

ADDENDUM No. 2

RFP No. 25-39

High-Level Trunkline Capacity Improvements

Due: October 30, 2025, at 11:00 AM (local time)

The information contained herein shall take precedence over the original documents and all previous addenda (if any) and is appended thereto. **This Addendum includes twenty-six (26) pages.**

The Proposer is to acknowledge receipt of this Addendum No. 2, including all attachments in its Proposal by so indicating in the proposal that the addendum has been received. Proposals submitted without acknowledgement of receipt of this addendum may be considered non-conforming.

The following forms provided within the RFP Document should be included in submitted proposal:

- Attachment B - General Declarations
- Attachment D - Prevailing Wage Declaration of Compliance
- Attachment E - Living Wage Declaration of Compliance
- Attachment G - Vendor Conflict of Interest Disclosure Form
- Attachment H - Non-Discrimination Declaration of Compliance

Proposals that fail to provide these completed forms listed above upon proposal opening may be rejected as non-responsive and may not be considered for award.

I. CORRECTIONS/ADDITIONS/DELETIONS

Changes to the RFP documents which are outlined below are referenced to a page or Section in which they appear conspicuously. Offerors are to take note in its review of the documents and include these changes as they may affect work or details in other areas not specifically referenced here.

Section/Page(s)	Change
Schedule of Pricing/Cost Section III, Part E	Replace in its entirety.
Detailed Specification, Project Schedule and Payment	Replace in its entirety.
Detailed Specification, Project Coordination	Replace in its entirety.
Detailed Specification, Bollard	Add attached specification.

Technical Specification,
33 05 36
Fiberglass-Reinforced
Jacking Pipe

Replace in its entirety.
Removed requirements for Centrifugally Cast Fiberglass Pipe.

RFP 25-39 Plans,
Sheets 17, 18 and 21

Replace in their entirety.

II. QUESTIONS AND ANSWERS

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the RFP. Respondents are directed to take note in its review of the documents of the following questions and City responses as they affect work or details in other areas not specifically referenced here.

Question 1: Is temporary removal or relocation of the underground fiber optic and electrical lines east of manhole S-2 feasible for shaft construction and utility work?

Answer 1: No, the proposed shaft location has been shown based on the location of these utilities. The electrical line is a substation feed which is unable to be relocated by DTE.

Question 2: Specification Section 33 05 07.36, Paragraph 1.04.F and 1.08.H state that dewatering is not allowed for the trenchless drive or shaft excavation where microtunneling is required, except when soldier pile and lagging shaft construction is used. Where are soldier pile shafts allowed?

Answer 2: Soldier pile shafts are only permitted where existing active utility penetrations prevent the installation of a watertight shaft.

Question 3: When and at what locations dewatering is allowed?

Answer 3: Dewatering is permitted for local sewer connections and when soldier pile and lagging shaft construction is utilized to accommodate existing utility penetrations into the shaft. Where soldier pile shafts are used at locations with utility penetrations, the contractor must make all efforts to minimize dewatering by using ground improvement techniques at the penetrations to prevent groundwater inflow.

Question 4: With regards to the shaft construction, is it the intent of the Engineer/Owner that all shafts be constructed watertight?

Answer 4: Yes, unless existing utility penetrations prevent watertight construction.

Question 5: Refer to Sheet 22 of 42. The Washington Diversion Structure Bypass states to bypass from MH 71-70522 to MH 71-50554. There is no MH 71-50554, is this meant to be MH 71-70554 or another manhole?

Answer 5: Yes, this is a typo and should refer to MH 71-70554 and not MH 71-50554.

Question 6: What is the pipe material for the existing 30-inch sanitary sewer on First Street?

Answer 6: The existing 30-inch sanitary sewer along First Street is concrete pipe installed in approximately 1926 via tunnel construction method. It was lined with a structural cured-in-place pipe liner in 2024.

- Question 7: Reference Sheet 19. When can the 21-inch Sanitary heading to the west from MH 71-70467 be abandoned?
- Answer 7: The section of 21-inch sanitary sewer can be abandoned following the installation of the proposed 36-inch sewer along Washington Street. At the Contractor's discretion, the 21-inch sewer in this section can be abandoned earlier for the construction of the shaft at Sta 150+70, but the bypass pump discharge that is routed into the 21-inch sewer must be redirected to either MH 71-70467, or MH S-2 if the proposed First Street sewer is able to accept flow.
- Question 8: When can the sanitary sewer between 71-70466 and 71-70473 be abandoned?
- Answer 8: The 10-inch sanitary sewer between 71-70473 and 71-70466 can be abandoned as soon as the proposed 10-inch sanitary sewer from S-10 to 71-70466 is placed into service. This proposed 10-inch sanitary sewer can be placed into service immediately after air testing and video inspection, however a mandrel test must still be completed after 30 days have passed from installation.
- Question 9: Is the Owner providing and paying for all backfill, concrete subbase and other testing (other than those specifically required of the Contractor) required in the specs?
- Answer 9: Yes, all material testing not required by the specifications will be provided by the Owner.
- Question 10: What surveying will be provided by the Owner?
- Answer 10: All construction surveying shall be performed by the Contractor.
- Question 11: The tunnel project crosses below an elevated railroad on West Washington Street. The contract requires a railroad protective insurance policy. Is there a railroad agreement associated with this project, and if so can it be made available to bidders?
- Answer 11: The Owner is in the process of obtaining the final railroad agreement from Watco. A railroad protective insurance policy will be required in accordance with the contract and the contractor will be expected to execute
- Question 12: The contract requires surface monitoring points be installed on the RR bridge. Is there an entry agreement with the RR or any special requirements for the Contractor to follow when entering RR property to install, monitor and remove these points?
- Answer 12: The Owner is in the process of obtaining the final railroad agreement from Watco. All costs associated with entering the railroad right-of-way not otherwise identified in the Contract, such as flagging, shall be covered by the Owner.
- Question 13: Dewatering requirements for this project will likely exceed 70 gpm, triggering the EGLE requirements outlined in Technical specification 31 23 19 – 5, Dewatering, Section 3.03 Permitting, items A-D. The specifications allow discharge to the Ann Arbor storm sewer system provided the water is treated and meets the EGLE discharge requirements. The Contractor is directed to the EGLE website to register and then input dewatering assumptions to assist in dewatering system adequacy. Would this dewatering information be required to be submitted with the bid or just included in the dewatering plan submittal after award?
- Answer 13: This information shall be included in the dewatering plan submittal after award. The Owner has preemptively registered for dewatering under EGLE Part 327 and will update that registration as necessary based on the Contractor's dewatering plan submittal.

Question 14: The specifications call for nominal 36" FRP. FRP Jack Pipe is 34.3" ID, is this acceptable?

Answer 14: Yes.

Question 15: Plan Sheets 10 and 17 have a total of 1,489 square yards of HMA removal areas, but the bid form item 02021.00, entitled "HMA Surface, Rem", and only has a quantity of 257 SY. Please clarify.

Answer 15: The surface callouts for Washington Street (Plan Sheet 10) are based on an HMA surface, but the boring information indicates that these sections will likely all be composite pavement and subsequently paid for as Item 02025.00 "Concrete Pavt, Any Thickness, Rem", which is reflected in the bid form quantities.

Question 16: Plan Sheet 19 of 42 has a note located in the upper left portion of the page that states "SHAFT SIZE SHOWN IS INDICATIVE, CONTRACTOR MAY TUNNEL UNDERNEATH MANHOLE 71-70527 OR RECEIVE AND RELAUNCH MTBM AT THEIR OPTION." The same note appears on sheet 20 of 42 and 21 of 42. We are unable to locate Manhole 71-70527. Please provide the location of this manhole?

Answer 16: Existing manhole 71-70527 is located at Station 103+80 along Washington Street, at the same location as proposed manhole S-7.

Question 17: Can you please clarify which permits are required for the project, who is responsible for applying for each, and which party (City or Contractor) will be responsible for payment?

Answer 17: The project permit list is as follows:

Permit	Responsible for Application	Responsible for Payment
EGLE Part 41 Permit	City of Ann Arbor	City of Ann Arbor
MDOT ROW Permit	City of Ann Arbor	City of Ann Arbor
WCWRC Drain Use Permit	City of Ann Arbor	City of Ann Arbor
EGLE Part 327 Water Withdrawal Permit	City of Ann Arbor	City of Ann Arbor
City of Ann Arbor Dewatering Permit	City of Ann Arbor	City of Ann Arbor
Ann Arbor (Watco) Railroad Permit to Enter (*Contractor to provide RPL Insurance)	City of Ann Arbor	City of Ann Arbor
City of Ann Arbor Lane Closure Permit	Contractor	City of Ann Arbor
City of Ann Arbor "No Parking" Signs Permit	Contractor	City of Ann Arbor
City of Ann Arbor Grading / Soil Erosion & Sedimentation Control Permit	Contractor	City of Ann Arbor
City of Ann Arbor Right-Of-Way Permit	Contractor	City of Ann Arbor

Question 18: Please clarify the stationing on Washinton Street in relation to Manhole S-2. The stationing does not align with the tunnel runs?

Answer 18: The structure stationing for S-2 is shown based on the project stationing for First Street. The associated stationing of S-2 along Washington Street is 105+65.

Offerors are responsible for any conclusions that they may draw from the information contained in the Addendum.

E. Schedule of Pricing/Cost – 20 Points**Company:****Project: High-Level Trunkline Capacity Improvements****File #: 2024-001****RFP #: 25-39**

ITEM NUMBER	LEGEND	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
General					
01000.00	General Conditions, Max. \$1,400,000	LSUM	1	\$ _____	\$ _____
01001.00	Project Supervision, Max. \$700,000	LSUM	1	\$ _____	\$ _____
01002.00	Project Clean-Up and Restoration	LSUM	1	\$ _____	\$ _____
01003.00	Digital Audio Visual Coverage	LSUM	1	\$ _____	\$ _____
01010.00	DS_Laboratory Testing Allowance	Dlr	150,000	\$ _____	\$ _____
01011.00	DS_Contaminated Groundwater Disposal Allowance	Dlr	400,000	\$ _____	\$ _____
01012.00	DS_Contaminated Soil Disposal	Cyd	5,700	\$ _____	\$ _____
01021.00	Erosion Control, Inlet Protection, Fabric Drop	Ea	16	\$ _____	\$ _____
01040.00	Minor Traffic Control, Max. \$80,000	LSUM	1	\$ _____	\$ _____
01050.00	Sign, Type B, Temp, Prismatic, Furn & Oper	Sft	1,272	\$ _____	\$ _____
01051.00	Sign, Type B, Temp, Prismatic, Special, Furn & Oper	Sft	419	\$ _____	\$ _____
01052.00	Temporary "No Parking" Sign	Ea	20	\$ _____	\$ _____
01070.00	Sign, Portable, Changeable Message, Furn & Oper	Ea	2	\$ _____	\$ _____
01080.00	Plastic Drum, High Intensity, Lighted, Furn & Oper	Ea	8	\$ _____	\$ _____
01081.00	Channelizer Cone, High Intensity, 42 In., Furn & Oper	Ea	100	\$ _____	\$ _____
01091.00	Barricade, Type III, High Intensity, Lighted, Furn & Oper	Ea	10	\$ _____	\$ _____
01100.00	Pedestrian Type II Barricade, Temp, Furn & Oper	Ea	4	\$ _____	\$ _____
01101.00	Pedestrian Channelizer Device, Furn & Oper	Ea	4	\$ _____	\$ _____
01102.00	Temporary Pedestrian Ramp, Furn & Oper	Ea	2	\$ _____	\$ _____
01103.00	Temporary Pedestrian Mat, Furn & Oper	Ft	21	\$ _____	\$ _____
01131.00	Pavt Mrkg, Wet Reflective, Type R, Tape, 12 In., White, Temp	Ft	60	\$ _____	\$ _____
Removals					
02000.02	Tree, Rem, 13 In. - 19 In.	Ea	4	\$ _____	\$ _____
02021.00	HMA Surface, Rem	Syd	257	\$ _____	\$ _____
02025.00	Concrete Pavt, Any Thickness, Rem	Syd	1,249	\$ _____	\$ _____
02030.00	Curb, Gutter, and Curb and Gutter, Any Type, Rem	Ft	333	\$ _____	\$ _____
02040.00	Sidewalk, Sidewalk Ramp, and Driveway Approach, Any Thickness, Rem	Sft	729	\$ _____	\$ _____
Earthwork					
03030.01	Exploratory Excavation, SD-TD-1, (0-10' Deep)	Ea	10	\$ _____	\$ _____
03030.02	Exploratory Excavation, SD-TD-1, Additional Depth	Ft	60	\$ _____	\$ _____
03001.00	Machine Grading	Syd	1,439	\$ _____	\$ _____
03070.00	Dewatering	LSUM	1	\$ _____	\$ _____
Sanitary Sewer					
04000.01	8 In., SDR 26 PVC Sanitary Sewer, SD-TD-2	Ft	84	\$ _____	\$ _____
04000.02	10 In., SDR 26 PVC Sanitary Sewer, SD-TD-2	Ft	53	\$ _____	\$ _____
04000.05	18 In., SDR 26 PVC Sanitary Sewer, SD-TD-2	Ft	77	\$ _____	\$ _____
04000.07	24 In., SDR 26 PVC Sanitary Sewer, SD-TD-2	Ft	23	\$ _____	\$ _____
TOTAL THIS PAGE (BF-1)					\$ _____

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ITEM NUMBER	LEGEND	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
Sanitary (Continued)					
04006.01	DS_30 In., FRP Sanitary Sewer, SD-TD-2	Ft	32	\$ _____	\$ _____
04007.01	DS_36 In., FRP Sanitary Sewer, Microtunneling	Ft	1,595	\$ _____	\$ _____
04014.01	6 In., SDR 26 PVC Sanitary Service Lead, SD-TD-2	Ft	50	\$ _____	\$ _____
04030.01	Sanitary Manhole, 48 In. Dia. (0-8' Deep)	Ea	1	\$ _____	\$ _____
04030.02	Sanitary Manhole, 48 In. Dia., Additional Depth	Ft	3	\$ _____	\$ _____
04035.01	DS_Sanitary Manhole, Fiberglass, 72 In. Dia., Sta 100+47	Ea	1	\$ _____	\$ _____
04035.02	DS_Sanitary Manhole, Fiberglass, 48 In. Dia., Sta 103+82	Ea	1	\$ _____	\$ _____
04035.03	DS_Sanitary Manhole, Fiberglass, 72 In. Dia., Sta 150+70	Ea	1	\$ _____	\$ _____
04035.04	DS_Sanitary Manhole, Fiberglass, 48 In. Dia., Sta 155+45	Ea	1	\$ _____	\$ _____
04035.05	DS_Sanitary Manhole, Fiberglass, 72 In. Dia., Sta 161+30	Ea	1	\$ _____	\$ _____
04036.05	DS_Sanitary Diversion Manhole, Sta 100+17	Ea	1	\$ _____	\$ _____
04050.01	Sanitary Manhole Over Existing ("Doghouse"), 48 In. Dia.	Ea	2	\$ _____	\$ _____
04050.05	DS_Sanitary Manhole Over Existing ("Doghouse"), 96 In. Dia. DS_Sanitary Manhole Over Existing ("Doghouse"), Fiberglass,	Ea	1	\$ _____	\$ _____
04051.04	84 In. Dia.	Ea	1	\$ _____	\$ _____
04060.00	Sanitary Structure Cover	Ea	13	\$ _____	\$ _____
04061.00	Sanitary Structure Cover, Adjust	Ea	13	\$ _____	\$ _____
04070.02	Sanitary Sewer Pipe, 10 In. Dia., Abandon	Ft	20	\$ _____	\$ _____
04070.05	Sanitary Sewer Pipe, 18 In. Dia., Abandon	Ft	114	\$ _____	\$ _____
04070.06	Sanitary Sewer Pipe, 21 In. Dia., Abandon	Ft	296	\$ _____	\$ _____
04080.02	Sanitary Sewer Pipe, 10 In. Dia., Rem	Ft	20	\$ _____	\$ _____
04080.05	Sanitary Sewer Pipe, 18 In. Dia., Rem	Ft	90	\$ _____	\$ _____
04090.00	Sanitary Sewer Structure, Abandon	Ea	3	\$ _____	\$ _____
04100.00	Sanitary Sewer Structure, Rem	Ea	1	\$ _____	\$ _____
04110.02	Sanitary Sewer Tap, 10 In. Dia.	Ea	1	\$ _____	\$ _____
04200.00	DS_Drilling and Geotechnical instrumentation and Monitoring	LS	1	\$ _____	\$ _____
04250.01	DS_Intermediate Shaft, Sta 103+82	LS	1	\$ _____	\$ _____
04250.02	DS_Launch Shaft, Sta 100+47	LS	1	\$ _____	\$ _____
04250.03	DS_Launch Shaft, Sta 161+30	LS	1	\$ _____	\$ _____
04250.04	DS_Launch/Reception Shaft, Sta 155+45	LS	1	\$ _____	\$ _____
04250.05	DS_Reception Shaft, Sta 150+70	LS	1	\$ _____	\$ _____
04300.00	DS_Sanitary Bypass Pumping	LS	1	\$ _____	\$ _____
Stormwater					
06000.05	24 In., CL IV RCP Storm Sewer, SD-TD-1	Ft	37	\$ _____	\$ _____
06030.04	Storm Sewer Tap, 12 In. Dia.	Ea	2	\$ _____	\$ _____
06030.08	Storm Sewer Tap, 24 In. Dia.	Ea	1	\$ _____	\$ _____
06050.01	Storm Manhole, 48 In. Dia. (0-8' deep)	Ea	1	\$ _____	\$ _____
06050.02	Storm Manhole, 48 In. Dia. , Additional Depth	Ft	3	\$ _____	\$ _____
TOTAL THIS PAGE (BF-2)					\$ _____

E. Schedule of Pricing/Cost – 20 Points**Company:****Project: High-Level Trunkline Capacity Improvements****File #: 2024-001****RFP #: 25-39**

ITEM NUMBER	LEGEND	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
Stormwater (Continued)					
06050.03	Storm Manhole, 60 In. Dia. (0-8' deep)	Ea	1	\$ _____	\$ _____
06120.03	Storm Sewer Pipe, 12 In. Dia., Rem	Ft	21	\$ _____	\$ _____
06160.01	Storm Structure Cover	Ea	3	\$ _____	\$ _____
06160.02	Storm Structure Cover, Adjust	Ea	3	\$ _____	\$ _____
Water Mains					
07000.05	12 In., PC 350 DIP w/polywrap, SD-TD-1	Ft	157	\$ _____	\$ _____
07013.01	12 In. 90° DIP Bend	Ea	12	\$ _____	\$ _____
07013.02	12 In. 45° DIP Bend	Ea	2	\$ _____	\$ _____
07090.00	Water Structure Cover	Ea	2	\$ _____	\$ _____
07091.00	Water Structure Cover, Adjust	Ea	2	\$ _____	\$ _____
07150.05	Water Main Pipe, 12 In. Dia., Rem	Ft	93	\$ _____	\$ _____
Streets, Driveways, & Sidewalks					
08000.00	Subbase, CIP	Cyd	66	\$ _____	\$ _____
08010.03	Aggregate Base, 8 In., 21AA, CIP	Syd	954	\$ _____	\$ _____
08010.04	Aggregate Base, 10 In., 21AA, CIP	Syd	648	\$ _____	\$ _____
08070.14	HMA, 4EL	Ton	295	\$ _____	\$ _____
08070.18	HMA, 5EL	Ton	208	\$ _____	\$ _____
08110.00	Conc, Curb or Curb & Gutter, All Types	Ft	333	\$ _____	\$ _____
08121.01	Conc, Driveway Opening, Type L	Ft	25	\$ _____	\$ _____
08131.01	Conc, Sidewalk, Drive Approach, or Ramp, 6 In.	Sft	654	\$ _____	\$ _____
08131.02	Conc, Sidewalk, Drive Approach, or Ramp, 8 In.	Sft	129	\$ _____	\$ _____
08150.00	Detectable Warning Surface	Ft	15	\$ _____	\$ _____
08155.00	DS_Bollard	Ea	3	\$ _____	\$ _____
08190.01	Pavt Mrkg, Polymer Cement Surface, Bike, Large Sym	Ea	2	\$ _____	\$ _____
08190.03	Pavt Mrkg, Polymer Cement Surface, Bike Thru Arrow Sym	Ea	2	\$ _____	\$ _____
08190.06	Pavt Mrkg, Polymer Cement Surface, Bike Lane Green	Sft	450	\$ _____	\$ _____
08220.03	Pavt Mrkg, Thermopl, 12 In., Crosswalk	Ft	505	\$ _____	\$ _____
08220.06	Pavt Mrkg, Thermopl, 24 In., Stop Bar	Ft	42	\$ _____	\$ _____
08220.30	Pavt Mrkg, Thermopl, 18 In. x 18 In. Bikeway Marks	Ft	40	\$ _____	\$ _____
08240.02	Pavt Mrkg, Waterborne, 4 In., Yellow	Ft	1,214	\$ _____	\$ _____
Landscaping					
10060.00	Turf Restoration	Syd	23	\$ _____	\$ _____
TOTAL THIS PAGE (BF-3)				\$ _____	
TOTAL FROM PAGE BF-1:				\$ _____	
TOTAL FROM PAGE BF-2:				\$ _____	
TOTAL BASE BID:				\$ _____	

CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
PROJECT SCHEDULE AND PAYMENT

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Description

Examination of Plans, Specifications, and Work Site

Bidders shall carefully examine the Bid Form, plans, specifications, and the work site until the Bidder is satisfied as to all local conditions affecting the contract and the detailed requirements of construction. The submission of the bid shall be considered prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and all requirements of the Contract.

The entire work under this Contract shall be completed in accordance with, and subject to, the scheduling requirements as outlined below, and all other requirements of the Contract Documents.

1. The Contractor shall begin the work of this project on **January 12, 2026**, and only upon receipt of the fully executed Contract and Notice to Proceed. Appropriate time extensions shall be granted if the Notice to Proceed is delayed beyond this date.
2. This Contract requires microtunneled sanitary sewer, water main, stormwater improvements, road repairs and concrete repair work on Washington St between Third St and First St, and First St between Washington St to north of Miller Ave. The Contract shall be completed in phases and shall be completed within **two hundred and sixty-nine (269) consecutive calendar days**.
3. The work shall be sequenced to meet the schedule requirements identified. Contractor shall determine the exact sequence of work at the project locations and clearly note any deviations from the sequence identified below.
 - a. **Relocate 10-inch sanitary sewer and other interfering utilities at First St and Washington St. (Detour Phase 1)**
 - b. Install microtunneling shafts on First St, including the launch shaft at Sta. 161+30, intermediate shaft at Sta. 155+45 and reception shaft at Sta. 150+70. **(Detour Phase 2)**
 - c. Install 36-inch sanitary sewer on First St starting at the Miller Ave end and constructing south. **(Detour Phase 2)**
 - d. Install sewer up to low-level connection manhole at Sta. 161+46 and complete testing of sanitary sewer from Sta. 150+70 to Sta. 161+46. Place sewer in service to permit bypass pumping into the sewer. **(Detour Phase 2)**
 - e. Complete restoration of First St north of Huron St including concrete and HMA pavement by **June 20, 2026**. **(Detour Phase 2 ends)**
 - f. **Install sanitary diversion structure at Sta. 100+17 to allow bypass pumping direct from the diversion structure. (Detour Phase 3)**
 - g. Washington St microtunneling shafts can be installed once the First St microtunneling has commenced. **(Detour Phase 4)**

CITY OF ANN ARBOR
DETAILED SPECIFICATION
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- h. **Install 36-inch sanitary sewer on Washington St starting at the west end and constructing east.** It is anticipated that the intermediate microtunnel shaft on Washington St will be installed after completion of the Washington St microtunnel has been installed. **(Detour Phase 4)**
 - i. Sewer connections on Washington Street with flow through the newly installed sewer must be completed by **August 22, 2026**. **In the event that the sewer connections along Washington St are not complete by August 22, 2026, the Contractor shall be responsible to ensure that discharge of the bypass pumping from the 18-inch sanitary sewer on Washington St is directed into proposed manhole S-2 at no additional cost.**
4. The following schedule and phasing of work shall form the basis for bidding of the project. The Contractor may submit an alternative project timeline for Owner review that adheres to the general scheduling requirements previously identified.

The entire work at these locations as required by this Contract includes, but is not limited to the following:

 - Temporary and permanent water main and valves installation, chlorinating, pressure testing and flushing.
 - Sanitary sewer structures needed for bypass pumping for microtunneling operations.
 - Storm sewer installations for installation of microtunneling shafts.
 - Pavement removal.
 - Replacement of pavement base within utility trenches.
 - Pavement base proof rolling and undercutting.
 - Replacement of storm sewer and structures.
 - Sanitary sewer installation and sanitary sewer abandonment.
 - Replacement and installation of curb and gutter, sidewalk and driveway approaches as needed.
 - Permanent placement of hot mix asphalt.
 - Restoration of all disturbed areas.
 - Removal of all traffic control devices.
5. Contractor shall sequence the sanitary sewer installation in a way that does not interrupt service of other utilities.
6. Contractor shall provide all necessary sewer flow control to maintain flow at all sewer replacement sections, sewer crossings, connections and lead transfers.

CITY OF ANN ARBOR
DETAILED SPECIFICATION
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PROJECT SCHEDULE AND PAYMENT

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7. The following workday, hour and other work restrictions are imposed by the City of Ann Arbor.

Contractor operations shall be limited by local municipality work time, noise and dust ordinance:

- Monday through Friday: 7am – 8pm
- Saturday: 7am – 8pm; Notice given to City of Ann Arbor no less than 48 hours and no more than 5 days
- Sunday: Only with written approval from the City of Ann Arbor

No work shall be performed during Holiday weekends as follows, unless approved by the City of Ann Arbor:

- Memorial Day, from 3:00 p.m. Friday through 7:00 a.m. Tuesday
- Fourth of July, from 3:00 p.m. July 2, 2026, through 7:00 a.m. July 6, 2026
- Labor Day, from 3:00 p.m. Friday through 7:00 a.m. Tuesday
- Thanksgiving, from 3:00 p.m. the Wednesday before Thanksgiving through 7:00 a.m. the Monday after Thanksgiving.

City Council approval is expected on or before **December 15, 2025**. The Contractor shall not begin the work without approval from the Project Engineer, and in no case before the receipt of the Notice to Proceed.

Contractor will be furnished with two (2) copies of the Contract, for his/her execution, before the aforementioned City Council meeting. The Contractor shall properly execute both copies of the Contract and return them, with the required Bonds and Insurance Certificate, to the City within ten (10) days.

Time is of the essence in the performance of the work of this contract. The Contractor is expected to mobilize sufficient personnel and equipment and work throughout all authorized hours to complete the project by the final completion date. Should the Contractor demonstrate that they must work on some Sundays in order to maintain the project schedule, they may do so between the hours of 9:00 a.m. and 5:00 p.m. with prior approval from the City. There will be no additional compensation due to the Contractor for work performed on Sundays.

Prior to the start of any construction, the Contractor shall submit a detailed schedule of work for the Engineer's review and approval. Work shall not be started until a schedule is approved in writing by the Engineer. The proposed schedule must fully comply with the scheduling requirements contained in this Detailed Specification. The Contractor shall update the approved work schedule upon request by the Engineer and present it to the Engineer within seven days of said request.

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DETAILED SPECIFICATION
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The Engineer may delay or stop the work due to threatening weather conditions. The Contractor shall not be compensated for unused materials or downtime due to rain, or the threat of rain. The Contractor is solely responsible for repairing all damages to the work and to the site, including road infrastructures, road subgrades, and any adjacent properties, which are caused as a result of working in the rain.

The Contractor shall not work in the dark except as approved by the Engineer and only when lighting for night work is provided as detailed elsewhere in this contract. The Engineer may stop the work, or may require the Contractor to defer certain work to another day, if, in the Engineer's opinion, the work cannot be completed within the remaining daylight hours, or if inadequate daylight is present to either properly perform or inspect the work. The Contractor will not be compensated for unused materials or downtime when delays or work stoppages are directed by the Engineer for darkness and/or inadequate remaining daylight reasons. The Contractor is solely responsible for repairing all damages to the work and to the site, including road infrastructures, road subgrades, and any adjacent properties, which are caused as a result of working in the dark.

Liquidated Damages

Failure to complete all work, including sub-phases, as specified herein within the times specified herein, including time extensions granted thereto as determined by the Engineer, shall entitle the City to deduct from the payments due the Contractor, **\$2,000.00** in Liquidated Damages, and not as a penalty, for delays in the completion of the work for each and every calendar day beyond the times for substantial completion as required by this Detailed Specification. **These Liquidated Damages shall apply to the June 20, 2026 and August 22, 2026 intermediate project deadlines identified in this Detailed Specification, along with the substantial completion deadline.**

Substantial Completion shall include the installation of all utilities, HMA roadway pavement open to traffic including pavement markings and restoration. If restoration has not been installed, temporary erosion control measures such as staked in-place mulch blanket shall be installed. This work is included in the cost of **Turf Restoration**.

Liquidated Damages will be assessed until the required work is completed in the current construction season. If, with the Engineer's approval, work is extended beyond seasonal limitations, the assessment of Liquidated Damages will be discontinued until the work is resumed in the following construction season.

If the construction Contract is not completed within the specified calendar day period including any extensions of time granted thereto, at the sole discretion of the City of Ann Arbor, this Contract may be terminated with no additional compensation due to the Contractor, and the Contractor may be forbidden to bid on future City of Ann Arbor projects for a period of at least three (3) years. If the Engineer elects to terminate the Contract, Contract items paid for on a Lump Sum basis shall be paid up to a maximum percentage equal to the percentage of the Contract work that has been completed.

CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
PROJECT COORDINATION

OHM:CJE

1 of 1

10/23/25

Description

The Contractor shall be aware of other road construction work projects within the City of Ann Arbor.

The Contractor shall also be aware that other projects may be constructed within the City by other agencies or contractors that may affect work under this contract.

It is the Contractor's responsibility to coordinate efforts with other projects. It is the Contractor's responsibility to investigate other projects in the area with the City and County. Additional costs incurred by the Contractor resulting from conflict with another project will not be considered for additional compensation.

The Contractor shall not receive a time extension due to reasonable work delays resulting from other projects within the area. Refer to the Proposal for information on the required completion date and associated penalties.

The City of Ann Arbor anticipates a water main and road reconstruction project on Ann St between 1st St and 5th Ave during the 2026 construction season. Detour routes may overlap and coordination may be required between the two projects. **The City may elect to shift the detour associated with Detour Phases 2-4 to Ashley Street in place of Main Street to coordinate with adjacent projects and closures. Costs associated with moving signs for this shift will not be paid separately but included in the existing temporary sign pay items.**

The Contractor shall coordinate to utilize the existing City owned parcel located adjacent to the project site at 415 W Washington Street. The proposed staging area is identified on the contract drawings and shall be fenced off with a permanent 6' high chain link fence. The existing standing chimney on this site must be protected as a roosting spot for chimney swifts, and temporary barriers should be installed around the chimney to protect it from damage. This site includes concrete slabs and foundations from previously demolished buildings. Any surface improvements necessary to utilize the site shall be provided by the Contractor and incidental to the work.

The Contractor shall coordinate with the YMCA located at 400 W Washington Street. This includes coordinating with YMCA staff to ensure access through the 415 W Washington site from Liberty Street for vendor deliveries, solid waste collection and bus transportation. The parking lot beneath the YMCA will be closed to normal traffic, and the parking area at 415 W Washington will be utilized by YMCA patrons. An accessible pedestrian route from this parking lot must be provided to the YMCA.

All required construction staking and survey work for the project shall be performed by the Contractor in accordance with the City of Ann Arbor 2025 Public Services Standard Specifications and Section 824 of the MDOT 2020 Standard Specifications for Construction. Unless survey work is otherwise identified in other Detailed or Technical Specifications, it shall be incidental to the General Conditions pay item.

CITY OF ANN ARBOR
DETAILED SPECIFICATION
FOR
BOLLARD

OHM:TJL

1 of 2

10/22/2025

a. Description. This work consists of removing, fabricating, delivering and installing concrete-filled steel pipe bollards and high-density polyethylene (HDPE) bollard covers.

b. Materials.

1. Furnish steel pipe in accordance with *ASTM A53/A53M, Type E*.
2. Furnish Grade 3500 concrete in accordance with section 1004 and mortar/grout in accordance with section 1005 of the Standard Specifications for Construction.
3. Furnish yellow HDPE bollard covers.

c. Construction. Fabricate the bollard to the dimensions shown on the plans. Prior to installing grind all sharp edges to a minimum 3/32 inch radius

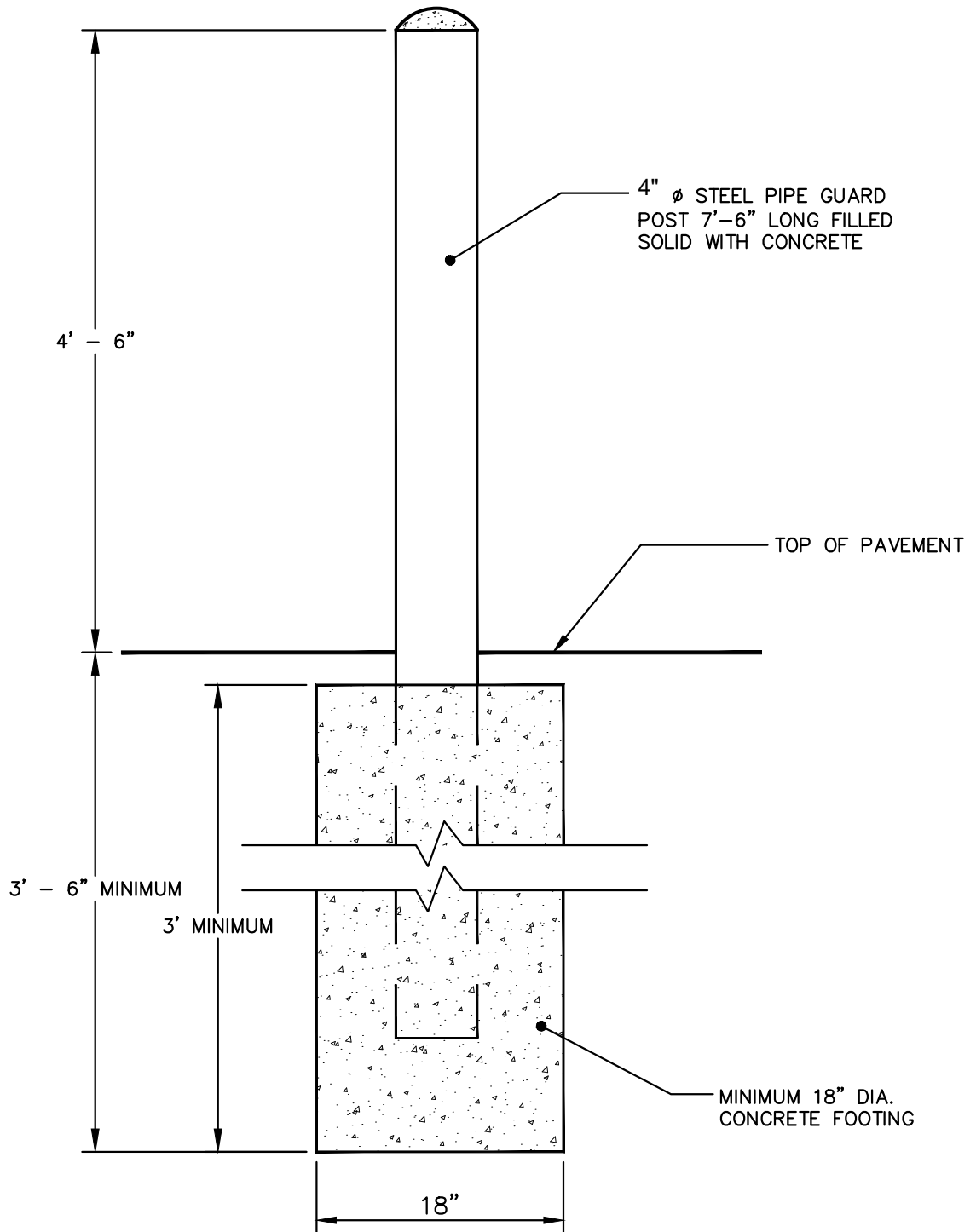
Install bollards plumb. Brace pipes to prevent displacement from center and plumb during pouring and curing of concrete. Consolidate wet concrete by rodding or vibrating. Finish concrete at top of pipe with convex (upward) dome for shedding of precipitation, while permitting bollard cover to be installed properly.

Install bollard covers according to manufacturer's specifications.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
DS_Bollard	Each

DS_Bollard includes removing and disposing of existing bollards, fabricating, delivering, and installing the bollard and bollard cover at the location shown on the plans. The pay item **DS_Bollard** also includes the cost of placing and finishing concrete in the bollard and constructing a concrete foundation for the bollard.



**CITY OF ANN ARBOR
PUBLIC SERVICES**
301 EAST HURON STREET
P.O. BOX 8647
ANN ARBOR, MI 48107-8647
734-794-6410
www.a2gov.org

REV. NO.	DATE	DRAWN BY	CHECKED BY
STEEL PIPE BOLLARD			
DR. ENG	CH. ENG	DRAWING NO.	
SCALE N.T.S.	DATE 12/8/2023	SD-M-3	

SECTION 33 05 36

FIBERGLASS-REINFORCED JACKING PIPE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The WORK specified in this Section includes the requirements for furnishing and installation of all ~~Centrifugally Cast~~ Fiberglass Reinforced Polymer Mortar Pipe (~~CCFRPM~~), gaskets, and accessories as designated in the Contract for use with microtunneling methodology described in Section 33 05 07.36 – Microtunneling.
- B. In general, the Work of this Section shall include furnishing the pipe and fittings; the laying, jointing and jacking the pipe; connecting to manholes, inlets, and other structures; furnishing and placing of all accessories, appurtenant materials, stoppers, and markers; and the furnishing of all drawings, testing, samples, and all labor, materials and equipment necessary to complete the Work as specified, shown, ordered and directed.

1.02 REFERENCES

A. Related Sections

- 1. 33 05 07.36 – Microtunneling

B. Reference Specifications, Codes, And Standards

The publications and standards listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the abbreviation only. Unless otherwise stated, the most recent version or edition of each publication or standard is implied.

1. American Society for Testing and Materials (ASTM):

- a. D638 – Test Method for Tensile Properties of Plastics.
- b. D790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- c. D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel- Plate Loading.
- d. D3262 - Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
- e. D3681 - Test Method for Chemical Resistance of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe in a Deflected Condition
- f. D4161 - Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.

g. F477 - Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

2. American Water Works Association (AWWA):

a. M45 – Fiberglass Pipe Design.

1.03 QUALIFICATIONS

A. The designer shall have at least five years of experience, all in the last ten years, in the design of **CCFRPM** for jacking. The design shall be stamped and sealed by a Professional Engineer registered in the State of Michigan.

1.04 SUBMITTALS

A. Product Data: The Contractor shall submit shop drawings showing pipe dimensions, joint details, grout hole details and other pertinent product data including manufacturers catalog cuts with printed specifications.

B. Calculations: The Contractor shall submit design calculations for the proposed pipe and joints. Calculations for the joints shall demonstrate that the axial jacking forces with the required factor of safety as stated in Section 33 05 07.36 – Microtunneling necessary to complete the work required for this project can be transmitted through the joints within tolerance limits of misalignment. For pipe alignment tolerance limits, refer to specification Section 33 05 07.36 – Microtunneling.

C. Quality Control:

1. Quality control program for pipe manufacturer, including names and qualifications of quality control personnel for acceptance by the Engineer.

2. Description of procedures for maintaining and checking tolerances for pipe dimensions.

3. The Contractor shall submit test results with respect to the physical characteristics of the **CCFRPMP**. These tests shall be done at no additional cost to the Owner and shall include the following:

a. Tests performed in accordance with ASTM D3262.

b. Tests performed on joints in accordance with ASTM D4161.

c. Pipe stiffness tests in accordance with ASTM D2412. Submit material safety data sheets to the Engineer for each chemical grout used.

d. Submit demonstration pipe test program results prior to pipe production.

1.05 DESIGN CRITERIA

- A. The Contractor is fully responsible for the design of **CCFRPM** that meets or exceeds the design requirements of this Specification and that is specifically designed for installation by microtunneling.
- B. The **CCFRPM** shall be designed to withstand the maximum jacking loads that the Contractor anticipates will be exerted on the **CCFRPM**, including any non-uniform load distributions. The pipe shall be designed with a safety factor on axial load capacity of at least 2.0. These loads shall be in addition to soil and groundwater loadings. The pipe shall have a minimum pipe stiffness of 140 psi.
- C. The jacking pipe shall be designed to carry the full weight of the soil above it, all applicable surcharge loads, as well as the external water pressure. For geotechnical information, the Contractor is referred to the Geotechnical Baseline Report and Supplemental Geotechnical Data Package.

1.06 QUALITY ASSURANCE

- A. The Owner or other designated representative shall be entitled to inspect pipes or witness the pipe manufacturing.
- B. Manufacturer's Notification to Customer: Should the Owner request to see specific pipes during any phase of the manufacturing process, the manufacturer must provide the Owner with adequate advance notice of when and where the production of those pipes will take place.

1.07 TESTING

- A. Pipe shall be inspected at the point of manufacture by an independent testing laboratory engaged by the Owner, at no cost to the Contractor. Pipe without marking as specified herein and tested pipe without the testing laboratory's mark of acceptance shall not be delivered to the site of the Work. The pipe manufacturer shall keep the laboratory informed as to when pipe is to be made and ready for inspection.
- B. Provide test results for the following tests:
 - 1. Pipes: Pipes shall be manufactured and tested in accordance with ASTM D3262.
 - 2. Joints: Joints shall meet the requirements of ASTM D4161.
 - 3. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 140 psi.
 - 4. Stain Corrosion: The extrapolated 50-year strain corrosion value shall not be less than 0.9% as determined in accordance with ASTM D3681 and ASTM D3262
- C. Pipe for testing shall be furnished and tested by the Contractor at no cost to the Owner or the testing laboratory. Centrifugally cast fiberglass reinforced polymer mortar pipe for microtunneling shall be tested and witnessed by the testing laboratory observer engaged by the Owner. Acceptance of centrifugally cast fiberglass reinforced polymer

mortar pipe shall be made on the basis of material tests and inspection of the manufactured pipe for visual defects and imperfections. The number of specimens of pipe sections required for the basis of acceptance shall be a minimum of one percent of the length furnished, but not less than 3 specimens of pipe of each size furnished unless otherwise permitted by the Engineer. Material tests shall include hydrostatic and permeability tests.

- D. The Owner or their designated representative shall be entitled to witness the pipe manufacturing.
- E. In-plant hydrostatic tests shall be performed on pipe produced for this project in accordance with the hydrostatic test for "Fiberglass" pipe joints using flexible elastomeric seals, ASTM D4161. The hydrostatic tests shall be performed at a frequency of at least 1 test in every 50 consecutive pipes produced, with a minimum of 50 pipes produced between each test. The pipe and joints for this project shall be tested to 2 bar (29 psi test pressure).
- F. Failure of the joints and pipe to meet test requirements as specified under ASTM D4161 and ASTM F477 shall, at the discretion of the Owner, cause the pipe to be rejected.
- G. All pipes used for hydrostatic testing shall not be used for installation for this project and shall be furnished by the Contractor at no additional cost to the Owner.
- H. All expenses relative to inspection, including any travel costs, shall be paid by the Owner. All expenses relative to testing shall be paid by the Contractor.

1.08 DELIVERY AND STORAGE

- A. Packaging, handling, and shipping shall be done in accordance with the manufacturer's instructions.
- B. Acceptance at Site:
 - 1. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer. Such inspection may be made at the place of manufacture, or on the site after delivery, or at both places, and the pipes shall be subject to rejection at any time on account of failure to meet the specification requirements, even though sample sections may have been previously accepted. Sections rejected after delivery to the job shall be visibly and clearly marked for identification and shall be removed from the job in a timely manner. All sections that have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted by the Engineer, or removed and replaced, at no additional cost to the Owner.
 - 2. At the time of inspection, the sections shall be carefully examined for compliance with ASTM designations specified herein and with the approved manufacturer's drawings. All sections shall be inspected for general appearance, dimension, tolerance, blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.

3. Imperfections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that a strong and permanent repair is achievable. The pipe shall be repaired by an authorized representative of the pipe manufacturer. Repairs shall be carefully inspected by the Engineer before final approval.

1.09 STORAGE AND PROTECTION:

- A. Care shall be exercised in handling, transporting, and placing pipe to prevent damage to the pipe. No interior hooks or slings shall be used in lifting pipe. All handling operations shall be done with an exterior sling or with a suitable forklift.
- B. Pipes shall be stored in an orderly manner so that there will be a minimum of rehandling from the storage area to the final position in the tunnel and so that there is a minimum of obstruction and inconvenience to any kind of traffic. Deliveries shall be scheduled so that the progress of the work is at no time delayed. Storage of pipe shall be restricted to the staging areas as shown on the Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.
- B. Glass Reinforcements: The reinforcing glass fibers used to manufacture the components shall be of the highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.
- C. Silica Sand: Sand shall be a minimum of 98% silica with a maximum moisture content of 0.2%.
- D. Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally affect the performance of the product.
- E. Elastomeric Gaskets: Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufacturers and be suitable for the service intended.
- F. Epoxy Cement: Epoxy cement for grout hole PVC plugs shall be LOCTITE EA E-00CL by Henkel, or equivalent, and approved by the ~~CC~~FRPM manufacturer.

2.02 DIMENSIONS

- A. Diameters:
 1. The actual outside diameter shall be in accordance with ASTM D3262 and the size requirements as indicated on the Contract Drawings.
 2. The nominal pipe diameter shall be 36 inches.

- 3. All measurements shall have a tolerance of $\pm 0.1\%$.
- B. Lengths: Pipe shall be supplied in nominal lengths of 10 or 20 feet. Actual supplied length shall be determined by the Contractor consistent with the means and methods of construction, and shall nominally be +1, -4 inches. At least 90% of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.
- C. Roundness: The **CCFRPM** shall be round within 0.1% of the outside diameter.
- D. Wall Thickness: The minimum wall thickness, measured at the bottom of the spigot gasket groove where the wall cross-section has been reduced, is to be determined from the maximum jacking load. The minimum factor of safety against jacking force is 2.0 based on straight alignment.
- E. End Squareness: Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/16 inch.

2.03 MANUFACTURE

- A. Pipes: Manufacture pipe by the centrifugal casting process to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a sand and resin layer, which provides UV protection to the exterior. Pipes shall be Type 1, Liner 2, Grade 3 per ASTM D3262.
- B. Joints: The **CCFRPM** shall be connected by gasket-sealed flush bell and spigot joints that do not materially increase the **CCFRPM** outside diameter or decrease the **CCFRPM** inside diameter. The bell (banding collars) shall be physically bonded to a pipe end using a fiberglass resin wrap. Gluing alone is insufficient. The gasket(s) shall meet the requirements of ASTM F477. Unless otherwise specified, the pipe shall be field connected with stainless steel couplings or bell-spigot joints that utilize elastomeric sealing gaskets as the sole means to maintain joint water tightness. The joints must meet the performance requirements of ASTM D4161. The joint shall have approximately the same O.D. as the pipe, so when the pipes are assembled, the joints are essentially flush with the pipe's outside surface. Joints at tie-ins, when needed, may utilize gasket-sealed closure couplings. The joints shall be leak-free under the following conditions:
 - 1. External pressures up to 2 bars (200 kPa) from bentonite or other lubricant, injection, slurry system operation or groundwater head.
 - 2. Gaps between the pipe ends shall not exceed 1/2 inch.
 - 3. Joints between pipes shall be protected by the installation of a fiber board or plywood compression ring to distribute jacking loads evenly. The maximum thickness of the compression ring shall be 1/2 inch.
- C. Grout Holes: The **CCFRPM** shall be supplied with factory-installed grout connections of diameter, quantity, and orientation compatible with the microtunneling lubrication

operation. Grout holes shall be fitted with either countersunk threaded corrosion-resistant steel plugs or PVC plugs fastened securely with epoxy to prevent infiltration of displaced earth during the jacking process. As a minimum, each pipe shall be supplied with 2-inch diameter grout holes spaced at 60 degrees (staggered at 10, 12, and 2 o'clock) on center, regularly spaced between 6-8 feet along the length of the pipe.

- D. Fittings: Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Properly protected standard ductile iron, fusion- bonded epoxy- coated steel and stainless-steel fittings may also be used.
- E. Acceptable Manufacturer: HOBAS Pipe USA, ~~Flowtite Technology~~ Thompson Pipe Group, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Pipe Installation: The installation of pipe and fittings shall be in accordance with the project plans and specifications and the manufacturer's requirements.
- B. Pipe Handling: Unloading, handling, and installation of pipe and fittings shall be in accordance with the project plans and specs and the manufacturer's requirements. ~~CCFRPM~~ shall be handled without the use of hooks or devices which might damage the tongue or groove or inside of the pipe. Use textile slings, other suitable materials or a forklift. Use of chains or cables is not recommended.
- C. Before pipe is lowered into the jacking shaft, it shall be checked for roundness and shape so that joints can be properly made. Any pipe unduly out of round or out of shape will be rejected.
- D. When the pipe is ready for installation, the joint surfaces shall be thoroughly clean of all dirt and foreign material. Care shall be used in entering the tongue into the groove so that the gasket will not be deformed or displaced. The joint components and the pipe ends shall be clean.
- E. Jointing:
 - 1. Clean ends of pipe and joint components.
 - 2. Apply joint lubricant to the bell interior surface and the elastomeric seals. Use only lubricants approved by the pipe manufacturer.
 - 3. Use suitable equipment and end protection to push the pipes together.
 - 4. Do not exceed forces recommended by the manufacturer for joining or pushing pipe.

- F. Jacking operations shall be performed in accordance with Section 33 05 07.36 – Microtunneling.
- G. Each **CCFRPM** pipe section shall be jacked forward as the MTBM advances in such a way that the joints maintain their integrity and the continuity of the **CCFRPM** train is maintained.
- H. Any pipe, which has been damaged or delaminated during installation, shall be pushed or pulled out and replaced, or repaired in-place using glass fiber fabrics and suitable thermoset resins in accordance with repair requirements by the manufacturer. The cost of replacement, repairing, or installation of a new pipe length shall be at no additional cost to the Owner.
- I. Field Tests:
 - 1. Infiltration / Exfiltration Test: maximum allowable leakage shall be per local specifications requirements.
 - 2. Low Pressure Air Test: Each reach may be tested with air pressure (max 5 psi). The system passes the test if the pressure drop due to leakage through the pipe or pipe joints is less than or equal to the specified amount over the prescribed time period.
 - 3. Deflection: Maximum allowable long-term deflection is typically 3% of the initial diameter.

3.02 PIPE ACCEPTANCE INSPECTION AND TESTING

- A. After installation, inspect pipelines for obstructions and clean pipe. Provide all the necessary facilities for the inspection and cleaning. Dispose of all waste, including water.
- B. Acceptance Inspection: Inspect the pipeline and repair any visual damage, defects, or leakage in the pipeline, manholes, and special structures. Leakage is defined as visible free movement of fluid into or out of the pipeline. Provide all labor and equipment to perform the remedial work. Submit a Repair Plan to the Engineer for approval prior to performing remedy and repair work.
- C. Test pipelines by either joint method:
 - 1. Individual Joint Tests - Hydrostatic: Provide all labor, materials, and equipment to perform the tests and retest as necessary. Provide equipment that is capable of accurately monitoring and recording the requested test information. Perform testing on all joints that experience a minimum static groundwater pressure of 3.5 psi or less measured at the crown of the pipe unless additional testing is required by the Engineer.
 - a. Perform the pipe joint test by placing a portable bulkhead or other sealing device at the joint and then introducing water under pressure into the annular space between the bulkhead and the joint gasket.

- b. Pressurize the joint and test for a minimum of 15 minutes, maintaining the required hydrostatic head at the crown of the pipe throughout the duration of the test. The hydrostatic head for test purposes shall exceed the maximum estimated groundwater level at the joint being tested by at least 72 inches. Record the test duration and resulting leakage of each joint. Determine the allowable leakage at a joint according to the following formula:

$$\text{Allowable Leakage} = 0.0004 \times D \times L$$

Where:

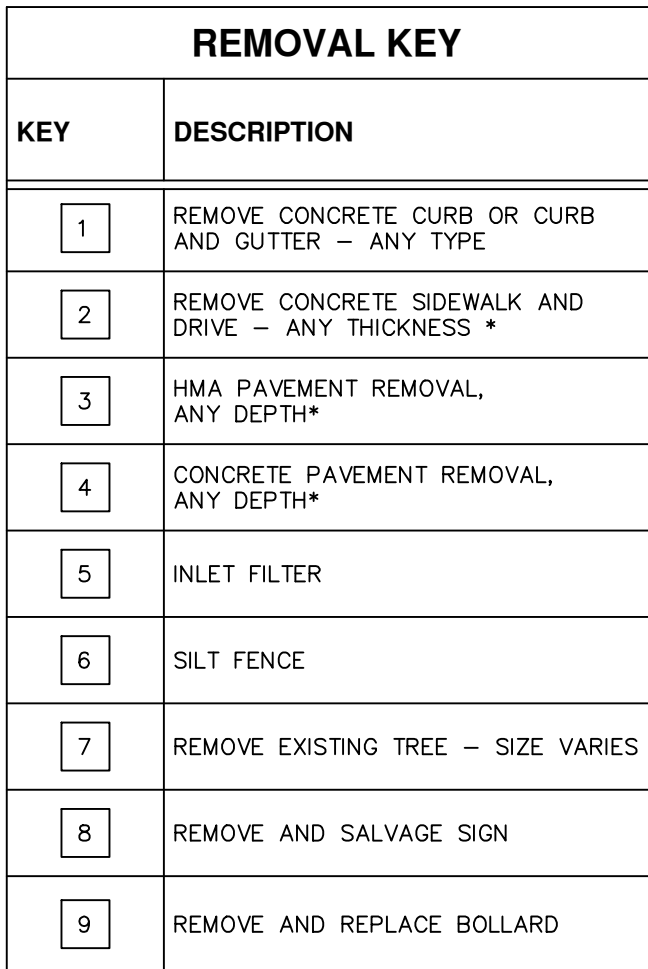
Allowable Leakage = Allowable leakage in gallons per hour per joint.

D = Nominal pipe diameter in inches.

L = Average of the lengths of the two abutting segments in feet.

2. When actual leakage exceeds the allowable, determine the cause and remedy it before the pipeline is accepted. Correct any visible leaks in the pipeline, manholes and special structures.
3. Acceptance of the pipeline is based on a final inspection of the entire line conducted with the Engineer.

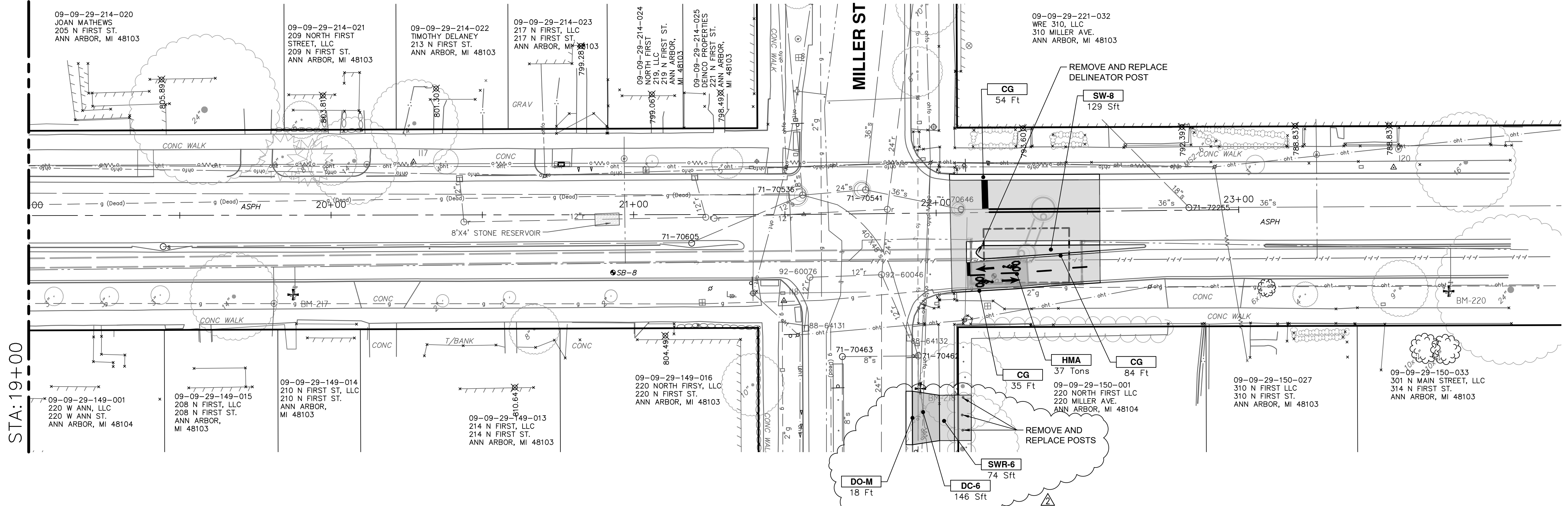
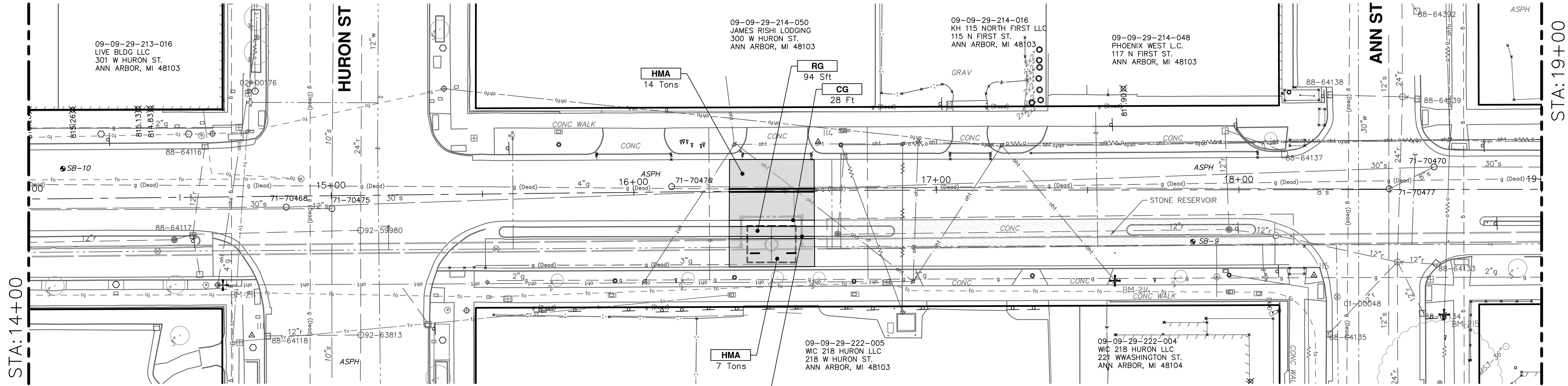
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- SAWCUT FULL DEPTH AT REMOVAL LIMITS

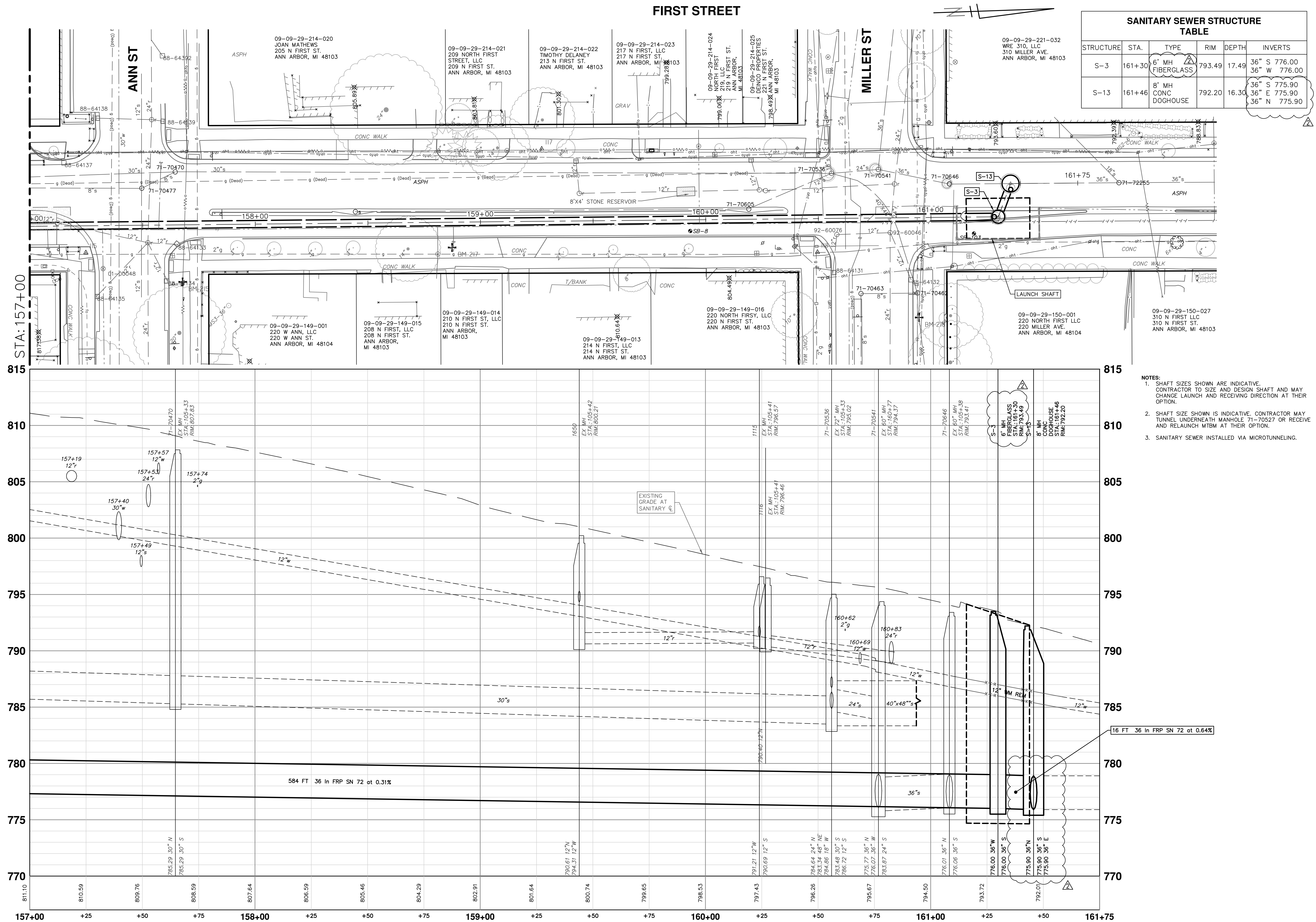
NOTES:

1. PAVEMENT SHALL BE SAW CUT FULL DEPTH AND REMOVED HALF WIDTH FOR WATER MAIN INSTALLATION. FINAL LIMITS OF PAVEMENT REMOVAL WILL BE AS DIRECTED BY THE ENGINEER.
2. UTILITY REMOVALS SHOWN ON UTILITY SHEET(S).
3. LIGHT POLES TO BE REMOVED BY CITY OF AN ARBOR AS NEEDED AND COORDINATED BY THE CONTRACTOR.



CONSTRUCTION KEY	
KEY	DESCRIPTION
ABM	ADJUST MONUMENT BOX OR GATE VALVE BOX
ASC	ADJUST STRUCTURE COVER
CD	6 INCH CURB DRAIN, HDPE DR17
CG	CURB AND GUTTER, CONCRETE, F4, SPECIAL
C-8	8 INCH CONCRETE PAVEMENT
DSC	STRUCTURE COVER
DWS	DETECTABLE WARNING, CAST IN PLACE
DO-M	DRIVEWAY OPENING, CONCRETE, DETAIL M
DC-6	6 INCH CONCRETE DRIVE, HIGH EARLY
HMA	HMA, PAVEMENT LEVELING COURSE/TOP COURSE PER TYPICAL SECTION
RG	RAINGARDEN
SW-4	4 INCH CONCRETE SIDEWALK
SWR-6	6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP
SW-8	8 INCH CONCRETE SIDEWALK
UD	6 INCH UNDERDRAIN





SANITARY SEWER STRUCTURE TABLE					
STRUCTURE	STA.	TYPE	RIM	DEPTH	INVERTS
S-3	161+30	6' MH FIBERGLASS 	793.49	17.49	36" S 776.00 36" W 776.00
S-13	161+46	8' MH CONC DOGHOUSE	792.20	16.30	36" S 775.90 36" E 775.90 36" N 775.90

- NOTES:**
1. SHAFT SIZES SHOWN ARE INDICATIVE. CONTRACTOR TO SIZE AND DESIGN SHAFT AND MAY CHANGE LAUNCH AND RECEIVING DIRECTION AT THEIR OPTION.
 2. SHAFT SIZE SHOWN IS INDICATIVE. CONTRACTOR MAY TUNNEL UNDERNEATH MANHOLE 71-70527 OR RECEIVE AND RELAUNCH MTBM AT THEIR OPTION.
 3. SANITARY SEWER INSTALLED VIA MICROTUNNELING.