Contractor shall be so limited.”

Add the following to Section 109 of the Standard Specifications.

“109.13 Payment for Contract Delay. Compensation for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be allowed when such costs result from a delay meeting the criteria in the following table.

Contract Type	Cause of Delay	Length of Delay
Working Days	Article 108.04(b)(3) or Article 108.04(b)(4)	No working days have been charged for two consecutive weeks.
Completion Date	Article 108.08(b)(1) or Article 108.08(b)(7)	The Contractor has been granted a minimum two week extension of contract time, according to Article 108.08.

Payment for each of the various costs will be according to the following.

- (a) Escalated Material and/or Labor Costs. When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.
- (b) Extended Project Overhead. For the duration of the delay, payment for extended project overhead will be paid as follows.
 - (1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

Original Contract Amount	Supervisory and Administrative Personnel
Up to \$5,000,000	One Project Superintendent
Over \$ 5,000,000 - up to \$25,000,000	One Project Manager, One Project Superintendent or Engineer, and One Clerk
Over \$25,000,000 - up to \$50,000,000	One Project Manager, One Project Superintendent, One Engineer, and

	One Clerk
Over \$50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

(2) Home Office and Unabsorbed Overhead. Payment for home office and unabsorbed overhead will be calculated as 8 percent of the total delay cost.

(c) Extended Traffic Control. Traffic control required for an extended period of time due to the delay will be paid for according to Article 109.04.

When an extended traffic control adjustment is paid under this provision, an adjusted unit price as provided for in Article 701.20(a) for increase or decrease in the value of work by more than ten percent will not be paid.

Upon payment for a contract delay under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this provision."

80384

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010

Revised: January 1, 2025

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term “equipment” refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted according to the table below.

Horsepower Range	Model Year and Older
50-99	2003
100-299	2002
300-599	2000
600-749	2001
750 and up	2005

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

- a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (<https://www.epa.gov/verified-diesel-tech/verified-technologies-list-clean-diesel>), or verified by the California Air Resources Board (CARB) (<http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>); or
- b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be \$1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected. Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

80261

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000

Revised: July 2, 2026

1. OVERVIEW AND GENERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory. Award of the contract is conditioned on meeting the requirements of 49 CFR Part 26, and failure by the Contractor to carry out the requirements of Part 26 is a material breach of the contract and may result in the termination of the contract or such other remedies as the Department deems appropriate.
2. CONTRACTOR ASSURANCE. All assurances set forth in FHWA 1273 are hereby incorporated by reference and will be physically attached to the final contract and all subcontracts.
3. CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. The Department has determined the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies and that, in the absence of unlawful discrimination and in an arena of fair and open competition, DBE companies can be expected to perform **20%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work in accordance with the requirements of 49 CFR 26.53 and SBE Memorandum No. 24-02.
4. IDENTIFICATION OF CERTIFIED DBE. Information about certified DBE Contractors can be found in the IL UCP Directory. Bidders can obtain additional information and assistance with identifying DBE-certified companies at the Department's website or by contacting the Department's Bureau of Small Business Enterprises at (217) 785-4611.

PLEASE NOTE: As of October 3, 2025, the U.S. Department of Transportation issued an Interim Final Rule requiring all existing DBE and ACDBE certifications to be re-evaluated for social and economic disadvantage without consideration of race or gender. As of March 24, 2026, the ILUCP has completed reevaluation of those firms that submitted required information by January 31, 2026. DBE and ACDBE Certifications appearing in the IL UCP directory as certified have been recertified under the current federal regulations and may be counted for DBE goal credit. DBE and ACDBE firms appearing in this directory as ineligible have not submitted required documentation for reevaluation to date. Ineligible firms cannot currently be counted for DBE goal credit, but HAVE NOT BEEN DECERTIFIED and may still submit documentation to be reevaluated. All firms decertified under the October 3, 2025

Interim Final Rule reevaluation process have been removed from the Directory. Additional information regarding the IFR and the current status of the DBE/ACDBE program can be found at <https://idot.illinois.gov/doing-business/certifications/dbe.html>.

PLEASE BE ADVISED THAT A FIRM THAT IS INDICATED AS INELIGIBLE CANNOT BE USED FOR GOAL CREDIT. IT IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR TO VERIFY THAT ANY FIRM RELIED UPON FOR DBE GOAL CREDIT IN A UTILIZATION PLAN IS CURRENTLY CERTIFIED AND CAN BE COUNTED FOR GOAL CREDIT AT THE TIME OF BID.

5. BIDDING PROCEDURES. Compliance with this Special Provision and SBE Policy Memorandum 24-02 is a material bidding requirement. The following shall be included with the bid.
 - (a) DBE Utilization Plan (form SBE 2026) documenting enough DBE participation has been obtained to meet the goal, or a good faith effort has been made to meet the goal even though the efforts did not succeed in obtaining enough DBE participation to meet the goal.
 - (b) Applicable DBE Participation Statement (form SBE 2023, 2024, and/or 2025) for each DBE firm the bidder has committed to perform the work to achieve the contract goal.

The required forms and documentation shall be submitted as a single .pdf file using the "Integrated Contractor Exchange (iCX)" application within the Department's "EBids System".

The Department will not accept a bid if it does not meet the bidding procedures set forth herein and the bid will be declared non-responsive. A bidder declared non-responsive for failure to meet the bidding procedures will not give rise to an administrative reconsideration. In the event the bid is declared non-responsive, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty and may deny authorization to bid the project if re-advertised for bids.

6. UTILIZATION PLAN EVALUATION. The contract will not be awarded until the Utilization Plan is approved. All information submitted by the bidder must be complete, accurate, and adequately document the bidder has committed to DBE participation sufficient to meet the goal, or that the bidder has made good faith efforts to do so, in the event the bidder cannot meet the goal, in order for the Department to commit to the performance of the contract by the bidder.

The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work to meet the contract goal or the Department determines, based upon the documentation submitted, that the bidder has made a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A and the requirements of SBE 2026.

If the Department determines that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan of that determination in accordance with SBE Policy Memorandum 24-02.

7. CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work the bidder commits to have performed by the specified DBEs and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE firms. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific guidelines for counting goal credit are provided in 49 CFR Part 26.55. In evaluating Utilization Plans for award the Department will count goal credit as set forth in Part 26 and in accordance with SBE Policy Memorandum 24-02.
8. CONTRACT COMPLIANCE. The Contractor must utilize the specific DBEs listed to perform the work and supply the materials for which each DBE is listed in the Contractor's approved Utilization Plan, unless the Contractor obtains the Department's written consent to terminate the DBE or any portion of its work. The DBE Utilization Plan approved by SBE is a condition-of-award, and any deviation to that Utilization Plan, the work set forth therein to be performed by DBE firms, or the DBE firms specified to perform that work, must be approved, in writing, by the Department in accordance with federal regulatory requirements. Deviation from the DBE Utilization Plan condition-of-award without such written approval is a violation of the contract and may result in termination of the contract or such other remedy the Department deems appropriate. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan.
 - (a) NOTICE OF DBE PERFORMANCE. The Contractor shall provide the Engineer with at least three days advance notice of when all DBE firms are expected to perform the work committed under the Contractor's Utilization Plan.
 - (b) SUBCONTRACT. If awarded the contract, the Contractor is required to enter into written subcontracts with all DBE firms indicated in the approved Utilization Plan and must provide copies of fully executed DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.
 - (c) PAYMENT TO DBE FIRMS. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goal has been paid to the DBE. The Contractor shall document and report all payments for work performed by DBE certified firms in accordance with Article 109.11 of the

Standard Specifications. All records of payment for work performed by DBE certified firms shall be made available to the Department upon request.

- (d) FINAL PAYMENT. After the performance of the final item of work or trucking, or delivery of material by a DBE and final payment to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement (form SBE 2115) to the Engineer. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages.
- (g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

80029

EROSION CONTROL BLANKET (BDE)

Effective: August 1, 2025

Revise Article 251.02 of the Standard Specifications to read:

“251.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Compost	1081.05(b)
(b) Mulch	1081.06(a)
(c) Chemical Mulch Binder	1081.06(a)(3)
(d) Chemical Compost Binder	1081.06(a)(4)
(e) Erosion Control Blanket	1081.10(a)
(f) Wildlife Friendly Erosion Control Blanket	1081.10(b)
(g) Wire Staples	1081.10(c)
(h) Wood Stakes	1081.10(d)
(i) Turf Reinforcement Mat	1081.10(e)”

Revise the first and second sentences of Article 251.04 of the Standard Specifications to read:

“251.04 Erosion Control Blanket. All erosion control blanket materials shall be placed on the areas specified within 24 hours of seed placement.”

Revise the second paragraph of Article 251.04 of the Standard Specifications to read:

“After the area has been properly shaped, fertilized (when applicable), and seeded, the blanket shall be laid out flat, evenly, and smoothly, without stretching the material. The erosion control blanket shall be placed according to the manufacture’s recommendations.”

Revise the second sentence of Article 251.06(b) of the Standard Specifications to read:

“Erosion control blanket, wildlife friendly erosion control blanket, and turf reinforcement mat will be measured for payment in square yards (square meters).”

Revise Article 251.07 of the Standard Specifications to read:

“251.07 Basis of Payment. This work will be paid for at the contract unit price per acre (hectare) for MULCH, of the method specified; and at the contract unit price per square yard (square meter) for EROSION CONTROL BLANKET, WILDLIFE FRIENDLY EROSION CONTROL BLANKET, or TURF REINFORCEMENT MAT.”

Revise first sentence of Article 280.04(h) of the Standard Specifications to read:

“This system consists of temporarily installing erosion control blanket or wildlife friendly erosion control blanket over areas that are to be reworked during a later construction phase.”

Revise Article 280.08(g) of the Standard Specifications to read:

“(g) Temporary Erosion Control Blanket. Temporary erosion control blanket will be paid for at the contract unit price per square yard (square meter) for TEMPORARY EROSION CONTROL BLANKET or TEMPORARY WILDLIFE FRIENDLY EROSION CONTROL BLANKET.

The work of removing, storing, and reinstalling the blanket over areas to be reworked more than once will not be paid for separately but shall be included in the cost of the temporary erosion control blanket or temporary wildlife friendly erosion control blanket.”

Revise Article 1081.10 of the Standard Specifications to read:

“**1081.10 Erosion Control Blankets.** The manufacturer shall furnish a certificate with each shipment stating the amount of product furnished and that the material complies with these requirements.

(a) Erosion Control Blanket. Erosion control blanket shall be covered on top and bottom, also known as double net, with a 100 percent biodegradable woven, natural fiber or jute net meeting the following.

Material	Minimum Value
Excelsior	80%
Straw	100%
Coconut or Coir	100% Coconut or Coir
Straw/Coconut or Coir	70% Straw / 30% Coconut or Coir

(b) Wildlife Friendly Erosion Control Blanket. Wildlife friendly erosion control blanket shall be according to Article 1081.10(a) except the netting shall be loose weave, also known as leno weave or gauze weave, with a moveable joint.

(c) Wire Staples. Staples shall be made from No. 11 gauge or heavier uncoated black carbon steel wire, a minimum of 1 in. (25 mm) wide at the top and a minimum overall length of 8 in. (200 mm).

(d) Wood Stakes. Hardwood blanket anchors shall be nominally 7 in. (180 mm) long from neck of hook to tip of anchor. The anchor shall have a minimum 1/2 in. (13 mm) curving hook to hold the blanket in place.

(e) Turf Reinforcement Mat (TRM). The TRM shall be comprised of non-degradable, ultraviolet stabilized synthetic fibers, filaments, netting, and/or wire mesh processed into

a three-dimensional reinforced mat. The mats may include degradable material to assist with vegetation establishment. Soil filled mats will not be allowed.

The TRM shall meet the following physical and performance properties:

Property	Value	Test Method
Tensile Strength, lb/ft (kN/m)	150 (2.19) min.	ASTM D 6818
UV Stability, (% Tensile Retained)	80 min.	ASTM D 4355 (1000 Hour Exposure)
Resiliency, (% Thickness Retained)	80 min.	ASTM D 6524
Allowable Shear Stress, lb/sq ft (Pa) ^{1/}	8 (384)	ECTC approved test method and independent laboratory

1/ Minimum shear stress the TRM (fully vegetated) can sustain without physical damage or excess erosion (> 1/2 in. (13 mm) soil loss) during a 30 minute flow event in large scale testing.

For TRMs containing degradable components, all property values shall be obtained on the non-degradable portion of the matting alone.”

80467

GUARDRAIL (BDE)

Effective: November 1, 2025

Revise Article 701.17(f) of the Standard Specifications to read:

- “(f) Guardrail. Where guardrail is temporarily removed or where the guardrail installation is incomplete, Type II barricades or drums shall be placed at 50 ft (15 m) centers during completion of the work.

Guardrail installation shall be completed within three calendar days of removal or shielded with a temporary longitudinal traffic barrier approved by the Engineer.

On staged construction projects all guardrail and end terminal installations shall be complete prior to switching traffic.”

80471

HOT-MIX ASPHALT – LONGITUDINAL JOINT SEALANT (BDE)

Effective: November 1, 2022

Revised: August 1, 2023

Add the following after the second sentence in the eighth paragraph of Article 406.06(h)(2) of the Standard Specifications:

“If rain is forecasted and traffic is to be on the LJS or if pickup/tracking of the LJS material is likely, the LJS shall be covered immediately following its application with FA 20 fine aggregate mechanically spread uniformly at a rate of 1.5 ± 0.5 lb/sq yd (0.75 ± 0.25 kg/sq m). Fine aggregate landing outside of the LJS shall be removed prior to application of tack coat.”

Add the following after the first sentence in the ninth paragraph of Article 406.06(h)(2) of the Standard Specifications:

“LJS half-width shall be applied at a width of 9 ± 1 in. (225 ± 25 mm) in the immediate lane to be placed with the outside edge flush with the joint of the next HMA lift. The vertical face of any longitudinal joint remaining in place shall also be coated.”

Add the following after the eleventh paragraph of Article 406.06(h)(2) of the Standard Specifications:

“LJS Half-Width Application Rate, lb/ft (kg/m) ^{1/}			
Lift Thickness, in. (mm)	Coarse Graded Mixture (IL-19.0, IL-19.0L, IL-9.5, IL-9.5L, IL-4.75)	Fine Graded Mixture (IL-9.5FG)	SMA Mixture (SMA-9.5, SMA-12.5)
$\frac{3}{4}$ (19)	0.44 (0.66)		
1 (25)	0.58 (0.86)		
$1 \frac{1}{4}$ (32)	0.66 (0.98)	0.44 (0.66)	
$1 \frac{1}{2}$ (38)	0.74 (1.10)	0.48 (0.71)	0.63 (0.94)
$1 \frac{3}{4}$ (44)	0.82 (1.22)	0.52 (0.77)	0.69 (1.03)
2 (50)	0.90 (1.34)	0.56 (0.83)	0.76 (1.13)
$\geq 2 \frac{1}{4}$ (60)	0.98 (1.46)		

1/ The application rate includes a surface demand for liquid. The thickness of the LJS may taper from the center of the application to a lesser thickness on the edge of the application, provided the correct width and application rate are maintained.”

Revise the second paragraph of Article 406.13(b) of the Standard Specifications to read:

“Aggregate for covering tack, LJS, or FLS will not be measured for payment.”

Add the following to the end of the second paragraph of Article 406.14 of the Standard Specifications:

“Longitudinal joint sealant (LJS) half-width will be paid for at the contract unit price per foot (meter) for LONGITUDINAL JOINT SEALANT, HALF-WIDTH.”

80446

INLET FILTERS

Effective: April 1, 2026

Revise the first paragraph of Article 1081.15(h) of the Standard Specifications to read:

“(h) Inlet Filters. An inlet filter shall consist of a steel frame with a two piece geotextile fabric bag or a single reinforced geotextile fabric bag attached with a stainless steel band and locking cap that is suspended from the frame. A clean, used bag and a used steel frame in good condition meeting the approval of the Engineer may be substituted for new materials. Materials for the inlet filter assembly shall be according to the following.”

Revise Article 1081.15(h)(3) of the Standard Specifications to read:

“(3) Geotextile Fabric Bag. The sediment bag shall have a minimum silt and debris capacity of 2.0 cu ft (0.06 cu m). The sediment bag shall also meet one of the following options.

a. OPTION 1. Two piece geotextile fabric bag.

The inner filter bag shall be constructed of a polypropylene geotextile fabric according to the following.

Inner Filter Bag		
Material Property	Test Method	Minimum Average Roll Value
Grab Tensile Strength	ASTM D 4632	100 lb (45 kg)
Grab Tensile Elongation	ASTM D 4632	50%
Puncture Strength	ASTM D 4833/ ASTM D 6241	65 lb (29 kg)
Trapezoidal Tear	ASTM D 4533	45 lb (20 kg)
UV Resistance	ASTM D 4355	70% at 500 hours
Apparent Opening Size	ASTM D 4751	No. 70 (212 µm) sieve
Permittivity	ASTM D 4491	2.0/sec
Water Flow Rate	ASTM D 4491	145 gpm/sq ft (5900 Lpm/sq m)

The outer reinforcement bag shall be constructed of a polyester mesh material according to the following.

Outer Reinforcement Bag		
Material Property	Test Method	Value
Content	ASTM D 629	Polyester
Weight	ASTM D 3776	4.55 oz/sq yd (155 g/sq m) $\pm$ 15%
Apparent Opening Size	ASTM D 4751	No. 30 (600 μ m) sieve
Water Flow Rate	ASTM D 4491	225 gpm/sq ft (9150 Lpm/sq m)
Burst	ASTM D 3786/ ASTM D 3787	120 psi (830 kPa) min.
Thickness	ASTM D 1777	0.040 $\pm$ 0.0050 in. (1.0 $\pm$ 0.1 mm)

b. OPTION 2. Reinforced geotextile fabric bag.

The filter bag shall be constructed of a polypropylene geotextile fabric reinforced with continuous filament fiberglass according to the following.

Reinforced Filter Bag		
Material Property	Test Method	Value or Minimum Average Roll Value
Weight	ASTM D 3776	5.00 oz/sq yd (170 g/sq m) $\pm$ 15%
Grab Tensile Strength	ASTM D 4632	200 lb (90 kg)
Grab Tensile Elongation	ASTM D 4632	50%
Puncture Strength	ASTM D 4833/ ASTM D 6241	95 lb (42 kg)
Trapezoidal Tear	ASTM D 4533	70 lb (31 kg)
Burst Strength	ASTM D 3786/ ASTM D 3787	325 psi (2240 kPa)
UV Resistance	ASTM D 4355	70% at 500 hours
Apparent Opening Size	ASTM D 4751	No. 70 (212 μ m) sieve
Permittivity	ASTM D 4491	2.0/sec
Water Flow Rate	ASTM D 4491	145 gpm/sq ft (5900 Lpm/sq m)

- (4) Certification. The manufacturer shall furnish a certification with each shipment of inlet filters, stating the amount of product furnished and that the material complies with these requirements.”

PAVEMENT MARKING (BDE)

Effective: April 1, 2025

Revised: November 1, 2025

Revise the fourth sentence of the fourth paragraph of Article 780.05 of the Standard Specifications to read:

“Grooves for letters and symbols shall be cut in a rectangular shape or in the shape of the proposed marking so the entire marking will fit within the limits of the grooved area.”

Revise the last sentence of the third paragraph of Article 780.08 of the Standard Specifications to read:

“The Contractor shall install the preformed plastic pavement markings according to the manufacturer’s recommendations.”

Revise the second sentence of the first paragraph of Article 780.13 of the Standard Specifications to read:

“In addition, thermoplastic, preformed plastic, epoxy, preformed thermoplastic, polyurea, and modified urethane pavement markings will be inspected following a winter performance period that extends from November 15 to April 1 of the next year.”

80464

PERFORMANCE GRADED ASPHALT BINDER (BDE)

Effective: January 1, 2023

Revised: April 1, 2026

Revise Article 1032.05 of the Standard Specifications to read:

“1032.05 Performance Graded Asphalt Binder. These materials will be accepted according to the Bureau of Materials Policy Memorandum, “Performance Graded Asphalt Binder Qualification Procedure.” The Department will maintain a qualified producer list. These materials shall be free from water and shall not foam when heated to any temperature below the actual flash point. Air blown asphalt, recycle engine oil bottoms (ReOB), and polyphosphoric acid (PPA) modification shall not be used.

When requested, producers shall provide the Engineer with viscosity/temperature relationships for the performance graded asphalt binders delivered and incorporated in the work.

- (a) Performance Graded (PG) Asphalt Binder. The asphalt binder shall meet the requirements of AASHTO M 320, Table 1 “Standard Specification for Performance Graded Asphalt Binder” for the grade shown on the plans and the following.

Test	Parameter
Small Strain Parameter (AASHTO PP 113) BBR, ΔT_c , 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)	-5 °C min.

- (b) Modified Performance Graded (PG) Asphalt Binder. The asphalt binder shall meet the requirements of AASHTO M 320, Table 1 “Standard Specification for Performance Graded Asphalt Binder” for the grade shown on the plans.

Asphalt binder modification shall be performed at the source, as defined in the Bureau of Materials Policy Memorandum, “Performance Graded Asphalt Binder Qualification Procedure.”

Modified asphalt binder shall be safe to handle at asphalt binder production and storage temperatures or HMA construction temperatures. Safety Data Sheets (SDS) shall be provided for all asphalt modifiers.

- (1) Polymer Modification (SBS). Elastomers shall be added to the base asphalt binder to achieve the specified performance grade and shall be a styrene-butadiene-styrene without oil extension. The polymer modified asphalt binder shall be smooth, homogeneous, and be according to the following requirements for the grade shown on the plans.

Requirements for Styrene-Butadiene Copolymer (SBS) Modified Asphalt Binders			
Separation of Polymer ITP, "Separation of Polymer from Asphalt Binder" Difference in °F (°C) of the softening point between top and bottom portions		4 (2) max.	
Tests on Residue from Rolling Thin Film Oven Test (RTFO), AASHTO T 240			
Multiple Stress Creep Recovery (MSCR), AASHTO T 350			
Asphalt Grade	Test Temperature	Maximum J _{nr} (3.2 kPa)	Minimum % Recovery (3.2 kPa)
SBS 76-22	64 °C	≤ 0.5	≥ 75 %
SBS 70-22		≤ 2	≥ 30 %
SBS 76-28	58 °C	≤ 0.5	≥ 80 %
SBS 70-28		≤ 1	≥ 60 %
SBS 64-28		≤ 2	≥ 30 %

- (2) Ground Tire Rubber (GTR) Modification. GTR modification is the addition of recycled ground tire rubber to liquid asphalt binder to achieve the specified performance grade. GTR shall be produced from processing automobile and/or truck tires by the ambient grinding method or micronizing through a cryogenic process. GTR shall not exceed 1/16 in. (2 mm) in any dimension and shall not contain free metal particles, moisture that would cause foaming of the asphalt, or other foreign materials. A mineral powder (such as talc) meeting the requirements of AASHTO M 17 may be added, up to a maximum of four percent by weight of GTR to reduce sticking and caking of the GTR particles. When tested in accordance with Illinois Modified AASHTO T 27 "Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates" or AASHTO PP 74 "Standard Practice for Determination of Size and Shape of Glass Beads Used in Traffic Markings by Means of Computerized Optical Method", a 50 g sample of the GTR shall conform to the following gradation requirements.

Sieve Size	Percent Passing
No. 16 (1.18 mm)	100
No. 30 (600 µm)	95 ± 5
No. 50 (300 µm)	> 20

GTR modified asphalt binder shall be tested for rotational viscosity according to AASHTO T 316 using spindle S27. GTR modified asphalt binder shall be tested for original dynamic shear and RTFO dynamic shear according to AASHTO T 315 using a gap of 2 mm.

Requirements for Ground Tire Rubber (GTR) Modified Asphalt Binders		
TESTS ON RESIDUE FROM ROLLING THIN FILM OVEN TEST (AASHTO T 240)		
Elastic Recovery ASTM D 6084, Procedure A, 77 °F (25 °C), 100 mm elongation, %	60 min.	70 min.

- (3) Softener Modification (SM). Softener modification is the addition of organic compounds, such as engineered flux, bio-oil blends, modified vegetable oils, amines, and fatty acid derivatives, to the base asphalt binder to achieve the specified performance grade. Softeners shall be dissolved, dispersed, or reacted in the asphalt binder to enhance its performance and shall remain compatible with the asphalt binder with no separation. Softeners shall not be added to modified PG asphalt binder as defined in Article 1032.05(b)(2).

An Attenuated Total Reflectance-Fourier Transform Infrared spectrum (ATR-FTIR) shall be collected for both the softening compound as well as the softener modified asphalt binder at the dose intended for qualification. The ATR-FTIR spectra shall be collected on unaged softener modified binder, 20-hour Pressurized Aging Vessel (PAV) aged softener modified binder, and 40-hour PAV aged softener modified binder. The ATR-FTIR shall be collected in accordance with Illinois Test Procedure 601. The electronic files spectral files (in one of the following extensions or equivalent: *.SPA, *.SPG, *.IRD, *.IFG, *.CSV, *.SP, *.IRS, *.GAML, *. [0-9], *.IGM, *.ABS, *.DRT, *.SBM, *.RAS) shall be submitted to the Central Bureau of Materials.

Requirements for Softener Modified (SM) Asphalt Binders		
Test	Asphalt Grade	
	SM PG 46-28	SM PG 46-34
	SM PG 52-28	SM PG 52-34
	SM PG 58-22	SM PG 58-28
	SM PG 64-22	
Small Strain Parameter (AASHTO PP 113) BBR, ΔT_c , 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)	-5 °C min.	
Large Strain Parameter (Illinois Modified AASHTO T 391) DSR/LAS Fatigue Property, $\Delta G^* _{peak}$, 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)	≥ 54 %	

- (4) Polymer/Softener Modification (SBS/SM). Polymer/Softener modification is the addition of organic compounds, such as engineered flux, bio-oil blends, modified vegetable oils, amines, and fatty acid derivatives, used in combination with SBS modified PG asphalt binder as modified in accordance with Article 1032.05(b)(1) to achieve the specified performance grade. Polymer/Softeners shall be compatible with

each other and dissolved, dispersed, or reacted in the asphalt binder to enhance its performance and shall remain compatible with the asphalt binder with no separation. Polymer/Softeners shall not be added to modified PG asphalt binder as defined in Article 1032.05(b)(2).

An Attenuated Total Reflectance-Fourier Transform Infrared spectrum (ATR-FTIR) shall be collected for both the polymer and the softening compound as well as the polymer/softener modified asphalt binder at the dose intended for qualification. The ATR-FTIR spectra shall be collected on unaged polymer/softener modified binder, 20-hour Pressurized Aging Vessel (PAV) aged polymer/softener modified binder, and 40-hour PAV aged polymer/softener modified binder. The ATR-FTIR shall be collected in accordance with Illinois Test Procedure 601. The electronic files spectral files (in one of the following extensions or equivalent: *.SPA, *.SPG, *.IRD, *.IFG, *.CSV, *.SP, *.IRS, *.GAML, *.I[0-9], *.IGM, *.ABS, *.DRT, *.SBM, *.RAS) shall be submitted to the Central Bureau of Materials.

Requirements for Polymer/Softener Modified (SBS-SM) Asphalt Binders			
Separation of Polymer ITP, "Separation of Polymer from Asphalt Binder" Difference in °F (°C) of the softening point between top and bottom portions		4 (2) max.	
Tests on Residue from Rolling Thin Film Oven Test (RTFO), AASHTO T 240			
Multiple Stress Creep Recovery (MSCR), AASHTO T 350			
Asphalt Grade	Test Temperature	Maximum J _{nr} (3.2 kPa)	Minimum % Recovery (3.2 kPa)
SBS-SM 76-22	64 °C	≤ 0.5	≥ 75 %
SBS-SM 70-22		≤ 2	≥ 30 %
SBS-SM 76-28	58 °C	≤ 0.5	≥ 80 %
SBS-SM 70-28		≤ 1	≥ 60 %
SBS-SM 64-28		≤ 2	≥ 30 %
Small Strain Parameter (AASHTO PP 113) BBR, ΔT _c , 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)			-5 °C min.
Large Strain Parameter (Illinois Modified AASHTO T 391) DSR/LAS Fatigue Property, Δ G* _{peak} τ, 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)			≥ 60 %

The following grades may be specified as tack coats.

Asphalt Grade	Use
PG 58-22, PG 58-28, PG 64-22	Tack Coat"

Revise Article 1031.06(c)(1) and 1031.06(c)(2) of the Standard Specifications to read:

- “(1) RAP/RAS. When RAP is used alone or RAP is used in conjunction with RAS, the percentage of virgin ABR shall not exceed the amounts listed in the following table.

HMA Mixtures - RAP/RAS Maximum ABR % ^{1/ 2/}			
Ndesign	Binder	Surface	Polymer Modified Binder or Surface ^{3/}
30	30	30	10
50	25	15	10
70	15	10	10
90	10	10	10

1/ For Low ESAL HMA shoulder and stabilized subbase, the RAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When RAP/RAS ABR exceeds 20 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

3/ The maximum ABR percentages for ground tire rubber (GTR) modified mixes shall be equivalent to the percentages specified for SBS polymer modified mixes.

- (2) FRAP/RAS. When FRAP is used alone or FRAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the following table.

HMA Mixtures - FRAP/RAS Maximum ABR % ^{1/ 2/}			
Ndesign	Binder	Surface	Polymer Modified Binder or Surface ^{3/}
30	55	45	15
50	45	40	15
70	45	35	15
90	45	35	15
SMA	- -	- -	25
IL-4.75	- -	- -	35

1/ For Low ESAL HMA shoulder and stabilized subbase, the FRAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When FRAP/RAS ABR exceeds 20 percent for all mixes, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

- 3/ The maximum ABR percentages for GTR modified mixes shall be equivalent to the percentages specified for SBS polymer modified mixes.”

Add the following to the end of Note 2 of Article 1030.03 of the Standard Specifications.

“A dedicated storage tank for the ground tire rubber (GTR) modified asphalt binder shall be provided. This tank shall be capable of providing continuous mechanical mixing throughout and/or recirculation of the asphalt binder to provide a uniform mixture. The tank shall be heated and capable of maintaining the temperature of the asphalt binder at 300 °F to 350 °F (149 °C to 177 °C). The asphalt binder metering systems of dryer drum plants shall be calibrated with the actual GTR modified asphalt binder material with an accuracy of ± 0.40 percent.”

80441

RAISED REFLECTIVE PAVEMENT MARKERS (BDE)

Effective: November 1, 2025

Revise the eighth sentence of the second paragraph of Article 781.03(a) of the Standard Specifications to read:

“A rapid setting epoxy selected from the Department’s qualified product list for raised reflective pavement markers shall be poured into the cut to within 3/8 in. (9 mm) of the pavement surface.”

Revise the first sentence of Article 1096.01 of the Standard Specifications to read:

“**1096.01 Raised Reflective Pavement Markers.** Raised reflective pavement markers shall meet the following requirements and be on the Department’s qualified product list.”

80473

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2024

Revised: April 1, 2026

Revise the first paragraph of Article 669.04 of the Standard Specifications to read:

“669.04 Regulated Substances Monitoring. Regulated substances monitoring includes environmental observation and field screening during regulated substances management activities. The excavated soil and groundwater within the work areas shall be managed as either uncontaminated soil, hazardous waste, special waste, or non-special waste.

As part of the regulated substances monitoring, the monitoring personnel shall perform and document the applicable duties listed on form BDE 2732 “Regulated Substances Monitoring Daily Record (RSMDR).”

Revise the first two sentences of the nineteenth paragraph of Article 669.05 of the Standard Specifications to read:

“The Contractor shall coordinate waste disposal approvals with the disposal facility and provide the specific analytical testing requirements of that facility. The Contractor shall make all arrangements for collection, transportation, and analysis of landfill acceptance testing.”

Revise the last paragraph of Article 669.05 of the Standard Specifications to read:

“The Contractor shall select a permitted landfill facility or CCDD/USFO facility meeting the requirements of 35 Ill. Admin. Code Parts 810-814 or Part 1100, respectively. The Department will review and approve or reject the facility proposed by the Contractor based upon information provided in BDE 2730. The Contractor shall verify whether the selected facility is compliant with those applicable standards as mandated by their permit and whether the facility is presently, has previously been, or has never been, on the United States Environmental Protection Agency (U.S. EPA) National Priorities List or the Resource Conservation and Recovery Act (RCRA) List of Violating Facilities. The use of a Contractor selected facility shall in no manner delay the construction schedule or alter the Contractor's responsibilities as set forth.”

Revise the first paragraph of Article 669.07 of the Standard Specifications to read:

“669.07 Temporary Staging. Soil classified according to Articles 669.05(a)(2), (b)(1), or (c) may be temporarily staged at the Contractor's option. All other soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) shall be managed and disposed of without temporary staging to the greatest extent practicable. If circumstances beyond the Contractor's control require temporary staging of these latter materials, the Contractor shall request approval from the Engineer in writing.

Topsoil for re-use as final cover which has been field screened and found not to exhibit PID readings over daily background readings as documented on the BDE 2732, visual staining or

odors, and is classified according to Articles 669.05(a)(2), (a)(3), (a)(4), (b)(1), or (c) may be temporarily staged at the Contractor's option."

Add the following paragraph after the fourth paragraph of Article 669.10 of the Standard Specifications.

"Regulated substances monitoring will be measured for payment per calendar day, where 4 or more hours of monitoring activities is defined as 1.0 calendar day and less than 4 hours of monitoring activities is defined as 0.5 calendar day."

Revise the second paragraph of Article 669.11 of the Standard Specification to read:

"Regulated substances monitoring, including completion of form BDE 2732 for each day of work, will be paid for at the contract unit price per calendar day for REGULATED SUBSTANCES MONITORING. In no case will more than 1.0 calendar day be paid on a given calendar day."

Add the following paragraph after the sixth paragraph of Article 669.11 of the Standard Specifications.

"The sampling and testing of effluent water derived from dewatering discharges for priority pollutants volatile organic compounds (VOCs), priority pollutants semi-volatile organic compounds (SVOCs), or priority pollutants metals, will be paid for at the contract unit price per each for VOCS GROUNDWATER ANALYSIS using EPA Method 8260B, SVOCs GROUNDWATER ANALYSIS using EPA Method 8270C, or RCRA METALS GROUNDWATER ANALYSIS using EPA Methods 6010B and 7471A. This price shall include transporting the sample from the job site to the laboratory."

Revise the first sentence of the eight paragraph of Article 669.11 of the Standard Specifications to read:

"Payment for temporary staging of soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) to be managed and disposed of, if required and approved by the Engineer, will be paid according to Article 109.04."

80455

SEEDING (BDE)

Effective: November 1, 2022

Revised: July 1, 2026

Revise Article 250.07 of the Standard Specifications to read:

“250.07 Seeding Mixtures. The classes of seeding mixtures and combinations of mixtures will be designated in the plans.

When an area is to be seeded with two or more seeding classes, those mixtures shall be applied separately on the designated area within a seven day period. Seeding shall occur prior to placement of mulch cover. A Class 7 mixture can be applied at any time prior to applying any seeding class or added to them and applied at the same time.

TABLE 1 - SEEDING MIXTURES		
Class - Type	Seeds	lb/acre (kg/hectare)
1 Lawn Mixture 1/	Kentucky Bluegrass Perennial Ryegrass <i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	100 (110) 60 (70) 40 (50)
1A Salt Tolerant Lawn Mixture 1/	Kentucky Bluegrass Perennial Ryegrass <i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue) <i>Festuca brevipilla</i> (Hard Fescue) <i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass)	60 (70) 20 (20) 20 (20) 20 (20) 60 (70)
1B Low Maintenance Lawn Mixture 1/	Turf-Type Fine Fescue 3/ Perennial Ryegrass Red Top <i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	150 (170) 20 (20) 10 (10) 20 (20)
2 Roadside Mixture 1/	<i>Lolium arundinaceum</i> (Tall Fescue) Perennial Ryegrass <i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue) Red Top	100 (110) 50 (55) 40 (50) 10 (10)
2A Salt Tolerant Roadside Mixture 1/	<i>Lolium arundinaceum</i> (Tall Fescue) Perennial Ryegrass <i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue) <i>Festuca brevipila</i> (Hard Fescue) <i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass)	60 (70) 20 (20) 30 (20) 30 (20) 60 (70)
3 Northern Illinois Slope Mixture 1/	<i>Elymus canadensis</i> (Canada Wild Rye) 5/ Perennial Ryegrass Alsike Clover 4/ <i>Desmanthus illinoensis</i> (Illinois Bundleflower) 4/ 5/ <i>Schizachyrium scoparium</i> (Little Bluestem) 5/ <i>Bouteloua curtipendula</i> (Side-Oats Grama) 5/ <i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass) Oats, Spring Slender Wheat Grass 5/ Buffalo Grass 5/ 7/	5 (5) 20 (20) 5 (5) 2 (2) 12 (12) 10 (10) 30 (35) 50 (55) 15 (15) 5 (5)
3A Southern Illinois Slope Mixture 1/	Perennial Ryegrass <i>Elymus canadensis</i> (Canada Wild Rye) 5/ <i>Panicum virgatum</i> (Switchgrass) 5/ <i>Schizachyrium scoparium</i> (Little Blue Stem) 5/ <i>Bouteloua curtipendula</i> (Side-Oats Grama) 5/ <i>Dalea candida</i> (White Prairie Clover) 4/ 5/ <i>Rudbeckia hirta</i> (Black-Eyed Susan) 5/ Oats, Spring	20 (20) 20 (20) 10 (10) 12 (12) 10 (10) 5 (5) 5 (5) 50 (55)

Class – Type		Seeds	lb/acre (kg/hectare)
4	Native Grass 2/ 6/	<i>Andropogon gerardi</i>	4 (4)
		(Big Blue Stem) 5/	
		<i>Schizachyrium scoparium</i>	5 (5)
		(Little Blue Stem) 5/	
		<i>Bouteloua curtipendula</i>	5 (5)
		(Side-Oats Grama) 5/	
		<i>Elymus canadensis</i>	1 (1)
		(Canada Wild Rye) 5/	
		<i>Panicum virgatum</i> (Switch Grass) 5/	1 (1)
		<i>Sorghastrum nutans</i> (Indian Grass) 5/	2 (2)
4A	Low Profile Native Grass 2/ 6/	Annual Ryegrass	25 (25)
		Oats, Spring	25 (25)
		Perennial Ryegrass	15 (15)
		<i>Schizachyrium scoparium</i>	5 (5)
		(Little Blue Stem) 5/	
		<i>Bouteloua curtipendula</i>	5 (5)
		(Side-Oats Grama) 5/	
		<i>Elymus canadensis</i>	1 (1)
		(Canada Wild Rye) 5/	
		<i>Sporobolus heterolepis</i>	0.5 (0.5)
4B	Wetland Grass and Sedge Mixture 2/ 6/	Annual Ryegrass	25 (25)
		Oats, Spring	25 (25)
		Wetland Grasses (species below) 5/	6 (6)
		<u>Species:</u>	<u>% By Weight</u>
		<i>Calamagrostis canadensis</i> (Blue Joint Grass)	12
		<i>Carex lacustris</i> (Lake-Bank Sedge)	6
		<i>Carex slipata</i> (Awl-Fruited Sedge)	6
		<i>Carex stricta</i> (Tussock Sedge)	6
		<i>Carex vulpinoidea</i> (Fox Sedge)	6
		<i>Eleocharis acicularis</i> (Needle Spike Rush)	3
		<i>Eleocharis obtusa</i> (Blunt Spike Rush)	3
		<i>Glyceria striata</i> (Fowl Manna Grass)	14
		<i>Juncus effusus</i> (Common Rush)	6
		<i>Juncus tenuis</i> (Slender Rush)	6
		<i>Juncus torreyi</i> (Torrey's Rush)	6
		<i>Leersia oryzoides</i> (Rice Cut Grass)	10
		<i>Scirpus acutus</i> (Hard-Stemmed Bulrush)	3
		<i>Scirpus atrovirens</i> (Dark Green Rush)	3
		<i>Bolboschoenus fluviatilis</i> (River Bulrush)	3
		<i>Schoenoplectus tabernaemontani</i> (Softstem Bulrush)	3
		<i>Spartina pectinata</i> (Cord Grass)	4

Class – Type	Seeds	lb/acre (kg/hectare)
5	Forb with Annuals Mixture 2/ 5/ 6/ Annuals Mixture (Below) Forb Mixture (Below) Annuals Mixture - Mixture not exceeding 25 % by weight of any one species, of the following: <i>Coreopsis lanceolata</i> (Sand Coreopsis) <i>Leucanthemum maximum</i> (Shasta Daisy) <i>Gaillardia pulchella</i> (Blanket Flower) <i>Ratibida columnifera</i> (Prairie Coneflower) <i>Rudbeckia hirta</i> (Black-Eyed Susan) Forb Mixture - Mixture not exceeding 5 % by weight PLS of any one species, of the following: <i>Amorpha canescens</i> (Lead Plant) 4/ <i>Anemone cylindrica</i> (Thimble Weed) <i>Asclepias tuberosa</i> (Butterfly Weed) <i>Aster azureus</i> (Sky Blue Aster) <i>Symphyotrichum leave</i> (Smooth Aster) <i>Aster novae-angliae</i> (New England Aster) <i>Baptisia leucantha</i> (White Wild Indigo) 4/ <i>Coreopsis palmata</i> (Prairie Coreopsis) <i>Echinacea pallida</i> (Pale Purple Coneflower) <i>Eryngium yuccifolium</i> (Rattlesnake Master) <i>Helianthus mollis</i> (Downy Sunflower) <i>Heliopsis helianthoides</i> (Ox-Eye) <i>Liatris aspera</i> (Rough Blazing Star) <i>Liatris pycnostachya</i> (Prairie Blazing Star) <i>Monarda fistulosa</i> (Prairie Bergamot) <i>Parthenium integrifolium</i> (Wild Quinine) <i>Dalea candida</i> (White Prairie Clover) 4/ <i>Dalea purpurea</i> (Purple Prairie Clover) 4/ <i>Physostegia virginiana</i> (False Dragonhead) <i>Potentilla arguta</i> (Prairie Cinquefoil) <i>Ratibida pinnata</i> (Yellow Coneflower) <i>Rudbeckia subtomentosa</i> (Fragrant Coneflower) <i>Silphium laciniatum</i> (Compass Plant) <i>Silphium terebinthinaceum</i> (Prairie Dock) <i>Oligoneuron rigidum</i> (Rigid Goldenrod) <i>Tradescantia ohiensis</i> (Spiderwort) <i>Veronicastrum virginicum</i> (Culver's Root)	1 (1) 10 (10)

Class – Type		Seeds	lb/acre (kg/hectare)
5A	Large Flower Native Forb Mixture 2/ 5/ 6/	Forb Mixture (see below)	5 (5)
	<u>Species:</u>	<u>% By Weight</u>	
	<i>Aster novae-angliae</i> (New England Aster)	5	
	<i>Echinacea pallida</i> (Pale Purple Coneflower)	10	
	<i>Helianthus mollis</i> (Downy Sunflower)	10	
	<i>Heliopsis helianthoides</i> (Ox-Eye)	10	
	<i>Liatris pycnostachya</i> (Prairie Blazing Star)	10	
	<i>Ratibida pinnata</i> (Yellow Coneflower)	5	
	<i>Rudbeckia hirta</i> (Black-Eyed Susan)	10	
	<i>Silphium laciniatum</i> (Compass Plant)	10	
	<i>Silphium terebinthinaceum</i> (Prairie Dock)	20	
	<i>Oligoneuron rigidum</i> (Rigid Goldenrod)	10	
5B	Wetland Forb 2/ 5/ 6/	Forb Mixture (see below)	2 (2)
	<u>Species:</u>	<u>% By Weight</u>	
	<i>Acorus calamus</i> (Sweet Flag)	3	
	<i>Angelica atropurpurea</i> (Angelica)	6	
	<i>Asclepias incarnata</i> (Swamp Milkweed)	2	
	<i>Aster puniceus</i> (Purple Stemmed Aster)	10	
	<i>Bidens cernua</i> (Beggarticks)	7	
	<i>Eutrochium maculatum</i> (Spotted Joe Pye Weed)	7	
	<i>Eupatorium perfoliatum</i> (Boneset)	7	
	<i>Helenium autumnale</i> (Autumn Sneezeweed)	2	
	<i>Iris virginica shrevei</i> (Blue Flag Iris)	2	
	<i>Lobelia cardinalis</i> (Cardinal Flower)	5	
	<i>Lobelia siphilitica</i> (Great Blue Lobelia)	5	
	<i>Lythrum alatum</i> (Winged Loosestrife)	2	
	<i>Physostegia virginiana</i> (False Dragonhead)	5	
	<i>Persicaria pensylvanica</i> (Pennsylvania Smartweed)	10	
	<i>Persicaria lapathifolia</i> (Curlytop Knotweed)	10	
	<i>Pycnanthemum virginianum</i> (Mountain Mint)	5	
	<i>Rudbeckia laciniata</i> (Cut-leaf Coneflower)	5	
	<i>Oligoneuron riddellii</i> (Riddell Goldenrod)	2	
	<i>Sparganium eurycarpum</i> (Giant Burreed)	5	
6	Conservation Mixture 2/ 6/	<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/ <i>Elymus canadensis</i> (Canada Wild Rye) 5/ Buffalo Grass 5/ 7/ Vernal Alfalfa 4/ Oats, Spring	5 (5) 2 (2) 5 (5) 15 (15) 48 (55)
6A	Salt Tolerant Conservation Mixture 2/ 6/	<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/ <i>Elymus canadensis</i> (Canada Wild Rye) 5/ Buffalo Grass 5/ 7/ Vernal Alfalfa 4/ Oats, Spring <i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass)	5 (5) 2 (2) 5 (5) 15 (15) 48 (55) 20 (20)
7	Temporary Turf Cover Mixture	Perennial Ryegrass Oats, Spring	50 (55) 64 (70)

Notes:

- 1/ In Districts 1 through 6, the planting times shall be April 15 to June 15 and September 15 to November 1. In Districts 7 through 9, the planting times shall be April 1 to June 1 and October 15 to December 1. Seeding may be performed outside these dates provided the Contractor guarantees a minimum of 75 percent uniform growth over the entire seeded area(s) after a period of establishment. The guarantee shall be submitted to the Engineer in writing prior to performing the work. Seeding shall be performed when the ambient temperature has been between 45 °F (7 °C) and 80 °F (27 °C) for a minimum of seven (7) consecutive days and is forecasted to be the same for the next five (5) days according to the National Weather Service.
- 2/ Planting times shall be April 15 to June 15 and October 1 to December 1. Seeding shall be performed in late fall through spring beginning when the ambient temperature has been below 45 °F (7 °C) for a minimum of seven (7) consecutive days and ending when the ambient temperature exceeds 80 °F (27 °C) according to the National Weather Service.
- 3/ Specific variety as shown in the plans or approved by the Engineer.
- 4/ Inoculation required.
- 5/ Pure Live Seed (PLS) shall be used.
- 6/ Fertilizer shall not be used.
- 7/ Seed shall be primed with KNO_3 to break dormancy and dyed to indicate such.

Seeding will be inspected after a period of establishment. The period of establishment shall be six (6) months minimum, but not to exceed nine (9) months. After the period of establishment, areas not exhibiting 75 percent uniform growth shall be interseeded or reseeded, as determined by the Engineer, at no additional cost to the Department.”

80445

SHORT TERM AND TEMPORARY PAVEMENT MARKINGS (BDE)

Effective: April 1, 2024

Revised: April 2, 2024

Revise Article 701.02(d) of the Standard Specifications to read:

“(d) Pavement Marking Tapes (Note 3) 1095.06”

Add the following Note to the end of Article 701.02 of the Standard Specifications:

“Note 3. White or yellow pavement marking tape that is to remain in place longer than 14 days shall be Type IV tape.”

Revise Article 703.02(c) of the Standard Specifications to read:

“(c) Pavement Marking Tapes (Note 1) 1095.06”

Add the following Note to the end of Article 703.02 of the Standard Specifications:

“Note 1. White or yellow pavement marking tape that is to remain in place longer than 14 days shall be Type IV tape.”

Revise Article 1095.06 of the Standard Specifications to read:

“1095.06 Pavement Marking Tapes. Type I white or yellow marking tape shall consist of glass spheres embedded into a binder on a foil backing that is precoated with a pressure sensitive adhesive. The spheres shall be of uniform gradation and distributed evenly over the surface of the tape.

Type IV tape shall consist of white or yellow tape with wet reflective media incorporated to provide immediate and continuing retroreflection in wet and dry conditions. The wet retroreflective media shall be bonded to a durable polyurethane surface. The patterned surface shall have approximately 40 ± 10 percent of the surface area raised and presenting a near vertical face to traffic from any direction. The channels between the raised areas shall be substantially free of exposed reflective elements or particles.

Blackout tape shall consist of a matte black, non-reflective, patterned surface that is precoated with a pressure sensitive adhesive.

- (a) Color. The white and yellow markings shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degrees circumferential/zero degree geometry, illuminant D65, and two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

Color	Daylight Reflectance %Y
White	65 min.
Yellow *	36 - 59

*Shall match Aerospace Material Specification Standard 595 33538 (Orange Yellow) and the chromaticity limits as follows.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456

- (b) Retroreflectivity. The white and yellow markings shall be retroreflective. Reflective values measured in accordance with the photometric testing procedure of ASTM D 4061 shall not be less than those listed in the table below. The coefficient of retroreflected luminance, R_L , shall be expressed as average millicandelas/footcandle/sq ft (millicandelas/lux/sq m), measured on a 3.0 x 0.5 ft (900 mm x 150 mm) panel at 86 degree entrance angle.

Coefficient of Retroreflected Luminance, R_L , Dry					
Type I			Type IV		
Observation Angle	White	Yellow	Observation Angle	White	Yellow
0.2°	2700	2400	0.2°	1300	1200
0.5°	2250	2000	0.5°	1100	1000

Wet retroreflectance shall be measured for Type IV under wet conditions according to ASTM E 2177 and meet the following.

Wet Retroreflectance, Initial R_L	
Color	R_L 1.05/88.76
White	300
Yellow	200

- (c) Skid Resistance. The surface of Type IV and blackout markings shall provide a minimum skid resistance of 45 BPN when tested according to ASTM E 303.
- (d) Application. The pavement marking tape shall have a precoated pressure sensitive adhesive and shall require no activation procedures. Test pieces of the tape shall be applied according to the manufacturer's instructions and tested according to ASTM D 1000, Method A, except that a stiff, short bristle roller brush and heavy hand pressure will be substituted for the weighted rubber roller in applying the test pieces to the metal test panel. Material tested as directed above shall show a minimum adhesion value of 750 g/in. (30 g/mm) width at the temperatures specified in ASTM D 1000. The adhesive shall be resistant to oils, acids, solvents, and water, and shall not leave objectionable stains or residue after removal. The material shall be flexible and conformable to the texture of the pavement.

- (e) Durability. Type IV and blackout tape shall be capable of performing for the duration of a normal construction season and shall then be capable of being removed intact or in large sections at pavement temperatures above 40 °F (4 °C) either manually or with a roll-up device without the use of sandblasting, solvents, or grinding. The Contractor shall provide a manufacturer's certification that the material meets the requirements for being removed after the following minimum traffic exposure based on transverse test decks with rolling traffic.

- (1) Time in place - 400 days
- (2) ADT per lane - 9,000 (28 percent trucks)
- (3) Axle hits - 10,000,000 minimum

Samples of the material applied to standard specimen plates will be measured for thickness and tested for durability in accordance with ASTM D 4060, using a CS-17 wheel and 1000-gram load, and shall meet the following criteria showing no significant change in color after being tested for the number of cycles indicated.

Test	Type I	Type IV	Blackout
Minimum Initial Thickness, mils (mm)	20 (0.51)	65 (1.65) ^{1/} 20 (0.51) ^{2/}	65 (1.65) ^{1/} 20 (0.51) ^{2/}
Durability (cycles)	5,000	1,500	1,500

1/ Measured at the thickest point of the patterned surface.

2/ Measured at the thinnest point of the patterned surface.

The pavement marking tape, when applied according to the manufacturer's recommended procedures, shall be weather resistant and shall show no appreciable fading, lifting, or shrinkage during the useful life of the marking. The tape, as applied, shall be of good appearance, free of cracks, and edges shall be true, straight, and unbroken.

- (f) Sampling and Inspection.

- (1) Sample. Prior to approval and use of Type IV pavement marking tape, the manufacturer shall submit a notarized certification from an independent laboratory, together with the results of all tests, stating that the material meets the requirements as set forth herein. The independent laboratory test report shall state the lot tested, the manufacturer's name, and the date of manufacture.

After initial approval by the Department, samples and certification by the manufacturer shall be submitted for each subsequent batch of Type IV tape used. The manufacturer shall submit a certification stating that the material meets the requirements as set forth herein and is essentially identical to the material sent for qualification. The certification shall state the lot tested, the manufacturer's name, and the date of manufacture.

- (2) Inspection. The Contractor shall provide a manufacturer's certification to the Engineer stating the material meets all requirements of this specification. All material samples for acceptance tests shall be taken or witnessed by a representative of the Bureau of Materials and shall be submitted to the Engineer of Materials, 126 East Ash Street, Springfield, Illinois 62704-4766 at least 30 days in advance of the pavement marking operations."

80457

SIGN PANELS AND APPURTENANCES (BDE)

Effective: January 1, 2025

Revised: January 1, 2026

Add Article 720.02(c) of the Standard Specifications to read:

“(c) Aluminum Epoxy Mastic 1008.03”

Revise the second and third paragraphs of Article 720.02 of the Standard Specifications to read:

“The sign mounting support channel shall be manufactured from steel or aluminum and shall be according to Standard 720001.

Steel support channels shall be according to ASTM A 1011 (A 1011M), ASTM A 635 (A 635M), ASTM A 568 (A 568M), or ASTM A 684 (A 684M), and shall be galvanized. Galvanizing shall be according to ASTM A 653 (A 653M) when galvanized before fabrication, and AASHTO M 111 (M 111M) when galvanized after fabrication. Field or post fabricated drilled holes shall be spot painted with one coat of aluminum epoxy mastic paint prior to installation.”

Revise the fifth paragraph of Article 720.02 of the Standard Specifications to read:

“The stainless steel banding for mounting signs or sign support channels to light or signal standards shall be according to ASTM A 240 (A 240M) Type 302 stainless steel.”

Revise the first sentence of the tenth paragraph of Article 720.03 of the Standard Specifications to read:

“The backs of all sign panels shall be marked in a manner designed to last as long as the sign face material, in letters and numerals at least 3/8 in. (9.5 mm) but no more than 3/4 in. (19 mm) in height with the month and year of manufacture, the name of the sign manufacturer, the name of the sign sheeting manufacturer, the method of manufacture (“screened”, “EC film”, “direct applied”, or “digital print”), and the initials IDOT.”

Revise the first sentence of the fourth paragraph of Article 1091.03(a)(10) of the Standard Specifications to read:

“Transparent colors screened, or transparent acrylic electronic cutting films, or digital printing on white sheeting, shall meet the minimum initial coefficient of retroreflection values of the 0.2 degree observation angle, -4.0 degree entrance angle values as listed in the previous tables for the color being applied.”

Add the following after the fourth paragraph of Article 1091.03(a)(10) of the Standard Specifications:

“Digitally printed signs shall be produced using digital print technologies and ink systems, products and processes that comply with the sheeting manufacturer’s recommendation. The digitally printed signs shall be fabricated with a full sign protective overlay film designed to provide a smooth surface needed for retroreflectivity, and to protect the sign from fading and UV degradation. The overlamine shall comply with the sheeting manufacturer’s recommendations to ensure proper adhesion and transparency.”

Add the following after the third paragraph of Article 1106.01 of the Standard Specifications:

“Digitally printed signs may omit protective overlay film.”

80462

SOURCE OF SUPPLY AND QUALITY REQUIREMENTS (BDE)

Effective: January 2, 2023

Revised: January 1, 2026

Revise the third through ninth paragraphs of Article 106.01 of the Standard Specifications to read:

“Articles, materials, and supplies shall be classified into only one of the following categories.

- (a) Iron and Steel. All iron and steel products, which are to be incorporated into the work, shall be domestically manufactured or produced and fabricated, unless an exception is expressly permitted under Federal and/or State law and written permission is given by the Department. The Contractor shall obtain from the iron or steel producer and/or fabricator, in addition to the mill analysis, a certification that all iron or steel materials meet these domestic source requirements.

The applications of all coatings, epoxy, galvanizing, painting, etc. to iron and steel products shall be domestically applied.

- (b) Manufactured Products. Manufactured products shall include articles, materials or supplies that have been processed into a specific form or shape; or have been combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies. Manufactured products incorporated into the work shall have the final assembly for the manufacturing process occur domestically.

A manufactured product may include components that are construction materials, iron or steel products, or exempt materials.

Precast concrete products and intelligent transportation systems (ITS) or other electronic hardware systems shall comply with the requirements of Article 106.01(a) in addition to the requirements of manufactured products.

- (c) Construction Materials. All manufacturing processes for construction materials shall occur within the United States. Construction materials shall include an article, material, or supply consisting of only one of the following.

- (1) Non-ferrous metals;

- (2) Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);

- (3) Glass (including optic glass);

- (4) Fiber optic cable (including drop cable);

- (5) Optical fiber;

(6) Lumber;

(7) Drywall;

(8) Engineered wood.

Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.

- (d) Exempt Materials. Materials exempt from domestic production requirements are cement or cementitious materials, aggregates, aggregate binding agents or additives, or items not permanently incorporated into the work. Exempt materials may be combined with other materials into a final form to produce a manufactured product.”

80448

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

“109.14 Subcontractor and Disadvantaged Business Enterprise Payment Reporting.
The Contractor shall report all payments made to the following parties:

- (a) first tier subcontractors;
- (b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;
- (c) material suppliers or trucking firms that are part of the Contractor's submitted DBE utilization plan.

The report shall be made through the Department's on-line subcontractor payment reporting system within 21 days of making the payment.”

80397

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017

Revised: April 1, 2019

Replace the second paragraph of Article 109.12 of the Standard Specifications with the following:

“This mobilization payment shall be made at least seven days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor’s work.

Value of Subcontract Reported on Form BC 260A	Mobilization Percentage
Less than \$10,000	25%
\$10,000 to less than \$20,000	20%
\$20,000 to less than \$40,000	18%
\$40,000 to less than \$60,000	16%
\$60,000 to less than \$80,000	14%
\$80,000 to less than \$100,000	12%
\$100,000 to less than \$250,000	10%
\$250,000 to less than \$500,000	9%
\$500,000 to \$750,000	8%
Over \$750,000	7%”

80391

SUBMISSION OF BIDDERS LIST INFORMATION (BDE)

Effective: January 2, 2025

Revised: March 2, 2025

In accordance with 49 CFR 26.11(c) all DBE and non-DBEs who bid as prime contractors and subcontractors shall provide bidders list information, including all DBE and non-DBE firms from whom the bidder has received a quote or bid to work as a subcontractor, whether or not the bidder has relied upon that bid in placing its bid as the prime contractor.

The bidders list information shall be submitted with the bid using the link provided within the “Integrated Contractor Exchange (iCX)” application of the Department’s “EBids System”.

80463

SUBMISSION OF PAYROLL RECORDS – FEDERAL AID CONTRACT (BDE)

Effective: April 1, 2026

If the prevailing rate of wages published by the Illinois Department of Labor (IDOL) is equal to or greater than the prevailing wage determination by the United States Secretary of Labor for the same locality for the same type of construction used to classify the federal construction project, the requirements of the Illinois Prevailing Wage Act (820 ILCS 130) shall apply, including the “ILLINOIS PREVAILING WAGE ACT” section below. If not, only the requirements of the Davis-Bacon Act shall apply, including the “DAVIS-BACON ACT” section below.

DAVIS-BACON ACT. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

“STATEMENTS AND PAYROLLS

The payroll records shall include the worker’s name, social security number, last known address, telephone number, email address, classification(s) of work actually performed, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof), daily and weekly number of hours actually worked in total, deductions made, and actual wages paid.

The Contractor and each subcontractor shall submit certified payroll records to the Department each week from the start to the completion of their respective work, except that full social security numbers, last known addresses, telephone numbers, and email addresses shall not be included on weekly submittals. Instead, the payrolls need only include an identification number for each employee (e.g., the last four digits of the employee’s social security number). The submittals shall be made using LCPTracker Pro software. The software is web-based and can be accessed at <https://lcptracker.com/>. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate option (“No Work”, “Suspended”, or “Complete”) selected.”

ILLINOIS PREVAILING WAGE ACT. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

“STATEMENTS AND PAYROLLS

- (1) Prevailing Wages. All wages paid by the Contractor and each subcontractor shall be in compliance with The Prevailing Wage Act (820 ILCS 130), as amended, except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto. If the Department of Labor revises the wage rates, the Contractor will not be allowed additional compensation on account of said revisions.

(2) Payroll Records. The Contractor and each subcontractor shall make and keep, for a period of five years from the later of the date of final payment under the contract or completion of the contract, records of the wages paid to his/her workers. The payroll records shall include the worker's name, the worker's address, the worker's telephone number when available, the worker's social security number, the worker's classification or classifications, the worker's gross and net wages paid in each pay period, the worker's number of hours worked each day, and the worker's starting and ending times of work each day. However, any Contractor or subcontractor who remits contributions to a fringe benefit fund that is not jointly maintained and jointly governed by one or more employer and one or more labor organization must additionally submit the worker's hourly wage rate, the worker's hourly overtime wage rate, the worker's hourly fringe benefit rates, the name and address of each fringe benefit fund, the plan sponsor of each fringe benefit, if applicable, and the plan administrator of each fringe benefit, if applicable. Upon seven business days' notice, these records shall be available at a location within the State, during reasonable hours, for inspection by the Department or the Department of Labor; and Federal, State, or local law enforcement agencies and prosecutors.

(3) Submission of Payroll Records. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month to the Illinois Department of Labor (IDOL) through the Certified Transcript of Payroll Portal in compliance with the State Prevailing Wage Act (820 ILCS 130). The portal can be found on the IDOL website at <https://labor.illinois.gov>. Payrolls shall be submitted in the format prescribed by the IDOL.

In addition to filing certified payroll(s) with the IDOL, the Contractor and each subcontractor shall certify and submit payroll records to the Department each week from the start to the completion of their respective work, except that full social security numbers shall not be included on weekly submittals. Instead, the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted. The submittals shall be made using LCPTracker Pro software. The software is web-based and can be accessed at <https://lcptracker.com/>. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate option ("No Work", "Suspended", or "Complete") selected.

(4) Employee Interviews. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor."

SURVEYING SERVICES (BDE)

Effective: April 1, 2025

Delete the fourth paragraph of Article 667.04 of the Standard Specifications.

Delete Section 668 of the Standard Specifications.

80465

TEMPORARY CONCRETE BARRIER (BDE)

Effective: January 1, 2026

Add the following to Article 704.02 of the Standard Specifications:

“(f) Type C Reflector 1097.02(c)”

80481

TRAINING SPECIAL PROVISIONS (BDE)

Effective: October 15, 1975

Revised: September 2, 2021

This Training Special Provision supersedes Section 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be 2. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also ensure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee it employs on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he or she has successfully completed a training course leading to journeyman status or in which he or she has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor Employment Training Administration shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The Contractor shall provide for the maintenance of records and furnish periodic reports documenting its performance under this Training Special Provision.

For contracts with an awarded contract value of \$500,000 or more, the Contractor is required to comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules to the extent permitted by Section 20-20(g). For federally funded projects, the number of trainees to be trained under this contract, as stated in the Training Special Provisions, will be the established goal for the Illinois Works Apprenticeship Initiative 30 ILCS 559/20-20(g). The Contractor shall make a good faith effort to meet this goal. For federally funded projects, the Illinois Works Apprenticeship Initiative will be implemented using the FHWA approved OJT procedures. The Contractor must comply with the recordkeeping and reporting obligations of the Illinois Works Apprenticeship Initiative for the life of the project, including the certification as to whether the trainee/apprentice labor hour goals were met.

Method of Measurement. The unit of measurement is in hours.

Basis of Payment. This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price, and total price have been included in the schedule of prices.

20338

VEHICLE AND EQUIPMENT WARNING LIGHTS (BDE)

Effective: November 1, 2021

Revised: November 1, 2026

Add the following paragraph after the first paragraph of Article 701.08 of the Standard Specifications:

“The Contractor shall equip all vehicles and equipment with high-intensity oscillating, rotating, or flashing; green, amber, or amber-and-white warning lights which are visible from all directions. In accordance with 625 ILCS 5/12-215, the lights may only be in operation while the vehicle or equipment is engaged in construction operations.”

80439

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

Revised: January 2, 2025

The following applies to all Disadvantaged Business Enterprise (DBE) trucks on the project, whether they are utilized for DBE goal credit or not.

The Contractor shall notify the Engineer at least three days prior to DBE trucking activity.

The Contractor shall submit a weekly report of DBE trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) to the Engineer on Department form "SBE 723" within ten business days following the reporting period. The reporting period shall be Sunday through Saturday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: March 2, 2020

Revised: January 1, 2026

Add the following to Article 701.03 of the Standard Specifications:

“(q) Temporary Sign Supports 1106.02”

Revise Article 701.03(p) of the Standard Specifications to read:

“(p) Detectable Pedestrian Channelizing Barricades 1106.02(m)”

Revise the third paragraph of Article 701.14 of the Standard Specifications to read:

“For temporary sign supports, the Contractor shall provide a FHWA eligibility letter for each device used on the contract. The letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support per the manufacturer’s specifications.”

Revise the first paragraph of Article 701.15 of the Standard Specifications to read:

“**701.15 Traffic Control Devices.** For devices that must meet crashworthiness standards, the Contractor shall provide a manufacturer’s self-certification or a FHWA eligibility letter for each Category 1 device and a FHWA eligibility letter for each Category 2 and Category 3 device used on the contract. The self-certification or letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device.”

Revise the first six paragraphs of Article 1106.02 of the Standard Specifications to read:

“**1106.02 Devices.** Work zone traffic control devices and combinations of devices shall meet crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, plastic drums, and delineators, with no attachments (e.g. lights). Category 1 devices shall be MASH compliant.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include vertical panels with lights, barricades, temporary sign supports, and Category 1 devices with attachments (e.g. drums with lights). Category 2 devices shall be MASH compliant.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1 or 2. Category 3 devices manufactured after December 31, 2019 shall be MASH compliant. Category 3 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350, may be used on contracts let before December 31, 2029. Category 3 devices shall be crash tested for Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as sign supports, speed feedback displays, arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. It is preferable for Category 4 devices manufactured after December 31, 2019 to be MASH-16 compliant; however, there are currently no crash tested devices in this category, so it remains exempt from the NCHRP 350 or MASH compliance requirement.

For each type of device, when no more than one MASH compliant is available, an NCHRP 350 compliant device may be used, even if manufactured after December 31, 2019.”

Revise the first paragraph of Section 1106.02(a) of the Standard Specifications to read:

- “(a) Lights. Lights shall meet the requirements of Chapter 13 of the “Equipment and Materials Standards of the Institute of Transportation Engineers,” 1998, Institute of Transportation Engineers, and shall be visible on a clear night from a distance of 3000 ft (900 m). Lights are classified as follows.”

Revise Articles 1106.02(g), 1106.02(k), 1106.02(l), and 1106.02(m) of the Standard Specifications to read:

- “(g) Truck Mounted/Trailer Mounted Attenuators. The attenuator shall be approved for use at Test Level 3. Test Level 2 may be used for normal posted speeds less than or equal to 45 mph.

- (k) Temporary Water Filled Barrier. The water filled barrier shall be a lightweight plastic shell designed to accept water ballast and be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings.

- (l) Movable Traffic Barrier. The movable traffic barrier shall be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The

Engineer shall be provided one copy of the shop drawings. The barrier shall be capable of being moved on and off the roadway on a daily basis.

- (m) Detectable Pedestrian Channelizing Barricades. The top panel or handrail shall be continuous and there should be at least a 2 in. (50 mm) gap between the hand trailing edge and its support. When visible to vehicular traffic, the top rail shall have alternating white and orange retroreflective stripes sloping at 45 degrees. The bottom panel shall be continuous and have alternating white and orange retroreflective stripes sloping at 45 degrees. Barricade stripes shall be 6 in. (150 mm) in width. The predominant color for other barricade components shall be white, orange, or silver.”

80427

WORK ZONE WIDTH RESTRICTION (BDE)

Effective: July 1, 2026

Revise the second paragraph of Article 701.06 of the Standard Specifications to read:

“Where the clear width through a work zone will be 17.5 ft (5.34 m) or less, the Contractor shall notify the Engineer at least 21 days in advance of implementing the traffic control for that restriction.”

80485

JACK AND REMOVE EXISTING BEARINGS

Effective: April 20, 1994

Revised: April 13, 2018

Description: This work consists of furnishing all labor, tools and equipment for jacking and supporting the existing beams/slab while removing the bearing assembly. The Contractor is responsible for the complete design of the bridge lifting procedures and the materials used. The Contractor shall furnish and place all bracing, shoring, blocking, cribbing, temporary structural steel, timber, shims, wedges, hydraulic jacks, and any other materials and equipment necessary for safe and proper execution of the work. The Contractor shall remove and dispose of the bearings according to Article 501.05 of the Standard Specifications.

Construction Requirements: The Contractor shall submit details and calculations of his/her proposed jacking systems and temporary support procedures for approval by the Engineer before commencing work. If unforeseen field conditions preclude the execution of the approved jacking plan, the Engineer may require the Contractor to provide additional supports or measures. All changes to the jacking plan shall be approved by the Structural Engineer that sealed the jacking plan. Neither added precautions nor the failure of the Engineer to order additional protection will in any way relieve the Contractor of sole responsibility for the safety of lives, equipment and structure.

- (a) Jack and Remove Existing Bearings with bridge deck in place. Jacking and cribbing under and against the existing diaphragms, if applicable, will not be allowed. The Contractor's jacking plans and procedures shall be designed and sealed by an Illinois Licensed Structural Engineer.

In all cases, traffic shall be removed from the portion of the structure to be jacked prior to and during the entire time the load is being supported by the hydraulic pressure of the jack(s). The minimum jack capacity per beam shall be as noted in the plans. Whenever possible, traffic shall be kept off that portion of the structure during the entire bearing replacement operation. The shoring or cribbing supporting the beam(s) during bearing replacement shall be designed to support the dead load plus one half of the live load and impact shown in the plans. If traffic cannot be kept off that portion of the structure during the bearing replacement then the shoring or cribbing supporting the beam(s) shall be designed to support the dead load and full live load and impact shown in the plans.

No jacking shall be allowed during the period of placement and cure time required for any concrete placed in the span(s) contributing loads to the bearings to be jacked and removed.

Jacking shall be limited to 1/8 in. (4 mm) maximum when jacking one bearing at a time. Simultaneous jacking of all beams at one support may be performed provided the maximum lift is 1/4 in. (7 mm) and the maximum differential displacement between adjacent beams is 1/8 in. (4 mm). Suitable gauges for the measurement of superstructure movement shall be furnished and installed by the Contractor.

- (b) Jack and Remove Existing Bearings when entire bridge deck is removed. Jacking and bearing removal shall be done after the removal of the existing bridge deck is complete. The Contractor's plans and procedures for the proposed jacking and cribbing system shall be designed and sealed by an Illinois Licensed Structural Engineer, unless jacking can be accomplished directly from the bearing seat under the beams or girders.

Jacking shall be limited to 1/4 in. (7 mm) maximum when jacking one beam at a time. Simultaneous jacking of all beams at one support may be performed provided the maximum lift is 3/4 in. (19 mm) and the maximum differential displacement between adjacent beams is 1/4 in. (7 mm). When staged construction is utilized, simultaneous jacking of all beams shall be limited to 1/4 in. (7 mm) unless the diaphragms at the stage line are disconnected, in which case the maximum lift is 3/4 in. (19 mm). Suitable gauges for the measurement of superstructure movement shall be furnished and installed by the Contractor.

The Contractor shall be responsible for restoring to their original condition, prior to jacking, the drainage ditches, pavement, or slopewall disturbed by the cribbing footings.

Basis of Payment: This work will be paid for at the contract unit price each for JACK AND REMOVE EXISTING BEARINGS.

Additional supports or measures resulting from unforeseen field conditions will be paid for according to Article 109.04.

CLEANING AND PAINTING EXISTING STEEL STRUCTURES

Effective: October 2, 2001

Revised: October 17, 2025

Description. This work shall consist of the preparation of all designated metal surfaces by the method(s) specified on the plans. This work also includes the painting of those designated surfaces. This work also includes caulking locations designated on the plans and painting with the paint system(s) specified on the plans. The Contractor shall furnish all materials, equipment, labor, and other essentials necessary to accomplish this work and all other work described herein and as directed by the Engineer.

Materials. All materials to be used on an individual structure shall be produced by the same manufacturer.

The Bureau of Materials and Physical Research has established a list of all products that have met preliminary requirements. Each batch of material, except for the penetrating sealer, shall be tested and assigned a CMMS approval number before use. The specified colors shall be produced in the coating manufacturer's facility. Tinting of the coating after it leaves the manufacturer's facility is not allowed.

The paint materials shall meet the following requirements of the Standard Specification and as noted below:

<u>Item</u>	<u>Article</u>
(a) Waterborne Acrylic	1008.04
(b) Aluminum Epoxy Mastic	1008.03
(c) Organic Zinc Rich Primer	1008.05
(d) Epoxy/ Aliphatic Urethane	1008.05
(e) Penetrating Sealer (Note 1)	
(f) Moisture Cured Zinc Rich Urethane Primer (Note 2)	
(g) Moisture Cured Aromatic/Aliphatic Urethane (Note 2)	
(h) Moisture Cured Penetrating Sealer (Note 3)	
(i) Caulk (Polyurethane Joint Sealant)	1050.04

Note 1: The Epoxy Penetrating Sealer shall be a cross-linked multi component sealer. The sealer shall have the following properties:

- (a) The volume solids shall be 98 percent (plus or minus 2 percent).
- (b) Shall be clear or slightly tinted color.

Note 2: These material requirements shall be according to the Special Provision for the Moisture Cured Urethane Paint System.

Note 3: The Moisture Cured Penetrating Sealer manufacturer's certification will be required.

Submittals. The Contractor shall submit for Engineer review and acceptance, the following plans and information for completing the work. The submittals shall be provided within 30 days of execution of the contract unless given written permission by the Engineer to submit them at a later date. Work cannot proceed until the submittals are accepted by the Engineer. Details for each of the plans are presented within the body of this specification.

- a) Contractor/Personnel Qualifications. Evidence of Contractor qualifications and the names and qualifications/experience/training of the personnel managing and implementing the Quality Control program and conducting the quality control tests, and certifications for the CAS (Coating Application Specialists) on SSPC-QP1 and QP2 projects.
- b) Quality Control (QC) Program. The QC Program shall identify the following: the instrumentation that will be used, a schedule of required measurements and observations, procedures for correcting unacceptable work, and procedures for improving surface preparation and painting quality as a result of quality control findings. The program shall incorporate at a minimum, the IDOT Quality Control Daily Report form, or a Contractor form (paper or electronic) that provides equivalent information.
- c) Inspection Access Plan. The inspection access plan for use by Contractor QC personnel for ongoing inspections and by the Engineer during Quality Assurance (QA) observations.
- d) Surface Preparation/Painting Plan. The surface preparation/painting plan shall include the methods of surface preparation and type of equipment to be utilized for washing, hand/power tool cleaning, removal of rust, mill scale, paint or foreign matter, abrasive blast or water jetting, and remediation of chloride. If detergents, additives, or inhibitors are incorporated into the water, the Contractor shall include the names of the materials and Safety Data Sheets (SDS). The Contractor shall identify the solvents proposed for solvent cleaning together with SDS.

If cleaning and painting over existing galvanized surfaces are specified, the plan shall address surface preparation, painting, and touch up/repair of the galvanized surfaces.

The plan shall also include the methods of coating application and equipment to be utilized.

If the Contractor proposes to heat or dehumidify the containment, the methods and equipment proposed for use shall be included in the Plan for the Engineer's consideration.

- e) Paint Manufacturer Certifications and Letters. When a sealer is used, the Contractor shall provide the manufacturer's certification of compliance with IDOT testing requirements listed under "Materials" above. A certification regarding the compatibility of the sealer with the specified paint system shall also be included.

When rust inhibitors are used, the Contractor shall provide a letter from the coating manufacturer indicating that the inhibitor is compatible with and will not adversely affect the performance of the coating system.

If the use of a chemical soluble salt remover is proposed by the Contractor, provide a letter from the coating manufacturer indicating that the material will not adversely affect the performance of the coating system.

The paint manufacturer's most recent application and thinning instructions, SDS and product data sheets shall be provided, with specific attention drawn to storage temperatures, and the temperatures of the material, surface and ambient air at the time of application.

A letter or written instructions from the coating manufacturer shall be provided indicating the length of time that each coat must be protected from cold or inclement weather (e.g., exposure to rain) during its drying period, the maximum recoat time for each coat, and the steps necessary to prepare each coat for overcoating if the maximum recoat time is exceeded.

- f) Abrasives. Abrasives to be used for abrasive blast cleaning, including SDS. For expendable abrasives, the Contractor shall provide certification from the abrasive supplier that the abrasive meets the requirements of SSPC-AB1. For steel grit abrasives, the certification shall indicate that the abrasive meets the requirements of SSPC-AB3.
- g) Protective Coverings. Plan for containing or controlling paint debris (droplets, spills, overspray, etc.). Any tarpaulins or protective coverings proposed for use shall be fire retardant. For submittal requirements involving the containment used to remove lead paint, the Contractor shall refer to Special Provision for Containment and Disposal of Lead Paint Cleaning Residues.
- h) Progress Schedule. Progress schedule shall be submitted per Article 108.02 and shall identify all major work items (e.g., installation of rigging/containment, surface preparation, and coating application).

When the Engineer accepts the submittals, the Contractor will receive written notification. The Contractor shall not begin any paint removal work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, State, or Local regulations and this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Contractor Qualifications. Unless indicated otherwise on the contract plans, for non lead abatement projects, the painting Contractor shall possess current SSPC–QP1 certification. Unless indicated otherwise on the plans, for lead abatement projects the Contractor shall also possess current SSPC-QP2 certification. The Contractor shall maintain certified status throughout the duration of the painting work under the contract. The Department reserves the right to accept Contractors documented to be currently enrolled in the SSPC-QP7, Painting Contractor Introductory Program, Category 2, in lieu of the QP certifications noted above.

Quality Control (QC) Inspections. The Contractor shall perform first line, in process QC inspections. The Contractor shall implement the submitted and accepted QC Program to ensure that the work accomplished complies with these specifications. The designated Quality Control inspector shall be onsite full time during any operations that affect the quality of the coating system (e.g., surface preparation and chloride remediation, coating mixing and application, and evaluations between coats and upon project completion). The Contractor shall use the IDOT Quality Control Daily Report form to record the results of quality control tests. Alternative forms (paper or electronic) will be allowed provided they furnish equivalent documentation as the IDOT form, and they are accepted as part of the QC Program submittal. The completed reports shall be turned into the Engineer before work resumes the following day. The Engineer or designated representative will sign the report. The signature is an acknowledgment that the report has been received but should not be construed as an agreement that any of the information documented therein is accurate.

Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and the means employed to control project debris and paint spills, overspray, etc.
- Ambient conditions
- Surface preparation (solvent cleaning, pressure washing including chalk tests, hand/power tool or abrasive blast cleaning, etc.)
- Chloride remediation
- Coating application (specified materials, mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity and coverage (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses, etc.)

The personnel managing the Contractor's QC Program shall possess a minimum classification of Society of Protective Coatings (SSPC) BCI certified, National Association of Corrosion Engineers (NACE) Coating Inspector Level 2 - Certified and shall provide evidence of successful inspection of 3 bridge projects of similar or greater complexity and scope that have been completed in the last 2 years. Copies of the certification and experience shall be provided. References for experience shall be provided and shall include the name, address, and telephone number of a contact person employed by the bridge owner.

The personnel performing the QC tests shall be trained in coatings inspection and the use of the testing instruments. Documentation of training shall be provided. The QC personnel shall not perform hands on surface preparation or painting activities. Painters shall perform wet film thickness measurements, with QC personnel conducting random spot checks of the wet film. The Contractor shall not replace the QC personnel assigned to the project without advance notice to the Engineer, and acceptance of the replacement(s), by the Engineer.

The Contractor shall supply all necessary equipment with current calibration certifications to perform the QC inspections. Equipment shall include the following at a minimum:

- Sling psychrometer or digital psychrometer for the measurement of dew point and relative humidity, together with all necessary weather bureau tables or psychrometric charts. In the event of a conflict between readings with the sling psychrometer and the digital psychrometer, the readings with the sling psychrometer shall prevail.
- Surface temperature thermometer
- SSPC Visual Standards VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning; SSPC-VIS 3, Visual Standard for Power and Hand-Tool Cleaned Steel; SSPC-VIS 4, Guide and Reference Photographs for Steel Prepared by Water Jetting, and/or SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning, as applicable.
- Test equipment for determining abrasive cleanliness (oil content and water-soluble contaminants) according to SSPC abrasive specifications AB1, AB2, and AB3.
- Commercially available putty knife of a minimum thickness of 40 mils (1mm) and a width between 1 and 3 in. (25 and 75 mm). Note that the putty knife is only required for projects in which the existing coating is being feathered and tested with a dull putty knife.
- Testex Press-O-Film Replica Tape and Micrometer compliant with Method C of ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel, or digital profile depth micrometer compliant with ASTM D4417, Method B. In the event of a conflict between measurements with the two instruments on abrasive blast cleaned steel, the results with the Testex Tape shall prevail. Note that for measuring the profile of steel power tool cleaned to SSPC-SP15, Commercial Grade Power Tool Cleaning, the digital profile depth micrometer shall be used.
- Bresle Cell Kits or CHLOR*TEST kits for chloride determinations, or equivalent
- Wet Film Thickness Gage
- Blotter paper for compressed air cleanliness checks
- Type 2 Electronic Dry Film Thickness Gage per SSPC - PA2, Procedure for Determining Conformance to Dry Coating Thickness Requirements
- Standards for verifying the accuracy of the dry film thickness gage
- Light meter for measuring light intensity during paint removal, painting, and inspection activities
- All applicable ASTM and SSPC Standards used for the work (reference list attached)

The accuracy of the instruments shall be verified by the Contractor's personnel according to the equipment manufacturer's recommendations and the Contractor's QC Program. All inspection equipment shall be made available to the Engineer for QA observations on an as needed basis.

Hold Point Notification. Specific inspection items throughout this specification are designated as Hold Points. Unless other arrangements are made at the project site, the Contractor shall provide the Engineer with a minimum 4-hour notification before a Hold Point inspection will be reached. If the 4-hour notification is provided and the Work is ready for inspection at that time, the Engineer will conduct the necessary observations. If the Work is not ready at the appointed time, unless other arrangements are made, an additional 4-hour notification is required. Permission to proceed beyond a Hold Point without a QA inspection will be granted solely at the discretion of the Engineer, and only on a case by case basis.

Quality Assurance (QA) Observations. The Engineer will conduct QA observations of any or all phases of the work. The presence or activity of Engineer observations in no way relieves the Contractor of the responsibility to provide all necessary daily QC inspections of his/her own and to comply with all requirements of this Specification.

The Engineer has the right to reject any work that was performed without adequate provision for QA observations.

Inspection Access and Lighting. The Contractor shall facilitate the Engineer's observations as required, including allowing ample time to view the work. The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. Examples of acceptable access structures include:

- Mechanical lifting equipment, such as, scissor trucks, hydraulic booms, etc.
- Platforms suspended from the structure comprised of trusses or other stiff supporting members and including rails and kick boards.
- Simple catenary supports are permitted only if independent lifelines for attaching a fall arrest system according to Occupational Safety and Health Administration (OSHA) regulations are provided.

When the surface to be inspected is more than 6 ft. (1.8 m) above the ground or water surface, and fall prevention is not provided (e.g., guardrails are not provided), the Contractor shall provide the Engineer with a safety harness and a lifeline according to OSHA regulations. The lifeline and attachment shall not direct the fall into oncoming traffic. The Contractor shall provide a method of attaching the lifeline to the structure independent of the inspection facility or any support of the platform. When the inspection facility (e.g., platform) is more than 2 1/2 ft. (800 mm) above the ground, the Contractor shall provide an approved means of access onto the platform.

The Contractor shall provide artificial lighting in areas both inside and outside the containment where natural light is inadequate, as determined by the Engineer, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 30 foot-candles (325 LUX). Illumination for cleaning and painting, including the working platforms, access and entryways shall be at least 20 foot-candles (215 LUX). General work area illumination outside the containment shall be employed at the discretion of the Engineer and shall be at least 5 foot-

candles. The exterior lighting system shall be designed and operated so as to avoid glare that interferes with traffic, workers, and inspection personnel.

Surface Preparation and Painting Equipment. All cleaning and painting equipment shall include gages capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air, water or paint as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

Diesel or gasoline powered equipment shall be positioned or vented in a manner to prevent deposition of combustion contaminants on any part of the structure.

Hand tools, power tools, pressure washing, water jetting, abrasive blast cleaning equipment, brushes, rollers, and spray equipment shall be of suitable size and capacity to perform the work required by this specification. All power tools shall be equipped with vacuums and High Efficiency Particulate Air (HEPA) filtration. Appropriate filters, traps and dryers shall be provided for the compressed air used for abrasive blast cleaning and conventional spray application. Paint pots shall be equipped with air operated continuous mixing devices unless prohibited by the coating manufacturer.

Test Sections. Prior to surface preparation, the Contractor shall prepare a test section(s) on each structure to be painted in a location(s) which the Engineer considers to be representative of the existing surface condition and steel type for the structure as a whole. More than one test section may be needed to represent the various design configurations of the structure. The purpose of the test section(s) is to demonstrate the use of the tools and degree of cleaning required (cleanliness and profile) for each method of surface preparation that will be used on the project. Each test section shall be approximately 10 sq. ft. (0.93 sq m). The test section(s) shall be prepared using the same equipment, materials and procedures as the production operations. The Contractor shall prepare the test section(s) to the specified level of cleaning according to the appropriate SSPC visual standards, modified as necessary to comply with the requirements of this specification. The written requirements of the specification prevail in the event of a conflict with the SSPC visual standards. Only after the test section(s) have been approved shall the Contractor proceed with surface preparation operations. Additional compensation will not be allowed the Contractor for preparation of the test section(s).

For the production cleaning operations, the specifications and written definitions, the test section(s), and the SSPC visual standards shall be used in that order for determining compliance with the contractual requirements.

Protective Coverings and Damage. All portions of the structure that could be damaged by the surface preparation and painting operations (e.g., utilities), including any sound paint that is allowed to remain according to the contract documents, shall be protected by covering or shielding. Tarpaulins drop cloths, or other approved materials shall be employed. The Contractor shall comply with the provisions of the Illinois Environmental Protection Act. Paint drips, spills, and overspray are not permitted to escape into the air or onto any other surfaces or surrounding property not intended to be painted. Containment shall be used to control paint drips, spills, and overspray, and shall be dropped and all equipment secured when sustained

wind speeds of 40 mph (64 kph) or greater occur, unless the containment design necessitates action at lower wind speeds. The contractor shall evaluate project-specific conditions to determine the specific type and extent of containment needed to control the paint emissions and shall submit a plan for containing or controlling paint debris (droplets, spills, overspray, etc.) to the Engineer for acceptance prior to starting the work. Acceptance by the Engineer shall not relieve the Contractor of their ultimate responsibility for controlling paint debris from escaping the work zone.

When the protective coverings need to be attached to the structure, they shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing. When removing coatings containing lead the containment and disposal of the residues shall be as specified in the Special Provision for Containment and Disposal of Lead Paint Cleaning Residues contained elsewhere in this Contract. When removing coatings not containing lead the containment and disposal of the residues shall be as specified in the Special Provision for Containment and Disposal of Non-Lead Paint Cleaning Residues contained elsewhere in this Contract.

The Contractor shall be responsible for any damage caused to persons, vehicles, or property, except as indemnified by the Response Action Contractor Indemnification Act. Whenever the intended purposes of the controls or protective devices used by the Contractor are not being accomplished, work shall be immediately suspended until corrections are made. Damage to vehicles or property shall be repaired by the Contractor at the Contractor's expense. Painted surfaces damaged by any Contractor's operation shall be repaired, removed and/or repainted, as directed by the Engineer, at the Contractor's expense.

Weather Conditions. Surfaces to be painted after cleaning shall remain free of moisture and other contaminants. The Contractor shall control his/her operations to ensure that dust, dirt, or moisture do not come in contact with surfaces cleaned or painted that day.

- a) The surface temperature shall be at least 5°F (3°C) above the dew point during final surface preparation operations. The manufacturers' published literature shall be followed for specific temperature, dew point, and humidity restrictions during the application of each coat.
- b) If the Contractor proposes to control the weather conditions inside containment, proposed methods and equipment for heating and/or dehumidification shall be included in the work plans for the Engineer's consideration. Only indirect fired heating equipment shall be used to prevent the introduction of moisture and carbon monoxide into the containment. The heating unit(s) shall be ventilated to the outside of the containment. Any heating/dehumidification proposals accepted by the Engineer shall be implemented at no additional cost to the department.
- c) Cleaning and painting shall be done between April 15 and October 31 unless authorized otherwise by the Engineer in writing.

The Contractor shall monitor temperature, dew point, and relative humidity every 4 hours during surface preparation and coating application in the specific areas where the work is being performed. The frequency of monitoring shall increase if weather conditions are changing. If the weather conditions after application and during drying are forecast to be outside the acceptable limits established by the coating manufacturer, coating application shall not proceed. If the weather conditions are forecast to be borderline relative to the limits established by the manufacturer, monitoring shall continue at a minimum of 4-hour intervals throughout the drying period. The Engineer has the right to reject any work that was performed, or drying that took place, under unfavorable weather conditions. Rejected work shall be removed, recleaned, and repainted at the Contractor's expense.

Compressed Air Cleanliness. Prior to using compressed air for abrasive blast cleaning, blowing down the surfaces, and painting with conventional spray, the Contractor shall verify that the compressed air is free of moisture and oil contamination according to the requirements of ASTM D 4285. The tests shall be conducted at least one time each shift for each compressor system in operation. If air contamination is evident, the Contractor shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air. The Contractor shall also examine the work performed since the last acceptable test for evidence of defects or contamination caused by the compressed air. Effected work shall be repaired at the Contractor's expense.

Low Pressure Water Cleaning and Solvent Cleaning (HOLD POINT). The Contractor shall notify the Engineer 24 hours in advance of beginning surface preparation operations.

- a) Water Cleaning of Lead Containing Coatings Prior to Overcoating. Prior to initiating any mechanical cleaning such as hand/power tool cleaning on surfaces that are painted with lead, all surfaces to be prepared and painted, and the tops of pier and abutment caps shall be washed. Washing is not required if the surfaces will be prepared by water jetting.

Washing shall involve the use of potable water at a minimum of 1000 psi (7 MPa) and less than 5000 psi (34 MPa) according to "Low Pressure Water Cleaning" of SSPC-SP WJ-4. There are no restrictions on the presence of flash rusting of bare steel after cleaning. Paint spray equipment shall not be used to perform the water cleaning. The cleaning shall be performed in such a manner as to remove dust, dirt, chalk, insect and animal nests, bird droppings, loose coating, loose mill scale, loose rust and other corrosion products, and other foreign matter. Water cleaning shall be supplemented with scrubbing as necessary to remove the surface contaminants. . The water, debris, and any loose paint removed by water cleaning shall be collected for proper disposal. The washing shall be completed no more than 2 weeks prior to surface preparation.

If detergents or other additives are added to the water, the detergents/additives shall be included in the submittals and not used until accepted by the Engineer. When detergents or additives are used, the surface shall be rinsed with potable water before the detergent water dries.

After washing has been accepted by the Engineer, all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants which remain on the steel surfaces to be painted shall be removed by solvent cleaning according to SSPC – SP1, supplemented with scraping (e.g., to remove large deposits of asphaltic cement) as required. The solvent(s) used for cleaning shall be compatible with the existing coating system. The Contractor shall identify the proposed solvent(s) in the submittals. If the existing coating is softened, wrinkled, or shows other signs of attack from the solvents, the Contractor shall immediately discontinue their use. The name and composition of replacement solvents, together with MSDS, shall be submitted for Engineer acceptance prior to use.

Under no circumstances shall subsequent hand/power tool cleaning or abrasive blast cleaning be performed in areas containing surface contaminants or in areas where the Engineer has not accepted the washing and solvent cleaning. Surfaces prepared by hand/power tool cleaning or abrasive blast cleaning without approval of the washing and solvent cleaning may be rejected by the Engineer. Rejected surfaces shall be recleaned with both solvent and the specified mechanical means at the Contractor's expense.

After all washing and mechanical cleaning are completed, representative areas of the existing coating shall be tested to verify that the surface is free of chalk and other loose surface debris or foreign matter. The testing shall be performed according to ASTM D4214. Cleaning shall continue until a chalk rating of 6 or better is achieved in every case.

- b) Water Cleaning of Non-Lead Coatings Prior to Overcoating. Thoroughly clean the surfaces according to the steps defined above for "Water Cleaning of Lead Containing Coatings Prior to Overcoating." The wash water does not need to be collected, but paint chips, insect and animal nests, bird droppings and other foreign matter shall be collected for proper disposal. If the shop primer is inorganic zinc, the chalk rating does not apply. All other provisions are applicable.
- c) Water Cleaning/Debris Removal Prior to Total Coating Removal. When total coating removal is specified, water cleaning of the surface prior to coating removal is not required by this specification and is at the option of the Contractor. If the Contractor chooses to use water cleaning, the above provisions for water cleaning of lead and non-lead coatings apply as applicable, including collection and disposal of the waste.

Whether or not the surfaces are pre-cleaned using water, the tops of the pier caps and abutments shall be cleaned free of dirt, paint chips, insect and animal nests, bird droppings and other foreign matter and the debris collected for proper disposal. Cleaning can be accomplished by wet or dry methods.

Prior to mechanical cleaning, oil, grease, and other soluble contaminants on bare steel or rusted surfaces shall be removed by solvent cleaning according to SSPC-SP1.

- d) **Water Cleaning Between Coats.** When foreign matter has accumulated on a newly applied coat, washing and scrubbing shall be performed prior to the application of subsequent coats. The water does not need to be collected unless it contacts existing lead containing coatings.

Laminar and Stratified Rust. All laminar and stratified rust that has formed on the existing steel surfaces shall be removed. Pack rust formed along the perimeter of mating surfaces of connected plates or shapes of structural steel shall be removed to the extent feasible without mechanically detaching the mating surface. When caulking is specified, all rust shall be removed to a surface depth as directed by the Engineer to accommodate the approved sealant. Any pack rust remaining after cleaning the mating surfaces shall be tight and intact when examined using a dull putty knife. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the surface preparation or removal of rust results in nicks or gouges in the steel, the work shall be suspended, and the damaged areas repaired to the satisfaction of the Engineer, at the Contractor's expense. The Contractor shall also demonstrate that he/she has made the necessary adjustments to prevent a reoccurrence of the damage prior to resuming work. If surface preparation reveals holes or section loss, or creates holes in the steel, the Contractor shall notify the Engineer. Whenever possible, the Department will require that the primer be applied to preserve the area, and allow work to proceed, with repairs and touch up performed at a later date.

Surface Preparation (HOLD POINT). One or more of the following methods of surface preparation shall be used as specified on the plans. When a method of surface preparation is specified, it applies to the entire surface, including areas that may be concealed by the containment connection points. In each case, as part of the surface preparation process, soluble salts shall be remediated as specified under "Soluble Salt Remediation." The Contractor shall also note that the surface of the steel beneath the existing coating system may contain corrosion and/or mill scale. Removal of said corrosion and/or mill scale, when specified, shall be considered included in this work and no extra compensation will be allowed.

When a particular cleaning method is specified for use in distinct zones on the bridge, the cleaning shall extend into the existing surrounding paint until a sound border is achieved. The edge of the existing paint is considered to be sound and intact after cleaning if it cannot be lifted by probing the edge with a dull putty knife. The sound paint shall be feathered for a minimum of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared steel and the existing coatings. Sanders with vacuum attachments, which have been approved by the Engineer, shall be used as necessary to accomplish the feathering.

- a) **Limited Access Areas:** A best effort with the specified methods of cleaning shall be performed in limited access areas such as the backsides of rivets inside built up box members. The equipment being used for the majority of the cleaning may need to be supplemented with other commercially available equipment, such as angle nozzles, to properly clean the limited access areas. The acceptability of the best effort cleaning in these areas is at the sole discretion of the Engineer.

- b) Near-White Metal Blast Cleaning: This surface preparation shall be accomplished according to the requirements of Near-White Metal Blast Cleaning SSPC-SP 10. Unless otherwise specified in the contract, the designated surfaces shall be prepared by dry abrasive blast cleaning, wet abrasive blast cleaning, or water jetting with abrasive injection. A Near-White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.

Random staining shall be limited to no more than 5 percent of each 9 sq. in. (58 sq. cm) of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. With the exception of crevices as defined below, surface discoloration is considered to be a residue that must be removed, rather than a stain, if it possesses enough mass or thickness that it can be removed as a powder or in chips when scraped with a pocketknife.

A surface profile shall be created on the steel as defined later under "Surface Profile."

At the discretion of the Engineer, after a best effort cleaning, slight traces of existing coating may be permitted to remain within crevices such as those created between the steel and rivets or bolts/washers/nuts, and between plates. When traces of coating are permitted to remain, the coating shall be tightly bonded when examined by probing with a dull putty knife. The traces of coating shall be confined to the bottom portion of the crevices only and shall not extend onto the surrounding steel or plate or onto the outer surface of the rivets or bolts. Pitted steel is excluded from exemption considerations and shall be cleaned according to SSPC-SP10.

If hackles or slivers are visible on the steel surface after cleaning, the Contractor shall remove them by grinding followed by reblast cleaning. At the discretion of the Engineer, the use of power tools to clean the localized areas after grinding, and to establish a surface profile acceptable to the coating manufacturer, can be used in lieu of blast cleaning.

If the surfaces are prepared using wet abrasive methods, attention shall be paid to tightly configured areas to assure that the preparation is thorough. After surface preparation is completed, the surfaces, surrounding steel, and containment materials/scaffolding shall be rinsed to remove abrasive dust and debris. Potable water shall be used for all operations. An inhibitor shall be added to the supply water and/or rinse water to prevent flash rusting. With the submittals, the Contractor shall provide a sample of the proposed inhibitor together with a letter from the coating manufacturer indicating that the inhibitor is suitable for use with their products and that the life of the coating system will not be reduced due to the use of the inhibitor. The surfaces shall be allowed to completely dry before the application of any coating.

- c) Commercial Grade Power Tool Cleaning: This surface preparation shall be accomplished according to the requirements of SSPC-SP15. The designated surfaces shall be completely cleaned with power tools. A Commercial Grade Power Tool Cleaned

surface, when viewed without magnification, is free of all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter, except for staining. In previously pitted areas, slight residues of rust and paint may also be left in the bottoms of pits.

Random staining shall be limited to no more than 33 percent of each 9 sq. in. (58 sq. cm) of surface area. Allowable staining may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Surface discoloration is considered to be a residue that must be removed, rather than a stain, if it possesses enough mass or thickness that it can be removed as a powder or in chips when scraped with a pocketknife.

A surface profile shall be created on the steel as defined later under "Surface Profile."

At the Contractor's option, Near-White Metal Blast Cleaning may be substituted for Power Tool Cleaning – Commercial Grade, as long as containment systems appropriate for abrasive blast cleaning are utilized and there is no additional cost to the Department.

- d) Power Tool Cleaning – Modified SP3: This surface preparation shall be accomplished according to the requirements of SSPC-SP3, Power Tool Cleaning except as modified as follows. The designated surfaces shall be cleaned with power tools. A power tool cleaned surface shall be free of all loose rust, loose mill scale, loose and peeling paint, and loose rust that is bleeding through and/or penetrating the coating. All locations of visible corrosion and rust bleed, exposed or lifting mill scale, and lifting or loose paint shall be prepared using the power tools, even if the material is tight.

Upon completion of the cleaning, rust, rust bleed, mill scale and surrounding paint are permitted to remain if they can not be lifted using a dull putty knife.

- e) Power Tool Cleaning of Shop Coated Steel: When shop-coated steel requires one or more coats to be applied in the field, the surface of the shop coating shall be cleaned as specified under "Water Cleaning of Non-Lead Coatings Prior to Overcoating." If the damage is to a fully applied shop system, water cleaning is not required unless stipulated in the contract. Damaged areas of shop coating shall be spot cleaned according to Power Tool Cleaning - Modified SSPC-SP3. If the damage extends to the substrate, spot cleaning shall be according to SSPC-SP15. The edges of the coating surrounding all spot repairs shall be feathered.

- f) Galvanized Surfaces: If galvanized surfaces are specified to be painted, they shall be prepared by brush-off blast cleaning in accordance with SSPC-SP 16 or by using proprietary solutions that are specifically designed to clean and etch (superficially roughen) the galvanized steel for painting. If cleaning and etching solutions are selected, the Contractor shall submit the manufacturer's technical product literature and SDS for Engineer's review and written acceptance prior to use.

Abrasives. Unless otherwise specified in the contract, when abrasive blast cleaning is specified, it shall be performed using either expendable abrasives (other than silica sand) or recyclable steel grit abrasives. Expendable abrasives shall be used one time and disposed of. Abrasive suppliers shall certify that the expendable abrasives meet the requirements of SSPC-AB1 and that recyclable steel grit abrasives meet SSPC-AB3. Tests to confirm the cleanliness of new abrasives (oil and water-soluble contamination) shall be performed by the Contractor according to the requirements and frequencies of SSPC-AB1 and SSPC-AB3, as applicable. On a daily basis, the Contractor shall verify that recycled abrasives are free of oil and water-soluble contamination by conducting the tests specified in SSPC-AB2.

All surfaces prepared with abrasives not meeting the SSPC-AB1, AB2, or AB3 requirements, as applicable, shall be solvent cleaned or low-pressure water cleaned as directed by the Engineer, and reblast cleaned at the Contractor's expense.

Surface Profile (HOLD POINT). The abrasives used for blast cleaning shall have a gradation such that the abrasive will produce a uniform surface profile of 1.5 to 4.5 mils (38 to 114 microns). If the profile requirements of the coating manufacturer are more restrictive, advise the Engineer and comply with the more restrictive requirements. For recycled abrasives, an appropriate operating mix shall be maintained in order to control the profile within these limits.

The surface profile for SSPC-SP15 power tool cleaned surfaces shall be within the range specified by the coating manufacturer, but not less than 2.0 mils (50 microns).

The surface profile produced by abrasive blast cleaning shall be determined by replica tape or digital profile depth micrometer according to SSPC-PA 17 at the beginning of the work, and each day that surface preparation is performed. Areas having unacceptable profile measurements shall be further tested to determine the limits of the deficient area. When replica tape is used, it shall be attached to the daily report. In the event of a conflict between measurements taken with the replica tape and digital profile depth micrometer, the measurements with the replica tape shall prevail.

The surface profile produced by power tools to SSPC-SP15, shall be measured using the digital profile depth micrometer only. Replica tape shall not be used.

When unacceptable profiles are produced, work shall be suspended. The Contractor shall submit a plan for the necessary adjustments to ensure that the correct surface profile is achieved on all surfaces. The Contractor shall not resume work until the new profile is verified by the QA observations, and the Engineer confirms, in writing, that the profile is acceptable.

Soluble Salt Remediation (HOLD POINT). The Contractor shall implement surface preparation procedures and processes that will remove chloride from the surfaces to levels below 7 micrograms per square centimeter. Surfaces that may be contaminated with chloride include, but are not limited to, expansion joints and all areas that are subject to roadway splash or run off such as fascia beams and stringers. Surfaces shall be tested for chlorides at a frequency of five tests per bearing line or fascia beam, with tests performed on both the beams and diaphragms/cross-frames at expansion joints.

Methods of chloride removal may include, but are not limited to, hand washing, steam cleaning, or pressure washing with or without the addition of a chemical soluble salt remover as approved by the coating manufacturer and scrubbing before or after initial paint removal. The Contractor may also elect to clean the steel and allow it to rust overnight followed by recleaning, or by utilizing blends of fine and coarse abrasives during blast cleaning, wet abrasive/water jetting methods of preparation, or combinations of the above. If steam or water cleaning methods of chloride removal are utilized over surfaces where the coating has been completely removed, and the water does not contact any lead containing coatings, the water does not have to be collected. The Contractor shall provide the proposed procedures for chloride remediation in the Surface Preparation/Painting Plan.

Upon completion of the chloride remediation steps, the Contractor shall use cell methods of field chloride extraction and test procedures (e.g., silver dichromate) accepted by the Engineer, to test representative surfaces that were previously rusted (e.g., pitted steel) for the presence of remaining chlorides. Remaining chloride levels shall be no greater than $7\mu\text{g/sq cm}$ as read directly from the surface without any multiplier applied to the results. The testing must be performed, and the results must be acceptable, prior to painting each day.

A minimum of 5 tests per 1000 sq. ft. (93 sq m) or fraction thereof completed in a given day, shall be conducted at project start up. If results greater than $7\mu\text{g/sq cm}$ are detected, the surfaces shall be recleaned and retested at the same frequency. If acceptable results are achieved on three consecutive days in which testing is conducted, the test frequency may be reduced to 1 test per 1000 sq. ft. (93 sq. m) prepared each day provided the chloride remediation process remains unchanged. If unacceptable results are encountered, or the methods of chloride remediation are changed, the Contractor shall resume testing at a frequency of 5 tests per 1000 sq. ft. (93 sq. m).

Following successful chloride testing the chloride test areas shall be cleaned. SSPC-SP15, Commercial Grade Power Tool Cleaning can be used to clean the test locations when the specified degree of cleaning is SSPC-SP10.

Surface Condition Prior to Painting (HOLD POINT). Prepared surfaces shall meet the requirements of the respective degrees of cleaning immediately prior to painting and shall be painted before rusting appears on the surface. If rust appears or bare steel remains unpainted for more than 12 hours, the affected area shall be prepared again at the expense of the Contractor.

All loose paint and surface preparation cleaning residue on bridge steel surfaces, scaffolding and platforms, containment materials, and tops of abutments and pier caps shall be removed prior to painting. When lead paint is being disturbed, cleaning shall be accomplished by HEPA vacuuming unless it is conducted within a containment that is designed with a ventilation system capable of collecting the airborne dust and debris created by sweeping and blowing with compressed air.

The quality of surface preparation and cleaning of surface dust and debris must be accepted by the Engineer prior to painting. The Engineer has the right to reject any work that was performed without adequate provision for QA observations to accept the degree of cleaning. Rejected coating work shall be removed and replaced at the Contractor's expense.

General Paint Requirements. Paint storage, mixing, and application shall be accomplished according to these specifications and as specified in the paint manufacturer's written instructions and product data sheets for the paint system used. In the event of a conflict between these specifications and the coating manufacturers' instructions and data sheets, the Contractor shall advise the Engineer and comply with the Engineer's written resolution. Until a resolution is provided, the most restrictive conditions shall apply.

Unless noted otherwise, if a new concrete deck or repair to an existing deck is required, painting shall be done after the deck is placed and the forms have been removed.

- a) **Paint Storage and Mixing.** All Paint shall be stored according to the manufacturer's published instructions, including handling, temperatures, and warming as required prior to mixing. All coatings shall be supplied in sealed containers bearing the manufacturers name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used.

The Contractor shall only use batches of material that have an IDOT CMMS approval number. For multi-component materials, the batch number from one component is tested with specific batch numbers from the other component(s). Only the same batch number combinations that were tested and approved shall be mixed together for use.

Mixing shall be according to the manufacturer's instructions. Thinning shall be performed using thinner provided by the manufacturer, and only to the extent allowed by the manufacturer's written instructions. In no case shall thinning be permitted that would cause the coating to exceed the local Volatile Organic Compound (VOC) emission restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers according to the manufacturer's instructions, in the original containers before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. Excessive skinning or partial hardening due to improper or prolonged storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted, and the container may have been unopened.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, paint buckets, etc. overnight. It shall be stored in a covered container and remixed before use.

The Engineer reserves the right to sample field paint (individual components and/or the mixed material) and have it analyzed. If the paint does not meet the product requirements due to excessive thinning or because of other field problems, the coating shall be removed from that section of the structure and replaced as directed by the Engineer.

- b) **Application Methods.** Unless prohibited by the coating manufacturer's written instructions, paint may be applied by spray methods, rollers, or brushes. If applied with conventional or airless spray methods, paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern.

The painters shall monitor the wet film thickness of each coat during application. The wet film thickness shall be calculated based on the solids by volume of the material and the amount of thinner added. When the new coating is applied over an existing system, routine QC inspections of the wet film thickness shall be performed in addition to the painter's checks in order to establish that a proper film build is being applied.

When brushes or rollers are used to apply the coating, additional applications may be required to achieve the specified thickness per layer.

- c) **Field Touch Up of Shop-Coated Steel.** After cleaning, rusted and damaged areas of shop-primed inorganic zinc shall be touched up using epoxy mastic. Damaged areas of shop-applied intermediate shall be touched-up using the same intermediate specified for painting the existing structure. Following touch up, the remaining coats (intermediate and finish, or finish only, depending on the number of coats applied in the shop) shall be the same materials specified for painting the existing structure. When inorganic zinc has been used as the shop primer, a mist coat of the intermediate coat shall be applied before the application of the full intermediate coat in order to prevent pinholing and bubbling.
- d) **Recoating and Film Continuity (HOLD POINT for each coat).** Paint shall be considered dry for recoating according to the time/temperature/humidity criteria provided in the manufacturer's instructions and when an additional coat can be applied without the development of film irregularities; such as lifting, wrinkling, or loss of adhesion of the under coat. The coating shall be considered to be too cured for recoating based on the maximum recoat times stipulated by the coating manufacturer. If the maximum recoat times are exceeded, written instructions from the manufacturer for preparing the surface to receive the next coat shall be provided to the Engineer. Surface preparation and application shall not proceed until the recommendations are accepted by the Engineer in writing. If surfaces are contaminated, washing shall be accomplished prior to intermediate and final coats. Wash water does not have to be collected unless the water contacts existing lead containing coatings.

Painting shall be done in a neat and workmanlike manner. Each coat of paint shall be applied as a continuous film of uniform thickness free of defects including, but not limited

to, runs, sags, overspray, dryspray, pinholes, voids, skips, misses, and shadow-through. Defects such as runs and sags shall be brushed out immediately during application. Dry spray on the surface of previous coats shall be removed prior to the application of the next coat.

Paint Systems. The paint system(s) from the list below shall be applied as specified.

The paint manufacturer's relative humidity, dew point, and material, surface, and ambient temperature restrictions shall be provided with the submittals and shall be strictly followed. Written recommendations from the paint manufacturer for the length of time each coat must be protected from cold or inclement weather (e.g., exposure to rain), during the drying period shall be included in the submittals. Upon acceptance by the Engineer, these times shall be used to govern the duration that protection must be maintained during drying.

Where stripe coats are indicated, the Contractor shall apply an additional coat to edges, rivets, bolts, crevices, welds, and similar surface irregularities. The stripe coat shall be applied by brush or spray, but if applied by spray, it shall be followed immediately by brushing to thoroughly work the coating into or on the irregular surfaces and shall extend onto the surrounding steel a minimum of 1 in. (25 mm) in all directions. The purpose of the stripe coat is to assure complete coverage of crevices and to build additional thickness on edges and surface irregularities. If the use of the brush on edges pulls the coating away, brushing of edges can be eliminated, provided the additional coverage is achieved by spray. Measurement of stripe coat thickness is not required, but the Contractor shall visually confirm that the stripe coats are providing the required coverage.

The stripe coat may be applied as part of the application of the full coat unless prohibited by the coating manufacturer. If applied as part of the application process of the full coat, the stripe coat shall be allowed to dry for a minimum of 10 minutes in order to allow Contractor QC personnel to verify that the coat was applied. If a wet-on-wet stripe coat is prohibited by the coating manufacturer or brush or roller application of the full coat pulls the underlying stripe coat, the stripe coat shall dry according to the manufacturers' recommended drying times prior to the application of the full coat. In the case of the prime coat, the full coat can also be applied first to protect the steel, followed by the stripe coat after the full coat has dried.

The thicknesses of each coat as specified below shall be measured according to SSPC-PA2, using Coating Thickness Restriction Level 3 (spot measurements 80% of the minimum and 120% of the maximum, provided the entire area complies with the specified ranges).

- a) System 1 – OZ/E/U – for Bare Steel: System 1 shall consist of the application of a full coat of organic (epoxy) zinc-rich primer, a full intermediate coat of epoxy, and a full finish coat of aliphatic urethane. Stripe coats of the prime and finish coats shall be applied. The film thicknesses of the full coats shall be as follows:
 - One full coat of organic zinc-rich primer between 3.5 and 5.0 mils (90 and 125 microns) dry film thickness. The prime coat shall be tinted to a color that contrasts with the steel surface.

- One full intermediate coat of epoxy between 3.0 and 6.0 mils (75 and 150 microns) dry film thickness. The intermediate coat shall be a contrasting color to both the first coat and finish coat.
- One full finish coat of aliphatic urethane between 2.5 and 4.0 mils (65 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 9.0 and 15.0 mils (225 and 375 microns).

- b) System 2 – PS/EM/U – for Overcoating an Existing System: System 2 shall consist of the application of a full coat of epoxy penetrating sealer, a spot intermediate coat of aluminum epoxy mastic and a stripe and full finish coat of aliphatic urethane.

A full coat of epoxy penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of the aluminum epoxy mastic on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full finish coat of aliphatic urethane shall be applied. The film thicknesses shall be as follows:

- One full coat of epoxy penetrating sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One spot coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The color shall contrast with the finish coat.
- One full finish coat of aliphatic urethane between 2.5 and 4.0 mils (65 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of the stripe coat, shall be between 8.5 and 13.0 mils (215 and 325 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

- c) System 3 – EM/EM/AC – for Bare Steel: System 3 shall consist of the application of two full coats of aluminum epoxy mastic and a full finish coat of waterborne acrylic. Stripe coats for first coat of epoxy mastic and the finish coat shall be applied. The film thicknesses of the full coats shall be as follows:

- One full coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The first coat of aluminum epoxy mastic shall be tinted a contrasting color with the blast cleaned surface and the second coat.

- One full intermediate coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The intermediate coat shall be a contrasting color to the first coat and the finish coat.
- A full finish coat of waterborne acrylic between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 12.0 and 18.0 mils (360 and 450 microns).

- d) System 4 – PS/EM/AC – for Overcoating an Existing System: System 4 shall consist of the application of a full coat of epoxy penetrating sealer, a spot intermediate coat of aluminum epoxy mastic and a stripe and full finish coat of waterborne acrylic.

A full coat of epoxy penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of the aluminum epoxy mastic on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full finish coat of waterborne acrylic shall be applied. The film thicknesses shall be as follows:

- One full coat of epoxy penetrating sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One spot coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The color shall contrast with the finish coat.
- One full finish coat of waterborne acrylic between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of the stripe coat, shall be between 8.0 and 13.0 mils (200 and 325 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

- e) System 5 – MCU – for Bare Steel: System 5 shall consist of the application of a full coat of moisture cure urethane (MCU) zinc primer, a full coat of MCU intermediate, and a full coat of MCU finish. Stripe coats of the prime and finish coats shall be applied. The Contractor shall comply with the manufacturer's requirements for drying times between the application of the stripe coats and the full coats. The film thicknesses of the full coats shall be as follows:

- One full coat of MCU zinc primer between 3.0 and 5.0 mils (75 and 125 microns) dry film thickness. The prime coat shall be tinted to a color that contrasts with the steel surface.

- One full MCU intermediate coat between 3.0 and 4.0 mils (75 and 100 microns) dry film thickness. The intermediate coat shall be a contrasting color to both the first coat and finish coat.
- One full MCU finish coat between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 8.0 and 13.0 mils (200 and 325 microns).

- f) System 6 – MCU – for Overcoating an Existing System: System 6 shall consist of the application of a full coat of moisture cure urethane (MCU) penetrating sealer, a spot coat of MCU intermediate, and a stripe and full coat of MCU finish.

A full coat of MCU penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of MCU intermediate on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full coat of MCU finish shall be applied. The Contractor shall comply with the manufacturer's requirements for drying time between the application of the stripe coat and the full finish coat. The film thicknesses shall be as follows:

- One full coat of MCU sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One full MCU intermediate coat between 3.0 and 4.0 mils (75 and 100 microns) dry film thickness. The color shall contrast with the finish coat.
- One full MCU finish coat 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 6.0 and 10.0 mils (150 and 250 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

Application of Paint System over Galvanizing: If galvanized surfaces are present and specified to be painted, the Contractor shall apply one of the following as designated on the plans:

- A 2-coat system consisting of a full aluminum epoxy mastic coat and a full waterborne acrylic finish coat from System 3. If red rust is visible, rusted areas shall be spot primed with aluminum epoxy mastic prior to the application of the full coat of aluminum epoxy mastic.

- A 2-coat system consisting of a full epoxy coat and a full urethane coat from System 1. If red rust is visible, rusted areas shall be spot primed with organic zinc prior to the application of the full coat of epoxy.

Surface Preparation and Painting of Galvanized Fasteners: The Contractor shall prepare all fasteners (i.e., galvanized nuts, bolts, etc.) by power tool cleaning in accordance with SSPC-SP 2 or SSPC-SP3 to remove loose material. Following hand/power tool cleaning and prior to painting, the surfaces shall be solvent cleaned according to SSPC-SP 1. Slight stains of torqueing compound dye may remain after cleaning provided the dye is not transferred to a cloth after vigorous rubbing is acceptable. If any dye is transferred to a cloth after vigorous rubbing, additional cleaning is required.

The fasteners shall be coated with one coat of an aluminum epoxy mastic meeting the requirements of Article 1008.03 and the same acrylic or urethane topcoat specified above for use on galvanized members.

Repair of Damage to New Coating System and Areas Concealed by Containment. The Contractor shall repair all damage to the newly installed coating system and areas concealed by the containment/protective covering attachment points, at no cost to the Department. The process for completing the repairs shall be included in the submittals. If the damage extends to the substrate and the original preparation involved abrasive blast cleaning, the damaged areas shall be prepared to SSPC-SP15 Power Tool Cleaning - Commercial Grade. If the original preparation was other than blast cleaning or the damage does not extend to the substrate, the loose, fractured paint shall be cleaned to Power Tool Cleaning – Modified SP3.

The surrounding coating at each repair location shall be feathered for a minimum distance of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared areas and the existing coating.

If the bare steel is exposed, all coats shall be applied to the prepared area. For damaged galvanizing, the first coat shall be aluminum epoxy mastic. If only the intermediate and finish coats are damaged, the intermediate and finish shall be applied. If only the finish coat is damaged, the finish shall be applied.

Special Instructions.

- a) At the completion of the work, the Contractor shall stencil the painting date and the paint code on the bridge. The letters shall be capitals, not less than 2 in. (50 mm) and not more than 3 in. (75 mm) in height.

The stencil shall contain the following wording "PAINTED BY (insert the name of the Contractor)" and shall show the month and year in which the painting was completed, followed by the appropriate code for the coating material applied, all stenciled on successive lines:

CODE U (for field applied System 3 or System 4).

CODE Z (for field applied System 1 or System 2).

CODE AA (for field applied System 5 or System 6).

This information shall be stenciled on the cover plate of a truss end post near the top of the railing, or on the outside face of an outside stringer near both ends of the bridge facing traffic, or at some equally visible surface near the end of the bridge, as designated by the Engineer.

- b) All surfaces painted inadvertently shall be cleaned immediately.
- c) Caulking complex structures. Pack rust shall be removed prior to the application of the approved sealant as per the Laminar and Stratified Rust article of this special provision. Chloride shall be remediated as specified elsewhere in this provision. The caulk shall be compatible with the approved paint system, and applied in accordance with the paint manufacturers recommendations as described in the Contractors submittal

The following coatings shall be applied prior to the application of the caulk. Stripe coat of organic zinc primer, full coat of organic zinc primer, intermediate epoxy stripe coat, full coat of epoxy intermediate, full coat of urethane finish. Apply caulk after the urethane has dried for top coating. After the caulk has been applied it shall be allowed to dry to coat according the manufacturer's written recommendations and a stripe coat of urethane applied to all areas of caulking.

Alternatively, as directed by the Engineer, apply the caulking after the intermediate coat has dried for overcoating. After the caulking has dried according to the manufacturer's written recommendations, apply the urethane finish over the caulking and intermediate coat.

1. All vertical, diagonal and horizontal lapping members shall be caulked along the top and sides. The bottom shall remain open for drainage.
2. Locations where pack rust was removed leaving a gap between two steel surfaces shall also be caulked. Locations greater than $\frac{1}{4}$ inch in depth shall be filled with a closed cell backer rod in accordance with the caulking manufacturer's instructions prior to the application of the caulk.

It is understood and agreed that the cost of all work outlined above, unless otherwise specified, has been included in the bid, and no extra compensation will be allowed.

Basis of Payment. This work shall be paid for at the contract Lump Sum price for CLEANING AND PAINTING STEEL BRIDGE, at the designated location, or for CLEANING AND PAINTING the structure or portions thereof described. Payment will not be authorized until all requirements for surface preparation and painting have been fulfilled as described in this specification,

including the preparation and submittal of all QC documentation. Payment will also not be authorized for non-conforming work until the discrepancy is resolved in writing.

Appendix 1 – Reference List

The Contractor shall maintain the following regulations and references on site for the duration of the project:

- Illinois Environmental Protection Act
- ASTM D 4214, Standard Test Method for Evaluating Degree of Chalking of Exterior Paint Films
- ASTM D 4285, Standard Test Method for Indicating Oil or Water in Compressed Air
- ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- SSPC-AB 1, Mineral and Slag Abrasives
- SSPC-AB 2, Cleanliness of Recycled Ferrous Metallic Abrasives
- SSPC-AB 3, Ferrous Metallic Abrasive
- SSPC-PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements
- SSPC-PA 17, Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements
- SSPC-QP 1, Standard Procedure for Evaluating Painting Contractors (Field Application to Complex Structures)
- SSPC-QP 2, Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint
- SSPC-SP 1, Solvent Cleaning
- SSPC-SP 2, Hand Tool Cleaning
- SSPC-SP 3, Power Tool Cleaning
- SSPC-SP 10/NACE No. 2, Near White Metal Blast Cleaning
- SSPC-SP WJ-4, Waterjet Cleaning of Metals – Light Cleaning
- SSPC-SP 15, Commercial Grade Power Tool Cleaning
- SSPC-SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals
- SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
- SSPC-VIS 3, Visual Standard for Power- and Hand-Tool Cleaned Steel
- SSPC-VIS 4, Guide and Reference Photographs for Steel Cleaned by Water Jetting
- SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning
- The paint manufacturer's application instructions, MSDS and product data sheets

MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES

Effective: October 4, 2016

Revised: March 1, 2019

Description. This work shall consist of furnishing and placing a membrane waterproofing system on the top slab and sidewalls, or portions thereof, for buried structures as detailed on the contract plans.

All membrane waterproofing systems shall be supplied by qualified producers. The Department will maintain a list of qualified producers.

Materials. The materials used in the waterproofing system shall consist of the following.

- (a) Cold-applied, self-adhering rubberized asphalt/polyethylene membrane sheet with the following properties:

Physical Properties	
Thickness ASTM D 1777 or D 3767	60 mils (1.500 mm) min.
Width	36 inches (914 mm) min.
Tensile Strength, Film ASTM D 882	5000 lb./in ² (34.5 MPa) min.
Pliability [180° bend over 1" inch (25 mm) mandrel @ -20 °F (-29 °C)] ASTM D 146 (Modified) or D1970	No Effect
Puncture Resistance-Membrane ASTM E 154	40 lb. (178 N) min.
Permeability (Perms) ASTM E 96, Method B	0.1 max.
Water Absorption (% by Weight) ASTM D 570	0.2 max.
Peel Strength ASTM D 903	9 lb./in (1576 N/m) min.

- (b) Ancillary Materials: Adhesives, Conditioners, Primers, Mastic, Two-Part Liquid Membranes, and Sealing Tapes as required by the manufacturer of the membrane and film for use with the respective membrane waterproofing system.

Construction. The areas requiring waterproofing shall be prepared and the waterproofing shall be installed in accordance with the manufacturer's instructions. The Contractor shall not install any part of a membrane waterproofing system in wet conditions, or if the ambient or concrete surface temperature is below 40° (4° C), unless allowed by the Engineer.

Surfaces to be waterproofed shall be smooth and free from projections which might damage the membrane sheet. Projections or depressions on the surface that may cause damage to the membrane shall be removed or filled as directed by the Engineer. The surface shall be power washed and cleaned of dust, dirt, grease, and loose particles, and shall be dry before the waterproofing is applied.

The Contractor shall uniformly apply primer to the entire area to be waterproofed, at the rate stated in the manufacturer's instructions, by brush, or roller. The Contractor shall brush out primer that tends to puddle in low spots to allow complete drying. The primer shall be cured according to the manufacturer's instructions. Primed areas shall not stand uncovered overnight. If membrane sheets are not placed over primer within the time recommended by the manufacturer, the Contractor shall recoat the surfaces at no additional cost to the Department.

The installation of the membrane sheet to primed surfaces shall be such that all joints are shingled to shed water by commencing from the lowest elevation of the buried structure's top slab and progress towards the highest elevation. The membrane sheets shall be overlapped as required by the manufacturer. The Contractor shall seal with mastic any laps that were not thoroughly sealed. The membrane shall be smooth and free of wrinkles and there shall be no depressions in horizontal surfaces of the finished waterproofing. After placement, exposed edges of membrane sheets shall be sealed with a troweled bead of a manufacturer's recommended mastic, or two-part liquid membrane, or with sealing tape.

Sealing bands at joints between precast segments shall be installed prior to the waterproofing system being applied. Where the waterproofing system and sealing band overlap, the installation shall be planned such that water will not be trapped or directed underneath the membrane or sealing band.

Care shall be taken to protect and to prevent damage to the waterproofing system prior to and during backfilling operations. The waterproofing system shall be removed as required for the installation of slab mounted guardrails and other appurtenances. After the installation is complete, the system shall be repaired and sealed against water intrusion according to the manufacturer's instructions and to the satisfaction of the Engineer.

Replace the last paragraph of Article 540.06 Precast Concrete Box Culverts and replace with:

Handling holes shall be filled with a polyethylene plug. The plug shall not project beyond the inside surface after installation nor project above the outside surface to the extent that may cause damage to the membrane. When metal lifting inserts are used, their sockets shall be filled with mastic or mortar compatible with the membrane.

Method of Measurement. The waterproofing system will be measured in place, in square yards (square meters) of the concrete surface to be waterproofed.

Basis of Payment. This work will be paid for at the contract unit price, per square yard (square meter) for MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES.

DRILLED SHAFTS

Effective: October 5, 2015

Revised: October 27, 2023

Revise Section 516 of the Standard Specifications to read:

“SECTION 516. DRILLED SHAFTS

516.01 Description. This work shall consist of constructing drilled shaft foundations.

516.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) Reinforcement Bars	1006.10
(c) Grout (Note 2).....	1024.01
(d) Permanent Steel Casing.....	1006.05(d)
(e) Slurry (Note 3)	

Note 1. When the soil contains sulfate contaminates, ASTM C 1580 testing will be performed to assess the severity of sulfate exposure to the concrete. If the sulfate contaminate is >0.10 to < 0.20 percent by mass, a Type II (MH) cement shall be used. If the sulfate contaminate is >0.20 to < 2.0 percent by mass, a Type V cement shall be used. If the sulfate contaminate is ≥ 2.0 percent by mass, refer to ACI 201.2R for guidance.

Note 2. The sand-cement grout mix shall be according to Section 1020 and shall be two to five parts sand and one part Type I or II cement. The maximum water cement ratio shall be sufficient to provide a flowable mixture with a typical slump of 10 in. (250 mm).

Note 3. Slurry shall be bentonite, emulsified polymer, or dry polymer, and shall be approved by the Engineer.

516.03 Equipment. Equipment shall be according to the following.

Item	Article/Section
(a) Concrete Equipment	1020.03
(b) Drilling Equipment (Note 1)	
(c) Hand Vibrator	1103.17(a)
(d) Underwater Concrete Placement Equipment	1103.18

Note 1. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans.

516.04 Submittals. The following information shall be submitted on form BBS 133.

(a) Qualifications. At the time of the preconstruction conference, the Contractor shall provide the following documentation.

(1) References. A list containing at least three projects completed within the three years prior to this project's bid date which the Contractor performing this work has installed drilled shafts of similar diameter, length, and site conditions to those shown in the plans. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractor's participation on those projects.

(2) Experience. Name and experience record of the drilled shaft supervisor, responsible for all facets of the shaft installation, and the drill operator(s) who will be assigned to this project. The supervisor and operator(s) shall each have a minimum of three years experience in the construction of drilled shafts.

(b) Installation Procedure. A detailed installation procedure shall be submitted to the Engineer for acceptance at least 28 days prior to drilled shaft construction and shall address each of the following items unless otherwise directed by the Engineer in writing.

(1) Equipment List. List of proposed equipment to be used including cranes, drill rigs, augers, boring tools, casing, vibratory hammers, core barrels, bailing buckets, final cleaning equipment, slurry equipment, tremies, or concrete pumps, etc.

(2) General Sequence. Details of the overall construction operation sequence, equipment access, and the sequence of individual shaft construction within each substructure bent or footing group. The submittal shall address the Contractor's proposed time delay and/or the minimum concrete strength necessary before initiating a shaft excavation adjacent to a recently installed drilled shaft.

(3) Shaft Excavation. A site specific step by step description of how the Contractor anticipates the shaft excavation to be advanced based on their evaluation of the subsurface data and conditions expected to be encountered. This sequence shall note the method of casing advancement, anticipated casing lengths, tip elevations and diameters, the excavation tools used and drilled diameters created. The Contractor shall indicate whether wet or dry drilling conditions are expected and if groundwater will be sealed from the excavation.

- (4) Slurry. When the use of slurry is proposed, details on the types of additives to be used and their manufacturers shall be provided. In addition, details covering the measurement and control of the hardness of the mixing water, agitation, circulation, de-sanding, sampling, testing, and chemical properties of the slurry shall be submitted.
- (5) Shaft Cleaning. Method(s) and sequence proposed for the shaft cleaning operation.
- (6) Reinforcement Cage and Permanent Casing. Details of reinforcement placement including rolling spacers to be used and method to maintain proper elevation and location of the reinforcement cage within the shaft excavation during concrete placement. The method(s) of adjusting the reinforcement cage length and permanent casing if rock is encountered at an elevation other than as shown on the plans. As an option, the Contractor may perform soil borings and rock cores at the drilled shaft locations to determine the required reinforcement cage and permanent casing lengths.
- (7) Concrete Placement. Details of concrete placement including proposed operational procedures for free fall, tremie or pumping methods. The sequence and method of casing removal shall also be stated along with the top of pour elevation, and method of forming through water above streambed.
- (8) Mix Design. The proposed concrete mix design(s).
- (9) Disposal Plan. Containment and disposal plan for slurry and displaced water. Containment and disposal plan for contaminated concrete pushed out of the top of the shaft by uncontaminated concrete during concrete placement.
- (10) Access and Site Protection Plan. Details of access to the drilled shafts and safety measures proposed. This shall include a list of casing, scaffolding, work platforms, temporary walkways, railings, and other items needed to provide safe access to the drilled shafts. Provisions to protect open excavations during non- working hours shall be included.

The Engineer will evaluate the drilled shaft installation procedure and notify the Contractor of acceptance, need for additional information, or concerns with the installation's effect on the existing or proposed structure(s).

CONSTRUCTION REQUIREMENTS

516.05 General. Excavation for drilled shaft(s) shall not proceed until written authorization is received from the Engineer. The Contractor shall be responsible for verification of the dimensions and alignment of each shaft excavation as directed by the Engineer.

Unless otherwise approved in the Contractor's installation procedure, no shaft excavation, casing installation, or casing removal with a vibratory hammer shall be made within four shaft diameters center to center of a shaft with concrete that has a compressive strength less than 1500 psi (10,300 kPa). The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

Lost tools shall not remain in the shaft excavation without the approval of the Engineer.

Blasting shall not be used as a method of shaft excavation.

516.06 Shaft Excavation Protection Methods. The construction of drilled shafts may involve the use of one or more of the following methods to support the excavation during the various phases of shaft excavation, cleaning, and concrete placement dependent on the site conditions encountered. Surface water shall not flow uncontrolled into the shaft excavation, however water may be placed into the shaft excavation in order to meet head pressure requirements according to Articles 516.06(c) and 516.13.

The following are general descriptions indicating the conditions when these methods may be used.

- (a) Dry Method. The dry construction method shall only be used at sites where the groundwater and soil conditions are suitable to permit the drilling and dewatering of the excavation without causing subsidence of adjacent ground, boiling of the base soils, squeezing, or caving of the shaft side walls. The dry method shall consist of drilling the shaft excavation, removing accumulated water, cleaning the shaft base, and placing the reinforcement cage and concrete in a predominately dry excavation.
- (b) Slurry Method. The slurry construction method may be used at sites where dewatering the excavation would cause collapse of the shaft sidewalls or when the volume and head of water flowing into the shaft is likely to contaminate the concrete during placement resulting in a shaft defect. This method uses slurry, or in rare cases water, to maintain stability of the shaft sidewall while advancing the shaft excavation. After the shaft excavation is completed, the slurry level in the shaft shall be kept at an elevation to

maintain stability of the shaft sidewall, maintain stability of the shaft base, and prevent additional groundwater from entering the shaft. The shaft base shall be cleaned, the reinforcement cage shall be set, and the concrete shall be discharged at the bottom of the shaft excavation, displacing the slurry upwards.

- (c) Temporary Casing Method. Temporary casing shall be used when either the dry or slurry methods provide inadequate support to prevent sidewall caving or excessive deformation of the shaft excavation. Temporary casing may be used with slurry or be used to reduce the flow of water into the excavation to allow dewatering and concrete placement in a dry shaft excavation. Temporary casing shall not be allowed to remain permanently without the approval of the Engineer.

During removal of the temporary casing, the level of concrete in the casing shall be maintained at a level such that the head pressure inside the casing is a minimum of 1.25 times the head pressure outside the casing, but in no case is less than 5 ft (1.5 m) above the bottom of the casing. Casing removal shall be at a slow, uniform rate with the pull in line with the shaft axis. Excessive rotation of the casing shall be avoided to limit deformation of the reinforcement cage. In addition, the slump requirements during casing removal shall be according to Article 516.12.

When called for on the plans, the Contractor shall install a permanent casing as specified. Permanent casing may be used as a shaft excavation support method or may be installed after shaft excavation is completed using one of the above methods. After construction, if voids are present between the permanent casing and the drilled excavation, the voids shall be filled with grout by means of tremie(s) or concrete pump which shall be lowered to the bottom of the excavation. The contractor's means and methods for grout placement shall fill the annular void(s) between the permanent casing and the surrounding earth material to restore and provide lateral earth resistance to the shaft. Grout yield checks shall be performed by the contractor for submittal to the Engineer. Permanent casing shall not remain in place beyond the limits shown on the plans without the specific approval of the Engineer.

When the shaft extends above the streambed through a body of water and permanent casing is not shown, the portion above the streambed shall be formed with removable casings, column forms, or other forming systems as approved by the Engineer. The forming system shall not scar or spall the finished concrete or leave in place any forms or casing within the removable form limits as shown on the plans unless approved as part of the installation procedure. The forming system shall not be removed until the concrete has attained a minimum compressive strength of 2500 psi (17,200 kPa) and cured for a minimum of 72 hours. For shafts extending through water, the concrete shall be protected from water action after placement for a minimum of seven days.

516.07 Slurry. When slurry is used, the Contractor shall provide a technical representative of the slurry additive manufacturer at the site prior to introduction of the slurry into the first shaft where slurry will be used, and during drilling and completion of a minimum of one shaft to adjust the slurry mix to the specific site conditions. During construction, the level of the slurry shall be maintained a minimum of 5 feet (1.5 m) above the height required to prevent

caving of the shaft excavation. In the event of a sudden or significant loss of slurry in the shaft excavation, the construction of that foundation shall be stopped and the shaft excavation backfilled or supported by temporary casing, until a method to stop slurry loss, or an alternate construction procedure, has been approved by the Engineer.

- (a) General Properties. The material used to make the slurry shall not be detrimental to the concrete or surrounding ground. Mineral slurries shall have both a mineral grain size that remains in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. Polymer slurries shall have sufficient viscosity and gel characteristics to transport excavated material to suitable screening systems or settling tanks. The percentage and specific gravity of the material used to make the slurry shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement.

If approved by the Engineer, the Contractor may use water and excavated soils as drilling slurry. In this case, the range of acceptable values for density, viscosity and pH, as shown in the following table for bentonite slurry shall be met.

When water is used as the slurry to construct rock sockets in limestone, dolomite, sandstone or other formations that are not erodible, the requirements for slurry testing shall not apply if the entire fluid column is replaced with fresh water after drilling. To do so, fresh water shall be introduced at the top of the shaft excavation and existing water used during drilling shall be pumped out of the shaft excavation from the bottom of the shaft excavation until the entire volume of fluid has been replaced.

- (b) Preparation. Prior to introduction into the shaft excavation, the manufactured slurry admixture shall be pre-mixed thoroughly with clean, fresh water and for adequate time in accordance with the slurry admixture manufacturer's recommendations. Slurry tanks of adequate capacity shall be used for slurry mixing, circulation, storage and treatment. No excavated slurry pits will be allowed in lieu of slurry tanks without approval from the Engineer. Adequate desanding equipment shall be provided to control slurry properties during the drilled shaft excavation in accordance with the values provided in Table 1.
- (c) Quality Control. Quality control tests shall be performed on the slurry to determine density, viscosity, sand content and pH of freshly mixed slurry, recycled slurry and slurry in the shaft excavation. Tests of slurry samples from within two feet of the bottom and at mid-height of the shaft excavation shall be conducted in each shaft excavation during the excavation process to measure the consistency of the slurry. A minimum of four sets of tests shall be conducted during the first eight hours of slurry use on the project. When a series of four test results do not change more than 1% from the initial test, the testing frequency may be decreased to one set every four hours of slurry use. Reports of all tests, signed by an authorized representative of the Contractor, shall be furnished to the

Engineer upon completion of each drilled shaft. The physical properties of the slurry shall be as shown in Table 1.

The slurry shall be sampled and tested less than 1 hour before concrete placement. Any heavily contaminated slurry that has accumulated at the bottom of the shaft shall be removed. The contractor shall perform final shaft bottom cleaning after suspended solids have settled from the slurry. Concrete shall not be placed if the slurry does not have the required physical properties.

Table 1 – SLURRY PROPERTIES				
	Bentonite	Emulsified Polymer	Dry Polymer	Test Method
Density, lb/cu ft (kg/cu m) (at introduction)	65.2 ± 1.6 ¹ (1043.5 ± 25.6)	63 (1009.0) max.	63 (1009.0) max.	ASTM D 4380
Density, lb/cu ft (kg/cu m) (prior to concrete placement)	67.0 ± 3.5 ¹ (1073.0 ± 56.0)	63 (1009.0) max.	63 (1009.0) max.	ASTM D 4380
Viscosity ² , sec/qt (sec/L)	46 ± 14 (48 ± 14)	38 ± 5 (40 ± 5)	65 ± 15 (69 ± 16)	ASTM D 6910
pH	9.0 ± 1.0	9.5 ± 1.5	9.0 ± 2.0	ASTM D 4972
Sand Content, percent by volume (at introduction)	4 max.	1 max.	1 max.	ASTM D 4381
Sand Content, percent by volume (prior to concrete placement)	10 max.	1 max.	1 max.	ASTM D 4381
Contact Time ³ , hours	4 max.	72 max.	72 max.	

Note 1. When the slurry consists of only water and excavated soils, the density shall not exceed 70 lb/cu ft (1121 kg/cu m).

Note 2. Higher viscosities may be required in loose or gravelly sand deposits.

Note 3. Contact time is the time without agitation and sidewall cleaning.

516.08 Obstructions. An obstruction is an unknown isolated object that causes the shaft excavation method to experience a significant decrease in the actual production rate and requires the Contractor to core, break up, push aside, or use other means to mitigate the obstruction. Subsurface conditions such as boulders, cobbles, or logs and buried infrastructure such as footings, piling, or abandoned utilities, when shown on the plans, shall not constitute an obstruction. When an obstruction is encountered, the Contractor shall notify the Engineer immediately and upon concurrence of the Engineer, the Contractor shall mitigate the obstruction with an approved method.

516.09 Top of Rock. The top of rock will be considered as the point where rock, defined as bedded deposits and conglomerate deposits exhibiting the physical characteristics and difficulty of rock removal as determined by the Engineer, is encountered which cannot be drilled with augers and/or underreaming tools configured to be effective in the soils indicated in the contract documents.

516.10 Design Modifications. If the top of rock elevation differs from that shown on the plans by more than 10 percent of the length of the drilled shaft above the rock, the Engineer shall be contacted to determine if any drilled shaft design changes may be required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Contractor may be required to extend the drilled shaft length(s) beyond those specified in the plans. In either case, the Engineer will determine if revisions are necessary and the extent of the modifications required.

516.11 Excavation Cleaning and Inspection. Materials removed or generated from the shaft excavations shall be disposed of according to Article 202.03.

After excavation, each shaft shall be cleaned. For a drilled shaft terminating in soil, the depth of sediment or debris shall be a maximum of 1 1/2 in. (38 mm). For a drilled shaft terminating in rock, the depth of sediment or debris shall be a maximum of 1/2 in. (13 mm).

A shaft excavation shall be overreamed when, in the opinion of the Engineer, the sidewall has softened, swelled, or has a buildup of slurry cake. Overreaming may also be required to correct a shaft excavation which has been drilled out of tolerance. Overreaming may be accomplished with a grooving tool, overreaming bucket, or other approved equipment. Overreaming thickness shall be a minimum of 1/2 in. (13 mm) and a maximum of 3 in. (75 mm).

516.12 Reinforcement. This work shall be according to Section 508 and the following.

The shaft excavation shall be cleaned and inspected prior to placing the reinforcement cage. The reinforcement cage shall be completely assembled prior to drilling and be ready for adjustment in length as required by the conditions encountered. The reinforcement cage shall be lifted using multiple point sling straps or other approved methods to avoid reinforcement

cage distortion or stress. Cross frame stiffeners may be required for lifting or to keep the reinforcement cage in proper position during lifting and concrete placement.

The Contractor shall attach rolling spacers to keep the reinforcement cage centered within the shaft excavation during concrete placement and to ensure that at no point will the finished shaft have less than the minimum concrete cover(s) shown on the plans. The rolling spacers or other approved non-corrosive spacing devices shall be installed within 2 ft (0.6 m) of both the top and bottom of the drilled shaft and at intervals not exceeding 10 ft (3 m) throughout the length of the shaft to ensure proper reinforcement cage alignment and clearance for the entire shaft. The number of rolling spacers at each level shall be one for each 1.0 ft (300 mm) of shaft diameter, with a minimum of four rolling spacers at each level. For shafts with different shaft diameters throughout the length of the excavation, different sized rolling spacers shall be provided to ensure the reinforcement cage is properly positioned throughout the entire length of the shaft.

When a specific concrete cover between the base of the drilled shaft and the reinforcement cage is shown on the plans, the bottom of the reinforcement cage shall be supported so that the proper concrete cover is maintained.

If the conditions differ such that the length of the shaft is increased, additional longitudinal bars shall be either mechanically spliced or lap spliced to the lower end of the reinforcement cage and confined with either hoop ties or spirals. The Contractor shall have additional reinforcement available or fabricate the reinforcement cages with additional length as necessary to make the required adjustments in a timely manner as dictated by the encountered conditions. The additional reinforcement may be non-epoxy coated.

516.13 Concrete Placement. Concrete work shall be performed according to the following.

Throughout concrete placement the head pressure inside the drilled shaft shall be at least 1.1 times the head pressure outside the drilled shaft.

Concrete placement shall begin within 1 hour of shaft cleaning and inspection. The pour shall be made in a continuous manner from the bottom to the top elevation of the shaft as shown on the contract plan or as approved in the Contractor's installation procedure. Concrete placement shall continue after the shaft excavation is full and until 18 in. (450 mm) of good quality, uncontaminated concrete is expelled at the top of shaft. Vibration of the concrete will not be allowed when the concrete is displacing slurry or water. In dry excavations, the concrete in the top 10 ft (3 m) of the shaft shall be vibrated.

When using temporary casing or placing concrete under water or slurry, a minimum of seven days prior to concrete placement, a 4 cu yd (3 cu m) trial batch of the concrete mixture shall be

performed to evaluate slump retention. Temporary casing shall be withdrawn before the slump of the concrete drops below 6 in. (150 mm). For concrete placed using the slurry method of construction, the slump of all concrete placed shall be a minimum of 6 in. (150 mm) at the end of concrete placement.

Devices used to place concrete shall have no aluminum parts in contact with concrete.

When the top of the shaft is at the finished elevation and no further concrete placement above the finished elevation is specified, the top of the shaft shall be level and finished according to Article 503.15(a).

Concrete shall be placed by free fall, tremie, or concrete pump subject to the following conditions.

- (a) Free Fall Placement. Concrete shall only be placed by free fall when the rate of water infiltration into the shaft excavation is less than 12 in. (300 mm) per hour and the depth of water in the shaft excavation is less than 3 in. (75 mm) at the time of concrete placement.

Concrete placed by free fall shall fall directly to the base without contacting the reinforcement cage, cross frame stiffeners, or shaft sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Drop chutes used to direct placement of free fall concrete shall consist of a smooth tube. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. The drop chute shall be supported so that free fall does not exceed 60 ft (18.3 m) for conventional concrete or 30 ft (9.1 m) for self-consolidating concrete. If placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, either a tremie or pump shall be used to accomplish the pour.

- (b) Tremie and Concrete Pump Placement. Concrete placement shall be according to Article 503.08, except the discharge end of the steel pipe shall remain embedded in the concrete a minimum of 10 ft (3.0 m) throughout concrete placement when displacing slurry or water.

516.14 Construction Tolerances. The following construction tolerances shall apply to all drilled shafts.

- (a) Center of Shaft. The center of the drilled shaft shall be within 3 in. (75 mm) of the plan station and offset at the top of the shaft.

- (b) Center of Reinforcement Cage. The center of the reinforcement cage shall be within 1 1/2 in. (40 mm) of plan station and offset at the top of the shaft.
- (c) Vertical Plumbness of Shaft. The out of vertical plumbness of the shaft shall not exceed 1.5 percent.
- (d) Vertical Plumbness of Reinforcement Cage. The out of vertical plumbness of the shaft reinforcement cage shall not exceed 0.83 percent.
- (e) Top of Shaft. The top of the shaft shall be no more than 1 in. (25 mm) above and no more than 3 in. (75 mm) below the plan elevation.
- (f) Top of Reinforcement Cage. The top of the reinforcement cage shall be no more than 1 in. (25 mm) above and no more than 3 in. (75 mm) below the plan elevation.
- (g) Bottom of shaft. Excavation equipment and methods used to complete the shaft excavation shall have a nearly planar bottom. The cutting edges of excavation equipment used to create the bottom of shafts in rock shall be normal to the vertical axis of the shaft within a tolerance of 6.25 percent.

516.15 Method of Measurement. This work will be measured for payment in place and the volume computed in cubic yards (cubic meters). The volume will be computed using the plan diameter of the shaft multiplied by the measured length of the shaft. The length of shaft in soil will be computed as the difference in elevation between the top of the drilled shaft shown on the plans, or as installed as part of the Contractor's installation procedure, and the bottom of the shaft or the top of rock (when present) whichever is higher. The length of shaft in rock will be computed as the difference in elevation between the measured top of rock and the bottom of the shaft.

When permanent casing is specified, it will be measured for payment in place, in feet (meters). Permanent casing installed at the Contractor's option will not be measured for payment.

Reinforcement furnished and installed will be measured for payment according to Article 508.07.

516.16 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) for DRILLED SHAFT IN SOIL, and/or DRILLED SHAFT IN ROCK.

Permanent casing will be paid for at the contract unit price per foot (meter) for PERMANENT CASING.

Reinforcement furnished and installed will be paid for according to Article 508.08.

Obstruction mitigation will be paid for according to Article 109.04.”

BAR SPLICERS, HEADED REINFORCEMENT

Effective: September 2, 2022

Revised: October 27, 2023

Add the following to Article 508.08(b):

When bar splicers are epoxy-coated, all damaged or uncoated areas near the threaded ends shall be coated with a two-part epoxy according to ASTM D 3963 (D 3963M). All threaded ends of Stage II construction threaded splicer bars shall be coated according to ASTM D 3963 or dipped in an epoxy-mastic primer prior to joining the Stage II construction threaded splicer bar to the threaded coupler.

Add the following Article 508.02 (d)

Bar Terminators 1006.10(a)(1)h

Add the following paragraph after Article 508.08 (c):

Bar terminators are threaded, headed attachments to reinforcement to form headed reinforcement. When specified on the plans, a bar terminator shall be attached to the designated reinforcement for development.

Add the following 4th paragraph to Article 508.11:

Bar Terminators will be paid for at the contract unit price per each for BAR TERMINATORS.

Add the following to Article 1006.10(a)(1)g:

For bar splicers with welded connections between the threaded coupler and threaded rod, the Stage I construction threaded splicer bar shall be welded to the threaded coupler using an all-around fillet weld.

Add the following Article 1006.10(a)(1)h:

Bar Terminators. Designated bars shall use a bar terminator to form headed reinforcement. Headed reinforcement shall conform to ASTM A970 with threaded attachment; Class HA; and reinforcement bars conforming to ASTM A706, except the connection strength of the bar terminator to the reinforcement bar shall meet, in tension, at least 125 percent of the specified yield strength of the reinforcement bar. The bar terminator shall be on the Department's qualified product list.

When the reinforcement bar to receive the bar terminator is epoxy coated, the bar terminator shall also be epoxy coated according to ASTM A 775 (A 775M)

NOISE ABATEMENT WALL, GROUND MOUNTED

Effective: December 9, 2022

Revised: October 17, 2025

General. This work shall consist of furnishing the design, shop drawings, materials, post anchorage, and construction of ground mounted concrete noise abatement walls (noise walls) according to this Special Provision, the Contract Plans and/or as directed by the Engineer.

The noise abatement wall shall consist of precast concrete panels spanning between vertical posts supported by concrete drilled shaft foundations (ground mounted) as shown on the plans. Driven piles will not be allowed. The posts shall be steel or concrete, unless otherwise specified on the Contract Plans. The design, material, fabrication and construction shall comply with this Special Provision and the requirements specified by the noise wall supplier selected by the Contractor for use on this project. The walls shall have no omissions or gap except as detailed in the Contract Plans.

The Contractor shall verify the locations for the proposed ground mounted wall for conflicts and inform the Engineer in writing of any conflicts before realigning or redesigning the wall. The Contractor shall realign or redesign the wall to avoid any conflicts.

Post spacing shall avoid existing and proposed underground utilities and storm sewers.

Wall components shall be fabricated and erected to produce a precast concrete reflective noise wall system and/or an absorptive noise reduction system at the locations shown in the Contract Plans. The noise reduction system shall satisfy the acoustical requirements as specified on the Contract Plans. An absorptive noise reduction system may be used as an alternate to a reflective noise wall system. Substitution of alternate materials in lieu of precast concrete panels will not be allowed.

All appurtenances behind, in front of, under, over, mounted upon, or passing through the noise wall, such as drainage structures, fire hydrant access, highway signage, emergency access, utilities, and storm sewers shall be accounted for in design of the wall.

The noise walls shall be designed and constructed to extend to the minimum lines, grades and dimensions of the wall envelope, with no omissions or gaps, as shown on the Contract Plans and as directed by the Engineer.

Submittals. A complete wall and foundation design submittal, including design calculations for wall panels, posts, foundations, and all connections and shop drawings shall be submitted to the Department for review and approval no later than 90 days prior to beginning construction of the wall. Approval shall be contingent upon acceptance by the utilities and/or railroad companies involved. The time required for the preparation and review of these submittals shall be charged to the allowable contract time. Delays caused by untimely submittals or insufficient data will not be considered justifications for any time extensions. No additional compensation will be made for any additional material, equipment or other items found necessary to comply with the project specifications as a result of the Engineer's review. The Contractor will be required to submit the

necessary shop drawings. All submittals shall be prepared and sealed by an Illinois Licensed Structural Engineer.

Submittals shall include all structural calculations, details, dimensions, quantities and cross sections necessary for the construction of the noise abatement walls including but not be limited to:

- (1) Structural design calculations for all structural members, foundations, and connections prepared and sealed by an Illinois Licensed Structural Engineer, and prints of shop drawings on reduced size 11 x 17 in. (275 x 425 mm) sheets in accordance with Article 505.03 and 1042.03(b) of the Standard Specifications. Each sheet shall provide adequate space for review and approval stamps at the lower right hand corner. Both lettering and details shall ensure legibility for review and reproduction. All drawings shall be completely titled according to the contract plans, including structure number, state contract number, route, section and county, and shall pertain to only one structure.
- (2) A plan view of the wall indicating the stations and offsets required to locate the drilled shaft foundations. The proposed foundation diameter(s) and spacing(s) shall be indicated with all changes to the horizontal alignment shown. Each panel and post shall be numbered and any changes in type or size shall be noted. The centerline of any utilities passing under the wall and locations of expansion joints, access doors, lighting, signing, curb cuts, and drainage structures shall also be shown.
- (3) An elevation view of the wall, indicating the elevations of the top of the posts and panels as well as the elevations of the bottom of the panels, tops of the shaft foundations, all steps in wall system, the finished grade line, and vertical clearances to existing utilities and storm sewers. Each post size and length, panel type and size, and foundation depth shall be designated.
- (4) A typical cross section(s) that shows the panel, post, foundation, and the elevation relationship between existing ground conditions and the finished grade as well as slopes adjacent to the wall.
- (5) All general notes required for constructing the wall.
- (6) All details for the steps in the bottom of panels shall be shown. The bottom of the panels shall be located at or below the theoretical bottom of panel line shown on the Contract Plans. The theoretical bottom of panel line is assumed to be 8 in (200 mm) below the finished grade line at front face of the wall for ground mounted noise walls, unless otherwise shown on the Contract Plans.
- (7) Tops of the panels and posts shall extend to or above the theoretical top of wall line shown on the Contract Plans. All panel tops shall be cast and placed horizontally with any changes in elevation accomplished by stepping adjacent panel sections at posts. Steps shall not exceed 2 ft (300 mm) in height.

- (8) All panel types shall be detailed. The details shall show panel weight, orientation, all dimensions necessary to cast and/or fabricate each type of panel, the reinforcing steel, and location of post or foundation connection hardware as well as lifting devices embedded in the panels. The Noise Reduction Coefficient (NRC) of each panel of the absorptive face shall be noted. The NRC shall be applied to the entire panel face(s) as specified on the contract plans.
- (9) All post types shall be detailed. The details shall show post weight, orientation, all dimensions necessary to cast and/or fabricate each type of post, the reinforcing steel, connecting plates, and anchorage details as well as lifting devices embedded in or attached to the posts. Post spacing for walls shall be limited to a distance that does not over stress the supporting structure.
- (10) Details of wall panels with appurtenances attached to or passing through the wall, as shown on the contract plans, such as utilities, emergency access doors, framed openings, drainage structures, signs, etc. shall be shown. Any modifications to the design or location of these appurtenances to accommodate a particular system shall also be submitted.
- (11) All architectural panel treatment, including color, texture and form liner patterns shall be shown. All joints shall be placed horizontal or vertical and shall be aligned with adjacent panels.
- (12) The details for the connection between panels and posts as well as their connection to the foundation, shall be shown. Foundation details, including details showing the dimensions, reinforcement, and post anchorage system for the drilled shaft foundations, shall be shown. The method of securing the reinforcement in the foundation prior to concrete placement shall be shown.
- (13) Testing, certifications and reports from independent laboratories documenting that the panel's sound Transmission Loss (TL) and NRC for the panel satisfy the criteria shown in the design criteria section of this specification. The testing results for the flame spread, smoke density and freeze-thaw/salt scaling requirements described in the materials section of this specification shall also be submitted. If unable to document panel and post deflections by calculations, reports of full scale testing shall be submitted to demonstrate the deflection criteria have been met.
- (14) Manufacturer recommended installation requirements, a sequence of construction and a detailed bill of materials shall be included.
- (15) The color of the wall panels and support posts identified by Federal Standard 595-B color number.

The Contractor shall deliver to the Department, a 2 ft x 2 ft (600 mm x 600 mm) precast concrete sample of the wall which contains the colors, textures and patterns proposed for use on the project for approval.

The samples shall be made at the same plant manufacturing the product for the noise walls under this contract and shall be representative of those which will be tested per this specification. Once the color sample is approved, a batch shall be designated by batch number and date and will remain the standard for the entire project.

The Contractor shall submit site access plans showing access and limits of the work areas for the installation of the wall. Any required traffic controls shall be according to the requirements in the plans or the special provision for TRAFFIC CONTROL PLAN.

The initial wall and foundation design submittal shall include a complete set of shop drawings and calculations. A set of drawings will be returned to the Contractor with any corrections indicated. The Contractor shall do no work or ordering of materials for the structure until the Engineer has approved the submittal.

Design Criteria. The wall system shall be designed to withstand wind pressure, applied perpendicular to the panels in either direction, according to the AASHTO LRFD Bridge Design Specifications, Chapter 15, for the Design of Sound Barriers. The noise wall design life shall be 75 years unless otherwise noted. The wall system shall be designed to withstand active earth pressure and live load surcharge at locations indicated on the plans. The contractor shall be responsible for the structural adequacy of the panels, posts, foundations and connections as well as overall wall overturning stability. Prestressed and/or post tensioned panel concepts will not be permitted.

The factored Strength III and Strength V design wind loading shall be as specified on the plans but not less than 35 psf (1.7 kPa). The Service I factored design wind loading shall be as specified on the plans but not less than 15 psf. When a sound wall is also required to support earth pressures, the unfactored design active earth pressure shall be based on an equivalent fluid pressure of 55 pounds per cubic foot (880 kg/m³) and a minimum live load surcharge resulting in an additional lateral pressure of 110 psf. The earth pressure fill height shall be defined by the proposed grade line elevation and the theoretical bottom of panel line.

The post shall be connected to the foundation by either embedding the post inside the concrete foundation shaft or by attaching the post to the foundation shaft with base plates and anchor bolts as required by design. Embedded posts shall extend into the shaft for the full length of the shaft. A maximum tolerance of 6" from the base of the shaft will be permitted, as permitted by the Engineer, to achieve uniform panel and post height alignment. For base plate and anchor bolt connections, the minimum number of anchor bolts per post shall be four 1 in. (M24) diameter bolts, with a minimum embedment depth of 18 in. (450 mm). The concrete shaft for base plate and anchor bolt type connections shall be reinforced. For embedded post type connections, the shaft need not be reinforced unless the minimum clear cover over the post exceeds 10 inches (250 mm). When reinforcement of the concrete shaft is required as specified above, the reinforcement shall consist of a minimum of eight #5 (#15) vertical bars symmetrically placed and tied with #3 (#10) ties at 6 in. (150 mm) centers. An additional tie shall be provided at the top and bottom of the foundation. As an alternative to the ties, a #3 (#10) spiral at a 6 in. (150 mm) pitch with an additional 1 1/2 turns at the top and bottom of the foundation or an equivalent 4 x 4 – W12.3 x W7.4 welded wire fabric may be substituted. Reinforcement bars inside the concrete

foundations shall extend to the base of the shaft. The reinforcement does not require epoxy coating.

Posts shall be oversized by 0.0625 in. in each direction to account for corrosion.

The material and construction of the foundations (drilled shafts) shall be according to Section 516 of the Standard Specifications.

The shaft foundation dimensions shall be determined according to AASHTO LRFD Bridge Design Specifications. Soil borings from prior soil investigations when available are shown in the plans and may be used to generate foundation design parameters. The design shall utilize load and resistance factors as specified in the AASHTO LRFD Bridge Design Specifications and shall account for the effects of a sloping ground surface and water table indicated on the plans. In the event that insufficient data is shown on the plans, the following parameters should be assumed for the foundation design:

Effective unit weight	70 pcf (1120 kg/m ³)
Internal friction angle	30 degrees
Cohesion intercept	0 ksf (0 kg/m ³)

The maximum post spacing shall be as specified in the Contractor's approved design, but not greater than 20 ft.

The maximum allowable panel deflection shall be no more than the panel length (L) divided by 240 (L/240). The maximum post deflection due to post curvature shall be $H/180$, where H is the height of the post above the foundation. The maximum total post deflection due to post curvature, foundation curvature, and top-of-foundation rotation shall be $H/90$. A method utilizing P-y springs for different soil layers shall be used to calculate the total post deflection. When meeting the deflection limits cannot be demonstrated by calculations, a lateral load test and report shall be submitted to the Engineer indicating that the above noted design lateral loads can be applied to the panels and/or posts without exceeding noted deflection tolerance. The test shall apply lateral loads to the panel simulating uniform wind pressure, and earth pressure when present.

The design shall account for the presence of all appurtenances mounted on or passing through the wall such as drainage structures, existing or proposed utilities, emergency access doors and other items.

Corrugations, ribs or battens on the panel shall be oriented vertically when erected. The panels shall be designed to prevent entrapment and ponding of water. The walls shall not have openings allowing the perching or nesting of birds or the collection of dirt, debris or water.

The walls shall not have handholds or grips promoting climbing of the walls. Any bolts or fasteners used to connect material to the supporting panel, posts, or foundations shall be recessed or embedded in concrete, hidden from view and weather exposure. No external mechanical fastening devices such as frames or clips shall be used for these connections.

The noise abatement material shall be designed to achieve a sound TL equal to or greater than 20 dB in all one-third octave bands from 100 hertz to 5000 hertz, inclusive, when tested according to ASTM E-90. The sound absorptive material shall have a minimum NRC as indicated on the plans. For the side of the walls specified as reflective, no minimum NRC is required.

The NRC shall be determined per ASTM E795, tested according to ASTM C423 (mounting type A). The ratio of noise absorptive material on the panel surface to total wall area (including posts) shall be greater than 90 percent. NRC testing shall be performed on coated samples, utilizing the stain that will be applied for color.

Access Doors. All access doors shall be designed to fit within the design of the noise wall as shown on the plans. Doors shall be complete with hardware and locking devices. Each door shall provide a 3 ft (0.9 m) wide by 7 ft (2.1 m) high minimum clear access opening. Both door jambs shall be securely fastened to anchored posts. Front and back face of the installed door shall be flush with the faces of the noise wall.

The door, jambs, head, hinges, door appurtenances, and adjacent ground mounted posts shall be designed to withstand the wind pressure of 30 psf (1.4 kPa) with the door in fully open and fully closed positions and support the weight of the door and a 300 lb (136 kg) vertical load on the non-hinged side of the door. Provide steel bracing as required. Door bottom shall be equipped with drainage holes to avoid accumulation of trapped moisture.

Door jambs and head section shall be hot dip galvanized steel. Door hinges shall be barrel type, edge mount, extra heavy-duty, hot dip galvanized steel or stainless steel. The hinges shall be designed to support the weight of door assembly, wind loads on the open door, and a 300 lb (136 kg) vertical load on the non-hinged side of the door.

Door pulls shall be provided on both sides of access door(s). Door locking hardware shall be hasp-type to be used with a padlock and shall be located according to local fire department or other requirements as applicable. A solid steel emergency access lock box system shall be provided and mounted near the hasp location at the steel post on the locking hardware side of door. The lock box for emergency access doors shall be according to local fire department requirements.

Doors shall be equipped with lifting bolts or beams as required for safe lifting of door units.

Materials. Noise wall materials shall conform to the supplier's standards, AASHTO Specifications for noise walls and the following:

- (a) Reinforcement bars shall satisfy ASTM A706 Grade 60 (400). Welded wire fabric shall be according to AASHTO M 336. All reinforcement in the wall panels shall be epoxy coated or galvanized.
- (b) Anchor bolts shall conform to ASTM F1554 Grade 55 or 105 and shall be galvanized per AASHTO M232.

- (c) The precast elements shall be according to applicable portions of Section 1042 of the Standard Specifications. The precast elements are considered to be Precast Concrete Structural Members. Coarse Aggregate shall meet the requirements of Article 1004.02(f) of the Standard Specifications. Concrete shall be Class PC with a minimum compressive strength of 4500 psi (31,000 kPa) at 28 days. Dry cast concrete element will not be permitted.
- (d) Sound absorptive panels shall have a precast concrete core as described in (c) with a bonded sound absorptive material on one or both sides of the precast concrete core as required by the contract plans. The manufacturer shall provide test information from an independent lab that the panels meet specified durability requirements. Test data older than 5 years prior of the execution date of the contract will not be accepted.

All sound absorbing concrete and composite concrete components shall be tested for long-term durability according to AASHTO T 161 (ASTM C666), Procedure A or B, or ASTM C672-12. For testing according to AASHTO T 161 (ASTM C666), a minimum of three specimens shall be tested, and the maximum weight (mass) loss after 300 cycles shall be 7.0 percent with no cracks, delamination (applies to composite panels), or other excessive physical distress. For testing according to ASTM C672-12, the following modifications and requirements shall apply:

Three specimens of a full cross section of the panel at least 144 square inches in face area will be selected at random from the provided panel. Sample specimens shall be representative of the manufacturer's continuous production operation, as selected and marked by the engineer. Specimens shall be 2D-symmetric and shaped according to the testing laboratory's accommodations. Surfaces of the sample specimens shall be prepared for testing as follows. Brush the surfaces of the sample to remove any loose particles. Before testing, submerge the test specimens be submerged in water for a period of 24 hours before testing. Immediately following this, cover the specimens with the sodium chloride solution as stated below.

Test Procedure

Place samples in a 5-sided water tight container, fully submerged in a solution of sodium chloride (concentration 3% by mass). Maintain 1/4 inch of sodium chloride solution above the top surface of the fully submerged specimen within the container.

Subject the submerged specimens to continuous freeze-thaw cycles as follows:

After each five cycles, remove the salt solution and particles of deteriorated concrete from the slab and collect in a watertight container. The operation is best accomplished by tilting the slab in a funnel approximately 20 inches in diameter and washing the surface of the slab with a 3% sodium chloride solution. Continue this washing until all loose particles are removed from the sample. Strain the solution through a filter and dry the residue at 221 degrees Fahrenheit to a constant mass condition. Cumulatively weigh the residue after each five cycles. The dry residue is defined as the loss of mass. Calculate the loss of mass to the nearest 0.01 pounds per square foot, not including the exposed surface of any core material on the cast or cut edges. Visually rate the surfaces according to 10.1.5 of ASTM C672

including any delamination of the sound absorbing material from the concrete core for composite concrete materials. After each washing of each sample, re-establish the initial submerged condition with a new solution of 3% sodium chloride before continuing with freeze-thaw cycling.

Continue the test until 30 freeze-thaw cycles have been completed.

During the test position and support each specimen to allow free circulation of the test solution under, around, and over test pieces. Support the bottom of the specimens on blocks in a manner to facilitate movement of moisture through and around the test specimens.

Test Report

Submit to the engineer an independent testing laboratory test report which shows that all solid and composite concrete products meet or exceed the following criteria:

1. After 30 freeze-thaw cycles the test specimens shall not exhibit excessive deterioration in the form of cracks, spalls, aggregate disintegration, delamination or other objectionable features.
 2. Compliance with the test requirements is based upon a loss of mass of not more than 0.2 pounds per square foot from the surface after 30 cycles of freezing and thawing.
 3. The report shall include the following:
 - a. Name of manufacturer.
 - b. Location of production.
 - c. Production description.
 - d. Date product sample was cast.
 - e. Date testing began.
 - f. Specimen identification.
 - g. 5x7-inch color photographs of the test specimens before and after the 30 cycles of freeze-thaw test showing both sound absorbing faces and at least one representative side view of a cut (not cast) face, and any defects.
 - h. A graph of the cumulative mass loss of each specimen plotted against the number of freeze-thaw cycles for 5, 10, 15, 20, 25, and 30 freeze-thaw cycles.
 - i. Visual rating according to ASTM C672 Section 10.1.5, including report of any delamination of the sound absorbing material from the concrete core for composite concrete components.
- (e) The manufacturer for the noise abatement wall shall provide their quality control plan for testing the product, and test results shall be provided upon request by the Engineer. Manufacturers on the Department's Qualified Product List of Certified Precast Concrete Producers who are approved for noise abatement walls will be considered in compliance with this requirement. The panel manufacturer shall warranty the panels for aesthetic coating durability and no material delaminations or failures for a minimum of ten years.
- (f) Steel plates and posts shall conform to AASHTO M 270 (M 270 M) Grade 36 (250) or 50 (345). All portions of the post shall be galvanized according to AASHTO M111 and ASTM A385 or primed according to Section 506 of the Standard Specifications. The exposed

portions of the steel posts shall be painted according to Section 506 of the Standard Specifications. The adjacent concrete panels shall be protected from over spray. The color shall closely match the color of the concrete panels, unless otherwise specified on the plans. Steel bolts, nuts, and washers shall be galvanized according to AASHTO M232.

- (g) Lifting inserts cast into the panels shall be hot dipped galvanized.
- (h) Non shrink grout shall be according to Section 1024 of the Standard Specifications.
- (i) The default color of both sides of the panels, posts and other visible elements shall be a light brown earth tone unless specified otherwise on the Contract Plans. Colors shall be achieved through the use of integral pigments or stains, which are in compliance with the environmental regulation of the State of Illinois. Components manufactured with integral pigment shall be tested and certified in conformance to ASTM C979. Stains shall be non film forming, penetrating stains. Stains shall be applied to concrete at the cured age of the manufacturer's recommendation. Surface preparation and application shall be according to manufacturer written recommendations. Coloring of concrete elements shall be accomplished using a single component water based, sound absorptive, penetrating, architectural stain that is weather resistant. Stains and/or pigments must be applied at the manufacturing plant; application in the field on site will not be allowed. The final color shall be consistent with the quality and appearance of the approved sample. The surface coating shall be tested for accelerated weathering as follows:
 - Submit to the engineer certification of compliance that all coatings on barrier components, with the exception of structural steel and wood components comply with the following requirements when tested according to ASTM Standard G155, G153, or G152 after 2400 hours of exposure on a cement based test specimens:
 1. No checking when rated according to ASTM D660.
 2. No cracking when rated according to ASTM D661.
 3. No blistering when rated according to ASTM D714.
 4. No difference in adhesion between the unexposed control sample and an exposed sample when tested according to ASTM D3359, Method A.
 5. No chalking less than #7 rating when rated according to ASTM D4214.
 6. No color change greater than 5 NBS units when measured according to ASTM D2244, using illuminant D65 and the 1964 10-degree standard observer.
- (j) The finish pattern of the precast panels shall be as specified on the Contract Plans.
- (k) With the exception of the steel and Portland cement concrete elements of the wall, all materials shall be tested for flame spread and smoke density developed according to ASTM E84. The material must exhibit a flame-spread index less than 10 and a smoke density developed value of 10 or less.

Fabrication. All precast units shall be manufactured according to Section 504 of the Standard Specifications, and the following requirements and tolerances with respect to the dimensions shown on the approved shop drawings.

- (a) The minimum reinforcement bar cover shall be 1 1/2 in (40 mm).
- (b) Panel dimensions shall be within 1/4 in (6 mm).
- (c) All hardware embedded in panels or posts shall be within 1/4 in (6 mm).
- (d) Angular distortion with regard to panel squareness, defined as the difference between the two diagonals, shall not exceed 1/2 in (13 mm).
- (e) Surface defects on formed surfaces measured on a length of 5 ft (1.5 m) shall not be more than 0.10 in (2.5 mm).
- (f) Posts shall be installed plumb to within 1/2 in (13 mm) of vertical for every 15 ft (5 m) of height and to within 1/2 in (13 mm) of the station and offset indicated on the approved shop drawings.
- (g) Drilled shaft foundations shall be placed within 2 in (50 mm) of the station and offset indicated on the approved shop drawings.
- (h) Panel reinforcement and lifting devices shall be set in place to the dimension and tolerances shown on the plans and these special provisions prior to casting.

The date of manufacture, the production lot number, and the piece-mark shall be clearly noted on each panel.

Absorptive material shall be permanently attached to their supporting elements and no external mechanical fastening systems such as frames or clips shall be used. Any bolts or fasteners used shall be recessed or embedded below the surface.

Any chipping, cracks, honeycomb, or other defects, to be allowed, shall be within acceptable standards for precast concrete products according to Section 1042 of the Standard Specifications and as determined by the Engineer.

Construction. The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the contract unit price for Noise Abatement Wall. The instructions provided by the wall supplier are guidelines and do not relieve the contractor of the responsibility to adhere to contract requirements.

It is recommended that all bottom panels be installed for a length of wall prior to placing middle or top panels. After bottom panels are in-place, finish grading can be accomplished with heavy equipment by reaching over the in-place panels.

Site excavations and/or fill construction shall be completed to plan elevations and profiles prior to the start of wall foundation construction. All underground utility or drainage structure installation shall be completed prior to foundation installation. The ground elevations as shown on the plans and the approved noise wall shop drawings shall be verified by the contractor and discrepancies corrected prior to material fabrication. Buried utilities shall be marked to verify proper clearance from the drilled foundations. The Contractor should consider overhead obstruction such as electric and telephone wires prior to wall erection.

If the soils encountered during drilling of the foundations do not satisfy the design strengths shown on the Contract Plans, the Engineer shall be notified to evaluate the required foundation

modifications. The shaft foundation will normally require additional length, which may be paid separately under Article 104.03 of the Standard Specifications. All drilled shaft excavations shall be filled with concrete within 6 hours of their initiation. The concrete for the drilled shaft foundations shall be placed against undisturbed, in-place soils. The concrete at the top of the shaft shall be shaped to provide the panels on each side of the post full bearing area and correct elevation per the approved shop drawings.

The panels shall be delivered to the project site in full truckload quantities. They may be off-loaded individually or by forklift with a solid steel plate spanning between the forks providing uniform, fully distributed bearing support to the underside of the panels. Units shall be shipped, handled and stored in such a manner as to minimize the danger of staining, chipping, spalling, development of cracks, fractures, and excessive bending stresses. Panels shall be stored and shipped in bundles, on edge. Any touch up and repair is at the Contractor's expense and shall be carried out according to the manufacturer's recommendations.

Method of Measurement. Noise abatement walls will be measured in square feet (square meters) from the wall envelope, defined by the theoretical top of wall line to the theoretical bottom of wall line for the length of the wall as shown on the Contract Plans.

Drilled shafts, concrete, reinforcement bars and other elements for supporting the ground mounted noise abatement walls will not be measured for payment.

Access doors shown on the Contract Plans will not be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for NOISE ABATEMENT WALL, GROUND MOUNTED.

The costs for drilled shafts, concrete, reinforcement bars and other elements supporting the noise abatement walls will not be paid for separately but will be included in the item for NOISE ABATEMENT WALL, GROUND MOUNTED.

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work

performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide

sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants /

Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:

The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA- 1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act ([29 CFR part 3](#))), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act ([40 U.S.C. 3141\(2\)\(B\)](#)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in [29 CFR part 1](#), a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to DBAconformance@dol.gov. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division

under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.*

Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901–3907](#).

3. Records and certified payrolls (29 CFR 5.5)

a. Basic record requirements (1) Length of record retention. All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) Information required. Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) Additional records relating to fringe benefits. Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) Additional records relating to apprenticeship. Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. Certified payroll requirements (1) Frequency and method of submission. The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting

agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) Information required. The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (e.g., the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <https://www.dol.gov/sites/dolgov/files/WHDLegacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) Statement of Compliance. Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in [29 CFR part 3](#); and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) Use of Optional Form WH-347. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under [18 U.S.C. 1001](#) and [31 U.S.C. 3729](#).

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access (1) Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under [29 CFR part 6](#) any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address

of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices (1) Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 CFR part 30](#).

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, [18 U.S.C. 1001](#).

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#); or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#).

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

4. **Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the

event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. **Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and

health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

- a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

- b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

- a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or

cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY
SYSTEM OR APPALACHIAN LOCAL ACCESS**

ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)
This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.