

DIST. 1 - DESIGN / CONSULTANT SERVICES PROJECT MANAGER: BRIAN KUTTAB (847) 705-4431
BEAM FAB:3116&17COV

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
303	2010-086-F	LAKE	29	1

D-91-025-11
CONTRACT NO. 60L81

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
PLANS FOR PROPOSED HIGHWAY

**FAP 303 - IL ROUTE 173 OVER BOAT CHANNELS
(1.8 MI WEST OF IL 59 & 2.5 MI WEST OF IL 59)
SECTION: 2010-086-F
BEAMS AND BEARINGS FABRICATION**

C-91-025-11

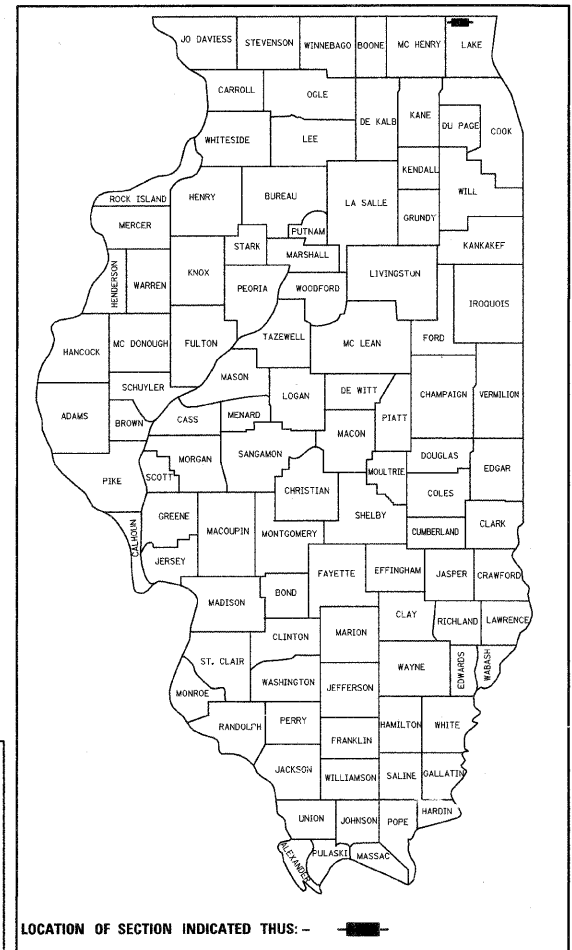
**Project located
in THE TOWNSHIP OF ANTIOCH**

FOR INDEX OF SHEETS, SEE SHEET NO. 2

TRAFFIC DATA
2007 ADT: 12,400 VEHICLES
2007 ADTT: 1,875
2027 ADT: 16,700 VEHICLES

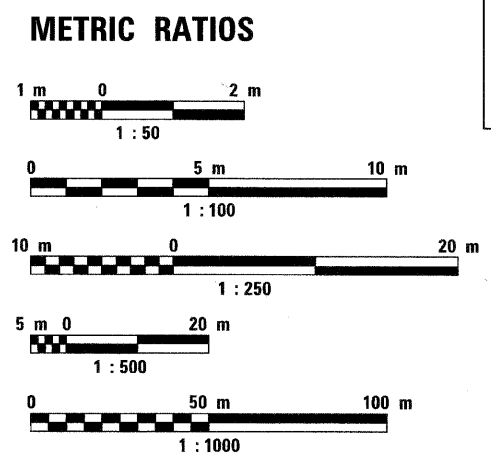
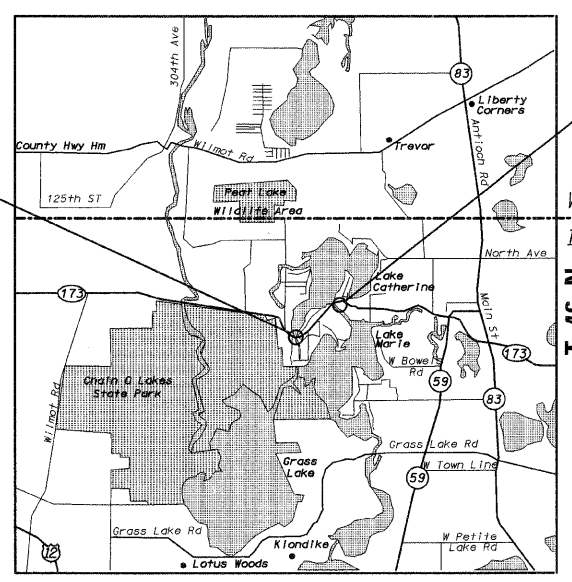
POSTED SPEED LIMIT
65 km/h (40 mph)

DESIGN DESIGNATION
17,400(30) PRINCIPAL ARTERIAL
5.07 (FD-20)



Project Description
IL ROUTE 173 OVER WEST BOAT CHANNEL,
2.5 MI WEST OF IL ROUTE 59,
PROPOSED BEAM AND BEARING FABRICATION
EXISTING S.N. 049-0055
EXISTING BRIDGE LENGTH 9.72 M
STA. 25+093.533 TO STA. 25+103.253

Project Description
IL ROUTE 173 OVER EAST BOAT CHANNEL,
1.8 MI WEST OF IL ROUTE 59,
PROPOSED BEAM AND BEARING FABRICATION
EXISTING S.N. 049-0056
PROPOSED S.N. 049-0198
EXISTING BRIDGE LENGTH 29.58 M
PROPOSED BRIDGE LENGTH 43.55 M
STA. 26+250.541 TO STA. 26+294.164



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123

CONTRACT NO. 60L81

GROSS LENGTH OF WEST BOAT CHANNEL SN 049-0055 = 9.72m = 0.0097km
GROSS LENGTH OF EAST BOAT CHANNEL SN 049-0198 = 43.55m = 0.0436km



7/12/10
Expires 11/30/10

SEAL

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED July 13, 2010
Diana M. O'Keefe
DEPUTY DIRECTOR OF HIGHWAY, REGION ONE ENGINEER

August 13, 2010
Scott E. Stitt, P.E.
acting ENGINEER OF DESIGN AND ENVIRONMENT

August 13, 2010
Christine M. Reesler
DIRECTOR, DIVISION OF HIGHWAYS

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OF THE STATE OF ILLINOIS**

Applied Technologies
CONSULTING ENGINEERS
468 PARK AVENUE
LAKE VILLA, ILLINOIS 60046
PHONE: 847-265-7325, EXT 101
FAX: 847-265-7327

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
303	2010-086-F	LAKE	29	2
STA.		TO STA.		
FED. ROAD DIST. NO.		ILLINOIS	FED. AID PROJECT	

CONTRACT NO. 60L81

INDEX OF SHEETS	
1	COVER SHEET
2	INDEX OF SHEETS, SUMMARY OF QUANTITIES AND HIGHWAY STANDARDS
3-14	BRIDGE PLANS - SN 049-055
15-29	BRIDGE PLANS - SN 049-0198

SUMMARY OF QUANTITIES				URBAN 100% STATE CONSTRUCTION TYPE CODE	
				WEST BOAT CHANNEL SN: 049-0055	EAST BOAT CHANNEL SN: 049-0198
CODE NO.	ITEM	UNIT	TOTAL QTY.	X081-2A	X081-2A
50500205	FURNISHING STRUCTURAL STEEL	L SUM	1	0.07	0.93
50500455	STORAGE OF STRUCTURAL STEEL	CAL DA	120	60	60
X0320622	FIELD MEASUREMENTS	L SUM	1	1	

LIST OF HIGHWAY STANDARDS

000001 STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS

COMMITMENTS

NONE

BEAM FAB: 3116&17INDEX.DGN



REVISIONS		ILLINOIS DEPARTMENT OF TRANSPORTATION IL ROUTE 173 OVER WEST AND EAST BOAT CHANNELS INDEX OF SHEETS, SUMMARY OF QUANTITIES AND HIGHWAY STANDARDS SCALE: NTS DATE 7-12-10
NAME	DATE	
DRAWN BY CLG CHECKED BY JJD		

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 1
FAP 303 IL 173	2010-086-F	LAKE	29	3	17 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-		

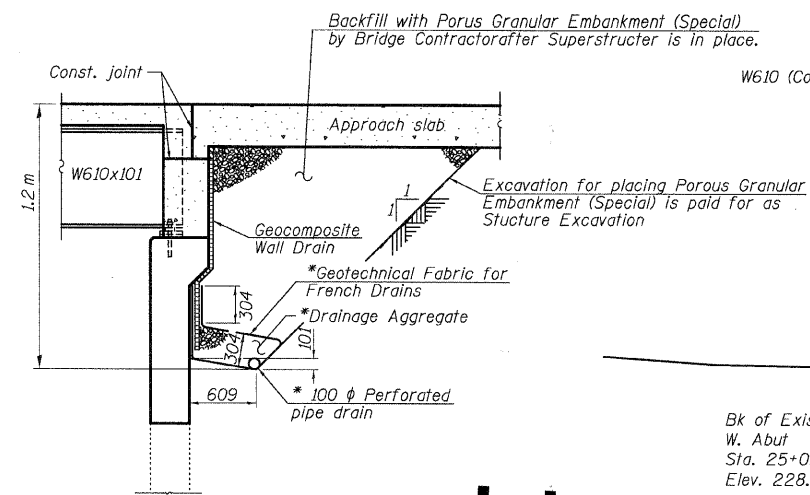
Bench Mark: USGS Reference Mark on S.W. wingwall of structure 049-0055 Elev. 228.867

Existing Structure: S.N. 049-0055, single span 9.720m Back to Back abutments, 15.748m Out to Out, R.C. slab bridge on closed abutments. Built as IL Route 173, Section 134B at Sta. 830+21 (English) in 1931. The contractor shall remove the existing superstructure and replace it with a single span Composite Steel Wide Flange Superstructure. The road shall be kept open to traffic at all times utilizing stage construction.

Note: All dimensions in millimeters (mm) except as noted.

No Salvage.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



SECTION THRU ABUTMENT
(Horiz. dim. @ Rt. L's)

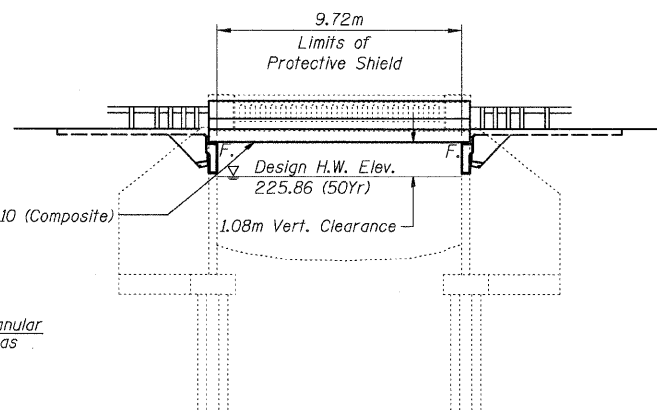
* Included in the cost of Pipe Underdrains for Structures

All drainage systems components shall extend to 308mm from the end of each wingwall except an outlet pipe shall extend until intersecting with the side slopes. The pipes shall drain into the concrete headwalls. (See Article 601.04 of the Standard Specifications and Highway Standard 601101) Drain may be connected to existing drain holes in existing abutment.

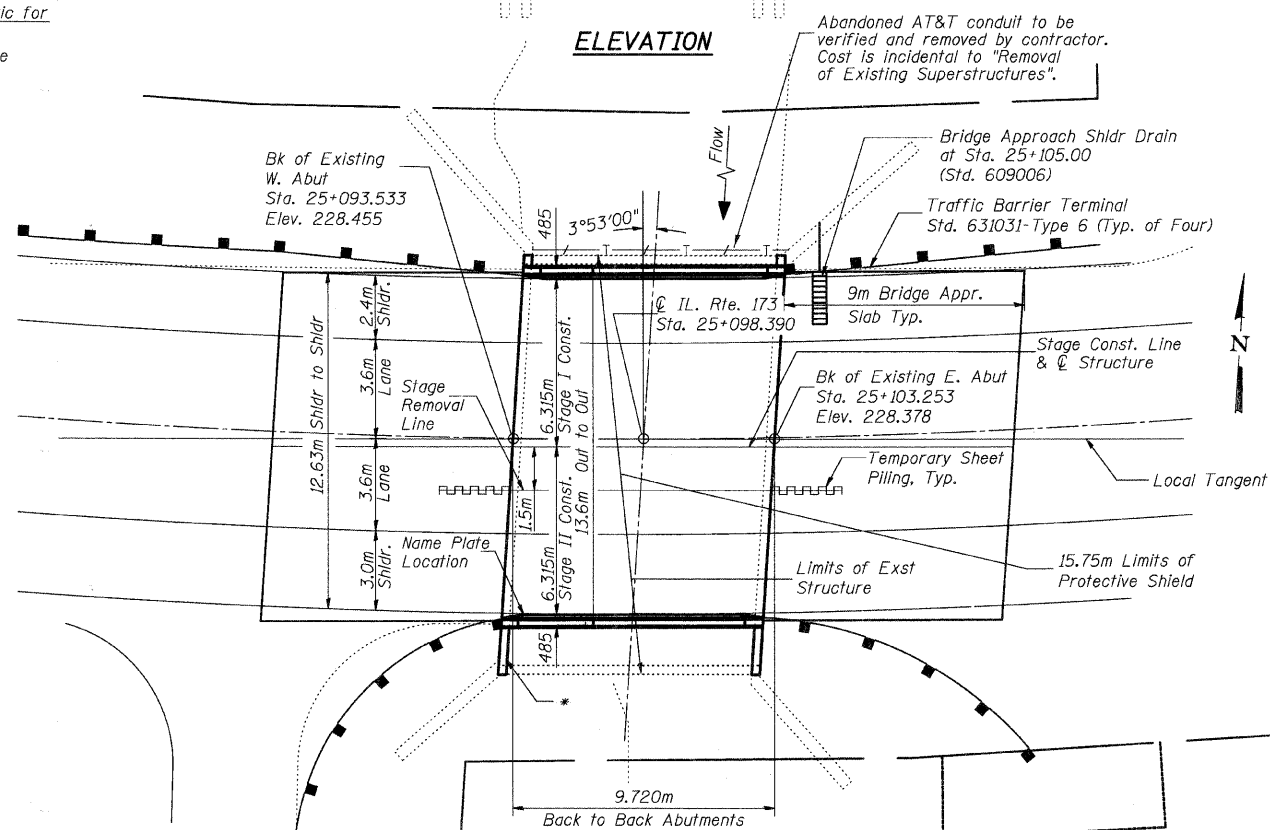
APPROVED
FOR STRUCTURAL ADEQUACY ONLY

Ralph E. Anderson (SE)
ENGINEER OF BRIDGES AND STRUCTURES

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2



ELEVATION



PLAN

CURVE DATA

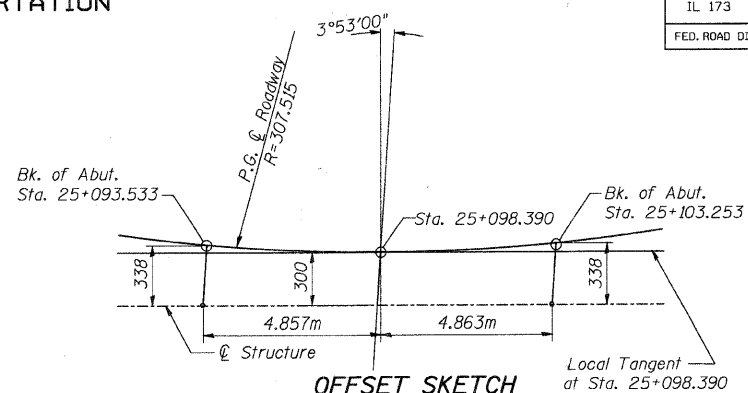
$\Delta = 117^{\circ}58'50.836''$
 $T = 511.600$
 $R = 307.515$
 $L = 633.221$
 $E = 289.394$
 $S.E. = 0.083$
 $P.C. STA = 24+702.249$
 $P.T. STA = 25+335.470$
 $P.I. STA = 25+213.849$

WATERWAY INFORMATION

Drainage Area = 2256 km² Low Grade Elev. 226.94 @ Sta. 25+103

Flood	Freq. Yr.	Q C.M.S.	Opening Sq. M		Natural H.W.E.		Head - Ft.		Headwater El.	
			Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	Exist.	Prop.
NPDES	25	0	14.7	14.7	225.69	225.69	0.00	0.00	225.69	225.69
Design	50	0	16.3	16.3	225.86	225.86	0.00	0.00	225.86	225.86
Base	100	0	17.8	17.8	226.04	226.04	0.00	0.00	226.04	226.04
Overlapping							0.00	0.00		
Max. Calc.	500	0	21.8	21.8	226.44	226.44	0.00	0.00	226.44	226.44

* Wire-weight stream gage to be relocated by USGS 6 weeks prior to guard rail removal. Contractor shall coordinate stream gage relocation with USGS.



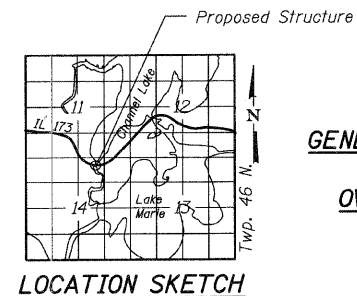
OFFSET SKETCH

INDEX OF SHEETS

Sheet Number	Description of Sheet
1.	General Plan and Elevation
2.	Stage Construction and General Data
3.	Top of Slab Elevations - 1
4.	Top of Slab Elevations - 2
*** 5.	Top of West Approach Slab Elevations
*** 6.	Top of East Approach Slab Elevations
7.	Deck Plan and Cross Section
8.	Superstructure Details
9.	Bridge Approach Slab - 1
10.	Bridge Approach Slab - 2
11.	Framing Plan
12.	Framing Details and Design Data Tables
13.	Abutment Details
14.	Substructure Repair
*** 15.	Temporary Concrete Barrier
*** 16.	Bar Splicer Details
*** 17.	Cantilever Forming Brackets

*** - This work is not in the fabrication contract and sheet is not included in these plans.

These plans are for the fabrication of the structural steel and bearings. All work shown that is not related to the fabrication is for information only. It is not included in this contract, and is identified as "Not Included in this Contract" or "For Information Only"



LOCATION SKETCH

STATION 25+098.390
BUILT 200_ BY
STATE OF ILLINOIS
FAP 303 SEC 134B
LOADING MS18
STRUCTURE NO. 049-0055

NAME PLATE

See Std. 515001

Existing Name Plate Shall be Cleaned and Relocated Next to New Name Plate. Cost Included with "Name Plates".

LOADING MS18

Allow 2.4 kN/m² for future wearing surface.

DESIGN SPECIFICATIONS

AASHTO 1996 thru 2000 & 2002 Interims

DESIGN STRESSES

FIELD UNITS

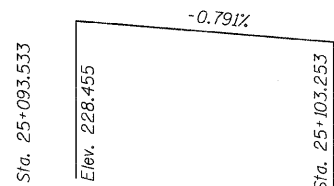
$f'_c = 24$ MPa
 $f_y = 420$ MPa (Reinforcement)
 $f_y = 250$ MPa (M270M Grade 250)
 $f_y = 345$ MPa (M270M Grade 345)

EXISTING UNITS

$f'_c = 24$ MPa
 $f_y = 228$ MPa (reinforcement)

SEISMIC DATA

Seismic Performance Category (SPC) = A
 Bedrock Acceleration Coefficient (A) = 0.035g
 Site Coefficient (S) = 1.0



PROFILE GRADE

Along Roadway



GENERAL PLAN AND ELEVATION
 FAP 303 IL. ROUTE 173
 OVER WEST BOAT CHANNEL
 SECTION 2010-086-F
 LAKE COUNTY
 STATION 25+098.390
 STRUCTURE NO. 049-0055

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 2
FAP 303 IL 173	2010-086-F	LAKE	29	4	17 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-		

GENERAL NOTES

- No field welding is permitted except as specified in the contract documents.
- The main load carrying member components subject to tensile stress shall conform to the Supplemental Requirements for Notch Toughness Zone 2. These components are the wide flange beams.
- ** Reinforcement bars shall conform to the requirements of ASTM A 706m Gr. 420. See special provisions.
- ** Reinforcement bars designated (E) shall be epoxy coated.
- ** Backfill shall be placed behind the abutment after the superstructure has been poured and falsework removed. See Article 502.10 of the Standard Specifications.

- All dimensions are in millimeters (mm) except as noted.
- The Organic Zinc Rich Primer / Epoxy / Urethane Paint System shall be used for painting of new structural steel except where otherwise noted. The entire system shall be shop applied, with the exception that masked off connection surfaces, field installed fasteners and damaged areas shall be touched up in the field. The color of the final finish coat for all steel surfaces shall be Gray, Munsell No. 5B 7/1. See Special Provision for "Cleaning and Painting New Metal Structures".
- ** All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
- ** Slipforming of the parapet is not allowed.

Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in the scope of the work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

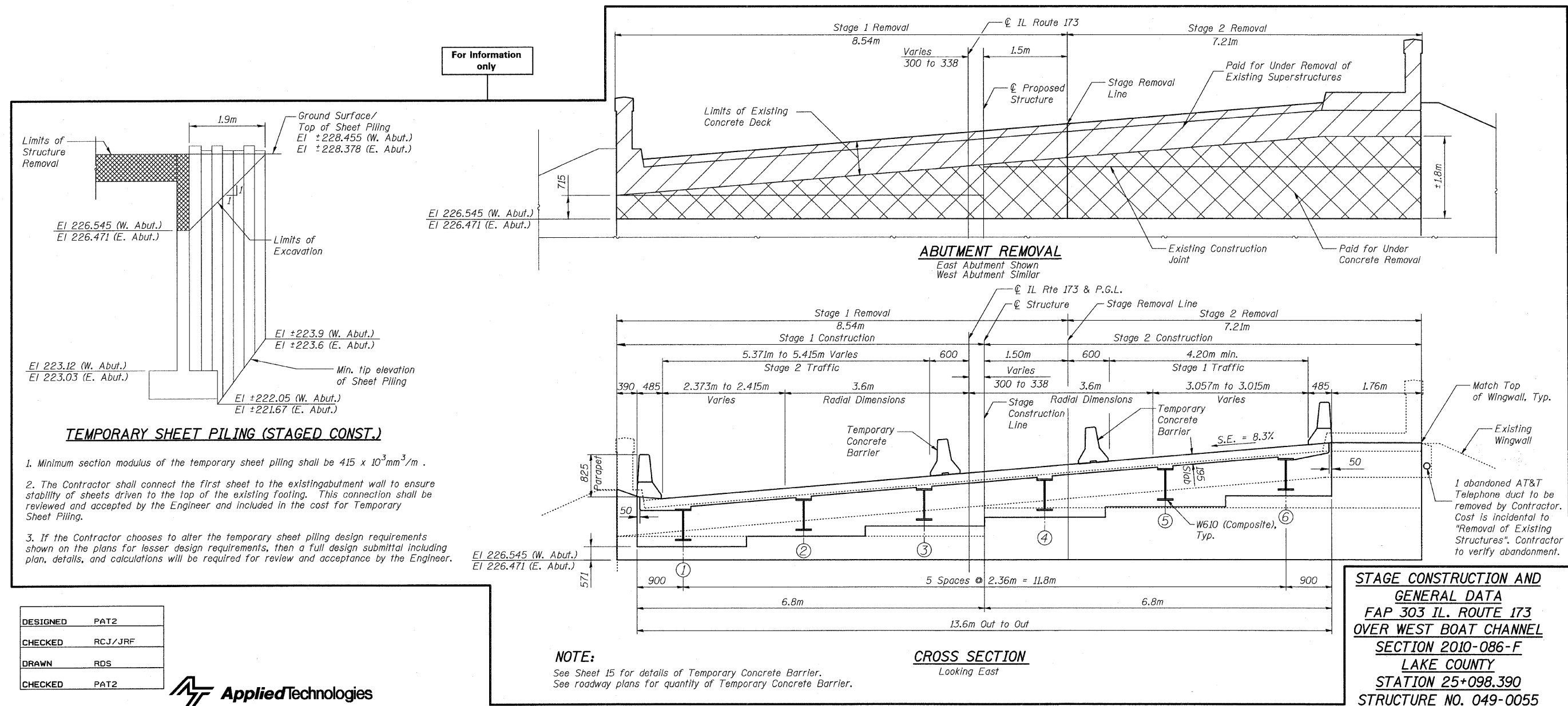
- ** - This work is not included in this fabrication contract and is provided for information only.
- Fasteners shall be AASHTO M164 Type 1, mechanically galvanized bolts. Bolts M22 open hole 24mm ϕ unless otherwise noted.

Calculated mass of Structural Steel = 1005 kg (Grade 250)*
= 5825 kg (Grade 345)
* includes mass of bearings

This work is included in the fabrication contract and is paid for under "Field Measurement"

** - This work is not included in this fabrication contract and is provided for information only.
These plans are for the fabrication of the structural steel and bearings. All work shown that is not related to the fabrication is for information only. It is not included in this contract, and is identified as "Not Included in this Contract" or "For Information Only"

- Note:
- ** The top of existing abutment shall be braced prior to removal of existing superstructure. The bracing shall remain in place until the anchor bolts are set and the concrete in the new deck slab attains the specified 28-day strength (f'c). The Contractor shall submit details and calculations of the proposed bracing system for approval by the Engineer, before commencing work. The submittal shall be designed and sealed by a licensed Structural Engineer in Illinois. All costs of the bracing shall be included with "Removal of Existing Superstructures."



- TEMPORARY SHEET PILING (STAGED CONST.)**
- Minimum section modulus of the temporary sheet piling shall be $415 \times 10^3 \text{ mm}^3/\text{m}$.
 - The Contractor shall connect the first sheet to the existing abutment wall to ensure stability of sheets driven to the top of the existing footing. This connection shall be reviewed and accepted by the Engineer and included in the cost for Temporary Sheet Piling.
 - If the Contractor chooses to alter the temporary sheet piling design requirements shown on the plans for lesser design requirements, then a full design submittal including plan, details, and calculations will be required for review and acceptance by the Engineer.

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2



NOTE:
See Sheet 15 for details of Temporary Concrete Barrier.
See roadway plans for quantity of Temporary Concrete Barrier.

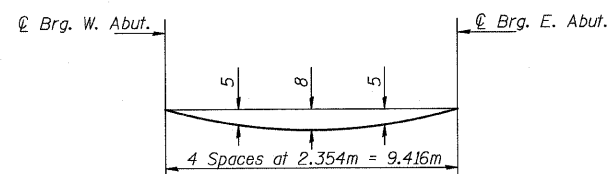
STAGE CONSTRUCTION AND GENERAL DATA
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

3117-849-0285.DGN

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 303 IL 173	2010-086-F	LAKE	29	5
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

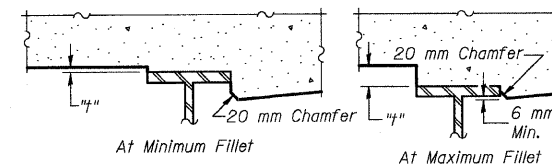
SHEET NO. 3
17 SHEETS



DEAD LOAD DEFLECTION DIAGRAM

(Includes weight of concrete only).

Note: The above deflections are not to be used in the field if the engineer is working from the grade elevations adjusted for dead load deflections as shown below and on Sheet 4 of 17.



To determine "t": After all structural steel has been erected, elevations of the top flanges of the beams shall be taken at intervals shown on Sheet 4 of 17. These elevations subtracted from the "Theoretical Grade Elevations Adjusted For Dead Load Deflection" shown below and on Sheet 4 of 17, minus slab thickness, equals the fillet heights "t" above top flange of beams.

FILLET HEIGHTS

GIRDER 1

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.827	-5.567	227.991	227.991
☉ West Abut.	25+093.982	-5.569	227.989	227.989
C	25+097.038	-5.597	227.963	227.969
D	25+100.093	-5.595	227.939	227.946
☉ East Abut.	25+103.572	-5.557	227.914	227.914
Back East Abut.	25+103.727	-5.555	227.913	227.913

GIRDER 2

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.701	-3.205	228.188	228.188
☉ West Abut.	25+093.854	-3.207	228.186	228.186
C	25+096.886	-3.236	228.160	228.166
D	25+099.918	-3.236	228.136	228.143
☉ East Abut.	25+103.370	-3.200	228.112	228.112
Back East Abut.	25+103.527	-3.198	228.111	228.111

GIRDER 3

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.576	-0.842	228.385	228.385
☉ West Abut.	25+093.729	-0.845	228.383	228.383
C	25+096.737	-0.876	228.357	228.363
D	25+099.746	-0.877	228.333	228.340
☉ East Abut.	25+103.171	-0.843	228.309	228.309
Back East Abut.	25+103.323	-0.841	228.308	228.308

☉ IL. Rte. 173 and P.G.L.

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.532	0.000	228.455	228.455
☉ West Abut.	25+093.684	0.000	228.454	228.454
C	25+096.682	0.000	228.430	228.436
D	25+099.682	0.000	228.406	228.413
☉ East Abut.	25+103.101	0.000	228.379	228.379
Back East Abut.	25+103.253	0.000	228.378	228.378

NOTES

For Plan View, ☉ Structure, Stage Construction Line and Girders 4 thru 6, See Sheet 4.
All dimensions are in millimeters (mm) except as noted.

TOP OF SLAB ELEVATIONS-1
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 4 17 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	6	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

☉ STRUCTURE and STAGE CONSTRUCTION LINE

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.515	0.339	228.483	228.483
☉ West Abut.	25+093.667	0.336	228.482	228.482
C	25+096.663	0.305	228.456	228.462
D	25+099.660	0.303	228.432	228.438
☉ East Abut.	25+103.073	0.336	228.407	228.438
Back East Abut.	25+103.225	0.338	228.406	228.407

GIRDER 4

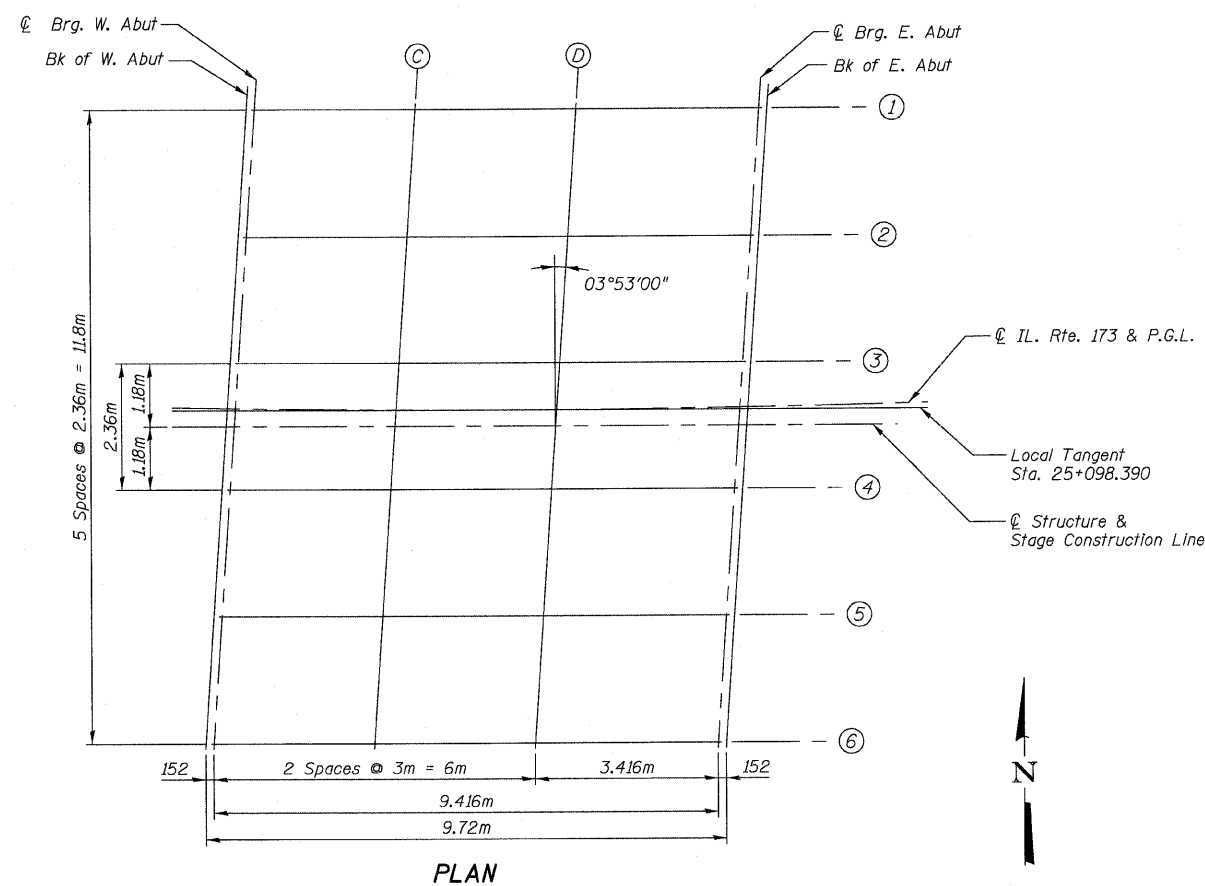
Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.454	1.520	228.582	228.582
☉ West Abut.	25+093.605	1.517	228.580	228.580
C	25+096.590	1.485	228.554	228.560
D	25+099.576	1.482	228.530	228.537
☉ East Abut.	25+102.975	1.514	228.506	228.506
Back East Abut.	25+103.126	1.517	228.505	228.505

GIRDER 5

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.333	3.882	228.779	228.779
☉ West Abut.	25+093.483	3.880	228.777	228.777
C	25+096.446	3.846	228.751	228.758
D	25+099.409	3.842	228.727	228.734
☉ East Abut.	25+102.782	3.872	228.703	228.703
Back East Abut.	25+102.932	3.874	228.702	228.702

GIRDER 6

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back West Abut.	25+093.214	6.244	228.976	228.976
☉ West Abut.	25+093.363	6.242	228.974	228.974
C	25+096.303	6.207	228.948	228.955
D	25+099.244	6.201	228.925	228.931
☉ East Abut.	25+102.592	6.229	228.900	228.900
Back East Abut.	25+102.741	6.231	228.899	228.899



NOTES

For Dead Load Deflection Diagram and Fillet Heights, See Sheet 3.
For Girders 1 thru 3 and ☉ of Roadway, See Sheet 3.
All dimensions are in millimeters (mm) except as noted.

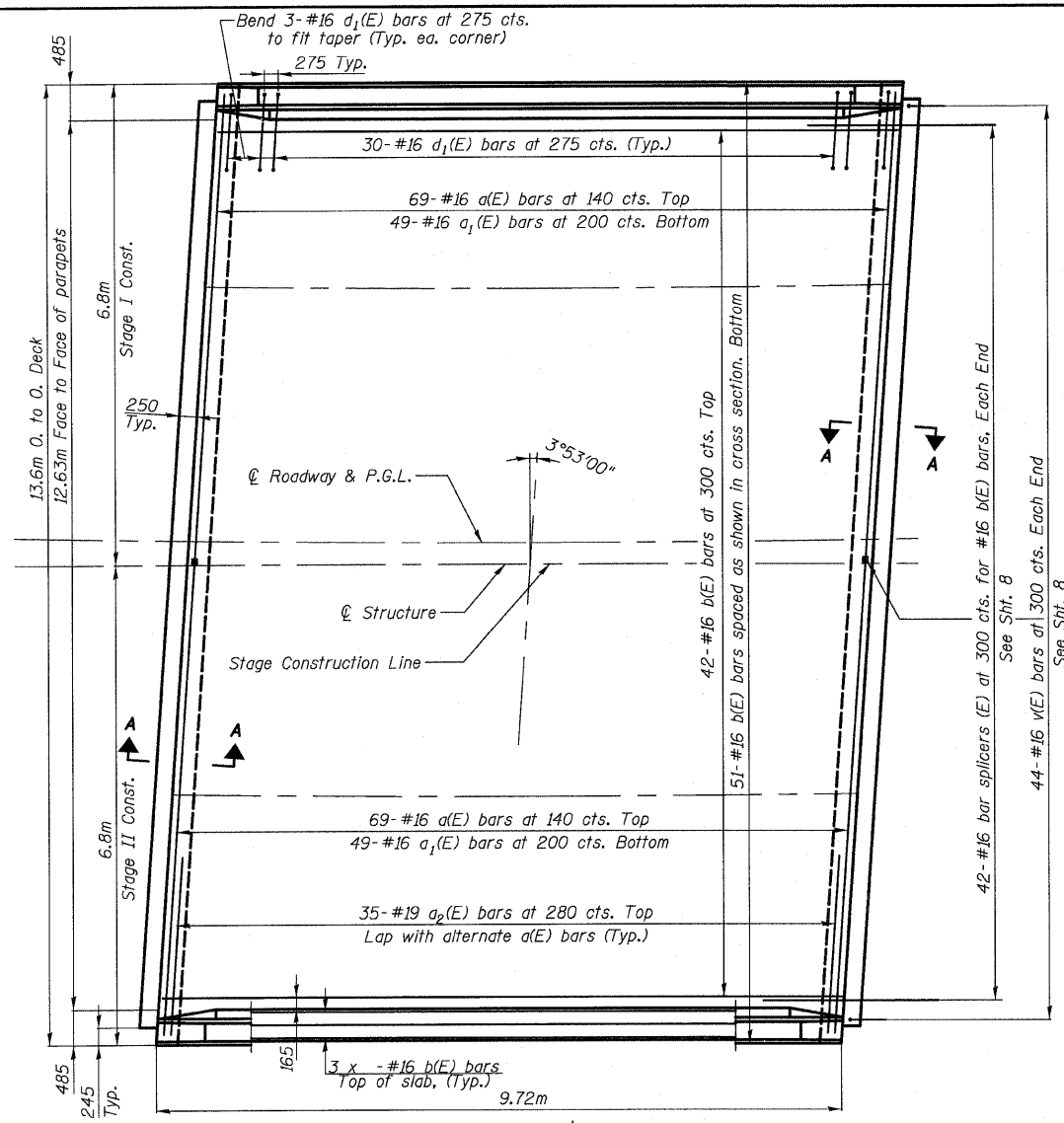
TOP OF SLAB ELEVATIONS-2
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2

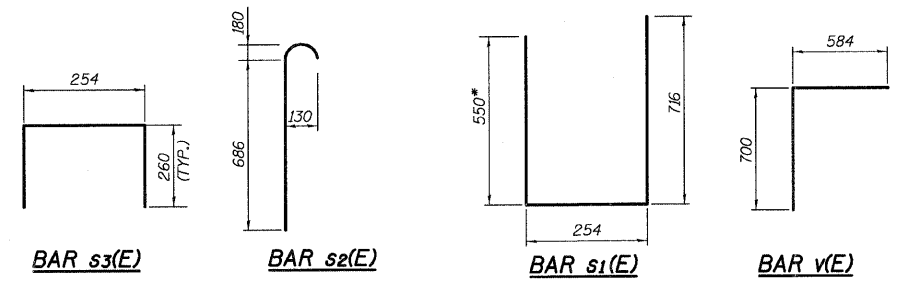
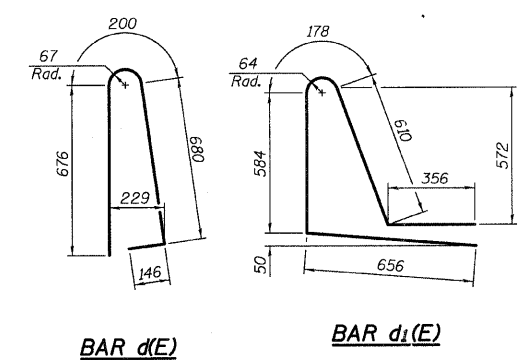


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 7
FAP 303 IL 173	2210-086-F	LAKE	29	7	17 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			



69 Bar Splicers (E) at 140 cts. for #16 a(E) bars, Top.
49 Bar Splicers (E) at 200 cts. for #16 a1(E) bars, Bottom.



*field trim bar to maintain
clr at approach seat

**SUPERSTRUCTURE
BILL OF MATERIAL**

Bar	No.	Size	Length(m)	Shape
a(E)	138	#16	6.685	—
a1(E)	98	#16	6.421	—
a2(E)	70	#19	2.000	—
b(E)	99	#16	9.640	—
d(E)	72	#16	1.702	⌒
d1(E)	72	#16	2.384	⌒
e(E)	32	#16	4.770	—
e1(E)	2	#25	9.640	—
m(E)	24	#16	3.270	—
m1(E)	4	#16	6.732	—
m2(E)	2	#16	1.970	—
m3(E)	2	#16	4.330	—
m4(E)	4	#16	4.670	—
m5(E)	4	#16	2.260	—
m6(E)	2	#16	4.390	—
m7(E)	2	#16	2.030	—
s1(E)	92	#16	1.520	⌒
s2(E)	92	#16	0.866	⌒
s3(E)	92	#16	0.774	⌒
v(E)	88	#16	1.284	⌒
Reinforcement Bars Epoxy Coated		kg	5850	
Concrete Superstructure		m ³	39	

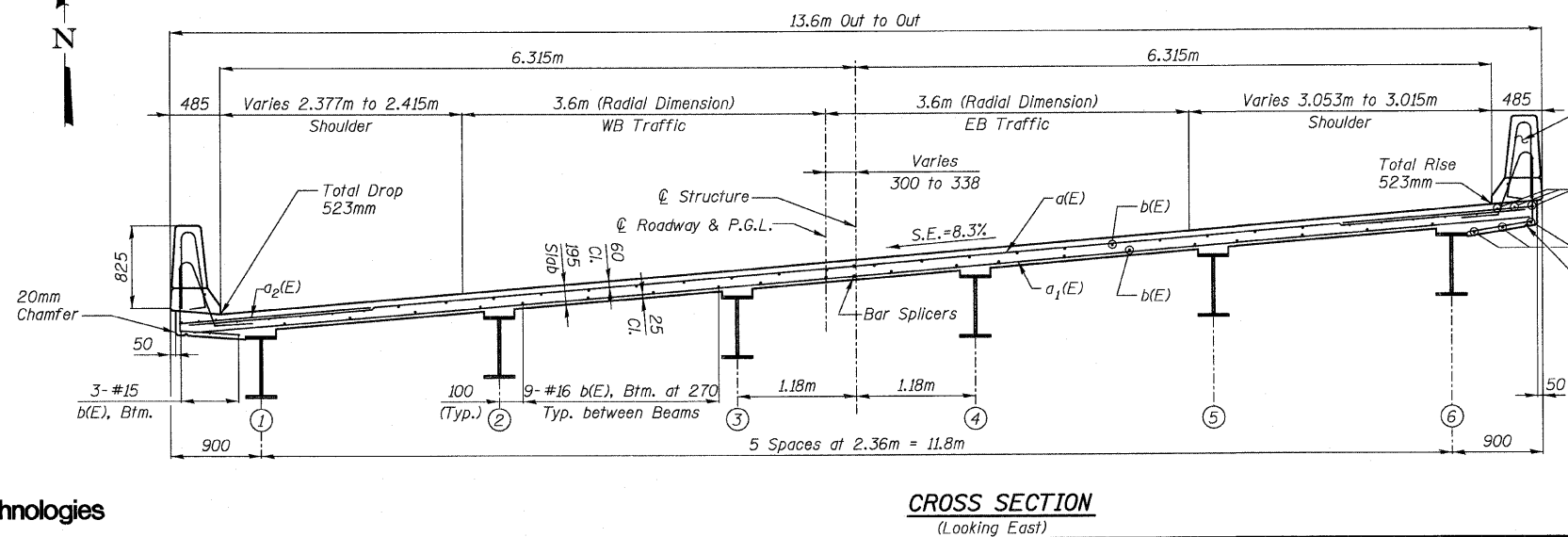
NOTES

- Bars designated (E) shall be epoxy coated.
- See Sheet No. 8 for Superstructure Details.
- See Sheet No. 8 for parapet reinforcement.
- For Section A-A, See Sheet No. 8.
- Indicates Girder Number.
- All dimensions are in millimeters (mm) except as noted.
- See Sheet No. 16 for Bar Splicer Details.

NOTES

- See Sheet No. 16 for Bar Splicer Details.
- Place Transverse Bars Parallel to Skew.

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2



MINIMUM BAR LAP

- #16 bar = 470
- #19 bar = 610
- #25 bar = 1.010m

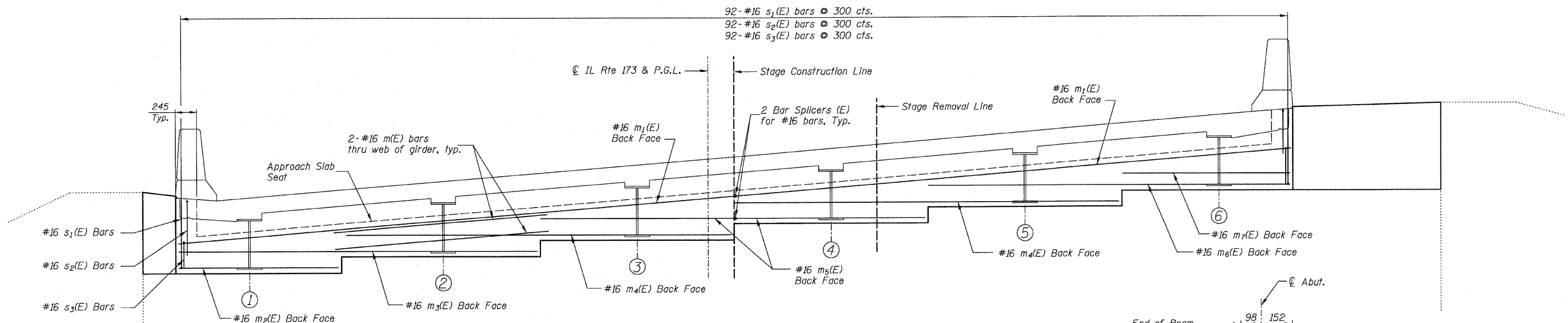
DECK PLAN AND CROSS SECTION
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

FOR INFORMATION ONLY

3117-049-0055.DGN

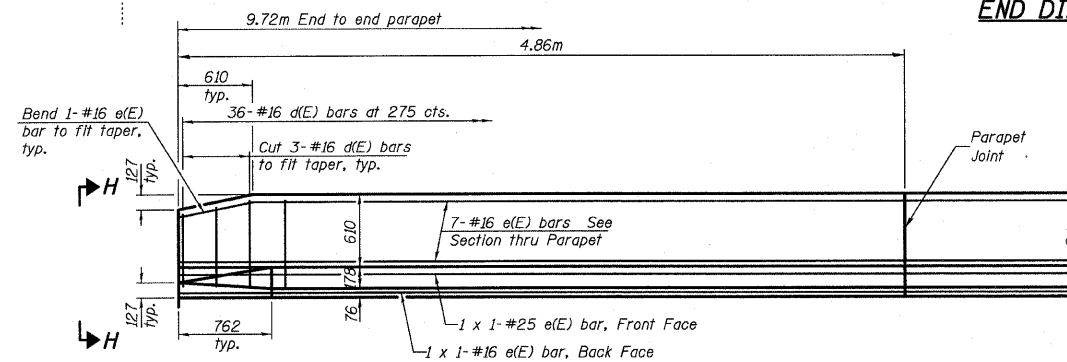
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
FAP 303 IL 173	2010-086-F	LAKE	29	8	17 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

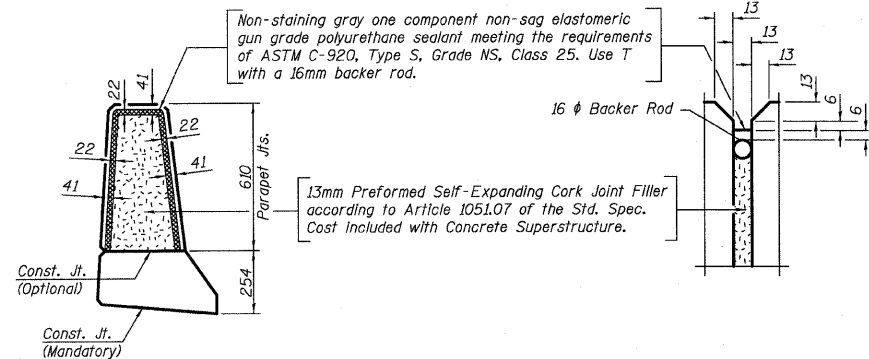


END DIAPHRAGM AT ABUTMENT

Looking East
East Abutment Shown
West Abutment Similar

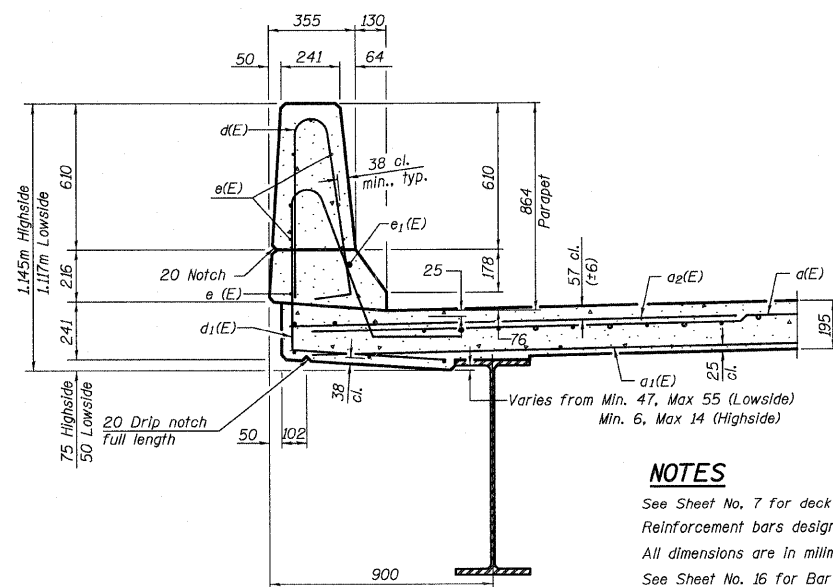


INSIDE ELEVATION OF PARAPET



PARAPET JOINT DETAILS

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2

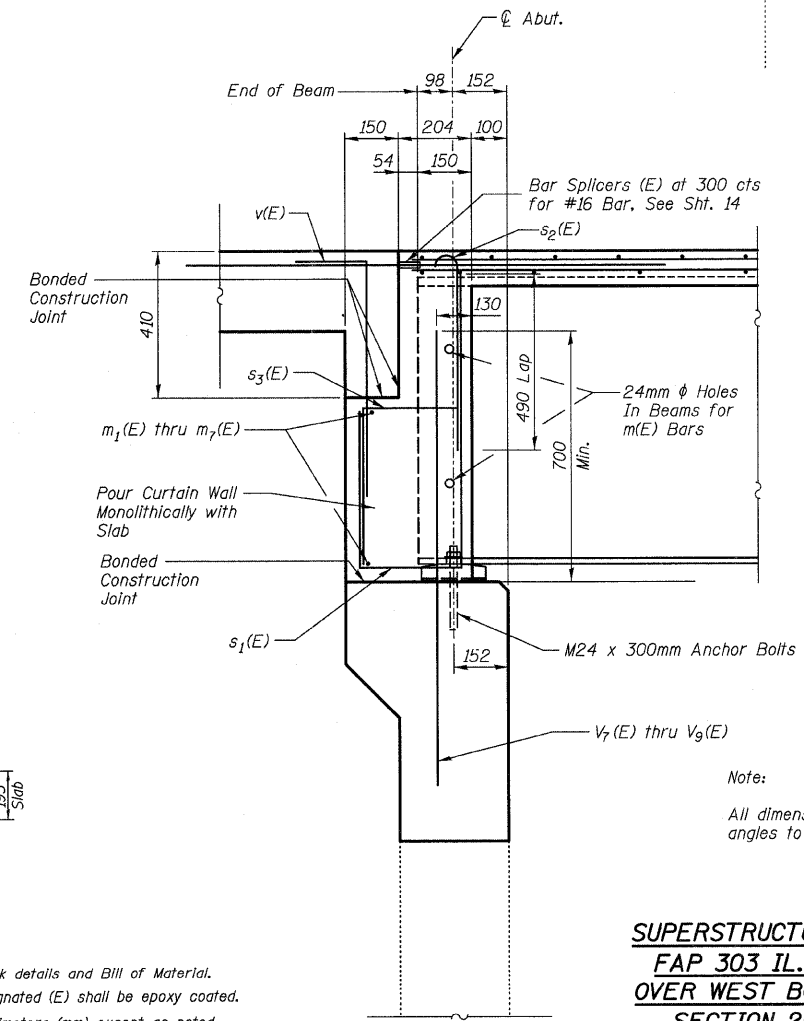


SECTION THRU PARAPET

Lowside Shown
Highside Similar

NOTES

See Sheet No. 7 for deck details and Bill of Material.
Reinforcement bars designated (E) shall be epoxy coated.
All dimensions are in millimeters (mm) except as noted.
See Sheet No. 16 for Bar Splicer Details.
See Sheet No. 10 for View H-H



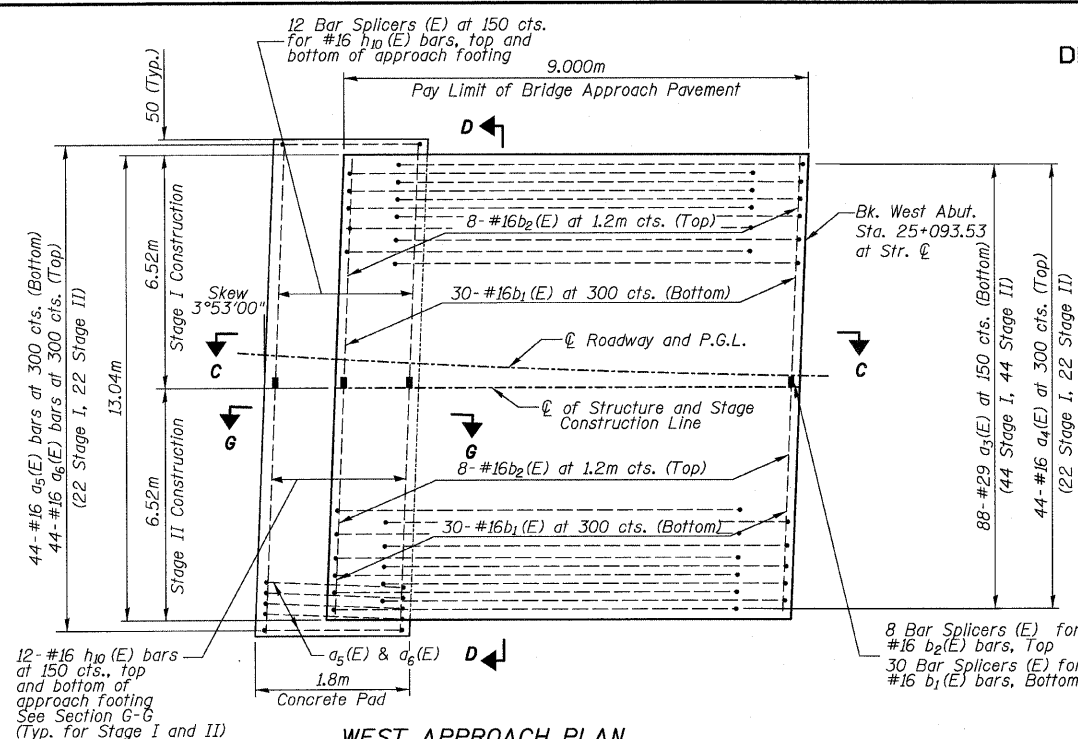
SECTION A-A

Note:
All dimensions at right
angles to abutment.

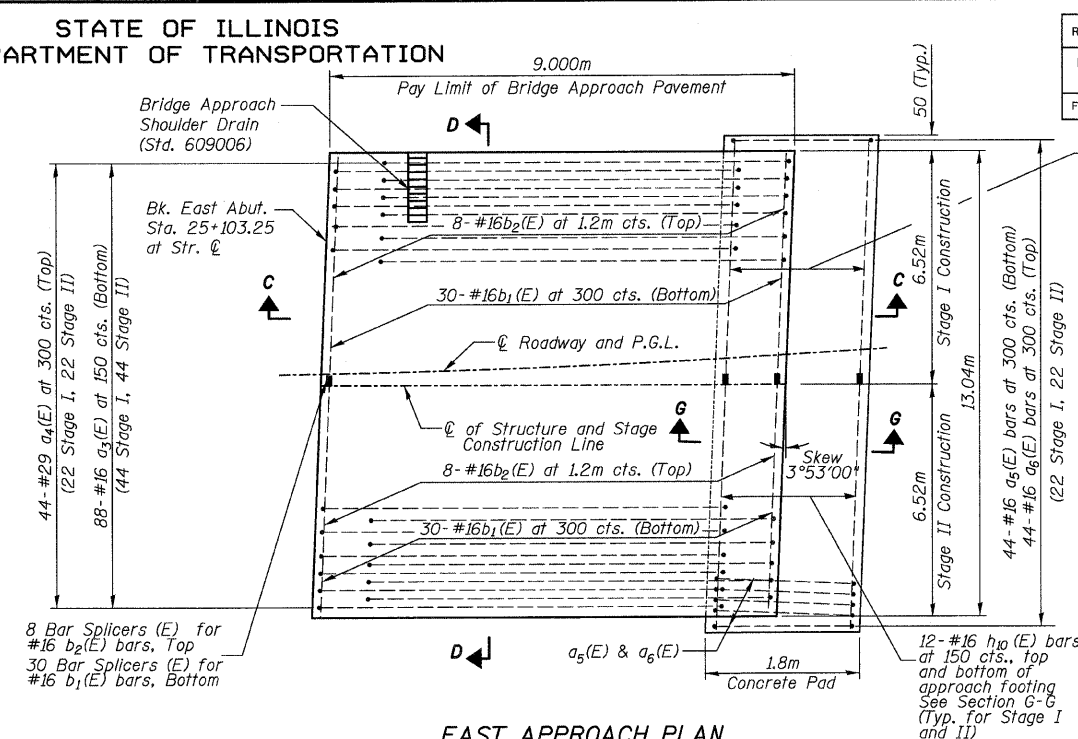
SUPERSTRUCTURE DETAILS
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 9
FAP 303 IL 173	2010-086-F	LAKE	29	9	17 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-		



WEST APPROACH PLAN

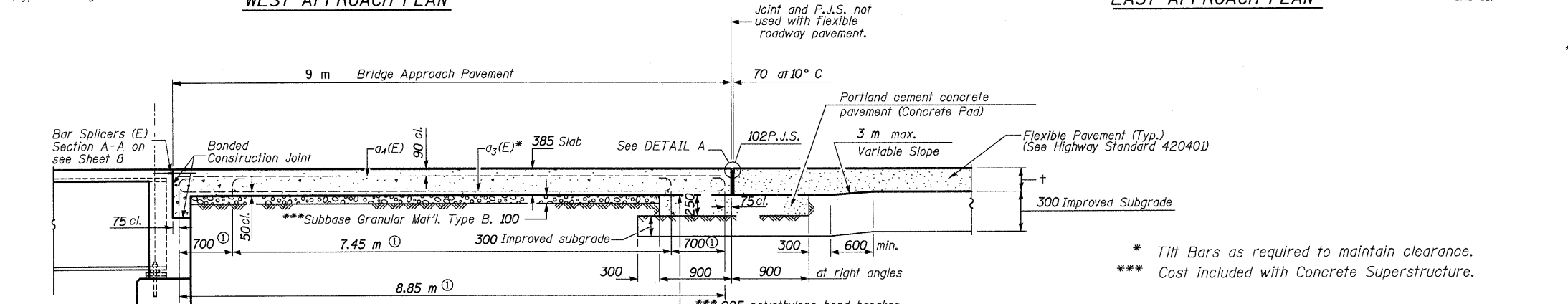


EAST APPROACH PLAN

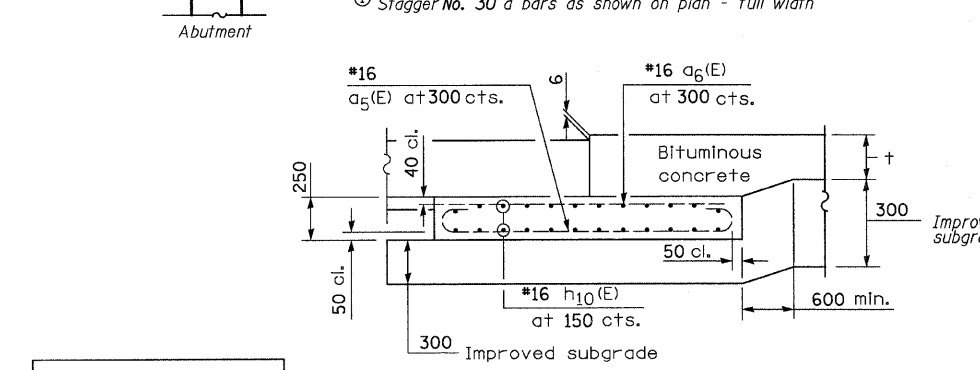
BRIDGE APPROACH SLAB
BILL OF MATERIAL

Bar	No.	Size	Length (m)	Shape
a3(E)	176	#29	8.987	U
a4(E)	88	#16	8.850	—
a5(E)	88	#16	2.462	U
a6(E)	88	#16	1.700	—
b1(E)	120	#16	6.455	—
b2(E)	32	#16	6.455	—
h10(E)	96	#16	6.505	—
Concrete Structures			m ³	12
Concrete Superstructure			m ³	92
Reinforcement Bars, Epoxy Coated			kg	12,280

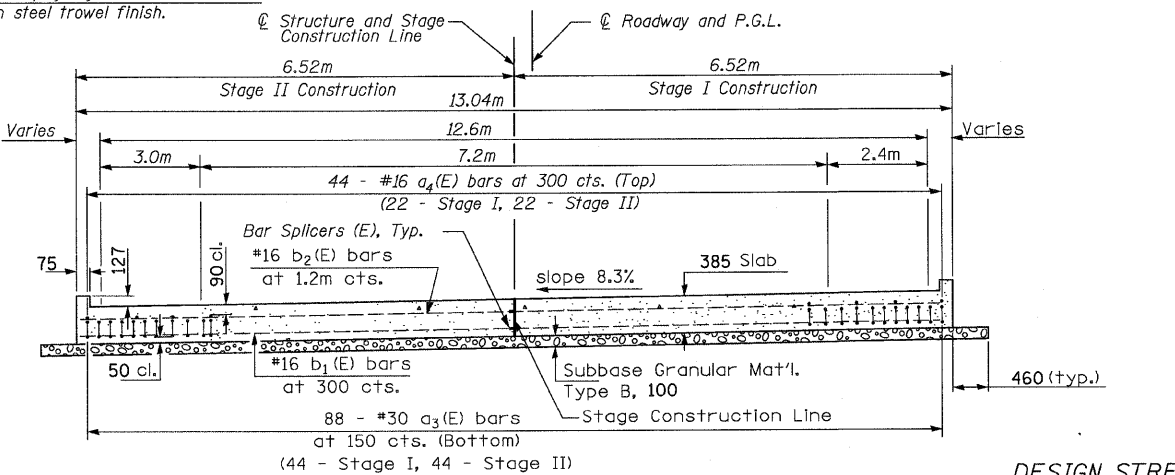
The above table contains information and quantities for two Bridge Approach Slabs.
See Sheet 10 for Bar Diagrams.



SECTION C-C



SECTION G-G - FLEXIBLE PAVEMENT
(Showing reinforcement)



SECTION D-D
(See Plan for Dimensions not shown)

DESIGN STRESSES
fy = 400 MPa
f'c = 24 MPa
n = 8.5

NOTES:
THICKNESS-"="Thickness of Pavement.
All dimensions are in millimeters unless otherwise shown.
See Sheet 16 for Bar Splicer Details.
See Sheet 10 for Bar Bending Details.

BRIDGE APPROACH SLAB -1
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

DESIGNED	RGT
CHECKED	RJC/JRF
DRAWN	RDS
CHECKED	PAT2



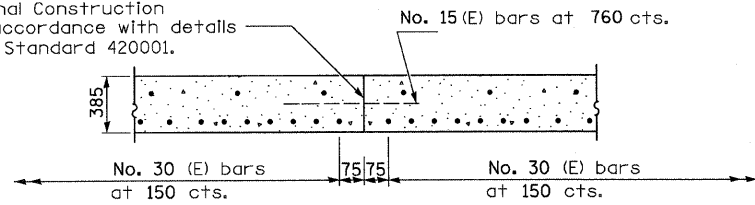
3117APPROACH.PVT.DGN

FOR INFORMATION ONLY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

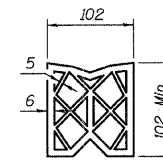
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 10
FAP 303 IL 173	2010-086-F	LAKE	29	10	17 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

Longitudinal Construction Joint in accordance with details shown on Standard 420001.

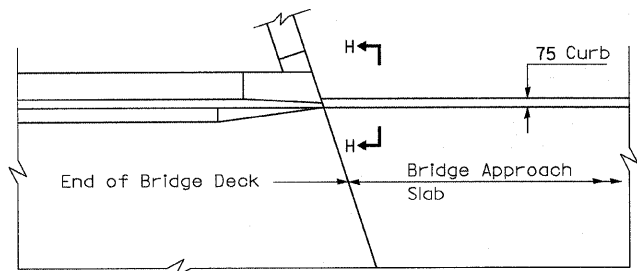


LONGITUDINAL CONSTRUCTION JOINT

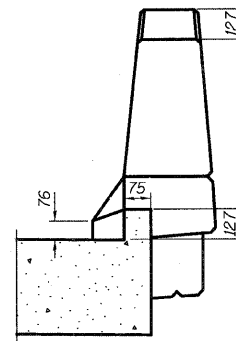
As approved by the Engineer, the Contractor may elect to reduce the widths of pour by use of the Optional Longitudinal Construction Joint shown. Joints shall be located at the edge of a traffic lane.



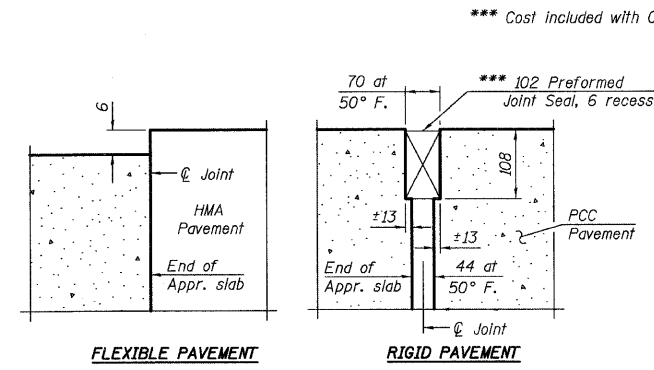
PREFORMED JOINT SEAL



PARAPET TO CURB TRANSITION



VIEW H-H

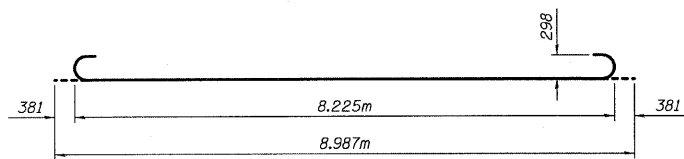


FLEXIBLE PAVEMENT

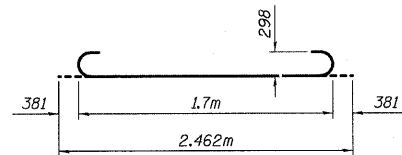
RIGID PAVEMENT

DETAIL A

*** Cost included with Concrete Superstructure.



BAR #1(E)



BAR #2(E)

NOTES:

All dimensions are in millimeters unless otherwise shown.

BRIDGE APPROACH SLAB - 2
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

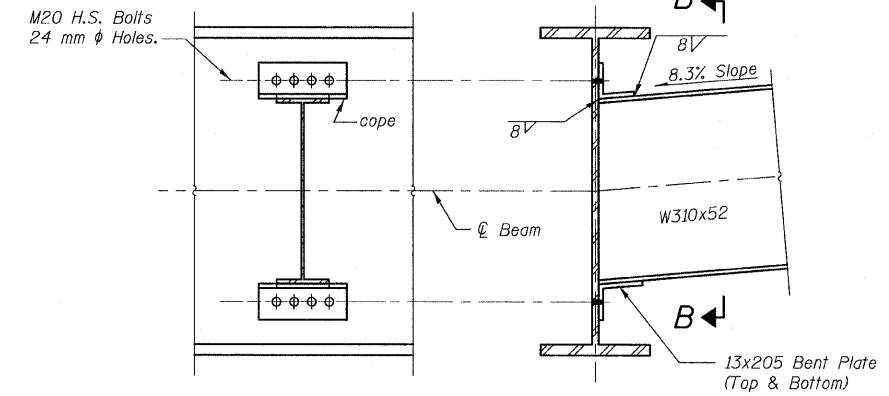
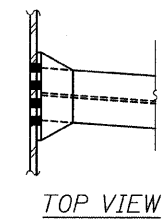
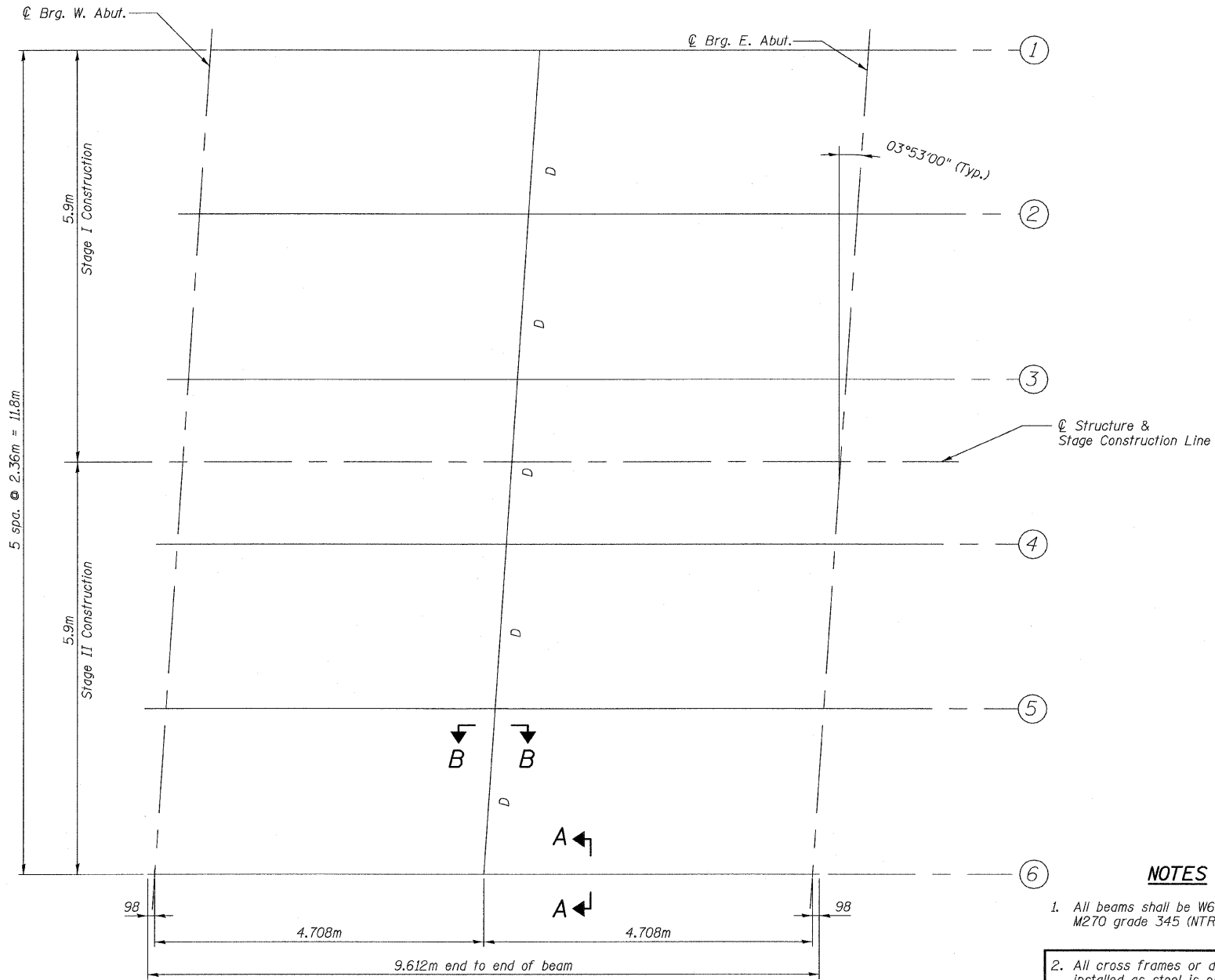
DESIGNED	RGT
CHECKED	RJC/JRF
DRAWN	RDS
CHECKED	PAT2



3117APPROACHPVT.DGN

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 11
FAP 303 IL 173	2010-086-F	LAKE	29	11	17 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT-			



NOTES

- All beams shall be W610 x 101 AASHTO M270 grade 345 (NTR)
- All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
- Load Carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness Zone 2.
- Hardened washers shall be required over all oversize holes for diaphragms.
- For Steel Beam Details See Sheet No. 12.
- All dimensions are in millimeters (mm) except as noted.

Not Included in this Contract

DIAPHRAGM D
5 Required

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2

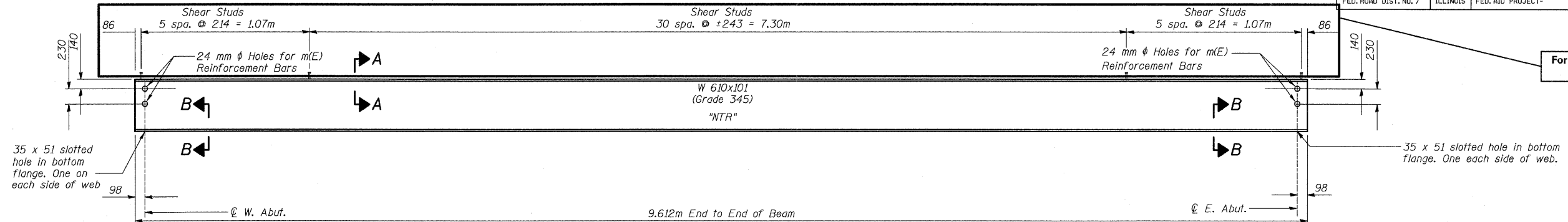


FRAMING PLAN
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

3117-245-0055.DGN

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

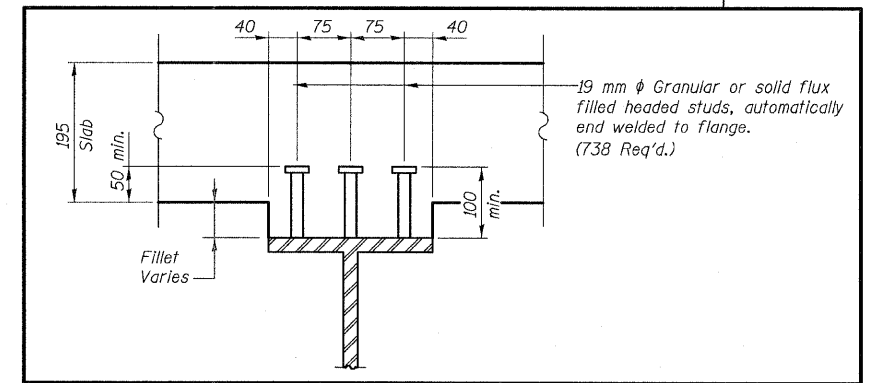
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 12 17 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	12	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			



For Information only

GIRDER ELEVATION
(Looking North)

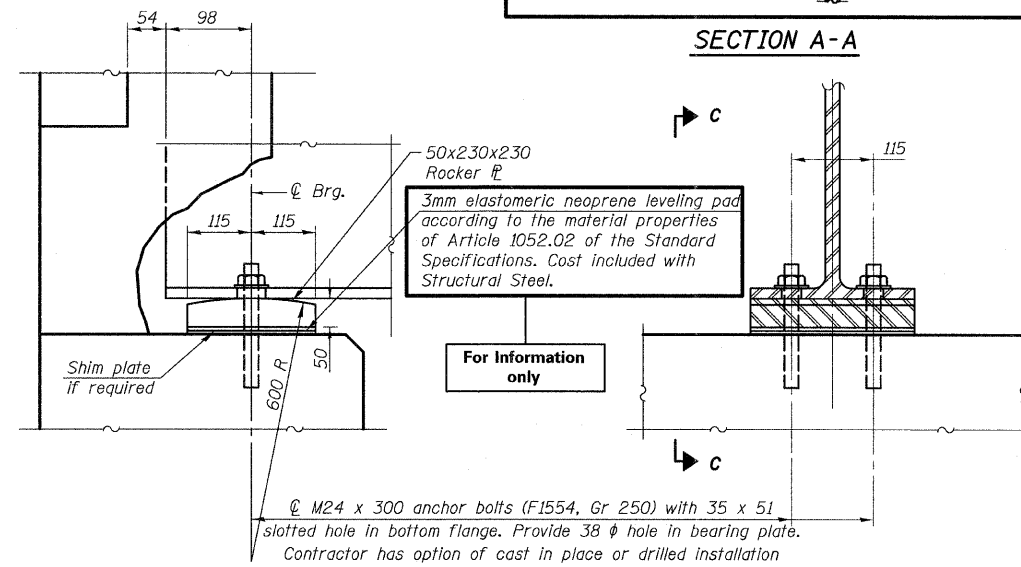
Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.



		0.5 Sp. 1
I_s	(10^6 mm^4)	764
$I_c (n)$	(10^6 mm^4)	2876
$I_c (sn)$	(10^6 mm^4)	2205
S_s	(10^3 mm^3)	2534
$S_c (n)$	(10^3 mm^3)	4487
$S_c (sn)$	(10^3 mm^3)	4029
\bar{Q}	(kN/m)	12.4
$M\bar{Q}$	($\text{kN}\cdot\text{m}$)	134
$s\bar{Q}$	(kN/m)	7.23
$M_s\bar{Q}$	($\text{kN}\cdot\text{m}$)	86
$M\bar{t}$	($\text{kN}\cdot\text{m}$)	365
$M (Imp)$	($\text{kN}\cdot\text{m}$)	110
$S_3[M\bar{t} + M(Imp)]$	($\text{kN}\cdot\text{m}$)	837
M_a	($\text{kN}\cdot\text{m}$)	1374
M_u	($\text{kN}\cdot\text{m}$)	1821
$f_s\bar{Q} (non-comp)$	(MPa)	57.6
$f_s\bar{Q} (comp)$	(MPa)	21.3
$f_s S_3 (\bar{t} + Imp)$	(MPa)	188
$f_s (Overload)$	(MPa)	263
VR	(kN)	235

	Abuts.	
$R\bar{Q}$	(kN)	95.6
$R\bar{t}$	(kN)	180.8
$Imp.$	(kN)	54.2
$R (Total)$	(kN)	330.6

I_s and S_s are the moment of inertia and section modulus of the steel section used in computing f_s (Total & Overload).
 $I_c(n)$ and $S_c(n)$ are the moment of inertia and section modulus of the composite section used in computing stresses due to Live Load.
 $I_c(sn)$ and $S_c(sn)$ are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed dead loads.
 VR is the maximum Live Load + Impact shear range in span.
 M_a (Applied Moment) = $1.3[M\bar{Q} + M_s\bar{Q} + S_3(M\bar{t} + M(Imp))]$.
 The Plastic Moment capacity (M_u) is computed according to AASHTO 10.48.1 and 10.50.1.1.
 f_s (Overload) is the sum of the stresses due to $M\bar{Q} + M_s\bar{Q} + S_3(M\bar{t} + M(Imp))$.



For Information only

For Information only

TOP OF GIRDER ELEVATIONS
(FOR FABRICATION ONLY)

Location	W. Abut.	E. Abut.
Girder 1	227.772	227.697
Girder 2	227.969	227.895
Girder 3	228.166	228.092
Girder 4	228.363	228.289
Girder 5	228.560	228.486
Girder 6	228.757	228.683

NOTES

Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. ASTM A307 Grade C anchor bolts may be used in lieu of ASTM F1554 Grade 250 ($F_y=250\text{MPa}$). The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.

Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.

FIXED BEARING

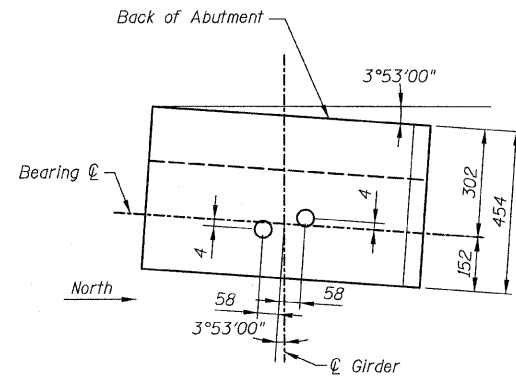
* Mass of fixed bearings included with "Furnishing Structural Steel"

FRAMING DETAILS AND DESIGN DATA TABLES
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2

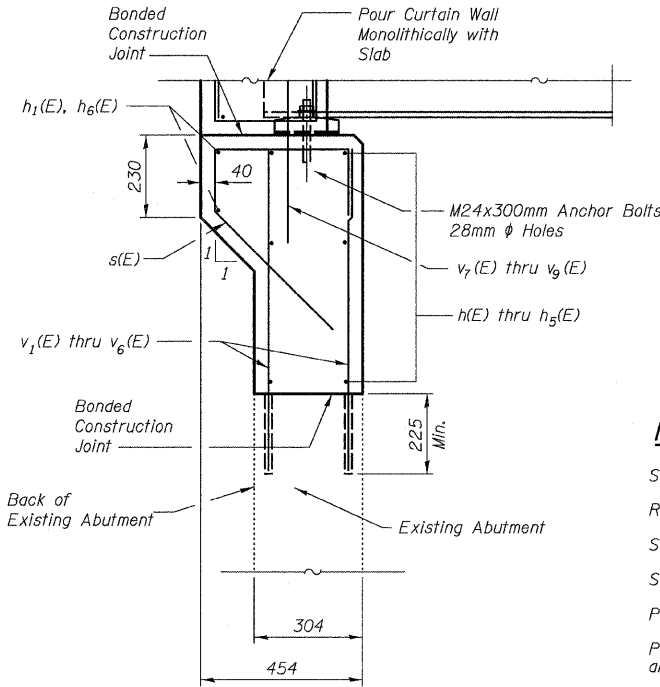


ROUTE NO. FAP 303 IL 173	SECTION 2010-086-F	COUNTY LAKE	TOTAL SHEETS 29	SHEET NO. 13	SHEET NO. 13 17 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT-			

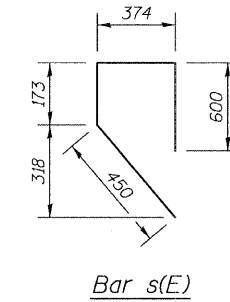


ANCHOR BOLT LAYOUT DETAIL
West Abutment shown
East Abutment similar

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



SECTION THRU ABUTMENT

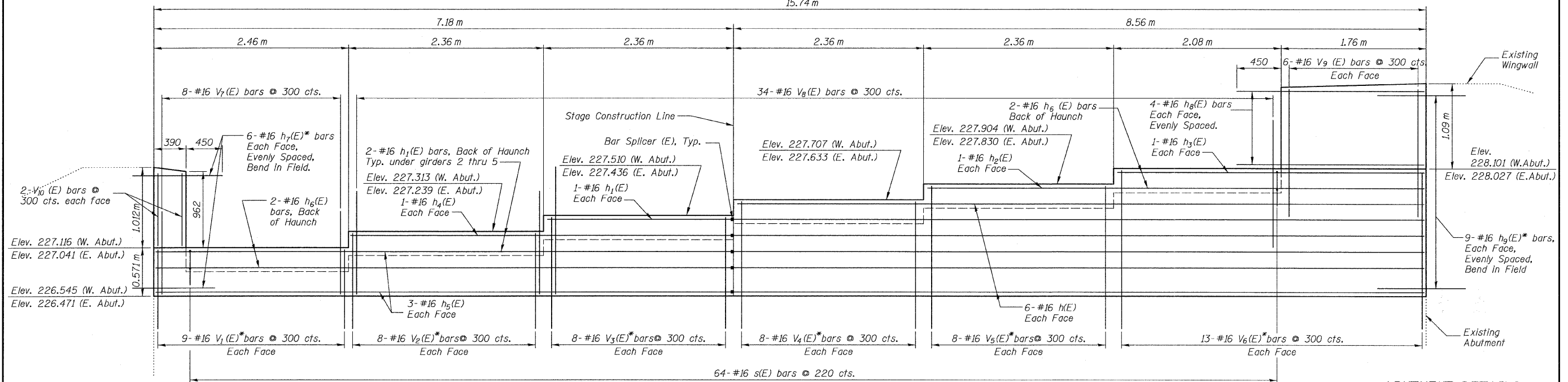


NOTES

- See Sheet No. 16 for Bar Splicer Details.
- Reinforcement bars designated (E) shall be epoxy coated.
- See Sheet No. 8 for $v_7(E)$ thru $v_9(E)$ details.
- See Sheet No. 12 for Girder Bearing Details.
- Pour steps monolithically with cap.
- Place reinforcement in cap to miss anchor bolts.

**ABUTMENT
BILL OF MATERIALS**

Bar	No.	Size	Length(m)	Shape
$h(E)$	24	#16	8.480	—
$h_1(E)$	20	#16	2.280	—
$h_2(E)$	4	#16	6.120	—
$h_3(E)$	4	#16	3.760	—
$h_4(E)$	4	#16	4.640	—
$h_5(E)$	12	#16	7.100	—
$h_6(E)$	4	#16	1.990	—
$h_7(E)$	24	#16	1.070	—
$h_8(E)$	16	#16	2.170	—
$h_9(E)$	36	#16	0.680	—
$s(E)$	128	#16	1.597	□
$v_1(E)$	36	#16	0.746	—
$v_2(E)$	32	#16	0.943	—
$v_3(E)$	32	#16	1.140	—
$v_4(E)$	32	#16	1.337	—
$v_5(E)$	32	#16	1.534	—
$v_6(E)$	52	#16	1.731	—
$v_7(E)$	8	#16	1.231	—
$v_8(E)$	68	#16	1.400	—
$v_9(E)$	24	#16	1.550	—
$v_{10}(E)$	8	#16	0.882	—
Reinforcement Bars Epoxy Coated		kg	1730	
Concrete Structures		m ³	14	



ABUTMENT DETAILS

* Epoxy grout bars in 225mm min drilled holes according to section 584 of the Standard Specifications. Cost included with Reinforcement Bars, Epoxy Coated.

Looking East
East Abutment Shown
West Abutment Similar

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2

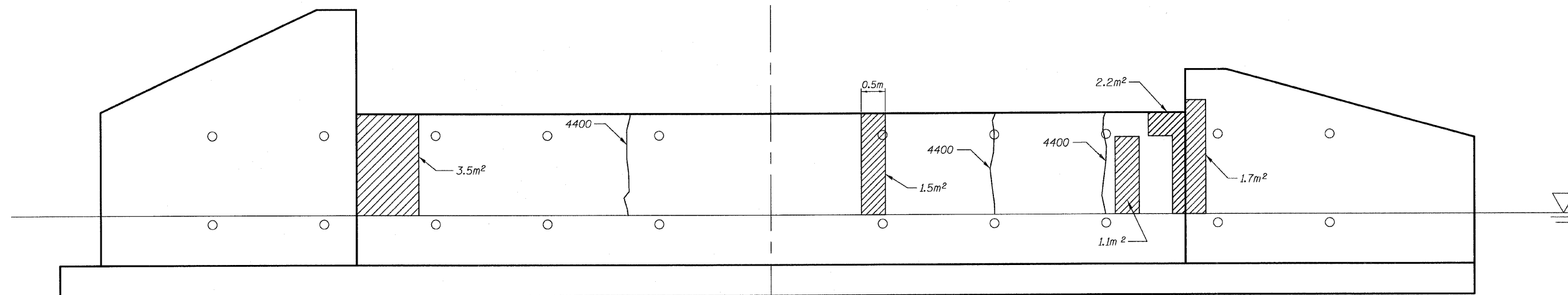


ABUTMENT DETAILS
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION


ROUTE NO. FAP 303 IL 173	SECTION 2010-086-F	COUNTY LAKE	TOTAL SHEETS 29	SHEET NO. 14
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

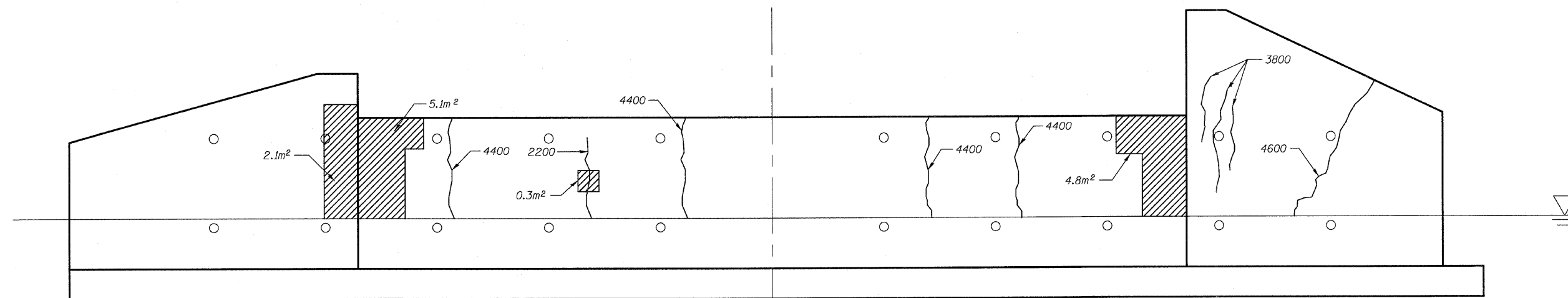
SHEET NO. 14
OF SHEETS



NOTE:
Contractor to prevent debris from falling
into waterway.

EXISTING WEST ABUTMENT
(Looking West)

LEGEND
 Formed Concrete Repair (<=125mm)
 1800 } Epoxy Crack Injection
 All Crack Lengths are in mm
 All Areas are in m²



EXISTING EAST ABUTMENT
(Looking East)

BILL OF MATERIALS

ITEM	UNIT	TOTAL
Structural Repair of Concrete (<=125mm)	m²	23
Epoxy Crack Injection	m	42

SUBSTRUCTURE REPAIR
FAP 303 IL. ROUTE 173
OVER WEST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 25+098.390
STRUCTURE NO. 049-0055

DESIGNED	PAT2
CHECKED	RCJ/JRF
DRAWN	RDS
CHECKED	PAT2



FOR INFORMATION ONLY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 1
FAP 303 IL 173	2010-086-F	LAKE	29	15	23 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Bench Mark: USGS reference mark on S.W. wingwall of structure 049-0055 (Elev. 228.867)

Existing Structure:
S.N. 049-0056, three span 29.58m Back to Back abutments,
15.748m Out to Out, R.C. slab bridge on closed abutments.
Built as IL Route 173, Section 134B-BR at Sta. 860+77 (English)
in 1931. The contractor shall remove the existing structure
and replace it with a two span steel girder composite superstructure
on integral abutments. The road shall be kept open to traffic at all
times utilizing stage construction.

Note: All dimensions in millimeters (mm) except as noted.

No salvage

*** - This work is not in the fabrication contract and sheet is not included in these plans.**

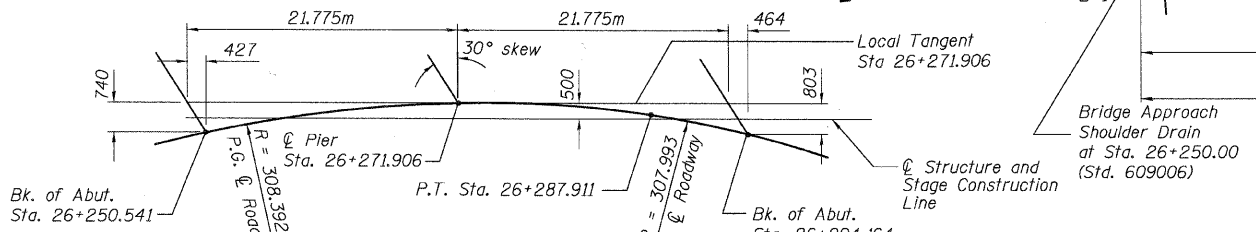
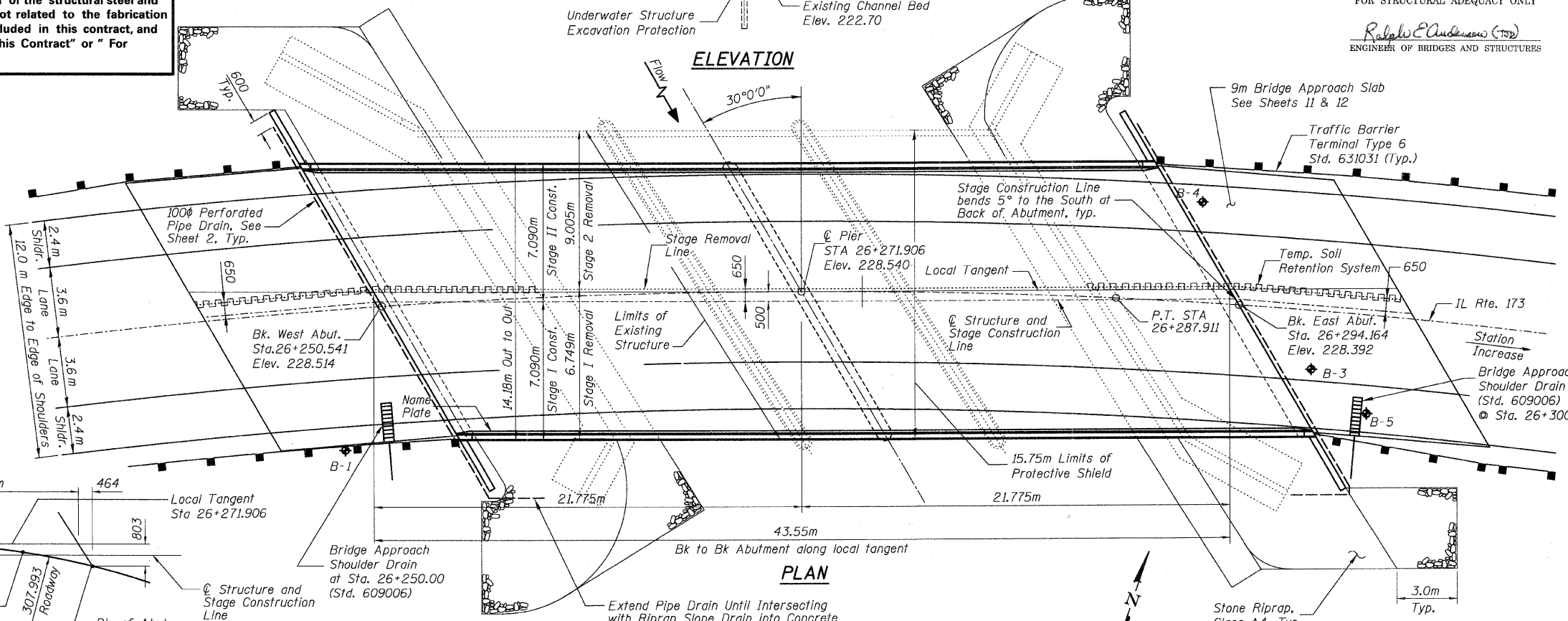
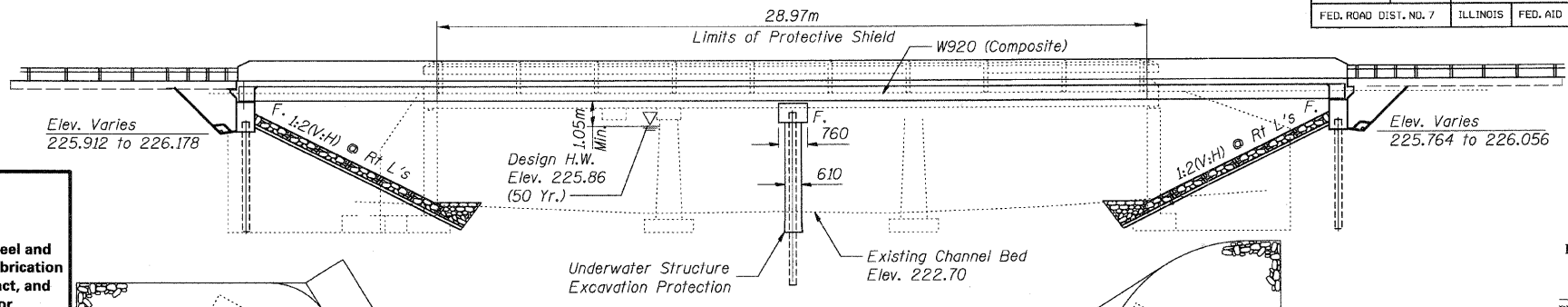
These plans are for the fabrication of the structural steel and bearings. All work shown that is not related to the fabrication is for information only. It is not included in this contract, and is identified as "Not Included in this Contract" or "For Information Only"

APPROVED
FOR STRUCTURAL ADEQUACY ONLY

Ralph E. Anderson (SE)
ENGINEER OF BRIDGES AND STRUCTURES

INDEX OF SHEETS

SHEET NUMBER	SHEET DESCRIPTION
1.	General Plan and Elevation
2.	Bill of Material, General Data
* 3.	Stage Construction
4.	Top of Slab Elevations - 1
5.	Top of Slab Elevations - 2
* 6.	Top of West Approach Slab Elevations
* 7.	Top of East Approach Slab Elevations
8.	Deck Plan and Cross Section
9.	Superstructure Details - 1
10.	Superstructure Details - 2
11.	Bridge Approach Slab - 1
12.	Bridge Approach Slab - 2
13.	Framing Plan and Design Data Tables
14.	Steel Girder Details
15.	Low-Profile Fixed Bearings
16.	West Abutment
17.	East Abutment
18.	Pier
* 19.	Temporary Concrete Barrier
* 20.	Bar Splicer Details
* 21.	HP Pile Details
* 22.	Soil Boring Logs B-1 & B-3
* 23.	Soil Boring Logs B-4 & B-5



OFFSET SKETCH

HORIZONTAL CURVE DATA-1	HORIZONTAL CURVE DATA-2
$\Delta = 20^\circ 20' 01''$	$\Delta = 18^\circ 59' 40''$
$T = 55.304m$	$T = 51.525m$
$R = 308.392m$	$R = 307.993m$
$L = 109.443m$	$L = 102.100m$
$E = 4.920m$	$E = 4.280$
$S.E. = 0.054$	$S.E. = 0.054$
P.C. STA = 26+178.468	P.C. STA = 26+287.911
P.T. STA = 26+287.911	P.T. STA = 26+390.011
P.I. STA = 26+233.772	P.I. STA = 26+339.436

STATION 26+271.906
BUILT 200_ BY
STATE OF ILLINOIS
FAP 303 SEC 134(B-2) R-1
LOADING MS18
STR. NO. 049-0198

NAME PLATE
See Std. 515001

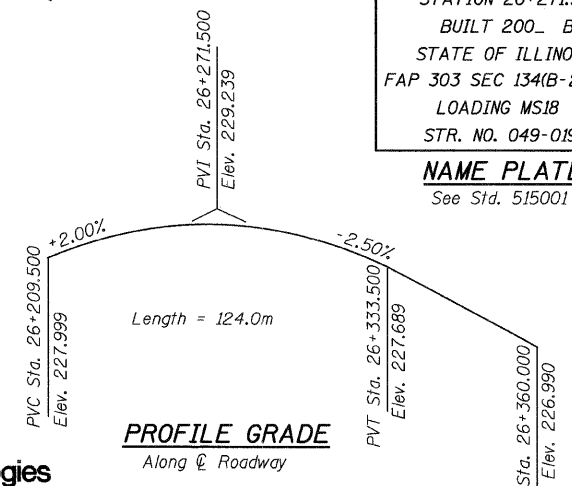
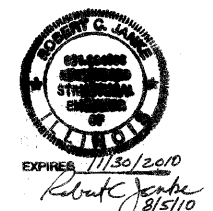
LOADING MS18
Allow 2.4 kN/m² For future wearing surface.

DESIGN SPECIFICATIONS
AASHTO 1996, 1997 Through
2000 and 2002 Interims

DESIGN STRESSES

FIELD UNITS
 $f_c = 24 \text{ MPa}$
 $f_y = 420 \text{ MPa}$ (reinforcement)
 $f_y = 250 \text{ MPa}$ (M270M Grade 250)
 $f_y = 345 \text{ MPa}$ (M270M Grade 345)

SEISMIC DATA
Seismic Performance Category (SPC) = A
Bedrock Acceleration Coefficient (A) = 0.035g
Site Coefficient (S) = 1.2

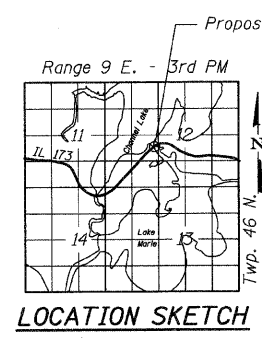


PROFILE GRADE
Along ϕ Roadway

WATERWAY INFORMATION

Drainage Area = 2256 km² Low Grade Elev. 226.7m ϕ Sta. 26+287

Flood Yr.	Freq.	Q C.M.S.	Opening Sq. M		Natural H.W.E.		Head - Ft.		Headwater El.	
			Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	Exist.	Prop.
10	0	62.10	61.00	225.46	225.46	0.00	0.00	225.46	225.46	
NPDES	25	0	67.40	70.90	225.69	225.69	0.00	0.00	225.69	225.69
Design	50	0	71.40	73.00	225.86	225.86	0.00	0.00	225.86	225.86
Base	100	0	75.60	78.50	226.04	226.04	0.00	0.00	226.04	226.04
Overtopping		0					0.00	0.00		
Max. Calc.	500	0	84.90	91.20	226.44	226.44	0.00	0.00	226.44	226.44



GENERAL PLAN AND ELEVATION
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO. FAP 303 IL 173	SECTION 2010-086-F	COUNTY LAKE	TOTAL SHEETS 29	SHEET NO. 16	SHEET NO. 2 23 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT-	

GENERAL NOTES

Fasteners shall be AASHTO M164, Type 1, mechanically galvanized bolts. Bolts 22mm ϕ , holes 24mm ϕ , unless otherwise noted.

Calculated mass of Structural Steel = $\frac{6765}{79,485}$ Kg (Grade 250)
Kg (Grade 345)

No field welding is permitted except as specified in the Contract Documents.

The main load carrying member components subject to tensile stress shall conform to the Supplemental Requirements for Notch Toughness Zone 2. These components are the wide flange beams and all splice plate material except fill plates.

* Reinforcement bars shall conform to the requirements of ASTM A 706m Gr. 420. See Special Provisions.

* Reinforcement bars designated (E) shall be epoxy coated.

* Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of 3 mm. Adjustment shall be made either by grinding the surface or by shimming the bearings.

The Organic Zinc Rich Primer / Epoxy / Urethane Paint System shall be used for painting of new structural steel except where otherwise noted. The entire system shall be shop applied, with the exception that masked off connection surfaces, field installed fasteners and damaged areas shall be touched up in the field. The color of the final finish coat for all interior steel surfaces shall be Gray, Munsell No. 5B 7/1. The color of the final finish coat for the exterior and bottom flange of the fascia beams shall be Gray, Munsell No. 5B 7/1. See Special Provision for "Cleaning and Painting New Metal Structures".

* Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.

* All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms of supports may be temporarily disconnected to install bearing anchor rods.

Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.

Two 3 mm adjusting shims shall be provided for each bearing in addition to all other plates or shims and placed as shown on bearing details.

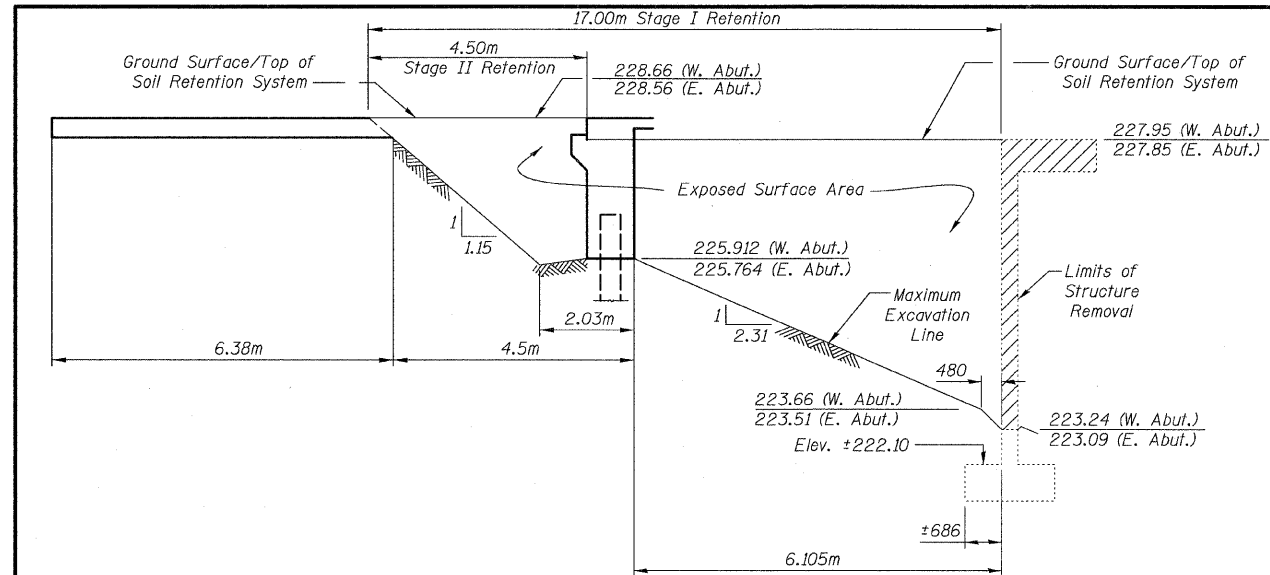
* Excavation behind existing abutment walls shall be performed to balance front and back soil pressure before removing the existing superstructure. The Contractor shall sawcut the upper portion of the existing abutment at the stage removal line before Stage I removal to ensure the remaining portion will not be prematurely damaged.

All dimensions are in millimeters (mm) except as noted.

* Slipforming of the parapets is not allowed.

* - This work is not included in this fabrication contract and is provided for information only.

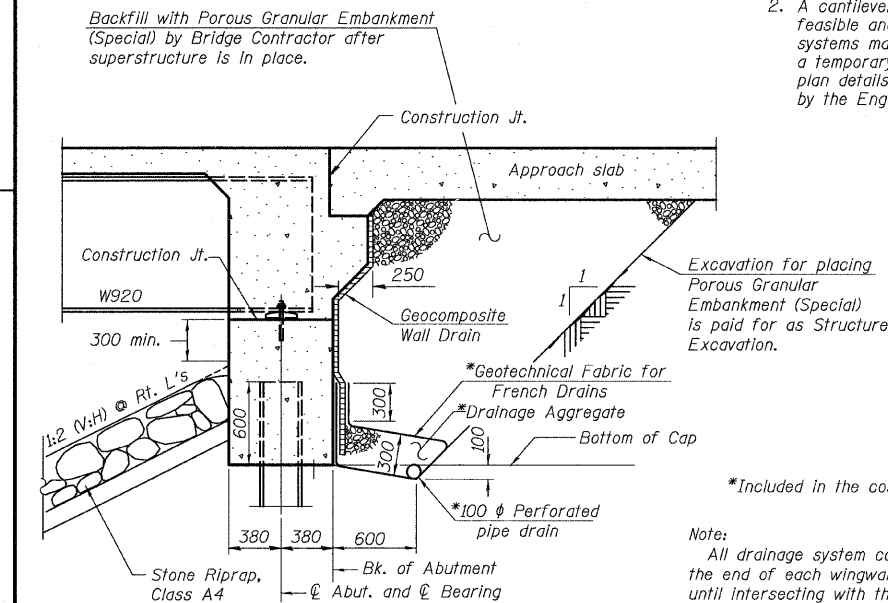
These plans are for the fabrication of the structural steel and bearings. All work shown that is not related to the fabrication is for information only. It is not included in this contract, and is identified as "Not Included in this Contract" or "For Information Only"



TEMPORARY SOIL RETENTION SYSTEM

1. Slopes and distances shown along alignment of sheeting. (for structure with 30 degree skew).
2. A cantilevered sheet piling design does not appear feasible and additional members or other retention systems may be necessary. The Contractor shall submit a temporary soil retention system design including plan details and calculations for review and acceptance by the Engineer.

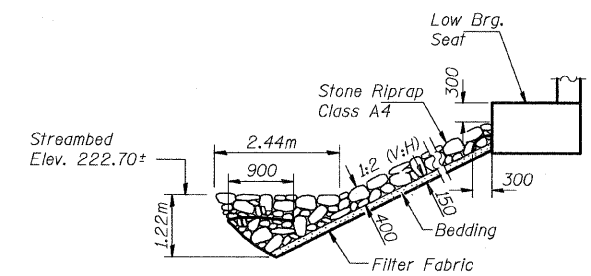
Not Included in this Contract



SECTION THRU INTEGRAL ABUTMENT
(Horiz. dim. ϕ Rt. L's)

*Included in the cost of Pipe Underdrains for Structures.

Note:
All drainage system components shall extend to 600mm from the end of each wingwall except an outlet pipe shall extend until intersecting with the riprap slope as shown on the Plan view on Sheet 1. The pipes shall drain into concrete headwalls. (See Article 601.05 of the Standard Specifications and Highway Standard 601101). Drainage components shall step at the change in elevation of the bottom of the abutment. Use a section of 100 ϕ perforated pipe at a 45 degree slope while maintaining the typical French Drain dimensions.



STONE RIPRAP ANCHOR DETAIL

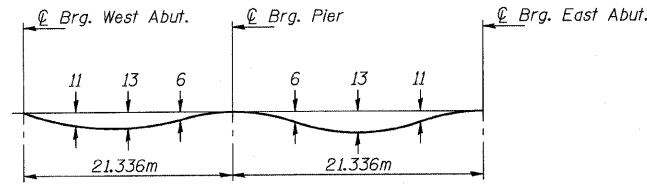
**BILL OF MATERIAL,
GENERAL DATA
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198**

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 4 23 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	17	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

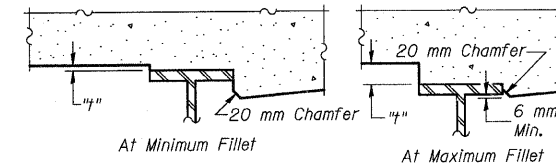


DEAD LOAD DEFLECTION DIAGRAM

(Includes weight of concrete only)

Note: The above deflections are not to be used in the field if the engineer is working from the grade elevations adjusted for dead load deflections as shown below and on Sheet 5 of 23.

All offsets are in meters.



To determine "t": After all structural steel has been erected, elevations of the top flanges of the beams shall be taken at intervals shown below and on Sheet 5 of 23. These elevations subtracted from the "Theoretical Grade Elevations Adjusted for Dead Load Deflection" shown below and on Sheet 5 of 23, minus slab thickness, equals the fillet heights "t" above top flange of beams.

FILLET HEIGHTS

GIRDER NO. 1

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+247.352	-6.688	228.857	228.857
☉ W. Abut.	26+247.780	-6.654	228.858	228.858
C	26+250.710	-6.433	228.862	228.870
D	26+253.643	-6.242	228.865	228.877
E	26+256.580	-6.078	228.867	228.880
F	26+259.520	-5.943	228.866	228.878
G	26+262.462	-5.837	228.864	228.872
H	26+265.406	-5.760	228.861	228.864
☉ Pier	26+268.680	-5.707	228.855	228.855
I	26+271.626	-5.690	228.848	228.851
J	26+274.572	-5.702	228.840	228.847
K	26+277.517	-5.742	228.830	228.841
L	26+280.461	-5.811	228.818	228.832
M	26+283.403	-5.908	228.805	228.817
N	26+286.344	-6.035	228.790	228.798
☉ E. Abut.	26+289.611	-6.208	228.772	228.772
Bk. E. Abut.	26+290.040	-6.234	228.769	228.769

GIRDER NO. 2

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+248.564	-4.109	228.725	228.725
☉ W. Abut.	26+248.996	-4.076	228.726	228.726
C	26+251.950	-3.868	228.730	228.737
D	26+254.909	-3.688	228.732	228.744
E	26+257.870	-3.537	228.733	228.746
F	26+260.834	-3.415	228.732	228.744
G	26+263.801	-3.322	228.729	228.737
H	26+266.768	-3.257	228.725	228.728
☉ Pier	26+270.070	-3.220	228.719	228.719
I	26+273.039	-3.216	228.711	228.713
J	26+276.007	-3.242	228.702	228.708
K	26+278.975	-3.296	228.691	228.702
L	26+281.942	-3.379	228.678	228.692
M	26+284.907	-3.491	228.664	228.676
N	26+287.870	-3.632	228.648	228.656
☉ E. Abut.	26+291.161	-3.822	228.629	228.629
Bk. E. Abut.	26+291.593	-3.850	228.626	228.626

GIRDER NO. 3

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+249.796	-1.534	228.593	228.593
☉ W. Abut.	26+250.231	-1.503	228.594	228.594
C	26+253.211	-1.307	228.597	228.604
D	26+256.195	-1.140	228.599	228.611
E	26+259.181	-1.001	228.599	228.612
F	26+262.170	-0.892	228.597	228.609
G	26+265.161	-0.812	228.594	228.601
H	26+268.153	-0.761	228.589	228.592
☉ Pier	26+271.481	-0.738	228.581	228.581
I	26+274.474	-0.749	228.573	228.575
J	26+277.466	-0.788	228.563	228.570
K	26+280.457	-0.857	228.551	228.562
L	26+283.447	-0.955	228.537	228.551
M	26+286.434	-1.081	228.522	228.534
N	26+289.419	-1.237	228.505	228.513
☉ E. Abut.	26+292.732	-1.444	228.485	228.485
Bk. E. Abut.	26+293.168	-1.474	228.482	228.482

STAGE CONSTRUCTION JOINT and ☉ STRUCTURE

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+250.420	-0.249	228.527	228.527
☉ W. Abut.	26+250.857	-0.219	228.528	228.528
C	26+253.850	-0.028	228.531	228.538
D	26+256.846	0.133	228.532	228.544
E	26+259.845	0.264	228.532	228.545
F	26+262.847	0.367	228.530	228.541
G	26+265.850	0.441	228.526	228.533
H	26+268.854	0.485	228.521	228.523
☉ Pier	26+272.195	0.500	228.513	228.513
I	26+275.200	0.482	228.504	228.506
J	26+278.204	0.436	228.493	228.500
K	26+281.207	0.360	228.481	228.492
L	26+284.208	0.255	228.467	228.480
M	26+287.207	0.121	228.451	228.463
N	26+290.203	-0.043	228.434	228.441
☉ E. Abut.	26+293.530	-0.259	228.412	228.412
Bk. E. Abut.	26+293.968	-0.290	228.409	228.409

NOTES

For information about ☉ of roadway and girders 4 thru 6, See Sheet 5 of 23.

All dimensions are in millimeters (mm) except as noted.

TOP OF SLAB ELEVATIONS-1
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 5 23 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	18	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-		

IL ROUTE 173 (PGL)

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+250.541	0.000	228.514	228.514
W. Abut.	26+250.964	0.000	228.516	228.516
C	26+253.864	0.000	228.529	228.536
D	26+256.778	0.000	228.539	228.551
E	26+259.706	0.000	228.546	228.559
F	26+262.649	0.000	228.549	228.561
G	26+265.606	0.000	228.550	228.557
H	26+268.580	0.000	228.547	228.550
Pier	26+271.906	0.000	228.540	228.540
I	26+274.915	0.000	228.531	228.533
J	26+277.940	0.000	228.518	228.525
K	26+280.984	0.000	228.501	228.513
L	26+284.047	0.000	228.482	228.495
M	26+287.129	0.000	228.458	228.470
N	26+290.231	0.000	228.431	228.439
E. Abut.	26+293.705	0.000	228.397	228.397
E. Abut.	26+294.164	0.000	228.392	228.392

GIRDER NO. 4

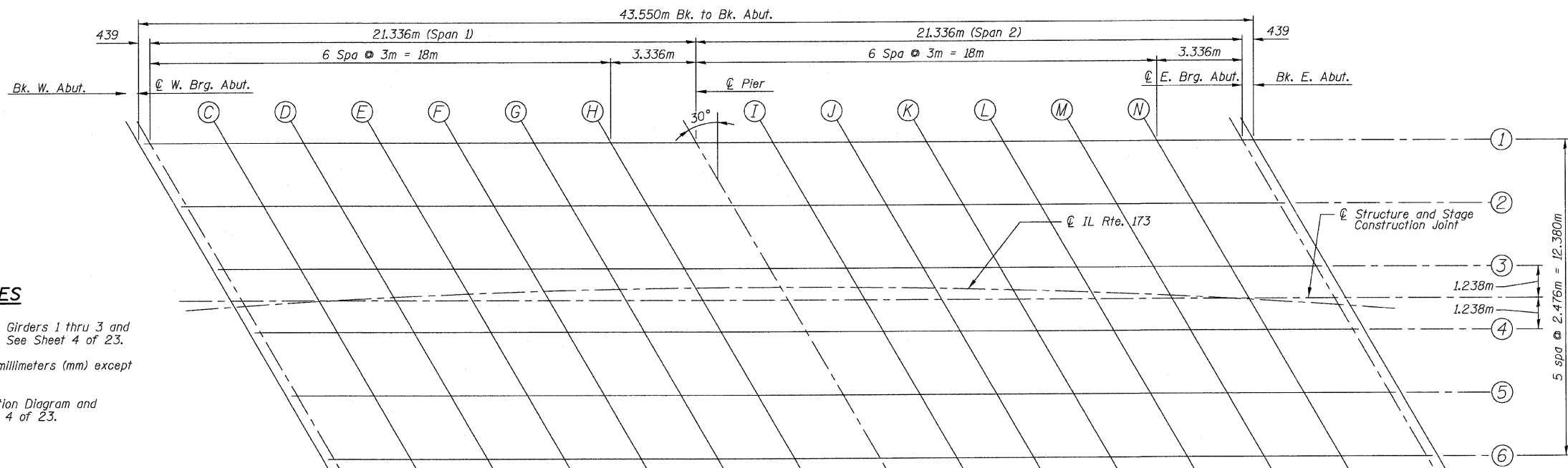
Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+251.049	1.035	228.461	228.461
W. Abut.	26+251.488	1.065	228.461	228.461
C	26+254.493	1.249	228.464	228.471
D	26+257.502	1.403	228.465	228.477
E	26+260.514	1.529	228.464	228.478
F	26+263.528	1.625	228.462	228.474
G	26+266.543	1.692	228.458	228.465
H	26+269.560	1.729	228.452	228.455
Pier	26+272.915	1.736	228.444	228.444
I	26+275.932	1.712	228.434	228.437
J	26+278.948	1.658	228.423	228.430
K	26+281.963	1.575	228.410	228.422
L	26+284.975	1.462	228.396	228.409
M	26+287.985	1.321	228.380	228.392
N	26+290.993	1.150	228.362	228.370
E. Abut.	26+294.333	0.925	228.340	228.340
E. Abut.	26+294.771	0.893	228.337	228.337

GIRDER NO. 5

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+252.322	3.600	228.328	228.328
W. Abut.	26+252.765	3.627	228.329	228.329
C	26+255.797	3.799	228.331	228.338
D	26+258.832	3.940	228.331	228.343
E	26+261.869	4.053	228.330	228.343
F	26+264.908	4.136	228.327	228.338
G	26+267.949	4.189	228.322	228.329
H	26+270.990	4.213	228.315	228.318
Pier	26+274.373	4.204	228.306	228.306
I	26+277.414	4.165	228.295	228.298
J	26+280.454	4.097	228.283	228.290
K	26+283.492	3.999	228.269	228.281
L	26+286.528	3.872	228.254	228.267
M	26+289.561	3.715	228.237	228.249
N	26+292.591	3.528	228.218	228.225
E. Abut.	26+295.956	3.287	228.194	228.194
E. Abut.	26+296.398	3.252	228.191	228.191

GIRDER NO. 6

Location	Station	Offset (m)	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	26+253.618	6.159	228.196	228.196
W. Abut.	26+254.065	6.184	228.196	228.196
C	26+257.123	6.343	228.197	228.205
D	26+260.183	6.472	228.197	228.209
E	26+263.247	6.571	228.196	228.209
F	26+266.311	6.640	228.191	228.203
G	26+269.377	6.680	228.185	228.193
H	26+272.444	6.690	228.178	228.180
Pier	26+275.854	6.665	228.167	228.167
I	26+278.919	6.612	228.156	228.158
J	26+281.984	6.529	228.143	228.150
K	26+285.046	6.416	228.128	228.139
L	26+288.105	6.273	228.111	228.125
M	26+291.162	6.101	228.093	228.105
N	26+294.214	5.899	228.073	228.080
E. Abut.	26+297.604	5.639	228.048	228.048
E. Abut.	26+298.049	5.602	228.045	228.045



NOTES

For Information about Girders 1 thru 3 and Stage Construction Joint, See Sheet 4 of 23.

All dimensions are in millimeters (mm) except as noted.

For Dead Load Deflection Diagram and Fillet Heights, See Sheet 4 of 23.

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



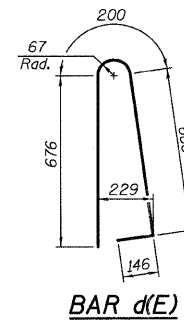
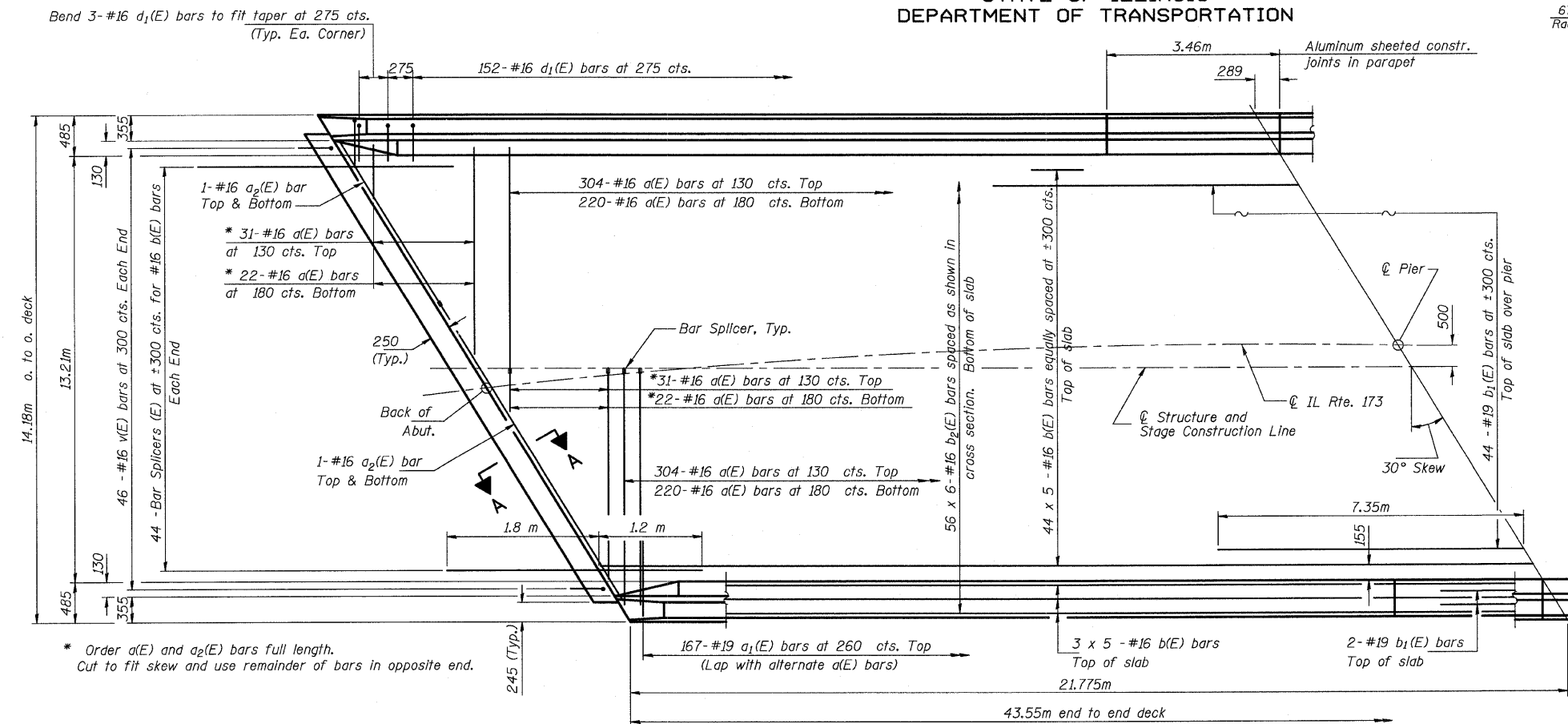
FRAMING PLAN

TOP OF SLAB ELEVATIONS-2
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

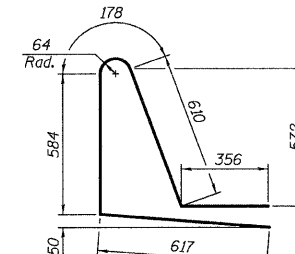
FOR INFORMATION ONLY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

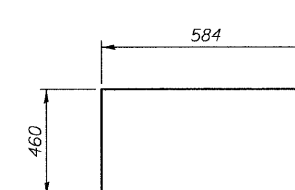
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 8
FAP 303 IL 173	2010-086-F	LAKE	29	19	23 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			



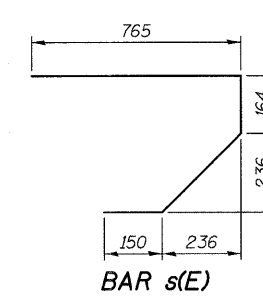
BAR d(E)



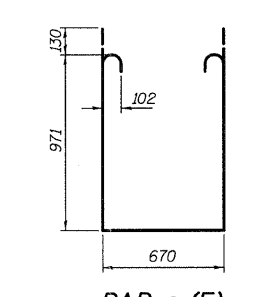
BAR d1(E)



BAR v(E)



BAR s(E)



BAR s1(E)

**SUPERSTRUCTURE
BILL OF MATERIAL**

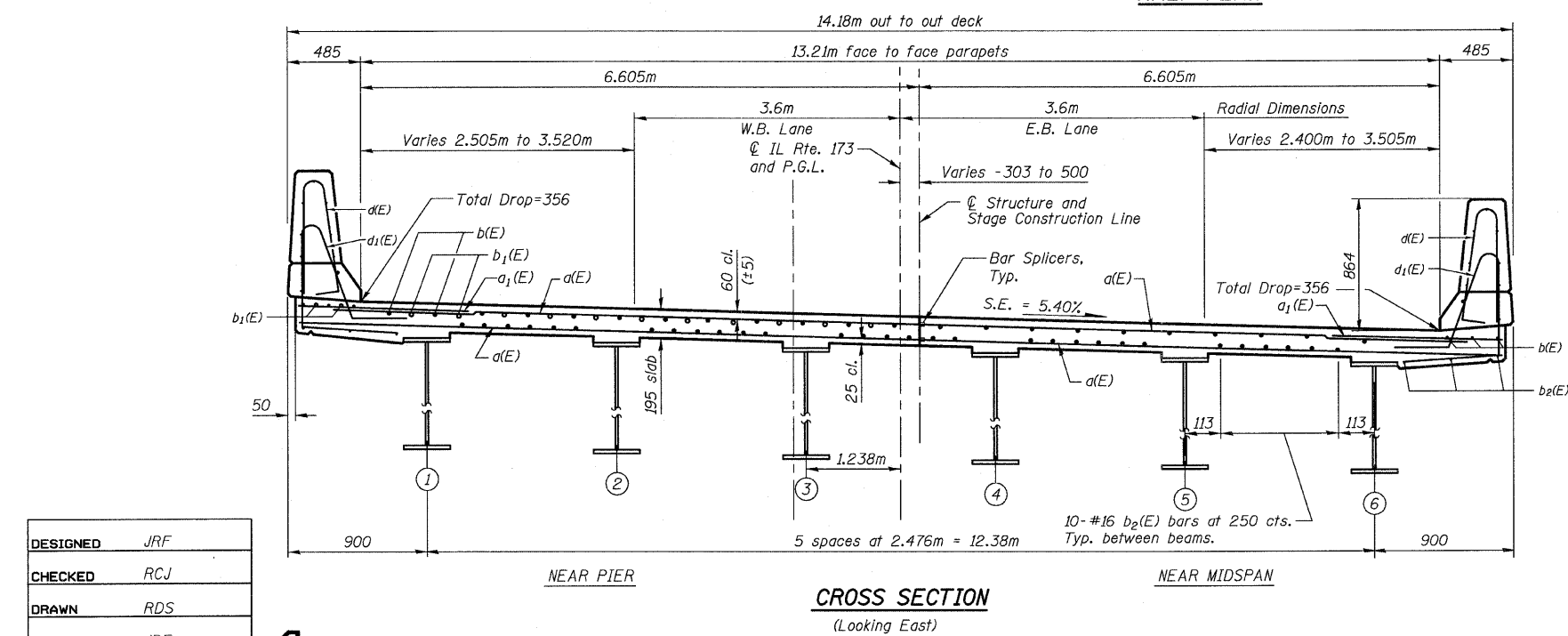
Bar	No.	Size	Length(m)	Shape
a(E)	1154	#16	6.800	—
a1(E)	334	#19	2.000	—
a2(E)	8	#16	8.000	—
b(E)	250	#16	9.180	—
b1(E)	48	#19	14.700	—
b2(E)	336	#16	7.750	—
d(E)	316	#16	1.702	U
d1(E)	316	#16	2.345	U
e(E)	64	#16	9.370	—
e1(E)	8	#25	9.700	—
e2(E)	32	#16	3.460	—
e3(E)	4	#25	3.460	—
m(E)	8	#19	8.107	—
m1(E)	12	#19	8.107	—
m2(E)	24	#19	3.709	—
m3(E)	10	#19	2.739	—
m4(E)	4	#19	0.939	—
s(E)	92	#16	1.413	U
s1(E)	92	#16	2.872	U
v(E)	92	#16	1.044	U
Reinforcement Bars Epoxy Coated		kg	27,800	
Concrete Superstructure		m ³	175	

MINIMUM BAR LAP

#16 bar = 610
#25 bar = 1.270m

NOTES

- See Sheets #9 and 10 for additional Superstructure details.
- Bars indicated thus 20x3-#15 etc. indicates 20 lines of bar with 3 lengths per line.
- See Sheet #10 for parapet reinforcement.
- See Sheet #9 for Section A-A.
- Reinforcing Bars designated (E) shall be Epoxy Coated.
- All dimensions are in millimeters (mm) except as noted.
- (X) Girder designation



CROSS SECTION
(Looking East)

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF

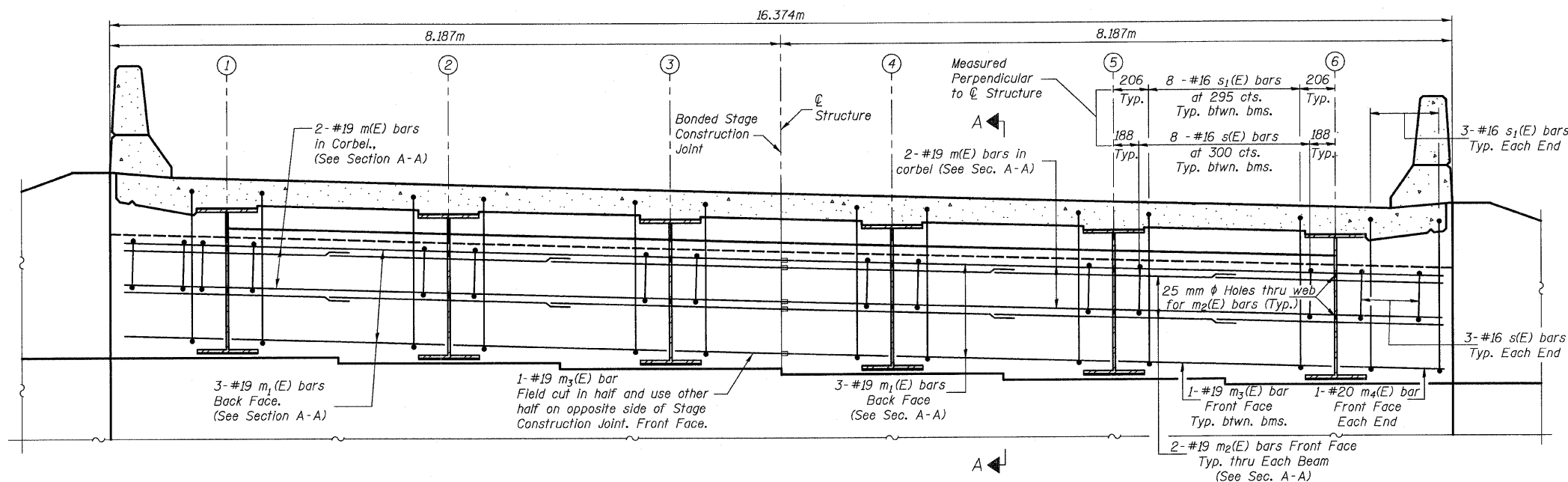


DECK PLAN AND CROSS SECTION
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

FOR INFORMATION ONLY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 9 23 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	20	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			



END DIAPHRAGM AT ABUTMENT

NOTES

Reinforcement bars in diaphragm are billed with superstructure on Sheet #8.

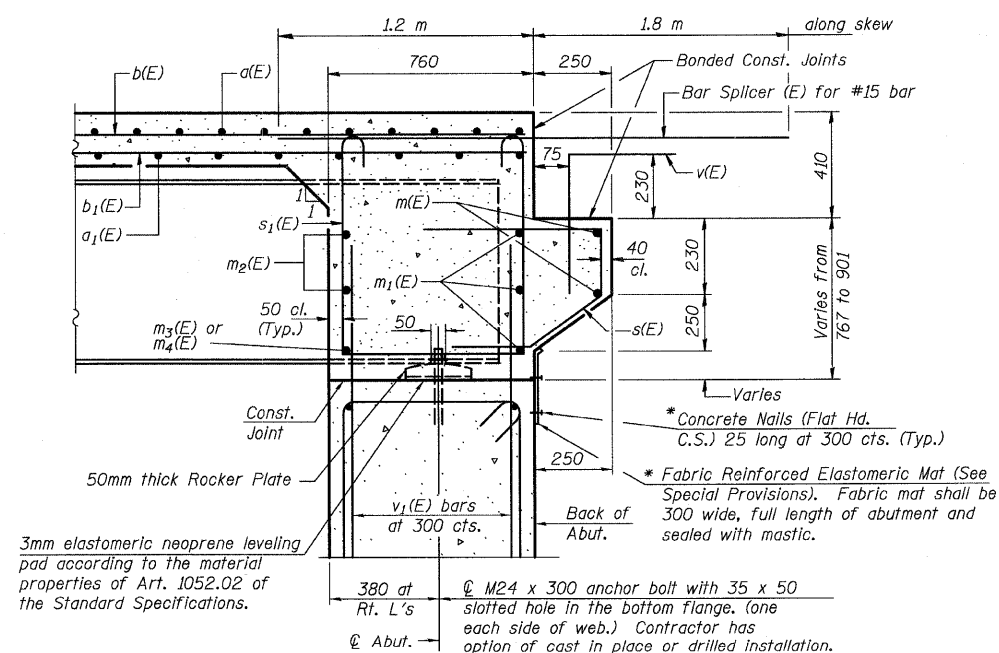
Concrete in diaphragm is included with Concrete Superstructure on Sheet #8.

For details of bars s(E) and s1(E) see Sheet #8.

The s(E) and s1(E) bars shall be placed parallel to the beams. Spacing for these bars shall be at right angles to the beams.

Reinforcement Bars designated (E) shall be Epoxy Coated.

All dimensions are in millimeters (mm) except as noted.



SECTION A-A

Dimensions in Section A-A at right angles to abutment.
* Cost Included with Concrete Structures.

MINIMUM BAR LAP

#19 bar = 850

SUPERSTRUCTURE DETAILS-1
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

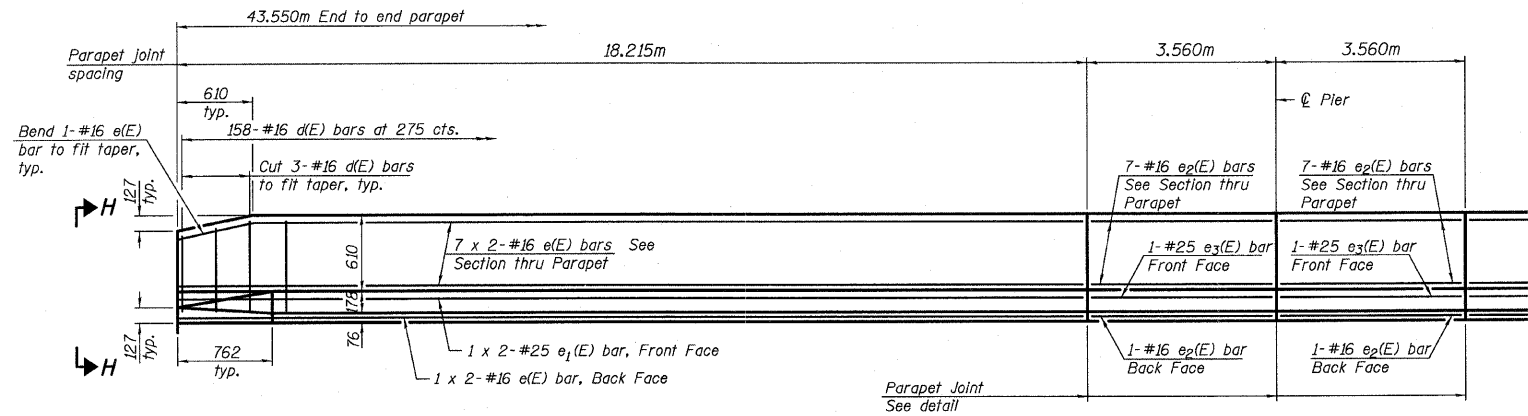
DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF

SI-DS1 (M) 4-30-99



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

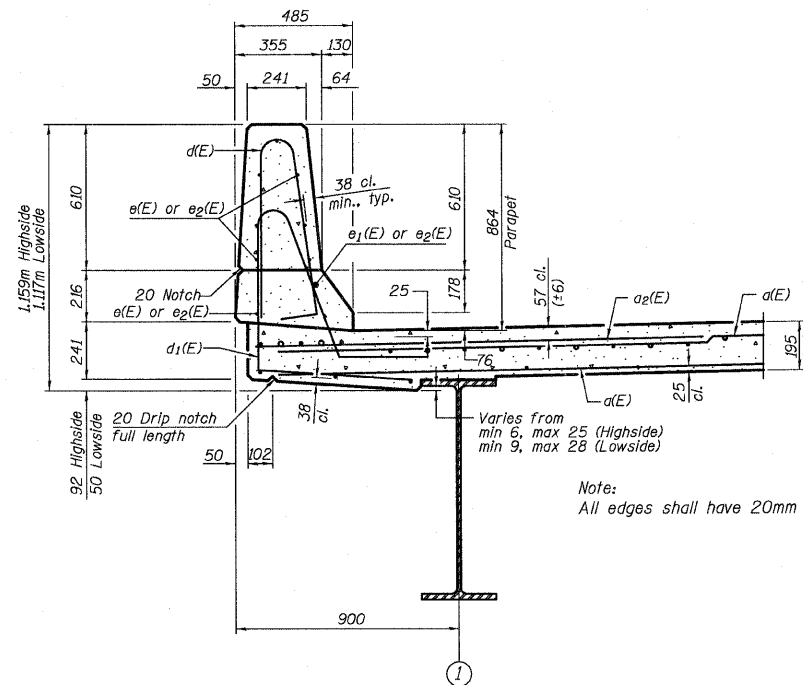
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FAP 303 IL 173	2010-086-F	LAKE	29	21	23 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			



MINIMUM BAR LAP
(Parapet)

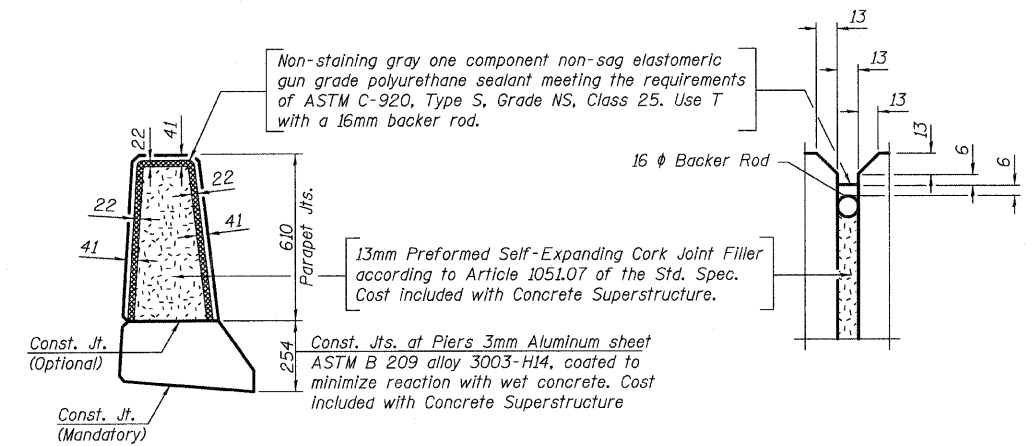
- #10 bar = 350
- #16 bar = 470
- #19 bar = 610
- #25 bar = 1,010m

INSIDE ELEVATION OF PARAPET



SECTION THRU PARAPET

Highside Shown
Lowside Similar



PARAPET JOINT DETAILS

NOTES

- See Sheet #8 for deck details and Bill of Material.
- Reinforcement bars designated (E) shall be epoxy coated.
- All dimensions are in millimeters (mm) except as noted.
- Reinforcement bars in Parapet are billed with Superstructure on Sheet #8.
- Concrete in Parapet is included with concrete Superstructure on Sheet #8.
- See Sheet #12 for Section H-H.

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF

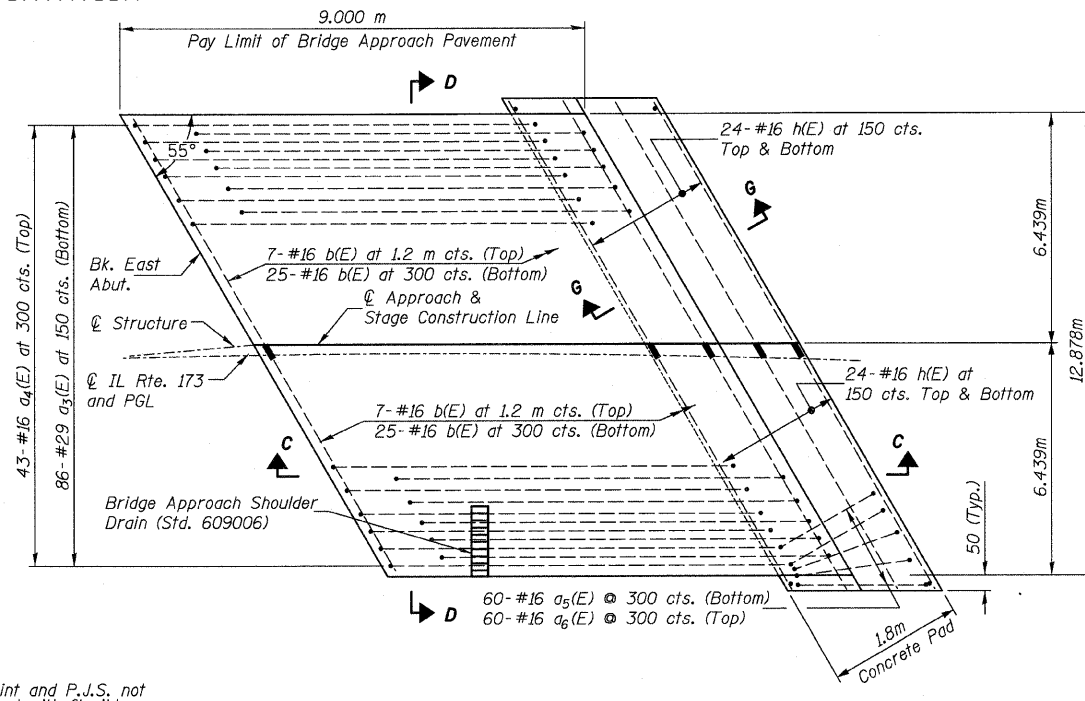
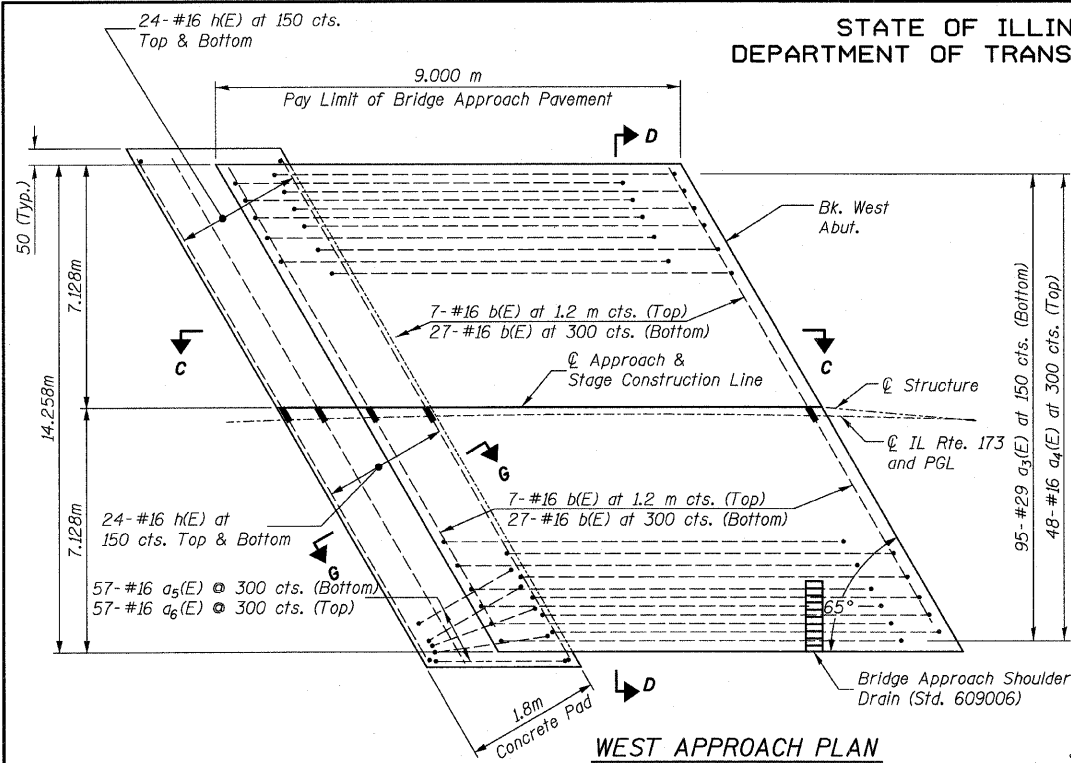


SUPERSTRUCTURE DETAILS-2
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

FOR INFORMATION ONLY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

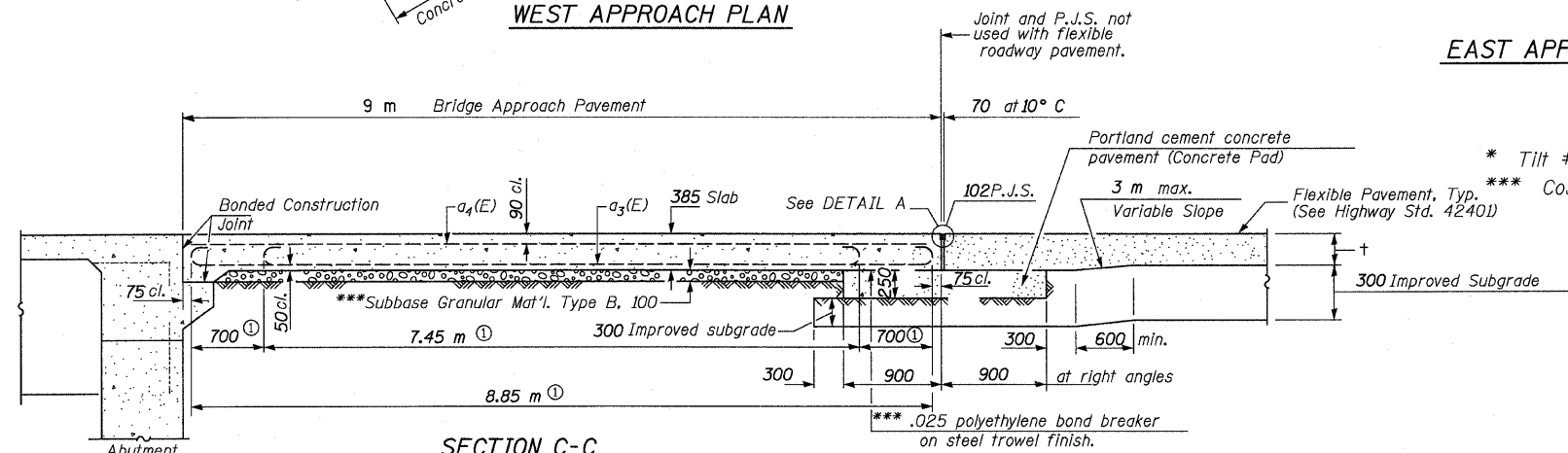
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 11
FAP 303 IL 173	2010-086-F	LAKE	29	22	24 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT-	



BRIDGE APPROACH SLAB
BILL OF MATERIAL

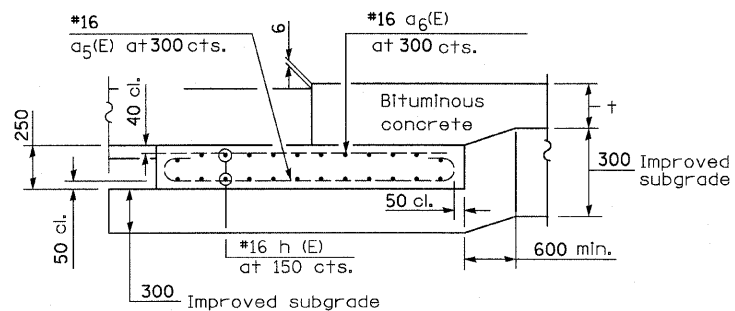
Bar	No.	Size	Length (m)	Shape
a ₃ (E)	181	#29	8.912	(U)
a ₄ (E)	91	#16	8.85	(—)
a ₅ (E)	113	#16	2.512	(U)
a ₆ (E)	113	#16	1.70	(—)
b(E)	132	#16	7.81	(—)
h(E)	96	#16	7.87	(—)
Concrete Structures			m ³	15
Concrete Superstructure			m ³	95
Reinforcement Bars, Epoxy Coated			kg	12,930
Bar Splicers (#16 bar)			Each	114

The above table contains information and quantities for two Bridge Approach Pavements.
See Sheet 12 for Bar Diagrams.



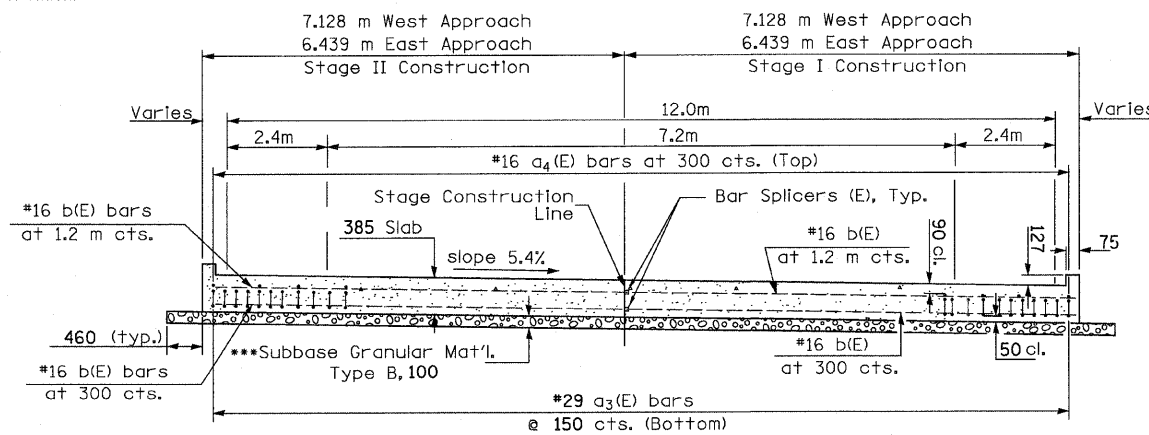
SECTION C-C

Stagger No. 30 a bars as shown on plan - full width



SECTION G-G - FLEXIBLE PAVEMENT

(Showing reinforcement)



SECTION D-D

(See Plan for Dimensions not shown)

* Tilt #29 Bars as required to maintain clearance.
*** Cost included with Concrete Superstructures.

NOTES:

THICKNESS- "t" = Thickness of Pavement.
All dimensions are in millimeters unless otherwise shown.
See Sheet 20 for Bar Splicer Details.
See Sheet 12 for Bar Bending Details.

DESIGN STRESSES

f_y = 400 MPa
f'c = 24 MPa
n = 8.5

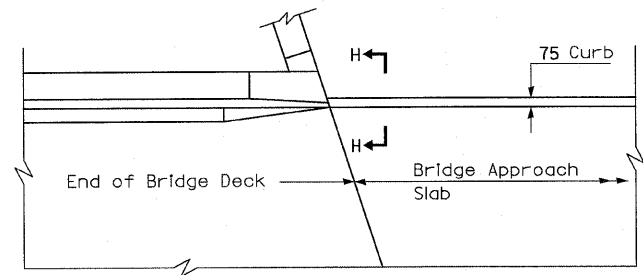
BRIDGE APPROACH SLAB - 1
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF

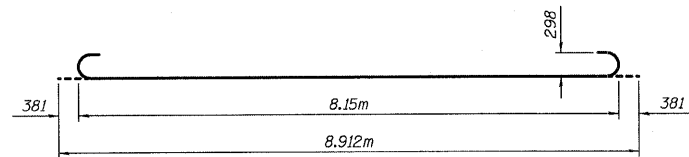


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

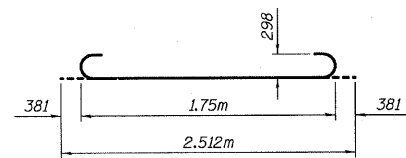
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FAP 303 IL 173	2010-086-F	LAKE	29	23	24 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			



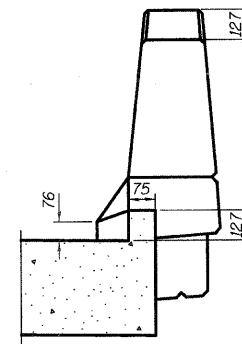
PARAPET TO CURB TRANSITION
INTEGRAL ABUTMENT



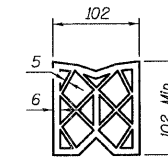
BAR a₁(E)



BAR a₂(E)

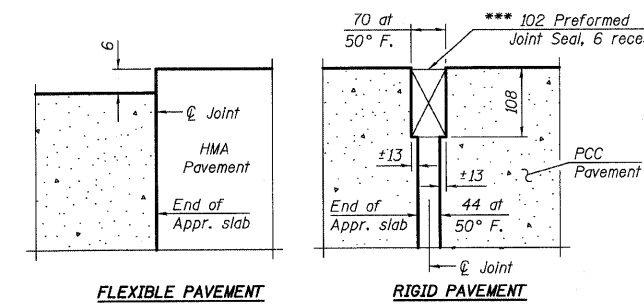


VIEW H-H



PREFORMED
JOINT SEAL

*** Cost Included with Concrete Superstructure.



FLEXIBLE PAVEMENT

RIGID PAVEMENT

DETAIL A

NOTES:

All dimensions are in millimeters unless otherwise shown.

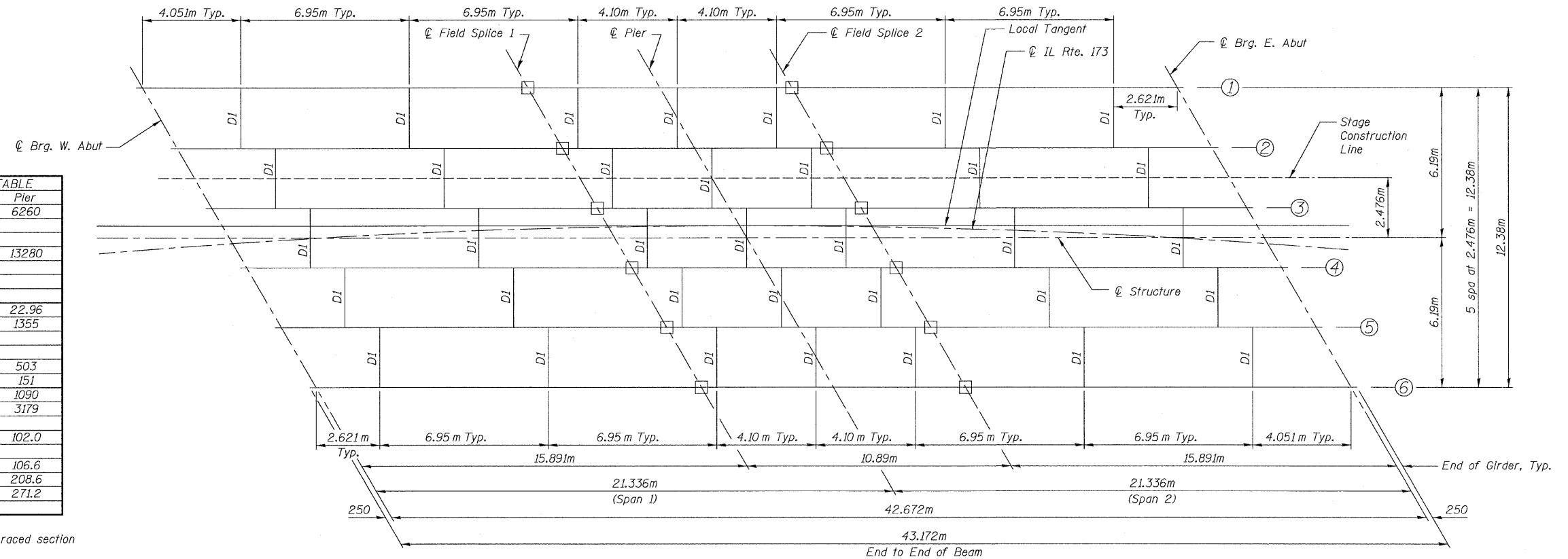
BRIDGE APPROACH SLAB -2
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO. FAP 303 IL 173	SECTION 2010-086-F	COUNTY LAKE	TOTAL SHEETS 29	SHEET NO. 24	SHEET NO. 13 23 SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT-			



INTERIOR GIRDER MOMENT TABLE

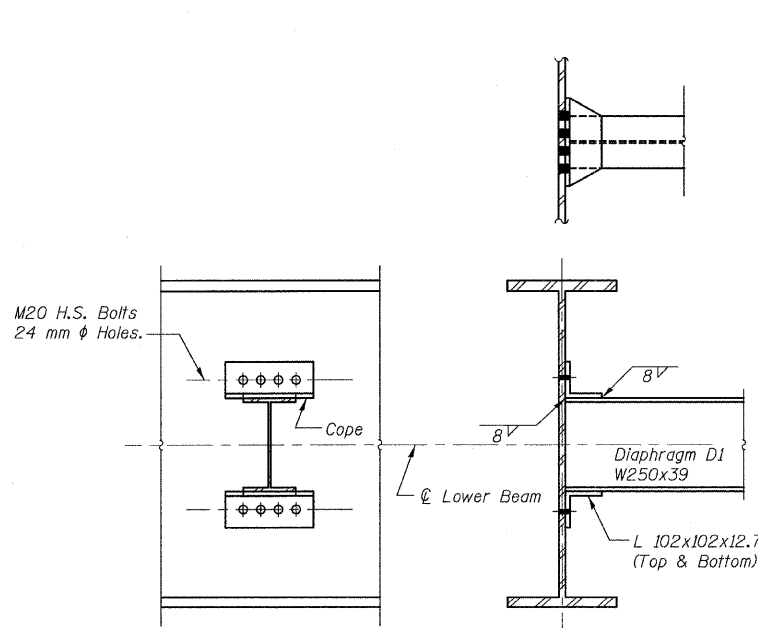
	0.4 Sp. 1	Pier
I_s (10^6 mm^4)	4720	6260
I_c (n) (10^6 mm^4)	11790	
I_c (3n) (10^6 mm^4)	8610	
S_s (10^3 mm^3)	10230	13280
S_c (n) (10^3 mm^3)	14610	
S_c (3n) (10^3 mm^3)	13170	
Z (10^3 mm^3)		
D (kN/m)	14.84	22.96
$M \ell$ (kN·m)	442	1355
$s \ell$ (kN/m)	8.12	
$M s \ell$ (kN·m)	276	
$M \ell$ (kN·m)	802	503
M (Imp) (kN·m)	241	151
$S_3[M \ell + M(\text{Imp})]$ (kN·m)	1735	1090
$M a$ (kN·m)	3189	3179
$M u$ (kN·m)	5898	
$f_s \ell$ (non-comp) (MPa)	43.2	102.0
$f_s \ell$ (comp) (MPa)	21.0	
$f_s S_3(\ell + \text{Imp})$ (MPa)	118.8	106.6
f_s (Overload) (MPa)	177.7	208.6
f_s (Total) (MPa)		271.2
VR (kN)	298	

* Compact Section
** Braced non-compact and partially braced section

INTERIOR GIRDER REACTION TABLE

	Abut.	Pier
$R \ell$ (kN)	181	617
$R \ell$ (kN)	213	254
Imp. (kN)	64	76
R (Total) (kN)	458	947

I_s and S_s are the moment of inertia and section modulus of the steel section used in computing f_s (Total & Overload).
 I_{cn} and S_{cn} are the moment of inertia and section modulus of the composite section used in computing stresses due to Live Load.
 I_{c3n} and S_{c3n} are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed dead loads. (see AASHTO 10.38)
 VR is the maximum Live Load + Impact shear range in span.
 Z is the plastic section modulus used to determine the fully plastic moments in the non-composite areas.
 $M a$ (Applied Moment) = $1.3[M \ell + M s \ell + S_3(M \ell + M(\text{Imp}))]$.
 The Plastic Moment capacity ($M u$) is computed according to AASHTO 10.48.1 and 10.50.1.1.
 f_s (Overload) is the sum of the stresses due to $M \ell + M s \ell + S_3(M \ell + M(\text{Imp}))$.
 f_s (Total) (Non-compact section) is the sum of the stresses due to $1.3[M \ell + M s \ell + S_3(M \ell + M(\text{Imp}))]$.



DIAPHRAGM D1
(35 Required)

Note: Two hardened washers shall be required over all oversized holes.

FRAMING PLAN

NOTES

- Not Included in this Contract** - All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.
- Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.
- For Beam Elevations see Sheet #14.
- For Bearing Details see Sheet #15.
- All dimensions are in millimeters (mm) except as noted.

**FRAMING PLAN AND
DESIGN DATA TABLES
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198**

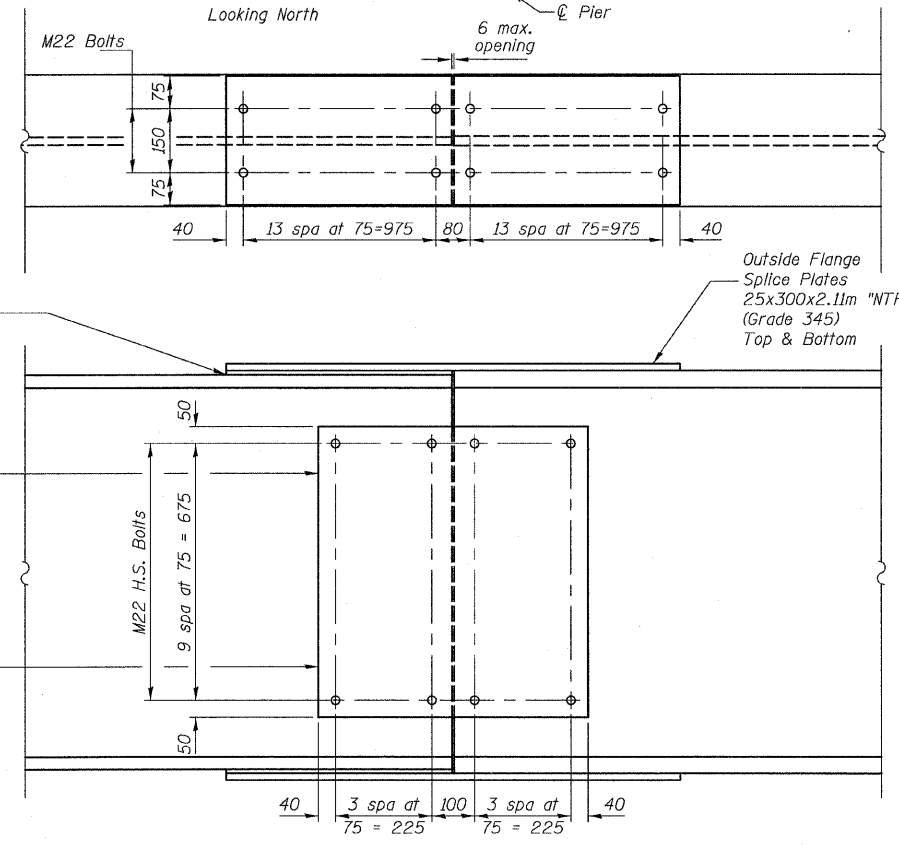
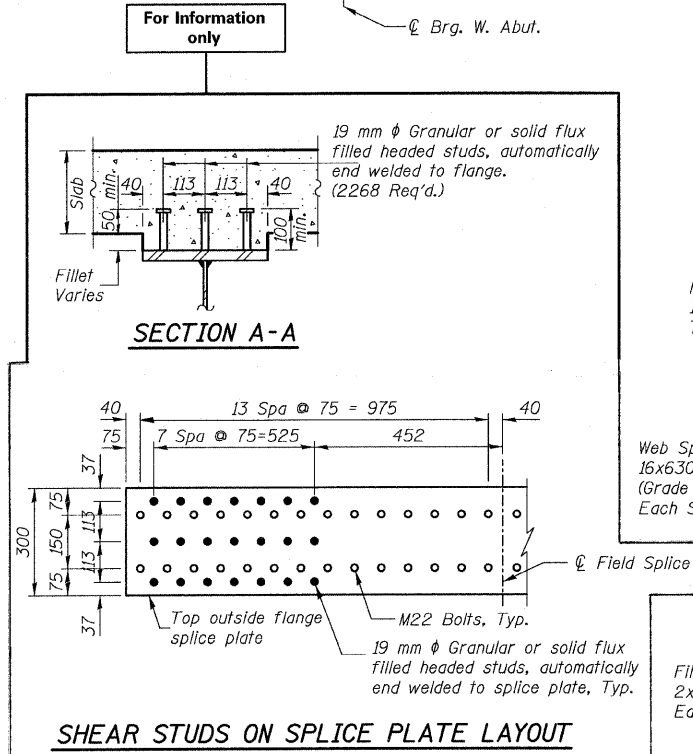
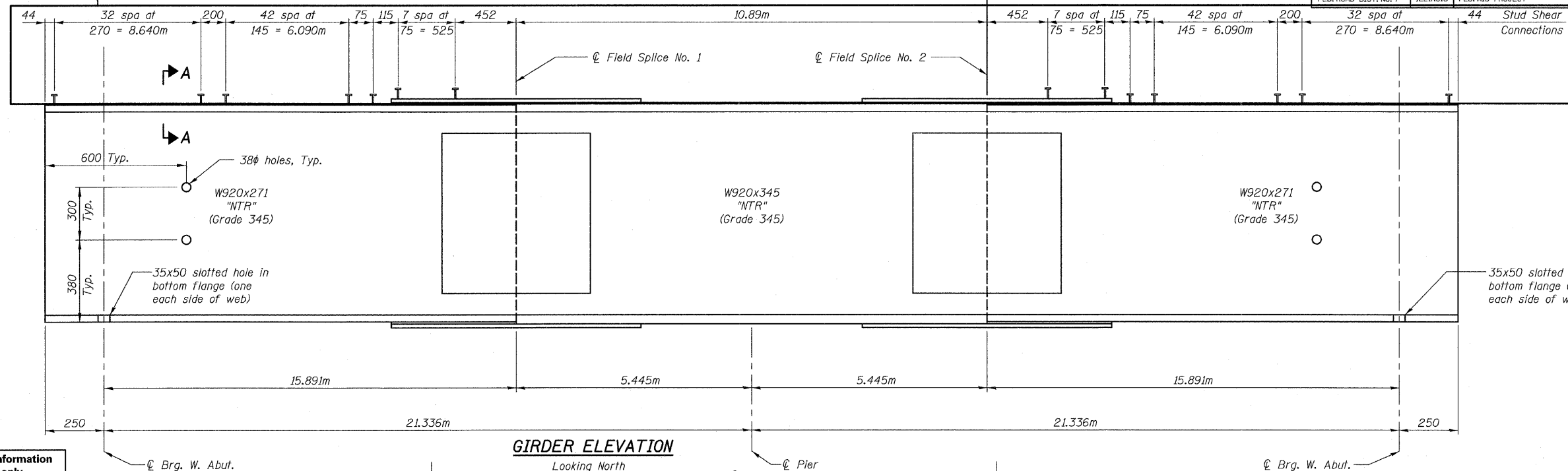
DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 303 IL 173	2010-086-F	LAKE	29	25
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. 14
23 SHEETS



TOP OF GIRDER ELEVATIONS
(For Fabrication Only)

LOCATION	ϕ BEARING W. ABUT.	* ϕ FIELD SPLICE NO. 1	ϕ PIER	* ϕ FIELD SPLICE NO. 2	ϕ BEARING E. ABUT.
Girder 1	228.641	228.622	228.611	228.600	228.555
Girder 2	228.509	228.486	228.474	228.461	228.412
Girder 3	228.377	228.351	228.337	228.323	228.268
Girder 4	228.244	228.215	228.199	228.183	228.123
Girder 5	228.112	228.078	228.061	228.044	227.977
Girder 6	227.979	227.941	227.922	227.903	227.831

*Elevation at Field Splice Location is measured at top of W920X345

NOTES

- For Anchor Bolt Installation Details, see Sheet #21.
- For Bearing Details see Sheet #15.
- For Diaphragm Details see Sheet #13.
- All dimensions are in millimeters (mm) except as noted.
- Load Carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness Zone 2.

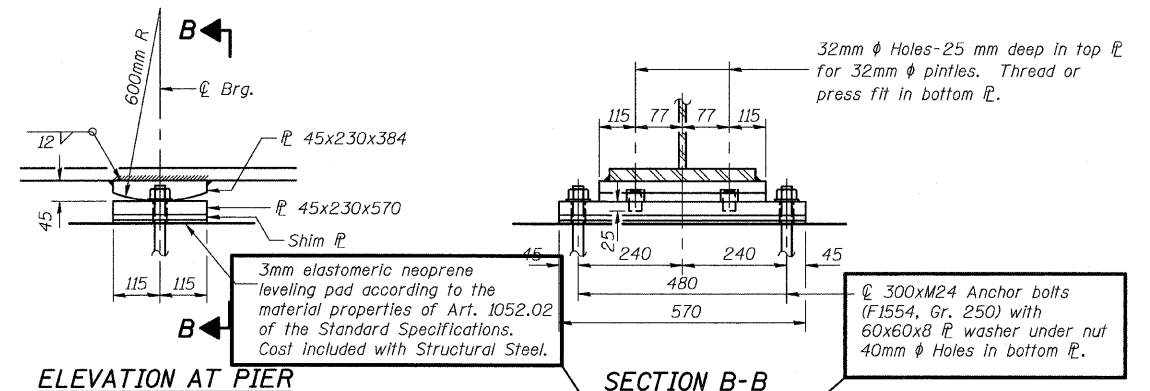
STEEL GIRDER DETAILS
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 15
FAP 303 IL 173	2010-086-F	LAKE	29	26	23 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

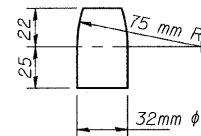


ELEVATION AT PIER

SECTION B-B

FIXED BEARING
(6 Required)

Not Included in this Contract



PINTLE

NOTES

Mass of bearing plates included in Furnishing Structural Steel.

Two 3 mm adjusting shims shall be provided for each bearing in addition to all other plates or shims and placed as shown on bearing details.

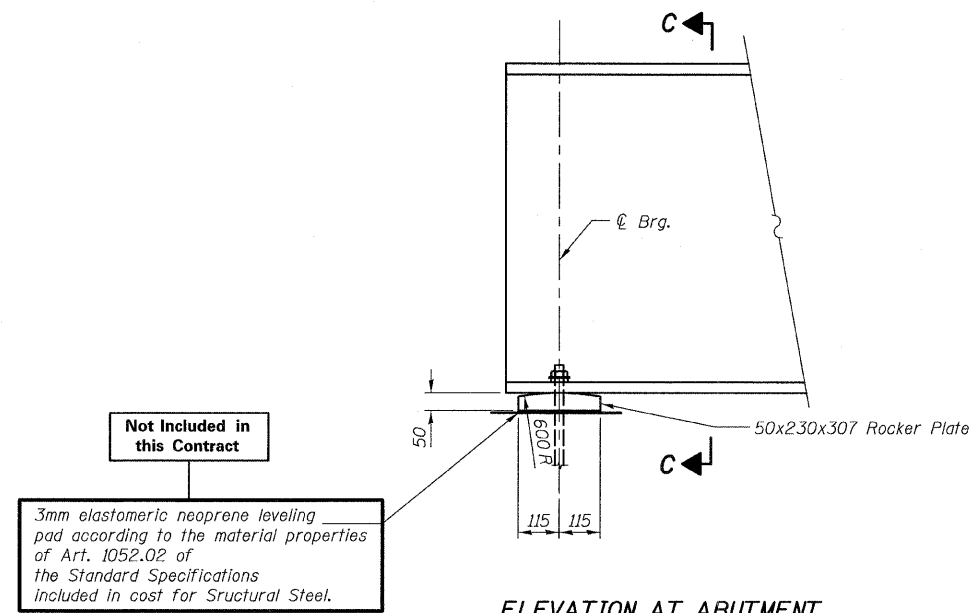
All dimensions are in millimeters (mm) except as noted.

* Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. ASTM A307 Grade C anchor bolts may be used in lieu of ASTM F1554 Grade 250 (Fy=250mpa). The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

* Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.

* Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.

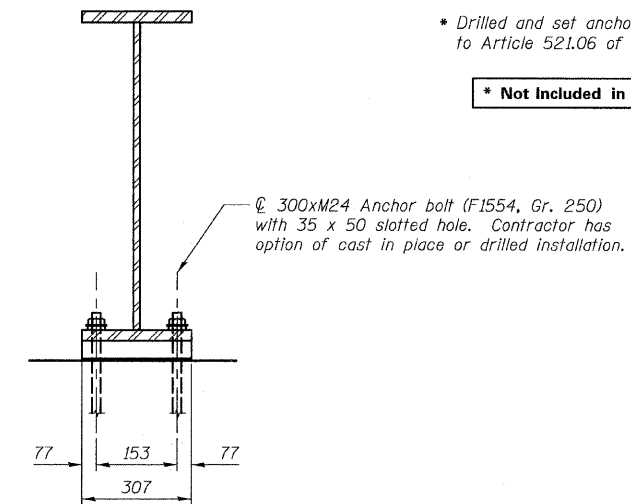
*** Not Included in this Contract**



ELEVATION AT ABUTMENT

Not Included in this Contract

3mm elastomeric neoprene leveling pad according to the material properties of Art. 1052.02 of the Standard Specifications included in cost for Structural Steel.



SECTION C-C

ROCKER BEARING
(12 Required)

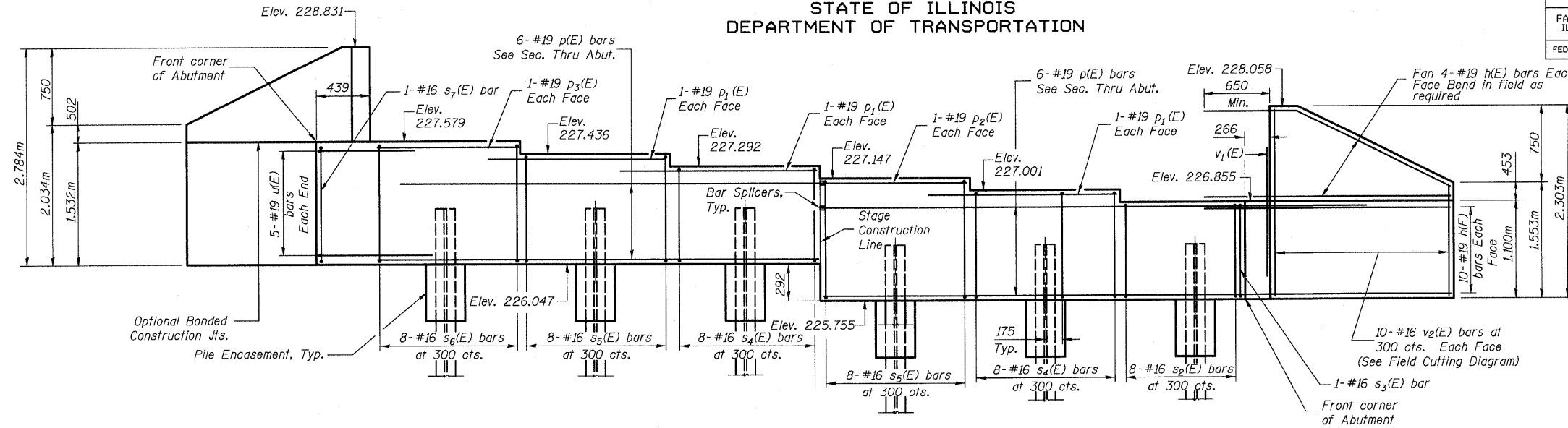
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CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



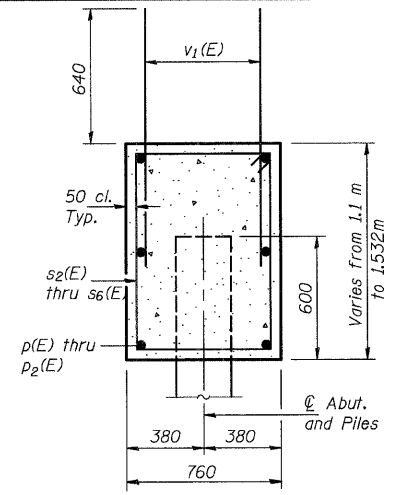
LOW-PROFILE FIXED BEARINGS
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 17 23 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	28	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

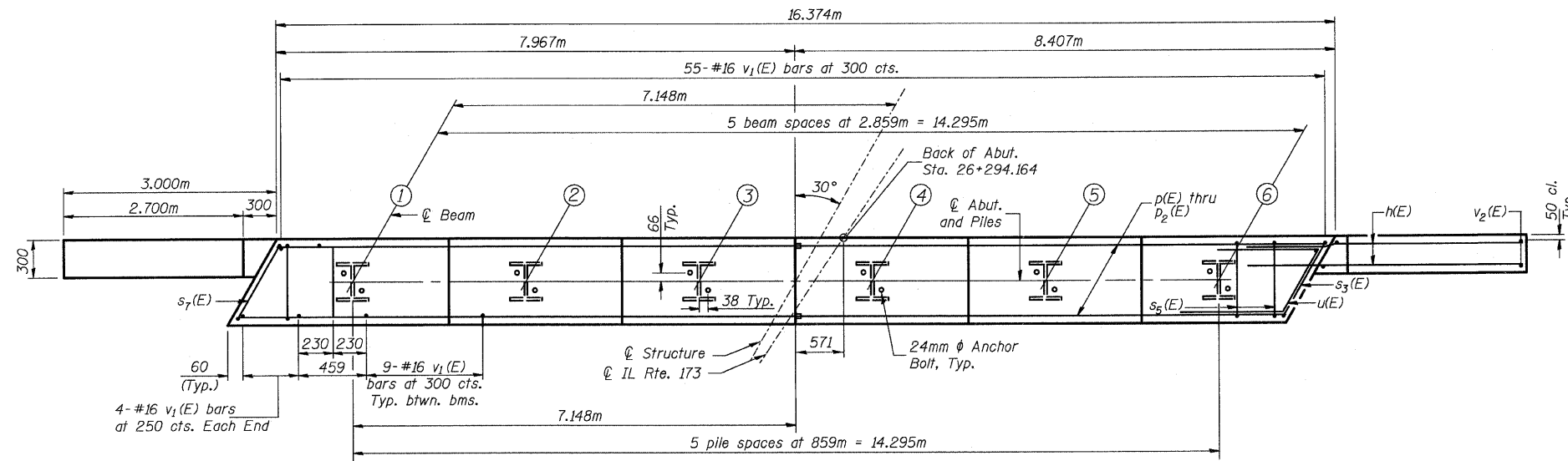
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



EAST ABUTMENT ELEVATION
(Looking East)



SEC. THRU ABUT.
Dimensions at right angle to abutment

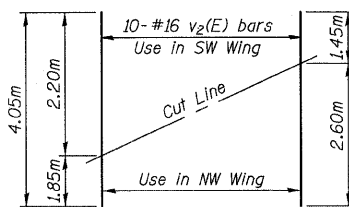


PLAN

PILE DATA

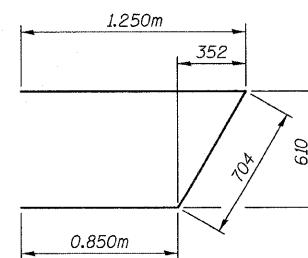
Type: HP 310x79
Allowable Capacity Required: 580kN
Allowable Capacity Available: 580kN
Est. Length: 20.5m
No. Production Piles Required: 5
No. Test Piles: 1

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF

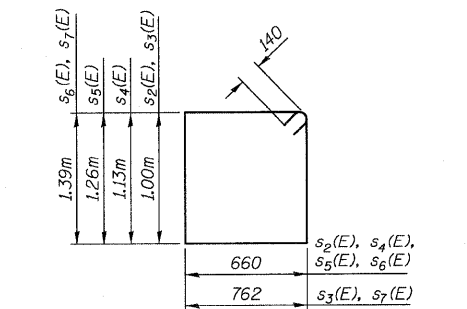


FIELD CUTTING DIAGRAM

Order v2(E) full length. Cut as shown and use remainder of bars in opposite wingwall.



BAR u(E)



BARS s2(E), s3(E), s4(E), s5(E), s6(E)

MINIMUM BAR LAP
#19 bar = 850

NOTES

Pour steps monolithically with cap.

Place reinforcement in cap to miss anchor bolts.

Reinforcement bars designated (E) shall be epoxy coated.

All dimensions are in millimeters (mm) except as noted.

Stage Construction Line differs from Stage Construction Line in the deck above due to the skew of the bridge.

See Sheet 21 for Pile Encasement details.

**EAST ABUTMENT
BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
h(E)	56	#19	3.750	
p(E)	12	#19	7.887	
p1(E)	6	#19	3.540	
p2(E)	2	#19	2.779	
p3(E)	2	#19	2.170	
s2(E)	8	#16	3.600	□
s3(E)	1	#16	3.804	□
s4(E)	16	#16	3.860	□
s5(E)	16	#16	4.128	□
s6(E)	8	#16	4.390	□
s7(E)	1	#16	4.594	□
u(E)	10	#19	2.804	▤
v1(E)	108	#16	1.280	
v2(E)	20	#16	4.050	
Concrete Structures			m ³	20
Concrete Encasement			m ³	2.0
Reinforcement Bars Epoxy Coated			kg	1,470
Furnishing Steel Piles HP310x79			m	105
Driving Steel Piles			m	105
Test Pile, HP310x79			each	1
Structure Excavation			m ³	550

**EAST ABUTMENT
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198**

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 18 23 SHEETS
FAP 303 IL 173	2010-086-F	LAKE	29	29	
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			

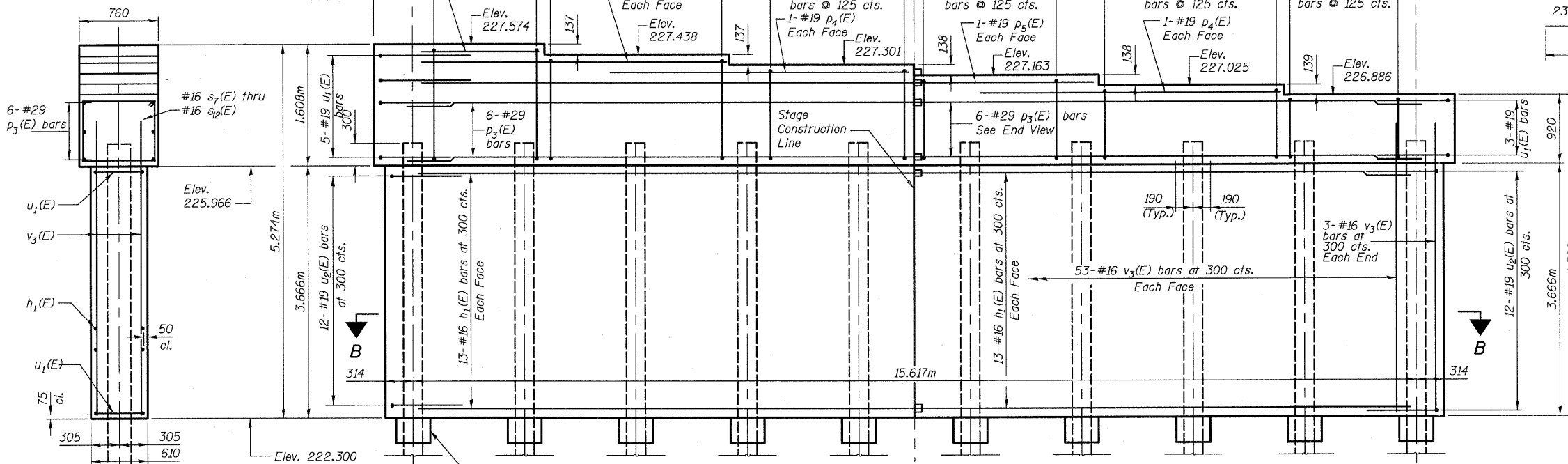
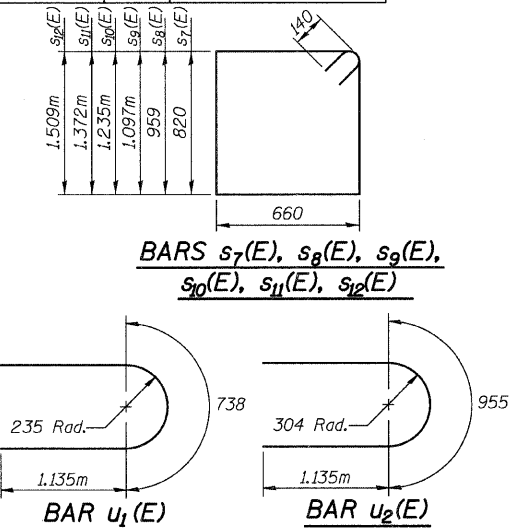
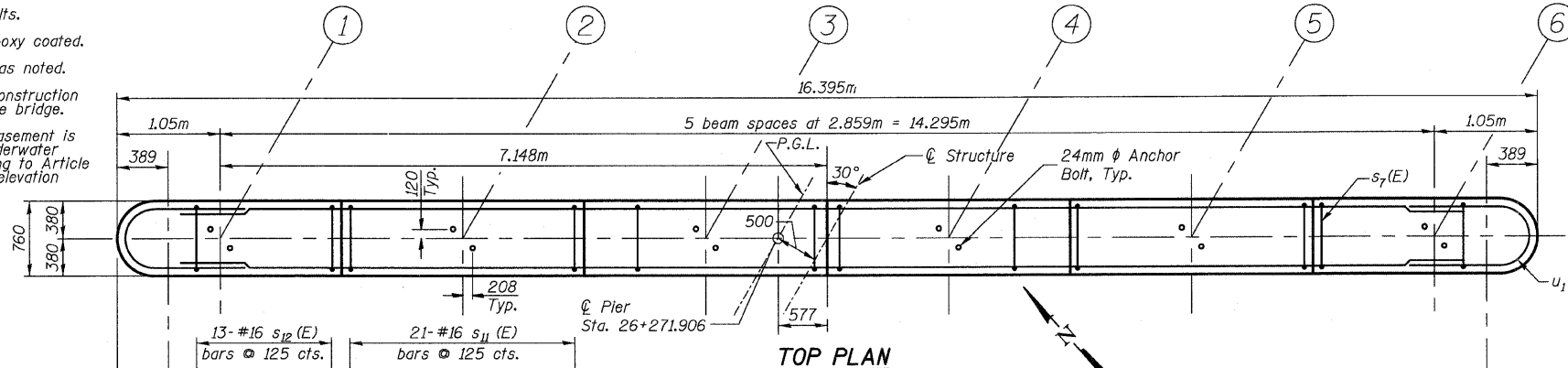
NOTES

Pour steps monolithically with cap.
Place reinforcement in cap to miss anchor bolts.
Reinforcement bars designated (E) shall be epoxy coated.
All dimensions are in millimeters (mm) except as noted.
Stage Construction Line differs from Stage Construction Line in the deck above due to the skew of the bridge.
If a portion of the pier wall or concrete encasement is under water, reinforcement may be placed underwater into forms. Concrete shall be tremied according to Article 503.08 of the Standard Specifications to an elevation of 300 above the water line at the time of construction.
See Sheet 21 for Pile Encasement details.

PILE DATA

Type: HP 310x79
Allowable Capacity Required: 500kN
Allowable Capacity Available: 530kN
Est. Length: 18.6m
No. Production Piles Required: 9
No. Test Piles: 1

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



PIER BILL OF MATERIAL

Bar	No.	Size	Length (m)	Shape
h ₁ (E)	52	#16	7.603	—
p ₃ (E)	12	#29	7.603	—
p ₄ (E)	6	#19	3.620	—
p ₅ (E)	2	#19	2.779	—
p ₈ (E)	2	#19	2.060	—
s ₇ (E)	13	#16	3.240	□
s ₈ (E)	21	#16	3.518	□
s ₉ (E)	17	#16	3.794	□
s ₁₀ (E)	17	#16	4.070	□
s ₁₁ (E)	21	#16	4.344	□
s ₁₂ (E)	13	#16	4.618	□
u ₁ (E)	8	#19	3.250	—
u ₂ (E)	24	#19	3.008	—
v ₃ (E)	108	#16	4.018	—
Underwater Structure Excavation Protection, Location 1		Each	1	
Concrete Structures		m ³	53	
Concrete Encasement		m ³	3.0	
Furnishing Steel Piles, HP310x79		Meter	170	
Driving Steel Piles		Meter	170	
Test Pile, HP310x79		Each	1	
Reinforcement Bars, Epoxy Coated		kg	2,240	

Reinforcement Bars designated (E) shall be epoxy coated.

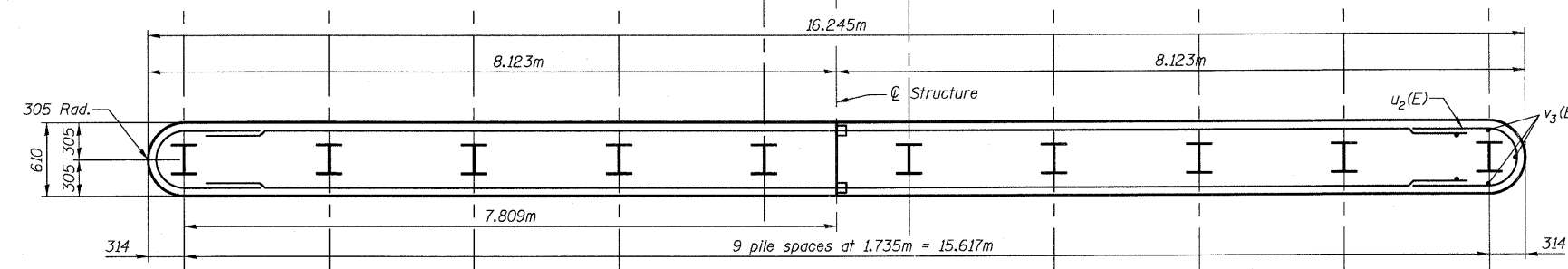
END VIEW

DESIGNED	JRF
CHECKED	RCJ
DRAWN	RDS
CHECKED	JRF



ELEVATION (Looking East)

SECTION B-B



PIER
FAP 303 IL. ROUTE 173
OVER EAST BOAT CHANNEL
SECTION 2010-086-F
LAKE COUNTY
STATION 26+271.906
STRUCTURE NO. 049-0198

FOR INFORMATION ONLY