Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

January 5, 2026

SUBJECT FAI Route 290 (I-290)
Project NHPP-G73E(408)
Section 2019-189-BR
Cook County
Contract No. 62K62

Item No. 021, January 16, 2026, Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised the Schedule of Prices.
2. Revised sheets 1, 3, 10 - 12, 15, 21, 24, 32, 33, 41, 47 - 49, 78 – 81, 188, 189, 193, 194, 203, 205, 207, 220 – 222, 225 - 227, & 249 of the Plans.
3. Added sheets 81A & 81B to the Plans.
4. Revised the Table of Contents to the Special Provisions
5. Revised pages 2-11 of the Special Provisions
6. Added pages 310-366 to the Special Provisions

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

Jack A. Elston, P.E.
Bureau Chief, Design and Environment

MTS

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STATUS OF UTILITIES (D-1)
Effective: June 1, 2016
Revised: April 1, 2025

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.

Closure

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	DURATION OF TIME
Central Park Ave bridge and approaches	Electric	Lighting cable in conduit and luminaires attached to the bridge will be removed and replaced.	Contractor/ CDOT-DEO	TBD
	Electric	Electric cable in asbestos cement conduit (9-ducts, 3Wx3H) attached to bridge from Sta 602+09 LT to 608+58 LT will be removed & relocated	Contractor/CDOT-DEO	TBD
	Electric	Electric cable in asbestos cement conduit (12-ducts, 4Wx3H) attached to the bridge from Sta. 602+09 RT to 608+58 RT will be removed & relocated. Approx. 400 feet of underground and bridge attached duct package will be relocated.	ComEd	7 calendar weeks

Revised 1/5/26

	Electric	Electric aerial cable on bridge from Sta. 604+56 RT to 605+35 RT will be temporarily relocated.	Contractor/OEMC	TBD
	License plate readers	License plate readers attached to the bridge will be relocated by others	Illinois State Patrol	3 days
SE Corner of Central Park Ave Bridge from Harrison St to EB I-290	Water	Existing 12” cast iron water main parallel to and east of the bridge will be cut and capped between Harrison St and the embankment along EB I-290 for wing wall construction. Existing cast iron water main will be removed for construction and replaced with ductile iron water main after wing wall construction. Contractor to coordinate with CDWM Water.	Contractor / CDWM Water	TBD
NE Corner of Central Park Ave Bridge from Congress Pkwy to WB I-290	Water	Existing 12” cast iron water main parallel to and east of the bridge will be cut and capped between Congress Pkwy and the embankment along WB I-290 for wing wall construction. Existing cast iron water main will be removed for construction and replaced with ductile iron water main after wing wall construction. Contractor to coordinate with CDWM Water.	Contractor / CDWM Water	TBD
Central Park Ave & W Congress Parkway intersection	Traffic Signals	Signals will be partially removed and replaced.	Contractor/ CDOT-DEO	TBD
	Sewer	Combined sewer structures and CB outlet pipes to be adjusted and/or removed.	Contractor / CDWM-Sewer	TBD

	Water	Existing at grade water valves at the NE corner to be adjusted to be flush with finished grade.	CDWM-Water	TBD
	Gas	Existing at grade gas valves at the NE corner to be adjusted to be flush with finished grade	Peoples Gas	TBD
Central Park Ave & W Harrison St Intersection	Traffic Signals	Signals will be partially removed and replaced.	Contractor/ CDOT-DEO	TBD
	Sewer	Combined sewer structures and CB outlet pipes to be adjusted and/or removed. 15” VCP combined sewer along Central Park Ave to be removed.	Contractor/ CDOT-DEO	TBD
	Water	Existing at grade water valves along at the SE and SW corners to be adjusted to be flush with finished grade	CDWM-Water	TBD
	Gas	Existing at grade gas valves at the SE corner to be adjusted to be flush with finished grade	Peoples Gas	TBD
	Electric	Existing MH #0418070 at the SE corner to be adjusted to be flush with finished grade	ComEd	1 day

Conflicts are listed as noted above.

Closure: ___TBD_____ 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-D	Tom Laskowski Janet Ahern (New Plans) Stan Plodzien (AT&T – D) Jamie Gwin (AT&T – D))	(630) 573-6414 (630) 408-7267 (630) 573-5453 (630) 573-5423 (630) 573-6496	g05256@att.com sp3264@att.com jg8128@att.com ja1763@att.com
AT&T – T (Transmission/Core/ Legacy/Long Distance /Long Lines)	Vanessa Ross (New Plans) Edward Tilton Rich Meyers, Ken Caudill	(630) 215-7567	vf2021@att.com rcm5@sbcglobal.net Edward.Tilton@kci.com Ken.Caudill@kci.com
Comcast	Thomas Munar Bob Schulter Robert Stoll Martha Gieras	(224) 229-5861 (224) 229-5849	Thomas_Munar@comcast.com Bob_Schulter@comcast.com Robert_Stoll@comcast.com Martha_Gieras@comcast.com htinspector@comcast.net
ComEd	Vincent Mazzaferro John Leibforth (Large Customer Accounts)	(779) 231-1027 (872) 395-1872 (312) 758-8838	Vincent.MazzaferroPE@ComEd.com Plansubmittalsandmaprequests@ exeloncorp.com john.leibforth@comed.com
Crown Castle (Sunesys, Lightower, & Sidera)	Mike Kyriazakos John Pyka	(847) 370-7617 (312) 415-8184	Michael.Kyriazakos@crowncastle.com John.Pyka@crowncastle.com Fiber.dig@crowncastle.com
Crosstown	Samantha Curley	(845) 282 6962	scurley@hbkengineering.com
JC Decaux North America	Miguel Mejia	(312) 456-2977	Miguel.mejia@jcdecaux.com
Peoples Gas	Laura Doyle, Annie-Beryl Akuamoah, Catrina Farr, Eric Stall, Sandy Salinas, Randy Perez, & Shirgena Washington	(312) 240-4779, (312) 240-4016, (312) 240-7394 & (866) 556-6002	laura.doyle@peoplesgasdelivery.com, erin.emhoff@peoplesgasdelivery.com, annie-beryl.akuamoah@peoplesgasdelivery.com, catrina.farr@peoplesgasdelivery.com, erstall@integrysgroup.com, erin.emhoff@peoplesgasdelivery.com, Sandra.salinas@peoplesgasdelivery.com, Randy.perez@peoplesgasdelivery.com, Shirgena.washington@peoplesgasdelivery.com
Chicago Park District	Clem Taylor	(312) 742 4695	Clem.taylor@chicagoparkdistrict.com
City of Chicago Department of Water Management. – Sewer Section	Anupam Verma Chuck Mann Brendan Schreiber Pablo Martinez Jason McCubbin Patrik Maloney	(312) 744-5070 (312) 744-0344 (312) 742-7226	Anupam.Verma@cityofchicago.org Chuck.Mann@cityofchicago.org Brendan.Schreiber@cityofchicago.org Pablo.Martinez@cityofchicago.org Jason.mccubbin@dwmpmo.net Patrick.Maloney@cityofchicago.org

Revised 1/5/26

City of Chicago Department of Water Management – Water Section	Jason McCubbin Vito Montana Rolando Villalon Angela Krueger (CDWM) Hans Krueger (CDWM) Consuelo Venegas (CDWM)	(312) 217-7928 (312) 742-3619 (312) 744-5070	IDOT Construction or the IDOT Contractor should send an e-mail to the CDWM - Water PMO general email FACM@dwmpmo.net and carbon copy Jason McCubbin at Jason.mccubbin@dwmpmo.net at least 2 days prior to needing a CDWM- Water inspector on site. Jason McCubbin can be contacted directly by telephone at (312) 217-7928. Jason.mccubbin@dwmpmo.net brian.santi@dwmpmo.net angela.krueger@cityofchicago.org hans.krueger@cityofchicago.org consuelo.venegas@cityofchicago.org
City of Chicago -CDOT Div of Electrical Operations	Arturo Rodriguez Chris Quinlan Henry Yau Anthony Vieu Stephen Ingram	(312) 746-4409 (312) 546-2257 (312) 744-2450 (312) 742-8556 (312) 744-8775	Arturo.Rodriguez2@cityofchicago.org Christopher.Quinlan@cityofchicago.org Henry.Yau@cityofchicago.org Anthony.Vieu@cityofchicago.org Stephen.Ingram@cityofchicago.org
Illinois State Police	M/Sgt. Emily Sandberg (ISP) Jose Machado (Motorola Solutions Inc.)	(847) 257-6333 (708) 557-3227	emily.sandberg@illinois.gov jose.machado@motorolasolutions.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.

Closure

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER
Central Park Ave & W Congress Parkway intersection	Electric	Multiple underground and aerial electric lines run parallel to Congress Parkway and Central Park Ave and cross the intersection. Follow current OSHA rules and other applicable guidelines regarding working safely around electrical power lines. Call 1-800-334-7661 to request “Facility Protection”, charges may be involved.	ComEd
	Electric	Multiple underground and aerial electric lines run parallel to Congress Parkway and Central Park Ave and cross the intersection.	CDOT – DEO
	Water	An 8” water main runs east along W Congress Pkwy, east of Central Park Ave. An 8” water main runs north along Central Park Ave, north of W Congress Pkwy.	CDWM – Water
	Water	Existing FHs in NE and NW corner of intersection.	CDWM – Water
	Sewer	Combined sewer drains north bridge approach, joins sewers along W Congress Pkwy, then flows north along Central Park Ave north of W Congress Pkwy	CDWM – Sewer
	Gas	6” gas main east and west legs of intersection. 2” gas main on south leg intersection.	Peoples Gas (PGL)
Central Park Ave & W Harrison Street intersection	Electric	Multiple underground and aerial electric lines run parallel to Congress Parkway and Central Park Ave and cross the intersection. Follow current OSHA rules and other applicable guidelines regarding working safely around electrical power lines. Call 1-800-334-7661 to request “Facility Protection”, charges may be involved.	ComEd
	Electric	Multiple underground and aerial electric lines run parallel to Congress Parkway and Central Park Ave and cross the intersection.	CDOT – DEO
	Water	An 8” water main runs east and west along W Harrison St, east/west of Central Park Ave. An 8” water main runs south along Central Park Ave, south of W Congress Pkwy.	CDWM – Water

	Water	Existing FH in SE corner of intersection and FH at approximately STA 600+80RT	CDWM – Water
	Sewer	Combined sewer drains south bridge approach, joins sewers along W Harrison St, then flows south along Central Park Ave South of W Harrison St.	CDWM – Sewer
	Gas	4" gas main on east leg of intersection. 6" gas line on north leg intersection. Gas main cover in this intersection may be less than 36" and steel or reinforced plastic protection plates (FRP) may be present. Extra precaution to be taken during excavation. See additional notes on plans.	Peoples Gas (PGL)
I-290	Water	A 12" water main crosses I-290 adjacent to Central Park Ave	CDWM – Water
	Water	Active CDWM 13' water tunnel crosses I-290 below Central Park Ave	CDWM – Water
	CTA	CTA duct bank along I-290, adjacent to south barrier wall of WB I290.	CTA
	CTA	CTA 12 duct package along I-290 in between EB &WB CTA tracks.	CTA

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-D	Tom Laskowski Janet Ahern (New Plans) Stan Plodzien (AT&T – D) Jamie Gwin (AT&T – D))	(630) 573-6414 (630) 408-7267 (630) 573-5453 (630) 573-5423 (630) 573-6496	g05256@att.com sp3264@att.com jg8128@att.com ja1763@att.com
AT&T – T (Transmission/Core/ Legacy/Long Distance /Long Lines)	Vanessa Ross (New Plans) Edward Tilton Rich Meyers, Ken Caudill	(630) 215-7567	vf2021@att.com rcm5@sbcglobal.net Edward.Tilton@kci.com Ken.Caudill@kci.com
Comcast	Thomas Munar Bob Schulter Robert Stoll Martha Gieras	(224) 229-5861 (224) 229-5849	Thomas_Munar@comcast.com Bob_Schulter@comcast.com Robert_Stoll@comcast.com Martha_Gieras@comcast.com htinspector@comcast.net
ComEd	Vincent Mazzaferro John Leibforth (Large Customer Accounts)	(779) 231-1027 (872) 395-1872 (312) 758-8838	Vincent.MazzaferroPE@ComEd.com Plansubmittalsandmaprequests@

			exeloncorp.com john.leibforth@comed.com
Crown Castle (Sunesys, Lightower, & Sidera)	Mike Kyriazakos John Pyka	(847) 370-7617 (312) 415-8184	Michael.Kyriazakos@crowncastle.com John.Pyka@crowncastle.com Fiber.dig@crowncastle.com
Crosstown	Samantha Curley	(845) 282 6962	scurley@hbkengineering.com
JC Decaux North America	Miguel Mejia	(312) 456-2977	Miguel.mejia@jcdecaux.com
Peoples Gas	Laura Doyle, Annie-Beryl Akuamoah, Catrina Farr, Eric Stall, Sandy Salinas, Randy Perez, & Shirgena Washington	(312) 240-4779, (312) 240-4016, (312) 240-7394 & (866) 556-6002	laura.doyle@peoplesgasdelivery.com, erin.emhoff@peoplesgasdelivery.com, annie-beryl.akuamoah@peoplesgasdelivery.com, catrina.farr@peoplesgasdelivery.com, erstall@integrysgroup.com, erin.emhoff@peoplesgasdelivery.com, Sandra.salinas@peoplesgasdelivery.com, Randy.perez@peoplesgasdelivery.com,Shirgena.washington@peoplesgasdelivery.com
Chicago Park District	Clem Taylor	(312) 742 4695	Clem.taylor@chicagoparkdistrict.com
City of Chicago Department of Water Management. – Sewer Section	Anupam Verma Chuck Mann Brendan Schreiber Pablo Martinez Jason McCubbin Patrik Maloney	(312) 744-5070 (312) 744-0344 (312) 742-7226	Anupam.Verma@cityofchicago.org Chuck.Mann@cityofchicago.org Brendan.Schreiber@cityofchicago.org Pablo.Martinez@cityofchicago.org Jason.mccubbin@dwmpmo.net Patrick.Maloney@cityofchicago.org
City of Chicago Department of Water Management – Water Section	Jason McCubbin Vito Montana Rolando Villalon Angela Krueger Hans Krueger (CDWM) Consuelo Venegas	(312) 217-7928 (312) 742-3619 (312) 744-5070	IDOT Construction or the IDOT Contractor should send an e-mail to the CDWM - Water CTR general email FACM@ctrwater.net and carbon copy Jason McCubbin at Jason.mccubbin@dwmpmo.net at least a couple of days prior to needing a CDWM- Water inspector on site. Jason McCubbin can be contacted

			directly by telephone at (312) 217-7928. Jason.mccubbin@dwmpmo.net brian.santi@ctrwater.net angela.krueger@cityofchicago.org hans.krueger@cityofchicago.org consuelo.venegas@cityofchicago.org
City of Chicago CDOT Div of Engineering Electrical Const. Mgmt.	Bernard Fiorito Jose Vasquez Daniel F Grigas Adeeel Ansari Anthony Vieu Yi Zhang	(312) 746-4636 (312) 743-1175 (312) 742-8556	Bernard.Fiorito@cityofchicago.org Jose.Vasquez@cityofchicago.org Daniel.Grigas@cityofchicago.org Adeel.Ansari@cityofchicago.org Anthony.Vieu@cityofchicago.org Yi.Zhang@cityofchicago.org

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 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. Additional locate requests will be at the contractor's expense.

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.

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.

WATER MAIN REMOVAL, 12”

Description. This work consists of cutting and removing existing water main at locations shown on the contract drawings.

General. The existing water main shall be cut, removed, and disposed of in accordance with the applicable portions of Section 561 of the Standard Specifications at the locations specified in the contract drawings.

Prior to removal, the Contractor shall submit the anticipated order of operations and schedule for the proposed water main work to the Engineer for review and approval.

Method of Measurement. This work shall be measured per FOOT of water main removed.

Basis of Payment. This work will be measured and paid for at the contract unit price per foot for WATER MAIN REMOVAL, 12”. The contract unit price includes all labor, equipment, excavation, and material costs necessary to remove the existing water main herein specified. The cut and cap of the water main at each removal limit will be paid for separately under the pay item CUT AND CAP EXISTING 12” WATER MAIN.

CUT AND CAP EXISTING 12” WATER MAIN

Description. This work consists of cutting and capping existing water main at locations indicated in the plans or as directed by the Engineer.

Construction Requirements. The Contractor shall sawcut the existing cast iron water main and install a mechanical joint end cap on the cut end. Thrust blocking shall be used against the end cap for additional restraint.

The Contractor shall coordinate with the Chicago Department of Water Management (CDWM) prior to, during, and after the cutting and capping process.

The portions of the existing cast iron water main that are in conflict with the construction of the northeast and southeast wingwalls and footings will be cut, capped and braced at the locations shown on the plans prior to the installation of the temporary soil retention system for the wingwall construction.

Method of Measurement. This work shall be measured complete in place per EACH.

Basis of Payment. This work will be measured and paid for at the contract unit price per each for CUT AND CAP EXISTING 12” WATER MAIN. The contract unit price includes all labor, equipment, and material costs and work herein specified. Removal of the existing water main and replacement after construction will be paid for separately under the applicable pay items.

STEEL CASINGS 24"

Description. This work shall consist of furnishing and installing water main casing pipe in an excavated trench and concrete wingwall penetration as shown on the plans or directed by the Engineer in the field.

Materials. The steel casing shall be in accordance with ASTM A53 and galvanized in accordance with ASTM A123.

Construction Requirements. At locations shown on the plans and where directed by the Engineer.

The water main shall be centered in the casing pipe and have a minimum four casing spacers placed per length, following manufacturer's recommendations. Spacers shall be configured to provide restraint against utility pipe movement due to flotation. The spacers shall be stainless steel. Additionally, water mains shall be installed with self-restraining casing spacers that provide axial thrust restraint to prevent pipe joint separation. Restrained casing spaces shall be provided at all pipe joints.

The annular space between the casing pipe and carrier pipe shall be sealed at both ends using modular, mechanical link-type seals. Installation shall be performed in accordance with the manufacturer's written instructions to provide a watertight, hydrostatic seal.

The Contractor shall submit shop drawings of the casing pipe, spacers, and link seals to the Engineer for approval prior to ordering material.

The Contractor shall coordinate with the Chicago Department of Water Management (CDWM) prior to, during, and after the casing pipe installation process.

Method of Measurement. This work shall be measured complete in place per FOOT from one end of the casing pipe to the opposite end of the casing.

Basis of Payment. This work will be measured and paid for at the contract unit price per foot for STEEL CASINGS 24". The contract unit price includes all labor, equipment, and material costs and work herein specified.

CDWM WATER SPECIFICATIONS

SECTION 01 30 00

HEALTH AND SAFETY PLAN

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes the requirements for providing a Health and Safety Plan.

B. Prevention of accidents on or near the Work is the Contractor's responsibility. The Contractor shall take all necessary precautions to assure the safety of all persons and property during performance of the Work and will protect the Work and adjacent property from damage. The Contractor will conform to all laws and regulations relating to health and safety. The Contractor shall designate a qualified representative responsible for safety.

C. The Contractor shall at all times be solely responsible for all aspects of safety in connection with the Work, including initiating, maintaining and supervising all safety precautions and plans. The Contractor shall perform the Work or ensure that it is performed, in a manner to avoid risk of injury to persons or damage to property and shall continuously inspect the Work, which includes all of the Contractor's materials, equipment and lower tier subcontractors, to discover the existence of any conditions which impose a risk of bodily injury or damage to property.

1.2 SUBMITTALS

A. Prior to beginning the Work, The Contractor shall submit for the Commissioner's review, a written Safety Plan, with detail commensurate with the Work. Such Plan shall be prepared by an appropriate health or safety professional and shall describe anticipated hazards and control methods. The Contractor will employ to administer a Safety Plan which provides adequate safeguards for all construction employees, the Commissioner's employees, site visitors, and the public. The Plan's safety measures, policies and standards shall conform to those required or recommended by governmental and quasi-governmental authorities having jurisdiction and by the Commissioner, including, but not limited to, requirements imposed by the Contract Documents.

PART 2 – PRODUCTS - (Not Applicable)

PART 3 - EXECUTION

3.1 The Safety Plan must include, at a minimum, the following components:

A. **Training.** The Contractor is responsible for the safety education of their employees. The training must comply with all laws and standards and include additional training for site supervision. Training must continue through the term of the Contract. The Contractor shall provide copies of training certificates to the Commissioner for all operations, which require such training. These documents must be submitted prior to performing the Work. As a minimum, the following training is required:

1. Supervisor Safety Training – must cover record keeping, incident investigation, OSHA inspections, H&S documentation requirements, and the OSHA 10 hour course for construction.
2. Competent Person Training – each person designated as a competent person shall attend training on that particular operation. Operations requiring a competent person per OSHA requirements include, but are not limited to, trenching and excavation, fall protection, scaffolds, confined space entry, and rigging.
3. Employee Orientation Training – must cover the various safety policies, safety manuals, first aid availability, accident reporting procedures, safety meeting participation, personal protective equipment, and enforcement procedures.
4. Emergency Procedures – must cover notification procedures, evacuation routes, mustering points, and accountability.
5. Safety Meetings – must be conducted weekly with all Subcontractor's onsite personnel. Documentation detailing the subject discussed and signatures of all participants must be kept for each meeting.
6. Hazard Communication Standard – must cover all aspects of the standard including MSDSs, chemicals onsite, labeling and the written program. Annual re-training is required.
7. Lockout / Tagout – must cover each individual piece of machinery or equipment that is to be serviced or altered during this Project.

B. **Incident Investigation**. The Contractor must report all OSHA recordable injuries and any property damage to the Commissioner immediately (within 1 hour of incident). An incident investigation must be conducted and a complete report issued to the Commissioner within twenty-four (24) hours of incident.

C. **Emergency Procedures and First Aid/Medical Services**. The Contractor must meet OSHA's first aid requirements and provide at least one (1) onsite employee possessing a current training certification in CPR and First Aid.

D. **Record Keeping**. Project-specific OSHA 300 and first aid logs must be maintained onsite at all times.

E. **Personal Protective Equipment**. The Contractor shall provide and inspect all personal protective equipment (PPE). In addition, the Contractor shall enforce the use of PPE by its employees, as specified in the project health and safety plan. Minimum PPE for the Commissioner projects includes: hard hats, safety glasses, hard soled work boots and high visibility warning vests (meeting ANSI/ISEA 107-2004 standards) when personnel are in proximity to moving equipment. The minimum dress code for the Commissioner projects includes appropriate clothing (long pants and sleeved shirts that must cover torso).

F. **Competent Person**. The Contractor agrees to provide a competent person onsite at all times during operations which require such according to the OSHA regulations. This person must be experienced in the operation and have received detailed training on the regulations pertaining to the operation. The competent person shall perform a daily inspection of the operation.

G. **Housekeeping and Site Services**. The Contractor is solely responsible for housekeeping in their work areas. Good housekeeping is essential for all work performed at any of the Commissioner's sites. The Contractor is responsible to supply drinking water, adequate toilets, washing facilities, fire extinguishers, first aid kits and jobsite posters per OSHA requirements.

3.2 The Contractor shall designate a qualified safety representative with responsibility for preventing accidents and implementing and supervising the Safety Plan and other safety programs. The safety representative shall attend all project safety meetings, participate fully in all activities outlined in the Safety Plan and shall devote whatever time is necessary to perform such duties properly.

END OF SECTION 01 30 00

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SECTION 01 32 23

CONSTRUCTION STAKING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes the establishing and maintaining lines and grades for construction.

1.2 QUALITY ASSURANCE

A. Work is to be performed by a professional having appropriate equipment and experience in construction staking.

PART 2 – PRODUCTS - (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL

A. All work under this Contract must be constructed in accordance with the lines and grades shown on the Plans, specified, or as directed by the Commissioner. The Contractor has full responsibility for keeping alignment and grade.

3.2 REFERENCE MARKS FOR CONSTRUCTION

A. Reference marks for line and grade will be set by the Commissioner as the Work progresses and will be located to cause as little inconvenience to the prosecution on the Work as possible. The Contractor must so place excavation and other materials as to cause no inconvenience in the use of the reference marks provided. The Contractor must remove any obstructions placed that are contrary to this provision.

B. The Contractor must furnish stakes and other such materials and give such assistance, including the supervision of a Registered Professional Engineer or a Professional Land Surveyor in the State of Illinois, and qualified helpers, as may be required by the Commissioner for setting line and grade reference marks. This process is considered incidental to the establishing and maintaining of lines and grades and no additional payment will be allowed. The Commissioner will establish controlling points for benchmarks and base lines. The Contractor must check such lines and grades by such means as are deemed necessary and, before using them, must call the Commissioner's attention to any inaccuracies. The establishment of all working or construction lines and grades as required from the reference marks set by the Commissioner is considered incidental to the construction and no additional payment will be allowed. Also, the Contractor has sole responsibility for the accuracy of the working or construction lines and grades. The Contractor, however, is subject to the check and review of the Commissioner.

C. The Contractor must keep the Commissioner informed in a reasonable time in advance as to the Contractor's need for line and grade reference marks in order that they may be furnished, and all necessary measurements made for record and payment with minimum inconvenience to the Commissioner and minimum delay to the Contractor.

D. The Contractor must verify all distances and elevations prior to removing any material or ordering any material. The distances and angles shown on the drawings are for information only. The City makes no guarantees as to the accuracy of the measurements shown.

E. It is the intention not to delay the Work for the establishment of reference lines and grades, but when necessary, working operations may be suspended for such reasonable time as the Commissioner may require for this purpose.

3.3 PRESERVATION OF REFERENCE MARKS

A. The Contractor must safeguard all points, stakes, grade marks, monuments,

and bench marks made or established on the Work, reestablish them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining, protecting, or removing without authorization such established points, stakes, and marks.

END OF SECTION 01 32 23

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SECTION 01 32 38

TELEVISED INSPECTION OF WATER MAINS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes requirements for televising the interior of existing water mains for the purpose of evaluating their physical condition.

1.2 SUBMITTALS

A. Videotaped inspections must be recorded on a DVD read only format. Recordings are to be in high quality color. Printed labels on DVD containers must include the contract name and number, date of inspection, and the location of the inspection.

B. Provide written report of the water main video results. Identify all defects in the pipeline as follows: Location of item in feet from entry point and location on pipe interior surface of pipe (degree from horizontal). Number each defect and provide a diagram of the total pipe length inspected indicating the location of each defect by number. Include a table on the diagram with the additional information about each defect.

1. Provide three (3) draft copies of the report.

2. After review by DWM, incorporate comments, and provide three (3) copies of final report.

1.3 QUALITY ASSURANCE

A. Work is to be performed by a professional video operator having appropriate equipment and significant documentable experience in televising similar types of work.

B. The entire televised inspection process must be done in the presence of the Commissioner or his representative.

PART 2 – PRODUCTS – (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor will not be entitled to any additional days due to delays in securing the videotaping services of a private vendor.

3.2 PROTECTION OF PIPELINE

A. Remove all dirt, debris and other foreign material from any equipment, cables and accessories to be placed within the pipeline. Clean all televising equipment, cables and accessories with a disinfectant solution of 100 ppm chlorine solution prior to placing equipment within the pipeline.

3.3 TELEVISING PROCEDURES

A. Televising must be done one (1) section at a time, each section isolated from the remainder of the line as required or directed by the Commissioner.

B. The camera must be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the condition of the line, but in no case may the television camera be pulled at speed greater than 30-feet per minute. Panning and zoom rates must be controlled to maintain clarity of the documented items during playback. Manual winches, power winches, TV cable and powered rewinds, or other devices that do not obstruct the camera view or interfere with proper documentation of the line conditions may be used to move the camera through the line.

C. Whenever non-remote powered and controlled winches are used to pull the television camera through the pipe line, a suitable means of communication must be set up between the access pits of the section being inspected to ensure adequate communication exist between members of the televising crew. Measurement for the location of defects must be above ground by means of a metering device. Marking the cable or similar methods to determine measurement or location which requires interpolation is not acceptable.

D. The accuracy of the measurement meters must be checked daily by use of a walking meter, roll-a-tape, or other suitable device. Footage measurements must begin at the entrance of the pipe, unless permission is given by the Commissioner to do otherwise. Footage must be shown on the video data view at all times.

E. Camera, cables, supports and all appurtenant equipment placed in the water main must be thoroughly cleaned of dirt and debris, and disinfected with chlorine solution with a chlorine concentration of at least 50 parts per million.

3.4 DOCUMENTATION OF TELEVISING

A. Audio and written documentation must accompany all videotapes submitted to the Commissioner.

B. The voice recording on the videotapes must make brief but informative comments on data of significance, including, but not limited to, the locations of unusual conditions, side connections, the presence of scale and corrosion, and other discernible features.

C. The video(s) must include the following information:

1. Data View:
   a. Report Number.
   b. Date of TV inspection.
   c. Upstream and downstream access pit or station numbers.
   d. Current distance along reach (tape counter footage).

2. Printed labels on tape container and tape cartridge must include location, date, format, and other descriptive information.

D. The following items are to be documented as per 1.2.B:

1. Cracks

2. Pitting

3. Corrosion

4. Tuberculation

5. Mineral Deposits

6. Failure of Cement Lining

7. Internal Joint Seals

8. Connections: Water Main, Services, Hydrant Leads including sizes.

3.5 REMOVAL OF DEBRIS

A. If debris is found to exist in the water main, the Contractor must remove the debris.

3.6 FOLLOW UP TELEVISING

A. Upon removal of debris, the Contractor must again televise the water main to assure all debris has been removed to the satisfaction of the Commissioner. This televising is considered incidental to the water main inspection and no additional payment will be allowed.

END OF SECTION 01 32 38

SECTION 01 40 00

QUALITY CONTROL

PART 1 - GENERAL

1.1 SCOPE

A. This section includes requirements for the implementation of the Contractor's quality control program.

1.2 SITE INVESTIGATION AND CONTROL

A. The Contractor shall check and verify all dimensions and conditions in the field continuously during construction. The Contractor shall be solely responsible for any inaccuracies built into the Work due to the Contractor's failure to comply with this requirement.

B. The Contractor shall inspect related and appurtenant Work and report in writing to the Commissioner any conditions that will prevent proper completion of the Work. Failure to report such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor solely and entirely at the Contractor's expense.

1.3 INSPECTION OF THE WORK

A. All Work performed by the Contractor shall be inspected by the Contractor and non-conforming Work and any safety hazards in the site of the Work shall be noted and promptly corrected. The Contractor shall be responsible for the Work to be performed safely and in conformance to the Contract Documents.

B. The Work shall be conducted under the general observation of the Commissioner and is subject to inspection by representatives of the City acting on behalf of the City to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The Commissioner or any inspector(s) shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.

C. The presence of the Commissioner, or any inspector(s), however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with all the requirements of the Contract Documents. Compliance is the responsibility of the Contractor. No act or omission on the part of the Commissioner, or any inspector(s) shall be construed as relieving the Contractor of this responsibility. Inspection of Work later determined to be non-conforming shall not be

cause or excuse for acceptance of the non-conforming Work. The City may accept non-conforming Work when adequate compensation is offered and it is in the City's best interest as determined by the City.

D. All materials and articles furnished by the Contractor shall be subject to rigid documented inspection, by qualified personnel, and no materials or articles shall be used in the Work until they have been inspected and accepted by the Commissioner or other designated representative.

1.4 SAMPLING AND TESTING

A. The Contractor shall retain and pay for an independent materials testing laboratory approved by the Commissioner and the City. This independent testing agency will develop and submit a testing plan for quality assurance on each type of work activity. The testing laboratory shall document the processes and procedures utilized to verify and maintain quality work. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the most current standards, as applicable to the class and nature of the article or materials considered. However, the Commissioner reserves the right to use any generally accepted system of inspection which, in the opinion of the Commissioner, will assure the Commissioner that the quality of the workmanship is in full accord with the Contract Documents.

1. The Contractor may retain and pay for a qualified testing materials laboratory (approved by CDOT and IDOT); subject to the review and approval of the Commissioner, in lieu of using an independent testing agency. The qualified testing materials laboratory shall meet all CDOT and IDOT standards as a testing materials laboratory, and all applicable criteria within this specification section.

B. The City reserves the right to abbreviate, modify the frequency of, or waive tests or quality assurance measures, but waiver of any specific testing or other quality assurance measure, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, the City shall reserve the right to make independent investigations and tests as specified in the following paragraph and failure of any portion of the Work to meet any of the qualitative requirements of the Contract Documents, shall be reasonable cause for the City to require the removal or correction and reconstruction of any such Work.

D. In addition to any other inspection or quality assurance provisions that may be specified, the City shall have the right to independently select, test, and analyze, at the expense of the City, additional test specimens of any or all of the materials to be

used. Results of such tests and analyses shall be considered along with the tests or analyses made by the Contractor to determine compliance with the applicable specifications for the materials so tested or analyzed, provided that wherever any portion of the Work is discovered, as a result of such independent testing or investigation by the Commissioner, which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such Work shall be borne by the Contractor.

1.5 CONTRACTOR'S QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

A. Inspection and Tests:

1. The Contractor shall maintain and provide to the Commissioner, within two (2) working days of completion of each inspection and test, adequate records of all such inspections and tests. Inspection and test results shall be documented and evaluated to ensure that requirements have been satisfied.

2. The Contractor shall provide verification and control of all testing provided including, but not limited to:

c. Individual test records will contain the following information:

(1). Item tested: item number and description.

(2). Test results.

(3). Test designation.

(4). Test work sheet including location sample was obtained.

(5). Acceptance or rejection.

(6). Date sample was obtained.

(7). Retest information, if applicable.

(8). Control requirements.

(9). Tester signature.

d. Maintaining copies of all test results.

e. Ensuring that the Commissioner receives independent copies of all tests.

f. Ensuring that testing laboratories are functioning independently and in accordance with the requirements of these Specifications.

g. Ensuring re-tests are properly taken and documented.

H. Control of Measuring and Test Equipment: Measuring and/or testing instruments shall be adequately maintained, calibrated, certified and adjusted to maintain accuracy within prescribed limits. Calibration shall be performed at specified periods against valid standards traceable to nationally recognized standards and documented.

I. Supplier Quality Assurance: The Contractor shall insure that procured products and services conform to the requirements of these Specifications. Requirements of these procedures shall be applied, as appropriate, to lower-tier suppliers and/or subcontractors. QC inspections and certifications may not be deferred to the Contractor's subcontractors or suppliers.

J. Deficient, Defective, and Non-conforming Work Corrective Action:

1. The contractor shall investigate the cause of conditions that adversely effect the quality be determine and documented and measures implemented to prevent recurrence. In addition, at a minimum, this procedure shall address:

a. Personnel responsible for identifying deficient and non-complying items within the Work.

b. Tracking processes and tracking documentation for deficient and non-compliant items.

c. Personnel responsible for achieving resolution of outstanding deficiencies.

d. Once resolved, how the resolutions documented and by whom.

1.6 TESTING SERVICES

A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to Commissioner. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped and fully qualified to perform the tests in accordance with the specified standards. All standard quality assurance testing and installation verification testing will be at the expense of the Contractor.

B. The Contractor's independent testing laboratory shall be accredited by the American Association of State Highway and Transportation Officials (AASHTO) for the tests they will perform and as appropriate to the construction work being performed. The Contractor's laboratory shall also be AASHTO accredited in accordance with the requirements of ASTM C1077-92, "Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation"; ASTM D3740, "Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design/Construction"; and ASTM D3666, "Specifications for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials"; ACI, American Concrete Institute standards, and specified industry standards, for sewers, waterlines, sidewalks, curbs, and other applicable work. The independent testing laboratory shall be submitted to CDOT for approval.

C. Testing, when required, will be in accordance with all pertinent codes and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM).

D. The Commissioner shall have the right to inspect work performed by the independent testing laboratory both at the project and at the laboratory.

E. The Contractor shall obtain the Commissioner's acceptance of the testing firm before having services performed, and shall pay all costs for these testing services.

F. Testing services provided by City, if any, are for the sole benefit of City, however, test results shall be available to the Contractor. Testing necessary to satisfy the Contractor's internal quality control procedures shall be the sole responsibility of the Contractor.

G. Laboratory Duties:

1. Cooperate with the Commissioner and the Contractor.

2. Provide qualified personnel promptly on notice.

3. Perform specified inspections, sampling and testing of materials and methods of construction.

4. Comply with specified standards and other recognized authorities and as specified.

5. Ascertain compliance with requirements of the Contract Documents.

6. Promptly notify the Commissioner and the Contractor of irregularity or deficiency of Work, which are observed during performance of services.

7. Perform additional services as required.

8. Promptly submit two (2) written copies and one (1) electronic copy of the report for each test to the Commissioner. Transmit to the Commissioner within three (3) workdays after each test is completed. Each report for each type of test shall be consecutively numbered. Each report shall include:

    a. Date issued.

    b. Project title and number.

    c. Testing laboratory name and address.

    d. Name and signature of inspector.

    e. Date of inspection or sampling.

    f. Record of temperature and weather.

    g. Date of test.

    h. Identification of product and Specification section.

    i. Location of Project.

    j. Type of inspection or test.

    k. Results of test.

    l. Observations regarding compliance with the Contract Documents.

9. Laboratory is not authorized to:

    a. Release, revoke, alter or enlarge on requirements of the Contract Documents.

    b. Approve or accept any portion of the Work.

H. Testing Services Furnished by the Contractor

I. Unless otherwise specified, and in addition to all other specified testing requirements, the Contractor shall provide all testing services as required for the Commissioner's review:

1. Concrete strength tests.

2. Moisture-density and relative density tests on embankment, fill, and backfill materials.

3. In-place field density test on embankments, fills, and backfill.

4. Other materials and equipment as specified in this section.

5. Concrete materials and mix designs.

6. Embankment, fill, and backfill materials, density, optimum moistures, and compaction.

7. All other tests and Engineering data required for the Commissioner's review of materials and equipment proposed to be used in the Work

8. Testing, including sampling, shall be performed by the Contractor's testing firm's laboratory personnel, in general manner and frequency indicated in these Specifications. The Commissioner and/or the City shall have the right to stipulate the location of the confirmation tests. The Contractor shall provide preliminary representative samples of materials to be tested to the laboratory, in required quantities.

9. The testing firm's laboratory shall perform all laboratory tests within a reasonable time consistent with the specified standards and will furnish a written report of each test.

10. The Contractor shall furnish all sample materials and cooperate in the testing activities, including sampling. The Contractor shall interrupt the Work when necessary to allow testing, including sampling to be performed. The Contractor shall have no claim for an increase in Contract Price or Contract Times due to such interruption. The Contractor shall be responsible for transporting all samples, except those taken by testing laboratory personnel, to the testing laboratory.

11. When testing activities, including sampling are performed in the field by the test firm's laboratory personnel, the Contractor shall furnish required labor and facilities:

    a. To provide access to Work to be tested.

    b. To obtain and handle samples at the site of the Work.

    c. To facilitate inspections and tests.

    d. Build or furnish a holding box for concrete cylinders or other samples

as required by the laboratory.

12. Where such inspection and testing are to be conducted by an independent laboratory agency, the sample or samples shall be selected by such laboratory or agency or the Commissioner and shipped to the laboratory by the Contractor at the Contractor's expense.

13. Notify laboratory sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.

14. The Contractor shall be responsible for furnishing all materials necessary for testing.

J. Transmittal of Test Reports: Written reports of tests and Engineering data furnished by the Contractor for the Commissioner's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings. Final transmittal of all Project testing records will be required as a final close-out submittal for the release of retainage.

1. The Contractor shall promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in the progress of the Work.

K. The Contractor shall provide copies of all correspondence between the Contractor and testing agencies to the Commissioner.

L. Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

M. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

N. Schedules For Testing:

1. Establishing Schedule:

a. The Contractor shall, by advance discussion with the testing laboratory determine the time required for the laboratory to perform its tests and to issue each of its findings, and make all arrangements for the testing laboratory to be on site of the Work to provide the required testing.

b. The Contractor shall provide all required time within the construction schedule.

c. When changes of construction schedule are necessary during construction, the Contractor shall coordinate all such changes of schedule with the testing laboratory as required.

END OF SECTION 01 40 00

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SECTION 01 42 00

REFERENCES, DEFINITIONS AND ABBREVIATIONS

PART 1 – GENERAL

1.1 FORM OF SPECIFICATIONS

A. Wherever used in the Specifications, the following terms have the meanings indicated which are applicable to both the singular and plural form of the word.

B. Where "as shown," "as indicated," and "as detailed," or words of similar import are used, it is understood that reference to the Drawings is made unless stated otherwise. Where "as directed," "as permitted," "approved," or words of similar import are used, it is understood that the direction, requirements, permission, approval, or acceptance of the City is intended unless stated otherwise.

1.2 DEFINITIONS

A. Addenda: Written or graphic instruments issued prior to the opening of bids, which clarify, modify, or interpret the Contract Documents.

B. Agreement: The written Contract, which is evidence of the agreement between the City and the Contractor covering the Work.

C. Arterial Streets: Major streets where special construction techniques may be required by CDOT.

D. Chief Procurement Officer: The Chief Procurement Officer of the City of Chicago.

E. City: The City of Chicago.

F. Commissioner: The Commissioner of the City of Chicago Department of Water Management or the Commissioner's duly authorized representative.

G. Completion: All tests performed and accepted, water services transferred, connections made, and abandonment's completed.

H. Comptroller: The City Comptroller of the City of Chicago or the Comptroller's successor or successors upon whom the Comptroller's duties are transferred.

I. Contract: The entire and integrated written agreement between the City and the Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

J. Contract Documents: The Agreement, Addenda, Contractor's bid, and related documentation when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, the General Conditions, the Special Conditions, the Specifications and the Drawings, together with all Written Orders which completely describe the technical requirements of the Project including bid, Contract, and construction procedures.

K. Contract Notice: A written notice from the Chief Procurement Officer mailed to the Contractor at the address designated in the Contractor's proposal or to such other address as the Contractor may designate in writing as Contractor's official place of business, transmitting to the Contractor an executed copy of the Contract.

L. Contractor: The person, firm, or corporation with whom the City has executed the Contract, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

M. Defective: An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty, or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the

Contract Documents, or has been damaged prior to final acceptance.

N. Department: The City of Chicago Department of Water Management.

O. Drawings or Plans: The part of the Contract Documents, which shows the characteristics, and scope of the work to be performed and which have been prepared and approved by the Engineer.

P. Engineer: The Deputy Commissioner of the Bureau of Water Engineering Services or the Deputy Commissioner's duly authorized representative.

Q. Force Account: The method of payment for extra work performed.

R. Furnish: Furnish means supply and deliver to the Work area, ready for unloading, unpacking, assembly, installation, and similar operations.

S. Install: Install means the actual unloading, packing, assembly, erection, constructing, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

T. Municipal Code: The Municipal Code of the City of Chicago.

U. Neat Lines: The required clear width of a trench or excavation. In sheeted trenches, the required width is measured to the outside of the sheeting. Unless noted elsewhere on the Plans, neat line clear width is equal to:

1. the sum of the outside diameter of the pipe plus 2-feet for water main construction.
2. the sum of the outside diameter of the pipe plus 8-feet for sewer construction.
3. the sum of the outside diameter or edge plus 4-feet for structure construction

V. Notice to Bidders: The advertisement for bids, the official notice inviting bids for the work to be done.

W. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

X. Project: The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents. Refer to the definition, terms and conditions for "Project" in Book 1 of the Contract Documents.

Y. Provide: Furnish and Install as required.

Z. Samples: Physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

AA. Shop Drawings: All drawings, diagrams, illustrations, brochures, schedules, and other data, which are prepared by the Contractor, Subcontractor, manufacturer, supplier, or distributor, which illustrates how specific portions of the Work are proposed to be fabricated or installed.

BB. Site and/or Work Area: The lands and other places on, under, in, or through which the Work is to be executed or carried out and any other lands or places provided by the City for the purposes of the Contract, together with such other places as may be specifically designated in the Contract Documents as forming part of the Site and/or Work Area.

CC. Specifications: A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards, and workmanship.

DD. State: The State of Illinois.

EE. Subcontractor: An individual, firm, or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the Site. The term Subcontractor is referred to

throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.

FF. Sub-Order: A project (within this Term Agreement) for total construction of the Work to be performed in whole, or part as indicated elsewhere in the Contract Documents. "Sub-Order" shall be synonymous and interchangeable with the term "Project", including all "Project" terms and conditions as defined in Book 1 of these Contract Documents.

FF. Supplier: Any person, supplier, or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the Site. A supplier is not a Subcontractor who purchases an item or equipment from a manufacturer or supplier.

GG. Unit Price: A cost per unit of work or measurement of material, for a bid item.

HH. Work: All labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction. Work is also used to mean the same as Project.

II. Written Order: A directive, written and signed by the Commissioner, delivered to the Contractor at the address designated in the Contractor's bid or to such other address as the Contractor may designate in writing as Contractor's official place of business.

1.3 CITATION OF OTHER SPECIFICATIONS

A. Commonly used abbreviations have the meanings as specified in this Section. The plans may contain a list of additional abbreviations applicable thereto. Whenever the Contract Documents refer to the specifications of any society, institute, association, or governing organization, the specifications cited will become a part of this Contract as if written herein in full.

1.4 ABBREVIATIONS

A. AASHTO:	American Association of State Highway & Transportation Officials.
B. ACI:	American Concrete Institute.
C. AISC:	American Institute of Steel Construction.
D. ANSI:	American National Standards Institute.
E. APWA:	American Public Works Association.
F. ASCE:	American Society of Civil Engineers.
G. ASME:	American Society of Mechanical Engineers.
H. ASTM:	American Society for Testing and Materials.
I. AWS:	American Welding Society.
J. AWWA:	American Water Works Association.
K. CCD:	Chicago City Datum.
L. CDOT:	City of Chicago Department of Transportation.
M. CRSI:	Concrete Reinforcing Steel Institute.
N. FS:	Federal Specification Board.
O. IDOT:	Illinois Department of Transportation.
P. IEPA:	Illinois Environmental Protection Agency.
Q ISO:	Insurance Services Office of Illinois.

R. MWRD: Metropolitan Water Reclamation District of Greater Chicago.

S. NBFU: National Board of Fire Underwriters.

T. NBS: National Board of Standards.

U. NCMA: National Concrete Masonry Association.

V. NCPWB: National Certified Pipe Welding Bureau.

W. NEMA: National Electric Manufacturers Association.

X. NPT: National Pipe Thread.

Y. OSHA: Occupational Safety and Health Act.

Z. PCA: Portland Cement Association.

AA. SSRBC: Illinois Department of Transportation, Standard Specifications for Road and Bridge Construction.

BB. UL: Underwriters' Laboratory.

PART – 2 – PRODUCTS – (NOT APPLICABLE)

PART - 3 – EXECUTION – (NOT APPLICABLE)

END OF SECTION 01 42 00

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SECTION 33 11 13

DUCTILE IRON WATER PIPE AND FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes requirements for the installation of ductile iron water pipe and fittings as shown on the drawings and specified here.

1.2 WORK OF THIS SECTION SPECIFIED ELSEWHERE

A. Section 31 23 19 - Dewatering Excavations.
B. Section 31 23 10 - Excavation, Trenching and Backfilling.
C. Section 33 11 15 - Thrust Restraint for Water Main Piping.
D. Section 33 13 00 - Hydrostatic Testing and Disinfecting Water Mains.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM), latest edition:

1. AWWA C104 - Cement Mortar Lining for Ductile Iron Pipe and Fittings.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure pipe and Fittings.
5. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
6. AWWA C116 - Protective Fusion-Bonded Epoxy Coatings Int. and Ext. Surf. Ductile-Iron/Gray-Iron Fittings.
7. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
8. AWWA C151 - Ductile Iron Pipe, Centrifugally Cast.
9. AWWA C153 - Ductile Iron Compact Fittings for Water Service.
10. ASME/ANSI B16.1 - Flanges and Flanged Fittings.
11. ANSI B16.21 - Metallic Gaskets for Pipe Flanges.
12. ASME B18.2.1 - Square and Hex Bolts and Screws.
13. ASME B18.2.2 - Square and Hex Nuts.
14. ASTM A123 - Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
15. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel.
16. ASTM A240 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip, for Pressure Vessels and for General Applications.
17. ASTM A307 - Carbon Steel Bolts and Studs.

18. ASTM A536 - Ductile Iron Castings.
19. ASTM A767 - Zinc Coated (galvanized) Steel.
20. ASTM A775 - Epoxy Coated Steel.
21. ASTM A780-93 - Repair of Zinc Coated (Galvanized) Steel.
22. ASTM B308 – Stainless Steel Alloy Standard Structural Shapes, Rolled, or Extruded.
23. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
24. ANSI A21.5/AWWA C105 - Polyethylene Encasement.

1.4 SUBMITTALS

A. Refer to Book I for submittal requirements and procedures for Shop Drawings, Product Data, Records and Samples.

B. The Contractor must give notice in writing to the Commissioner, sufficiently in advance of his intention to purchase or place a special order for any pipe required to be installed under this contract. Fully dimensioned drawings and/or manufacturers' catalog cuts are to be submitted for review.

C. The Contractor must submit to the Commissioner certified copies of all test reports for test conducted on the pipe by the manufacturer when so requested by the Commissioner.

D. The Contractor must provide the Commissioner with a notarized statement that all tests have been made and met as specified.

1.5 QUALITY ASSURANCE

A. Each manufacturer supplying pipe for water mains under this contract must furnish all facilities, personnel, and materials to conduct tests required as applicable to the type of pipe being supplied, when requested by the Commissioner. The cost of all plant tests required as proof of the acceptability of the water main pipe will be considered incidental to the Work and no additional payment will be allowed.

B. **The Work performed on joining all pipe and fittings, must be performed by a plumber licensed in the State of Illinois or the City. This Work must include, but not be limited to, joining all pipe and fittings, installing joint gaskets, assembling all joints, installing continuity wedges, and tightening all gland nuts and bolts, as applicable for the installation.**

1.6 NOTIFICATION AND LIMITATIONS OF WATER MAIN SHUT DOWNS

A. **Whenever an existing water main or a section thereof is to be shut down during the course of construction, every individual consumer**

must be notified at least seventy-two (72) hours prior to the shut down. The Contractor must never operate, under any circumstances, an existing valve for a shut down or other purpose without first notifying and obtaining approval from the Commissioner.

B. **The time for a consumer shut down must not exceed eight (8) hours. Absolutely no shut downs will be permitted before 8:00 AM without approval from the Commissioner.**

C. In case of emergency shut downs, the Contractor must notify customers immediately. Notification may be verbal on a door-to-door basis. However, if a consumer cannot be contacted, a written notice must be placed at the property site showing all pertinent information regarding the shut down. The notice must show a telephone number the consumer may call for information or to express any problem that the consumer may have with the shut down.

D. If a consumer cannot withstand a planned shut down due to a dialysis machine being present or other medical reason, the Commissioner must be notified immediately.

E. All valves 16-Inches in diameter and larger must be operated only by personnel of the Department. Notify the Commissioner seventy-two (72) hours prior to the need for operation of the valve.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE

A. Ductile iron pipe must conform to the requirements of AWWA C151 and with the additions or substitutions specified in this Section.

B. Pipe bells must be designed to provide a watertight joint without leakage and must be capable of withstanding pressures exceeding those that will rupture pipe of this class and thickness without requiring additional jointing material.

C. Electrical conductivity must be provided at each joint on all push-on and mechanical jointed pipe 16-Inches in diameter and smaller, to facilitate thawing of frozen pipe and building water services. It must also be provided on pipe 24-inches in diameter and larger when building services are directly connected to the water main. Conductivity is to be accomplished by installing serrated silicon wedges as recommended or supplied by the pipe manufacturer. **The use of lead tip gaskets will not be allowed.** Wedges are to be installed in accordance with the requirements of paragraph C in Articles 3.6 and 3.7 of this specification.

D. All pipes must be manufactured so that where a cut is made at any point along the barrel, the cut end will fit properly into a standard mechanical joint bell and be drip tight at hydrostatic test pressure. All pipes shall be "gauged full length".

E. Exterior of pipe must be coated with a petroleum asphaltic material in conformance with AWWA C110, Section 10-10. Interior of pipe must be cement-mortar lined only, in accordance with AWWA C104; an asphaltic seal coat is not allowed, and shall not be used.

F. Pipe thickness and classes must conform to standards shown in Table A.

TABLE A PIPE THICKNESS AND CLASS

Pipe Size	Nominal Wall Thickness	Thickness Class
3-inch	0.34-inch	54
4-inch	0.38-inch	55
6-inch	0.40-inch	55
8-inch	0.45-inch	56
10-inch	0.47-inch	56
12-inch	0.49-inch	56
14-inch	0.48-inch	55
16-inch	0.46-inch	54
18-inch	0.44-inch	53
20-inch	0.45-inch	53
24-inch	0.50-inch	54
30-inch	0.47-inch	52
36-inch	0.53-inch	52
42-inch	0.59-inch	52
48-inch	0.65-inch	52
54-inch	0.73-inch	52
60-inch	0.77-inch	52

2.2 JOINTS

A. **LEAD JOINTS ARE NOT TO BE USED UNDER ANY CIRCUMSTANCES.**

B. Pipe joints must be push-on type joints unless otherwise noted on the drawings, specified here, or directed by the Commissioner. Push-on type joints must conform to AWWA C111.

C. Restrained joints when specified are to meet the following requirements:

1. Mechanical joint pipe with mechanical joint restraint glands. Mechanical joints must conform to AWWA C110. Gaskets must conform to Section 2.4 of this specification.

2. Restrained joint pipe with manufactured weldment, field weldments or manufactured locking rings, locking segments and runner retainers and appurtenances conforming to AWWA C110. Acceptable products are Super-Lock Pipe manufactured by Clow Water Systems Company; FlexRing Pipe or Lok-Ring Pipe manufactured by American Ductile Iron Pipe; or TRFLEX manufactured by United States Pipe and Foundry Company.

D. Mechanical Joint Restraint Glands.

1. Provide restraint glands at all mechanical joints.

2. Restraint glands must be designed for use with the standardized mechanical joint bell pipe conforming to AWWA C110 and AWWA C153. Restraint is to be incorporated into the design of the gland. Acceptable products for this use are Mega Lugs manufactured by EBAA Iron Works; Uniflange manufactured by Ford Meter Box; or Star Grip manufactured by Star Pipe Products.

3. Restraint is to be accomplished by the use of multiple, wedge style restraints. Proper actuation of the wedges is to be ensured with torque limiting twist off nuts.

4. Glands 3-Inches through 16-Inches are to be pressure rated at 350-psi; glands 18-Inch through 48-Inch are to be rated at 250 psi.

5. The gland body and restraint components are to be made from ductile iron conforming to ASTM A536, 65-45-12. Ductile iron wedges are to be heat-treated within a range of 370 to 470 BHN.

6. The joint is to be capable of full deflection during assembly and joint deflection after assembly

7. Provide glands with minimum weights and number of wedges as shown in Table B.

8. Retainer glands are not acceptable.

TABLE B – MINIMUM WEIGHT & NUMBER OF WEDGES PER RESTRAINED JOINT

Pipe Size.	Number of Wedges	Minimum Weight
3-inch	2	6.0-lbs
4-inch	2	7.0-lbs
6-inch	3	11.0-lbs
8-inch	4	14.5-lbs
10-inch	6	23.0-lbs
12-inch	8	28.5-lbs
14-inch	10	46.0-lbs
16-inch	12	52.0-lbs
18-inch	12	63.6-lbs
20-inch	14	71.0-lbs
24-inch	16	90.0-lbs
30-inch	20	190.7-lbs
36-inch	24	226.5-lbs
42-inch	28	400.0-lbs
48-inch	32	488.0-lbs

E. Flanged joints, when shown on the Drawings, specified, or directed by the Commissioner, must conform to the following:

1. Flanged joints must conform to AWWA C115. Flanges must be the long hub type, screwed on the threaded end of the pipe in the shop. There must be no leakage through the pipe threads. The flanges must be designed to prevent corrosion of the threads from the outside.

2. Flanges must be drilled according to the requirements of ANSI/ASME B16.1, Class 125 unless special drilling is called for on the Drawings, specified, or directed by the Commissioner. Bolt holes must be equally spaced, drilled smooth and true. When stud bolts are used flanges must be drilled and tapped to accommodate the studs.

3. The face of the screwed-on flange and plain-end of the pipe must be accurately refaced together, at right angles to the pipe axis. After facing and drilling, the face of the screwed-on flange must immediately be covered with an appropriate rust-preventive coating.

4. Flanged joints must be secured with either bolts and nuts, or stud bolts with a nuts. Bolts, stud bolts, and nuts must meet the

requirements of ASTM A307, Grade B. Bolts and stud bolts must conform to ANSI/ASME B18.2.1. Nuts must conform to ANSI/ASME B18.2.2. All bolts, stud bolts, and nuts must be primed with bitumastic paint after the bolts and nuts have been installed and tightened.

5. Gaskets must conform to Section 2.4 of this specification.

2.3 FITTINGS

A. Fittings to be furnished and installed as specified or shown on the Drawings must be mechanical joint, ductile iron, and full body type in accordance with AWWA C110. Laying length of mechanical joint castings must be as shown in AWWA C110. Wall thickness and allowable variation in the thickness of mechanical joint castings must conform to AWWA C110 and have a 250-psi pressure rating.

B. Compact fittings may not be used unless otherwise approved by the Commissioner.

C. Plain ends of mechanical joint fittings must be beveled and gauged to properly seat in push-on joint bells.

D. The fittings must be smooth and free from defects of every nature that would make them unfit for the use that they were intended. Plugging of fittings is not allowed. Repairing of defects by welding will be allowed if such repairs will not adversely affect the serviceability of the fittings or their ability to meet the strength requirements of the referenced AWWA standards.

E. All castings must be coated with a petroleum asphaltic material in conformance with AWWA C110, Section 10-10. Interior of pipe must be cement-mortar lined only, in accordance with AWWA C104; an asphaltic seal coat is not allowed, and shall not be used.

F. Flanged fittings must conform to AWWA C110, and have a 150-pound per square inch pressure rating.

2.4 GASKETS

A. All gaskets for pipe, fittings and appurtenances must be vulcanized natural or vulcanized synthetic rubber, non-porous, free of foreign materials and visible defects. Recycled rubber may not be used.

B. When soil conditions do not permit the use of natural or synthetic rubber gaskets and when directed by the Commissioner, all gaskets for pipe, fittings and appurtenances must be Nitrile (acrylonitrile butadiene), nonporous, free of foreign materials and visible defects.

C. Gaskets for flanged joints must be of the ring type, 1/16-Inch thick, and meet the requirements of ANSI Standard B16.21. Acceptable manufactures for gaskets type as manufactured by the Crane Company; Garlock Packing Company; or U.S. Rubber Company.

D. Gaskets must be stored in a cool place and protected from light, heat, oil, or grease until installed. Any gasket showing signs of cracking, weathering, abrasion or other deterioration will be rejected.

2.5 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement material must be either 8-mil, low density or 4-mil, cross-laminated, high-density polyethylene tubing in accordance with AWWA C105.

2.6 TRANSITION SLEEVES

A. Transition sleeves for pipe 16-inches in diameter and smaller must be of type as manufactured by Dresser, Style 253 Modular Cast Couplings; Smith Blair, Type 441 Cast Transition Couplings; Ford, Style FC2A Transition Couplings; Power Seal, Model 3501 Transition Couplings; or JCM Industries Model 212 Transition Couplings.

Transition sleeves for pipe diameter greater than 16-inches must be of type as manufactured by Ford, Style FC2A or Style FC5 Transition Couplings; Romac Industries, Style 501 Transition Couplings; Dresser Style 38, Style 62, or Style 138 Transition Couplings; or Power Seal, Model 3501 Transition Couplings; or Smith Blair, Type 441 Cast Transition Couplings.

B. Transition sleeves must be designed to join class "B" pit cast iron pipe to AWWA C111/C151 standard ductile iron pipe. They must provide for pipe misalignment and settlement deflection and make a leak proof non-soldered joint, which allows for limited line movement due to expansion and contraction. Design couplings for a minimum rated working pressure of 150-pounds per square inch.

C. Transition sleeves pipe 16-Inches in diameter and smaller must be constructed of ductile iron conforming to ASTM A536. Transition sleeves for pipe diameters greater than 16-Inches must be constructed of ductile iron conforming to ASTM A536 or carbon steel conforming to ASTM A36. Ends must have a smooth inside taper for uniform gasket seating. The follower flanges must be ductile iron conforming to ASTM A536 or carbon steel conforming to ASTM A36.

D. Transition sleeves must be shop coated inside and outside with fusion bonded epoxy coating conforming to AWWA C-213.

E. Gaskets must be of molded rubber conforming to ASTM C564 for potable water service.

F. Bolts and nuts must be 5/8-Inch in size and must be Grade 304L stainless steel, annealed. Nuts must be Teflon coated to prevent galling during storage.

G. Each transition sleeve must be supplied with four electrical continuity brackets for electrical continuity across the sleeve. The angle bracket must be made from ASTM A240-T304 stainless steel with a stainless steel set screw.

H. Contractor must field measure the existing cast iron water main for exact size of outer dimension and degree of out-of-roundness at the location to install the transition sleeve prior to ordering and installing the transition sleeve for that location.

2.7 PIPE SUPPORT SYSTEMS AND HANGERS (INTENDED FOR PERMANENT INSTALLATIONS)

A. Manufactured pipe support systems, fasteners, and miscellaneous hardware must be fabricated from high strength stainless steel conforming to ASTM B308, or hot-dipped galvanized steel conforming to ASTM 123 and ASTM 153. Pipe support systems must be designed to have a minimum load safety factor of three (3) times the anticipated loading.

B. Field fabricated pipe support systems, fasteners, and miscellaneous hardware must be cold-galvanized by painting metal surfaces with a 2-mil thick coating of ethyl silicate in-organic zinc-rich paint primer per manufacture's directions. Galvanized primer must be completely dry before backfilling the excavation. Field fabricated pipe support systems must be designed to have a minimum load safety factor of three (3) times the anticipated loading.

C. Repair damaged galvanized coated surfaces in accordance with ASTM A780-93. Apply 2-mil thick coating of ethyl silicate in-organic zinc-rich paint primer per manufacturer's directions. Zinc primer must be allowed to completely dry before backfilling the excavation.

D. Cold-galvanizing zinc primer paint must be of the inorganic, ethyl silicate type, containing at least 60% zinc dust and 40% adhesive binders, and conform to ASTM 780-93, type as manufactured by Tnemec Products, Kansas City, MO., Brite Products, Detroit, Mich., or Valspar Coatings, Minneapolis, MN.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All ductile iron pipe, fittings, and appurtenances must be installed in accordance with the manufacturer's recommendations and requirements.

B. All pipe, fittings, and accessories must be delivered, unloaded, strung, and laid as specified here.

C. The water mains must be laid with depths of cover as indicated under Article 3.12 of this specification, unless otherwise shown on the drawings, or directed by the Commissioner. The pipes must be laid true to line and grade.

D. Fittings as specified must be used where shown on the drawings and where grade or alignment changes require offsets greater than those recommended by the pipe manufacturer.

3.2 TRANSPORTATION, DELIVERY AND STORAGE

A. Every precaution must be taken to prevent damage to the pipe during transportation and delivery. Pipe ends, fittings, valves and hydrants must be sealed with caps or by another suitable method upon transportation from the supplier. Caps or end seals must be sturdy, secure, and wind-resistant so as to protect the pipe at all times prior to installation. Pipe ends, fittings, valves, and hydrants discovered without proper end caps or seals, upon delivery or during construction, will not be accepted until the unprotected pipe has been cleaned, swabbed, and or pressure washed by the contractor to the satisfaction of the Commissioner. Extreme care must be taken in loading and unloading the pipe and fittings. Such work must be done slowly with skids or suitable power equipment and the pipe must be under complete control at all times. Under no conditions may the pipe be dropped, bumped, dragged, pushed, or moved in any way that will cause damage to the pipe. When handling the pipe with a crane, a suitable pipe hook or rope sling around the pipe must be used. Under no condition may the sling be allowed to pass through the pipe unless adequate measures are taken to prevent damage to the pipe ends and lining.

B. If in the process of transportation, handling, or installation, any pipe or fitting is damaged, such pipe or fitting must be replaced by the Contractor and be considered incidental to the construction and no additional payment will be allowed.

C. The Contractor must store pipe in a manner that will prevent damage. Pipe must be placed on wooden timbers or another suitable support on level ground. The Contractor must prevent the pipe from rolling. The procedures used to prevent rolling must be approved by the Commissioner

3.3 PREPARATION FOR LAYING PIPE

A. Materials, coatings, and linings must be as specified herein, shown on drawings, or directed by the Commissioner. Water mains and services must be installed where shown on the drawings. Installation must be in accordance with standards as recommended by the pipe manufacturer, and as specified herein.

B. Proper and suitable tools and appliances for the safe and convenient cutting, handling, and laying of the pipe and fittings must be used.

C. Before laying, all pipe and fittings must be thoroughly examined for defects and no piece may be installed which is known to be defective. If defects are discovered after pipe or fittings have been installed, the Contractor must remove the defective pipe and/or fitting and replace it with a sound one at his expense and to the satisfaction of the Commissioner.

D. The pipe and fittings must be thoroughly cleaned before they are laid and must be kept clean until they are accepted in the finished work. Care must be exercised to avoid leaving bits of wood, dirt, rock and other foreign particles in the pipe. If any such materials are discovered before the final acceptance of the work, they must be removed and the pipe and fittings replaced, if necessary. All pipes must be kept absolutely clean during construction and must be stopped off with night plugs or caps at the end of each day's work so as to provide a watertight seal. Exposed ends of uncompleted lines and existing water mains and services cut and not abandoned must be capped or otherwise temporarily sealed watertight at all times when pipe laying is not in progress.

E. When cutting ductile iron pipe, it must be neatly cut perpendicular to the longitudinal axis of the pipe without damaging the pipes lining or coating or jointing surface area.

3.4 LAYING WATER MAIN PIPE

A. All pipelines must be laid in trench excavations on bedding or other foundations, as shown on the drawings, specified herein, or ordered by the Commissioner. The pipe must be properly secured against movement and pipe joints must be made in the excavation as required. Pipes must have solid bearing throughout their entire length.

B. At locations where pipe thrust is anticipated to occur, pipe and fittings must be anchored or restrained as shown on the drawings, specified in Section 33 11 15 – Thrust Restraint for Water Main Piping, or as directed by the Commissioner. **Polyethylene encasement is to be installed on all new water main pipe and fittings before pipe is installed and braced against movement**. Care must be taken so as not to damage the polyethylene

encasement during the installation or blocking of the pipe and fittings. If damage occurs, the Contractor must repair or replace the polyethylene encasement at his expense to the satisfaction of the Commissioner.

C. Pipe laying will be permitted only in dry trenches having a stable bottom. Groundwater or water from other sources must be removed as per Section 31 23 19 – Dewatering Excavations. If the trench bottom is unsuitable for the pipes foundation, the kind of stabilization to be utilized will be ordered in writing.

D. If, in the opinion of the Commissioner, the Contractor has failed to obtain an acceptably dry trench bottom using conventional methods of dewatering, the Commissioner may order the Contractor to excavate below the intended grade and to place sufficient sub-grade material as may be suitable over the trench bottom in accordance with Section 31 23 10 – Excavation, Trenching and Backfilling.

E. The Contractor must also take such required precautions to prevent flotation of the new pipeline.

3.5 ASSEMBLY OF FLANGED JOINTS

A. Flanged joints must be made with bolts or bolt studs with nuts as specified in Section 2.2 of this specification.

B. Tighten flange bolts as recommended by the gasket manufacturer to ensure an evenly compressed gasket and leak tight joint.

C. After the bolts and nuts have been properly installed, tightened, and cleaned, prime them with bitumastic paint.

3.6 ASSEMBLY OF MECHANICAL JOINTS

A. Thoroughly brush the surfaces with which the rubber gasket comes in contact with a wire brush just prior to assembly of the joint. Brush lubricant over the gasket and the plain end just prior to installation. In making up mechanical joints, the spigot must be centered in the bell.

B. The gasket and gland must be placed in position, the bolts inserted, and the nuts tightened finger tight. The nuts must be tightened by means of a torque wrench in such a manner that the gland must be brought up evenly into the joint.

C. Joints are to be made up to allow electrical continuity from one pipe to another by installing wedges as specified in Article 2.1, Paragraph C of this specification and are to be installed in the following manner:

1. Use two (2) wedges per joint for 3-Inch to 12-Inch diameter pipes. Wedges must be placed on opposite sides of the joint at an equal distance apart (9 and 3 o'clock positions) around the joint.

2. Use four (4) wedges per joint for 16-inch to 24-inch diameter pipes. Wedges must be installed side by side in pairs placed on opposite sides of the joint at an equal distance apart (9 and 3 o'clock positions) around the joint.

3. Use six (6) wedges per joint for pipes larger than 24-inches in diameter only if building services are directly connected to the main. Wedges must be installed side by side in pairs 120 degrees apart at the 12, 4, and 8 o'clock positions around the joint.

D. The following range of bolt torques must be applied as specified in Table C. If sealing is not obtained at the maximum torque requirements listed in Table C, the joint must be disassembled, thoroughly cleaned, and reassembled.

TABLE C – BOLT TORQUE REQUIREMENTS

Bolt Size	Torque Range
5/8-inch	45-60 ft-lbs
¾-inch	75-90 ft-lbs
1-inch	85-100 ft-lbs
1 1/4inches	105-120 ft-lbs

3.7 ASSEMBLY OF PUSH-ON RUBBER GASKET JOINTS

A. Thoroughly brush the gasket seat in the bell with a wire brush and wipe the gasket and gasket seat with a cloth. Place the gasket in the socket with the large round end entering first so that the groove fits over the bead in the seat. Apply a thin film of NSF 61 approved joint lubricant to the inside surface of the gasket that will come into contact with the entering pipe.

B. Thoroughly brush the plain end of the pipe with a wire brush and placed it in alignment with the bell of the pipe to which it is to be joined. Make up the joint by exerting sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket.

C. Joints are to be made up to provide electrical continuity from one pipe to another by installing wedges as specified in Article 2.1, Paragraph C of this specification and are to be installed in the following manner:

1. Use two (2) wedges per joint for 3-Inch to 12-Inch diameter pipes. Wedges must be placed on opposite sides of the joint at an equal distance apart (9 and 3 o'clock positions) around the joint.

2. Use four (4) wedges per joint for 16-Inch to 24-Inch diameter pipes. Wedges must be installed side by side in pairs placed on opposite sides of the joint at an equal distance apart (9 and 3 o'clock positions) around the joint.

3. Use six (6) wedges per joint for pipes larger than 24-Inches in diameter only if building services are directly connected to the main. Wedges must be installed side by side in pairs 120 degrees apart at the 12, 4, and 8 o'clock positions around the joint.

D. Assemble restrained joint pipe in accordance with manufacturer's instructions.

3.8 TEMPORARY BULKHEADS

A. At ends of constructed sections where adjoining water mains or structures have not been completed and are not ready to be connected, temporary bulkheads must be used.

3.9 SHORT TUNNEL CONSTRUCTION

A. Pipes to be placed in short tunnels must be jointed prior to being pulled into position. Pipe must be pushed or pulled into position in a manner arranged to keep joints tight and to prevent deflection.

3.10 ENCASING DUCTILE IRON PIPE IN POLYETHYLENE

A. All cast and ductile iron pipe and fittings must be encased in polyethylene tubing before being installed, blocked, or braced.

3.11 USE OF DAMAGED, DEFECTIVE, OR NON-SPECIFIED CASTINGS AND FITTINGS

A. All construction castings and pipe fittings that are determined to be damaged, defective or do not meet these specifications and are stored within the Work area must be marked for non-use and removed and replaced with fittings that conform to these Specifications.

3.12 DEPTH OF PIPE COVER

A. Unless otherwise shown on the Plans or directed by the Commissioner, all water mains and services must be installed so a minimum pipe cover is achieved as shown in Table D.

TABLE D – MINIMUM DEPTH OF COVER FOR WATER MAINS

Size of Pipe	Depth of Cover
3/4 to 3-inches	5-ft 6-inches ± 3-inches
4-inch	5-ft 6-inches ± 3-inches
6-inch	5-ft 6-inches ± 3-inches
8-inch	5-ft 3-inches ± 3-inches
12-inch	5-ft ± 2-inches
16-inch	5-ft ± 2-inches
24-inch	4-ft 6-inches ± 2-inches
30 to 42-inches	3-ft 6-inches (min) or as detailed on drawings
48-inches & Larger	3-ft (min) or as detailed on drawings

3.13 ABANDONMENT OF EXISTING WATER MAINS

A. All openings on abandoned pipe or conduit are to be sealed with a concrete mortar plug of a minimum of one (1) foot in length within the pipe. Pipe 16-Inches in diameter and larger must be filled with fine graded aggregate or controlled low strength material (CLSM) flowable fill, as appropriate, or directed by the Commissioner. CLSM flowable material must meet standards specified in Section 31 23 10, "Excavation, Trenching and Backfilling", paragraph 2.3, C of these specifications.

3.14 DISINFECTION OF PIPE AND FITTINGS

A. Protect new and existing pipe and fittings from water, debris and foreign materials as specified in Section 31 23 10 – "Excavation, Trenching and Backfilling".

B. All new pipe, fittings, and valves must be disinfected in accordance with Section 33 13 00 – "Hydrostatic Testing and Disinfecting Water Mains", and the requirements of the Bureau of Water Quality which may be contacted at 312.744.8190.

C. Swab all pipe and fittings that will not be pressure tested or chlorinated with a chlorine solution during installation. Extra precautions must be taken to prevent debris or ground water from entering the section of water main to be swabbed. Incorporate untested section of water main into the flushing routine

when the work is necessitated, or part of, a water main replacement project. When connecting pipes to the existing city water system use normal operating pressure to visually inspect for leaks. If feasible, inspect for leaks prior to backfilling the excavation. Comply with all standards and requirements of the Bureau of Water Quality.

3.15 WATER MAIN SUPPORT SYSTEMS

A. Support and anchor all piping in proper position and alignment with due allowance for expansion and contraction.

B. The type, location, and arrangement of hangers and supports must be as shown on the drawings, or as directed by the Commissioner. Pipe supports and hardware must be appropriate to meet installation conditions, anticipated loading, and fabricated from corrosion resistant materials described in paragraph 2.7 - Pipe Support and Hangers, of this specification. All support systems whether pre-manufactured or field fabricated must have a minimum load safety factor of three (3) times the anticipated loading. Corrosion protective coatings damaged during installation of the pipe support system must be repaired per the manufacturer's requirements, or as directed by the Commissioner to maintain corrosion protection.

3.16 SEPARATION BETWEEN WATER AND SEWER MAINS

A. When a water main crosses above a sewer main and the vertical separation is between 18 and 6-Inches, as measured between the bottom of the water main and crown of sewer pipe, the sewer must be constructed of ductile iron pipe (or PVC pipe as directed by the Commissioner) with rubber gasketed joints to a distance one foot beyond the wall of the trench excavation. Flexible transition coupling must be used to join the ductile iron pipe to the sewer pipe and be encased in bentonite as shown on the drawings. This sewer separation work (between 18 and 6-Inches) shall be approved by the Commissioner prior to commencing and completing this work.

B. When a water main crosses below a sewer main, the sewer pipe must be constructed of ductile iron pipe with rubber gasket joints for a perpendicular distance of 10 feet on each side of the center line of the water main, and an 18-Inch vertical separation must be maintained. Flexible transition couplings must be used to join the ductile iron pipe to the sewer pipe.

END OF SECTION 33 11 13

Section 33 11 15

THRUST RESTRAINT FOR WATER MAIN PIPING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes the requirements for providing thrust restraint for the installation of water mains and services as shown on the Drawings and specified here.

1.2 WORK OF THIS SECTION SPECIFIED ELSEWHERE

A. Section 33 11 13 – Ductile Iron Water Pipe and Fittings.

1.3 Design Requirements

A. Calculated thrust restraint must be based on the frictional force and bearing resistance between the pipe and the surrounding soil, with an allowance made for the polyethylene wrap on ductile iron pipe installations.

1.4 REFERENCES

A. ANSI B1.1 - Unified Inch Screw Threads.

B. American Society for Testing and Materials (ASTM), latest edition:

1. ASTM A193 – Steel and Stainless Steel Bolting Materials
2. ASTM A194 – Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
3. ASTM A325 - Heat Treated Structural Steel Bolts.
4. ASTM A449 – Quenched and Tempered Steel Bolts and Nuts
5. ASTM A536 - Ductile Iron Castings.
6. ASTM A563 – Carbon and Alloy Steel Nuts
7. ASTM A615 – Standard Specification for Deformed and plain Billet Steel Bars for Concrete Reinforcement.

C. IDOT Standard Specifications for Road and Bridge Construction (SSRBC), latest edition.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE RESTRAINT

A. Mechanical joint thrust restraint glands must be used unless otherwise

directed. Where such glands cannot be used to provide sufficient thrust restraint, concrete thrust blocks must be used, unless directed by the Commissioner.

2.2 CONCRETE THRUST BLOCK RESTRAINT

A. All concrete used in the construction of thrust blocks must be Class SI of the SSRBC.

B. All reinforcing steel used in the construction of thrust blocks must conform to the requirements of ASTM A615.

2.3 TIE ROD PIPE RESTRAINT

A. Where the use of tie rods to restrain thrust is approved by the Commissioner, they must meet the following ASTM Designations:

Tie Rod Diameter	Rods	Nuts	Washers
Up to 1-1/2"	A449	A563 Grade D	A325
Over 1-1/2"	A193	A194 Grade 2H	A325

B. Tie rod threads must be the Unified Coarse Thread Series conforming to ANSI B1.1 for rods 1-inch in diameter and smaller and 8-inch pitch thread series for larger diameters. Nuts must be hexagonal. Harness tie rod nuts must have a standard chamfer on the back face with finished spherical bearing surface. The nuts must seat in steel plate washers having similar finished concave spherical seats. Where the use of mechanical joint retainer glands are called for on the Plans or approved by the Commissioner, they must conform to ASTM A536. All special castings must be made of good quality ductile iron of such character and so adapted in chemical composition to produce spheroidal graphite structure. The iron must be of such character to provide superior mechanical properties of strength and ductility; the iron must be soft enough to satisfactorily allow drilling and cutting.

C. The minimum physical properties will be as follows:

1. Tensile strength- 60,000 pounds per square inch.

2. Yield strength- 42,000 pounds per square inch.

3. 2-Inch Elongation.-10%.

D. In addition to the standard required tests, the following requirements must be met: Keel Block Tests as detailed in ASTM A536-Standard 0.50-Inch diameter tensile test bars must be machined from keel block coupons cast from each heat and of the same hardness range as the special castings. Minimum test requirements are as specified above.

PART 3 - EXECUTION

3.1 GENERAL

A. Install all joint anchorage in accordance with the requirements of Section 33 11 13- Ductile Iron Water Pipe and Fittings. Install all joint anchorage for concrete pipe and fittings in accordance with manufacturer's installation instructions unless directed otherwise by the Commissioner.

3.2 DUCTILE IRON PIPE

A. All fittings and conditions, which result in tangential forces on the piping, must be provided with thrust restraints, unless otherwise specified or approved by the Commissioner.

3.3 CONCRETE PIPE

A. Whenever the harnessing of pipe joints by itself does not provide sufficient thrust restraint, the Contractor must provide additional thrust restraint as required. The Contractor must provide anchorage against thrust for water mains and appurtenances wherever the deflection of the pipeline exceeds six (6) degrees. The anchorage must be accomplished by placing concrete thrust blocks adjacent to the fittings to be anchored. All anchorage must be designed to withstand working pressure plus surge pressure. The Contractor must submit to the Commissioner complete design calculations and plans for all thrust restraints bearing the seal of a Structural Engineer licensed in the State of Illinois.

END OF SECTION 33 11 15

SECTION 33 13 00

HYDROSTATIC TESTING AND DISINFECTING WATER MAINS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes requirements for hydrostatic testing and disinfecting water mains as shown on the drawings and specified here.

1.2 WORK OF THIS SECTION SPECIFIED ELSEWHERE

A. Section 33 11 13 – Ductile Iron Water Pipe and Fittings.
B. Section 33 12 16 – Water Main Control Valves.

1.3 REFERENCES

A. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances, latest edition.
B. AWWA C651 - Disinfecting Water Mains, latest edition.
C. AWWA C509 - Resilient Seated Gate Valves for Water Supply Service, latest edition.

1.4 SUBMITTALS

A. Prior to starting work, furnish the Commissioner a detailed outline of the proposed sequence of operation. Include the manner of filling and flushing the water main, the method of disposing of the water flushed from the main, the hydrostatic testing procedure, the disinfecting procedure, relevant safety procedures and other relevant procedures to be used. Include the name of the Contractor that will be disinfecting the water main.

B. All submittals will be subject to review by the Water Quality Surveillance Section (WQSS) of the Department.

1.5 QUALITY ASSURANCE

A. Hydrostatic testing of water mains must be performed in accordance with AWWA C600 and the Department's requirements specified herein. The disinfection of water mains must be performed in accordance with IEPA Regulations, AWWA C651, and the Department's requirements specified herein.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PRESSURE TESTING AND FLUSHING WATER MAINS

A. All flushing and pressure testing of water mains must meet the requirements of AWWA Specification C600.

3.2 TEST SECTIONS

A. New water pipe must be tested in sections isolated from the existing city water system. All existing valves must be tested to determine if they are water tight when in the closed position. If valves are not found to be water tight, they must be repaired or replaced before proceeding with the testing and chlorination procedure.

3.3 INITIAL FILLING

A. Each valved section of pipeline must be slowly filled with water. The test sections may be filled through the isolation valves via the test taps if they are available. Before applying the specified test pressure, all air must be expelled completely from the pipeline section to be tested. When venting air from the pipeline, it is important to limit the pipeline fill rate to avoid excessive surge pressures when the water reaches the air venting opening(s). When the pipeline has been filled, do not permit water to backflow into existing water mains.

3.4 PRELIMINARY FLUSHING

A. All new water mains, extensions, connections, and hydrant branches must be flushed prior to the hydrostatic testing so that water flows clear from all hydrants and test taps. The flushing operation must continue uninterrupted until the water flows clear. Flushing operations may be extended longer when directed by the Commissioner.

3.5 HYDROSTATIC TESTING

A. Setup

Water-pressure testing is the only method allowed for performing hydrostatic tests. Compressed-air testing methods are not permitted. Ensure that all air has been expelled after the preliminary flushing. Use a suitable pump connected to the existing water main system to apply the test pressure. Allow the pipeline to stabilize at the test pressure before conducting the hydrostatic test.

B. Testing

The test must subject the water main to a minimum hydrostatic pressure of 100 psi for a minimum period of two (2) hours. The minimum hydrostatic pressure is to be maintained at the highest point of the pipe in the test section. The test pressure may not vary by more than ±5 psi for the duration of the test. Test pressure is to be maintained within this tolerance by adding makeup water into the pipeline through the pressure test pump. The amount of makeup water added must be accurately measured in gallons (accurate to two decimal places) by suitable methods.

C. Allowable Makeup Water

The amount of makeup water added during the test must not exceed the amount calculated using the following equations:

$$L = \frac{S \times D \times T \times \sqrt{P}}{148000} \qquad \text{Equation 1}$$

L = allowable makeup water, gallons
S = length of pipe tested, feet
D = nominal diameter of pipe tested, inches
T = duration of the test, hours
P = average test pressure, pounds per square inch (gauge)

When testing against closed metal-seated valves, additional makeup water is allowed per valve, as follows:

$$L_V = D \times T \times .0078 \qquad \text{Equation 2}$$

L_v = allowable makeup water per metal-seated valve, gallons
D = nominal diameter of valve, inches
T = duration of the test, hours

For a 1,000' section of pipe tested for 2 hours at 100 psi against one closed metal-seated valve, the allowable makeup water is equal to:

Table 1
Allowable Makeup Water per 1,000 feet of Pipe, gallons
Tested at 100 psi for 2 hours

Nominal Pipe Diameter									
8"	12"	16"	24"	30"	36"	42"	48"	54"	60"
1.21	1.81	2.41	3.62	4.52	5.43	6.33	7.24	8.14	9.04

D. Visual Examination

Any and all exposed pipe, fittings, valves, hydrants, and joints must be examined carefully during the pressure test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered during or following the pressure test must be repaired or replaced with reliable material. All visible leaks are to be repaired regardless of the allowance used for testing.

E. Acceptance

Hydrostatic testing is to be repeated until all visible leaks are repaired and the amount of makeup water used is below the allowable amount. After all visible leaks have been repaired, acceptance will be determined on the basis of allowable makeup water only. If any test of a new pipeline discloses a small amount of makeup water greater than that specified above, repairs or replacements are to be accomplished in accordance with the contract documents or directed by the Commissioner.

3.6 SECONDARY FLUSHING

A. After each test section has satisfactorily passed the hydrostatic pressure test, a secondary flushing must be performed. The secondary flushing must be performed before the pipeline is disinfected. The Contractor must give a minimum forty-eight (48) hour notice to the Commissioner before performing the secondary flushing procedure.

B. For water mains the test section must be flushed at a minimum velocity of 2.5 feet per second until the water flows clear. Flushing operations may be extended longer when directed by the Commissioner.

3.7 DISINFECTING WATER MAINS

A. After the secondary flushing has been completed and the water flows clear from the pipeline being tested, the water main must be disinfected. The disinfection procedure must be performed by a Contractor qualified to conduct such work. The Water Quality Surveillance Section (WQSS) of the Department of Water Management will observe the disinfection procedure.

3.8 FINAL FLUSHING

After completion of the chlorination process, the chlorination water must be thoroughly flushed from all pipelines. The water main must be flushed until the water flows clear and has representative distribution system chlorine residual as determined by the WQSS of the Department.

3.9 SAMPLING

When the WQSS of the Department has determined that the pipeline is ready to be sampled, the samples are to be collected under the direction of the WQSS. The samples are tested for bacterial content before the pipeline can be approved for service.

3.10 APPROVAL

Final approval of the water main rests with the WQSS of the Department.

3.11 DISPOSAL OF FLUSHING WATER

For all types of flushing, limit flow rates to existing City sewers as specified in Section 01 11 00 – Summary of Work of this specification.

3.12 SAFETY

The Contractor must have sufficient equipment to properly carry out the hydrostatic testing and disinfecting operations and have the necessary safety equipment on hand; including a Chlorine Institute Emergency Kit "A" and self contained breathing apparatus. Failure to provide such equipment will be cause for not allowing the disinfection operation to be performed.

3.13 CONTRACTOR RESPONSIBILITY

The Contractor must have overall responsibility for hydrostatic testing, disinfecting, and sampling. The Contractor must provide all the necessary personnel to: assist in the disinfection operation; perform the final flushing operation; and assist the WQSS of the Department in the water sampling. The Contractor must be responsible for guaranteeing that sufficient and necessary sanitary precautions are taken during construction to ensure approval of the main for service.

3.14 DISINFECTION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS

Swab pipe and fittings that will not be pressure tested or chlorinated with chlorine solution during installation and use extra precaution to prevent soil and debris from entering the pipe. Incorporate untested pipe into the flushing routine when possible. When connecting new pipe to the existing water system, use operating pressure to visually inspect for leaks. When feasible, perform inspection prior to backfilling. Comply with all standards and requirements of the WQSS of the Department.

END OF SECTION 33 13 00