

# ADDENDUM No. 1

ITB No. 4565

## Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project

**Bids Due: February 19, 2019 at 10:00 A.M. (Local Time)**

The following changes, additions, and/or deletions shall be made to the Invitation to Bid for Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project, ITB No. 4565, on which proposals will be received on/or before February 19, 2019, at 10:00 A.M. (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 One hundred, seventy-eight (178) pages.**

**Bidder is to acknowledge receipt of this Addendum No. 1, including all attachments (if any) in its Bid by so indicating on page ITB-1 of the Invitation to Bid Form. Bids submitted without acknowledgment of receipt of this addendum will be considered nonconforming.**

The following forms provided within the ITB document must be included in submitted bids:

- City of Ann Arbor Prevailing Wage Declaration of Compliance
- City of Ann Arbor Living Wage Ordinance Declaration of Compliance
- Vendor Conflict of Interest Disclosure Form
- City of Ann Arbor Non-Discrimination Ordinance Declaration of Compliance

**Bids that fail to provide these completed forms listed above upon bid opening will be rejected as non-responsive and will not be considered for award.**

### I. CORRECTIONS/ADDITIONS/DELETIONS

Changes to the Bid document which are outlined below are referenced to a page or Section in which they appear conspicuously. The Bidder is 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**

TC-1 & TC-2

As provided in ITB No. 4565 Bid Document:  
Table of Contents

As updated herein:

Table of Contents reorganized due to adding new Detailed Specifications for new pay items and renumbering some pay items, all Detailed Specifications have a new page number.

*Comment: The intent with this change is to simply replace the entire DS section provided in the ITB Document with the updated DS-1 thru DS-89 provided herein.*

BF-1 to BF-4 As provided in ITB No. 4565 Bid Document:

Bid Forms

As updated herein:

Bid Form, Section 1 – Schedule of Prices as Pages BF-1 to BF-4.

*Comment: The intent with this change is to simply replace the inaccurate Page BF-1 to BF-4 provided in the ITB Document with the accurate Page BF-1 to BF-4 provided herein.*

DS-1 As provided in ITB No. 4565 Bid Document:

Progress Schedule

As updated herein:

The Detailed Specification for Project Schedule eliminated the Measurement and Payment section.

DS-3 As provided in ITB No. 4565 Bid Document:

Maintenance of Traffic

As updated herein:

The Detailed Specification for Maintenance of Traffic was changed to increase the Detour limit to four (4) weeks.

DS-40 As provided in ITB No. 4565 Bid Document:

Digital Audio Visual Coverage

As updated herein:

The Detailed Specification for Digital Audio Visual Coverage was changed to add a couple more qualified companies.

DS-46 As provided in ITB No. 4565 Bid Document:

Clean-up and Restoration, special, Max \$10,000

As updated herein:

The Detailed Specification for Clean-up and Restoration, special, Max \$10,000 was changed to remove the turf establishment items to their own separate pay items. A Max cost was then added.

DS-51 As provided in ITB No. 4565 Bid Document:

Water Main Pipe Abandonment, Modified and Fire Hydrant Assembly  
Abandonment

As updated herein:

The Detailed Specification for Water Main Pipe Abandonment, Modified and Fire Hydrant Assembly Abandonment was changed to give the pay items new numbers.

DS-53 As provided in ITB No. 4565 Bid Document:

Absent

As updated herein:

The Detailed Specification for 6 inch Insertion Valve in Box was added to given a new pay item.

DS-59 As provided in ITB No. 4565 Bid Document:  
Temporary Water Main Line Stops

As updated herein:

The Detailed Specification for Temporary Water Main Line Stops was changed to add the pay item #221 Temporary Water Main Line Stop, Additional Rental Day and revise the Measurement and Payment section.

DS-59 As provided in ITB No. 4565 Bid Document:  
Temporary Water Main Line Stops

As updated herein:

The Detailed Specification for Temporary Water Main Line Stops was changed to add the pay item #221 Temporary Water Main Line Stop, Additional Rental Day and revise the Measurement and Payment section.

DS-62 As provided in ITB No. 4565 Bid Document:  
Machine Grading, Modified

As updated herein:

The Detailed Specification for Machine Grading Modified was changed due to creating pay items for turf establishment.

DS-68 As provided in ITB No. 4565 Bid Document:  
Concrete Curb & Gutter, Sidewalks, & Driveways

As updated herein:

The Detailed Specification for Concrete Curb & Gutter, Sidewalks, & Driveways was changed to clarify that the sand or aggregate base under new concrete items will be paid for separately from the concrete.

DS-74 As provided in ITB No. 4565 Bid Document:  
Sand and Aggregates

As updated herein:

The Detailed Specification for Sand and Aggregates was changed to add pay items #253 "Aggregate Base Course, 23A – C.I.P." and #254 "Aggregate Surface Course, 23A – C.I.P." and change the pay item unit of #252 "Aggregate Base Course, 21AA – C.I.P." from CYD to Ton.

DS-76 As provided in ITB No. 4565 Bid Document:  
Remove Concrete Curb & Gutter, Sidewalks, & Driveways

As updated herein:

The Detailed Specification for Removing Concrete Curb & Gutter, Sidewalks, & Driveways

was changed to address the Title change of the City employee needed to coordinate any root greater than 2 inches removals.

DS-86 As provided in ITB No. 4565 Bid Document:  
Absent

As updated herein:

The Detailed Specification for Turf Establishment was added to given new pay items for #281 "Fertilizer, Chemical Nutrient, CI A", #282 "Mulch Blanket, High Velocity", #283 "Seeding, Mixture THM", and #284 "Topsoil Surface, Furn, 4 inch" when those items were removed from DS-46 #205 "Clean-up and Restoration, special, Max \$10,000.

APDX-1 As provided in ITB No. 4565 Bid Document:  
Appendix

As updated herein:

The Appendix was changed to include the details for the new City castings required in this project.

APDX-14 to APDX-17 As provided in ITB No. 4565 Bid Document:  
Appendix -Absent

As updated herein:

The new the details for the new City castings required in this project were added to the Appendix.

Plan Sheets As provided in ITB No. 4565 Bid Document:  
Plan Sheets 1-54

As updated herein:

Plan Sheets 1-54 were updated to add the Revision 1: Addendum 12/13/19 in the Title Block.

Plan Sheets 4-6 were updated to clarify the pay items and construction methods being used in the Cross-Sections.

Plan Sheet 7 was updated to change the hydrant detail to match the Detailed Specification.

Plan Sheet 8 was updated to clarify the trench details based on pay items.

Plan Sheet 44 and 49 were updated to show the new 6 inch Insertion Valve in Box.

Plan Sheets 20-26, 32-34, 37-38, 42-44, and 48-50 were updated to clarify that Water Main Class 50 D.I.P. (Thickness Class) is being installed in this project. Two far-side Hydrant Profiles were also included on Sheet 21 and 25.

## **II. QUESTIONS AND ANSWERS**

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the ITB. Offerors are directed to take note in their 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: Can the duration of the detour route be extended to 4 weeks to accommodate the installation and testing of the water main, concrete work and cure time, and the paving of Pontiac Street?

Answer 1: Yes.

Question 2: What are the additional tests of the water are being considered?

Answer 2: AWWA released a Request for Proposal (RFP) - *ATP & Coliform Analysis Comparison for Infrastructure Release for Service*. The objective of this project is to determine if adenosine triphosphate (ATP) analysis is a suitable risk assessment tool for operational guidance that may be used as an alternate method for releasing newly installed water mains for service, releasing mains for service after breaks, and releasing treated water storage reservoirs for service after cleaning, disinfection, and/or maintenance. If successful, the project yields a heavy economic, conservation, customer, environmental, and community impact for utilities as the amount of time spent waiting for coliform sample results in these situations typically requires between 20-30 hours from the time of collection. The results of these samples will not affect your passing/failing results from the bacteriological testing outlined in the ITB.

Question 3: Is there a 16" x 16" x 12" Tee in the project.

Answer 3: No, that was a mistake on the Bid Form. It will be corrected in the addendum.

Question 4: When is the pay item "Structure Covers" being paid?

Answer 4: When adjusting covers of structures to remain in place, new covers shall be provided with the City's custom logo, and these will be paid by pounds. New water valves and drainage structures covers shall also have the custom logo, but the cost of the cover is included in the water valve or drainage structure. See custom casting in the updated Appendix.

Question 5: Does the City know if DTE uses remote meter readers at the properties in the project limits?

Answer 5: A survey of residents that are on the Project Update Email Distribution List were contacted, and it seems they all think that their meters are read remotely.

Question 6: There is a discrepancy on the class of water main pipe on the plans and the Bid Form.

Answer 6: The Class 50 DIP is the pay item, and refers to the Thickness Class (nominal thickness for 8-inch pipe is 0.25 inch). The labels in the plans refer to the Pressure Class (for which P.C. 350 also has a nominal thickness of 0.25 inch for 8-inch pipe). Plan Sheets are update to clarify.

Question 7: There is not a pay item for "23A" on the Bid Form.

Answer 7: Two will be added, one for the Base Course and one for the Surface Course. See DS-74 for items #253 and #254.

Question 8: There is not a pay item for "Inlet Filter" on the Bid Form.

Answer 8: The Detailed Specification for Soil Erosion Control (DS-24) states costs for inlet filters, silt fence, and other sedimentation control measures will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions, Max \$50,000.

Question 9: Can Turf Establishment and Restoration have its own pay items?

Answer 9: Yes, pay items for Fertilizer, Chemical Nutrient, CI A, Mulch Blanket, High Velocity, Seeding, Mixture THM, and Topsoil Surface, Furn, 4 inch have been added as DS-86 and as items # 281-284 on the Bid Forms.

Question 10: Can the sand layer in the trench be clarified; i.e. does it have to be under the curb as shown if the 1:1 trench just catches the curb for replacement?

Answer 10: Yes. Yes, the sand layer in the trench must be as shown under the new curb, as we intend to install underdrain under all new curb if there is an inlet to outlet to.

Question 11: Can insertion valves be considered for Pontiac Street?

Answer 11: Yes, 6-inch insertion valves have been added as DS-53, item #220 on the Bid Forms.

Question 12: Can you consider making the pay item for Line Stops unit per day, as Contractors get charged for equipment rental for additional days.

Answer 12: The pay items for Line Stops remain as EACH for their initial installation and use. An additional pay item was created to pay for additional days after the first as DS-59, item #221 on the Bid Forms

Question 13: The water main specification has conflicting information in it.

Answer 13: Post Meeting Note: The water main special provision that has popped up in other City projects in the past is not the same as the one included for this project. In addition, the Water Division of the Standard Specifications has been UPDATED online. Reference the website on SS-1

Question 14: Will the videotaping requirement for new sewer and waterlines be required if an existing sanitary service is broken and repaired while installing the water main?

Answer 14: No, the requirement refers to the main line pipe.

Question 15: If storm pipe is in conflict with the new water main, will the removal and replacement be paid for separately?

Answer 15: Yes, using appropriate items on the Bid Forms.

Question 16: Will you continue to use the City Standard Specification for the Granular Material CI II and Aggregates?

Answer 16: Yes. The City created those specifications to ensure we get the material we want and to improve the permeability and drainage characteristics of crushed limestone.

Question 17: Will Hydrant Profiles be included in the Addendum?

Answer 17: Yes, when hydrants are proposed on the far side of the water main, profiles will be created to show any utility conflicts.

Question 18: 6 inch sidewalk, curb, and fittings quantities in the Bid Form seems off.

Answer 18: There was an error made, and there are updated in the current Bid Forms.

Question 19: Clarify the Cross-sections and the payment of Aggregate Base.

Answer 19: Although said differently at the Pre-Bid Meeting and since in one-on-one conversations; the FINAL decision on the Aggregate Base is as follows: On roads in which will get new paved surfaces, the 8 inch aggregate Base will be paid for separately, but will only be in the trench. Additional Aggregate Base will be added to the existing stone outside the trench to achieve final base grade. For this reason, the pay item unit was changed to Ton. See DS-74, items #250-254 on the Bid Forms.

Question 20: Will the asphalt patch required in Pontiac Street at Amherst within the Detour timeframe be placed to final grade?

Answer 20: Yes. All intersections along Pontiac Street need to be patched to final grade (top course down) before the detour is opened.

Question 21: What is included in the Line Stop pay items?

Answer 21: Pavement removal, excavation, installation, and backfill will be incidental to the Line Stop. Aggregate Base and HMA will be paid for separately. If the excavation is adjacent to the project limits, "HMA Pavement Leveling/Top – LVSP" will be used. If the excavation is separated from the project limits by asphalt to remain in place, "HMA Handpatching" will be used. This logic is the same for the 6 inch insertion valves. See DS-59.

Question 22: Clarify the payment of sidewalk and sand base.

Answer 22: The sidewalk pay items include the concrete. Sand base/subbase will be paid for as "Sand Subbase Course, Class II – C.I.P." See DS-74.

Question 23: The Standard Specification states that the Contractor will be charged for the City installing corporation in Gate Valve in Wells. What are those fees?

Answer 23: Currently, a 1" corporation costs \$466 and a 2" corporation costs \$614 EACH. This fee is paid at the Customer Service desk in City Hall.

Question 24: How much do Bacti Samples cost?

Answer 24: Currently, each Bacti sample tested cost the Contractor \$25.

Question 25 The Hydrant Spec calls for push-on joints rather than MJ shoe, is this correct?

Answer 25: Yes, this is new. It should be the standard in City projects from now on. If you see the old spec on another project, let the Project Manager know.

Question 26: As it relates to abandonment of the existing water main, do you intend on cutting out the existing tees in Pontiac Trail, or do believe that we will stop short of the tee and cap the main somewhere in the corresponding side streets?

Answer 26: We will be cutting out the tees.

Question 27 If we are required to cut out the tees in Pontiac Trail, will the required pipe to reassemble the existing main be paid for separately, or will it be paid for as part of water main abandonment??

Answer 27: Material needed to reassemble the existing 6 inch main in Pontiac will be paid as part of the lump sum water main abandonment.

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

### **III. PRE-BID MEETING AGENDA AND SIGN-IN SHEET**

One correction to the Pre-Bid Meeting Agenda:

Item V.c.: Certified Payroll Compliance – using Davis Bacon Wage Decision pulled from site February 8, 2019 (for the 2/18/19 Bid Opening). Submit payroll weekly, see form at back of ITB.

Had the wrong date for the Bid Opening. The date is February 19, 2019 not February 18, 2019. City Hall is closed on February 18, 2019

**Pre-Bid Meeting for the  
Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project**

**February 5, 2019 @ 1:30 p.m. in the Larcom Fourth Floor Conference Room, City Hall**

- I. Introductions
  
- II. Addendum Items
  - a. Addendum #1 – will include the following:
    - i. Pre-Bid minutes, including Sign-in Sheet
    - ii. Updated Plan Sheets if necessary
    - iii. Updated Bid Form – Quantities if necessary
    - iv. Possible Detailed Specification for Structure Covers, paid as Each
  
- III. General
  - a. Project Overview
    - i. All Streets – 8 inch water main
    - ii. Geometric Changes to Intersections along Argo Drive
    - iii. Resurfacing – only Trench Filling on Ottawa and half Amherst (Chandler to Pontiac)
  - b. Standard Specifications and Detailed Specifications
    - i. Project Schedule
      - Starting Date – April 15th – Can start earlier if insurance /contracts are all set.  
City Council Award date will be April 1, 2019  
Completion Date – November 15, 2019 (214 days after commencement of work)  
Hours of work: 7:00 a.m. to 8:00 p.m. Monday thru Saturday (Sundays with permission)
    - ii. Engineer's estimate - \$2,307,850.34
    - iii. General Conditions
      - 1. Street sweeping & dust control
      - 2. Maintenance gravel
      - 3. Maintaining drainage
    - iv. Access to driveways - Contractor responsible for maintaining access to driveways during construction, and notifying residents when access will be unavailable (i.e. during water main installation, during paving, concrete work)
  
- IV. Construction
  - a. Utility Construction
    - i. Water Main – Installation and Testing
      - 1. HMA removal for trench / storm replacements
      - 2. Rest of road HMA removal prior to HMA placement (except streets listed above)
    - ii. Sanitary leads when conflicts exist
    - iii. Drainage Structure replacements
      - 1. Removals and Installations on Storm Plan Sheets (52-53)
    - iv. Reminder that all new sanitary and storm sewers (including manholes) shall be cleaned and televised before final acceptance.



- v. Manhole covers shall be labeled with “CITY OF ANN ARBOR” and “WATER”, “STORM”, or “SANITARY” – see handout.
    - b. Resurfacing the road and paving –
    - c. Sidewalk and ADA Ramps – ADA compliance MUST be achieved at all locations
    - d. Landscape Items and Restoration
      - i. Topsoil and Seeding
      - ii. Trees and shrubs
- V. Other Items
  - a. The 6” underdrains are intended to be installed where new curb and gutter is proposed, when an outlet basin is present.
  - b. The sanitary sewers were all inspected in October 2017. Video is available upon request.
  - c. Certified Payroll Compliance – using Davis Bacon Wage Decision pulled from site February 8, 2019 (for the 2/18/19 Bid Opening). Submit payroll weekly, see form at back of ITB.
- VI. Questions are due tomorrow, February 6, 2019 at 12:00pm

Contact Information:

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**Project Manager**  
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PRE-BID CONFERENCE SIGN-IN SHEET

Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Bid# 4565 FILE #: 2018-019 DATE: February 5, 2019 1:30pm

PLEASE PRINT (All information needs to be filled in to receive meeting minutes)

NAME	REPRESENTING	MAILING ADDRESS	TELEPHONE	EMAIL
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PLEASE PRINT (All information needs to be filled in to receive meeting minutes)

NAME	REPRESENTING	MAILING ADDRESS			TELEPHONE			EMAIL
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		Address			Direct			
		City, State		Zip:	Mobile:			
		Address			Fax:			
		City, State		Zip:	Direct			
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		Address			Fax:			
		City, State		Zip:	Direct			
		Address			Mobile:			
		City, State		Zip:	Fax:			

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APPENDIX – SOIL BORINGS and CUSTOM MANHOLE CASTINGS..... APDX-1

**ATTACHMENTS**

- City of Ann Arbor Prevailing Wage Declaration Form*
- City of Ann Arbor Living Wage Forms*
- City of Ann Arbor Vendor Conflict of Interest Disclosure Form*
- City of Ann Arbor Non-Discrimination Ordinance Notice and Declaration Form*

BID FORM

Section 1–Schedule of Prices

Company:

**Project: Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project.**

File #: 2018-019 Bid #: 4565

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
130	Protective Fencing	FT	1165	\$ _____	\$ _____
140	Exploratory Excavation (0-10' deep)	EA	12	\$ _____	\$ _____
200	Tree Removal, 8" or Larger, Modified	EA	3	\$ _____	\$ _____
201	Project Supervision, Max \$30,000.00	LS	1	\$ _____	\$ _____
202	General Conditions, Max. \$50,000.00	LS	1	\$ _____	\$ _____
203	Digital Audio Visual Coverage	LS	1	\$ _____	\$ _____
204	Minor Traffic Devices, Max \$20,000.00	LS	1	\$ _____	\$ _____
205	Clean-Up & Restoration, Special, Max \$10,000	LS	1	\$ _____	\$ _____
206	"No Parking" Signs	EA	125	\$ _____	\$ _____
209	Sewer, Any Size or Depth, Remove	FT	700	\$ _____	\$ _____
210	Drainage Structure, Any Size or Depth, Remove	EA	27	\$ _____	\$ _____
211	Additional Depth Structure Adjust/Repair	FT	20	\$ _____	\$ _____
212	Remove Sanitary Sewer Lead	FT	18	\$ _____	\$ _____
215	Water Main Pipe Abandonment, Modified	LS	1	\$ _____	\$ _____
216	Fire Hydrant Assembly Abandonment	EA	4	\$ _____	\$ _____
220	6 Inch Insertion Valve in Box	EA	2	\$ _____	\$ _____
221	Temporary Water Main Line Stop, Additional Rental Day	EA	4	\$ _____	\$ _____
222	Temporary Water Main Line Stop, Less than 6 inch	EA	2	\$ _____	\$ _____
223	Temporary 6 inch or 8 inch Water Main Line Stop	EA	6	\$ _____	\$ _____
224	Temporary 12 inch Water Main Line Stop	EA	2	\$ _____	\$ _____
225	6-Inch Wrapped Underdrain	FT	5080	\$ _____	\$ _____
226	Machine Grading, Modified	SYD	16000	\$ _____	\$ _____
TOTAL THIS PAGE (BF-1)				\$ _____	_____
(Also to be entered on page BF-5)					

BID FORM

Section 1–Schedule of Prices

Company:

**Project: Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project.**

File #: 2018-019 Bid #: 4565

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
227	Subgrade Undercutting - Type II	CYD	150	\$ _____	\$ _____
230	HMA Pavement Leveling/Top – LVSP	TON	3200	\$ _____	\$ _____
231	HMA Handpatching	TON	45	\$ _____	\$ _____
240	Concrete Curb or Curb and Gutter - All Types	FT	4700	\$ _____	\$ _____
241	Concrete Curb or Curb and Gutter - All Types (High Early)	FT	380	\$ _____	\$ _____
242	4 Inch Concrete Sidewalk	SFT	5000	\$ _____	\$ _____
243	6 Inch Concrete Sidewalk or Sidewalk Ramp	SFT	360	\$ _____	\$ _____
244	6 Inch Concrete Drive - High Early	SFT	2470	\$ _____	\$ _____
245	Detectable Warning, Cast In Place	SFT	70	\$ _____	\$ _____
246	Integral Sidewalk Retaining Wall, 6 inch to 18 inch	SFT	50	\$ _____	\$ _____
250	Sand Subbase Course, Class II - C.I.P.	CYD	100	\$ _____	\$ _____
251	21AA Limestone, C.I.P.	CYD	150	\$ _____	\$ _____
252	Aggregate Base Course, 21AA - C.I.P.	TON	3950	\$ _____	\$ _____
253	Aggregate Base Course, 23A - C.I.P.	CYD	500	\$ _____	\$ _____
254	Aggregate Surface Course, 23A - C.I.P.	TON	500	\$ _____	\$ _____
261	Remove Concrete Curb or Curb and Gutter - Any Type	FT	5000	\$ _____	\$ _____
262	Remove Concrete Sidewalk and Drive - Any Thickness	SFT	4800	\$ _____	\$ _____
263	HMA Surface Remove	SFT	100	\$ _____	\$ _____
265	Sidewalk Grading	STA	6	\$ _____	\$ _____
266	Sidewalk Ramp Grading	EA	5	\$ _____	\$ _____
270	Pavt Mrkg, Thermoplastic, 12 inch Crosswalk	FT	1008	\$ _____	\$ _____
271	Pavt Mrkg, Thermoplastic, 24 inch Stop Bar	FT	91	\$ _____	\$ _____

TOTAL THIS PAGE (BF-2) \$ \_\_\_\_\_  
 (Also to be entered on page BF-5)

BID FORM

Section 1–Schedule of Prices

Company:

**Project: Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project.**

File #: 2018-019 Bid #: 4565

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
272	Sign, Portable Changeable Message, Furnish and Operate	EA	3	\$ _____	\$ _____
273	Plastic Drum - Lighted, Furnish and Operate	EA	82	\$ _____	\$ _____
274	Barricade Type III - Lighted, Furnish and Operate	EA	42	\$ _____	\$ _____
275	Temporary Sign, Type B, Furnish and Operate	SFT	590	\$ _____	\$ _____
276	Channelizing Device, 42 Inch, Furnish and Operate	EA	150	\$ _____	\$ _____
280	Fire Hydrant Assembly	EA	8	\$ _____	\$ _____
281	Fertilizer, Chemical Nutrient, Cl A	LBS	150	\$ _____	\$ _____
282	Mulch Blanket, High Velocity	SYD	4000	\$ _____	\$ _____
283	Seeding, Mixture THM	LBS	185	\$ _____	\$ _____
284	Topsoil Surface, Furn, 4 inch	SYD	4000	\$ _____	\$ _____
299	Certified Payroll Compliance and Reporting	LS	1	\$ _____	\$ _____
320	12" CL IV RCP Storm Sewer Pipe, Trench Detail I	FT	704	\$ _____	\$ _____
353	4 inch SDR 35 PVC Sanitary Lead, Trench Detail I	FT	90	\$ _____	\$ _____
354	6 inch SDR 35 PVC Sanitary Lead, Trench Detail I	FT	90	\$ _____	\$ _____
366	Inlet-Junction Chamber	EA	1	\$ _____	\$ _____
367	Single Inlet	EA	24	\$ _____	\$ _____
400	6 inch Class 50 DIP w/polywrap, Trench Detail I	FT	62	\$ _____	\$ _____
401	8 inch Class 50 DIP w/polywrap, Trench Detail I	FT	4300	\$ _____	\$ _____
402	8 inch Class 50 DIP w/polywrap, Trench Detail II	FT	1580	\$ _____	\$ _____
403	12 inch Class 50 DIP w/polywrap, Trench Detail I	FT	5	\$ _____	\$ _____
410	6" 22.5° Bend	EA	1	\$ _____	\$ _____
411	6" 45° Bend	EA	2	\$ _____	\$ _____

TOTAL THIS PAGE (BF-3) \$ \_\_\_\_\_  
 (Also to be entered on page BF-5)



BID FORM

Section 1–Schedule of Prices

Company:

**Project: Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project.**

File #: 2018-019 Bid #: 4565

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
412	6" 90° Bend	EA	4	\$ _____	\$ _____
413	8" 11.25° Bend	EA	21	\$ _____	\$ _____
414	8" 22.5° Bend	EA	7	\$ _____	\$ _____
415	8" 45° Bend	EA	1	\$ _____	\$ _____
416	8" 90° Bend	EA	4	\$ _____	\$ _____
422	8" x 6" Reducer	EA	16	\$ _____	\$ _____
424	12" x 8" Reducer	EA	2	\$ _____	\$ _____
430	6" x 6" x 6" Tee	EA	3	\$ _____	\$ _____
431	8" x 8" x 8" Tee	EA	17	\$ _____	\$ _____
432	8" x 8" x 8" x 8" Cross	EA	2	\$ _____	\$ _____
436	12" x 12" x 12" Tee	EA	1	\$ _____	\$ _____
442	6" Gate Valve-in-Box	EA	1	\$ _____	\$ _____
443	8" Gate Valve-in-Box	EA	2	\$ _____	\$ _____
444	12" Gate Valve-in-Box	EA	1	\$ _____	\$ _____
446	6" Gate Valve-in Well	EA	1	\$ _____	\$ _____
447	8" Gate Valve-in Well	EA	22	\$ _____	\$ _____
448	12" Gate Valve-in Well	EA	1	\$ _____	\$ _____
460	Excavate & Backfill for Water Service Tap and Lead	FT	1400	\$ _____	\$ _____
563	Structure Covers	LBS	16000	\$ _____	\$ _____
566	Adjust Structure Cover	EA	38	\$ _____	\$ _____
567	Adjust Monument Box or Gate Valve Box	EA	6	\$ _____	\$ _____
800	Celtic occidentalis, (Hackberry), 2 inch	EA	2	\$ _____	\$ _____

TOTAL THIS PAGE (BF-4)

(Also to be entered on page BF-5)

\$ \_\_\_\_\_

BID FORM

Section 1–Schedule of Prices

Company:

**Project: Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project.**

File #: 2018-019 Bid #: 4565

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
801	Gleditsia tracanthos, (Honeylocust), 2 inch	EA	2		
802	Acer rubrum, (Red Maple), 2 inch	EA	2		

TOTAL THIS PAGE (BF-5) \$ \_\_\_\_\_

TOTAL FROM PAGE BF-1: \$ \_\_\_\_\_

TOTAL FROM PAGE BF-2: \$ \_\_\_\_\_

TOTAL FROM PAGE BF-3: \$ \_\_\_\_\_

TOTAL FROM PAGE BF-4: \$ \_\_\_\_\_

**TOTAL BASE BID:** \$ \_\_\_\_\_

## **DETAILED SPECIFICATION FOR PROJECT SCHEDULE**

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. By no later than **March 25, 2019** the Contractor shall submit a detailed schedule of work for the Engineer's review and approval. The proposed schedule must fully comply with the scheduling requirements contained in this Detailed Specification. The Contractor shall update the approved work schedule each week and present it to the Engineer at the weekly progress meeting.
2. The Contractor will receive two (2) copies of the Contract, for his/her execution, on or before **February 26, 2019**. The Contractor shall properly execute both copies of the Contract and return them, with the required Bonds and Insurance Certificate, to the City by **March 4, 2019**.
3. Contractor may begin construction on or before **April 15, 2019** and only after receiving the copy of executed contract documents and the Notice to Proceed from the City. Appropriate time extensions shall be granted if the Notice to Proceed is delayed due to the circumstances controlled by the City.
4. By **November 15, 2019** or within **two-hundred and fourteen (214)** calendar days from the date of Notice to Proceed, the Contractor must install the new water main; all of the required service leads to the water main and complete all the remaining work under this Contract for Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project including, but not limited to installation of the storm water structures, the restoration of all disturbed areas, permanent placement of hot mix asphalt and/or concrete, and the removal of any and all traffic control devices. Failure to complete all work 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, **\$400.00** in "Liquidated Damages", and not as a penalty, for each and every calendar day beyond the allowed number of calendar days to complete the above specified work.

### **PHASING SEQUENCE**

The work of this Contract is separated into two phases. The construction sequence for this project shall be as follows:

**Phase I** shall consist of Longshore Drive, from Argo Drive to 2000 Longshore Drive, Indianola Avenue from Longshore Drive to Pontiac Street, Ottawa Road from Argo Drive to Indianola Avenue, Argo Drive from Longshore Drive to Pontiac Street, and Amherst Avenue from Longshore Drive to Pontiac Street.

By **August 31, 2019** the Contractor must complete all work on Phase I of Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project including, but not limited to: install, swab, chlorinate, pressure test, and flush the new water main pipe on Longshore Drive. Successfully complete of all required bacteriological testing and place the new water main into

service.

**Phase II** shall consist of the water main connections in Pontiac Street to the new water mains along Argo Drive, Indianola Avenue, and Amherst Avenue.

Work cannot commence on **Phase II** of Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project until **Phase I** is complete. When **Phase I** is complete, the Contractor can set up the traffic detour along Plymouth Road and Barton Drive in order to connect the existing water main in Pontiac Street to the new water mains. The detour shall not exceed three weeks. By **October 1, 2019**, the Contractor must complete all work on **Phase II** of Longshore, Indianola, Ottawa, Argo, Amherst Water Main Replacement Project including, but not limited to: install, swab, chlorinate, pressure test, and flush the new water main pipe. Successfully complete of all required bacteriological testing and place the new water main into service. Backfill water main trenches, grade, and pave Pontiac Street prior to removing the detour.

In order to allow sufficient time to complete the road construction of the project, any water main installation not begun by **August 31, 2019** may, at the sole discretion of the Engineer, be postponed until the following construction season, or eliminated from this Contract entirely. If any portion of the project is postponed or eliminated, the Contractor must still complete all work on the remaining portion of the project, including paving up through the wearing course, within the current construction season. The Contractor will not be entitled to receive any additional compensation for the elimination or postponement of work from the enactment of this contract clause.

The Contractor may propose to adjust the limits or sequencing of construction in order to complete the work more efficiently. Changes to the recommended construction sequence must be approved in writing by the Engineer prior to construction and must assure all required coordination with other projects and time lines.

The City will not allow any shut down of existing water mains without prior written approval of construction methods and timing of shut down, by the City of Ann Arbor and the Engineer. All water main valves are to be operated by City of Ann Arbor personnel.

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 in order to complete the project by the final completion date. Costs for the Contractor to organize, coordinate, and schedule all of the work of the project, will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions, Max \$50,000."

Failure to complete all work 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, **\$400.00** in Liquidated Damages, and not as a penalty, for delays in the completion of the work for each and every calendar day beyond the completion date for each sub-phase, as detailed in the phasing above.

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.

# **DETAILED SPECIFICATION FOR MAINTENANCE OF TRAFFIC**

## **DESCRIPTION**

Traffic shall be maintained in accordance with the City of Ann Arbor Public Services Department Standard Specifications except as specified in Sections 104.11, 812, and 922 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD) and as amended herein.

The Contractor shall furnish, erect, maintain and, upon completion of the work, remove all traffic control devices within the project and around the perimeter of the project for the safety and protection of local traffic. This includes, but is not limited to, advance, regulatory, and warning signs; barricades and channeling devices at intersecting streets or detour streets on which traffic is to be maintained; barricades at the ends of the project and at right-of-way lines of intersecting streets; portable changeable message signs; lighted arrow boards, and moving traffic control devices for construction operations. Payment shall be paid for as “Minor Traffic Devices, Max \$20,000”.

## **MATERIALS**

The materials and equipment shall meet the requirements specified in the corresponding sections of the MDOT 2012 Standard Specifications for Construction and MMUTCD. The approximate quantities of materials are as follows: 3 Portable Changeable Message Signs, 2000 ft Black Pavement Marking Tape, Type R, 750 sft Temporary Signs, Type B, 48 Type III Barricades, 10 Type II Barricades, 150 Channelizing Devices, and 150 Type II Lighted Plastic Drums.

## **Maintenance of Local Traffic**

Unless otherwise indicated on the plans, all side roads east of Pontiac Trail, north of Barton Drive, or south of Argo Drive shall not be closed to through traffic except during construction operations of short duration and only upon written approval of the Engineer.

Local access shall be maintained at all times for emergency vehicles, refuse pick-up, mail delivery and ingress/egress to private properties.

Contractor must accommodate the safe access to the residential buildings, businesses, and parks located within construction area.

A lane-closure permit shall be obtained by the Contractor from the Engineering Division, at least 48 hours in advance of any proposed lane or street closing. The Contractor shall acquire a PIN (password) from Customer Service, login to eTRAKIT and apply for the permit. The issued permit shall be printed and displayed on site at all times.

The hours of work on all Local streets are 7:00 a.m. to 8:00 p.m., Monday through Saturday, or as specified on the lane-closure permit. No equipment will be allowed in the street before or after these hours. Local streets may only be closed to through traffic (local access only) with written authorization of the Engineer. Work must be completed each day such that all streets are re-opened to through traffic by 8:00 p.m. unless otherwise specified, directed, or authorized in writing by the Engineer. All major changes in traffic control shall be made either between 9:30 a.m. and 3:30 p.m., or between 7:00 p.m. and 8:00 p.m. in order to minimize interference with rush-hour traffic. All traffic controls must be in-place and ready for traffic each day by 7:00 a.m. and 3:30 p.m.

Driveways shall not be blocked for extended periods of time unless arrangements can be made with the affected property owner(s) or resident(s). When it becomes necessary to temporarily block driveways, the Contractor shall notify the affected property owners in advance to coordinate the work and allow sufficient time for vehicles to vacate from properties. It may be necessary to allow for vehicles to temporarily park

in the roadway at locations that do not interfere with the Contractor's work. During these periods the owners of the respective vehicles must be available to, with proper notice, move their vehicles if it becomes necessary to accommodate the work.

The Contractor shall maintain pedestrian traffic at all times covered under the pay item "Minor Traffic Devices, Max \$20,000". For maintaining normal pedestrian traffic while performing sidewalk and driveway repair, Type I barricades shall be placed by the Contractor, as directed by the Engineer. "Sidewalk Closed" and/or "Cross Here" signs shall be placed, by the Contractor, when directed by the Engineer.

During the construction of the water main, storm sewer, and road rehabilitation, parking of residences in the construction area will not be allowed. Temporary "No Parking" signs will be supplied by the City. "No Parking" signs shall be erected after MISS DIG clearance (at least 48 hours prior to enforcement), maintained throughout the project duration, and salvaged and returned to the City of Ann Arbor at the W. R. Wheeler Service Center at the completion of the project, as described in the Detailed Specification for "No Parking" Signs. They will be paid for at the Contract Unit Price for "No Parking" Signs". The Contractor shall fill out the "Temporary Permission to Reserve Parking Lane for Work-Related Purposes" form for each street and submit to the City of Ann Arbor Engineering Unit at least five (5) business days in advance of sign installation. Any vehicle parked in the construction zone shall be ticketed and towed at the owner's expense.

At times when it becomes necessary to temporarily obstruct local traffic during the performance of the work, the Contractor shall provide traffic regulation in conformance with Chapter 6E of the MMUTCD. A minimum of two traffic regulators are required. The cost of traffic regulation shall be included in the contract pay item "Minor Traffic Devices, Max \$20,000"

The Contractor shall use quantities of dust palliative, maintenance aggregate, and hot patching mixture for use as temporary base, surfacing, and dust control at utility crossings, side roads and driveways (wherever required to maintain traffic), and where directed by the Engineer to maintain local access. The cost for the use of dust palliative, maintenance aggregate and HMA wedging mixture, as required and directed by the Engineer for maintenance of traffic and local access, shall be included in contract pay item "General Conditions, Max. \$50,000" and it will not be paid for separately.

The Contractor shall perform the work of this Contract while maintaining traffic in accordance with the Contract Documents as specified herein. No traffic shall be allowed on newly placed asphalt surfaces until rolling has been satisfactorily completed and the surface has cooled sufficiently to prevent damage from traffic (170 degrees Fahrenheit). This is to be accomplished by traffic regulators and by relocating traffic control devices to prevent traffic from entering the work area until such time that it can be safely maintained without damaging the new construction. The Contractor shall provide traffic regulators in sufficient number to maintain traffic as described herein, and to keep traffic off sections being surfaced, and provide for safe travel at all times as directed by the Engineer. "No Parking" signs shall stay in effect on all newly placed asphalt surfaces for at least three days.

Each pressure distributor, paver and roller shall be equipped with at least one approved flasher light which shall be mounted on the equipment so as to give a warning signal ahead and behind.

There may be areas where the Engineer directs the paving of less than the full width of a phase to stagger the paving joints and to accommodate changes in crown and/or cross-sectional dimensions/locations. In these locations the gravel base courses shall be constructed to the full area of the phase, and the Contractor shall place traffic control devices on the base course grade as necessary, and shall place, maintain, and remove maintenance aggregate (MDOT 21AA) all as necessary, and as directed by the Engineer, to maintain local traffic to side streets and drives.

The City will not allow any shut down of existing water mains without prior written approval of construction methods and timing of shut down, by the City of Ann Arbor and the Engineer. Two (2) business days notice shall be given to the Engineer. All water main valves are to be operated by City of Ann Arbor personnel.

The Contractor shall place portable, changeable message signs (PCMs) a minimum of one week prior to the start of construction in locations indicated by the Engineer. PCMs shall be the smaller of the two MDOT and MMUTCD approved message signs so they can fit on Pontiac Trail in the lawn extension or the limited right-of-way beyond the sidewalk.

Before the detour of northbound Pontiac Street, the Contractor shall coordinate their activities with the City Public Works and the Signal Unit prior to setting up signs and rerouting traffic. The detour is for the water main connection in the Pontiac Street and Argo Drive, Indianola Avenue, and Amherst Avenue intersections, and shall not be installed until approved by the Engineer. The detour shall not extend four weeks.

## **DETAILED SPECIFICATION FOR COORDINATION AND COOPERATION WITH OTHERS AND WORK BY OTHERS**

The Contractor is reminded as to the requirements of article 104.07 of the 2012 edition of the MDOT Standard Specifications, "Cooperation by the Contractor."

The Contractor shall directly coordinate his/her work with individual City Departments/Divisions/Units.

The Contractor is hereby notified that the City of Ann Arbor Public Works Unit may be installing traffic control conduits, traffic signal sensors, and the like, at various locations.

No additional compensation will be paid to the Contractor, and no adjustments to contract unit prices will be made, due to delays and/or the failure of others in the performance of their work, nor for delays due to the encountering of existing utilities that are, or are not, shown on the Plans.

The following Utility Owners may have overhead and/or underground facilities located within the Right-of-Way:

- The City of Ann Arbor
- DTE - MichCon (Michigan Consolidated Gas Company)
- DTE - Edison (Detroit Edison Company)
- AT&T
- Comcast
- MCI Communications
- Windstream Fiber Optics

### **On all projects:**

**"3 Working Days before you Dig - Call MISS DIG - Toll Free" Phone No. 1-800-482-7171.**

The Owners of public or private utilities which will not interfere with the completed project and which do not present a hazard to the public or an extraordinary hazard to the Contractor's operations will not be required to move their facilities on or from the street right-of-way.

Stoppages created solely by the operations of the utility companies which delay utility revisions on any portion of this project may be considered as a basis of claim for an extension of time for project completion.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions, Max \$50,000."

The Contractor is hereby notified that there may be other construction projects, not associated with this project, scheduled for construction during the same timeframe as this project within the local vicinity.

The following is a listing of known road construction projects within the local vicinity that may have an impact on this project. Please note that this listing may not be complete and the Contractor shall verify any other projects within the local vicinity that may impact this project.

- Northside STEAM SRTS Sidewalk Gaps will be under construction.
- Ann Arbor Annual Street Resurfacing project will be ongoing.
- Dhu Varren Sidewalk Gap will be under construction.



- Riverview Sanitary and Water Extension will be under construction.
- Hoover / Hill /Green Improvement Project will be under construction
- Glen / Fuller Sanitary Diversion will be under construction.
- Wheeler Service Center PUD Non-motorized Improvements will be under construction.
- Miscellaneous private utility relocations with intermittent closures are anticipated.

The Contractor shall coordinate its work on this project with that by the Contractor on other projects, as directed by the Engineer. No additional compensation will be allowed for costs incurred by the Contractor due to coordinating with or delays caused by other projects.

# **DETAILED SPECIFICATION FOR SOIL EROSION CONTROL**

The Contractor shall furnish, place, maintain and remove soil erosion and sedimentation control measures, including but not limited to, silt fence and fabric filters at all drainage structures, all in accordance with all applicable City (and other governmental agencies) codes and standards, as directed by the Engineer, as detailed in the Standard Specifications, and as shown on the Plans.

## **DESCRIPTION**

This work consists of installing and maintaining inlet filters in accordance with Section 208 of the 2012 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans. Filters shall be installed in existing and proposed inlets in order to minimize the erosion of soil and the sedimentation of water courses. The related work includes the installation, maintenance and removal of the filter cloth, cleaning as required during the performance of the project work, removing and disposing of accumulated sediment, and replacement of filters if required by the Engineer so as to provide a properly working inlet filter and a well-drained site.

## **MATERIALS**

The inlet filters shall be in accordance with the REGULAR FLOW SILTSACK® manufactured by ACF Environmental (800) 448-3636; FLEXSTORM® Style FX manufactured by Advanced Drainage Systems, Inc. (800) 821-6710; CATCH-ALL® manufactured by Price & Company (866) 960-4300, or Engineer approved equal.

## **METHODS OF CONSTRUCTION**

The Contractor shall install, maintain, clean, and re-install and/or replace inlet filters in accordance with the manufacturer's specifications and as directed by the Engineer. The Contractor shall dispose of debris off-site.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions, Max \$50,000."

**DETAILED SPECIFICATION  
FOR  
VACUUM TYPE STREET AND  
UTILITY STRUCTURE CLEANING EQUIPMENT**

The Contractor shall furnish and operate throughout the construction period, vacuum type street cleaning and utility structure cleaning equipment (Vac-All, Vactor, etc.) approved by the Engineer, as and when directed by the Engineer for dust control, for dirt/debris control, and for street cleaning immediately prior to, and for street and utility structure cleaning after any and all paving. The cleaning equipment shall be of sufficient power to remove dust, dirt, and debris from the pavement and from utility structures in and adjacent to the construction area.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions, Max \$50,000."

## **DETAILED SPECIFICATION FOR MATERIALS AND SUPPLIES CERTIFICATIONS**

The following materials and supplies shall be certified by the manufacturer or supplier as having been tested for compliance with the Specifications:

- HMA materials
- Hot-poured Joint Sealants
- Cements, coatings, admixtures and curing materials
- Sands and Aggregates
- Steel and Fabricated metal
- Portland Cement Concrete Mixtures
- Reinforcing Steel for Concrete
- Reinforcing Fibers for Concrete
- Pre-cast Concrete products
- Sanitary Sewer Pipe
- Storm Sewer Pipe
- Water Main Pipe
- High Density Polyethylene Pipe
- Edge Drain and Underdrain Pipe
- Geotextile Filter Fabric and Stabilization Fabric/Grids

The Contractor shall submit all certifications to the Engineer for review and approval a minimum of three business days prior to any scheduled delivery, installation, and/or construction of same.

Costs for this work will not be paid for separately, but shall be included in the bid price of the Contract Item "General Conditions, Max \$50,000."

**DETAILED SPECIFICATION  
FOR  
CONTRACT DRAWINGS/PLANS**

Bidders shall carefully check and review all Drawings, plans, and specifications, and advise the Engineer of any errors or omissions discovered. The Drawings/Plans may be supplemented by such additional Drawings/Plans and sketches as may be necessary or desirable as the work progresses. The Contractor shall perform all work shown on any additional or supplemental Drawings/Plans issued by the Engineer.

Bidders shall carefully examine the Bid Form, preliminary layouts, specifications, and the work sites 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.

**DETAILED SPECIFICATION  
FOR EXISTING  
SOIL BORING AND PAVEMENT SECTION DATA**

Data pertaining to existing soil borings and pavement sections which may be included in these Contract Documents are provided to help the Engineer and Contractor determine the soil conditions existing within the construction area. The City in no way guarantees existing conditions to be the same as shown in the data. The Contractor is solely responsible for any and all conclusions he/she may draw from the data.

**DETAILED SPECIFICATION  
FOR  
WORKING IN THE RAIN OR IN THE DARK**

***Working in the Rain***

The Contractor shall not work in the rain unless authorized in writing by the Engineer.

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.

***Working in the Dark***

The Contractor shall not work in the dark except as approved by the Engineer.

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.

**DETAILED SPECIFICATION  
FOR  
QUANTITIES AND UNIT PRICES**

Quantities as given are approximate and are estimated for bidding purposes. Quantities are not guaranteed and may vary by any amount. While it is the City's intent to complete the project substantially as drawn and specified herein, quantities may be changed or reduced to zero for cost savings or other reasons. **The City reserves the right to change the quantities, delete streets, or add streets, and no adjustment in unit price will be made for any change in any quantity.**



# **DETAILED SPECIFICATION FOR WATER MAIN INSTALLATION AND TESTING**

## **DESCRIPTION**

This Detailed Specification is intended to supplement the current City of Ann Arbor Standard Specifications for Construction with regard to water main installation and hydrologic and bacteriologic testing. It is also intended to establish minimum requirements for the work that the Contractor is responsible to follow.

## **CONSTRUCTION METHODS**

During the delivery, handling, installation, and testing of the water main, the Contractor shall comply with the following requirements:

1. Keep all pipe clean and neatly stacked a minimum of six-inches off of the ground at all times. Ends of pipe shall be covered to prevent entry of dust, dirt, small animals, and any other objectionable matter at all times. During installation of the water main and all appurtenances no dirt, soil, or non-potable water shall be allowed to enter the pipe. If dirt, soil, or non-potable water does enter the pipe, the Contractor shall completely remove it prior to installing the next segment of pipe. Segments of pipe that have visible signs of contamination including, but not limited to; soil, dirt, mud, oil, grease, solvents, animal droppings, etc. shall have all visible traces of the offending substance completely removed by the Contractor in a manner acceptable to the Engineer. Sections of pipe or fittings that have been marked by the Engineer for cleaning shall not be approved for installation until such time as the Engineer has again approved them for use on the project. Acceptable methods of cleaning include flushing and/or power washing, compressed air, or other methods that the Engineer may approve. Approval by the Engineer of a cleaning method shall not be construed by the Contractor to include acceptance of the water main for the purposes of placing it into service. Water main pipe and fittings that have been placed shall remain covered on the advancing end until the next segment of pipe is connected. The Contractor may uncover no more than three segments of pipe in advance of placement. Water main pipe and fittings that have been laid out further in advance of the installation operation must remain covered.
2. Gasket lubricant shall only be applied immediately before connection to the next segment of pipe. Pipe with lubricant applied shall not come in contact with the ground. If the lubricated portion of the pipe end contacts the ground, it shall be thoroughly cleaned to the satisfaction of the Engineer, prior to its installation.
3. All water main shall be swabbed in accordance with the requirements of Section 3H, Flushing and Swabbing, of the current edition of the City of Ann Arbor Public Services Department Standards. During swabbing of the water main, the swab shall be flushed through the pipe in accordance with the manufacturer's recommendations and in a manner that is acceptable to the Engineer. The Contractor shall submit the product data of the swab from the manufacturer, for review and approval by the Engineer, at or before the pre-construction meeting.
4. Swabbing of the water main shall be followed immediately by flushing of the pipe so that any disturbed particles are washed out before they can resettle. The pipe shall be flushed in accordance with Section 3H, Flushing and Swabbing, of the current edition of the City of Ann Arbor Public Services Department Standard Specifications. The pipe shall be flushed until the water runs clear for a minimum of fifteen minutes or until two full pipe volumes have been flushed (whichever is longer.) Flushing from the existing water main that is to be replaced shall not be allowed.
5. During the chlorination process, the proper level of chlorination must be achieved throughout the entire length pipe. Chlorine levels shall be checked at intermediate locations as directed by the Engineer and the Contractor shall add chlorine until such time as the required levels are achieved

at all points. The “plug method” of chlorinating the pipe shall not be allowed. The Contractor shall chlorinate the proposed water main to a minimum residual concentration of 100 parts per million with commercial liquid chlorine solution. The chlorine concentrate shall be a minimum of 10% chlorine (sodium hypochlorite) by volume. Solid chlorine “pellets” or powder shall not be allowed. Any chlorine containing compound used on the project shall be approved by the Engineer. The minimum recommended dosage of chlorine (sodium hypochlorite) is as follows (based on 10% available chlorine):

**Recommended Minimum Chlorine Dosage to Disinfect 100 L.F. of Pipe**

<u>Pipe Diameter</u>	<u>10% Chlorine Solution (gallons)</u>
6	0.306
8	0.544
10	0.852
12	1.226
16	2.180
20	3.406
24	4.904

6. Bacteriological testing shall be performed by the City with the Contractor present. The Engineer shall determine the number, location, and type of testing points for each section of water main being tested. Bacteriological samples shall only be drawn from copper or brass sampling points. The use of galvanized steel blow-offs or sampling points are strictly prohibited. Obtaining bacteriological samples from fire hydrants will not be allowed.
7. If a new water main fails two consecutive sets of bacteriological tests, the Engineer may require the Contractor to re-swab the water main in accordance with Section 3H, Flushing and Swabbing, as described above. Additional flushing, prior to subsequent bacteriological sampling will also be required. The required additional swabbing and flushing of the water main by the Contractor shall be performed at no additional cost to the City of Ann Arbor.

**MEASUREMENT AND PAYMENT**

Payment for all labor, materials, and equipment that is required to comply with this Detailed Specification shall be considered as part of the unit price as bid for each respective water main pipe and fitting and will not be paid for separately.

Payment for all water main pipe shall be as follows:

The Contractor shall be paid for 50% of the water main pipe installed upon satisfactory completion of the installation and backfilling of the water main pipe. The remaining 50% shall be paid upon successful completion of all required bacteriological testing, the water main has been placed into service, and all water service leads have been connected and are in service.

# **DETAILED SPECIFICATION FOR ASPHALTIC SEAL COATINGS DUCTILE IRON PIPE FITTINGS**

## **DESCRIPTION**

The Contractor may not operate City water main valves. For valve operation, contact the City of Ann Arbor Public Services Area. It is recommended that the Contractor request that the existing valves, which will need to be operated in order to perform the water main work, are checked in advance of the work to ensure that they operate properly.

Several items of work on this project require coordination with the City of Ann Arbor Public Services Area (The City). The Contractor shall notify the City three (3) full working days in advance of any items requiring coordination with the City.

The Contractor shall complete the water main work in a manner which minimizes the disruption of water service. No shut downs shall occur on Saturdays or Sundays. Shut downs shall not be for longer than 8.0 hours for any given shutdown event. Liquidated damages as detailed and described on pages C-1 and C-2 of these documents shall apply to any shut downs that occur on Saturday or Sunday or for a period of time longer than 8.0 hours in any given 24 hour period.

The Contractor shall be responsible for coordination with the City of Ann Arbor Public Services Area for the installation of 1-inch corporations in the gate wells to be used for testing and filling of new main. The Contractor shall pay the City of Ann Arbor's Public Works Unit all costs associated with installing the corporations.

The Contractor must have all materials, fittings, pumps and other miscellaneous equipment, and personnel on site before the City of Ann Arbor Public Services Area personnel will prepare and shutdown an existing main.

The Contractor shall dig-up and expose utility crossings 60-feet in advance of laying any water main pipe in their vicinity. This will allow the Engineer to adjust the grade of the water main, if possible, to avoid the existing utilities. The costs of the advance excavations, and related costs, shall be included in the respective items of work listed in the Bid Form. Some dig-ups may need to occur out of line.

All ductile iron pipe and fittings shall have an asphaltic seal coat on their cement-mortar linings. The coatings shall meet the requirements of ANSI/NSF Standard 61, Drinking Water System Components - Health Effects, and be approved for contact with drinking water.

## **MEASUREMENT AND PAYMENT**

Asphaltic seal coat for ductile iron pipe and fittings shall not be measured or paid for separately. This work shall include all labor, materials and equipment costs necessary to provide asphaltic seal coat of ductile iron pipe and fittings. Payment for this work shall be considered as part of the unit price for each respective ductile iron pipe and fitting unit price.

# DETAILED SPECIFICATION FOR CONCRETE DURABILITY

## DESCRIPTION

The Contractor shall furnish a Portland cement concrete mixture for this project that has been tested under this specification and shown to be resistant to excessive expansion caused by alkali-silica reactivity (ASR) and provides adequate air entrainment for freeze thaw durability. The Contractor shall construct the project with practices outlined in this specification.

## MATERIALS

The materials provided for use on this project shall conform to the following requirements:

Portland cement	ASTM C 150
Fine Aggregate	ASTM C 33*
Coarse Aggregate	ASTM C 33*
Fly Ash, Class F	ASTM C 618
Slag Cement, Grade 100, 120	ASTM C 989
Silica Fume	ASTM C 1240
Blended Cements	ASTM C-595
Air Entraining Admixtures	ASTM C-260
Chemical Admixtures	ASTM C-494
White Membrane Cure	ASTM C-309 Type 2

\* Fine and coarse aggregates shall consist of natural aggregates as defined in the 2012 MDOT Standard Specifications Section 902.

The Contractor shall provide documentation that all materials to be incorporated into proposed mixed designs meet the requirements of this section.

## Alkali-Silica Reactivity

The Contractor shall supply to the Engineer preliminary concrete mix designs including a list and location of all suppliers of concrete materials. The Contractor shall evaluate the mixtures for the potential for excessive expansion caused by ASR and provide documentation to the Engineer. The Contractor's evaluation shall include a review of any previous testing of the material sources intended to be used for both the fine and coarse aggregates for the concrete mixtures. The previous testing may be from other projects or records provided by the material suppliers.

Aggregates shall be tested under ASTM C-1260. If the expansion of the mortar bars is less than 0.10%, at 14 days, the aggregates shall be considered innocuous and there are no restrictions for ASR mitigation required with this material.

Previous aggregate test data may be used. If no previous test data is available, for the concrete mix, that shows that it is resistant to ASR, a concrete mixture that will mitigate the potential for ASR must be designed using either method 1 or 2 as described below.

**Method 1.** Substitution of a portion of the cement with Class F Fly Ash, Slag Cement Grade 100 or 120 or a ternary mix (blended cement) containing a blend of Portland cement and slag cement, or Class F fly ash, or silica fume.

The maximum substitution of cement with the fly ash permitted shall be 25% by weight of total cementitious material (cement plus fly ash). Additional requirements for the Fly Ash, Class F are that the Calcium Oxide (CaO) percent shall be less than 10 % and the available alkalis shall not exceed a maximum of 1.5%. A copy of the most recent mill test report shall be submitted to verify. Note: a Class C fly ash with a minimum total oxides ( $\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$ ) of 66% and a minimum  $\text{SiO}_2$  of 38% may be used in lieu of Type F fly ash.

The maximum substitution of cement with the Slag Cement permitted shall be 40% by weight of total cementitious material (cement plus Slag Cement). The minimum replacement rate with Slag Cement shall be 25%.

For a ternary blend the total replacement of supplementary cementitious materials is 40% with a blend consisting of a maximum of 15% type F fly ash, and/or 8% silica fume and/or slag cement.

For method 1, the effectiveness of the proposed mix combination to resist the potential for excessive expansion caused by ASR shall be demonstrated using current or historic data. To demonstrate the effectiveness of the proposed mix the Contractor shall construct and test mortar bars per ASTM C1567 (14 day test) using both the fine and coarse aggregate along with the proposed cementitious material for the concrete mixture. If a mortar bar constructed of these materials produces an expansion of less than 0.10%, concrete mixture will be considered to be resistant to excessive expansion due to ASR.

If a mortar bar constructed produces an expansion of 0.10% or greater, concrete mixtures containing these materials shall not be considered resistant to the potential for excessive expansion due to ASR and shall be rejected. Additional testing, including alternate proportions or different materials will be required.

**Method 2.** Use low alkali cement and maintain the total alkali content from the cementitious at no more than 3.0 lbs/cyd ( $\text{Na}_2\text{O}_{\text{eq}}$ ). The total alkali contribution is calculated by the quantity contained in the Portland cement only.

Requirements for Low Alkali Cement are that the alkali content does not exceed 0.60% expressed as  $\text{Na}_2\text{O}$  equivalent. Equivalent sodium oxide is calculated as: (percent  $\text{Na}_2\text{O}$  + 0.658 x percent  $\text{K}_2\text{O}$ ).

For either method 1 or 2, if the Contractor intends to change any component material supplied after the mix design has been approved all concrete work will be suspended with no cost to the project or extensions of time, unless approved, until evaluation of the new mixtures and testing of the new materials demonstrates that it is resistant to excessive expansion due to ASR.

The Engineer and Contractor shall monitor the concrete that is delivered to the project site so as to insure that the approved mix design is being followed. The supplier shall include on the delivery ticket for each batch of concrete delivered to the job, the identification and proportions of each material batched.

When concrete is placed during cold weather, defined for the purposes of this Detailed Specification to be, air temperatures below 40° F, the use of accelerators, heated aggregates, silica fume and/or additional forms of cold weather protection will be required. Cold weather will not eliminate the requirement for furnishing and placing a concrete mix that is considered resistant to ASR attack.

Prior to cool weather placement, defined for the purposes of this detailed specification to be, air temperatures between 40° and 60° F, the set time of the proposed mix shall be verified under anticipated field conditions. This information shall be used when scheduling pours and saw crews.

### **Air Entrainment**

Air entrainment shall be accomplished by addition of an approved air entraining agent. Air content as determined by ASTM C 231 or ASTM C 173, shall be determined on each day of production as early and as frequently as necessary until the air content is consistently acceptable. If during the period of time while adjustments are being made to the concrete to create a mixture that is consistently acceptable, concrete is produced that does not meet the requirements of this Detailed Specification, the Engineer may reject the material and direct it to be removed from the jobsite. Any rejected material shall be removed from the

jobsite at the Contractor's sole expense. Quality Control testing performed by the Contractor to ensure compliance with the project specifications shall be performed on the grade ahead of the placement operation.

**Paver placement:** During production, the plastic concrete material shall be tested for acceptance at a point ahead of the paver. The air content of the concrete mixture that the Contractor shall provide shall be known as the Acceptance Air Content (AAC). The Contractor shall also provide additional entrained air in the concrete mixture to account for the air loss which occurs in the concrete mixture experienced during transportation, consolidation and placement of the concrete. The "air loss" shall be added to the air content of the concrete mixture as established on the approved concrete mix design. The AAC for the project will be 6.0% plus an amount equal to the air loss.

For up to the first four loads, the air content measured on-site prior to placement shall be at least 8.0% and no more than 12.0%. To establish the initial AAC on the first day of paving, the air content of the first load shall be tested at the plant. After initial testing at the plant the Contractor shall provide at least two sample sets to determine the actual air loss during placement. A sample set shall consist of two samples of concrete from the same batch, one taken at the point of discharge and the other from the in-place concrete behind the paver. The air loss from the two sample sets shall be averaged and added to 6.0% to establish the AAC (rounded to the next higher 0.5%). After the testing and adjustment procedure(s) have been completed, the project acceptance air tests shall be taken prior to placement. The Contractor shall provide concrete to the jobsite that has an air content of plus 2.0%, or minus 1.0%, of the AAC.

After the AAC has been established, it shall be verified and/or adjusted through daily checks of the air loss through the paver. The Contractor shall check the air loss through the paver a minimum of two times a day. A Revised AAC shall be required to be established by the Contractor if the average air loss from two consecutive tests deviates by more than 0.5% from the current accepted air loss. The testing operations performed by the Contractor to establish a revised AAC shall be performed to the satisfaction of the Engineer. The Contractor shall be solely responsible for any delays and/or costs that occur to the project while establishing revised AACs.

**Hand placed concrete:** The air content for non-slip-form paving shall be 7.0% plus 1.5%, or minus 1.0%, at the point of placement.

## **CONSTRUCTION METHODS**

### **Aggregate Control**

**Gradation control** – The supplier shall provide a detailed stockpile management plan, describing their process control procedure for shipping, handling, and stockpiling of each aggregate including workforce training.

**Moisture control** – All aggregate materials must be conditioned to a moisture content of not less than saturated surface dry (SSD) prior to batching. A watering process using an effective sprinkler system designed and operated by the Contractor shall be required on all coarse aggregate material stockpiles.

The Contractor shall provide verification that these processes have been performed by the supplier. The Engineer reserves the right to independently verify that the supplier has complied with these standards.

### **Mixing**

**Central mix plants** - The total volume of the batch shall not exceed the designated size of the mixer or the rated capacity as shown on the manufacturer's rating plate.

**Drum Mix Plants:** After all solid materials are assembled in the mixer drum; the mixing time shall be a minimum of 60 seconds and a maximum of 5 minutes. The mixing time may be decreased if the ASTM

C-94 11.3.3 mixer efficiency tests show that the concrete mixing is satisfactory. The Engineer may require an increase in the minimum mix time if the mixer efficiency test determines that the concrete is not being mixed satisfactorily. The minimum mixing time shall start after the mixer is fully charged. Mixers shall be operated at the speed recommended by the manufacturer as mixing speed. The mixer shall be charged so that a uniform blend of materials reached the mixer throughout the charging cycle. Any additional slump water required shall be added to the mixing chamber by the end of the first 25% of the specified mixing time. Mixers shall not be used if the drum is not clean or if the mixing blades are damaged or badly worn

Ribbon mixers: After all solid materials are assembled in the mixer; the mixing time shall be a minimum of 30 seconds and a maximum of 2.5 minutes. The mixing time may be decreased if the ASTM C-94 11.3.3 mixer efficiency tests show that the concrete mixing is satisfactory. The Engineer may require an increase in the minimum mix time if the mixer efficiency test determines that the concrete is not being mixed satisfactorily. The minimum mixing time shall be indicated by an accurate timing device which is automatically started when the mixer is fully charged. Mixers shall be operated at the speed recommended by the manufacturer as mixing speed. The mixer shall be charged so that a uniform blend of materials reached the mixer throughout the charging cycle. After any additional slump water is added to the mixing chamber the mixing shall continue for a minimum of 10 seconds. Mixers shall not be used if the mixer is not clean or if the mixing blades are damaged or badly worn.

**Truck Mixers** -The capacities and mixing capabilities shall be as defined in ASTM C 94, and each unit shall have an attached plate containing the information described therein. The plate may be issued by the Truck Mixer Manufacturer. The mixer capacity shall not be exceeded, and the mixing speeds shall be within the designated limits. Truck mixers shall be equipped with a reliable reset revolution counter. If truck mixers are used for mixing while in transit, the revolution counter shall register the number of revolutions at mixing speed.

An authorized representative of the concrete producer shall certify that the interior of the mixer drum is clean and reasonably free of hardened concrete, that the fins or paddles are not broken or worn excessively, that the other parts are in proper working order, and that the unit has been checked by the representative within the previous 30 calendar day period to substantiate this certification. The current, signed certification shall be with the unit at all times.

The required mixing shall be between 70 and 90 revolutions. The mixing shall be at the rate designated by the manufacturer and shall produce uniform, thoroughly mixed concrete.

The Engineer may inspect mixer units at any time to assure compliance with certification requirements, and removal of inspection ports may be required. Should the Engineer question the quality of mixing, the Engineer may check the slump variation within the batch. Should the slump variation between two samples taken, one after approximately 20% discharge and one after approximately 90% discharge of the batch, show a variation greater than 3/4 inch (20 mm) or 25% of the average of the two, whichever is greater, the Engineer may require the mixing to be increased, the batch size reduced, the charging procedure be modified or the unit removed from the work.

The practice of adding water on the site shall be discouraged. After the slump of the concrete in the first round of trucks has been adjusted on-site, the amount of water added at the plant shall be adjusted accordingly for that day's work. All additions of water on site shall be approved by the Engineer.

### **Curing**

Apply liquid curing compound in a fine atomized spray to form a continuous, uniform film on the horizontal surface, vertical edges, curbs and back of curbs immediately after the surface moisture has disappeared, but no later than 30 minutes after concrete placement. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties.

The cure system shall be on site and tested prior to concrete placement.

Apply a curing compound at a rate of application not less than 2 gallons per 25 square yards. The Contractor shall keep the material thoroughly mixed per the Manufacturer's recommendations. The curing compound shall not be diluted.

The finished product shall appear as a uniformly painted solid white surface. Areas exhibiting a blotchy or spotty appearance shall be recoated immediately.

### **COMPLIANCE WITH STANDARDS**

The Engineer will review and approve all material test reports and mix designs supplied by the Contractor before any placement of concrete. The Engineer will visually inspect the placed concrete and review the concrete test reports prior to final acceptance.

Acceptance sampling and testing will be performed using the sampling method and testing option selected by the Engineer. Acceptance testing will be performed at the frequency specified by the Engineer. Quality control measures to insure job control are the responsibility of the Contractor. The Engineer's testing and/or test results will not relieve the Contractor from his/her responsibilities to produce, deliver, and place concrete that meets all project requirements. The Engineer's test results are for acceptance purposes only.

If the results of the testing are not in compliance with the project specifications, the Engineer shall determine appropriate corrective action(s). Time extensions will not be granted to the Contractor during the time that the Engineer is determining the necessary corrective actions.

If, in the Engineer's judgment, the rejected material must be replaced, the material in question will be removed and replaced at the Contractor's sole expense. The removal costs will be deemed to include all relevant and associated costs including, but not limited to; re-mobilization, traffic control, re-grading the aggregate base course, if required, placement of material meeting the project specifications, and all other expenses. Time extensions will not be granted to the Contractor for any required repair work to meet the requirements of this specification.

If the Engineer decides that the material in question can remain in place, an adjustment to the contract unit price(s) may be made of up to 100% of the bid price(s) for the affected items of work.

### **MEASUREMENT AND PAYMENT**

The cost associated with complying with the requirements as described herein, including any required remedial action(s), shall be included in the cost of other items of work and shall not be paid for separately.



# **DETAILED SPECIFICATION FOR HMA PAVING**

## **DESCRIPTION**

Hot Mix Asphalt (HMA) pavement base, leveling, and top courses shall be constructed in accordance with Section 501 of the 2012 MDOT Standard Specifications for Construction, except as modified herein, and as directed by the Engineer.

## **CONSTRUCTION METHODS**

**Equipment-** All equipment shall conform to Section 501.03.A of the 2012 MDOT Standard Specifications, except as modified herein.

The Contractor shall have a 10 foot long straight edge, rubber-tired backhoe (Case 580 type, or equivalent), air-compressor with the ability to develop a minimum pressure of 100 pounds per square inch and continuous rated capacity of 150 cubic feet per minute of air flow, and jackhammer available during all paving operations. The Contractor shall be required to perform any miscellaneous cleaning, trimming, material removal, and other tasks as required by the Engineer in order to ensure the proper and orderly placement of all HMA materials on this project.

The Contractor shall provide sufficient rollers to achieve the specified asphalt densities.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas; including hauling units. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

**Cleaning and Bond Coat application-** Cleaning and bond coat application shall be performed in accordance with Sections 501.03.C and 501.03.D of the 2012 MDOT Standard Specifications, except as modified herein, and as directed by the Engineer.

The Contractor shall furnish and operate throughout the construction period, vacuum-type street cleaning and utility structure cleaning equipment (Vac-All, Vactor, etc.) approved by the Engineer, and when directed by the Engineer, for street cleaning immediately prior to, and for street and utility structure cleaning after any and all paving. The cleaning equipment shall be of sufficient power to remove dust, dirt, and debris from the pavement and from utility structures in and adjacent to the construction area. The vac-all or similar equipment and shall be approved by the Engineer prior to beginning the work. The equipment used shall have an effective means for preventing any dust resulting from the operation from escaping into the air.

The bond coat shall be applied at a minimum rate of 0.10 gallons/yd<sup>2</sup>. Before placing the bond coat, the existing pavement surface shall be thoroughly cleaned. The Contractor shall also thoroughly clean all joints, cracks, and edges to a minimum depth of one inch with compressed air, vac-all type equipment, or other approved mechanical or hand methods, to remove all dirt, debris, and all foreign material.

**HMA Placement-** Placement shall conform to Section 501.03.F of the 2012 MDOT Standard Specifications, except as modified herein, and as directed by the Engineer.

HMA placement shall not commence until a “Permit to Place” (no additional costs are required to obtain this permit) has been issued in writing by the Engineer. The Permit to Place shall be issued after the aggregate base course or the adjacent, underlying layer of pavement section has been approved by the Engineer.

The final structure adjustments must be approved by the Engineer prior to the issuance of the “Permit to Place” for the wearing course.

The top course shall be placed with a ¼” lip at the gutter edge of metal.

All HMA thickness dimensions are compacted-in-place.

**Paving Operation Scheduling** – The Contractor shall schedule the paving operation to avoid longitudinal cold joints that would be required to be left “open” overnight.

In all cases, the Contractor shall pave the primary road’s through-traffic lanes (“main line”) first, from point-of-beginning to the point-of-ending. All other paving including, but not limited to; acceleration and deceleration lanes, intersection approaches, and center left-turn lanes shall be paved following completion of main line paving, unless authorized by the Engineer prior to the placement of any pavement.

**Rate of Paver operation** - The rate of the paver’s travel shall be maintained such that the paving operation will be continuous, resulting in no transverse cold joints, but shall never exceed the rate of 50 feet per minute.

The Contractor shall furnish and operate enough material, equipment, and hauling units so as to keep the paving machine(s) moving continuously at all times. Failure to do so shall be cause for the suspension of the paving operation until the Contractor can demonstrate to the satisfaction of the Engineer, that sufficient resources have been dedicated to perform the work in accordance with the project specifications.

**Longitudinal and Transverse Joints-** shall conform to Section 502.03.F of the 2012 MDOT Standard Specifications and as specified herein.

For mainline HMA paving, the width of the mat for each pass of the paver shall be not less than 10.5’, nor greater than 15’, except as noted in the plans and as directed by the Engineer. The Engineer will direct the layout of all HMA longitudinal joints during construction.

Prior to placing the adjacent paving pass on the leveling and wearing courses of HMA, the Contractor shall cut and remove 6” to 8” of the previously placed pavement at the free edge of the pavement by means of a coultter wheel. The Engineer reserves the right to reject any method(s) for cutting the pavement that does not provide a vertical and satisfactory edge, free of tearing, bending, or other deformations, as determined by the Engineer. Any method(s) employed by the Contractor shall be completely effective. The cut edge shall have a uniform bead of pavement joint adhesive applied to the full-height of the joint. The removal of this HMA material and resulting edge must be approved by the Engineer prior to proceeding with the placement of the succeeding pass of HMA. The base course of HMA and its vertical edge will have bond coat applied in accordance with Section 501.03.D. All costs associated with complying with these requirements will not be paid for separately, but shall be considered to be included in the items of work “HMA Pavement Leveling/Top – LVSP”.

Pavement joint adhesive shall be hot-applied, meet, or exceed, the following properties, and be approved by the Engineer prior to performing HMA placement:

Brookfield Viscosity, 400°F, ASTM D2669 – 4,000 to 10,000 cp  
Cone Penetration, 77°F, ASTM D5329 – 60 to 100  
Flow, 140°F, ASTM D5329 – 5mm maximum  
Resilience, 77°F, ASTM D5329 – 30% minimum  
Ductility, 77°F, ASTM D113 – 30 cm minimum  
Ductility, 39.2°F, ASTM D113 – 30 cm minimum  
Tensile Adhesion, 77°F, ASTM D5329 – 500% minimum  
Softening Point, ASTM D36 - 170°F minimum  
Asphalt Compatability, ASTM D5329 – pass

**Feather Joints** – shall be constructed so as to vary the thickness of the HMA from zero inches to the required paving thickness at the rate of approximately 1.5” over a distance of 10 feet, or as directed by the Engineer. The Contractor shall rake the larger pieces of aggregate out of feather joints prior to compaction.

**Butt Joints** - Construction of butt joints, where directed by the Engineer, shall conform to Section 501.03.C.3 and 501.03.C.4 of the 2012 MDOT Standard Specifications, except as modified herein.

When a butt joint is specified or directed to be placed by the Engineer, remove the existing HMA surface to the thickness of the proposed overlay, or full-depth, as directed by the Engineer, for the full width or length of the joint. The HMA material shall be sawcut to the directed depth along the pavement edge or removal line to prevent tearing of the pavement surface. Cut joints that will be exposed in the completed surface must be cut with a saw or a cold-milling machine or other methods approved by the Engineer. Joints that will be covered by HMA must be cut with a saw, a cold-milling machine, or other methods approved by the Engineer.

**Rakers**- the Contractor shall provide a minimum of two rakers during the placement of all wearing and leveling courses.

**Faulty Mixtures** – The Contractor and Engineer shall carefully observe the paving operation for signs of faulty mixtures. Points of weakness in the surface shall be removed or corrected by the Contractor, at his/her sole expense, prior to paving subsequent lifts of bituminous material. Such corrective action may include the removal and replacement of thin or contaminated sections of pavement, segregated HMA, and any sections that are weak or unstable. Once the Contractor or his representative is notified by the Engineer that the material being placed is out of allowable tolerances, or that there is a problem with the paving operation, the Contractor shall stop the paving operation at once, and shall not be permitted to continue placing bituminous material until again authorized by the Engineer. Any costs associated with meeting the requirements specified herein shall not be paid for separately, but shall be included in the item(s) of work being performed at the time the faulty mixture was discovered.

#### **MEASUREMENT AND PAYMENT**

Unused HMA remaining in trucks after the work is completed shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the Engineer. No payment will be made for the unused HMA material. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight.

All costs of meeting the requirements of this special provision shall be included in the bid prices for HMA items in the proposal and will not be paid for separately.

# **DETAILED SPECIFICATION FOR ACCEPTANCE OF HMA MIXTURES**

## **A. DESCRIPTION**

This special provision establishes sampling and testing acceptance criteria for HMA Mixtures placed on City of Ann Arbor projects. The HMA mixtures shall meet all the requirements of Section 501 of the MDOT 2012 Standard Specifications for Construction, except as modified herein.

## **B. CONTRACTOR QUALITY CONTROL**

The Contractor must have a quality control plan as required by Section 501.03.M and as stipulated herein. The Quality Control (QC) Plan shall be submitted to the Engineer within 30 days of contract award or 14 days before the placement of any HMA materials, whichever date comes first. The QC Plan shall cover all aspects of HMA production, transportation, placement, and compaction. The Contractor shall have a QC representative on-site at all times during the paving operations to monitor and direct all paving-related operations. The placement of HMA shall not commence until such time as the QC Plan has been accepted by the Engineer. The Engineer's acceptance of the QC Plan shall not be construed as a basis of acceptance of any HMA materials, HMA placement results, or a waiver of any requirement(s) of the project specifications.

## **C. MATERIALS**

Aggregates, mineral filler (if required), and asphalt binder shall be combined as necessary to produce a mixture proportioned within the specification requirements including aggregate gradation; the mix design criteria including volumetric properties; the Superpave Gyratory (SGC) compaction criteria; and the uniformity tolerances listed in Table 1. Topsoil, clay, or loam shall not be added to aggregates which are to be used in plant mixed HMA mixtures.

## **D. MIX DESIGNS**

The Contractor shall submit mix designs for evaluation in accordance with the Michigan Department of Transportation Hot Mix Asphalt Production Manual. All mix designs shall be submitted for review a minimum of 3 weeks prior to the anticipated placement of the HMA. Do not begin production and placement of the HMA until receipt of the Engineer's approval of the JMF. The Contractor's production and paving schedules shall be considered to include the mix design review and approval process. Delays associated with the submittal, or re-submittal, of the required information shall not be a basis for an extension of contract time.

## **E. CONSTRUCTION**

Target air voids shall be 3.5% in leveling courses, top courses and shoulders paved in the same operation as the leveling and top courses. Target air voids shall be 3% in base courses and shoulders not paved in the same operation as the leveling and top courses. Pedestrian paths shall have a target air void content of 3%.

After the job-mix-formula (JMF) is established, the parameters identified in Table 1 shall be maintained within the Range 1 tolerance limits of Table 1. However, if deviations are predominately either below, or above, the JMF, the Engineer may order alterations in the plant to bring the mixture into better conformance

with the JMF.

The mixture will be considered out-of-specification, as determined by the acceptance tests, if for any one mixture, two consecutive tests per parameter (for Parameter 6, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. Consecutive refers to the production order and not necessarily the testing order. Out-of-specification mixtures are subject to rejection per Section f. Rejected Mixtures or a price adjustment per Section g. Price Adjustments of this special provision as determined by the Engineer.

Contractor paving operations will be suspended when the mixture is determined to be out-of-specification. Contract time will continue during periods when paving operations are suspended or when dispute resolution testing and investigations are occurring. The Engineer may issue a Notice of Non-Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. The Contractor shall submit a revised JMF or proposed alterations to the plant and/or materials to achieve the JMF to the Engineer. Effects on the Aggregate Wear Index (AWI) and mix design properties shall be taken into consideration. Production and placement of HMA material shall not resume until receipt of the Engineer's approval to proceed.

For production/mainline-type paving, obtain the minimum number of samples as shown in Table 2, each being 20,000 grams, each day of production, for each mix type. The Engineer will sample the HMA and maintain possession of each sample. Sampling from the paver hopper is prohibited. Each sample will be divided into two 10,000 gram halves with one half being used for initial testing and the other half being held for possible dispute resolution testing. Obtain a minimum of three samples for each mix type regardless of the number of days of production.

Ensure all persons performing Quality Control (QC) and Quality Assurance (QA) HMA field sampling are "Local Agency HMA Sampling Qualified" samplers. The Engineer shall obtain the QA samples from the hauling units in accordance with MTM 313 (Sampling HMA Paving Mixtures.) The samples shall be representative of the day's paving. Sample collection shall be spaced throughout the planned tonnage as directed by the Engineer. At a minimum, one sample will be obtained in the first half of the planned tonnage and, as a minimum, the second sample will be obtained in the second half of the tonnage. If planned paving is reduced or suspended, when paving resumes, the remaining sampling must be representative of the original intended sampling timing.

Samples shall be taken from separate loads as directed by the Engineer.

Ensure all persons performing testing are Bit Level One certified or Bit QA/QC Technician certified. Acceptance testing will be performed by the Engineer using the testing method selected by the Engineer. Quality control measures to ensure job control are the sole responsibility of the Contractor.

The test method for measuring asphalt content (AC) shall be MTM 325 (Quantitative Extraction of Bitumen from HMA Paving Mixtures). Back calculations to determine AC content will not be allowed.

All labs performing local agency acceptance testing shall be qualified labs as defined in the HMA Production Manual and participate in the MDOT round robin process, or they must be AASHTO Materials Reference Laboratory (AMRL) accredited for AASHTO T 30 or T 27, and AASHTO T 164 or T 308. Independent testing labs must not have conflicts of interest with the Contractor or Local Agency. On non-National Highway System (NHS) routes, Contractor labs may be used, but they must be qualified labs as previously stated. The Contractor shall provide copies of this documentation to the Engineer for review a minimum of 21 calendar days prior to the performance of any paving operations on the project.

Contractor labs may not be used for acceptance testing on NHS routes.

Material acceptance testing will be completed by the Engineer within 5 calendar days, except holidays and Sundays, after the Engineer has obtained the samples. QA test results will be provided to the Contractor after the Engineer receives the QC test results. Failure on the part of the Engineer or the laboratory to provide Quality Assurance test results within the specified time frame does not relieve the Contractor of their responsibility to provide an asphalt mix within specifications. The Contractor's schedule shall be deemed to include these material testing timeframes.

For production/mainline-type paving, the mixture may be accepted by visual inspection up to a quantity of 250 tons per mixture type, per project (not per day). For non-production-type paving defined as driveways, approaches, and patching, visual inspection may be allowed regardless of the tonnage.

The crushed particle content of the aggregate used in the HMA mixture shall not be more than 10 percentage points above or below the crushed particle content used in the JMF, nor less than the minimum specified for the aggregates in the contract documents.

Pavement density will be measured by the Engineer with a nuclear density gauge using the Gmm from the JMF for the density control target. The required in-place density of the HMA shall be between 92.0 and 96.0 percent of the density control target. The Contractor is responsible for establishing a rolling pattern that will achieve the required in-place density. Should the specified target densities not be met, the material shall be considered to have a Range 2 failure and shall be rejected. If the Engineer determines that the material is suitable to remain in place, a 50% reduction to the base price of all material affected shall be enacted by the Engineer. Should the Engineer determine that the material cannot remain in place, the affected material will be removed and replaced at the Contractor's sole expense as detailed in the Section F. "Rejected Mixtures."

After placement, roll the HMA mixture as soon after placement as the roller is able to bear without undue displacement or cracking. Start rolling longitudinally at the sides of the lanes and proceed toward the center of the pavement, overlapping on successive trips by at least half the width of the drum. Ensure each required roller is 8 tons minimum in weight unless otherwise approved by the Engineer.

Ensure the initial breakdown roller is capable of vibratory compaction and is a maximum of 500 feet behind the paving operations. The maximum allowable speed of each roller is 3 miles per hour (mph) or 4.5 feet per second. Ensure all compaction rollers complete a minimum of two complete rolling cycles prior to the mat temperature cooling to 180 degrees Fahrenheit (F). Continue finish rolling until all roller marks are eliminated and no further compaction is possible. The Engineer will verify and document that the roller pattern has been followed and density has been achieved. The Engineer can stop the placement of HMA when the roller pattern is not followed and density is not obtained. Contract time shall continue during this period and the Contractor shall be responsible for any additional costs incurred due to this work stoppage.

Pavement in-place density tests will be completed by the Engineer during paving operations and prior to traffic staging changes. Pavement in-place density acceptance testing will be completed by the Engineer prior to the Contractor being allowed to pave subsequent lifts of HMA or the newly placed HMA being opened to traffic.

**HMA Acceptance Criteria**  
**Table 1 – Uniformity Tolerance Limits for HMA Mixtures**

Parameter		Top and Leveling Courses		Base Course	
		*Range 1	Range 2	*Range 1	Range 2
Number	Description				
1	Air Voids	± 0.60	± 1.00	± 0.60	± 1.00
2	VMA	± 0.60	± 1.00	± 0.60	± 1.00
3	G <sub>mm</sub> (maximum specific gravity of mixture)	± 0.013	± 0.020	± 0.013	± 0.020
4	Fines to Effective Binder Ratio (this parameter is independent of JMF)	0.6 to 1.2	0.6 to 1.4	0.6 to 1.2	0.6 to 1.4
5	Binder Content	± 0.30	± 0.40	± 0.30	± 0.40
6	Percent Passing No. 8 and Larger Sieves	± 5.0	± 8.0	± 7.0	± 9.0
	Percent Passing No. 30 Sieve	± 4.0	± 6.0	± 6.0	± 9.0
	Percent Passing No. 200 Sieve	± 1.0	± 2.0	± 2.0	± 3.0
7	Crushed Particle Content	Below 10%	Below 15%	Below 10%	Below 15%
*This range allows for normal mixture and testing variations. The mixture shall be proportioned to test as closely as possible to the Job-Mix-Formula.					

The tolerances specified in Table 1, with the exception of the Fines to Effective Binder Ratio, reflect variations from the approved job-mix formula.

Parameter Number 6 as shown in Table 1 is aggregate gradation. Each sieve will be evaluated on one of the three gradation tolerance categories. If more than one sieve is exceeding Range 1 or Range 2 tolerances, the sieve with the largest difference from the JMF will be counted as the gradation parameter. The master gradation should be maintained throughout production; however, price adjustments will come by Table 1.

Extraction/gradation and volumetric tests will be performed by the Engineer to confirm conformance to the specifications and the tolerances identified in Table 1. The minimum number of samples to be obtained and tested shall be in accordance with Table 2.

**Table 2 – Minimum Number of Samples**

Quantity (tons) of Single Mixture Placed per Day	Minimum Number of Samples per Mixture per Day
<100	0
101 – 250	1
251 – 1,500	3
1,501 – 3,000	5
3,001 – 4,500	as directed by the Engineer

**F. REJECTED MIXTURES**

If, for any one mixture, two consecutive tests per parameter (for Parameter 6, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits the mixture is considered out-of-specification and will be rejected. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. If, for any one mixture, two consecutive tests do not meet the minimum requirements for crushed particle content specified in the project documents, the portion of the mixture with insufficient crushed particle content will be considered out-of-specification and will be rejected.

The quantity of material to be rejected is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.

If out-of-specification mixtures are placed in a pavement, the Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractor’s QC test results for the corresponding QA test results must result in an overall payment greater than QA test results, otherwise the QA tests will not be allowed to be disputed. The Engineer has 4 calendar days to send the dispute resolution sample to the MDOT Central Laboratory once dispute resolution testing is requested. The remaining 10,000 gram portion of the field samples (split samples) will be sent to the Central Laboratory to complete all Dispute Resolution testing and return test results to the Engineer, who will provide them to the Contractor, within 13 calendar days upon receiving the Dispute Resolution samples. The Contractor may only take pavement cores if approved in writing by the Engineer. If the Central Laboratory test results do not confirm the original field test results, then no price adjustments will be made for the mixture involved.

If the Central Laboratory test results confirm the original test results and, if in the Engineer’s judgment, the mixture warrants removal, the Contractor shall remove and replace the rejected (out-of-specification) mixture, at the Contractor’s expense, with a mixture meeting the specification requirements. These costs shall be deemed to include all costs associated with the material removal and replacement including, but not limited to; costs associated with re-mobilization of labor and equipment; traffic control; removal and disposal of the rejected material; transportation costs to provide material meeting the requirements of the specification; and, any other cost associated with the work. Contract time shall continue during the period of time that the rejected material is investigated and re-tested, as well as, during the removal and replacement operations.

If the Central Laboratory test results confirm the original test results and, if in the Engineer’s judgment, the mixture can remain in place, the base and/or unit price for the rejected (out-of-specification) mixture will be decreased as described in the Section G., “Price Adjustments.”

If no field extractions are performed on a given day because the quantity being placed is less than 100 tons, and if there is reason to believe that the mixture contains material parameters that exceed Range 2



tolerances, or if the crushed particle content is less than the established criteria, a price adjustment may also be applied, or removal may be required, based on extraction, gradation, and volumetric tests performed by the Engineer from pavement cores following the procedures outlined herein.

**G. PRICE ADJUSTMENTS**

Base Price. Price established by the Department to be used in calculating incentives and adjustments to pay items and shown in the contract.

The quantity of material receiving a price adjustment is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.

The price adjustments will be determined by the Engineer from the combination of sample test result parameters of the out-of-specification (rejected) material that create the largest total price adjustment for the material. The price adjustments shall be determined based on Tables 3 and 4. The Engineer is not obligated to accept a price adjustment for out-of-specification (rejected) material that exceeds Range 2 limits in lieu of requiring the material to be removed and replaced at the Contractor’s expense in accordance with Section F, Rejected Mixtures.

In all cases, when penalties are assessed, the penalty applies to each parameter, up to two parameters, that is out of specification.

**Table 3: Penalty Per Parameter**

Mixture Parameter out-of-Specification per Acceptance Tests	Mixture Parameter out-of-Specification per Dispute Resolution Test Lab	Price Adjustment per Parameter
NO	N/A	None
YES	NO	None
	YES	Outside Range 1 but not Range 2: decrease by 10%
		Outside Range 2: decrease by 25%

**Table 4  
Calculating Total Price Adjustment**

Cost Adjustment as a Sum of the Highest Parameter Penalties		
Number of Samples with Parameters Out-of-Specification	Range(s) Outside of Tolerance Limits of Table 1 per Parameter	Total Price Adjustment
One	Range 1	10%
	Range 2	25%

Two	Range 1 & Range 1	20%
	Range 1 & Range 2	35%
	Range 2 & Range 2	50%
Three or more	Range 1, Range 1 & Range 1	20%
	Range 1, Range 1 & Range 2	35%
	Range 1, Range 2 & Range 2	50%
	Range 2, Range 2 & Range 2	50%

Each parameter of Table 1 is evaluated with the total price adjustment applied to the base and/or unit price based on a sum of the two parameter penalties resulting in the highest total price adjustment in accordance with Table 4. For example, if three parameters are out-of-specification, with two parameters outside Range 1 of Table 1 tolerance limits, but within Range 2 of Table 1 limits and one parameter outside of Range 2 of Table 1 tolerance limits and the Engineer approves leaving the mixture in place, the total price adjustment for that quantity of material is 35 percent.

If acceptance tests, as described in Section e. of this special provision, show that a Table 1 mixture parameter exceeds the Range 1, but not the Range 2, tolerance limits, that mixture parameter will be subject to a 10 percent penalty. The 10 percent penalty will be assessed based on the acceptance tests only unless the Contractor requests that the 10,000 gram sample part retained for possible dispute resolution testing be tested. The Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractor's QC test results for the corresponding QA test results must result in an overall payment greater than QA test results, otherwise the QA tests will not be allowed to be disputed. The Engineer has 4 calendar days to send the dispute resolution sample to the MDOT Central Laboratory and the resultant dispute test results will be used to determine the penalty per parameter, if any. If the dispute testing results show that the mixture parameter is out-of-specification, the Contractor will pay for the cost of the dispute resolution testing and the contract unit and/or base price for the material will be adjusted, based on all test result parameters from the dispute tests, as shown in Table 3 and Table 4. If the dispute test results do not confirm the mixture parameter is out-of-specification, then the Local Agency will pay for the cost of the dispute resolution testing and no price adjustment is required.

If acceptance tests, as described in section e. of this special provision, show that a Table 1 mixture parameter exceeds the Range 2 tolerance limits, the 10,000 gram sample part retained for possible dispute resolution testing will be sent, within 4 calendar days, to the MDOT Central Laboratory for further testing. The MDOT Central Laboratory's test results will be used to determine the penalty per mixture parameter, if any. If the MDOT Central Laboratory's results do not confirm the mixture parameter is out-of-specification, then no price adjustment is required. If the MDOT Central Laboratory's results show that the mixture is out-of-specification, and the Engineer approves leaving the out-of-specification mixture in place, the contract unit and/or base price for the material will be adjusted, based on all parameters, as shown in Table 3 and Table 4.

In the case that the Contractor disputes the results of the test of the second sample obtained for a particular day of production, the test turn-around time frames given would apply to the second test and there would be no time frame on the first test.

## **H. MEASUREMENT AND PAYMENT**

The completed work, as described herein, will be measured and paid for using applicable pay items as described in subsection 501.04 of the Standard Specifications for Construction, or the contract, except as modified in Section g. Price Adjustments.

# **DETAILED SPECIFICATION FOR HMA APPLICATION ESTIMATE**

## **DESCRIPTION**

This work shall consist of furnishing and placing (HMA) hot mix asphalt on the prepared surfaces in accordance with the details shown on the plans and as specified in Section 501 of the Michigan Department of Transportation Standard Specifications for Construction, 2012 Edition with the exceptions and additions specified herein.

## **MATERIALS**

HMA (Mainline):

The HMA, LVSP used for top course shall have a yield of 220 pounds per square yard with a PG 58-28 binder. The HMA, LVSP used for top course shall have an AWI = 260 minimum.

The HMA, LVSP used for leveling course shall have a yield of 220 pounds per square yard with a PG 58-28 binder.

Hand Patching:

The HMA, LVSP used for Hand Patching shall have a yield of 440 pounds per square yard with a PG 58-28 binder. The HMA, LVSP used for Hand Patching shall have an AWI = 260 minimum.

## **CONSTRUCTION METHOD**

A bond coat shall be applied before each lift of HMA mixture is placed. The rate of application shall be 0.05 to 0.15 gallons per square yard.

## **MEASUREMENT AND PAYMENT**

Measurement shall be based on load weight tickets from a certified scale and accepted at the job site by a City agent.

Payment for HMA (Mainline) shall include all labor, equipment and materials to complete this work.

Payment for Hand Patching shall include all labor, equipment and materials to complete this work.

**DETAILED SPECIFICATION  
FOR  
ITEM #200 – TREE REMOVAL, 8” OR LARGER, MODIFIED**

**DESCRIPTION**

This work shall consist of removing existing trees that are 8 inch or larger in diameter where indicated on the Plans, and as directed by the Engineer. This work shall include cutting and removing trees, their stumps, and roots from the ground, and disposing of all removed materials. All materials need to accomplish this work are included in this pay item. All work shall be done in accordance with the City of Ann Arbor Public Services Department Standard Specifications, Section 202 of the Michigan Department of Transportation (MDOT) Standard Specifications for Construction (2012 edition) and as directed by the Engineer.

**CONSTRUCTION METHODS**

The Construction Methods shall meet all requirements of the City of Ann Arbor Standard Specifications and MDOT Standard Specifications for Construction (2012 edition). As required, remove and dispose of trees with a diameter of at least 8 inches. Stumps shall be removed using a stump grinder to a depth of at least 8 inches below final grade. Prior to tree removal, coordinated with the City’s Urban Forestry Coordinator for tree inspection. Do not remove the trees until adjacent water main trenches are excavated and inspected by the City Forester for roots and health of tree. As determined by the Urban Forestry Coordinator, some trees indicated on the Plans for removal may be saved and left in place. Coordination with the Urban Forestry Coordinator to determine if a tree is removed or not will not constitute an extension of time if the work is delayed.

**MEASUREMENT AND PAYMENT**

This item shall be measured per tree removed and paid for on the basis of unit price each. The tree size will be determined by the average diameter of the tree trunk, measured to the nearest full inch, at a point 4.5 feet above the base of the tree at the ground line. Trees having major limbs lower than 4.5 feet from the ground shall be measured at the smallest diameter below such limbs. Where more than one tree has grown from a common stump, each tree shall be measured as a separate tree. Trees found to be less than 8 inches in diameter shall be removed under the pay item “General Conditions, Max \$50,000.’

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**PAY ITEM**

Tree Removal, 8” or Larger, Modified

**PAY UNIT**

Each

**DETAILED SPECIFICATION  
FOR  
ITEM #201 - PROJECT SUPERVISION, MAX \$30,000**

**DESCRIPTION**

The Contractor shall designate a full-time Project Supervisor to act as the Contractor's agent/representative, and to be responsible for scheduling and coordination of all subcontractors, suppliers, other governmental agencies, and all public and private utility companies.

The Project Supervisor shall not be an active crew member of the Contractor, shall not be an active member or employee of any subcontractor's work force, and shall not perform general or specialized labor tasks.

**The Project Supervisor shall work exclusively on this project, and shall put forth his/her full effort into the organization and coordination of the work of this project.**

Prior to the pre-construction meeting, the Contractor shall designate a proposed Project Supervisor by name, and shall furnish the City with a current, thorough, detailed summary of the proposed Project Supervisor's work history, outlining all previous supervisory experience on projects of a similar size and nature. The detailed work history shall include personal and professional references (names and phone numbers) of persons (previous owners or agents) who can attest to the qualifications and work history of the proposed Project Supervisor. Proposed candidates for Project Supervisor shall have a demonstrated ability to work harmoniously with the City, the public, subcontractors, and all other parties typically involved with work of this nature. The Supervising Professional will have the authority to reject a proposed Project Supervisor whom he/she considers unqualified.

The Project Supervisor shall be available 24 hours-per-day to provide proper supervision, coordination and scheduling of the project for the duration of the Contract. The Contractor shall furnish the City with telephone numbers of the Project Supervisor in order to provide 24 hour-per-day access during business and non-business hours, including weekends and holidays.

The Project Supervisor shall be equipped by the Contractor with a mobile telephone to provide the City with 24 hour-per-day access to him/her during daily construction activities, during transit to and from the construction site, and during all non-business hours including weekends and holidays.

The Project Supervisor shall be equipped with assistants as necessary to provide project supervision as specified herein, and in accordance with the Contract.

**DUTIES AND RESPONSIBILITIES**

The Project Supervisor work harmoniously with the City, the public, subcontractors, and all other parties typically involved with work of this nature.

The Project Supervisor shall have a thorough, detailed understanding and working knowledge of all construction practices and methods specified elsewhere herein, as well as the handling, placement, testing and inspection of aggregates, aggregate products, HMA concrete, and portland cement concrete materials.

The Project Supervisor shall be responsible for all of the work of all of the Contractor's, subcontractors' and suppliers' work forces.

The Project Supervisor shall be responsible for proper and adequate maintenance (emissions, safety, and

general operation) of all of the Contractor's, subcontractors' and suppliers' equipment and vehicles.

The Project Supervisor shall be responsible for the legal, proper and safe parking/storage of all of the Contractor's, subcontractors' and suppliers' equipment, work vehicles, and employee's vehicles.

The Project Supervisor shall schedule and coordinate the work of all parties involved in the project, including utility companies, testing agencies, governmental agencies, all City departments (such as Utilities and Transportation), and City inspectors.

The Project Supervisor shall coordinate and schedule the work of any independent survey crews that may be retained by the City to witness and reset existing and new geographic/benchmark monuments. Failure to have existing monuments witnessed and reset may result in delays to the Contractor's work. Costs for such delays will be the Contractor's sole responsibility.

The Project Supervisor shall coordinate and schedule both Testing inspectors and City inspectors in a timely manner, to assure proper and timely testing and inspection of the work.

The Project Supervisor shall review the Inspector's Daily Reports (IDRs) for accuracy, and shall sign all IDRs on a daily basis as the representative of the Contractor. Items to be reviewed include descriptions, locations and measurements of quantities of work performed, workforce, equipment, and weather. The Project Supervisor shall also be responsible for its subcontractors' review and initialing of IDRs containing work items performed by each respective subcontractors.

The Project Supervisor shall submit to the Engineer, an updated, detailed schedule of the proposed work on a weekly basis, and an update of all proposed changes on a daily basis, all in accordance with the Detailed Specification for Project Schedule contained elsewhere herein.

The Project Supervisor shall schedule and chair a weekly progress meeting with the Engineer and all subcontractors to discuss the work. Upon the completion of each meeting, the Project Supervisor shall prepare and distribute, to all present, a written summary of the meeting's minutes. Those in attendance shall review the minutes and, if necessary, comment on any deficiencies or errors prior to or at the next scheduled progress meeting.

### **ADDITIONAL PERFORMANCE REQUIREMENTS**

If, in the sole opinion of the Supervising Professional, the Project Supervisor is not adequately performing the duties as outlined in this Detailed Specification, the following system of notices will be given to the contractor with the associated penalties:

First Notice – A warning will be issued in writing to the contractor detailing the deficiencies in the Project Supervision. The contractor must respond within 7 calendar days in writing with a plan to correct the stated deficiencies. Failure to respond within 7 calendar days will result in the issuing of a second notice.

Second Notice – A second warning will be issued in writing to the contractor further detailing the deficiencies in the Project Supervision. The contractor must respond within 7 calendar days in writing with a plan to correct the stated deficiencies. Failure to respond within 7 calendar days will result in the issuing of a third notice. A deduction of 10% will be made from the original Project Supervision contract amount. At this time, the City reserves the right to meet with personnel with the necessary authority within the Contractor's organization to discuss the deficiencies in the Project Supervision.

Third Notice – An additional deduction of 25% will be made from the original Project Supervision

contract amount, and the Project Supervisor shall be removed from the project, and replaced immediately with another individual to be approved by the Supervising Professional.

Should, in the sole opinion of the Supervising Professional, the Project Supervisor fail to perform his/her duties and responsibilities as described herein to such a degree that the successful completion of the project is put in jeopardy, the above system of notices may be foregone, and the Contractor shall immediately replace the Project Supervisor upon receipt of written notice. Failure to provide adequate project supervision, as determined by the Engineer, shall be considered basis for the Supervising Professional to suspend work without extension of contract time or additional compensation.

#### MEASUREMENT AND PAYMENT

This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum, minus any deductions incurred for inadequate performance as described herein. This amount will not be increased for any reason, including extensions of time, extras, and/or additional work.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

**PAY ITEM**

**PAY UNIT**

Project Supervision, Max \$30,000

Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #202 – GENERAL CONDITIONS, MAX. \$50,000**

**DESCRIPTION**

This item shall include all work described and required by the Plans and Specifications for which no item of work is listed in the Bid Form, including but not limited to:

- Coordination of, and cooperation with, other contractors, agencies, departments, and utilities
- Protection and maintenance of Utilities
- Placing, maintaining, and removing all soil erosion and sedimentation controls (as specified herein or as shown on project plans)
- Maintaining drainage
- Maintaining driveway drive openings, sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes the placement and maintenance of gravel in driveway openings as directed by the Engineer
- Using quantities of dust palliative, maintenance aggregate, and hot patching mixture for use as temporary base, surfacing, and dust control at utility crossings, side roads and driveways.
- Storing all materials and equipment off lawn areas
- Site clean-up
- Coordination efforts to furnish various HMA mixtures as directed by the Engineer
- Coordination efforts to furnish and operate various-size vehicles/equipment as directed by the Engineer
- Furnishing and operating vacuum-type street cleaning equipment a minimum of once per week or more frequently as directed by the Engineer
- Furnishing and operating vacuum-type utility structure cleaning equipment
- Furnishing and operating both vibratory plate and pneumatic-type (“pogo-stick”) compactors
- Furnishing and operating a backhoe during all work activities
- Furnishing and operating a jackhammer and air compressor during all work activities
- Noise and dust control
- Mobilization(s) and demobilization(s)
- Furnishing submittals and certifications for materials and supplies
- Disposing of excavated materials and debris
- Removal of shrubs, brush, trees, and stumps less than 8” diameter as directed by Engineer
- Trimming of trees to accommodate intersection sight distance as shown on plans and directed by Engineer.
- Fencing to protect excavations over one foot (1’) in depth during non-work hours or as directed by the Engineer. The fencing must be a minimum of 36” high, be constructed of orange HDPE material, and reasonably secured to prevent access.



- All miscellaneous and incidental items such as overhead, insurance, and permits.
- Meeting all requirements relating to Debarment Certification, Davis Bacon Act, and Disadvantaged Business Enterprise, and providing the necessary documentation.

**MEASUREMENT AND PAYMENT**

This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum. This amount will not be increased for any reason, including extensions of time, extras, and/or additional work.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

**PAY ITEM**

General Conditions, Max. \$50,000

**PAY UNIT**

Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

# **DETAILED SPECIFICATION FOR ITEM #203 – DIGITAL AUDIO VISUAL COVERAGE**

## **DESCRIPTION**

This work shall include digital audiovisual record of the physical, structural, and aesthetic conditions of the construction site and adjacent areas as provided herein. This work will be performed for the entire project limits prior to the start of construction.

The audio-visual record shall be:

1. Of professional quality, providing a clear and accurate audio and visual record of existing conditions.
2. Prepared within the four (4) week period immediately prior to the start of construction
3. Furnished to the Engineer a minimum of one (1) week prior to bringing any materials or equipment within the areas described in this Detailed Specification.
4. Carried-out under the supervision of the Engineer.

The Contractor shall furnish one (1) copy of the completed audiovisual record to the Engineer. An index of the footage shall be included, including the street and house number, which will enable any particular area of the project to be easily found. This includes indexing the files according to street. The Contractor shall retain a second copy of the audiovisual record for his/her own use.

Any portion of the record determined by the Engineer to be unacceptable for the documentation of existing conditions shall be recorded again at the Contractor's sole expense prior to mobilizing onto the site.

## **PRODUCTION**

The audio-visual record shall be completed in accordance with the following minimum requirements:

1. DVD Format, No Editing – The audio-visual record shall be done in color using equipment that allows audio and visual information to be recorded. Editing of the digital record, other to provide stationing and annotation on address, shall not be allowed and the speed and electronics of the videotaping equipment and DVD shall be equal to the 1080p video-recording standard.
2. Perspective / Speed / Pan / Zoom – To ensure proper perspective, the distance from the ground to the camera lens shall not be less than 5 feet and the recording must proceed in the general direction of travel at a speed not to exceed 48 feet per minute. Pan and zoom rates shall be controlled sufficiently so that playback will ensure quality of the object viewed.
3. Display – The recording equipment shall have transparent time, date stamp and digital annotation capabilities. The final copies of the tape shall continuously and simultaneously display the time (hours:minutes:seconds) and the date (month/date/year) in the upper left-hand corner of the frame. Accurate project stationing, where applicable, shall be included in the lower half of the frame in standard format (i.e. 1+00). Below the stationing periodic information is to be shown, including project name, name of area shown, street address, direction of travel, viewing direction, etc.

If in the event, the stationing has not been established on-site, refer to the plans and approximate the proposed stationing.

4. Audio Commentary / Visual Features – Locations relative to project limits and landmarks must be identified by both audio and video means at intervals no less frequent than 100 feet along the recording route. Additional audio commentary shall be provided as necessary during recording to describe streets, buildings, landmarks, and other details, which will enhance the record of existing conditions.

5. Visibility / Ground Cover – The recording shall be performed during a time of day when good visibility is available. Recording shall not be performed during periods of precipitation or when snow, leaves, or other natural debris obstruct the area being recorded. The Contractor shall notify the Engineer in writing in the event that the weather or snow cover is anticipated to cause a delay in recording the audio-visual record.

**COVERAGE**

The audio-visual record coverage shall include the following:

1. General Criteria – This general criteria shall apply to all recording and shall include all areas where construction activities will take place or where construction vehicles or equipment will be operated or parked and or where materials will be stored. The recording shall extend an additional 50 feet outside of all areas of construction. The recording shall include all significant, existing man-made and natural features including driveways, sidewalks, utility covers, utility markers, utility poles, other utility features, traffic signal structures and features, public signs, private signs, mailboxes, fences, landscaping, trees, shrubs, other vegetation, and other similar or significant features.
2. Other Areas – The Contractor shall record at his sole expense other areas where, in his/her opinion, the establishment of a record of existing conditions is warranted. The Contractor shall notify the Engineer in writing of such areas.
3. Street List – This item shall include the recording of all of the streets as listed in the Detailed Specification for Progress Schedule and Construction Limits.

The Engineer may direct the recording of other minor areas not specified herein at the Contractor’s sole expense.

**AUDIOVISUAL RECORDING SERVICES**

The following companies are known to be capable of providing the audio-visual recording services required by this Detailed Specification and shall be utilized, unless the Contractor receives prior written approval from the Engineer to utilize another company of comparable or superior qualifications.

- Construction Video Media
- Midwest Company
- Topo Video, Inc.
- Video Media Corp.
- Paradigm 2000, Inc.
- Finishing Touch Photo and Video

**MEASUREMENT AND PAYMENT**

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Digital Audio Visual Coverage	Lump Sum

Audiovisual Record Coverage shall include all labor, equipment, and materials required to perform the recording and to provide the finished audio-visual record to the Engineer. The unit price includes recording the entire project limits, for each and every street, as described above.

**DETAILED SPECIFICATION  
FOR  
ITEM #204 - MINOR TRAFFIC DEVICES, MAX. \$20,000**

**DESCRIPTION**

The work of Temporary Traffic Devices shall consist of protecting and maintaining vehicular and pedestrian traffic as shown on the plans, in the Maintenance of Traffic specification, and as directed by the Engineer, in accordance with Sections 103.05, 103.06, and 812 of the 2012 MDOT Standard Specifications for Construction; Part 6 of the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD); and the City Standard Specifications, except as modified herein. These devices include, but not limited to, advance, regulatory, and warning signs; barricades and channeling devices at intersecting streets on which traffic is to be maintained; barricades at the ends of the project and at right-of-way lines of intersecting streets; changeable message signs; lighted arrow boards; sign/signal covers and pavement marking cover tape for construction operations.

The work of Minor Traffic Devices shall include, but not be limited to:

- The furnishing and operating of miscellaneous signs, warning devices, flag-persons, and cones;
- The operation of additional signs furnished by the City;
- Furnishing and installing meter bags;
- Coordinating with the City to have meter heads removed and reinstalled;
- Maintaining pedestrian traffic;
- Temporarily covering traffic controls;
- Temporarily covering existing signs as directed;
- Temporarily covering existing pavement markings and symbols as directed;
- Any and all other miscellaneous and/or incidental items which are necessary to properly perform the work.

The Contractor shall maintain vehicular and pedestrian traffic during the work by the use of flag-persons, channelizing devices, and signs as necessary, as directed by the Engineer, and in accordance with MMUTCD. Typical applications for maintaining pedestrian traffic in accordance with the MMUTCD are included in this detailed specification.

**MATERIALS, EQUIPMENT, AND CONSTRUCTION METHODS**

**General**

Materials and equipment shall meet the requirements specified in the above-designated sections of the MDOT Standard Specifications.

All temporary traffic/pedestrian control devices furnished by the Contractor shall remain the property of the Contractor. The City shall not be responsible for stolen or damaged signs, barricades, barricade lights or other traffic maintenance items. The Contractor shall replace missing traffic control devices immediately, at no additional cost to the City.

All existing signs, and signs erected by the City of Ann Arbor on this project shall be preserved, protected, and maintained by the Contractor. Existing City owned signs which are damaged by the Contractor during the work will be repaired by the City at the Contractor's expense.

The Contractor shall temporarily cover conflicting traffic and/or parking signs when directed by the Engineer.

When traffic control devices have been damaged by, or due to, the negligence of the Contractor, his subcontractors or material suppliers, the traffic control devices shall be replaced at the Contractor's expense.

Lighted Plastic Drums; Barricades; Temporary Signs; Portable Changeable Message Signs; Lighted Arrow Boards; Pavement Marking Cover Tape; Temporary Pavement Markings

The Contractor shall furnish and operate these items as directed by the Engineer.

Approximate quantities for these items are 3 Portable Changeable Message Signs, 2000 ft Black Pavement Marking Tape, Type R, 750 sft Temporary Signs, Type B, 48 Type III Barricades, 10 Type II Barricades, 150 Channelizing Devices, and 150 Type II Lighted Plastic Drums.

Traffic control devices meeting current MDOT and MMUTCD specifications shall be used on this project.

Lighted plastic drums shall be sufficiently ballasted to minimize tipping.

Type I and III barricades shall have standard orange-and-white stripes on both sides of the barricade.

Sufficient signs shall be provided by the Contractor to ensure the safety of the workers and the general public in accordance with the current MMUTCD.

"Road Work Ahead" warning signs shall be placed, as indicated on the Plans, or as directed by the Engineer, prior to the start of work, regardless of the nature, magnitude or duration of the work.

Removable black pavement marking cover tape shall be used to cover conflicting pavement markings as directed by the Engineer.

Temporary pavement markings may be used within transition areas as directed by the Engineer and shall be removable.

**MEASUREMENT AND PAYMENT**

This item of work will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

**PAY ITEM**

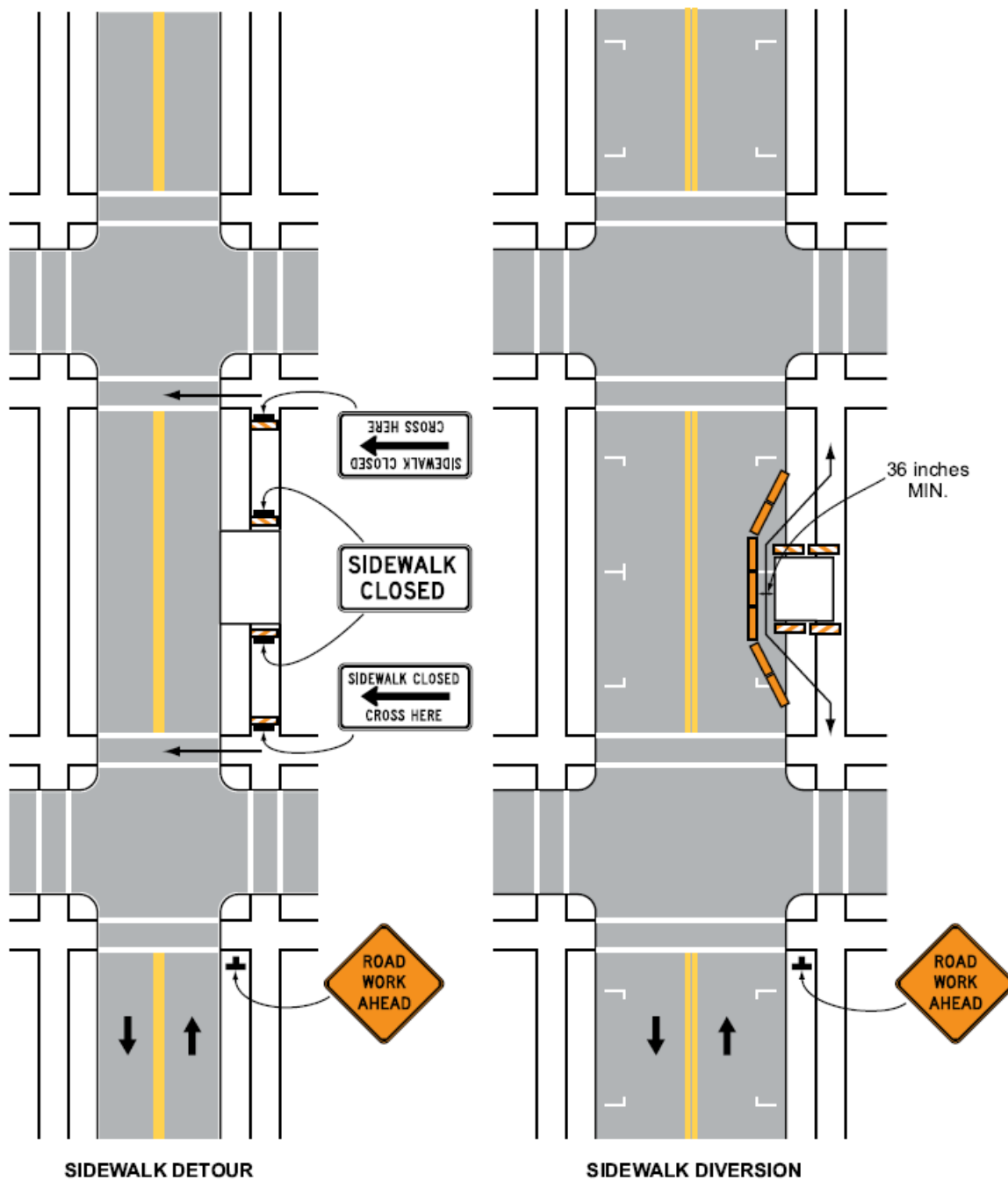
Minor Traffic Devices, Max \$20,000

**PAY UNIT**

Lump Sum

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

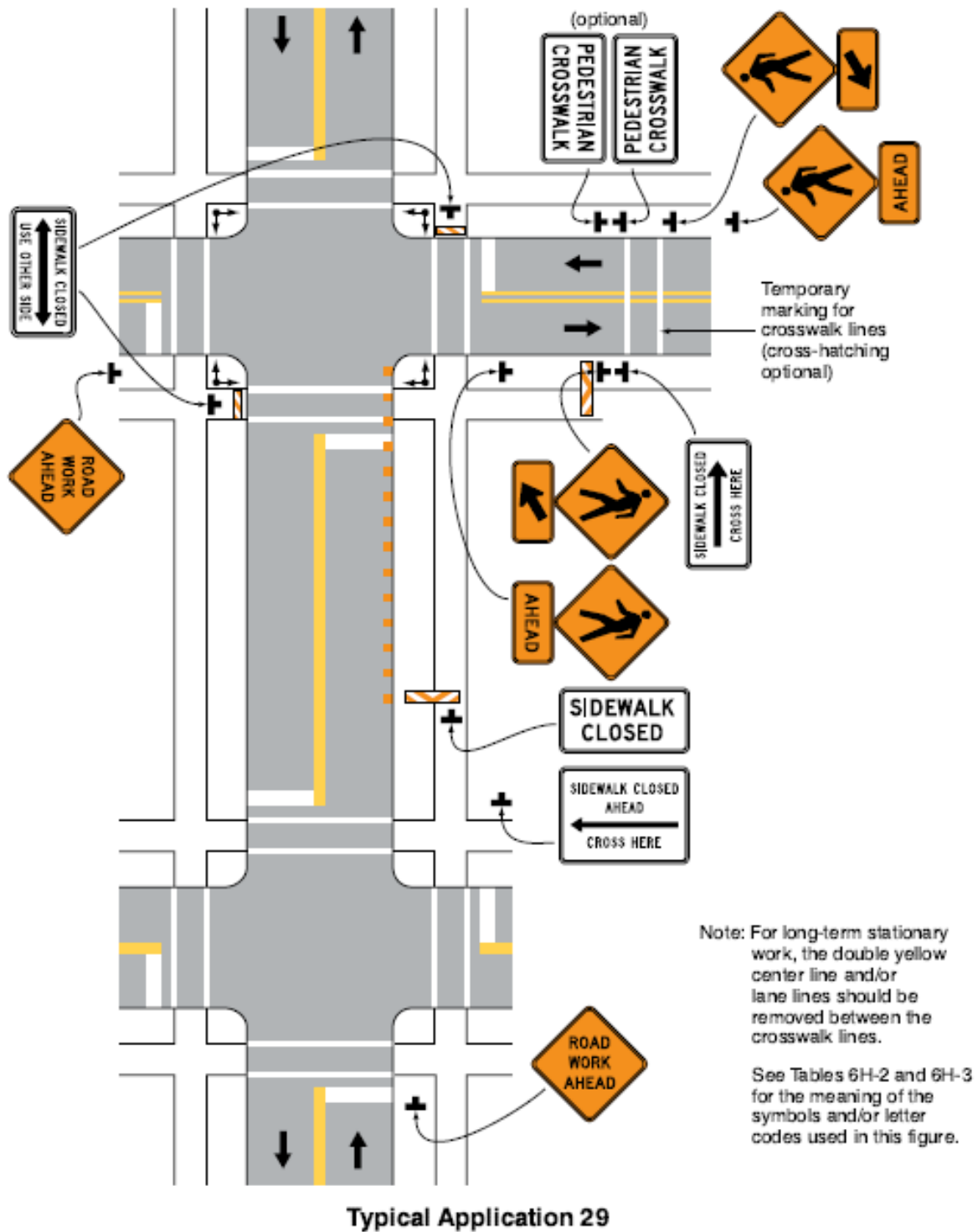
Figure 6H-28. Sidewalk Detour or Diversion (TA-28)



**Typical Application 28**

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Figure 6H-29. Crosswalk Closures and Pedestrian Detours (TA-29)



**DETAILED SPECIFICATION  
FOR  
ITEM #205 – CLEAN-UP AND RESTORATION, SPECIAL, MAX \$10,000**

**DESCRIPTION**

This item of work shall conform to Division IX, Section II, “Clean-Up & Restoration” of the Public Services Area Standard Specifications, except as specified herein.

This work shall include the removal of all surplus materials from the site including; but not limited to; tools, dirt, rubbish, construction debris, and excess excavated material. This work shall also include the restoration of all existing lawn areas, road surfaces, culverts, drives, and sidewalks disturbed by the work.

**CONSTRUCTION METHODS**

Clean-up and Restoration must be performed upon the completion of each stage of work, to prevent erosion, and not as one single operation at the completion of the entire project. Restoration work must be performed within one week of the placement of the wearing course for each street.

The Contractor shall restore all disturbed areas to better than or equal to their original condition.

**MEASUREMENT AND PAYMENT**

Measurement and payment for this item of work shall conform to Division IX, Section 2, “Clean-Up & Restoration” of the Public Services Area Standard Specifications except as modified herein.

The completed work for “Clean-Up & Restoration, Special, Max \$10,000” will be paid for on a lump sum (LS) basis. 80% of said lump sum shall be paid upon completion and approval of the site by the Engineer. By May 31<sup>st</sup> of the year following the completion of the project, the Engineer will inspect the seeded turf to ensure that the end product is well established; weed free, and in a growing and vibrant condition. If the Engineer determines that the restored areas meet the project requirements, the remaining 20% of the lump sum will be paid. If the Engineer determines that the restored areas do not meet the project requirements, the Contractor will continue with any and all measures necessary to meet the project requirements. All costs associated with the remedial measures shall be borne entirely by the Contractor.

**Pay Item**

Clean-Up & Restoration, Special, Max \$10,000

**Pay Unit**

Lump Sum



**DETAILED SPECIFICATION  
FOR  
ITEM #206 – “NO PARKING” SIGNS**

**DESCRIPTION**

This work shall consist of installing, maintaining and removing of "No Parking" signs and posts, as outlined herein and as referenced on the plans. "No Parking" signs shall be installed in accordance with the Public Services Department Standard Specifications and the most recent version of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

**MATERIAL**

All materials for this work shall conform to the requirements of the Public Services Department Standard Specifications.

**CONSTRUCTION METHODS**

Prior to the commencement of any construction activity, the Contractor will be required to place "No Parking" signs where directed by the Engineer. The Contractor shall obtain a form for "Temporary Permission to Reserve Parking Lane for Work-Related Purposes" for each street from the City of Ann Arbor Engineering Unit. This form shall be submitted a minimum of five (5) days prior to the posting of "No Parking" signs. The issued permit must be printed and displayed on site at all times.

The City will furnish "No Parking" signs to the Contractor at no cost. The Contractor shall furnish the signposts and shall securely bolt the signs to the signposts as directed by the Engineer. After MISS DIG Clearance, the Contractor shall install the signposts at least two feet deep into the ground, and there shall be a minimum 6-foot and maximum 7-foot clearance maintained between the bottom of the sign and the ground. The signs are to be placed at 150-foot intervals (or as necessary) to eliminate parking in the construction area.

The installation of "No Parking" signs shall be in accordance with the permit. "No Parking" signs shall be installed by the Contractor, as directed by the Engineer, at least 48 hours prior to the proposed start-of-work/enforcement date. "No Parking" signs shall be returned to the City at the completion of the work. The cost of unreturned signs will be back-charged to the Contractor. "No Parking" signs shall be covered by the Contractor, thereby allowing on-street parking, whenever there is no work being performed for a period of time longer than 72 hours.

**MEASUREMENT AND PAYMENT**

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

"No Parking" signs will be measured as the maximum number installed on each street at any one time. The unit price includes the removal and return of "No Parking" signs to the City upon completion of the project. The Contractor shall be back-charged for the replacement costs for damaged or unreturned signs.

**PAY ITEM**

**PAY UNIT**

“No Parking” Signs

Each

**DETAILED SPECIFICATION  
FOR  
ITEM #209 – SEWER, ANY SIZE OR DEPTH, REMOVE  
ITEM #210 – DRAINAGE STRUCTURE, ANY SIZE OR DEPTH, REMOVE**

**DESCRIPTION**

This work shall include abandoning existing sewers and drainage structures of various size and depth as required by the Plans. All work shall be done in accordance with Section 203 of the 2012 Michigan Department of Transportation Standard Specifications for Construction, as directed by the Engineer, and as described herein.

**MATERIALS**

Granular Material Class II.....Section 902

**METHODS OF CONSTRUCTION**

Sewers, manholes, and drainage structures shall be removed and disposed of off-site, in such a manner as not to damage any new work, or work or material which is to remain in-place. The hole or trench resulting from the removal of the manhole, sewer, or drainage structure shall be backfilled with Granular Material, Cl II, in maximum lifts of 12 inches, and be compacted to 95% of its maximum unit weight, if located within the public rights-of-way, railroad rights-of-way, or within the influence paved surfaces or structures. Otherwise, backfill shall be Engineer approved native material, compacted to 90% of its maximum unit weight, in lifts of 12 inches or less, unless otherwise noted on the plans. The resulting hole left in a structure from a sewer to be removed shall be bulkheaded with bricks and mortar to provide a watertight seal and constructed such that the remaining flow in the manhole is not impeded.

As directed by the Engineer and within two days of their removal, the Contractor shall deliver the existing structure covers to the City of Ann Arbor Field Services Unit located at the W.R. Wheeler Service Center at 4251 Stone School Road, Ann Arbor, MI 48108.

**MEASUREMENT AND PAYMENT**

The completed work shall be paid for at the Contract Unit Price for the following Contract Items:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Sewer, Any Size or Depth, Remove	Foot
Drainage Structure, Any Size or Depth, Remove	Each

Payment for the above items shall include all labor, material, and equipment to complete the work.

**DETAILED SPECIFICATION  
FOR  
ITEM #211 - ADDITIONAL DEPTH STRUCTURE ADJUST/REPAIR**

**DESCRIPTION**

This work shall consist of removing and disposing of portions of existing brick or block masonry drainage structures, and rebuilding drainage structures of concrete block masonry in conformance with Section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except as specified herein. Water main gate wells and gate box covers shall be considered to be included in this item of work.

This shall also cover the repair of manholes and structures where less than the substantial rebuilding of the structure, as determined by the Engineer, is required.

**MATERIALS**

The materials shall meet the requirements as specified in Section 403.02 of the Michigan Department of Transportation 2012 Standard Specifications except as specified herein.

Concrete masonry units shall conform to the requirements for concrete masonry units for catch basins and manholes, ASTM C 139.

Concrete brick shall conform to the requirements for concrete building brick, ASTM C 55, Grade N-1

**CONSTRUCTION METHODS**

The Construction Methods shall meet the requirements of Section 403.03, except that the provisions of Section 403.03.D shall not apply to the work covered by this special provision.

The Contractor shall furnish and install pre-cast manhole tops (flat-tops) for the structures where needed. The flat-tops shall be included in this item of work and will be paid for separately.

**MEASUREMENT AND PAYMENT**

The completed work as measured for "Structure, Additional Depth Adjust/Repair" shall be paid for at the contract unit price for the following contract item (pay item):

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Additional Depth Structure Adjust/Repair	Foot

"Additional Depth Structure Adjust/Repair" will be measured by depth in feet from a point 15 inches below finish grade of the structure down to the grade of the remaining structure, and will be paid for at the contract unit price per foot, which price shall be payment in full for all labor, equipment and materials needed to accomplish this work.

**DETAILED SPECIFICATION  
FOR  
ITEM #212 - REMOVE SANITARY SEWER LEAD**

**DESCRIPTION**

This work shall consist of removing and replacing existing sanitary lead pipe in new utility trenches as directed by engineer when conflicts with new utilities are identified or when the condition of the existing pipe prevents proper utility protection. Work includes cutting lead, carefully removing, replacing with SDR 35 PVC pipe and fittings along with Fernco connections. All materials need to accomplish this work is included in this pay item. All work shall be done in accordance with the City of Ann Arbor Public Services Department Standard Specifications, and as directed by the Engineer.

**CONSTRUCTION METHODS**

The Construction Methods shall meet all requirements of the City of Ann Arbor Standard Specifications.

Sewer leads are private and no official City records are kept. Approximate locations of leads have been placed on plans per survey data when available. Contractor to carefully excavate leads, not dig through lead but to saw cut out of way. Lead to be kept clean, have positive fall, and replaced as soon as possible. Contractor to coordinate with homeowner as needed to complete work. Trench must be carefully backfilled to prevent damage. Prior to placement of HMA contractor will have entire lead televised to verify condition of repaired sections and to verify sufficient slope has been provided. Any defects in the repaired sections shall be exposed and repaired at contractor's expense.

**MEASUREMENT AND PAYMENT**

The unit price for the pay item "Remove Sanitary Sewer Lead" includes all labor, material and equipment costs associated with the complete installation of the sewer lead, as specified herein, including but not limited to, excavation MDOT CL II backfill, compaction.

Payment shall include all labor, equipment, and materials necessary to remove and store the existing sewer lead as directed by the Engineer.

The unit prices for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**PAY ITEM**

Remove Sanitary Sewer Lead

**PAY UNIT**

Foot

**DETAILED SPECIFICATION  
FOR  
ITEM #215 – WATER MAIN PIPE ABANDONMENT, MODIFIED  
ITEM #216 – FIRE HYDRANT ASSEMBLY ABANDONMENT**

**DESCRIPTION**

This work shall include abandoning existing water mains, valves, valve wells, valve boxes, and fire hydrant assemblies of various sizes as required by the Plans. All work shall be done in accordance with the City of Ann Arbor Public Services Department Standard Specifications, and as directed by the Engineer.

**MATERIALS**

All materials shall meet the requirements specified in Division 7 and 9 of the MDOT 2003 Standard Specifications for Construction as follows:

Mortar Type II Section 702

MDOT Class II Sand Section 902

Masonry Units Section 913

Push-on joint plugs, caps, air relief assemblies (for grouting purposes), and thrust blocks shall conform to the City of Ann Arbor Standard Specifications.

**METHODS OF CONSTRUCTION**

The Construction Methods shall meet all requirements of the City of Ann Arbor Standard Specifications.

In locations as shown on the Plans or where abandoned water main, valves or valve wells are within 2.5 feet of the proposed subgrade, the pipe, valves or valve wells shall be removed completely. The resulting hole or trench shall be backfilled with Class II Sand, in maximum lifts of 12 inches, and be compacted to 95% of its maximum unit weight, if located within the influence paved surfaces or structures. Otherwise, backfill shall be Engineer approved native material, compacted to 90% of its maximum unit weight, in lifts of 12 inches or less, unless otherwise noted on the plans. Caps or plugs shall be installed in accordance with plans or as specified by Engineer.

Abandoned (salvaged) valve operating nuts, fire hydrant assemblies and structure covers shall be delivered to the City of Ann Arbor Field Services Unit located at the W.R. Wheeler Service Center at 4251 Stone School Road, Ann Arbor, MI 48108 within two days of their removal. Valve boxes should be disposed of at the contractor's sole expense.

**MEASUREMENT AND PAYMENT**

The unit price for the pay "Water Main Pipe Abandonment, Modified" shall be paid for on a lump sum (LS) basis and includes all labor, material and equipment costs necessary to abandon or remove the pipe including, but not limited to, excavation, cutting of pipe, push-on joint plugs, caps and thrust blocks, brick and mortar bulkheads, the furnishing, placement, and compaction of approved granular backfill material, as required, and the removal and proper disposal off-site of excess materials. In addition, this pay item includes the removal and salvage of valves, valve boxes, and manhole rings and covers, the removal of the

top 4 feet of valve wells, and breaking out the valve well base.

The unit price for the pay item "Fire Hydrant Assembly Abandonment," includes all labor, material and equipment costs associated with the complete removal of the existing fire hydrant assembly, as specified herein, including but not limited to, excavation MDOT CL II Backfill and compaction; pipe cutting; thrust block removal; pipe plug; thrust block; salvaging of fire hydrant, valve and valve box and delivery of fire hydrant, valve and valve box to the City of Ann Arbor Field Services Unit located at the W.R. Wheeler Service Center at 4251 Stone School Road, Ann Arbor, MI 48108.

**PAY ITEM**

**PAY UNIT**

Water Main Pipe Abandonment, Modified

Lump Sum

Fire Hydrant Assembly Abandonment

Each

The Item of work "Water Main Pipe Abandonment, Modified" will be paid for on a pro rata basis at the time of each progress payment. Measurement will be based on the ratio between work completed during the payment period and the total contract amount. When all of the work of this Contract has been completed, the measurement of this item shall be 1.0 Lump Sum, minus any deductions incurred for inadequate performance as described herein. This amount will not be increased for any reason, including extensions of time, extras, and/or additional work.

# **DETAILED SPECIFICATION FOR ITEM #220 – 6 INCH INSERTION VALVE IN BOX**

## **DESCRIPTION**

The Contractor shall furnish all materials, labor and equipment to properly install valves into the existing Ductile Iron Main(s) at the locations as shown on the plans and as directed by the Engineer. All work shall be performed in accordance with the requirements as detailed herein.

The existing mains, upstream and downstream of the proposed valve(s) cannot be shut down or taken out of service. To ensure that the entire operation shall be accomplished without interruption of service or flow, the installation shall be accomplished by Contractor personnel skilled and experienced in the procedures specific to installing valve(s) of the required size(s).

## **MATERIALS**

Bedding and trench backfill materials and compaction requirements shall be in accordance with the detailed specifications, or the details shown on the plans. Granular Material Class II shall meet the requirements of section 902 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The Engineer shall approve any native materials to be placed as trench backfill.

The Contractor shall submit to the Engineer two (2) sets of drawings, furnished by manufacturers, fully and distinctly illustrated and describing the valve fittings proposed to be furnished. Work shall not commence until such time as the drawings have been reviewed and accepted by the Engineer.

The Ductile Iron 250 p.s.i.g. **Team Insert Valve** shall be a Resilient Wedge Gate Valve designed for use in potable water, raw water, reclaimed water, sewage, irrigation and backflow control systems. The design will allow the valve to be installed into an existing pressurized pipeline while maintaining constant pressure and service as usual.

### **Ductile Iron Construction:**

- The ductile iron body, bonnet and wedge provide strength and a pressure rating that meets or exceeds the requirements of AWWA C515. Insert Valve shall be ductile iron construction meeting ASTM A536 Grade 65-45-12. Heavy-duty ductile iron construction for maximum toughness and strength.
- Chemical and modularity tests shall be performed as recommended by the Ductile iron Society, on a per ladle basis. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.
- Sizes 12" and smaller must be capable of working on Cast/Grey Iron or Ductile Iron Class A, B, C and D, IPS PVC, C900 and C909 PVC, Steel, AC pipe diameters without changing either top or bottom portion of split valve body.

- 250 psig maximum working pressure. The pressure rating markings must be cast into the body of the insert valve.
- After the installation of the insert valve body on to the existing pipe a pressure test of 1.1 times that of the contents shall sustained for 15 minutes. Once the pressure test is affectively achieved the insert valve body must not be moved in accordance with AWWA Standards. If the insert valve is moved the pressure test must be completed again. The insert valve must not be moved or repositioned once the pressure test is achieved.

### **Resilient Wedge Gate Assembly**

- The construction of the Resilient Wedge shall comply with AWWA C509 requirements.
- The ductile iron wedge shall be fully encapsulated with EPDM rubber by a high pressure and high temperature compression or injection mold process. This will assure the ductile gate is fully coated with molded rubber –no exposed iron.
- The resilient wedge shall seat on the valve body and not the pipe to obtain the optimum seating and flow control results. The resilient wedge shall be totally independent of the carrier pipe.
- The resilient wedge shall not come into contact with the carrier pipe or depend on the carrier pipe to create a seal. Abrasion results thus shorting the life and quality of the shut down if the wedge contacts the pipe.
- Pressure equalization on the down or upstream side of the closed wedge shall not be necessary to open the valve.
- The wedge shall be symmetrical and seal equally well with flow in either direction.
- The Resilient wedge must ride inside the body channels to maintain wedge alignment throughout its travel to achieve maximum fluid control regardless of high or low flow pressure or velocity. The resilient wedge must have more support than the operating stem as the resilient wedge enters and exits the water (fluid) way.
- Oversized flow way. Unobstructed to provide optimum flow.

### **Fusion-Bonded Epoxy**

- The insert valve is fully epoxy coated on the interior and the exterior. The fusion-bonded coating is applied prior to assembly so that even the bolt holes and body -to-bonnet flange surfaces are fully epoxy coated.



- Valve shall be coated with a minimum of 8 mils epoxy in compliance with AWWA C550 and certified to ANSI/NSF -61.

#### **Gaskets and Triple O -Ring Stem Seals:**

- This insert valve features triple O-Ring stem seals. Two O-Rings are located above, and one O-Ring is located below the thrust collar.
- The lower two O-Rings provide a permanently sealed lubrication chamber that will make the valve easier to operate over a longer period of time. The upper O-Ring ensures that sand, dirt or grit cannot enter the valve to cause damage to the lower O-Rings. This is especially important for buried and sewage service applications.
- Side flange seals shall be of the O-Ring type of either round, oval, or rectangular cross-sectional shape.

#### **Valve Stem & Thrust Washers:**

- The gate valve stem and wedge nut shall be copper alloy in accordance with Section 4.4.5.1 of the AWWA C515 Standard.
- The NRS stem must have an integral thrust collar in accordance with Section 4.4.5.3 of AWWA C515 Standard. Two-piece stem collars are not acceptable. The wedge nut shall be independent of the wedge and held in place on three sides by the wedge to prevent possible misalignment.
- Two thrust washers are used. One is located above, and one is located below the stem thrust collar. Two thrust washers ensure easy operation at all times.
- NRS with AWWA standard turns.
- Operated by 2” square wrench nut according to ASTM A126 CL.B – open left or open right.

#### **Hardware:**

- Bolting materials shall develop the physical strength requirements of ASTM A307 with dimensions conforming to ANSI B18.2.1.

#### **Extended Life Value:**

- The stuffing box, operating stem and resilient wedge (complete bonnet and all moving parts) shall be removable, repairable and or replaceable under pressure. In other words, even while the valve is fully pressurized in the system all moving components can be removed under pressure. In the event the valve stem is broken or damaged the bonnet can be removed under pressure.
- Internal pressure equalization system assures the safe entry and removal of the valve bonnet during initial installation as well as future maintenance. This alleviates the need for additional pipe penetration taps or foreign methods (i.e. compressed air or auxiliary water source) to equalize pressure.

### **Split Restraint Devices:**

- Shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.
- The devices shall have a working pressure rating of 350 psi for 4-12 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.
- Chemical and modularity tests shall be performed as recommended by the Ductile iron Society, on a per ladle basis. Three test bars shall be incrementally poured per production shift as per U.L. specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.
- Gland body wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.
- Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.
- Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts. Set screw pressure point type hardware shall not be used.
- Restraint devices shall be listed by Underwriters Laboratories and Approved by Factory Mutual (3" through 12" inch size).

**The insert valve shall be a Team Insert Valve Patent number 6,776,187 and 7,225,827 or written approved equal.**

## **CONSTRUCTION METHODS**

Installation of proposed valve(s) will require work in close proximity to existing utilities. This must be taken into consideration when the contractor determines the required trench safety requirements. All excavation shall conform to MIOSHA Standards; the Contractor is solely responsible for determining all excavation and trench safety requirements.

If necessary, The City will reduce the pressure to 100 psig or less for the duration of the installations. The entire operation of installing the line stop shall be accomplished without reduction of water pressure in the main(s) below 100 psig. It shall be the responsibility of the Contractor to verify pressure prior to commencing the installation.

Dimensional, specification, and other data regarding the existing mains have been taken from existing records. This information may be inaccurate, out of date, and/or inadequate. The data have not been verified by field inspections. Further, the water main consists of ductile iron pipe which may contain dimensional and structural flaws. In addition, the Contractor shall anticipate that exterior main conditions, bells, service connections, or presence of adjoining utilities may require relocation of proposed valve.

If, in Engineer's opinion, the proposed location is unsatisfactory based on measurements of the existing pipe at the locations of the proposed valve(s), the Engineer will direct excavation at another site. Excavating, de-watering, inspections, backfill, and restoration will be paid for separately in accordance with the applicable contract unit prices or Section 109.05.C and 109.05.D whichever the Engineer deems most appropriate.

Contractor shall power wire brush and grind the exterior of the water main to remove any debris, corrosion deposits, or other surface irregularities that might interfere with proper seating and sealing of each valve fitting against each main. Any structural defects in the water main, service connections, appurtenances, adjacent utilities, etc., that could interfere with the valve installation shall be immediately reported to Engineer.

All valve fittings and appurtenances shall be cleaned and disinfected in accordance with the current City of Ann Arbor Public Services Area Standard Specifications prior to bolting any of the line stop fittings in place or commencing any pipe cutting.

Contractor shall fit upper and lower saddle plate assemblies to main, thoroughly checking for proper fit to main. Under no circumstances shall Contractor attempt to force, reshape, or bend saddle plates by excessive tightening of saddle studs while the valve fitting is assembled around the main. Any required retrofitting shall be accomplished with the fitting removed from the main. Any damage to fitting, accessories, or main shall be repaired at Contractor's expense to the satisfaction of Engineer.

Upper and Lower saddle halves shall be drawn together by bolt assemblies and the Saddle plates shall be bolted together in the horizontal position.

All valve work shall be performed in accordance with the equipment manufacturers approved work procedures and installation guidelines.

The Contractor shall backfill water mains within the limits of the roadbed with granular material Class II. Place backfill in layers no greater than 10 inches thick and compact each layer to at least 95 % of the maximum unit weight. Backfill water main outside the limits of the roadbed with Engineer approved granular or suitable material, compacted to 90% of the maximum unit weight, in lifts of 12 inches or less, unless otherwise noted on the plans.

The Contractor shall place polyethylene encasement meeting the requirements of the City of Ann Arbor Standard Specifications for Construction around the upper and lower saddle halves, the blind flange, and to a point at least 1 foot on either side of the saddle halves. All polyethylene encasement shall be securely taped to the water main such that water entry is minimized to the greatest extent possible.

**MEASUREMENT AND PAYMENT**

The work shall include, but not be limited to; pavement saw-cutting; excavation and disposal of excavated material; the furnishing, installation, and removal of sheeting and/or shoring where needed; the furnishing, placement and compaction of approved bedding and backfill materials; furnishing and placing suitable, clean, gravel to create a stable working surface at the bottom of the excavation; de-watering; pipe cleaning, measuring, and performing all advance work necessary to prepare for the installation of the valve(s); nighttime lighting as required; the removal of all materials and equipment associated with the work when no longer needed; and, any other items needed to complete the work as detailed on the plans and as specified herein.

The completed work, as described, will be paid for at the contract unit price for the following pay item:

**PAY ITEM**

**PAY UNIT**

6 inch Insertion Valve in Box

Each

**DETAILED SPECIFICATION  
FOR**

**ITEM #221 – TEMPORARY WATER MAIN LINE STOP, ADDITIONAL RENTAL DAY**

**ITEM #222 - TEMPORARY WATER MAIN LINE STOP, LESS THAN 6 INCH**

**ITEM #223 - TEMPORARY 6 INCH OR 8 INCH WATER MAIN LINE STOP**

**ITEM #224 - TEMPORARY 12 INCH WATER MAIN LINE STOP**

**DESCRIPTION**

This work shall include all excavations, line stop contractor labor, materials, and backfill required to install a 6 inch or 8 inch line stop on an existing water main. All work shall be done in accordance with the City of Ann Arbor Public Services Department Standard Specifications, and as directed by the Engineer.

**CONSTRUCTION METHODS**

Construction shall meet all requirements of the City of Ann Arbor Standard Specifications. All excavation shall be of sufficient size that work can be performed safely. Line stop work shall be coordinated with proposed water main shut down. The line stop Contractor must be on site at all times during the line stop operation.

**MEASUREMENT AND PAYMENT**

The unit prices for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification. “Temporary Water Main Line stop, Additional Rental Day” will be paid for each day after the first installation and use day of a temporary water main line stop, regardless of size, until the line stop is no longer needed.

**PAY ITEM**

**PAY UNIT**

Temporary Water Main Line Stop, Additional Rental Day	Each
Temporary Water Main Line Stop, Less than 6 inch	Each
Temporary 6 inch or 8 inch Water Main Line Stop	Each
Temporary 12 inch Water Main Line Stop	Each

Backfill items associated with patching the excavation created by installing the line stop, such as Aggregate Base and HMA Handpatching or HMA Pavement Leveling/Top, will be paid for separately.

**DETAILED SPECIFICATION  
FOR  
ITEM #225 - 6-INCH WRAPPED EDGE DRAIN**

**DESCRIPTION**

This work shall consist of furnishing and installing 6-inch diameter geotextile-wrapped, perforated or slotted underdrain pipe, using MDOT 2NS, as directed by the Engineer, for all backfill material.

**MATERIALS**

The materials shall meet the requirements referenced in Section 404 of the 2012 edition of the MDOT Standard Specifications, except as specified herein.

The Geotextile Filter Fabric for encasing the underdrain pipe shall be an approved material such as nylon, polypropylene, fiberglass, or polyester, and shall be either woven, heat bonded, knitted, or of continuous fibers. The geotextile shall completely cover and be secured to the pipe. In an un-stretched condition, knitted polyester fabrics shall weigh at least 3.0 ounces per square yard, and all other geotextiles shall weigh at least 3.5 ounces per square yard. The fabric shall be strong and tough and have a porosity such that the fabric will retain soil particles larger than 0.106 mm (no. 140 sieve) and shall pass aggregate particles finer than 0.025 mm. Geotextiles shall be stored and handled carefully and in accordance with the both the manufacturer's recommendations and the Engineer's direction, and shall not be exposed to heat or direct sunlight. Torn or punctured geotextiles shall not be used.

**CONSTRUCTION METHODS**

Geotextile wrapped underdrain shall be installed as shown on the Plans or as directed by the Engineer and in accordance with Section 404 of the 2012 edition of the MDOT Standard Specifications, except as specified herein.

The installation of underdrain shall precede all other construction activities including but not limited to pavement milling, pavement pulverization, pavement removal, pavement patching, and curb repair.

The Contractor shall excavate, cut, remove stumps, remove brush, remove pavement, grade, and trim as needed and as directed, and shall import, furnish, fill, place, grade, and compact MDOT 2NS fine aggregate to construct underdrain as specified on the Plans, and as directed by the Engineer.

The trench shall be constructed to have a minimum width of 18-inches, and shall be typically excavated to the depth specified in the Plans or directed by the Engineer.

The underdrain shall be installed at the line, grade, and depth specified on the Plans or as directed by the Engineer. The minimum percent grade shall be 0.5%, and the minimum cover from top-of-pipe to finished top-of-curb grade shall be 4-feet. The Contractor shall maintain line and grade by means of a laser. The Engineer will not provide line, grade or staking.

Upgrade ends of the pipe shall be closed with suitable plugs to prevent entrance of trench backfill material. All couplings, tees, plugs, and other fittings shall be manufactured and installed so as to prevent any infiltration of trench backfill material.

The Contractor shall tap at least one end of the underdrain into a storm sewer structure, as directed by the Engineer.

During the construction of underdrain runs, the Engineer may direct the Contractor to terminate or modify underdrain construction due to conflicts with buried obstructions or if the minimum 4-foot cover cannot be maintained. There will be no adjustment to the Contract Unit Price due to changes in quantity.

The first lift (bedding) of backfill shall be MDOT 2NS material to a maximum thickness of 3-inches. Subsequent lifts shall be MDOT 2NS material to a maximum thickness of 12 inches.

Removed or excavated materials which are not incorporated into the work shall become the property of the Contractor and shall be immediately removed and properly disposed of off-site. Removed or excavated materials may not be stockpiled overnight on, or adjacent to, the site.

All structures, inlets and manholes shall be maintained free of accumulations of silt, debris, and other foreign matter throughout construction, until the time of final acceptance.

**MEASUREMENT AND PAYMENT**

Connecting (tapping) underdrain(s) into drainage structure(s) will not be paid for separately, but shall be included in the bid price for this item of work.

Underdrain will be measured in-place by length in lineal feet.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

**PAY ITEM**

6-Inch Wrapped Underdrain

**PAY UNIT**

Foot

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #226 – MACHINE GRADING, MODIFIED**

**DESCRIPTION**

This work shall consist of constructing earth grades by excavating, cutting, filling, trimming, and grading; general restoration, and sign removals in accordance with the Detailed Specifications elsewhere herein; and maintaining the work in a finished condition until such time that it is accepted by the Engineer. This work shall be done as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, and in accordance with Section 205 of the 2012 edition of the MDOT Standard Specification for Construction, except as specified herein.

**CONSTRUCTION METHOD**

The Contractor shall construct earth grades as required to develop the typical and/or detailed cross-section(s) as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, the excavation of concrete and HMA pavement, soil, rocks of any size, stumps, trees less than 8 inches, logs, and bricks; the removal and proper disposal off-site of surplus excavated material; the scarifying, plowing, disking, moving and shaping of earth; the trimming, grading, compaction and proof-rolling of the prepared subgrade; the importing, furnishing, placement and compaction of embankment and/or fill materials; the full depth saw-cutting of pavement at the removal limits; the grading of sideslopes; general restoration in accordance with the Detailed Specifications elsewhere herein and the general items of the work as specified herein. Road subbase and base materials shall be paid for separately.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials, and shall construct the roadway to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as detailed in the Specifications and as directed by the Engineer, for this work. Use of each specific piece of equipment is subject to the approval of the Engineer.

The Contractor shall remove, salvage, deliver to any location within the City limits, and neatly stack/stockpile all bricks, if present, as directed by the Engineer.

The Contractor shall remove other surface features, including signs, located within the grading limits and not otherwise identified, as directed by the Engineer. Signs shall be salvaged and provided to City as directed by the Engineer.

The Contractor shall move excavated and/or imported materials longitudinally and/or transversely where necessary, and as directed by Engineer.

The Contractor shall keep the work well graded and drained at all times.

The Contractor shall not use rubber-tired equipment on the subgrade, when its use causes or may cause, in the opinion of the Engineer, damage to the subgrade. The Contractor shall conduct its operation(s), and provide all necessary equipment, to insure the satisfactory completion of the work without damaging the subgrade. This includes the transporting, stockpiling, rehandling, and movement of materials over



additional distances, in lieu of driving on an unprotected, or partially unprotected, subgrade.

The Contractor is solely responsible for the maintenance and protection of the subgrade. Further, any damage to the subgrade which, in the opinion of the Engineer, is caused as a result of the Contractor's operation(s), or its subcontractors' or suppliers' operation(s), shall be repaired by the Contractor at the Contractor's expense. This includes any additional earthwork and/or maintenance materials as directed by the Engineer, for the purposes of the Contractor's maintenance and protection of the subgrade. The Contractor shall not be entitled to any additional compensation for the implementation of these procedures.

The Contractor shall perform all rough and/or finish grading and compaction to the grades shown on the Plans, as detailed in the Specifications, and as directed by the Engineer.

The Contractor shall proofroll all graded and compacted surfaces in the presence of the Engineer as detailed in the Specifications. The Engineer will monitor the proofrolling operation to locate deleterious and/or uncompacted materials, and will direct undercuts as necessary.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

The Contractor shall take any and all steps necessary to avoid interruption in the mail delivery, and solid waste, recycling, and compostable pick-up within the project limits. This shall include the temporary relocation of mailboxes, where required by the Engineer, as well as moving of all solid waste/recycling/compost containers to the nearest cross street.

The Contractor shall coordinate with the Urban Forestry and Natural Resources Planning Coordinator prior to the removal of any tree roots 2 inches or larger in size.

Butt joints are included in the pay item "Machine Grading, Modified".

Topsoil, seeding, fertilizer, and mulch shall be paid for as items "Fertilizer, Chemical Nutrient", "Mulch Blanket, High Velocity", "Seeding, Mixture THM", and "Topsoil Surface, Furn, 4 inch."

## **MEASUREMENT AND PAYMENT**

Measurement for payment for the item "Machine Grading" shall be the computed in square yard quantity of excavated material (pavement, soil, rock, brick, etc.) from the top of existing grade down to the bottom of the excavation. Embankment, fill, subgrade protection/maintenance, drainage maintenance quantities will not be paid for separately, and are included in this item of work.

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

### **PAY ITEM**

Machine Grading, Modified

### **PAY UNIT**

Square Yard

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #227 - SUBGRADE UNDERCUTTING - TYPE II**

**DESCRIPTION**

This work includes removal of unsuitable granular base, subbase or clay material(s) to depths as specified by the Engineer.

**CONSTRUCTION METHOD**

After the pavement has been removed, and/or after rough/finish grading, and/or at the time of proofrolling, the Engineer may inspect the grade to determine the need for, and the limits of, undercuts. After undercut areas are excavated to the depths as directed by the Engineer, the areas shall be trimmed, shaped, evenly graded and recompact to not less than 95% of the soils maximum unit weight as determined by the AASHTO T-180 test. The Contractor shall properly dispose of all excess materials.

Subgrade Undercutting - Type II shall be backfilled with Class II Sand or other material(s), as directed by the Engineer. The backfill material shall be compacted to not less than 98% of its maximum unit weight as determined by the AASHTO T-180 test. The fill material(s) for Subgrade Undercutting Type II shall be paid at the Contract unit price for the corresponding items of work as used which is "Sand Subbase Course, Class II - C.I.P."

The Contractor shall remove, salvage, deliver to W.R. Wheeler Service Center (4251 Stone School Road, Ann Arbor, MI 48108), and neatly stack/stockpile all bricks, if present, as directed by the Engineer.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials, and shall construct the roadway to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as directed by the Engineer, for this work. Use of each specific piece of equipment is subject to the approval of the Engineer.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

**MEASUREMENT AND PAYMENT**

These items of work shall be measured for payment by calculating the volume of the undercut excavation prior to the placement of backfill.

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

**PAY ITEM**

Subgrade Undercutting - Type II

**PAY UNIT**

Cubic Yard

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #230 HMA PAVEMENT LEVELING/TOP – LVSP  
ITEM #231 HMA HANDPATCHING**

**DESCRIPTION**

This work shall consist of constructing HMA pavement leveling and top courses in accordance with Division 5 and Section 904 of the 2012 edition of the MDOT Standard Specifications, current supplemental MDOT specifications, and the City of Ann Arbor Standard Specifications, except as modified herein, and as directed by the Engineer.

**MATERIALS AND EQUIPMENT**

General

The HMA mixtures to be used for this work shall be as follows:

<u>WORK ITEM</u>	<u>MDOT HMA MIXTURE #</u>
HMA Pavement Leveling/Top	LVSP (Superpave)
HMA Handpatching	LVSP (Superpave)

Binders for LVSP Superpave mixes shall be PG 58-28, or as directed by Engineer. These shall meet the requirements specified in Section 904 of the 2012 edition of the MDOT Standard Specifications, and any current supplemental MDOT specifications.

The Aggregate Wear Index (AWI) number for this project is 260 for LVSP. This AWI number applies to all aggregates used in all top course mixtures. Blending aggregates to achieve this AWI requirement is permitted in accordance with current MDOT Standards, and Supplemental Specifications.

Reclaimed Asphalt Pavement (RAP) in HMA Mixtures

The use of Reclaimed Asphalt Pavement (RAP) in HMA mixtures shall be in accordance with Section 501.02.A.2 of the 2012 edition of the MDOT Standard Specifications, and the City of Ann Arbor Standard Specifications.

**CONSTRUCTION METHODS**

All concrete work shall be completed prior to placing HMA mixtures.

The Contractor shall have a 10-foot long straight-edge, backhoe, air-compressor and jackhammer available during all paving operations.

Prior to placing the bond coat, the Contractor shall kill all vegetation (within the area to be paved) by applying an approved weed killer ("Round-Up" by Monsanto, or equal), shall thoroughly clean all joints & cracks in the existing pavement (and any gutter to be overlaid) with compressed air and/or vacuum-type street cleaning equipment to remove all dirt and debris to a depth of at least 1-inch, and shall thoroughly clean the entire surface to be paved, with a Vac-All or similar vacuum-type street cleaning equipment.

MDOT SS-1h bond coat shall be applied at a uniform rate of 0.10 gallons/square yard, on all exposed, existing HMA and concrete surfaces which will come in contact with the new HMA material. The Contractor shall take extra care to avoid covering surfaces which are not to be paved. If work after September 15, 2018 is allowed by the Engineer, the SS-1h bond coat shall not be diluted by more than 25%.

The Contractor shall place HMA wedges using the leveling or base mixture specified herein, as directed by the Engineer, prior to placing the top course. Such wedging shall be measured and paid for at the respective unit price of the appropriate HMA Pavement item.

Construction of butt joints, where directed by the Engineer, shall be measured and paid for as "Remove HMA Pavement".

The Contractor shall schedule the paving operation to avoid longitudinal cold joints.

HMA top and course shall be placed in a 2-inch lift.

HMA leveling course shall be placed in a 2-inch lift.

HMA Handpatching shall be placed in 0-inch to 4-inch lifts.

All specified HMA thickness dimensions are compacted-in-place.

The Contractor shall construct the pavement courses to provide the final cross-slopes (crowns) specified by the Engineer.

The Contractor shall construct feather joints, and shall feather the top course at structures, in drive approaches, and at intersection joints, as directed by the Engineer. Feather joints shall vary the thickness of the asphalt from 0.0-inches to the required full paving thickness (approximately 2 inches) over a 5-foot to 15-foot distance, or as directed by the Engineer. The Contractor shall rake all large aggregates out of the HMA mixture in feather joints, prior to compaction.

The Contractor shall provide a minimum of two rakers during the placement of all top courses. Further, the Contractor shall provide, when directed by the Engineer, a second "Break-Down" roller in order to achieve the specified asphalt densities.

The Contractor shall provide a minimum of 24-hour notice to the Engineer prior to paving, and shall obtain a "Permit To Pave" from the Engineer in advance of scheduling paving.

The Contractor and Engineer shall carefully observe the paving operation for signs of faulty mixtures. Points of weakness in the surface shall be removed or corrected by the Contractor, at his/her expense, prior to paving subsequent lifts of HMA material. Such corrective action may include the removal and replacement of thin or contaminated sections of pavement, including sections that are weak or unstable. Once the Contractor or his representative is notified by the Engineer that the material being placed is out of allowable tolerances, or there is a problem with the paving operation, the Contractor shall stop the paving operation at once, and shall not be permitted to continue placing HMA material until again authorized by the Engineer.

During the placement of all courses, the speed of the paving machine(s) shall not exceed 50-feet per minute.

The Contractor shall furnish and operate enough materials and equipment so as to keep the paving machine(s) moving continuously at all times. Failure to do so shall be cause for the suspension of the paving operation until the Contractor can demonstrate to the satisfaction of the Engineer, that sufficient resources have been dedicated to perform the work in accordance with the specifications.

Each layer of HMA mixture shall be compacted to between 92 to 96 percent (or as determined acceptable by the engineer) of the theoretical maximum density, as listed on the approved Job Mix Formula.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

**MEASUREMENT AND PAYMENT**

Measurement of this HMA paving item shall be by the ton, in place. Unused portions of material loads shall be returned to the plant and re-weighed, and the corrected weight slip shall be provided to the Engineer. All weight slips must include the type of mixture (codes are not acceptable), as well as vehicle number, gross weight, tare weight and net weight.

Corrective action shall be enforced as described in the “Acceptance of HMA Mixtures” Detailed Specification and will be based on the City's testing reports.

All costs for furnishing and operating vacuum-type street cleaning equipment, backhoes, jackhammers, and air compressors shall be included in the bid prices for these items of work or in the item of work “General Conditions, Max \$50,000.”

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
HMA Pavement Leveling/Top – LVSP	Ton
HMA Handpatching	Ton

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #240 CONCRETE CURB OR CURB AND GUTTER - ALL TYPES  
ITEM #241 CONCRETE CURB OR CURB AND GUTTER - ALL TYPES (HIGH EARLY)  
ITEM #242 4 INCH CONCRETE SIDEWALK  
ITEM #243 6 INCH CONCRETE SIDEWALK OR SIDEWALK RAMP  
ITEM #244 6 INCH CONCRETE DRIVE - HIGH-EARLY**

**DESCRIPTION**

This work shall consist of constructing concrete items including curb, gutter, curb and gutter, sidewalks, drive approaches, City of Ann Arbor Type M drive openings, all of any type and/or dimensions, all of either regular, fibermesh reinforced, and/or high-early concrete, in accordance with Sections 601, 602, 603, 801, 802, and 803 of the 2012 edition of the MDOT Standard Specifications for Construction, except as specified herein, as shown on the Plans, as shown in this Detailed Specification, and as directed by the Engineer.

**The Contractor is responsible to construct all sidewalks, sidewalk ramps, curbs, and all other concrete items within ADAAG compliance.** All sidewalks and curb ramps must be constructed in accordance with MDOT Standard Detail R-28 Series (version in place at time of the bid letting).

**MATERIALS**

Concrete mixtures shall be as follows (or as directed by the Engineer), and concrete materials shall meet the requirements specified in the referenced sections of the MDOT Standard Specifications:

<u>Concrete Item</u>	<u>Concrete Mixture</u>	<u>MDOT Section</u>
Curb or Curb & Gutter	P1, 6-sack	601
Curb or Curb & Gutter, High-Early	HE, 8.4-sack	601
4" or 6" Sidewalk or Ramp	P1, 6-sack	601
6" Drive - High-Early	HE, 8.4-sack	601

**CONSTRUCTION METHODS**

**General**

Concrete items, including sidewalk, non-integral curb/gutter, drives, and structure adjustments shall be completed prior to the placement of pavement.

All subgrade work shall be completed prior to placing concrete items, unless directed or approved by the Engineer.

The subbase shall be trimmed to final elevation before placing curb. Curb shall not be placed on a pedestal or mound.

The Contractor shall excavate, cut, remove stumps, remove brush, remove pavement, grade, and trim as needed and as directed, and shall import, furnish, fill, place, grade, and compact Class II granular material and 21AA Aggregate material as needed to: construct new concrete items; to repair or replace existing concrete items; to relocate existing concrete items to their new specified/directed elevations/locations, including all necessary grading at elevation changes of curb and gutter, sidewalks and ramps; and at locations where existing concrete items are to be removed and turf is to be established in its place.

At locations where the constructed subbase becomes either disturbed, saturated or otherwise damaged, and where directed by the Engineer, the Contractor shall remove a minimum 6-inch thick layer of the subbase and replace it with "Sand Subbase Course, CL II - C.I.P.". If additional subgrade requires removal as directed by the Engineer refer to specification for "Subgrade Undercutting – Type II".

**The Contractor shall coordinate with the Urban Forestry and Natural Resources Planning Coordinator prior to the removal of any tree roots with diameters 2" or greater.**

The Contractor is responsible for any damage to concrete items, including but not limited to vandalism; vehicular,

pedestrian and/or miscellaneous structural damage; surface texture damage; and rain damage.

The Contractor shall maintain on-site at all times, a sufficient quantity of adequate materials to protect concrete items. The Engineer may suspend or defer concrete placement if rain protection is not available. The Contractor shall not be entitled to any additional compensation due to work suspension or deferral resulting from a lack of adequate rain protection.

The Contractor shall perform full-depth saw cutting at removal limits, including those necessary to construct 2-foot wide Type M drive openings, and including those necessary to provide for the partial removal of existing drive approaches, as shown on the Plans, as directed by the Engineer, and as marked for removal.

The subbase and adjacent concrete shall be sufficiently wet-down with water prior to placing concrete, to prevent water loss from the new concrete, and to form a better bond between old and new concrete. If a cold-joint becomes necessary, (the) existing concrete surface(s) shall be cleaned with compressed air to expose the aggregate in the concrete.

Where it is necessary to remove existing pavement to provide space for concrete formwork, a sufficient amount of the existing pavement shall be removed to allow for the use of a vibratory plate compactor in front of the curb.

Where concrete items are placed in areas adjacent to existing pavement that is beyond the general resurfacing (pavement removal and/or milling) limits, the adjacent pavement area shall be backfilled and permanently patched within 48-hours of the removal of concrete formwork. The backfill material shall be MDOT 21AA aggregate compacted in place to 95% of its maximum unit weight, up to the elevation of the proposed bottom of pavement. The pavement patching material(s) shall be as specified and as directed by the Engineer.

Where concrete items are placed adjacent to existing pavement that is within areas scheduled for subsequent pavement removal and/or milling, the adjacent pavement area shall, within 48-hours of the removal of concrete formwork, be backfilled with MDOT 21AA aggregate compacted in place to 95% of its maximum unit weight, up to the elevation of the bottom of the adjacent pavement.

Prior to compacting backfill in front of curb and gutter, the back of curb shall be backfilled with approved material and compacted by mechanical means to 95% of the material's maximum unit weight.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

#### Contraction Joints in Sidewalk

Contraction joints shall be placed at 5-foot intervals and may be tooled or sawed. The method of forming joints and spacing shall be approved by the Engineer prior to construction.

#### Expansion Joints in Sidewalks

¾-inch wide expansion joints shall be placed through concrete sidewalks in line with the extension of all property lines, at all expansion joints in the abutting curb, gutter, and combination curb and gutter, and as directed by the Engineer. Transverse expansion joints shall be placed through the sidewalks at uniform intervals of not more than 300-feet.

½-inch wide expansion joints shall be placed between the sidewalk and back of abutting curb or gutter, at the juncture of two sidewalks, between the sidewalk and buildings and other rigid structures, and as directed by the Engineer.

#### Expansion Joints in Curb and Gutter

¾-inch wide expansion joints shall be placed at all street returns, at all expansion joints in an abutting pavement, at each side of all driveways (at radius points), elsewhere at 300-foot maximum intervals, and as directed by the Engineer.

Expansion joint material shall extend to the full depth of the joint. After installation, the top shall not be above the

concrete nor be more than ½-inch below it. No reinforcing steel shall extend through expansion joints.

**Plane of Weakness Joints in Curb and Gutter**

Intermediate plane of weakness joints shall be placed to divide the structure into uniform sections, normally 10-feet in length, with a minimum being 8-feet in length, and shall be placed opposite all plane of weakness joints in the abutting concrete base course.

Plane of weakness joints shall be formed by narrow divider plates, which shall extend 3-inches into the exposed surfaces of the curb or curb and gutter. Plates shall be notched, if necessary, to permit the steel reinforcement to be continuous through the joint.

**MEASUREMENT AND PAYMENT**

No additional compensation will be paid for the construction of concrete items adjacent to existing concrete curb, gutter, pavement, or any other pavement or surface feature(s) which requires modified construction to smoothly blend the proposed to existing.

No additional compensation will be paid for the removal of existing subgrade, subbase or base necessary to construct item per City of Ann Arbor standards. Removal of a greater depth, as directed by the Engineer, shall be paid for as "Subgrade Undercutting – Type II". Replacement with approved "Sand Subbase Course, CL II - C.I.P." or "Aggregate Base Course, 21AA – C.I.P." will be paid for separately. Removal of existing earth where new sidewalk is installed will be paid for as "Sidewalk Grading" or "Sidewalk Ramp Grading."

A deduction in length for catch basins and inlet castings will be made to measurements of Curb and Gutter.

Curb, gutter, curb and gutter, and City of Ann Arbor type M openings, shall be paid as "Concrete Curb and Gutter – All Type".

Payment for saw cutting for Type M openings and for partial removal of existing drives shall be included in the price for the item of work, "Remove Concrete Sidewalk and Drives - Any Thickness", and will not be paid for separately.

Payment for the removal of HMA pavement and aggregate base to provide space for concrete formwork and vibratory plate compactor shall be included in the price for the item of work, "Remove Concrete Curb and Gutter - Any Type", and will not be paid for separately.

The Item, "Detectable Warning, Cast In Place" will be measured and paid for by the square foot of area stamped, typically 2' x 5'. This measurement/payment is in addition to the measurement/payment for the concrete ramp placement.

Completed work as measured for these items of work will be paid for at Contract Unit Price for the following Contract (Pay) Items:

<b><u>PAY ITEMS</u></b>	<b><u>PAY UNIT</u></b>
Concrete Curb or Curb and Gutter – All Types	Feet
Concrete Curb or Curb and Gutter – All Types (High Early)	Feet
4 Inch Concrete Sidewalk	Square Feet
6 Inch Concrete Sidewalk or Sidewalk Ramp	Square Feet
6 Inch Concrete Drive - High Early	Square Feet

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.



**DETAILED SPECIFICATION  
FOR  
ITEM #245 -DETECTABLE WARNING, CAST IN PLACE**

**DESCRIPTION**

This work shall consist of furnishing and installing cast in place detectable warning units in compliance to the Americans with Disability Act (ADA). All work shall be in accordance with MDOT Standard Detail R-28 Series (version in place at time of the bid letting).

**MATERIALS AND CONSTRUCTION METHODS**

The detectable warning tiles shall be ceramic cement or composite polymer concrete (CRC), colored as Federal Number 22144 (frequently referred to as "Colonial Red" or "Brick Red"). The detectable warning tiles shall meet the following dimensions and tolerances:

1. Dimensions: Cast In Place Detectable/tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:

Length: 24"

Width: The full width of the approaching walk (60" for typical sidewalk)

Depth: 1.375" (1-3/8") (+/-) 5% max.

Face Thickness: 0.1875" (3/16") (+/-) 5% max. Warpage of Edge: 0.5% max.

Embedment Flange Spacing: shall be no greater than 3.1"

2. Water Absorption of Tile when tested by ASTM D 570-98 not to exceed 0.05%.
3. Slip Resistance of Tile when tested by ASTM C 1028-96 the combined Wet and Dry Static Co-Efficient of Friction not to be less than 0.80 on top of domes and field area.
4. Compressive Strength of Tile when tested by ASTM D 695-02a not to be less than 28,000 psi.
5. Tensile Strength of Tile when tested by ASTM D 638-03 not to be less than 19,000 psi.
6. Flexural Strength of Tile when tested by ASTM D 790-03 not to be less than 25,000 psi.
7. Chemical Stain Resistance of Tile when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - 10% hydrochloric acid, urine, saturated calcium chloride, black stamp pad ink, chewing gum, red aerosol paint, 10% ammonium hydroxide, 1% soap solution, turpentine, Urea 5%, diesel fuel and motor oil.
8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM D 2486-00 with reciprocating linear motion of  $37 \pm$  cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.060 after 1000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
9. Resistance to Wear of Unglazed Ceramic Tile by Taber Abrasion per ASTM C501-84 (re approved 2002) shall not be less than 500.
10. Fire Resistance of Tile when tested to ASTM E 84-05 flame spread shall be less than 15.
11. Gardner Impact to Geometry "GE" of the standard when tested by ASTM D 5420-04 to have a mean failure energy expressed as a function of specimen thickness of not less than 550 in. Ibf/in. A failure is noted when a crack is visible on either surface or when any brittle splitting is observed on the

bottom plaque in the specimen.

12. Accelerated Weathering of Tile when tested by ASTM G 155-05a for 3000 hours shall exhibit the following result -□E <4.5, as well as no deterioration, fading or chalking of surface.
13. Accelerated Aging and Freeze Thaw Test of Tile and Adhesive System when tested to ASTM D 1037-99 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other detrimental defects.
14. Salt and Spray Performance of Tile when tested to ASTM B 117-03 not to show any deterioration or other defects after 200 hours of exposure.
15. AASHTO HB-17 single wheel HS20-44 loading "Standard Specifications for Highways and Bridges". The Cast In Place Tile shall be mounted on a concrete platform with a ½" airspace at the underside of the tile top plate then subjected to the specified maximum load of 10,400 lbs., corresponding to an 8000 lb individual wheel load and a 30% impact factor. The tile shall exhibit no visible damage at the maximum load of 10,400 lbs.
16. Embedment flange spacing shall be no greater than 3.1" center to center spacing as illustrated on the product Cast In Place drawing.

**CONSTRUCTION METHODS**

The contractor shall follow manufacturer specifications for installation, except where they conflict with MDOT Standard Detail R-28 Series (version in place at time of the bid letting).

**MEASUREMENT AND PAYMENT**

The completed work as measured for this item of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Item:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Detectable Warning, Cast In Place	Square Feet

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #246 - INTEGRAL SIDEWALK RETAINING WALL, 6 INCH TO 18 INCH**

**DESCRIPTION**

This work shall consist of constructing concrete retaining walls adjacent to sidewalks, in accordance with Section 802 of the 2012 edition of the MDOT Standard Specifications for Construction, except as specified herein, as shown in this Detailed Specification, and as directed by the Engineer.

**MATERIAL**

Concrete mixtures shall be Grade P1 or S2 concrete, or as directed by the Engineer, meeting the requirements specified in Section 803 of the MDOT Standard Specifications.

**CONSTRUCTION METHODS**

The Contractor shall construct the Integral Sidewalk Retaining Walls as shown herein. Construction shall be in accordance with Section 802 of the 2012 MDOT Standard Specifications for Construction.

**MEASUREMENT AND PAYMENT**

Payment shall be measured by the exposed face area of the retaining wall in square feet. The completed work, as described, will be measured and paid for at the contract unit price for the following pay item:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Integral Sidewalk Retaining Wall, 6 inch to 18 inch	Square Foot

Payment for "Integral Sidewalk and Retaining Wall, 6 inch to 18 inch" shall include all labor, equipment and materials to complete this work.

**DETAILED SPECIFICATION  
FOR  
ITEM #250 – SAND SUBBASE COURSE, CLASS II – C.I.P.  
ITEM #251 – 21AA LIMESTONE – C.I.P.  
ITEM #252 – AGGREGATE BASE COURSE, 21AA – C.I.P.  
ITEM #253 – AGGREGATE BASE COURSE, 23A – C.I.P.  
ITEM #254 – AGGREGATE SURFACE COURSE, 23A – C.I.P.**

**DESCRIPTION**

This work shall consist of constructing an aggregate subbase or base course on an existing aggregate surface, or on a prepared subgrade in accordance with Sections 301, 302 and 307 of the 2012 edition of the MDOT Standard Specifications for Construction, except as specified herein.

**MATERIAL**

The materials used for this work shall be MDOT 21AA, 23A and Class II granular material meeting the requirements of the City of Ann Arbor Standard Specifications.

**CONSTRUCTION METHOD**

Sand or aggregate courses shall not be placed if, in the opinion of the Engineer, there are any indications that they may become frozen before their specified densities are obtained.

Sand or aggregate courses shall not be placed on a frozen base, subbase or subgrade.

The Contractor shall not use rubber-tired equipment on the grade, when its use causes, or may cause, in the opinion of the Engineer, damage to the grade. The Contractor shall conduct his/her operation(s), and provide all necessary equipment, to insure the satisfactory completion of the work without damaging the grade. This includes the transporting, stockpiling, rehandling, and movement of materials over additional distances, in lieu of driving on an unprotected, or partially unprotected, grade.

The Contractor is solely responsible for the maintenance and protection of the grade. Further, any damage to the grade which, in the opinion of the Engineer, is caused as a result of the Contractor's operation(s), or his/her subcontractors' or suppliers' operation(s), shall be repaired by the Contractor at the Contractor's expense. This includes any additional earthwork and/or maintenance materials as directed by the Engineer, for the purposes of the Contractor's maintenance and protection of the grade.

The Contractor shall shape the base, subbase and subgrade to the elevations, crowns, and grades as specified on the Plans and as directed by the Engineer. This may include regrading the subbase to provide different crown grades than those existing prior to the construction.

The Contractor shall remove, add to, re-shape, re-grade, and re-compact the existing roadbed materials, and shall construct the roadway to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as directed by the Engineer, for this work. Use of each specific piece of equipment is subject to the approval of the Engineer.

The Contractor shall maintain the base, subbase and subgrade in a smooth, well drained condition at all times.

Sand and aggregate courses shall be placed in uniform layers such that when compacted, they have the thicknesses shown on the Plans, or as directed by the Engineer. The loose measure of any layer shall not be more than 9-inches or less than 4-inches.

Sand subbase and aggregate surface courses shall be compacted to not less than 95% of their respective

maximum unit weights, as determined by the AASHTO T-180 test.

Aggregate base courses shall be compacted to not less than 98% of their respective maximum unit weights, as determined by the AASHTO T-180 test.

All granular materials shall be deposited from trucks or through a spreader in a manner that will minimize segregation of material.

Manholes, valve boxes, inlet structures and curbs shall be protected from damage. Manholes & inlet structures shall be continuously cleaned of construction debris and properly covered at all times during the construction. Upon completion of each day's work, manholes, water valve boxes, inlets and catch basins shall be thoroughly cleaned of all extraneous material.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

### **MEASUREMENT AND PAYMENT**

Where granular materials are used as base, as subbase, or as fill for excavations in Machine Grading areas, items of work "Aggregate Base Course, 21AA -C.I.P.", "Aggregate Base Course, 23A -C.I.P." and "Sand Subbase Course, CL II - C.I.P." shall be measured and paid accordingly.

Where granular materials are used as a surface course in Machine Grading areas, items of work "Aggregate Surface Course, 23A -C.I.P." shall be measured and paid accordingly.

Where granular materials are used as fill for undercuts at locations other than Machine Grading areas, item of work "21AA Limestone - C.I.P.", "Aggregate Base Course, 21AA -C.I.P." and/or "Sand Subbase Course, CL II - C.I.P." shall be measured and paid accordingly.

The completed work as measured for these items of work will be paid for at the Contract Unit Prices for the following Contract (Pay) Items:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Sand Subbase Course, Class II - C.I.P.	Cubic Yard
21AA Limestone - C.I.P.	Cubic Yard
Aggregate Base Course, 21AA - C.I.P.	Ton
Aggregate Base Course, 23A - C.I.P.	Cubic Yard
Aggregate Surface Course, 23A - C.I.P.	Ton

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**DETAILED SPECIFICATION FOR  
ITEM #261 - REMOVE CONCRETE CURB OR CURB & GUTTER - ANY TYPE  
ITEM #262 - REMOVE CONCRETE SIDEWALK AND DRIVE - ANY  
THICKNESS**

**DESCRIPTION**

This work shall consist of removing concrete curb, gutter, curb and gutter, integral curb, sidewalk, sidewalk ramps, drive openings, and drives as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, in accordance with Section 204 of the 2012 edition of the MDOT Standard Specifications for Construction, except as specified herein, and as directed by the Engineer.

**CONSTRUCTION METHOD**

**The Contractor shall remove concrete curb, gutter, curb & gutter, integral curb, sidewalk, sidewalk ramps, drive openings, and drives, all regardless of the type and thickness, and all as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer.**

Prior to the start of removals, the Engineer and Contractor together shall field measure all removals.

The Contractor shall perform full-depth saw cutting at removal limits, including those necessary to construct 2-foot wide City of Ann Arbor Type M drive openings, and including those necessary to provide for the partial removal of existing drive approaches as shown on the Plans, as directed by the Engineer, and as marked for removal. The Contractor shall cut steel reinforcement bars as directed by the Engineer at all areas of removal.

The Contractor shall remove, salvage, deliver to W. R. Wheeler Service Center (4251 Stone School Road, Ann Arbor, MI 48108), and neatly stack/stockpile all bricks, if present, as directed by the Engineer.

The Contractor shall excavate, cut, remove stumps, remove brush, grade, and trim as needed and as directed, and shall import, furnish, fill, place, grade, and compact granular material as needed to: construct new concrete items; to repair or replace existing concrete items; to relocate existing concrete items to their new specified/directed elevations/locations, including all necessary grading at elevation changes of curb and gutter, sidewalks and ramps; and at locations where existing concrete items are to be removed and turf is to be established in its place.

**The Contractor shall coordinate with the Urban Forestry and Natural Resources Planning Coordinator prior to the removal of any tree roots 2 inches or larger in size.**

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

The Contractor shall re-shape, re-grade, and re-compact the existing roadbed materials to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as directed by the Engineer. The use of each specific piece of equipment is subject to the approval of the Engineer.

The Engineer may direct aggregate base materials to be either removed from or added to the job-site, to properly complete the work. Where the Engineer directs the addition of such materials, they shall be paid for as either the Item of Work: "21AA Limestone - C.I.P.", "Aggregate Base Course, 21AA - C.I.P." or "Sand Subbase Course, CL II - C.I.P.". Where the Engineer directs such materials to be removed, they will not be paid for separately, but shall be included in the appropriate concrete removal item.

Where existing concrete curb & gutter is to be replaced on a street with a concrete (or brick) base, the Engineer may direct the Contractor to remove a 1-to-2-foot wide, full-depth section of pavement and

pavement base from immediately in front of the curb & gutter. As part of this pavement/base removal, the Contractor shall perform additional (double) full-depth saw-cutting along the entire removal limits, and shall take sufficient care so as not to damage and/or disturb any adjacent pavement, pavement base, and/or any other site feature, all as directed by the Engineer. The removals shall be to a sufficient width and depth to allow for the placement and removal of the curb & gutter formwork. After the removal of the formwork, the Contractor shall replace the concrete base to its original thickness and elevation(s).

Excavated/removal areas shall be adequately protected with barricades or fencing at all times.

Removed or excavated materials which are not incorporated into the work shall become the property of the Contractor and shall be immediately removed and properly disposed of off-site. Removed or excavated materials may not be stockpiled overnight on, or adjacent to, the site.

Subbase or subgrade removed without authorization by the Engineer shall be replaced and compacted by the Contractor at the Contractor's expense, with materials specified by the Engineer.

The Contractor shall restore all disturbed areas to better than or equal to their original condition. This includes the placement and compaction of 4 inches of topsoil, followed by placement of grass seed, followed by the placement fertilizer and mulch blanket at all turf restoration locations, and at locations where concrete items are removed and turf is to be established. All restoration work and materials shall be in accordance with the Detailed Specifications "Clean-up & Restoration, Special".

### **MEASUREMENT AND PAYMENT**

Sidewalk ramp removal shall be measured and paid for as "Remove Concrete Sidewalk and Drive - Any Thickness".

Payment for saw cutting to create or modify Type M openings, and to allow for the partial removal of existing drives shall be included in the price of the item of work, "Remove Concrete Sidewalk & Drive - Any Thickness", and will not be paid for separately.

All saw-cutting required for removals shall be included in the appropriate item of work, and will not be paid for separately.

Restoration work, including backfilling, compacting, HMA patching adjacent to concrete items, topsoiling and seeding will not be paid for separately, but shall be included in the appropriate associated items of work.

Concrete removal items shall be field measured and paid for at the Contract Unit Prices for their respective Contract (Pay) Items as follows:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Remove Concrete Curb or Curb and Gutter - Any Type	Foot
Remove Concrete Sidewalk and Drive - Any Thickness	Square Feet

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

## **DETAILED SPECIFICATION FOR ITEM #263 – HMA SURFACE REMOVE**

### **DESCRIPTION**

This work shall consist of removing asphalt drive openings and drives as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer, in accordance with Section 501 of the 2012 edition of the MDOT Standard Specifications for Construction, except as specified herein, and as directed by the Engineer.

### **CONSTRUCTION METHOD**

**The Contractor shall remove asphalt drive openings and drives, all regardless of the thickness, and all as shown on the Plans, as detailed in the Specifications, and as directed by the Engineer.**

Prior to the start of removals, the Engineer and Contractor together shall field measure all removals.

The Contractor shall perform full-depth saw cutting at removal limits, as shown on the Plans, as directed by the Engineer, and as marked for removal.

At various times throughout the work, the Engineer may direct the Contractor to use smaller and/or lighter equipment, and to defer certain work tasks, in order to protect the grade and/or adjacent areas. The Contractor shall not be entitled to any additional compensation for the use of smaller equipment, lighter equipment, or work task deferral.

The Contractor shall re-shape, re-grade, and re-compact the existing driveway base materials to the cross-section(s) as indicated on the Plans, as detailed in the Specifications, and as directed by the Engineer. The Contractor shall use blade graders, maintainers, vibratory rollers, and/or other equipment as necessary, and as directed by the Engineer. The use of each specific piece of equipment is subject to the approval of the Engineer.

The Engineer may direct aggregate base materials to be either removed from or added to the job-site, to properly complete the work. Where the Engineer directs the addition of such materials, they shall be paid for as either the Item of Work: "21AA Limestone - C.I.P.", "Aggregate Base Course, 21AA - C.I.P." or "Sand Subbase Course, CL II - C.I.P.". Where the Engineer directs such materials to be removed, they will not be paid for separately, but shall be included in this item.

Excavated/removal areas shall be adequately protected with barricades or fencing at all times.

Removed or excavated materials which are not incorporated into the work shall become the property of the Contractor and shall be immediately removed and properly disposed of off-site. Removed or excavated materials may not be stockpiled overnight on, or adjacent to, the site.

Subbase or subgrade removed without authorization by the Engineer shall be replaced and compacted by the Contractor at the Contractor's expense, with materials specified by the Engineer.

The Contractor shall restore all disturbed areas to better than or equal to their original condition. This includes the placement and compaction of 4 inches of topsoil, followed by placement of grass seed, followed by the placement fertilizer and mulch blanket at all turf restoration locations. All restoration work and materials shall be in accordance with the Detailed Specifications "Clean-up & Restoration, Special".

### **MEASUREMENT AND PAYMENT**

All saw-cutting to establish a neat line required for removals shall be included in the appropriate item of work, and will not be paid for separately.

Restoration work, including backfilling, compacting, topsoiling and seeding will not be paid for separately, but shall be included in the appropriate associated items of work.



HMA Surface Remove items shall be field measured and paid for at the Contract Unit Prices for their respective Contract (Pay) Items as follows:

**PAY ITEM**

**PAY UNIT**

HMA Surface Remove

Square Feet

The unit prices for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification and disposal of the HMA material.

**DETAILED SPECIFICATION FOR  
ITEM #265 – SIDEWALK GRADING  
ITEM #266 – SIDEWALK RAMP GRADING**

**DESCRIPTION**

Remove miscellaneous structures and materials and complete all earthwork required to construct the proposed cross sections within the limits shown on the plans or stated in this special provision. All lines and grades will be as shown on the plans and as directed by the Engineer. Complete this work according to the MDOT 2012 Standard Specifications for Construction and this special provision.

**MATERIALS**

Furnish and place required subbase and embankment material conforming to the MDOT 2012 Standard Specifications for Construction as necessary to achieve the required typical cross sections. Excavated material, if suitable, may be used as embankment material as approved by the Engineer.

**CONSTRUCTION METHOD**

Complete this work according to applicable sections of the Standard Specifications for Construction. Sidewalk Grading includes, but is not limited to, the following work:

1. Strip and stockpile topsoil for use in turf establishment.
2. Furnish, place and compact additional material.
3. Clearing, including trees less than 8 inches in diameter.
4. Remove rocks or boulders less than 0.5 cubic yards in volume.
5. Remove and relocate mailbox posts and mailboxes.
6. Sawcut existing pavement.
7. Match drive and approach grades to new pavement grades.
8. Remove miscellaneous structures and materials.
9. Dispose of excess and unsuitable material according to Section 205.
10. Place embankment and reshape to proposed grades.
11. Excavate material to a depth necessary for construction.
12. Place embankment to a thickness necessary for construction.
13. Excavate for subbase material.

**MEASUREMENT AND PAYMENT**

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

<b>Pay Item</b>	<b>Pay Unit</b>
Sidewalk Grading .....	Station
Sidewalk Ramp Grading .....	Each

**Sidewalk Grading** includes all labor, equipment and materials necessary to complete the work as described and will be measured by length in stations along the road centerline.

**Sidewalk Ramp Grading** will apply separately to each quadrant of an intersection where sidewalk is to be removed and/or graded for construction. The limits are specified on the plans or as directed by the Engineer.

**DETAILED SPECIFICATION  
FOR  
ITEM #270 PAVT MRKG, THERMOPLASTIC, 12 INCH CROSSWALK  
ITEM #271 PAVT MRKG, THERMOPLASTIC, 24 INCH STOP BAR**

**DESCRIPTION**

This work consists of providing and placing permanent pavement markings in accordance with the Michigan Manual of Uniform Traffic Control Devices (MMTUTCD), latest version published at time of advertisement. Provide pavement markings that conform to the Plans, the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, MDOT Pavement Marking Standard Plans, City of Ann Arbor Special Details, and as specified herein.

**MATERIALS**

Provide materials in accordance with section 811 and 920 of the MDOT 2012 Standard Specifications for Construction. Provide the Material Safety Data Sheets to the Engineer for required materials and supplies. Dispose of unused material and containers in accordance with the Federal Resource Conservation Recovery Act (RCRA) of 1976 as amended, and 1994 PA 451, Part 111 Hazardous Waste Management. Provide samples of permanent marking materials upon request.

**CONSTRUCTION METHODS**

The preparation and placement of permanent markings shall conform to section 811 of the MDOT 2012 Standard Specifications, the Plans, and as specified herein.

**MEASUREMENT AND PAYMENT**

Completed work, as described, will be measured and paid for at Contract Unit Prices for the following Contract (Pay) Items:

<b><u>PAY ITEMS</u></b>	<b><u>PAY UNIT</u></b>
Pavt Mrkg, Thermoplastic, 12 inch Crosswalk	Foot
Pavt Mrkg, Thermoplastic, 24 inch Stop Bar	Foot

The unit prices for these items of work shall include all labor, material, and equipment costs to perform all the work specified in the MDOT 2012 Standard Specifications for Construction and as modified by this Detailed Specification.

**DETAILED SPECIFICATION  
FOR  
ITEM #272 – SIGN, PORTABLE CHANGEABLE MESSAGE, FURNISH AND OPERATE  
ITEM #273 – PLASTIC DRUM – LIGHTED, FURNISH & OPERATE  
ITEM #274 – BARRICADE TYPE III – LIGHTED, FURNISH AND OPERATE  
ITEM #275 – TEMPORARY SIGN - TYPE B, FURNISH AND OPERATE  
ITEM #276 – CHANNELIZING DEVICE, 42 INCH, FURNISH AND OPERATE**

**DESCRIPTION**

This work shall consist of protecting and maintaining vehicular and pedestrian traffic, in accordance with Sections 103.05, 103.06, 812, and 922, of the 2012 MDOT Standard Specifications for Construction; Part 6 of the Michigan Manual of Uniform Traffic Control Devices, Latest Revised Edition (MMUTCD); and the City Standard Specifications, except as modified herein.

**MATERIALS, EQUIPMENT, AND CONSTRUCTION METHODS**

General

Materials and equipment shall meet the requirements specified in the above-designated sections of the MDOT Standard Specifications.

The Contractor shall maintain traffic such that no vehicle shall be required to drive into active work areas. Patch areas which extend more than halfway across the roadway shall be removed and replaced so as to provide a minimum of half the pavement width at all times for maintaining traffic.

The Contractor shall maintain pedestrian traffic at all times. For maintaining normal pedestrian traffic while performing sidewalk and driveway repair, Type I barricades shall be placed by the Contractor, as directed by the Engineer. "Sidewalk Closed" and/or "Cross Here" signs shall be placed, by the Contractor, when directed by the Engineer.

All temporary traffic/pedestrian control devices furnished by the Contractor shall remain the property of the Contractor. The City shall not be responsible for stolen or damaged signs, barricades, barricade lights or other traffic maintenance items. The Contractor shall replace missing traffic control devices immediately, at no additional cost to the City.

All existing signs, and signs erected by the City of Ann Arbor on this project shall be preserved, protected, and maintained by the Contractor. Existing City owned signs which are damaged by the Contractor during the work will be repaired by the City at the Contractor's expense.

Parking violation citations issued to the Contractor, subcontractor and material suppliers, including their employees, shall be enforced under appropriate City Code.

The Contractor shall replace missing or damaged traffic control devices, as directed by the Engineer. When traffic control devices have been damaged by, or due to, the negligence of the Contractor, his subcontractors or material suppliers, the traffic control devices shall be replaced at the Contractor's expense.

Lighted Plastic Drums; III Barricades; Type B Temporary Signs

The Contractor shall furnish and operate these items as directed by the Engineer.

Type III Barricades shall have standard orange-and-white stripes on both sides of the barricade.

Sufficient signs shall be provided by the Contractor to insure the safety of the workers and the general public in accordance with the current MMUTCD.

"Construction Ahead" warning signs shall be placed, as indicated on the Plans, or as directed by the Engineer, prior to the start of work, regardless of the nature, magnitude or duration of the work.

## **MEASUREMENT AND PAYMENT**

### **General**

All temporary traffic/pedestrian control devices furnished by the Contractor shall remain the property of the Contractor. The City shall not be responsible for stolen or damaged signs, barricades, barricade lights or other traffic maintenance items. The Contractor shall replace missing traffic control devices immediately, at no additional cost to the City.

Costs for transporting barricades and other traffic control devices shall be included in the bid prices for the individual items of work.

### **Barricade Type III - Lighted - Furnish and Operate**

Payment for furnishing and operating lighted Type III barricades shall be for the maximum quantity in-place at any one time during the work of the entire project (all streets).

### **Temporary Sign - Type B**

Payment for Type B signs shall be for the maximum quantity used on each street.

### **Plastic Drum - Lighted – Furnish and Operate**

There will be a one-time payment for each street for the maximum number of lighted drums in-place (operated) at any one time, as directed by the Engineer.

### **Portable Changeable Message Signs**

Measurement for furnishing and operating Portable Changeable Message Signs will be for the maximum quantity in-place at any one time during the work of the entire project (all streets).

The completed work as measured for these items of work will be paid for at the Contract Unit Price for the following Contract (Pay) Items:

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Sign, Portable Changeable Message, Furnish and Operate	Each
Plastic Drum - Lighted - Furnish& Operate	Each
Barricade Type III - Lighted - Furnish and Operate	Each
Temporary Sign, Type B	Square Foot
Channelizing Device, 42 inch, Furnish and Operate	Each

**DETAILED SPECIFICATION  
FOR  
ITEM #280 – FIRE HYDRANT ASSEMBLY**

**DESCRIPTION**

This Detailed Specification is intended to supplement the current City of Ann Arbor Standard Specifications for Construction with regard to Fire Hydrant Assembly.

**MATERIALS**

Fire hydrants shall be either the East Jordan Model Watermaster 5BR250 with traffic flange, or the Waterous Pacer Model WB67-250 with traffic flange. All fire hydrants shall have the following features: a 6 inch push-on tyton joint connection, ANSI/AWWA C111/A21.11; one 5 inch storz connection; one 3-3/8 inch threaded Ann Arbor Standard pumper connection with 7-1/2 threads per inch and 4.05 in. O.D.; 1-3/8 inch pentagon operating and cap nuts (1-3/8 in. point-to-flat at top; 1-7/16 in. point-to-flat at base); open left; breakable flange construction; no barrel drain; and a painted red finish. Depth of bury (bottom of pipe to ground surface) is generally 6 feet but may vary depending on specific site conditions. The pumper nozzles must be 21 in. ± 3 in. above finished grade, and the breakable traffic flange must be between finished grade and 8 in. above finished grade. Fire hydrant extensions for Waterous hydrants shall be Waterous Part # K562. Extensions for East Jordan hydrants shall be hydrant model 5BR250 extension kits. All fire hydrants must be certified by Underwriters Laboratory (UL) or the National Sanitation Foundation (NSF) for use in a potable water system.

**MEASUREMENT AND PAYMENT**

The unit price for this item of work shall include all labor, material, and equipment costs to perform all the work specified in the Standard Specifications and as modified by this Detailed Specification.

**PAY ITEM**

**PAY UNIT**

Fire Hydrant Assembly

Each

Fire hydrant assemblies shall be measured per unit constructed and paid for on the basis of unit price each. The unit price for fire hydrant assemblies shall include a 6-inch gate valve in box, 3 lineal feet of 6 inch pipe, an approved hydrant with traffic flange, and a thrust block. Any required extension will be paid for separately, on a per each installed basis.

**DETAILED SPECIFICATION  
FOR  
ITEM #281 – FERTILIZER, CHEMICAL NUTRIENT, CL A  
ITEM #282 – MULCH BLANKET, HIGH VELOCITY  
ITEM #283 – SEEDING, MIXTURE THM  
ITEM #284 – TOPSOIL SURFACE, FURN, 4 INCH**

**DESCRIPTION**

This work shall consist of furnishing and installing turf restoration items to reestablish and permanently stabilize disturbed areas within the project as shown on the plans, including all labor, equipment, and material required.

This work shall be completed in accordance with the drawings and detailed specifications of this contract, the MDOT 2012 Standard Specifications for Construction, and as herein specified, including any detailed specifications

**MATERIALS**

The materials shall meet the requirements specified in the MDOT 2012 Standard Specifications as designated, as specified herein, and as approved by the Engineer:

- Seed shall be THM (Turf Loamy to Heavy) seed mixture as described in MDOT Table 816-1.
- Fertilizers shall be a Class A. The percentages by weight shall be 12- 12- 12, or as approved by the Engineer.
- Water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances.
- Mulch blankets shall be High Velocity Straw Mulch Blankets as specified in MDOT section 917.
- Topsoil shall be 4 inches furnished as specified in MDOT section 917

**CONSTRUCTION METHODS**

These items shall be constructed as required in the MDOT 2012 Standard Specifications for Construction.

**MAINTENANCE AND ACCEPTANCE**

It is the responsibility of the Contractor to establish a dense lawn of permanent grasses, free from mounds and depressions prior to final acceptance and payment of this project. Any portion of a seeded area that fails to show a uniform germination shall be reseeded. Such reseeding shall be at the Contractor's expense and shall continue until a dense lawn is established. The Contractor is responsible for restoring all areas disturbed by his construction.

The Contractor shall maintain all lawn areas until they have been accepted by the Engineer. Lawn maintenance shall begin immediately after the grass seed is in place and continue until final acceptance with the following requirements:

Lawns shall be protected and maintained by watering, mowing, and reseeding as necessary, until the period of time when the final acceptance and payment is made by the Engineer for the project, to establish a uniform, weed-free, stand of the specified grasses. Maintenance includes furnishing and installing



additional topsoil, and reseeded all as may be required to correct all settlement and erosion until the date of final acceptance.

Damage to seeded areas resulting from erosion shall be repaired by the Contractor at the Contractor's expense. Scattered bare spots in seeded areas will not be allowed over three (3) percent of the area nor greater than 6"x 6" in size.

When the above requirements have been fulfilled, the Engineer will accept the lawn.

Restoration must be performed upon the completion of each stage of work, to prevent erosion, and not as one single operation at the completion of the entire project. Restoration work must be performed within one week of the placement of the wearing course for each street.

The Contractor shall restore all disturbed areas to better than or equal to their original condition.

**MEASUREMENT AND PAYMENT**

The completed work as measured shall be paid for at the contract unit price for the following contract item (pay item):

<b><u>PAY ITEM</u></b>	<b><u>PAY UNIT</u></b>
Fertilizer, Chemical Nutrient, Cl A	Lbs
Mulch Blanket, High Velocity	Syd
Seeding, Mixture THM	Lbs
Topsoil Surface, Furn, 4 inch	Syd

All work indicated herein shall be included in the unit prices for the above pay items and shall include all labor, materials and equipment required to complete the work.

**DETAILED SPECIFICATION  
FOR  
ITEM #299 – CERTIFIED PAYROLL COMPLIANCE AND REPORTING**

**DESCRIPTION**

This specification covers all administrative requirements, payroll reporting procedures to be followed by Contractors performing work on City-sponsored public improvements projects, and all other miscellaneous and incidental costs associated with complying with the applicable sections of the City of Ann Arbor Code of Ordinances with regard to payment of prevailing wages and its Prevailing Wage Compliance policy.

This specification is not intended to include the actual labor costs associated with the payment of prevailing wages as required. Those costs should be properly incorporated in all other items of work bid.

**GENERAL**

The Contractor is expected to comply with all applicable sections of Federal and State prevailing wage laws, duly promulgated regulations, the City of Ann Arbor Code of Ordinances, and its Prevailing Wage Compliance Policy as defined within the contract documents. The Contractor shall provide the required certified payrolls, city-required declarations, and reports requested elsewhere in the contract documents within the timeline(s) stipulated therein.

The Contractor shall also provide corrected copies of any submitted documents that are found to contain errors, omissions, inconsistencies, or other defects that render the report invalid. The corrected copies shall be provided when requested by the Supervising Professional.

The Contractor shall also attend any required meetings as needed to fully discuss and ensure compliance with the contract requirements regarding prevailing wage compliance. The Contractor shall require all employees engaged in on-site work to participate in, provide the requested information to the extent practicable, and cooperate in the interview process. The City of Ann Arbor will provide the needed language interpreters in order to perform wage rate interviews or other field investigations as needed.

Certified Payrolls may be submitted on City-provided forms or forms used by the Contractor, as long as the Contractor's forms contain all required payroll information. If the Contractor elects to provide their own forms, the forms shall be approved by the Supervising Professional prior to the beginning of on-site work.

**UNBALANCED BIDDING**

The City of Ann Arbor will examine the submitted cost for this item of work prior to contract award. If the City determines, in its sole discretion, that the costs bid by the Contractor for complying with the contract requirements are not reasonable, accurately reported, or may contain discrepancies, the City reserves the right to request additional documentation that fully supports and justifies the price as bid. Should the submitted information not be determined to be reasonable or justify the costs, the City reserves the right to pursue award of the contract to the second low bidder without penalty or prejudice to any other remedies that it may have or may elect to exercise with respect to the original low-bidder.

The Contract Completion date will not be extended as a result of the City's investigation of the as-bid amount for this item of work, even if the anticipated contract award date must be adjusted. The only exception will be if the Contractor adequately demonstrates that their costs were appropriate and justifiable. If so, the City will adjust the contract completion date by the number of calendar days commensurate with the length of the investigation, if the published Notice to Proceed date of the work cannot be met. The

contract unit prices for all other items of work will not be adjusted regardless of an adjustment of the contract completion date being made.

**MEASUREMENT AND PAYMENT**

The completed work as measured for this item of work will be paid for at the Contract Unit Price for the following Contract (Pay) Item:

**PAY ITEM**

Certified Payroll Compliance and Reporting

**PAY UNIT**

Lump Sum

The unit price for this item of work shall include all supervisory, accounting, administrative, and equipment costs needed to monitor and perform all work related to maintaining compliance with the tasks specified in this Detailed Specification, the City of Ann Arbor Code of Ordinances, its Prevailing Wage Compliance policy and the applicable Federal and State laws.

Payment for this work will be made with each progress payment, on a pro-rata basis, based on the percentage of construction completed. When all of the work of this contract has been completed, the measurement of this item shall be 1.0 times the Lump Sum bid amount. This amount will not be increased for any reason, including extensions of time, extra work, and/or adjustments to existing items of work.

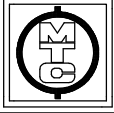
# APPENDIX

## SOIL BORINGS

- Longshore Drive
- Indianola Avenue
- Ottawa Drive
- Argo Drive
- Amherst Avenue

## STANDARD CASTING SCHEDULE SD-GU-5

- Sanitary Manhole Cover
- Storm Manhole Cover
- Water Manhole Cover



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-20

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 5'E of Longshore Drive West Curb, 19'S of 1502 Longshore Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

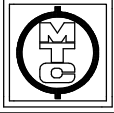
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5	A-1				3 1/2" HMA, 16" Natural Aggregate Base				Fill 0' to 5.0'
	1.0									
	1.5	A-2				Brown poorly graded SAND with silt; mostly coarse to fine sand, few silty fines, few coarse to fine gravel, moist, fill	1.5			
	2.0									
	2.5	A-3			SP-SM					
	3.0									
	3.5									
	4.0									
	4.5	A-4								
	5.0									
						End of Boring				

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-21

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 15'W of Longshore Drive East Edge of Road, 16'N of 1600 Longshore Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

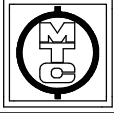
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5	A-1				9" Clayey Gravel	0.8	2.25	18	
	1.0									
	1.5	A-2			CL	Brown lean CLAY; mostly clayey fines, few fine sand, moist	1.8			
	2.0									
	2.5	A-3			SP-SC	Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist	5.0			
	3.0									
	3.5									
	4.0	A-4								
	4.5									
	5.0									
End of Boring										

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-22

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 15'W of Longshore Drive East Edge of Road, 42'N of 1730 Longshore Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

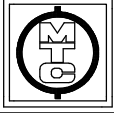
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5	A-1				9" Gravel	0.8	3.75	17	
	1.0									
	1.5	A-2			CL	Brown lean CLAY; mostly clayey fines, few medium to fine sand, moist	2.3			
	2.0									
	2.5	A-3			ML	Brown SILT; mostly silty fines, few fine sand, moist	5.0			
	3.0									
	3.5									
	4.0	A-4								
	4.5									
	5.0									
End of Boring										

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-23

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 19'W of Longshore Drive East Edge of Road, 6'S of  
1906 Longshore Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

**Depth Drilled:** 5.0 ft.

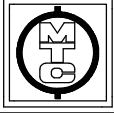
**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5					6" Clayey Gravel				
	1.0	A-1				Brown clayey SAND; mostly coarse to fine sand, some clayey fines, moist		21		A-1: Trace roots encountered
	1.5									
	2.0									
	2.5	A-2			SC				19	
	3.0									
	3.5									
	4.0									
	4.5									
	5.0	A-3						15		
						End of Boring				

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.





**LOG OF BORING**

Project No.: 171311.2

Boring No.: B-25

Sheet: 1 of 1

Project: City of Ann Arbor Street Borings Bundle No. 3

Client: City of Ann Arbor, MI

Location: Ann Arbor, MI

Drill Type: CME 45

Crew Chief: ZM Field Eng.: KD Rev. By: RW

Coordinates:

Elevation: Datum:

Notes: Located 6'S of Indianola Drive Centerline, 11'W of 601 Indianola Drive Driveway Centerline

Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch.

Date Begin: 04/19/18

Date End: 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

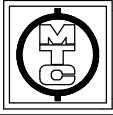
Depth Drilled: 5.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
	0.5	A-1				4 3/4" HMA, 4" Natural Aggregate Base with Little Clayey Fines	0.7			HMA core split horizontally at 1 1/2" and 2 1/2" from surface and bottom 3/4" deteriorated upon removal	
	1.0					Brown clayey SAND with gravel; mostly coarse to fine sand, some clayey fines, little fine gravel, moist					
	1.5										
	2.0	A-2			SC			8			
	2.5										
	3.0										
	3.5										
	4.0	A-3				Grades with little clayey fines	5.0	8			
	4.5										
	5.0										
						End of Boring					

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-26

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 4'S of Indianola Drive North Curb, 5'W of 709 Indianola Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 4.4 ft.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

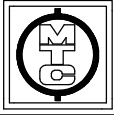
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5	A-1				4 1/2" HMA, 13" Natural Aggregate Base				
	1.0									
	1.5							1.5		
	2.0	A-2			SP-SC	Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, few fine gravel, moist				
	2.5									
	3.0									
	3.5	A-3								
	4.0									
	4.5					CL	Brown sandy lean CLAY; mostly clayey fines, some fine sand, moist			
	5.0						1.25	18		
						End of Boring				

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-24

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 10'E of Ottawa Road West Curb, 41'N of 1505 Ottawa Road Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch.

**Date Begin:** 04/16/18

**Date End:** 04/16/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

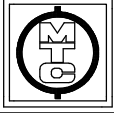
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5					2" HMA, 13" Natural Aggregate Base				
	1.0	A-1								
	1.5						1.3			
	2.0	A-2				Brown poorly graded SAND with clay and gravel; mostly coarse to fine sand, little coarse to fine gravel, few clayey fines, moist				
	2.5				SP-SC					
	3.0									
	3.5	A-3								
	4.0						4.1			
	4.5									
	5.0	A-4			SP-SM	Brown poorly graded SAND with silt and gravel; mostly coarse to fine sand, some coarse to fine gravel, few silty fines, moist	5.0			
						End of Boring				

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-17

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**                      **Datum:**

**Notes:** Located 5'N of Argo Drive South Curb, 51'W of Pontiac Trail West Curb

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch.

**Date Begin:** 04/16/18

**Date End:** 04/16/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

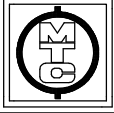
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
	0.5					3 1/2" HMA	0.3				
	1.0	A-1			SC	Brown clayey SAND; mostly coarse to fine sand, some clayey fines, moist		12			
	1.5										
	2.0										
	2.5	A-2								12	
	3.0										
	3.5										
	4.0										
	4.5										
	5.0	A-3					5.0	12			
						End of Boring					

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-18

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 8'S of Argo Drive North Curb, 44'W of 605 Argo Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch.

**Date Begin:** 04/16/18

**Date End:** 04/16/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

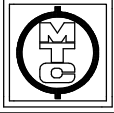
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5					5 3/4" HMA, 6" Natural Aggregate Base				
	1.0	A-1					1.0			
	1.5	A-2				Brown clayey SAND; mostly coarse to fine sand, little clayey fines, few fine gravel, moist		18		
	2.0									
	2.5	A-3						14		
	3.0				SC	Grades with some clayey fines				
	3.5									
	4.0									
	4.5									
	5.0	A-4				Grades with few coarse to fine gravel	5.0	15		
						End of Boring				

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG OF BORING**

**Project No.:** 171311.2

**Boring No.:** B-19

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**      **Datum:**

**Notes:** Located 18'S of Argo Drive South Curb, 164'W of 409 Argo Drive Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

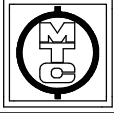
**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5	A-1				3 1/2" HMA, 9" Natural Aggregate Base				
	1.0						1.0			
	1.5	A-2			SC	Brown clayey SAND with gravel; mostly coarse to fine sand, some clayey fines, little coarse to fine gravel, moist		12		
	2.0						2.8			
	2.5	A-3			CL	Brown sandy lean CLAY; mostly clayey fines, some coarse to fine sand, moist	1.0	12		
	3.0						4.0			
	3.5	A-4			SP-SC	Brown poorly graded SAND with clay and gravel; mostly coarse to fine sand, little coarse to fine gravel, few clayey fines, moist				
	4.0						5.0			
	4.5									
	5.0					End of Boring				

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-27

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**                      **Datum:**

**Notes:** Located 6'S of Amherst Avenue North Curb, 17'W of 809 Amherst Avenue Driveway Centerline

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

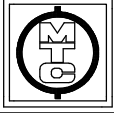
**Depth Drilled:** 7.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS	
	0.5					5 1/2" HMA, 6" Natural Aggregate Base					
	1.0	A-1					1.0				
	1.5	A-2			CL	Brown lean CLAY; mostly clayey fines, few fine sand, moist	1.75	15			
	2.0										
	2.5							0.75	19		
	3.0	A-3									
	3.5										
	4.0							0.5	20		
	4.5	A-4									
	5.0										
	5.5										
	6.0										
	6.5	A-5				2.75	21				
	7.0					7.0					
						End of Boring					

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



**LOG  
OF  
BORING**

**Project No.:** 171311.2

**Boring No.:** B-28

**Sheet:** 1 of 1

**Project:** City of Ann Arbor Street Borings Bundle No. 3

**Client:** City of Ann Arbor, MI

**Location:** Ann Arbor, MI

**Drill Type:** CME 45

**Crew Chief:** ZM      **Field Eng.:** KD      **Rev. By:** RW

**Coordinates:**

**Elevation:**                      **Datum:**

**Notes:** Located 12'S of Amherst Avenue North Curb, 61'E of Longshore Drive East Curb

**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 4.0 ft.

**Date Begin:** 04/19/18

**Date End:** 04/19/18

Tooling	Type	Dia.	Groundwater, ft.	
Casing			During	None
Sampler	SSA	3 3/4"	End	NA
Core			Seepage	
Tube			Date	Depth, ft.
SPT Hammer				

**Depth Drilled:** 5.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP =** Calibrated Penetrometer (tons/sq. ft.)

Elev. FT.	Depth FT.	Sample Number	Recov. FT.	Dyn. Cone Eq. "N": ASTM STP 399	*USCS Group Symbol	*DESCRIPTION	QP tsf	MST %	DD pcf	REMARKS
	0.5					3 1/2" HMA	0.3			
	1.0	A-1			SC	Brown clayey SAND; mostly coarse to fine sand, little clayey fines, moist	1.0	12		
	1.5									
	2.0	A-2			CL	Brown sandy lean CLAY; mostly clayey fines, some coarse to fine sand, moist	1.5	16		
	2.5									
	3.0	A-3					2.8			
	3.5					Brown lean CLAY; mostly clayey fines, few fine sand, moist	1.25	24		
	4.0									
	4.5									
	5.0	A-4					1.0	24		

End of Boring

\* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.



TYPE OF CASTING	NEEHAH FOUNDRY	EAST JORDAN IRON WORKS
BARRIER CURB INLET	R-3013B, TYPES GRATE (500 POUNDS)	7045, TYPE M1 GRATE (490 POUNDS)
BARRIER CURB DOUBLE INLET	R- 3249F, TYPE S GRATE (410 POUNDS)	N/A
MOUNTABLE CURB INLET	R-3034B, TYPE S GRATE (500 POUNDS)	7065, TYPE M1 GRATE (470 POUNDS)
GUTTER INLET	R-3448C, TYPE S GRATE (285 POUNDS)	5080, TYPE M2 GRATE (490 POUNDS)
GUTTER DOUBLE INLET	R-3448B, TYPE S GRATE (265 POUNDS)	5000, TYPE M2 GRATE (490 POUNDS)
YARD DRAIN	R-2560-E1 (285 POUNDS)	1040, TYPE O2 GRATE (355 POUNDS)
YARD DRAIN IN CITY PARK	N/A	1040, TYPE M1 GRATE (400 POUNDS)
*MANHOLE FRAME & COVER (WATER & STORM)		1040, TYPE A COVER (400 POUNDS)
**WATERTIGHT MANHOLE FRAME & COVER (SANITARY)		1040, TYPE AGS COVER (400 POUNDS)
MONUMENT BOX	N/A	8360 (100 POUNDS)

**NOTES:**

\*FRAMES AND COVERS MUST HAVE MACHINED BEARING SURFACES.

\*\*MANHOLE COVERS SHALL BE LABELED WITH "CITY OF ANN ARBOR" AND "WATER", "STORM" OR "SANITARY", WHICHEVER IS APPLICABLE. ALL COVERS SHALL INCLUDE THE CITY'S CUSTOM LOGO IN USE AT THE TIME OF THE PROJECT.

\*\*\*SANITARY MANHOLE COVERS SHALL BE 1040AGS WITH A 1/4" NEOPRENE GASKET TO SEAL AGAINST THE FRAME.

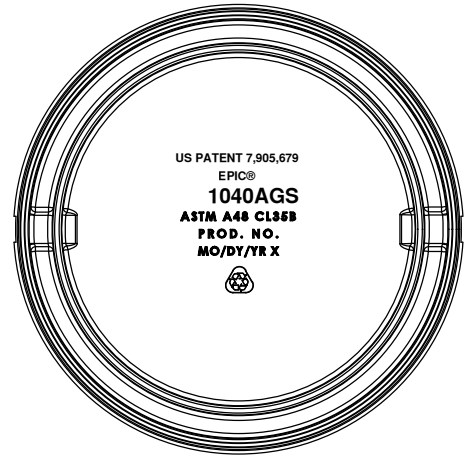
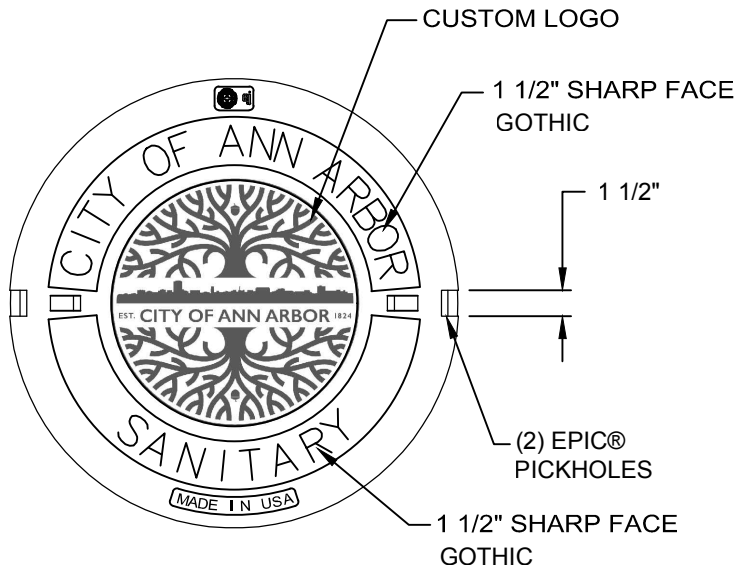
## STANDARD CASTING SCHEDULE SD-GU-5

REVISED  
1-24-19

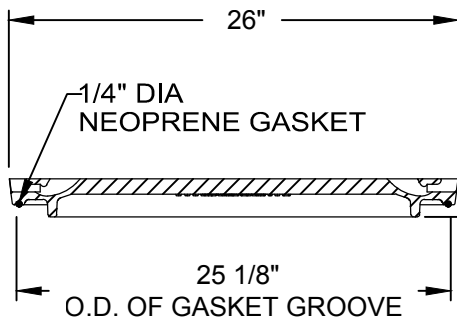


**CITY OF ANN ARBOR  
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301 EAST HURON STREET  
P.O. BOX 8647  
ANN ARBOR, MI 48107-8647  
734-794-6410  
www.a2gov.org

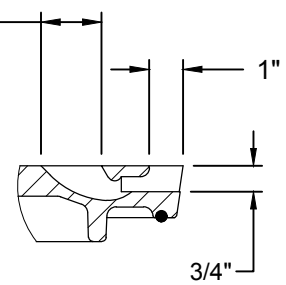
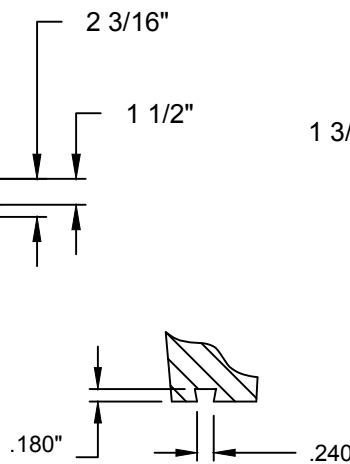
REV. NO.	DATE	DRAWN BY	CHECKED BY
<b>STANDARD CASTING SCHEDULE</b>			
DR. ARG	CH. CEC	DRAWING NO.	
SCALE N.T.S.	DATE 1/24/19	<b>SD-GU-5</b>	



**BOTTOM VIEW**



**SECTION**



**EPIC ® DETAIL**

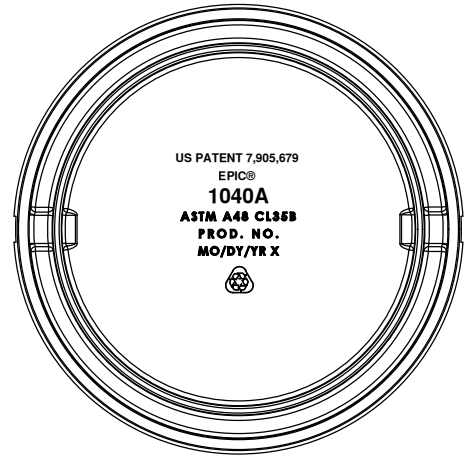
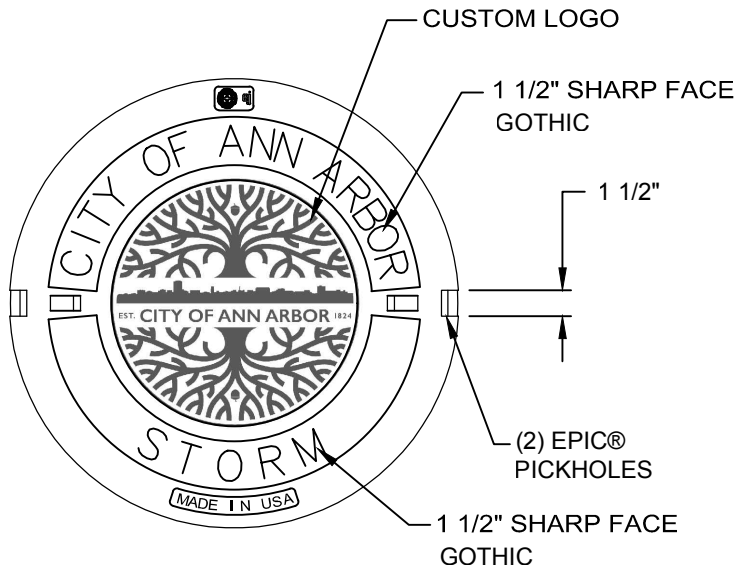
**REVISED**  
1-24-19

**EJ PRODUCT #001040326**

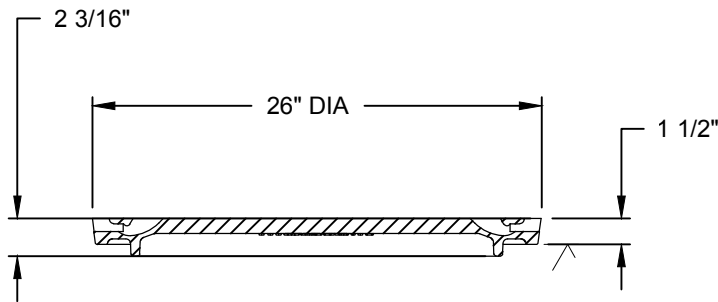


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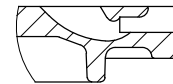
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<b>SANITARY MANHOLE COVER 1040A</b>			
DR. ARG	CH. CEC	DRAWING NO.	
SCALE N.T.S.	DATE 1/24/19	<b>SAN-MH</b>	



BOTTOM VIEW



SECTION



EPIC® DETAIL

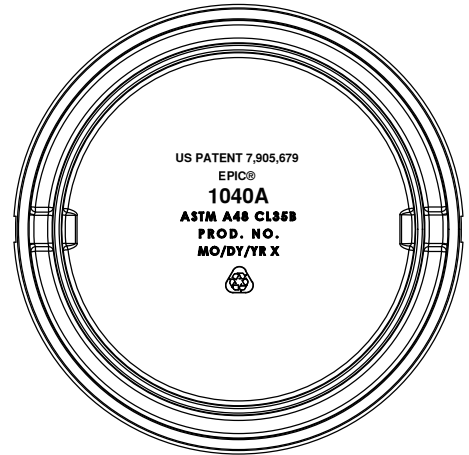
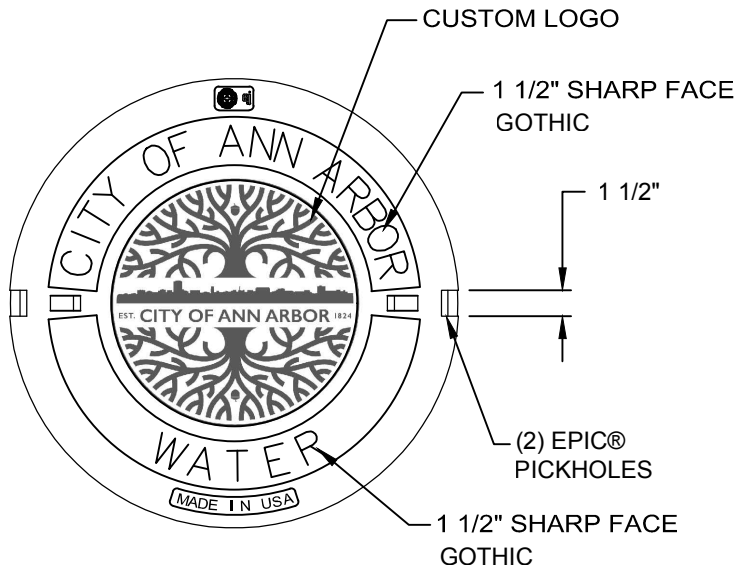
EJ PRODUCT #001040325

**REVISED**  
1-24-19

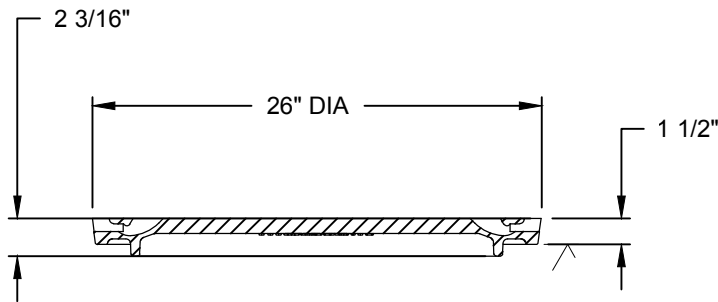


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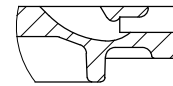
REV. NO.	DATE	DRAWN BY	CHECKED BY
<b>STORM MANHOLE COVER 1040A</b>			
DR. ARG	CH. CEC	DRAWING NO.	
SCALE N.T.S.	DATE 1/24/19	<b>STM-MH</b>	



**BOTTOM VIEW**



**SECTION**



**EPIC® DETAIL**

**EJ PRODUCT #001040324**

**REVISED  
1-24-19**



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REV. NO.	DATE	DRAWN BY	CHECKED BY
<b>WATER MANHOLE COVER 1040A</b>			
DR. ARG	CH. CEC	DRAWING NO.	
SCALE N.T.S.	DATE 1/24/19	<b>W-MH</b>	



# CITY OF ANN ARBOR ENGINEERING

## NOTES

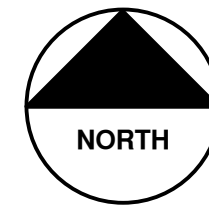
FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174 OF 2013, THE CONTRACTOR SHALL CALL 811 OR 1-800-482-7171 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS, PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

THE UNDERGROUND LOCATIONS SHOWN FOR NATURAL GAS, TELEPHONE, ELECTRICAL POWER, CABLE TV AND FIBER OPTIC LINES ARE APPROXIMATE. THE CITY OF ANN ARBOR ASSUMES NO RESPONSIBILITY FOR THEIR ACCURATE REPRESENTATION IN THIS DRAWING. MISS DIG MUST BE CONTACTED PRIOR TO CONSTRUCTION TO LOCATE THESE UTILITIES.

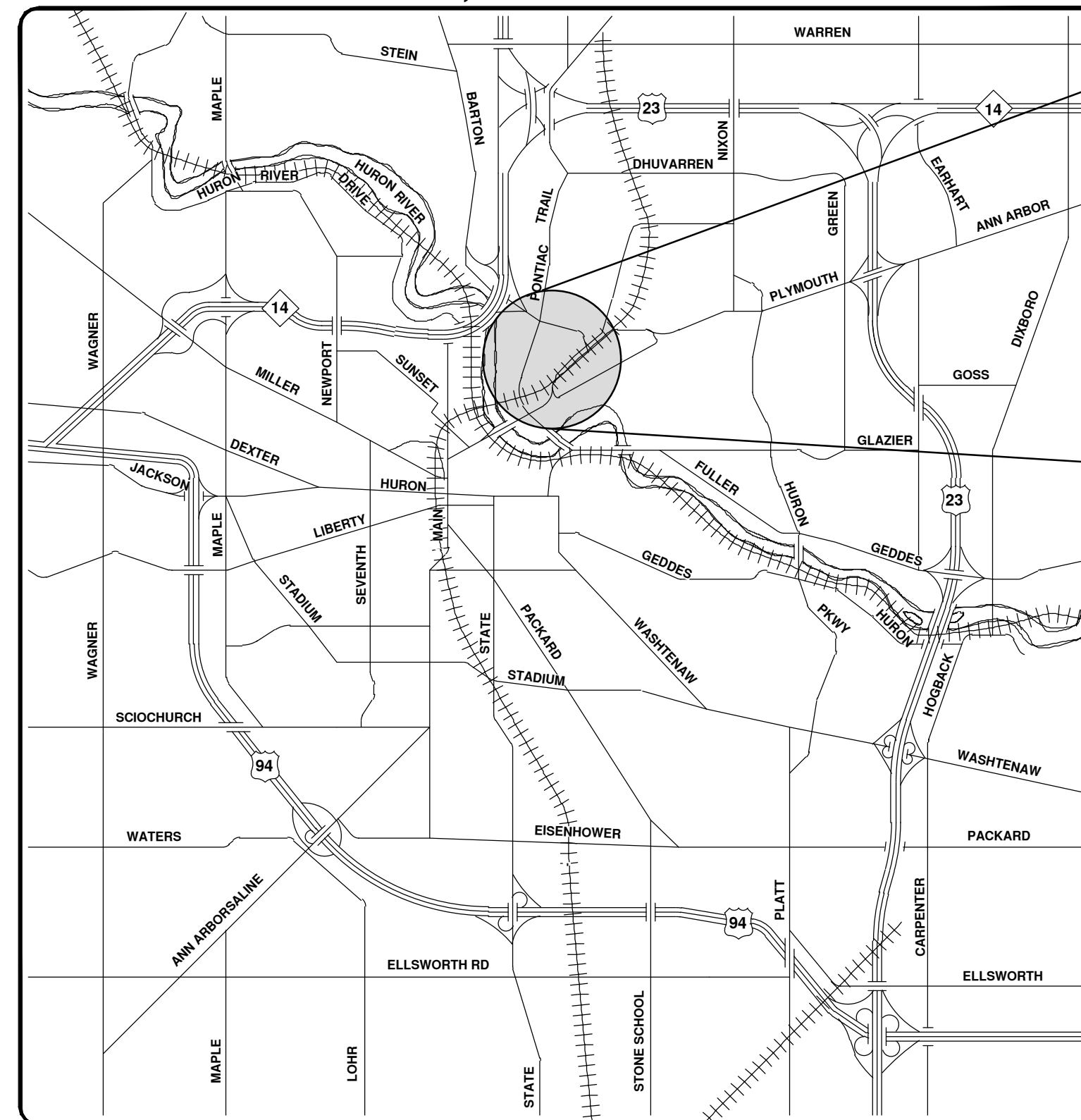
THE CONSTRUCTION COVERED BY THESE PLANS SHALL CONFORM TO THE 1994 EDITION OF THE CITY OF ANN ARBOR PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS, ITS DETAILS, WHICH ARE INCLUDED BY REFERENCE, AND THIS PROJECT'S CONTRACT DOCUMENTS. THE OMISSION OF ANY CURRENT STANDARD DETAIL DOES NOT RELIEVE THE CONTRACTOR FROM THIS REQUIREMENT.

# LONGSHORE INDIANOLA OTTAWA ARGO AMHERST WATERMAIN

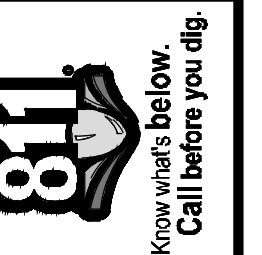
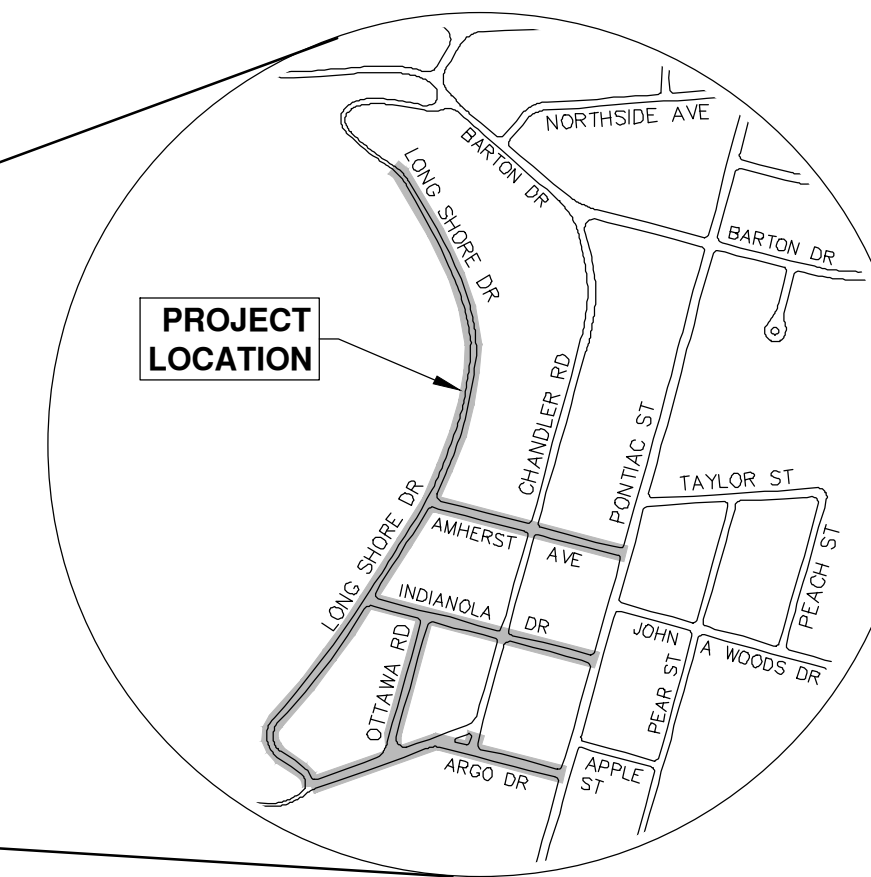
SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	NOTES
3	LEGEND
4 - 6	TYPICAL PROPOSED ROAD SECTIONS
7	WATER MAIN DETAILS
8	STORM SEWER AND TRENCH DETAILS
9	MISC. DETAILS
10	OVERALL WATER MAIN LAYOUT
TRAFFIC CONTROL	
11	OVERALL
12 - 13	PEDESTRIAN DETOUR ROUTE DETAILS
14	NORTH BOUND PONTIAC STREET DETOUR
15	WATER MAIN CONNECTION AT PONTIAC STREET
LONGSHORE DRIVE	
16 - 19	REMOVALS
20 - 26	WATER MAIN
27 - 30	ROAD
INDIANOLA AVENUE	
31	REMOVALS
32 - 34	WATER MAIN
35	ROAD
OTTAWA ROAD	
36	REMOVALS
37 - 38	WATER MAIN
39	ROAD
ARGO DRIVE	
40 - 41	REMOVALS
42 - 44	WATER MAIN
45 - 46	ROAD
AMHERST DRIVE	
47	REMOVALS
48 - 50	WATER MAIN
51	ROAD
52 - 53	STORM SEWER
54	PAVEMENT MARKINGS



ITB 4565, FILE No. 2018019

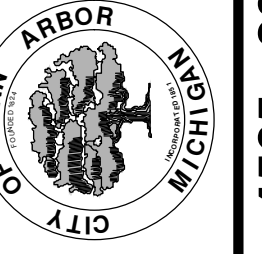


VICINITY MAP



REV.	DATE	DESCRIPTION	CHECKED	DRAWN
01	2-13-19	ADDENDUM No. 1	JKA	JKA
00	1-23-19	OUT FOR BID	JKA	JKA

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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
SCALE  
DRAWING No. 2018019-1  
SHEET No. 1 OF 54

PREPARED UNDER THE SUPERVISION OF  
*Jane K. Allen*  
JANE KATHERINE ALLEN, P.E. - MI LICENSE No. 57254  
PROJECT MANAGER  
1 / 23 / 2019  
DATE



**CONSTRUCTION NOTES:**

1. Driveways and entrances to buildings, real property, and the like shall not be blocked except for short durations and only when approved by the Engineer. Vehicular and pedestrian access shall be maintained at all times. It shall be the Contractor's responsibility to coordinate all necessary driveway closures with the property owner(s) and resident(s) in the areas of construction.
2. The location and depth of all existing utilities and service leads are to be field verified by the Contractor prior to construction.
3. Location and depth of utilities as depicted on the plans is approximate and shown according to the best information available. It is the Contractor's responsibility to excavate ahead and adjust depth of conflict utilities accordingly. Any damage to utilities is the Contractor's responsibility to avoid and/or repair as necessary.
4. The Contractor is to take special care to protect the existing water main and be responsible for maintaining consistent water service.
5. During non-working hours no trench shall remain open; any open trench shall be properly secured with protective fencing. This work shall be included in the item of work "General Conditions".
6. Trenches for new water services shall be excavated to MIOSHA and City of Ann Arbor Public Works requirements.
7. City of Ann Arbor Public Works will install the corporation and copper service lead(s) to transfer the connection(s). If an existing water service is found to be failing or is not copper, the lead will be replaced to the curb box by Public Works.
8. For the installation of corporations, or any other related activities, the Contractor shall not receive additional compensation for delays due to the scheduling of or coordination with the City of Ann Arbor Public Works.
9. The Contractor shall backfill trenches in accordance with Trench Detail specified on plans. This work shall be included in the item of work "Excavate and Backfill for Water Service Tap and Lead". All concrete removals and replacements required for this work will be paid for separately.
10. All ductile iron pipe and fittings shall be polyethylene wrapped per ANSI/AWWA C105/A21.5.
11. Cor-blw bolts to be used at all mechanical water main joints at hydrants and Megalug fittings
12. The Contractor shall construct, flush, and bacteriologically test the water main per Detailed Specification "Water Main Installation and Testing" and as approved by the Engineer. All chlorinated water shall be discharged directly into an approved sanitary sewer. The Contractor shall supply all necessary hoses, fittings and the like to accomplish this work.
13. Water main fittings, other than those specifically listed as separate pay items, which are required to complete the work, such as blow-off assemblies, concrete thrust blocks, solid sleeves and mechanical plugs, shall not be paid for separately, but shall be included in the pipe pay items.
14. "No Parking" signs shall be installed by the Contractor at locations as approved or directed by the Engineer. All signs shall be installed in accordance with the detailed specifications.

15. Postal delivery and refuse pickup service shall be maintained at all times by the Contractor.
16. All fittings, hydrants, valves and castings removed during construction are the property of the City of Ann Arbor. The Contractor within 48 hours shall deliver to City of Ann Arbor Public Works Facility at the W.R. Wheeler Service Center located at 4251 Stone School Road.
17. Where street curbs are undermined due to construction activities, they shall be removed and replaced as directed by the Engineer.
18. The Contractor shall be responsible for the continuous maintenance of the temporary road surface and soil erosion control measures within the construction area until the full completion of the project. This work shall be included in the item of work "General Conditions".
19. All curb, sidewalk, driveway approach removals shall be approved by Engineer before the work is done.
20. Sawed sewer pipe connections shall be coupled with a Fernco flexible coupling and a stainless steel shear ring.
21. The location of material stock piles and on-site staging areas to be approved by the Engineer.
22. For mainline paving, the width of the mat for each pass of the paver shall be not less than 10.5' or greater than 15', as directed by the Engineer. The Engineer will direct the layout of the longitudinal joints during construction.
23. All structures shall receive new castings as directed by the Engineer, as specified on the standard casting schedule. The existing castings are the property of the City of Ann Arbor. The Contractor shall deliver to City of Ann Arbor Public Works Facility at the W.R. Wheeler Service Center located at 4251 Stone School Road.
24. Payment for drainage structure sumps, where specified, shall be included in the payment for the various drainage structure sizes and or types.
25. Where sewer pipes of different sizes or materials are joined, Fernco flexible couplings with stainless steel shear rings shall be used. The Contractor's purchase price for these devices, including shipping, shall be paid as an extra. Prior to payment for this item, the Contractor shall submit receipts for the Engineer's review and approval. All other costs associated with the installation of these devices shall be included in the payment for the sewer.
26. Where sewer and water main are to be removed & replaced or added, all pipe shall be installed using Trench Detail detailed in the specifications or shown on Plans. Backfill for sewer and water construction shall be MDOT Granular Material, Class II, Modified.
27. Existing street name, guide, and regulatory signs, and mailboxes which conflict with the proposed construction shall be removed prior to construction, stored in a manner which will prevent damage, and re-set in locations as directed by the Engineer. This work will not be paid for separately, but shall be included in "Machine Grading, Modified"
28. In areas where edge drain cannot be installed in accordance with City of Ann Arbor Detail SD-TD-11, the edge drain shall be installed at the depth as indicated on the plans, or as directed by Engineer. In no case shall the edge drain be installed at a grade less than 0.50% or at a depth of less than 2' below top of proposed pavement.

**GENERAL**

NOTIFY THE CITY OF ANN ARBOR SOIL EROSION CONTROL OFFICE 48 HOURS PRIOR TO BEGINNING WORK ON THE PROJECT. PHONE: 734-794-6265.

1. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER AT ALL TIMES DURING CONSTRUCTION. ANY MODIFICATIONS OR ADDITIONS TO THE SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE AS DIRECTED AND APPROVED BY THE ENGINEER.
2. ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE PERMIT REQUIREMENTS OF THE CITY OF ANN ARBOR, CITY ORDINANCE CHAPTER 63, CITY OF ANN ARBOR STANDARDS DIVISION VII, THE LAWS OF THE STATE OF MICHIGAN, AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
3. DAILY, OR AFTER ANY STORM EVENT, INSPECTIONS OF EROSION CONTROL MEASURES SHALL BE MADE BY THE CONTRACTOR. PERIODIC INSPECTIONS MAY BE MADE BY THE ENGINEER TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY CORRECTIONS SHALL BE MADE WITHOUT DELAY, AND WITHOUT ADDITIONAL COST TO THE CITY OF ANN ARBOR.
4. EROSION AND SEDIMENTATION FROM WORK ON THE SITE SHALL BE CONTAINED ON THE SITE AND NOT BE ALLOWED TO COLLECT ON ANY OFF-SITE AREAS, ROADWAYS OR WATERWAYS.
5. ALL MUD/SOIL TRACKED ONTO ROADWAYS FROM THE SITE DUE TO CONSTRUCTION, SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR. IF SO ORDERED, THE CONTRACTOR SHALL PROVIDE AND OPERATE A VACUUM-TYPE STREET SWEEPER, AT NO ADDITIONAL COST TO THE CITY OF ANN ARBOR, WITHIN FOUR (4) HOURS OF BEING SO ORDERED.
6. RESTORATION OF ALL DISTURBED AREAS, INCLUDING PLACEMENT OF TOPSOIL, SEED, FERTILIZER AND MULCH AND/OR SOD SHALL BE PERFORMED WITHIN FIVE (5) DAYS OF THE COMPLETION OF FINAL GRADE.
7. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE SOIL EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION IN CRITICAL AREAS AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING OPERATIONS.
8. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
9. PROPER DUST CONTROL SHALL BE MAINTAINED DURING CONSTRUCTION BY USE OF WATER TRUCKS AND/OR DUST PALLATIVE AS REQUIRED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND REMOVAL OF SOME MEASURES UPON AUTHORIZED COMPLETION OF THE PROJECT. FINAL COMPLETION OF PROJECT WILL NOT BE AUTHORIZED UNTIL ALL SITE WORK AND UTILITY CONSTRUCTION IS COMPLETE AND ALL SOILS ARE STABILIZED.
11. THE CONTRACTOR SHALL NOT GRADE INTO ADJACENT PROPERTIES. SILT AND PROTECTIVE FENCE SHALL BE INSTALLED AND MAINTAINED TO PREVENT GRADING, EROSION AND SEDIMENTATION INTO THE ADJACENT PROPERTIES.
12. TREE PROTECTION FENCING MUST REMAIN INTACT UNTIL RESTORATION OF THE SITE IS COMPLETE.

**SEQUENCE OF EROSION CONTROL MEASURES:**

1. THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER, A SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION CONTROL MEASURES FOR REVIEW, COMMENT AND APPROVAL. THIS SCHEDULE IS TO INCLUDE INSPECTION AND REPAIR OF ALL TEMPORARY EROSION CONTROL MEASURES DAILY AND WITHIN 24 HOURS OF A STORM EVENT.

**SAMPLE SOIL EROSION AND SEDIMENTATION CONTROL INSTALLATION MINIMUM REQUIREMENTS:**

- 1.1. INSTALL SILT FENCE, TREE PROTECTION FENCING, MUD MATS, INLET FILTERS ON EXISTING DRAINAGE FEATURES, AND ALL OTHER TEMPORARY SOIL EROSION CONTROLS, PRIOR TO ANY CLEARING OR EARTH MOVING OPERATION.
- 1.2. STRIP AND STOCKPILE TOPSOIL. STABILIZE STOCKPILE AS REQUIRED.
- 1.3. INSTALL WATER MAINS, STORM AND SANITARY SEWERS, AND OTHER ENCLOSED DRAINAGE FEATURES. NEW INLET FILTERS SHALL BE INSTALLED IMMEDIATELY FOLLOWING INSTALLATION OF NEW DRAINAGE INLETS.
- 1.4. PERFORM MACHINE GRADING OPERATIONS AND CONSTRUCT PAVEMENTS (MAINLINE, SIDEWALKS, DRIVES, ETC.).
- 1.5. CONTINUALLY MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED TO ALLOW DRAINAGE AND SEDIMENT REMOVAL. REMOVE ANY ACCUMULATED SEDIMENT IMMEDIATELY.
- 1.6. COMPLETE ALL FINE GRADING.
- 1.7. TEMPORARY SEED AND INSTALL EROSION CONTROL BLANKET IN ALL DISTURBED AREAS.
- 1.8. REFER TO LANDSCAPE PLANTING PLANS FOR PERMANENT SITE STABILIZATION.
- 1.9. CLEAN OUT STORM SEWER SYSTEMS.
- 1.10. REMEDY ANY NOTED DEFECTS TO THE SATISFACTION OF THE CITY OF ANN ARBOR'S SOIL EROSION AND SEDIMENTATION CONTROL OFFICIAL.
- 1.11. ALL TEMP. SOIL EROSION CONTROL MEASURES MUST BE REMOVED, WITH ENGINEERS APPROVAL, PRIOR TO FINAL INSPECTION

NOTE: THIS SEQUENCE IS FOR INFORMATION ONLY. IT IS INTENDED TO SHOW THE SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING THEIR OWN DETAILED CONSTRUCTION SEQUENCE AND SCHEDULE TO THE ENGINEER FOR REVIEW, COMMENT, AND APPROVAL.

**TEMPORARY SEEDING:**

1. SEED IN ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS.
2. ANY DISTURBED AREA NOT PAVED, SEEDED, MULCHED, SODDED OR BUILT UPON BY NOVEMBER 15TH OR JUNE 30TH IS TO BE TEMPORARILY STABILIZED PER SPECIFICATIONS.

**PERMITS REQUIRED TO BE OBTAINED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF CONSTRUCTION.**

PERMIT	ISSUING AUTHORITY
LANE CLOSURE PERMIT*	CITY OF ANN ARBOR ENGINEERING
"NO PARKING" SIGNS PERMIT*	CITY OF ANN ARBOR ENGINEERING
GRADING/SOIL EROSION & SEDIMENTATION CONTROL PERMIT*	CITY OF ANN ARBOR CUSTOMER SERVICE
RIGHT-OF-WAY PERMIT*	CITY OF ANN ARBOR CUSTOMER SERVICE
* NO COST TO CONTRACTOR	

**PERMITS REQUIRED TO BE OBTAINED BY THE CITY OF ANN ARBOR PRIOR TO THE BEGINNING OF CONSTRUCTION.**

PERMIT	ISSUING AUTHORITY
M.D.E.Q. WATER MAIN CONSTRUCTION PERMIT	MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

**CONTACT INFORMATION**

PUBLIC UTILITIES	OWNER	CONTACT
WATER		
SANITARY		
STORM	CITY OF ANN ARBOR PUBLIC WORKS W.R. WHEELER SERVICE CENTER 4251 STONE SCHOOL ROAD ANN ARBOR, MI 48108	(734) 794-6350
FORESTRY		
SIGNS SIGNALS STREET LIGHTS		(734) 794-6361
PRIVATE UTILITIES	OWNER	CONTACT
GAS	DTE ENERGY 3150 E. MICHIGAN AVE, YPSILANTI TOWNSHIP, MI 48198	ROBERT CZAPIEWSKI (734) 544-7818
ELECTRIC	DTE ENERGY WESTERN WAYNE SERVICE CENTER 8001 HAGGERTY ROAD BELLEVILLE, MI 48111	ANTHONY IGNASIAK (734) 397-4447
CABLE	COMCAST 27800 FRANKLIN ROAD SOUTHFIELD, MI 48034	RON SUTHERLAND (313) 999-8300
PHONE	AT&T 550 S. MAPLE ROAD ANN ARBOR, MI 48103	(734) 996-2135
FIBER OPTIC	MCI 2800 N. GLENFILLE ROAD RICHARDSON, TX 75082	DEAN BOYERS (972) 729-6016

LONGSHORE / INDIANOLA / OTTAWA / ARGO / AMHERST BENCHMARKS		
BM #	ELEV	DESCRIPTION
3	835.50	SET CHISELED "X" ON NORTH FLANGE BOLT OF HYDRANT IN CURB ISLAND AT CHANDLER ROAD AND ARGO DRIVE
5	843.40	SET SPIKE IN WEST FACE OF POWER POLE IN THE SOUTHEAST QUADRANT OF ARGO DRIVE AND PONTIAC TRAIL
7	826.93	SET RAILROAD SPIKE IN NORTH FACE OF POWER POLE ON THE SOUTH SIDE OF ARGO DRIVE, FIRST POLE WEST OF OTTAWA ROAD
9	844.49	SET RAILROAD SPIKE IN WESTERLY FACE OF POWER POLE ON THE EAST SIDE OF LONGSHORE DRIVE, FIRST POLE SOUTH OF HOUSE #1516
11	847.75	SET SPIKE IN WEST FACE OF POWER POLE BETWEEN HOUSE #1604 AND #1606 ON THE EAST SIDE OF LONGSHORE DRIVE
14	843.45	SET SPIKE IN WEST FACE OF POWER POLE BETWEEN HOUSE #1810 AND #1812 ON THE EAST SIDE OF LONGSHORE DRIVE
16	841.13	SET CHISELED "X" ON EASTERLY FLANGE BOLT OF HYDRANT AT HOUSE #2000 LONGSHORE DRIVE
17	839.90	SET SPIKE IN WEST FACE OF POWER POLE BETWEEN HOUSE #1502 AND #1508 ON THE EAST SIDE OF OTTAWA ROAD
19	837.21	SET SPIKE IN NORTH FACE OF POWER POLE IN THE NORTHWEST QUADRANT OF INDIANOLA AVENUE AND CHANDLER ROAD
21	845.64	SET CHISELED "X" ON EASTERLY FLANGE BOLT OF HYDRANT IN THE SOUTHWEST QUADRANT OF INDIANOLA AVENUE AND PONTIAC TRAIL
24	850.36	SET RAILROAD SPIKE IN NORTH FACE OF POWER POLE BETWEEN HOUSE #806 AND #1607 ON THE SOUTH SIDE OF AMHERST AVENUE
25	850.48	SET CHISELED "X" ON NORTHERLY FLANGE BOLT OF HYDRANT IN THE NORTHEAST QUADRANT OF AMHERST AVENUE AND CHANDLER ROAD



DATE	DRAWN	CHECKED
2-13-19	CC/DJ/KB	JKA
1-23-19	CC/DJ/KB	JKA
DESCRIPTION	REV.	
	01	ADDENDUM No. 1
	02	OUT FOR BID

CITY OF ANN ARBOR  
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301 EAST HURON STREET  
ANN ARBOR, MI 48106-8647  
www.a2gov.org

**ENGINEERING**  
**PUBLIC SERVICES -**  
**LONGSHORE INDIANOLA OTTAWA**  
**ARGO AMHERST WATERMAIN**

NOTES

SCALE: NTS  
DRAWING No. 2018019-2

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**EXISTING LEGEND**

- FIRE HYDRANT
- GATE VALVE IN BOX
- GATE VALVE IN WELL
- STOP BOX
- WATER VAULT
- WELL
- CATCH BASIN (SQ)
- CATCH BASIN (RD)
- STORM MANHOLE
- NON-CURB CATCH BASIN (SQ)
- END SECTION
- SANITARY MANHOLE
- CLEAN-OUT
- POST
- PEDESTRIAN SIGNAL
- SIGN
- HAND HOLE
- ORNAMENTAL LIGHT
- FLOOD LIGHT
- UNKNOWN MANHOLE
- TELEPHONE MANHOLE
- TELEPHONE RISER
- GAS VALVE
- GAS VENT
- GAS BOX
- ELECTRICAL RISER
- TRANSFORMER
- UTILITY POLE
- LAMP POLE
- GUY ANCHOR
- GUY POLE
- MONITORING WELL
- MAILBOX
- SOIL BORING
- TRAVERSE POINT
- BENCH MARK
- IRON PIPE
- MON BOX

- WATER MAIN
- WATER MAIN ABANDONED
- STORM SEWER
- STORM SEWER ABANDONED
- SANITARY SEWER
- SANITARY SEWER ABANDONED
- GAS MAIN
- GAS MAIN (DEAD)
- ELECTRICAL OVER HEAD
- ELECTRICAL UNDER GROUND
- ELECTRICAL DUCT BANK
- TELEPHONE OVER HEAD
- TELEPHONE UNDER GROUND
- TELEPHONE DUCT BANK
- CABLE TV OVER HEAD
- CABLE TV UNDER GROUND
- FIBER OPTIC
- FIBER OPTIC DUCT BANK
- BOUNDARY
- BUILDING
- CENTERLINE OF DITCH
- CENTERLINE/CROWN OF ROAD
- CONTOUR MAJOR
- CONTOUR MINOR
- EDGE OF WATER
- FLOODPLAIN
- FENCE
- GRAVEL
- GUARDRAIL
- STONE WALL
- R.O.W.
- TREELINE
- WETLAND
- EDGE OF BRUSH
- HEDGE
- TREE (DECIDUOUS)
- TREE (CONIFEROUS)
- SHRUB (DECIDUOUS)
- STUMP
- TREE TO REMAIN & PROTECT (DECIDUOUS)  
CRITICAL ROOT ZONE (C.R.Z.) = DIAMETER BREST HEIGHT (INCHES) X 10
- TREE TO REMAIN & PROTECT (CONIFEROUS)  
CRITICAL ROOT ZONE (C.R.Z.) = DIAMETER BREST HEIGHT (INCHES) X 10

**PROPOSED LEGEND**

- HYDRANT (PLAN)
- WATER GATE WELL
- REDUCER
- WATER GATE VALVE
- WATER STOP BOX
- WATER VAULT
- INLET
- DOUBLE INLET
- INLET JUNCTION CHAMBER
- ROUND CATCH BASIN
- STORM MANHOLE
- DRAIN ARROW
- FLARED END SECTION
- SANITARY MANHOLE
- CLEAN-OUT
- SIGN
- PUSH BUTTON
- HAND HOLE
- WATER MAIN
- STORM SEWER
- SANITARY SEWER
- FIBER OPTIC
- ELECTRICAL
- CENTERLINE OF DITCH
- CENTERLINE OF ROAD
- FENCE
- GRAVEL
- SILT FENCE
- PROTECTIVE FENCE
- GUARDRAIL
- LOT/UNIT
- CURB
- TEMPORARY GRADING PERMIT
- CONTOUR MAJOR
- CONTOUR MINOR
- WATER EASMENT
- STORM EASEMENT
- SANITARY EASEMENT
- R.O.W.
- LIMITS OF CONSTRUCTION
- LIMIT OF GRADING
- STONE WALL
- DETECTABLE WARNING
- ASPHALT
- CONCRETE
- SIDEWALK
- TREE (DECIDUOUS)
- TREE (CONIFEROUS)
- TREE TO BE REMOVED (DECIDUOUS)
- TREE TO BE REMOVED (CONIFEROUS)
- STUMP TO BE REMOVED




**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN

LEGEND

REV.	DATE	DESCRIPTION
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02	1-23-19	OUT FOR BID
		CHECKED
		DRAWN

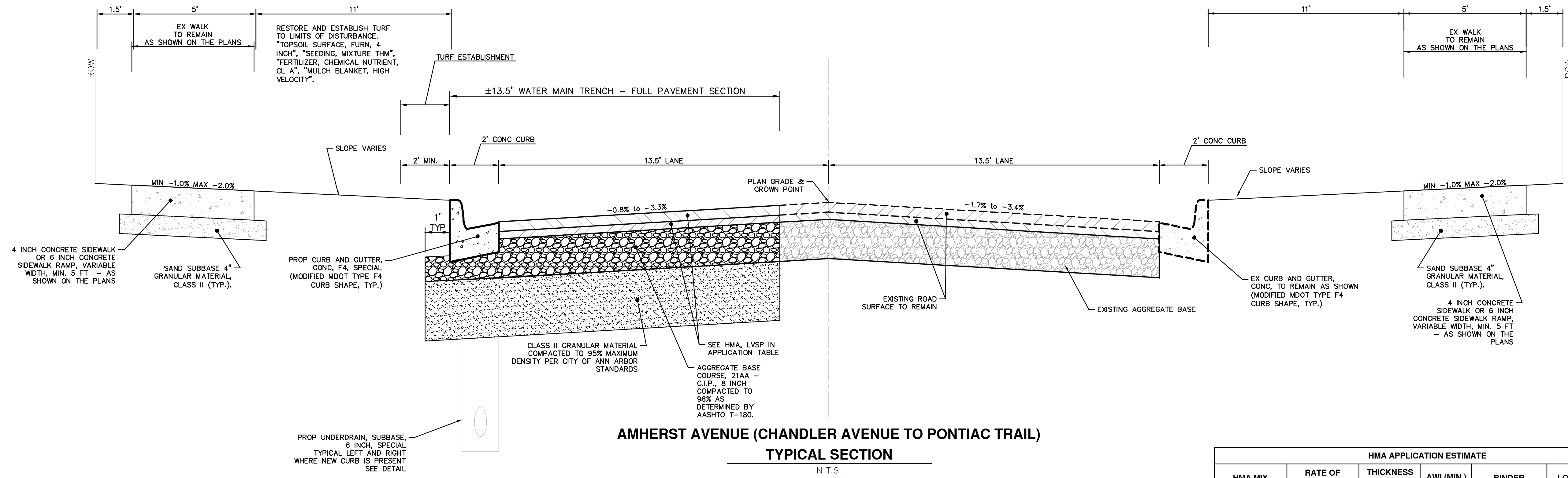
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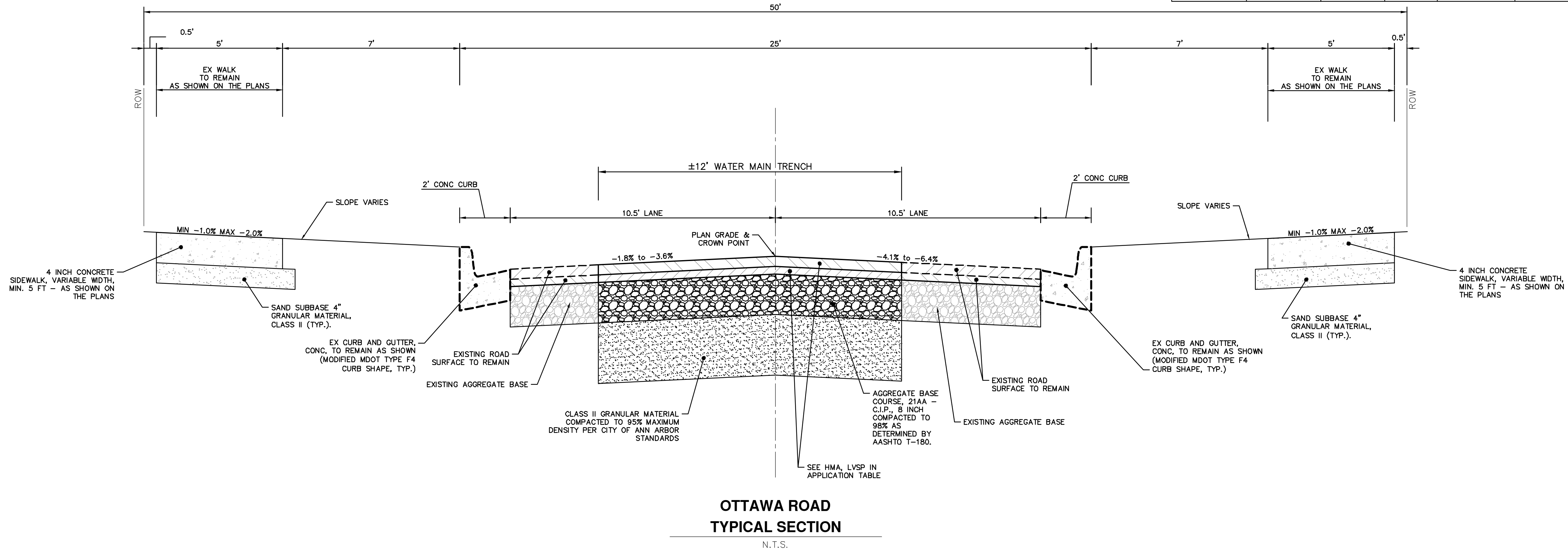
SHEET No. **3 OF 54**

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**AMHERST AVENUE (CHANDLER AVENUE TO PONTIAC TRAIL)**  
TYPICAL SECTION  
N.T.S.

HMA APPLICATION ESTIMATE					
HMA MIX	RATE OF APPLICATION	THICKNESS (INCHES)	AWI (MIN.)	BINDER	LOCATION/NOTES
LVSP	220 LB/SYD	2	260 (TOP)	PG 58-28	TOP COURSE
LVSP	220 LB/SYD	2	-	PG 58-28	LEVELING COURSE
Bond Coat SS-1h	0.05 - 0.15 GAL/SYD	-	-	-	INCLUDE IN COST OF HMA ITEM




**OTTAWA ROAD**  
TYPICAL SECTION  
N.T.S.



Know what's below.  
Call Before you dig.

01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA	CC/DF/KB	JKA	CC/DF/KB	JKA	CHECKED
00	OUT FOR BID	1-23-19							DATE
									DESCRIPTION
									REV.



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
TYPICAL PROPOSED ROAD SECTIONS

SCALE: NTS

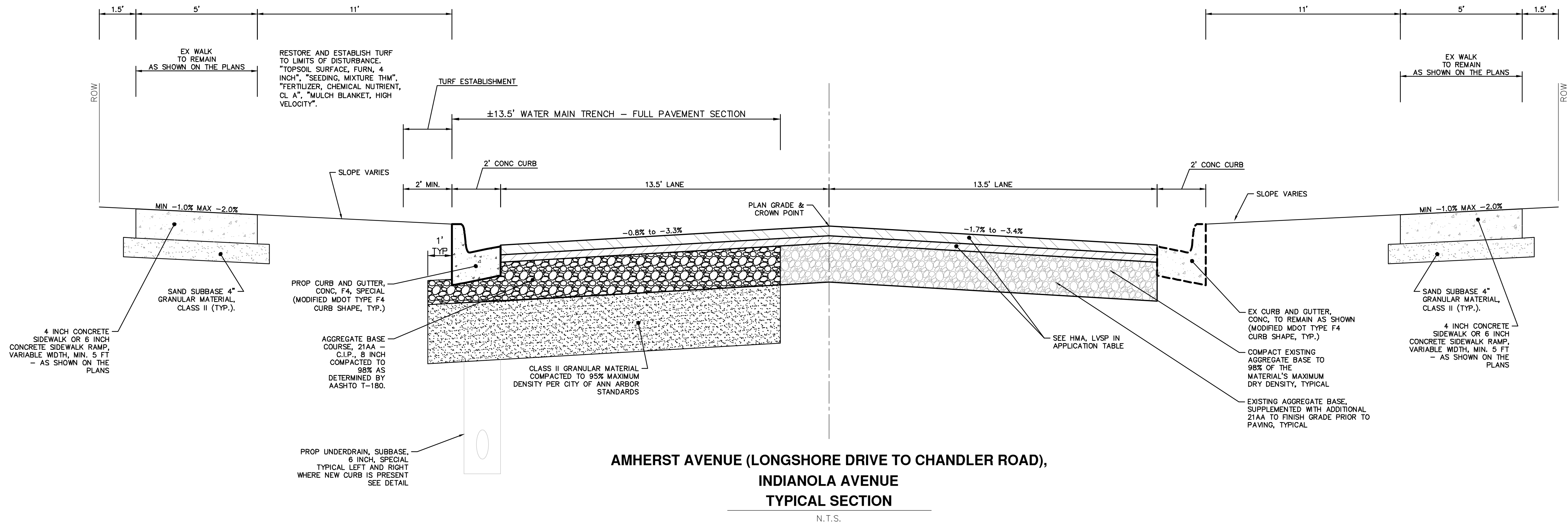
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SHEET No.

4 OF 54

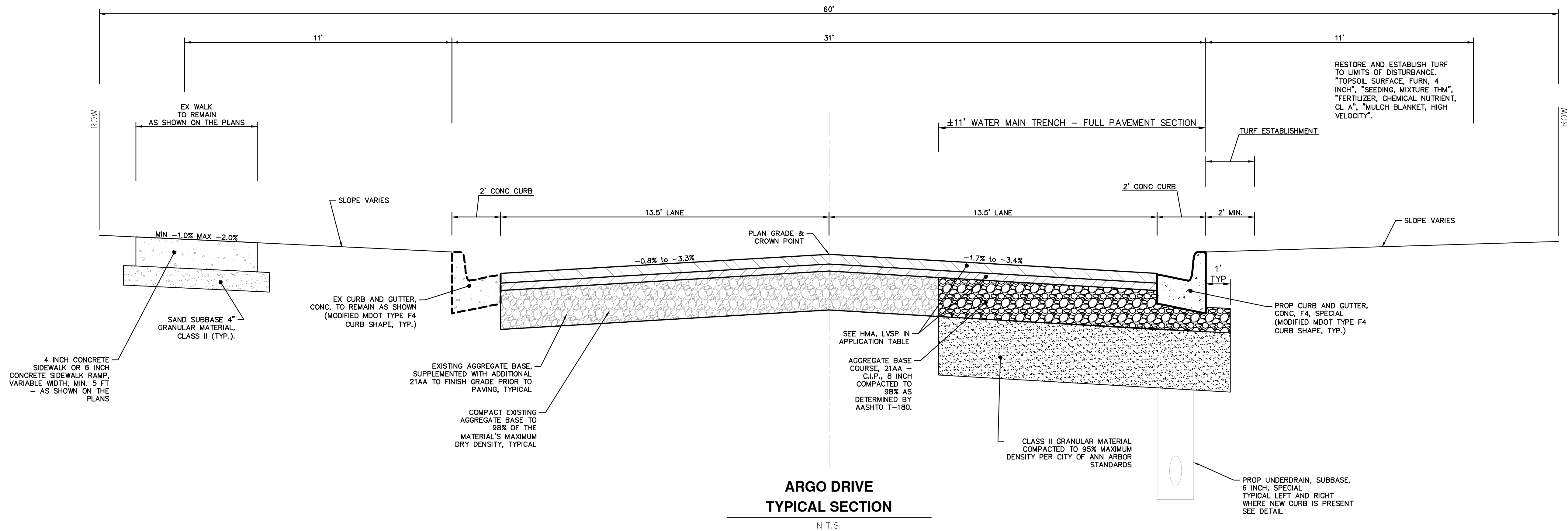


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AMHERST AVENUE (LONGSHORE DRIVE TO CHANDLER ROAD),  
INDIANOLA AVENUE  
TYPICAL SECTION

N.T.S.



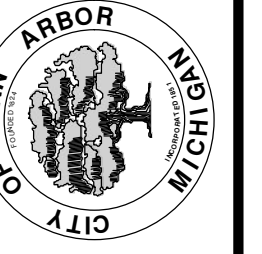
ARGO DRIVE  
TYPICAL SECTION

N.T.S.



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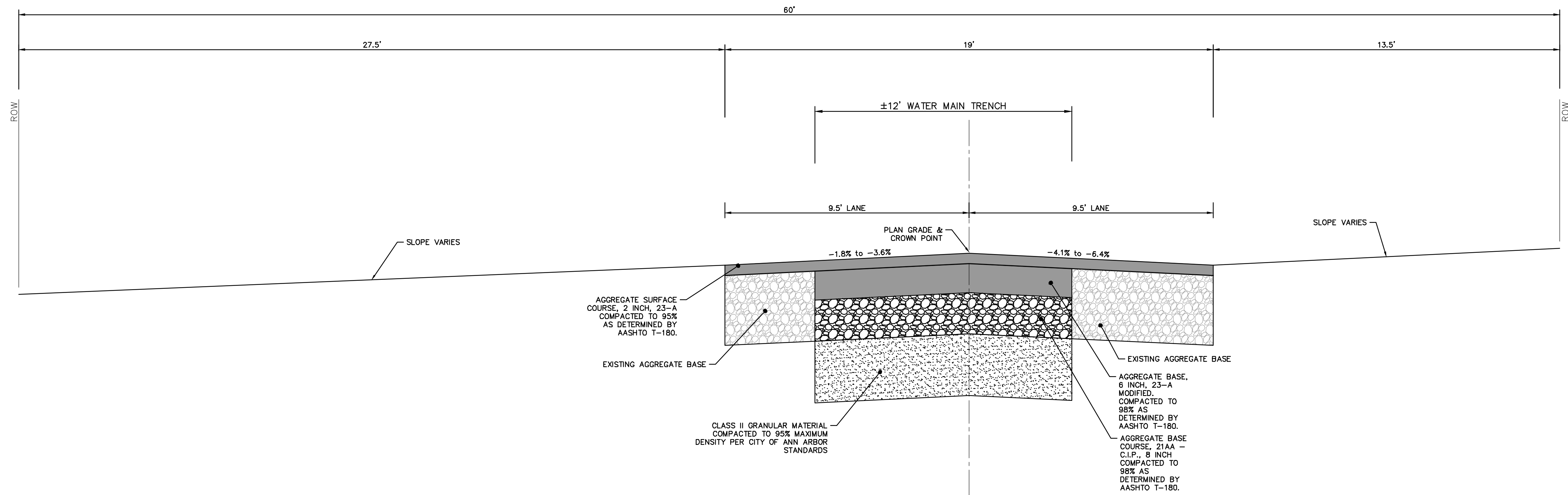
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LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
TYPICAL PROPOSED ROAD SECTIONS

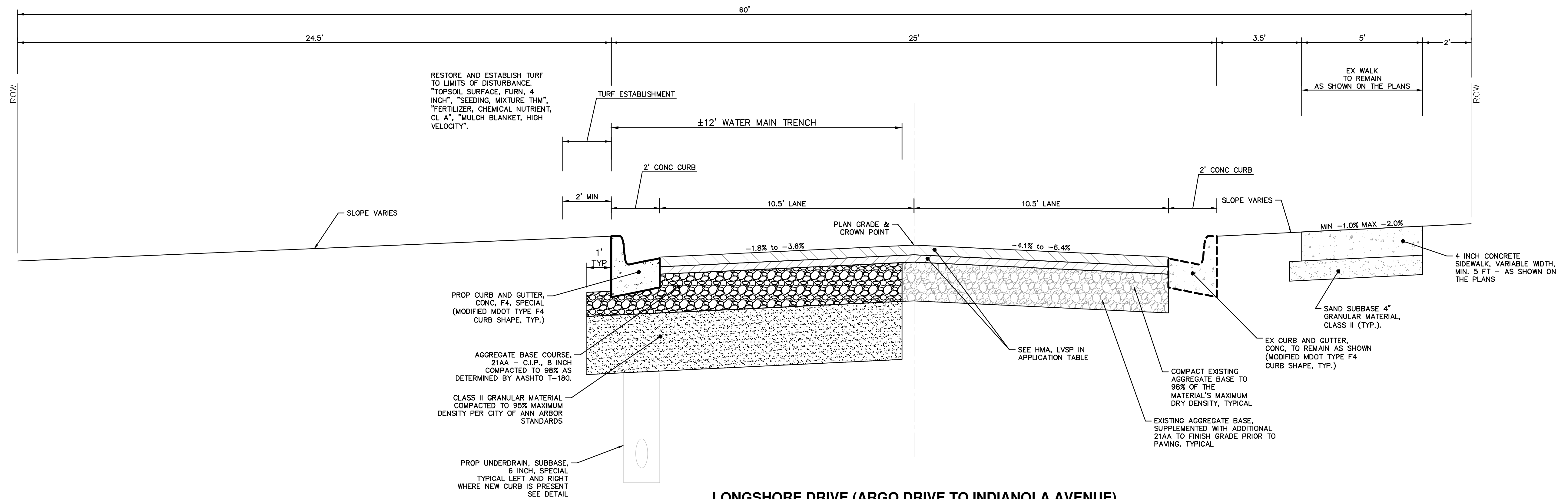
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SHEET No.

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**LONGSHORE DRIVE (INDIANOLA AVENUE TO BARTON DRIVE)**  
TYPICAL SECTION

N.T.S.



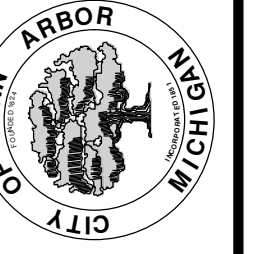
**LONGSHORE DRIVE (ARGO DRIVE TO INDIANOLA AVENUE)**  
TYPICAL SECTION

N.T.S.



REV.	DATE	DESCRIPTION	DRAWN	CHECKED
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00	1-23-19	OUT FOR BID	CC/DF/KB	JKA

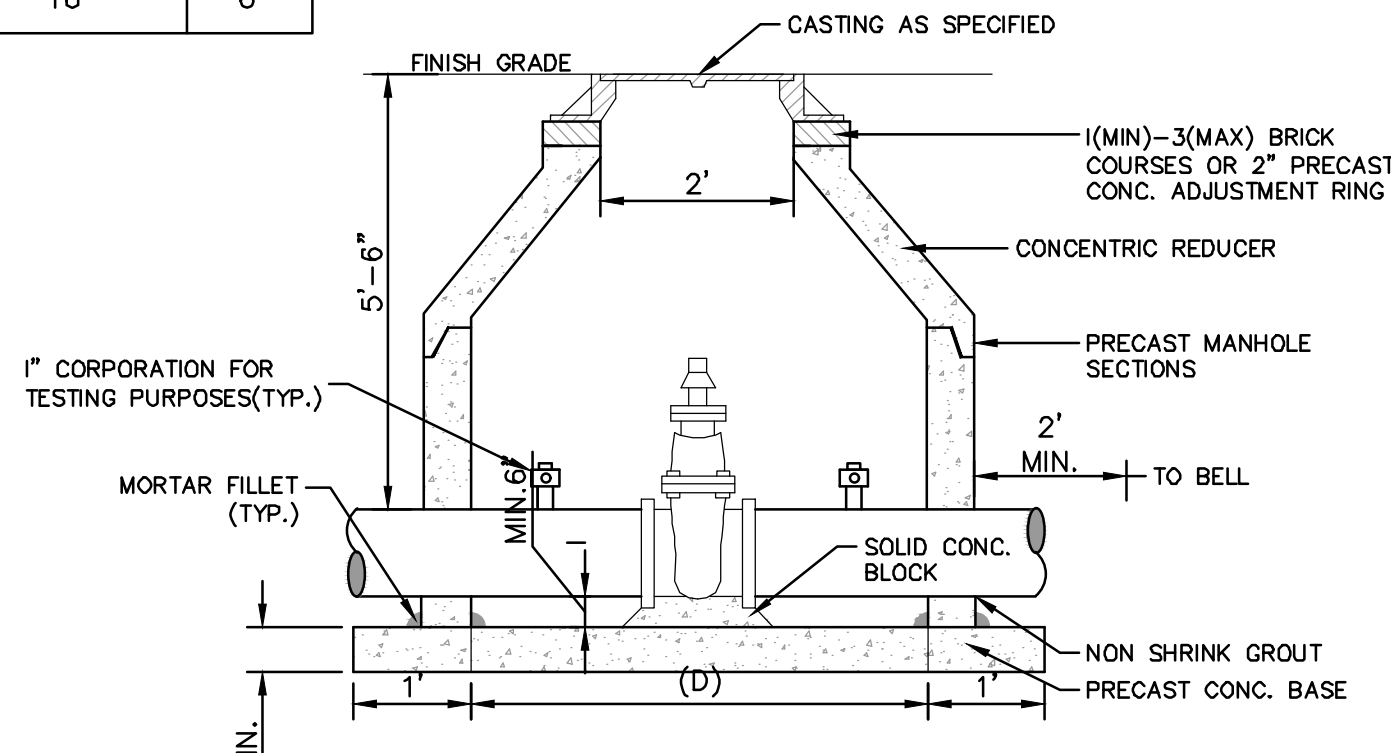
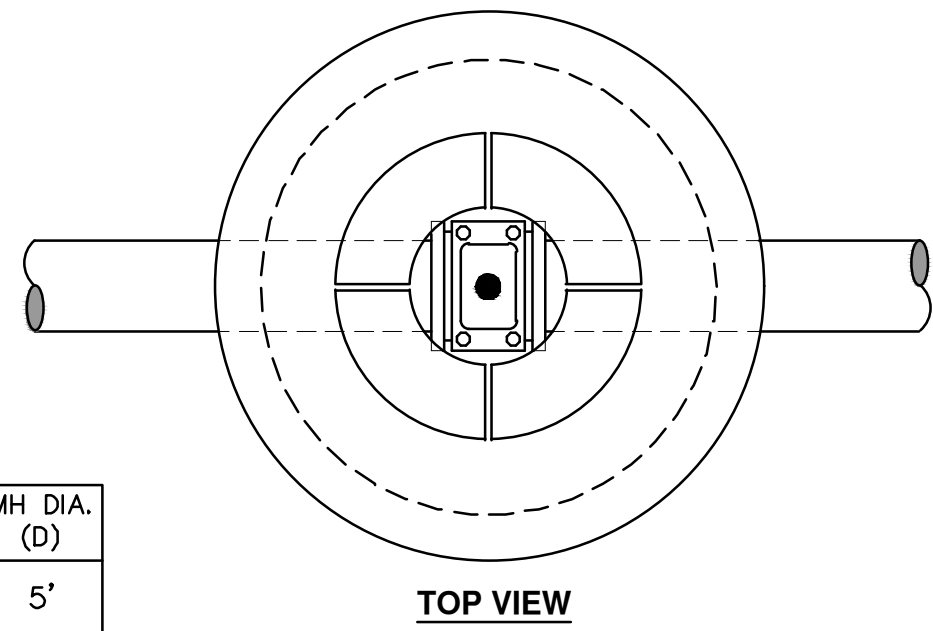
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CITY OF ANN ARBOR - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
TYPICAL PROPOSED ROAD SECTIONS

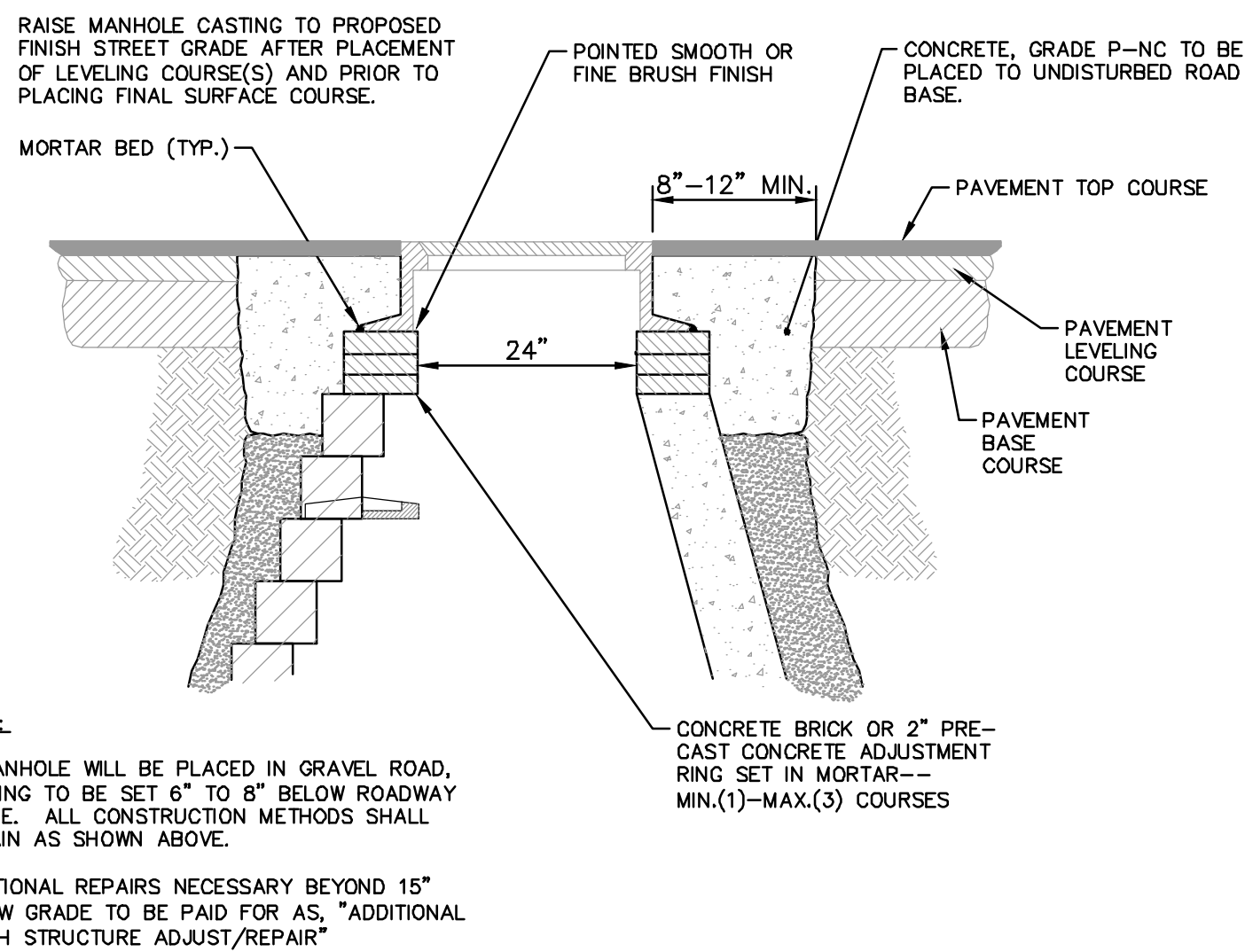
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PIPE SIZE	MH DIA. (D)
12" OR LESS	5'
16"	6'



- NOTES:
1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE
  2. ALL JOINTS SHALL BE MADE WATER TIGHT WITH RUBBER GASKET JOINTS
  3. NO STEPS ARE PERMITTED
  4. MANHOLE SECTIONS SHALL MEET ASTM C-478

**GATE WELL FOR MAIN 16" & SMALLER SD-W-3**



- NOTE:
- IF MANHOLE WILL BE PLACED IN GRAVEL ROAD, CASTING TO BE SET 6" TO 8" BELOW ROADWAY GRADE. ALL CONSTRUCTION METHODS SHALL REMAIN AS SHOWN ABOVE.
- ADDITIONAL REPAIRS NECESSARY BEYOND 15" BELOW GRADE TO BE PAID FOR AS "ADDITIONAL DEPTH STRUCTURE ADJUST/REPAIR"

**MANHOLE CASTING ADJUSTMENT SD-GU-6**

**MINIMUM STANDARDS**

THE MDOT GRADE PI OR P-NC CONCRETE AT THE FITTING FACE SHALL EXTEND TO WITHIN 2 INCHES OF THE BELL AND SHALL EXTEND FROM THE FITTING FACE A MINIMUM OF 2 FEET TO THE UNDISTURBED SOLID GROUND.

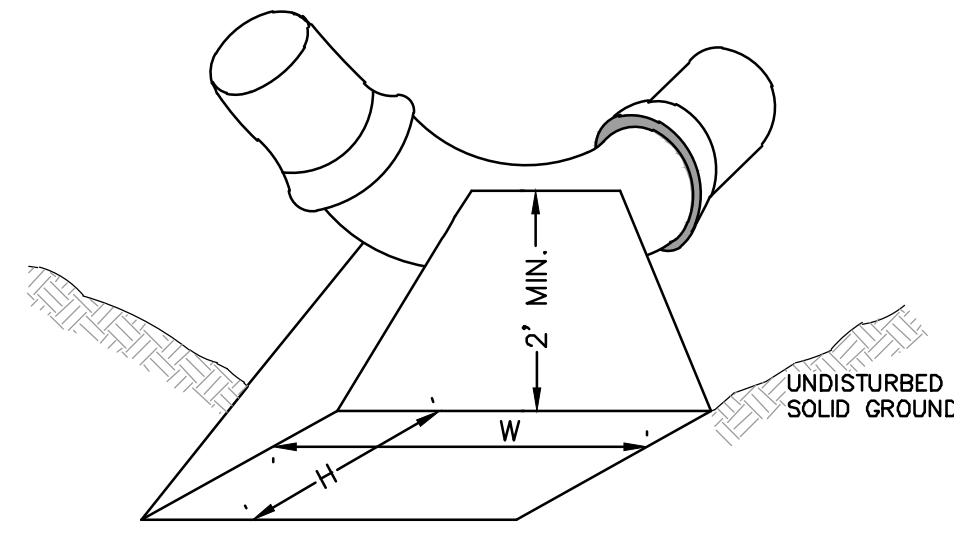
THE DIMENSIONS OF THE THRUST BLOCK AT THE FACE OF THE UNDISTURBED SOLID GROUND SHALL BE AS SHOWN IN THE TABLE BELOW.

IF THERE ISN'T SUFFICIENT SPACE FOR THE INSTALLATION OF THE THRUST BLOCK WITHOUT INTERFERENCE WITH OTHER SERVICES, ANOTHER ARRANGEMENT SATISFACTORY TO THE ENGINEER SHALL BE USED.

FITTINGS I.D.	PLUG TEE CROSS		BENDS				HYDRANT	
	W	H	90°	45°	22 1/2°	11 1/4°	W	H
4	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.5
6	2.0	1.5	2.0	2.0	2.0	1.0	1.0	2.5
8	2.5	2.0	3.5	2.0	2.0	1.0	1.0	2.0
12	3.5	3.0	5.5	3.0	3.5	2.5	2.0	1.0
16	6.0	3.5	6.0	4.0	5.0	3.0	2.5	2.0

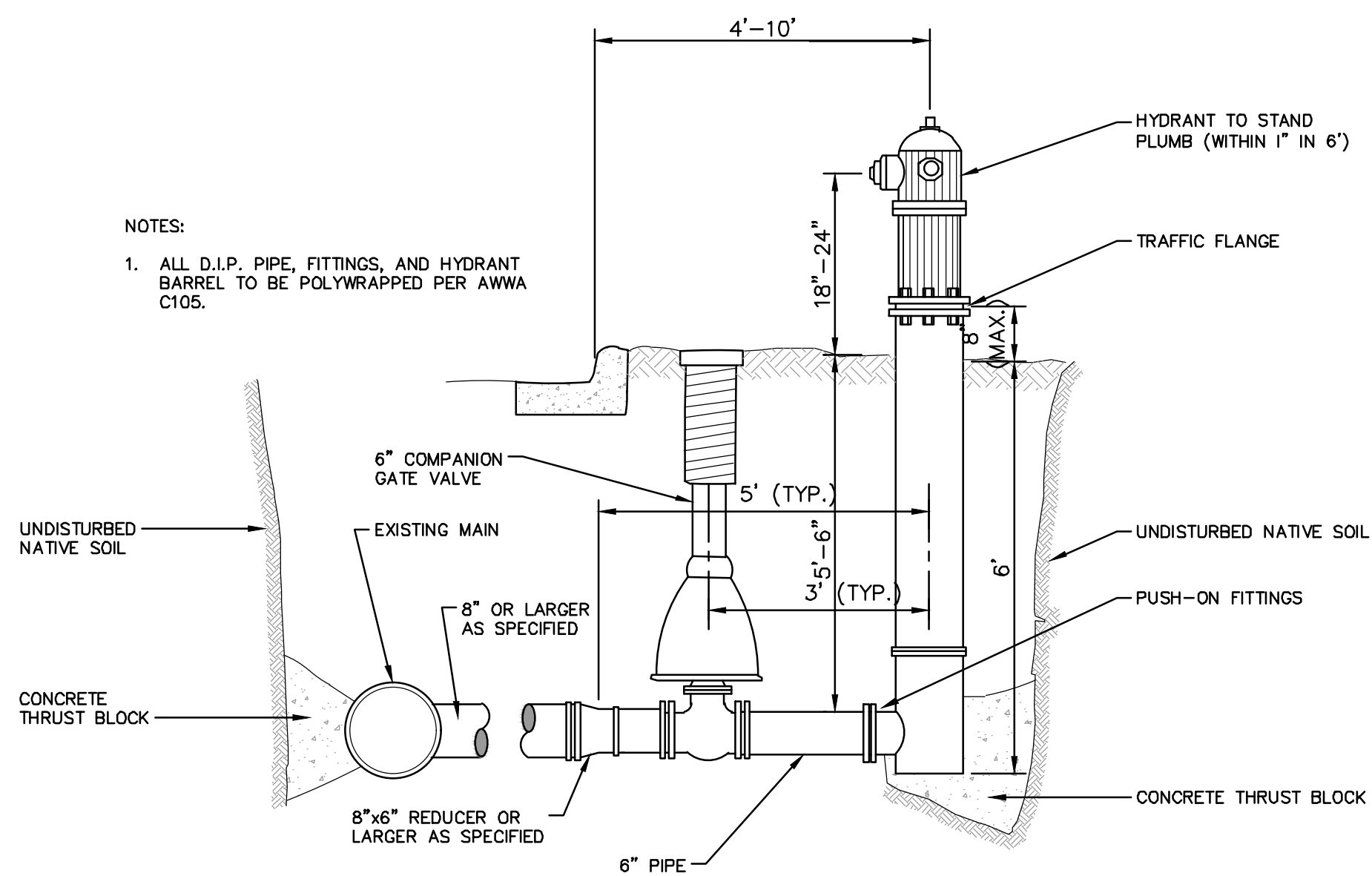
FOR FITTING SIZES LARGER THAN 16", THRUST BLOCK DIMENSIONS SHALL BE AS SPECIFIED BY ENGINEER.

W = WIDTH IN FEET  
H = HEIGHT IN FEET



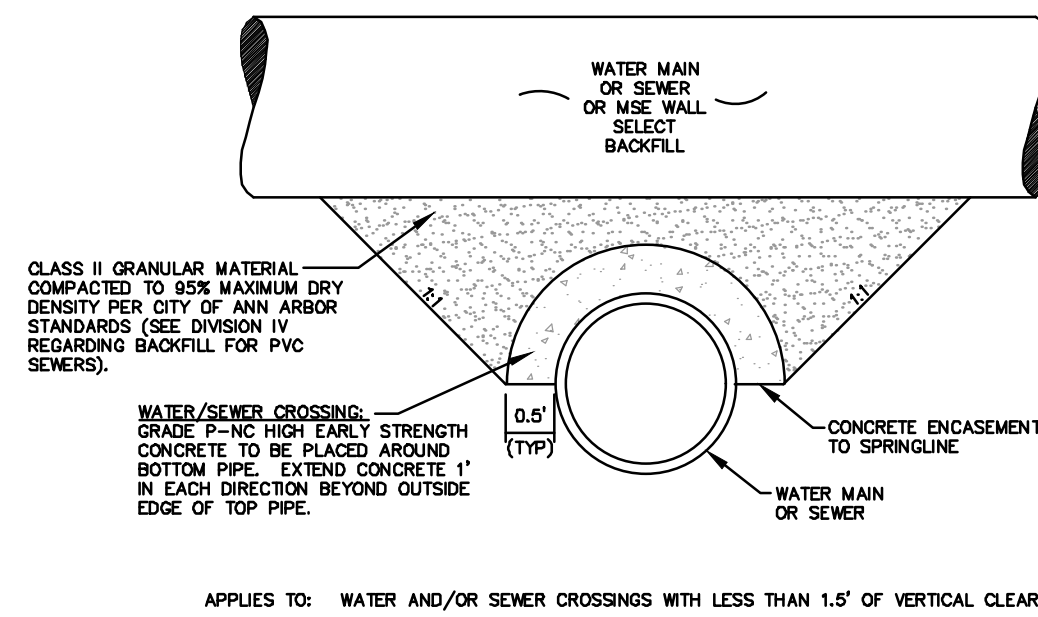
- NOTE:
- THESE ARE MINIMUM STANDARDS. WHERE SOIL CONDITIONS DICTATE, ADJUSTMENTS IN SIZE SHALL BE MADE AS DIRECTED BY THE PUBLIC SERVICES AREA ADMINISTRATOR.

**THRUST BLOCK SD-W-2**



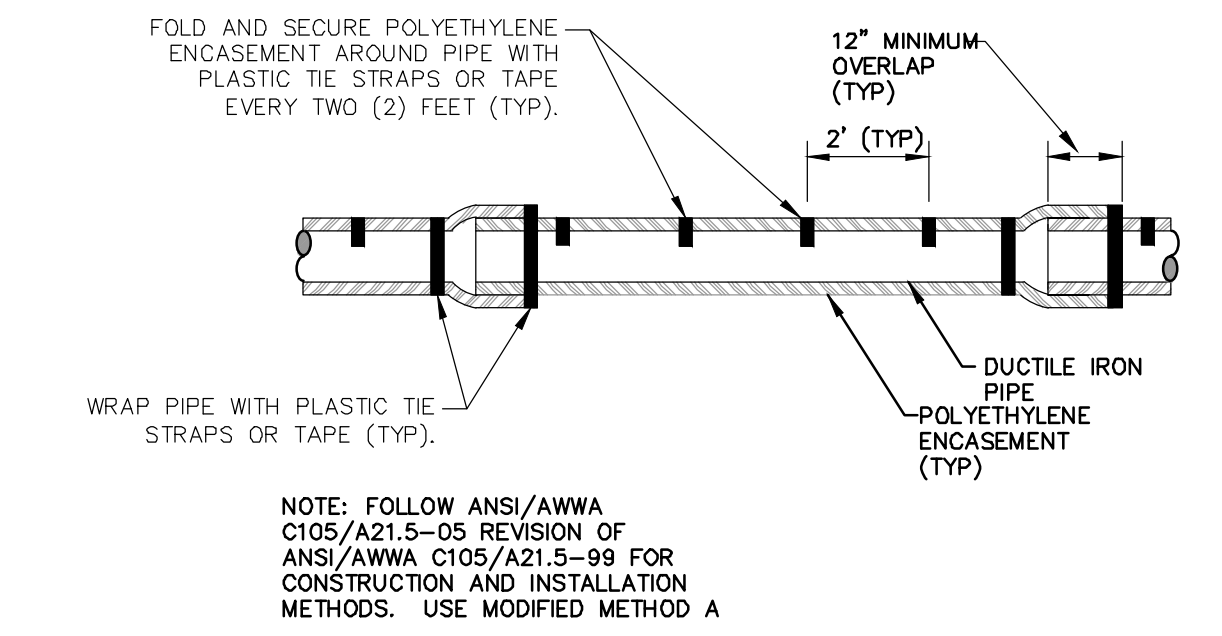
- NOTES:
1. ALL D.I.P. PIPE, FITTINGS, AND HYDRANT BARREL TO BE POLYWRAPPED PER AWWA C105.

**FIRE HYDRANT ASSEMBLY**

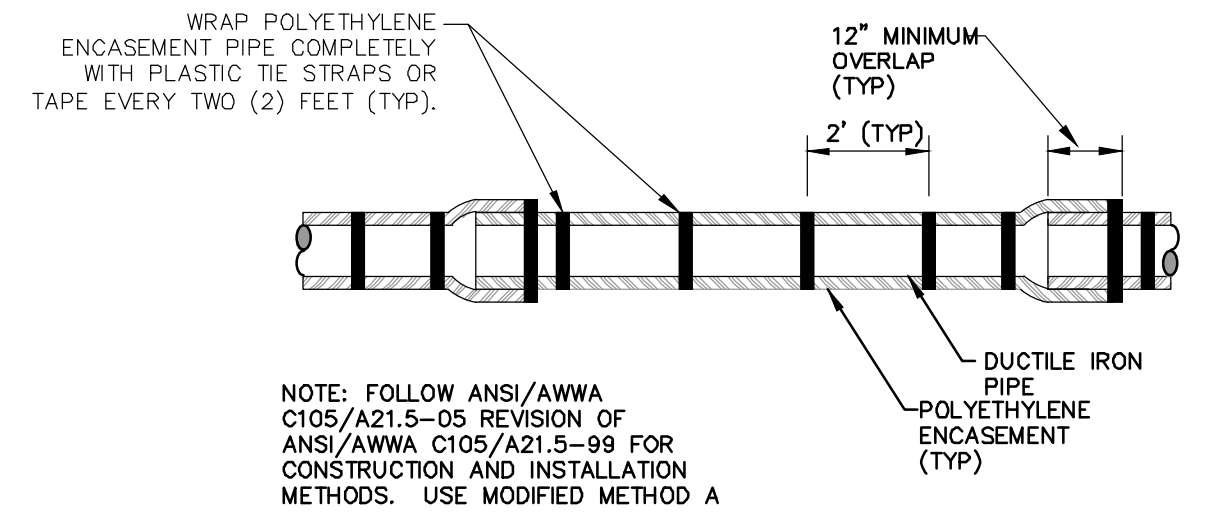


**CONCRETE UTILITY SADDLE**

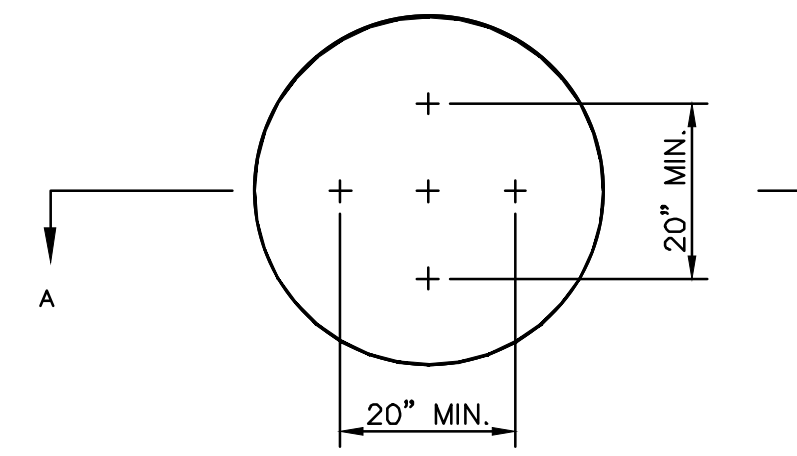
APPLIES TO: WATER AND/OR SEWER CROSSINGS WITH LESS THAN 1.5' OF VERTICAL CLEARANCE



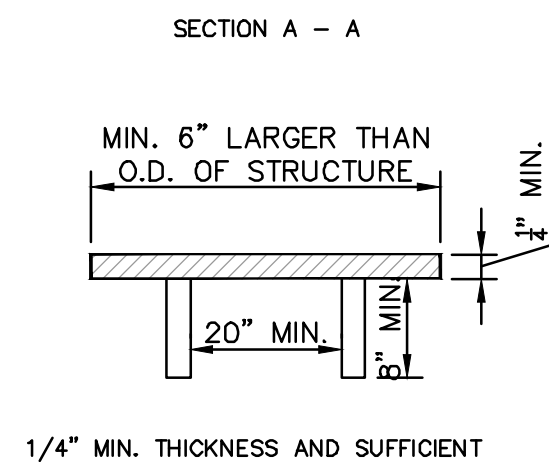
**POLYETHYLENE ENCASEMENT (DRY INSTALLATION)**



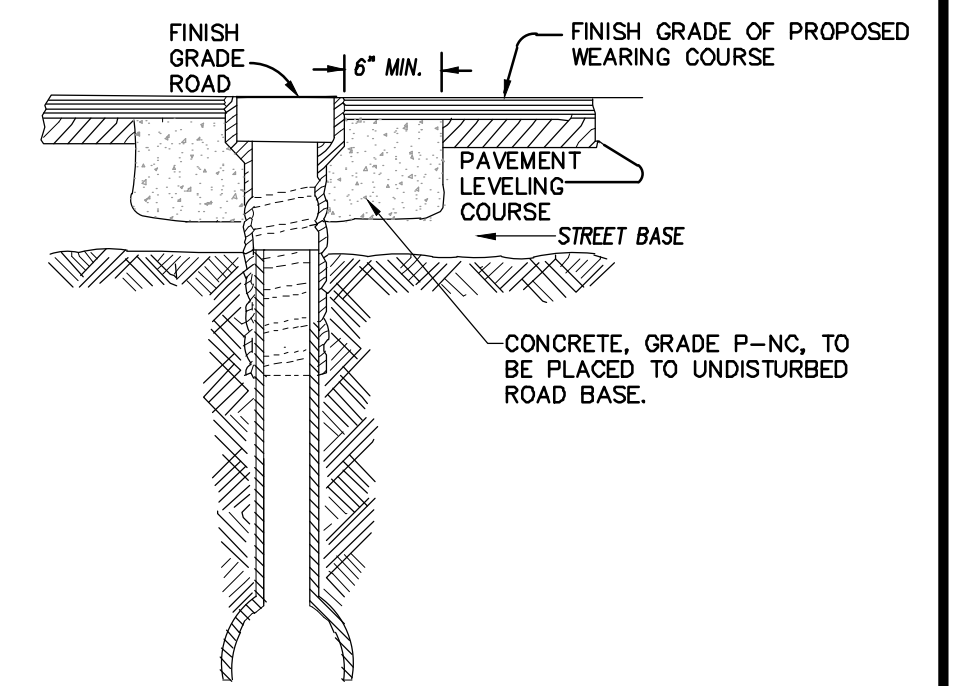
**POLYETHYLENE ENCASEMENT (WET INSTALLATION)**



NOTE: PLATE MAY BE CIRCULAR, SQUARE OR RECTANGULAR



**STRUCTURE PLATE SD-GU-8**



- NOTE:
- RAISE CASTING TO PROPOSED FINISH STREET GRADE AFTER PLACEMENT OF LEVELING COURSE(S) AND PRIOR TO PLACING FINAL SURFACE COURSE

**WATER VALVE BOX ADJUSTMENT**

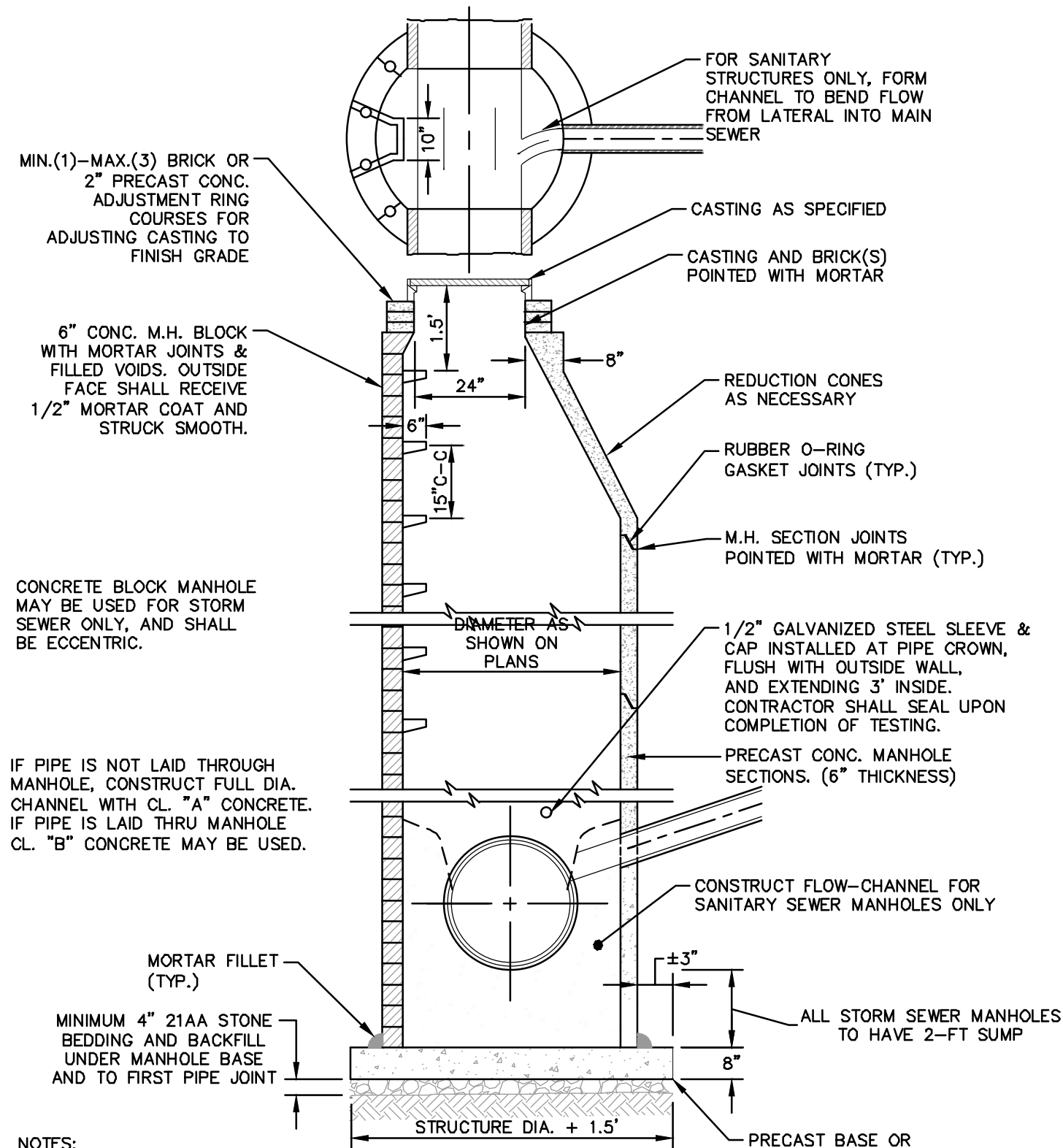
R: \2018019 Longshore Dr. WMA\Plan Production\2018019Det.dwg Dwg Created: 11-Feb-19 - 10:22 standard b.w.stb - Plot Date: 12-Feb-19

**811** Know what's below. Call before you dig.

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
WATER MAIN DETAILS

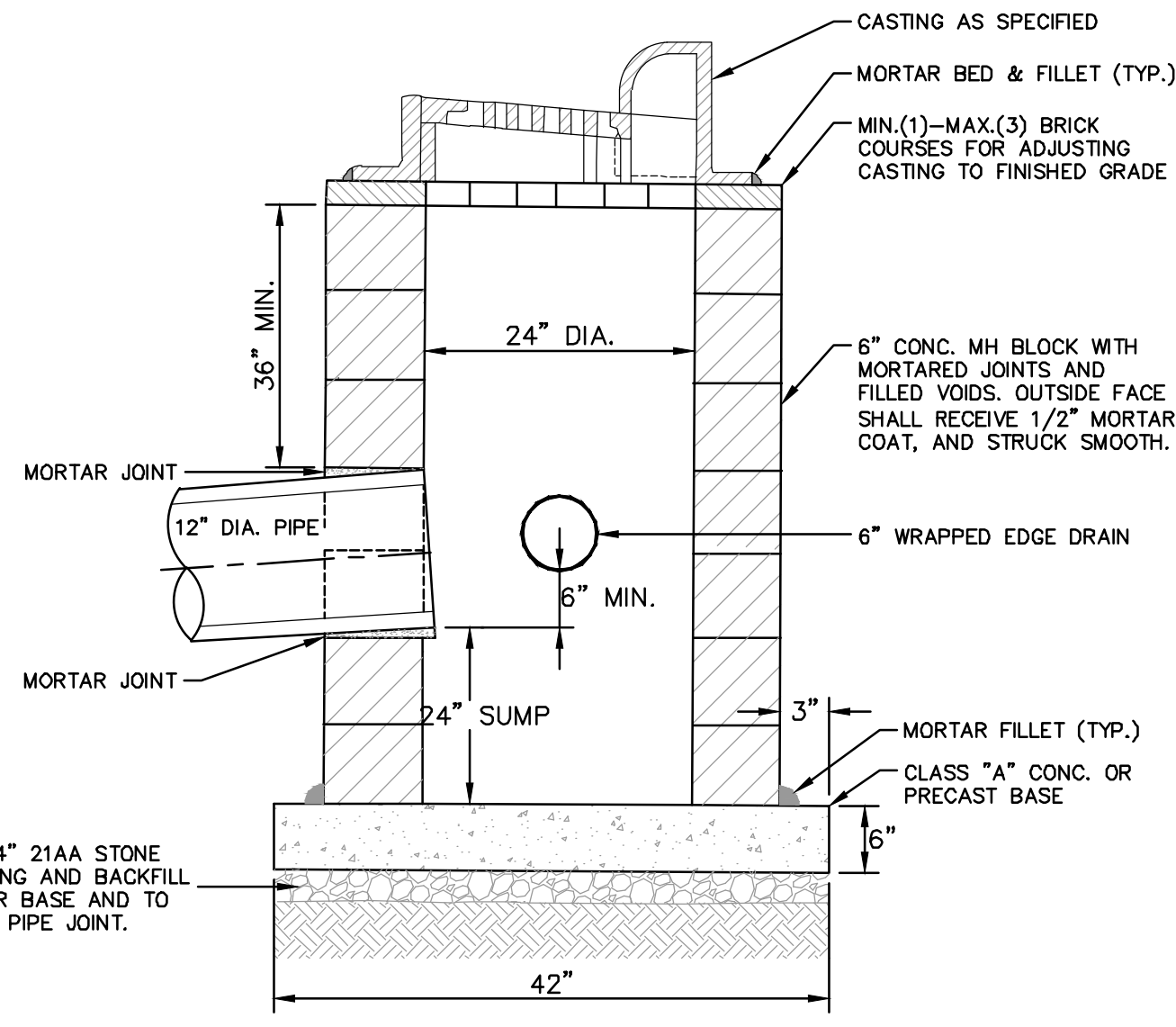
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DRAWING No. 2018019-7  
SHEET No. 7 OF 54

01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA	CHECKED
02	OUT FOR BID	1-23-19	CC/DF/KB	JKA	DRAWN
					DATE
					REV.
					DESCRIPTION



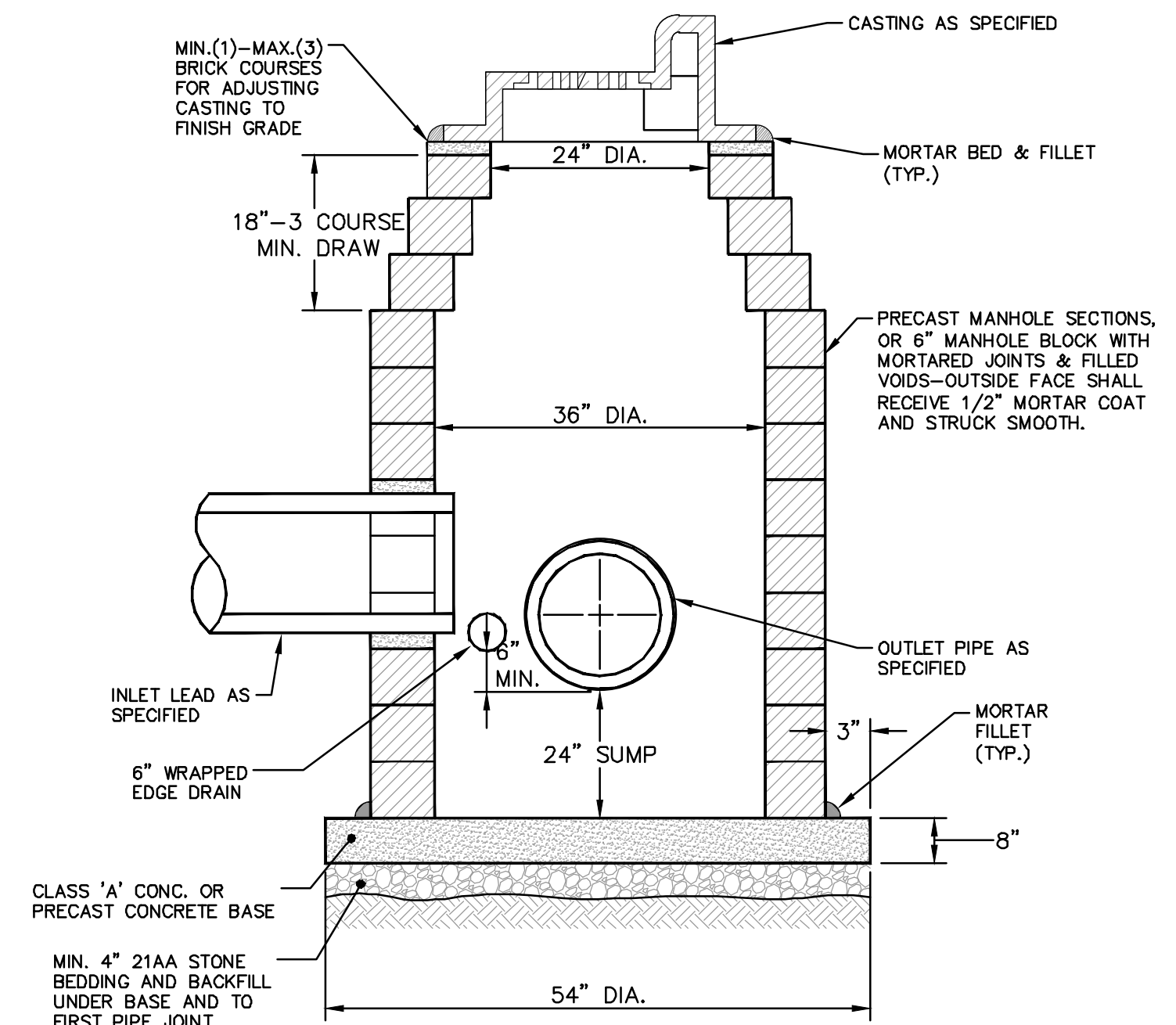
- NOTES:
1. ALL SANITARY MANHOLES SHALL BE PRECAST CONCRETE.
  2. ALL MANHOLES MUST HAVE ECCENTRIC CONES - BOTH STORM AND SANITARY
  3. ALL SANITARY SEWER OPENINGS SHALL BE PRECAST WITH RUBBER BOOT CONNECTIONS.
  4. 2' SUMP REQUIRED ON ALL DRAINAGE STRUCTURES.

**STANDARD MANHOLE (TYPE I)**



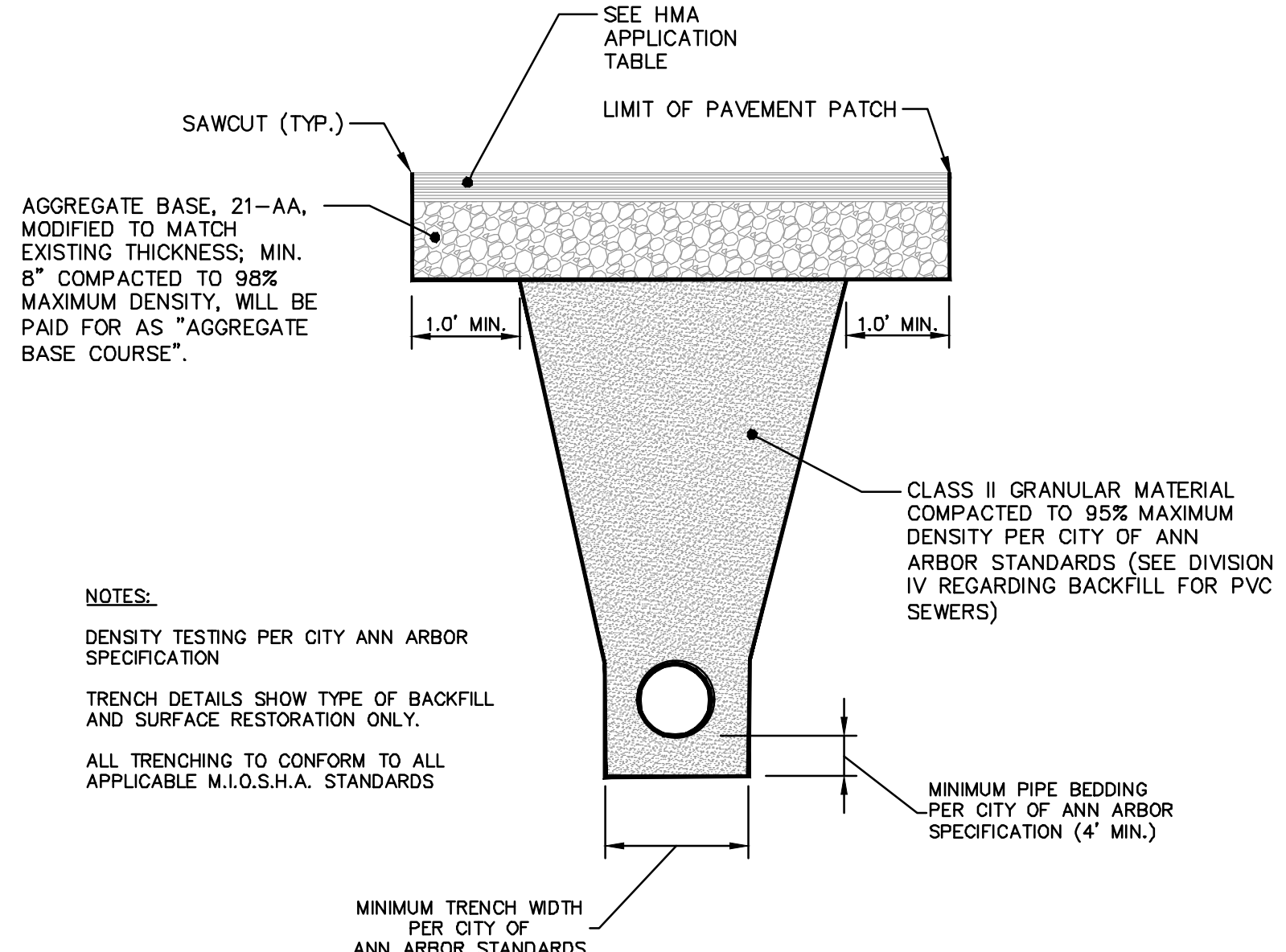
- NOTES:
1. MAY BE USED WITH ONLY SINGLE OUTLET PIPE, AND NO INLET PIPE
  2. FRONT EDGE OF INLET CASTING SHALL BE FLUSH WITH FRONT EDGE OF GUTTER (EDGE-OF-METAL)

**SINGLE INLET STRUCTURE SD-S-10**



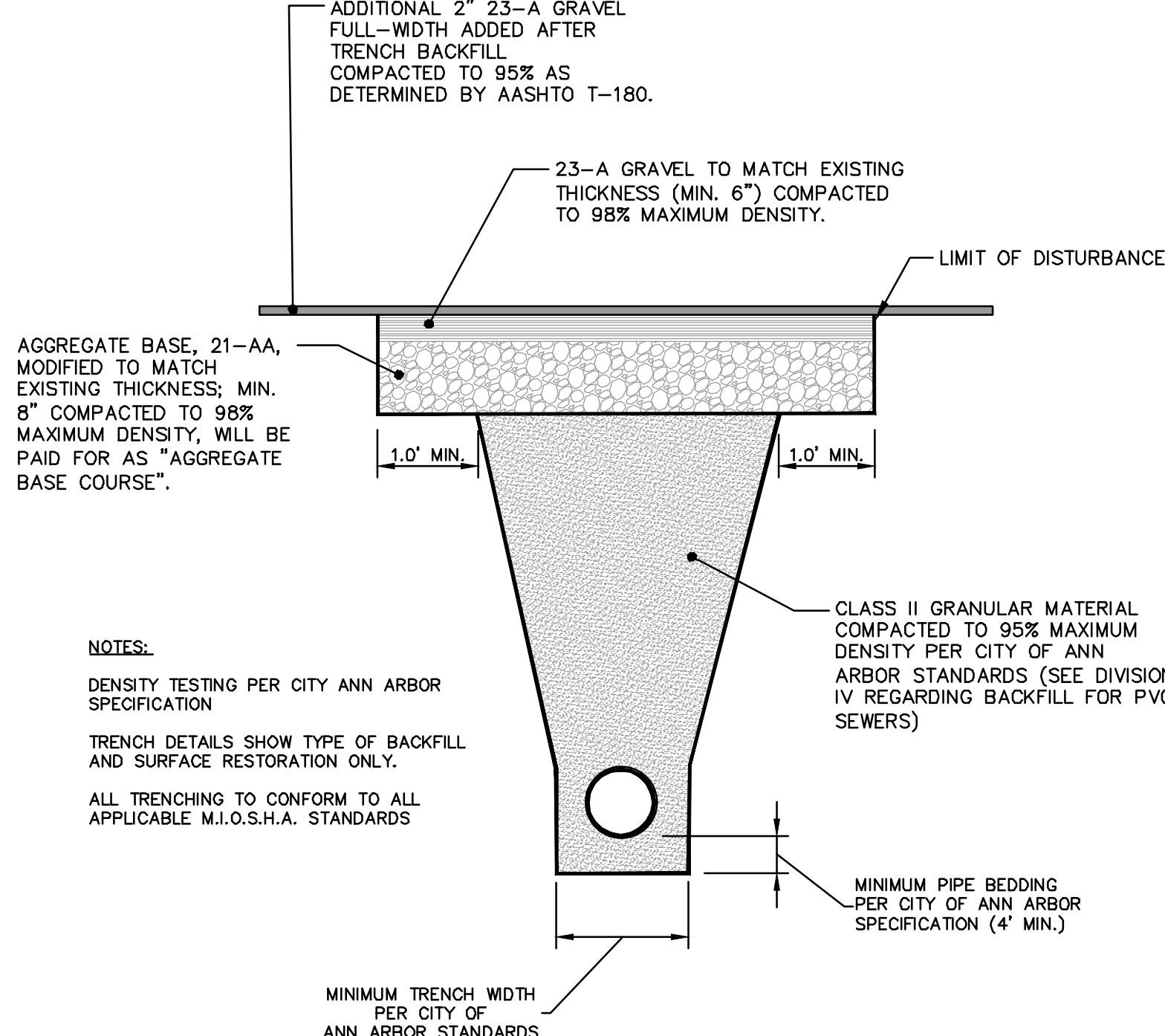
- NOTES:
1. SHALL BE USED IF SINGLE OUTLET PIPE AND SINGLE INLET PIPE.
  2. FRONT EDGE OF INLET CASTING SHALL BE FLUSH WITH FRONT EDGE OF GUTTER (EDGE-OF-METAL)

**INLET-JUNCTION CHAMBER SD-S-9**



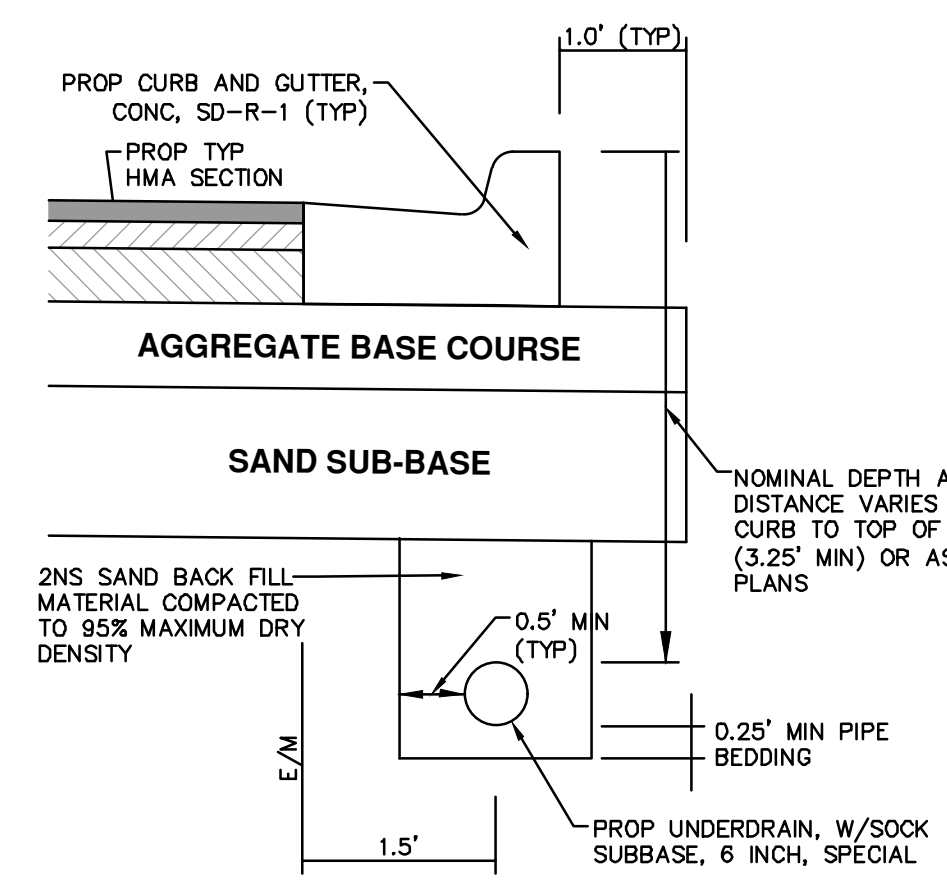
- NOTES:
- DENSITY TESTING PER CITY ANN ARBOR SPECIFICATION
- TRENCH DETAILS SHOW TYPE OF BACKFILL AND SURFACE RESTORATION ONLY.
- ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. STANDARDS

**UTILITY TRENCH-TYPE I SD-TD-1 (MODIFIED)**  
(UNDER HMA PAVEMENT)



- NOTES:
- DENSITY TESTING PER CITY ANN ARBOR SPECIFICATION
- TRENCH DETAILS SHOW TYPE OF BACKFILL AND SURFACE RESTORATION ONLY.
- ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. STANDARDS


**UTILITY TRENCH-TYPE II SD-TD-2 (MODIFIED)**  
(UNDER GRAVEL ROAD)



- NOTES:
- IN AREAS WHERE EDGE DRAIN CANNOT BE INSTALLED IN ACCORDANCE WITH THE DETAIL, THE EDGE DRAIN SHALL BE INSTALLED AT THE DEPTH AS INDICATED ON THE PLANS, OR AS DIRECTED BY ENGINEER. IN NO CASE SHALL THE EDGE DRAIN BE INSTALLED AT A GRADE LESS THAN 0.50% OR AT A DEPTH OF LESS THAN 2' BELOW TOP OF PROPOSED PAVEMENT.
- FOR PAVEMENT BASE AND SUBBASE THICKNESS, SEE TYPICAL PAVEMENT CROSS-SECTION(S)
- TRENCH DETAILS SHOW TYPE OF BACKFILL AND SURFACE RESTORATION ONLY
- ALL TRENCHING TO CONFORM TO ALL APPLICABLE M.I.O.S.H.A. STANDARDS
- EDGE DRAINS SHALL BE CONNECTED TO A DRAINAGE STRUCTURE AND WILL EXTEND A MINIMUM OF 100 FEET UPSLOPE FROM THE STRUCTURE.
- ADDITIONAL LENGTHS OF EDGE DRAIN MAY BE REQUIRED BY THE ENGINEER BASED ON EXISTING SITE CONDITIONS, INCLUDING CONDITION OF THE SUBGRADE.


**TRENCH DETAIL FOR UNDER DRAIN**  
(UNDER HMA PAVEMENT)

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00	OUT FOR BID	1-23-19	CC/DF/KB	JKA	JKA	DATE	DRAWN	CHECKED	REV.
DESCRIPTION									
STORM SEWER AND TRENCH DETAILS									



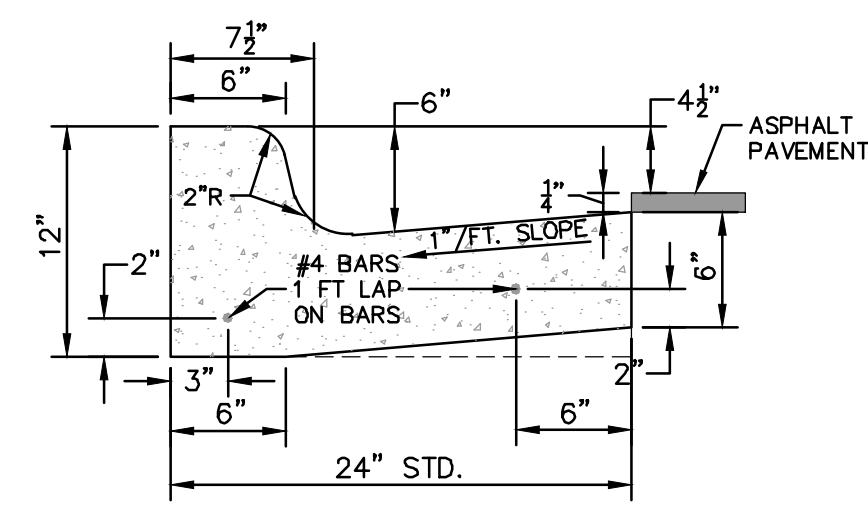
**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN

SCALE: NTS

DRAWING No. 2018019-8

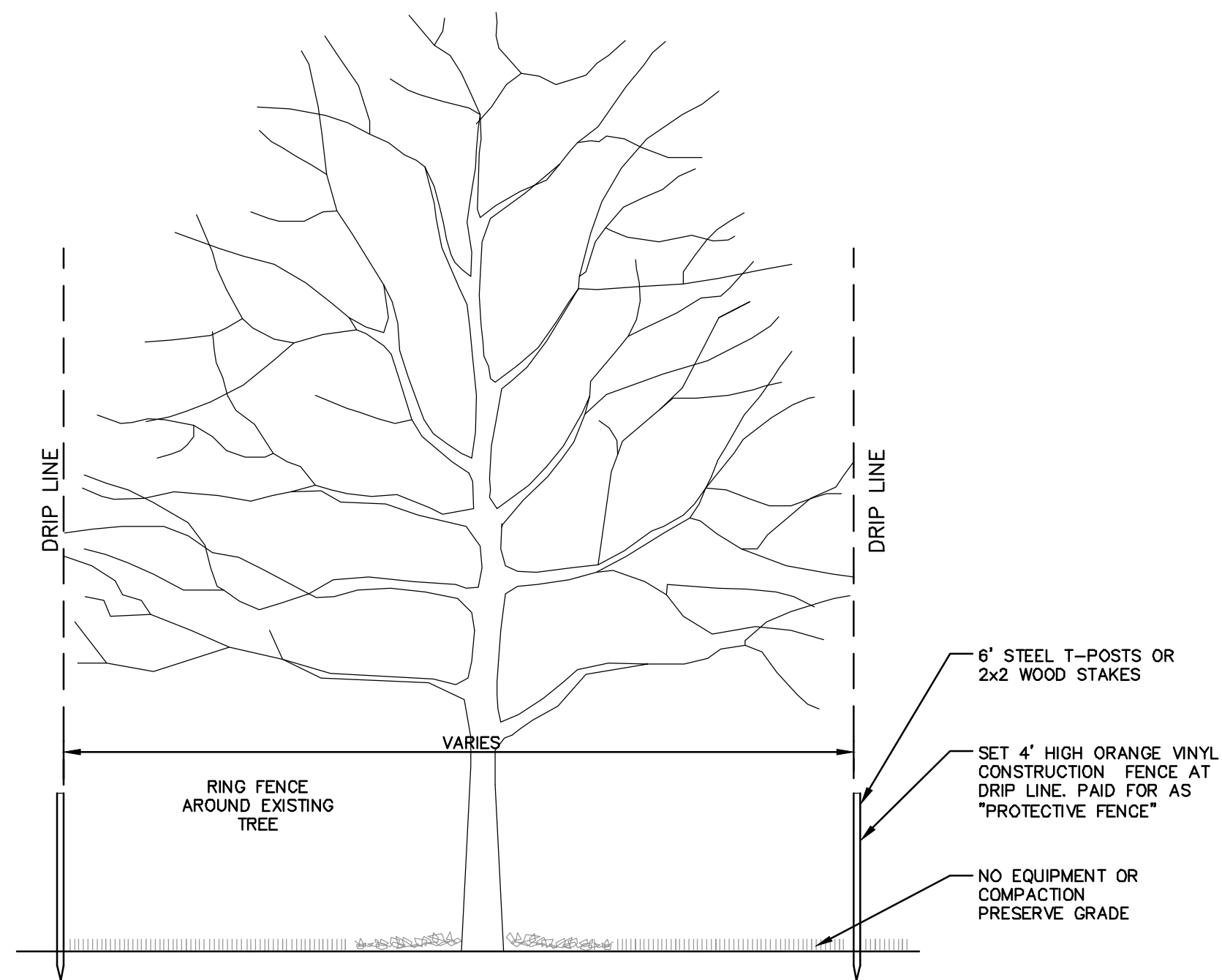
SHEET No. 8 OF 54

**CURB AND GUTTER, CONC, DET F4, SPECIAL**

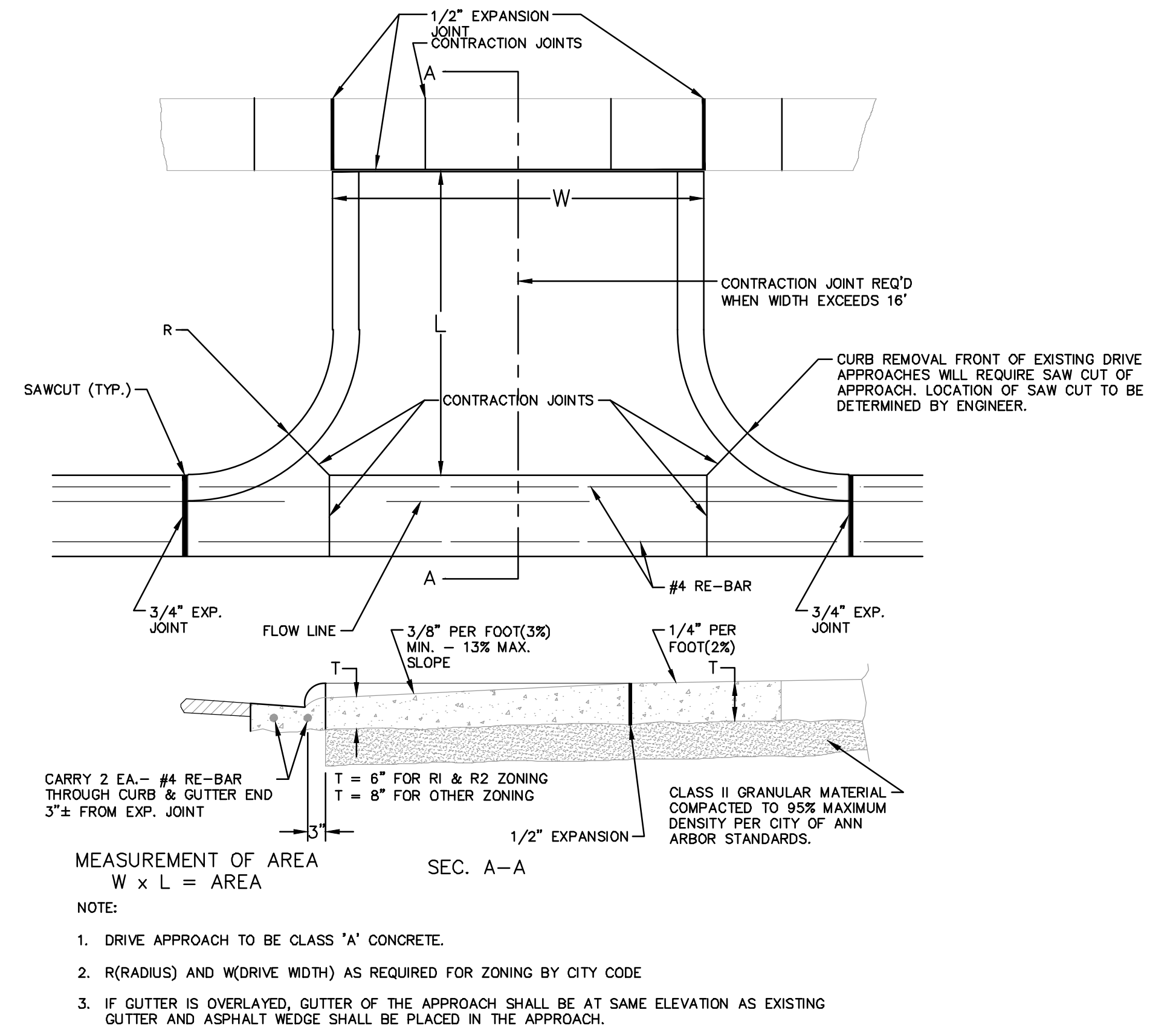


NO SCALE

**TREE PROTECTION DETAIL**



**TYPE 'M' DRIVE APPROACH SD-R-6**



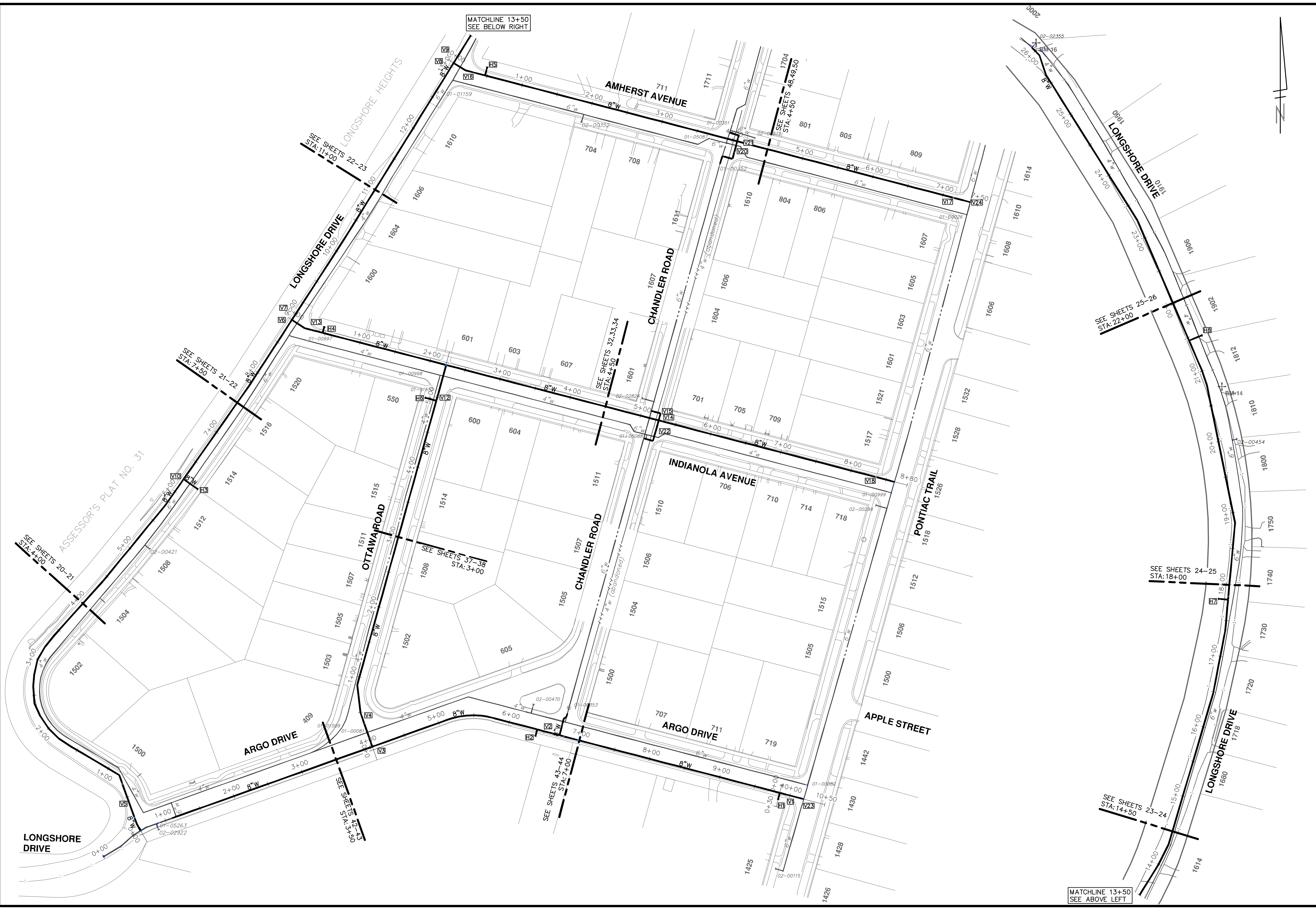
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00	1-23-19	OUT FOR BID	CC/DF/KB	JKA


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 301 EAST HURON STREET  
 ANN ARBOR, MI 48106-8647  
 734-794-4410  
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 LONGSHORE INDIANOLA OTTAWA  
 ARGO AMHERST WATERMAIN  
 MISC. DETAILS

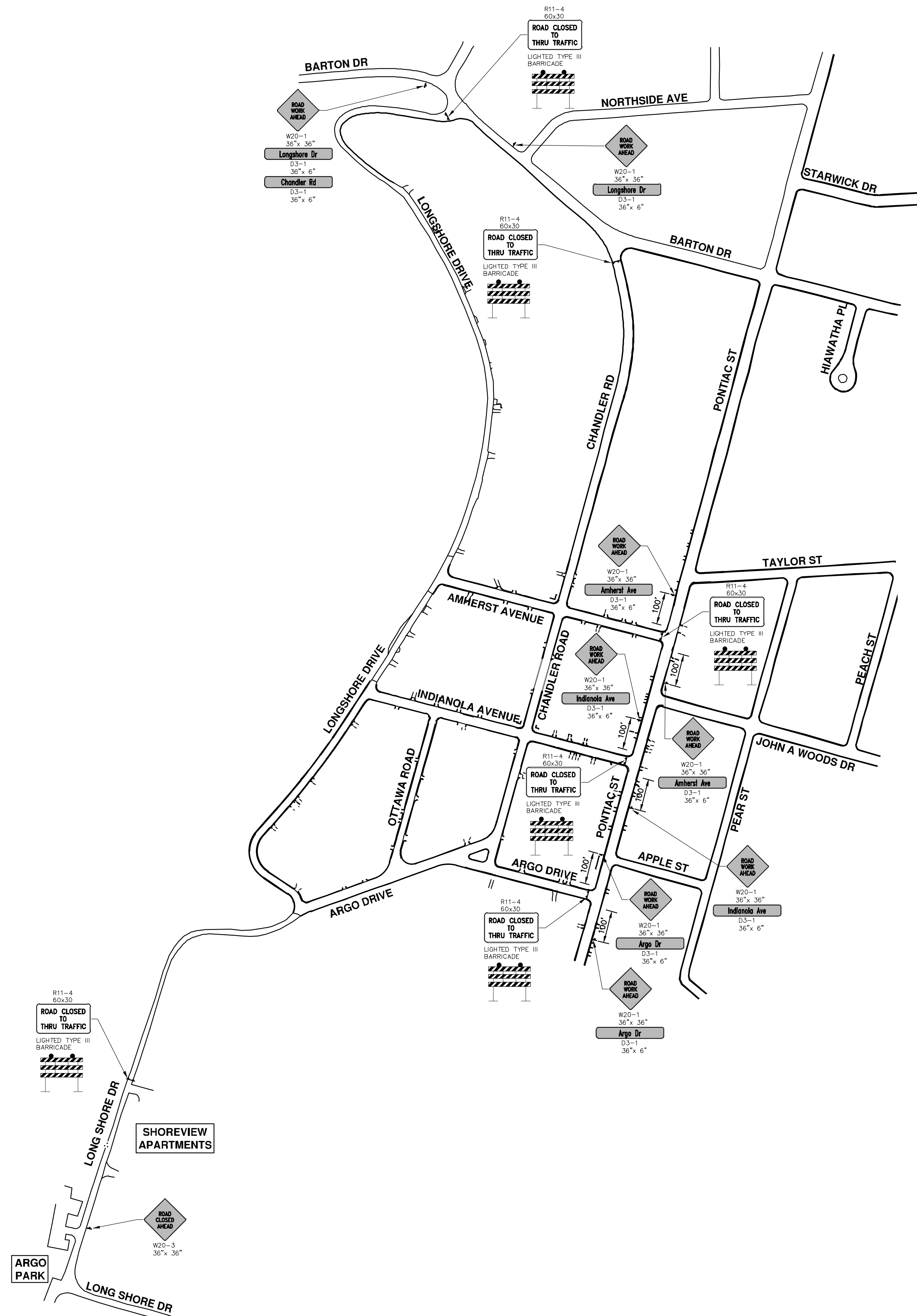
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 SHEET No.: 9 OF 54

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		<b>CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING</b> <b>LONGSHORE INDIANOLA OTTAWA</b> <b>ARGO AMHERST WATERMAIN</b> OVERALL WATER MAIN LAYOUT	
SCALE PLAN: 1" = 60' DRAWING No.: 2018019-10		SHEET No.: 10 OF 54	
CITY OF ANN ARBOR PUBLIC SERVICES 301 EAST HURON STREET ANN ARBOR, MI 48106-8647 www.a3gov.org		REV. DATE DESCRIPTION 01 2-13-19 CC/DF/KB JKA 02 1-23-19 CC/DF/KB JKA 03 1-23-19 DATE DRAWN CHECKED	

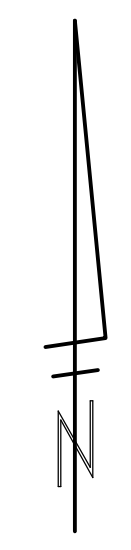
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SIGN	NUMBER	QUANTITY
ROAD CLOSED	R11-2 48"x30"	8
BARRICADE, TYPE III, HIGH INTENSITY, LIGHTED - 24 EACH		

**NOTES:**

1. FINAL LIMITS OF PAVEMENT REMOVAL FOR UTILITY INSTALLATION WILL BE AS DIRECTED BY ENGINEER.
2. UTILIZE PLASTIC DRUMS AND PROTECTIVE FENCING WITHIN WORK ZONE TO DELINEATE OPEN TRENCHES AS DIRECTED BY ENGINEER.
3. MAINTAIN PEDESTRIAN ACCESS DURING CONSTRUCTION.
4. COVER CONFLICTING SIGNS AS NEEDED OR AS DIRECTED BY ENGINEER.
5. REMOVE CONFLICTING PAVEMENT MARKINGS AS DIRECTED BY THE ENGINEER.
6. CONTRACTOR SHALL PLACE PORTABLE, CHANGEABLE MESSAGE SIGNS A MINIMUM OF ONE (1) WEEK PRIOR TO THE START OF CONSTRUCTION IN LOCATIONS INDICATED BY ENGINEER. MESSAGE TO BE PROVIDED BY THE ENGINEER.



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
**LONGSHORE INDIANOLA OTTAWA**  
**ARGO AMHERST WATERMAIN**  
 TRAFFIC CONTROL OVERALL

SCALE PLAN: 1" = 150'  
 DRAWING No. **2018019-11**

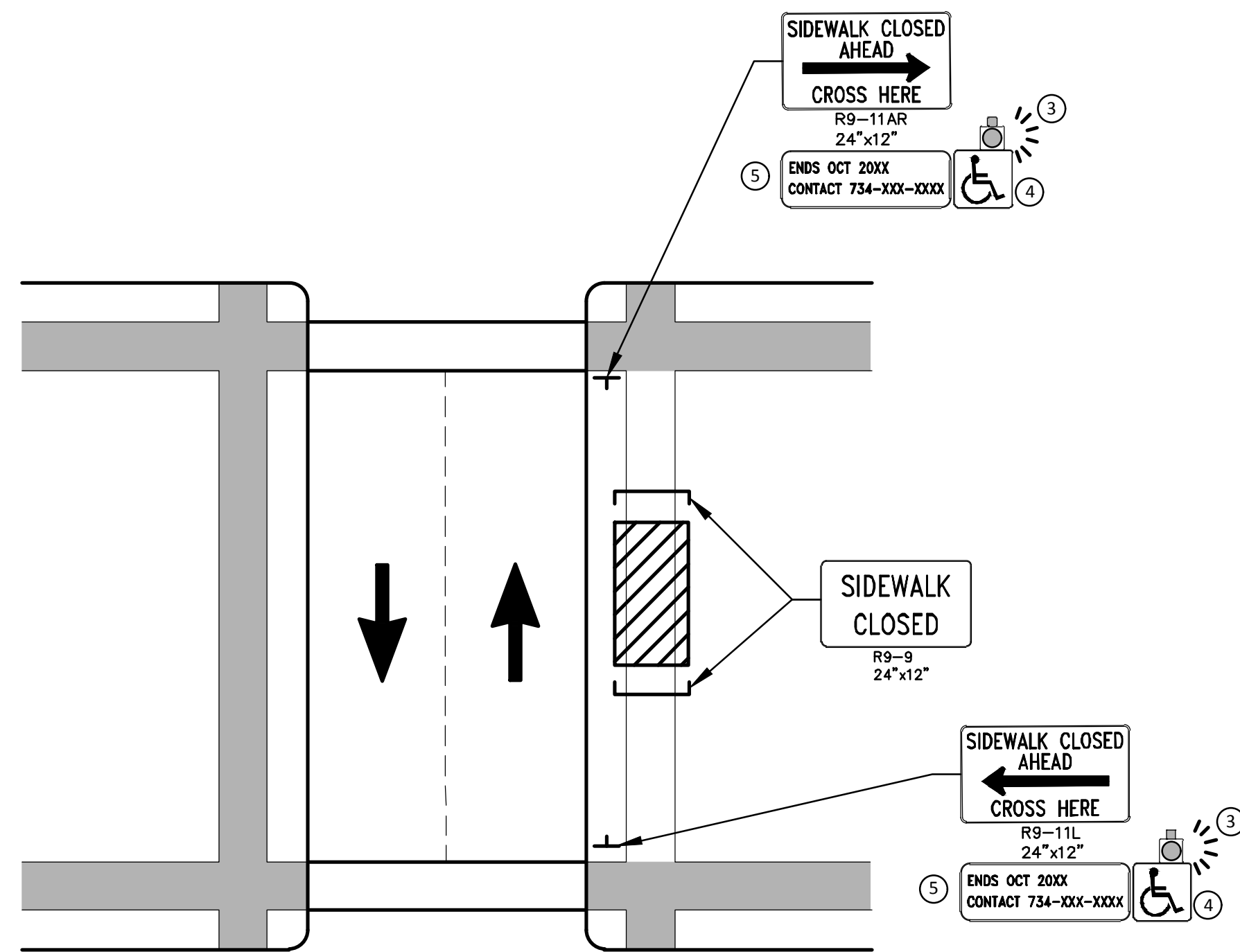
SHEET No. **11 OF 54**

**811**  
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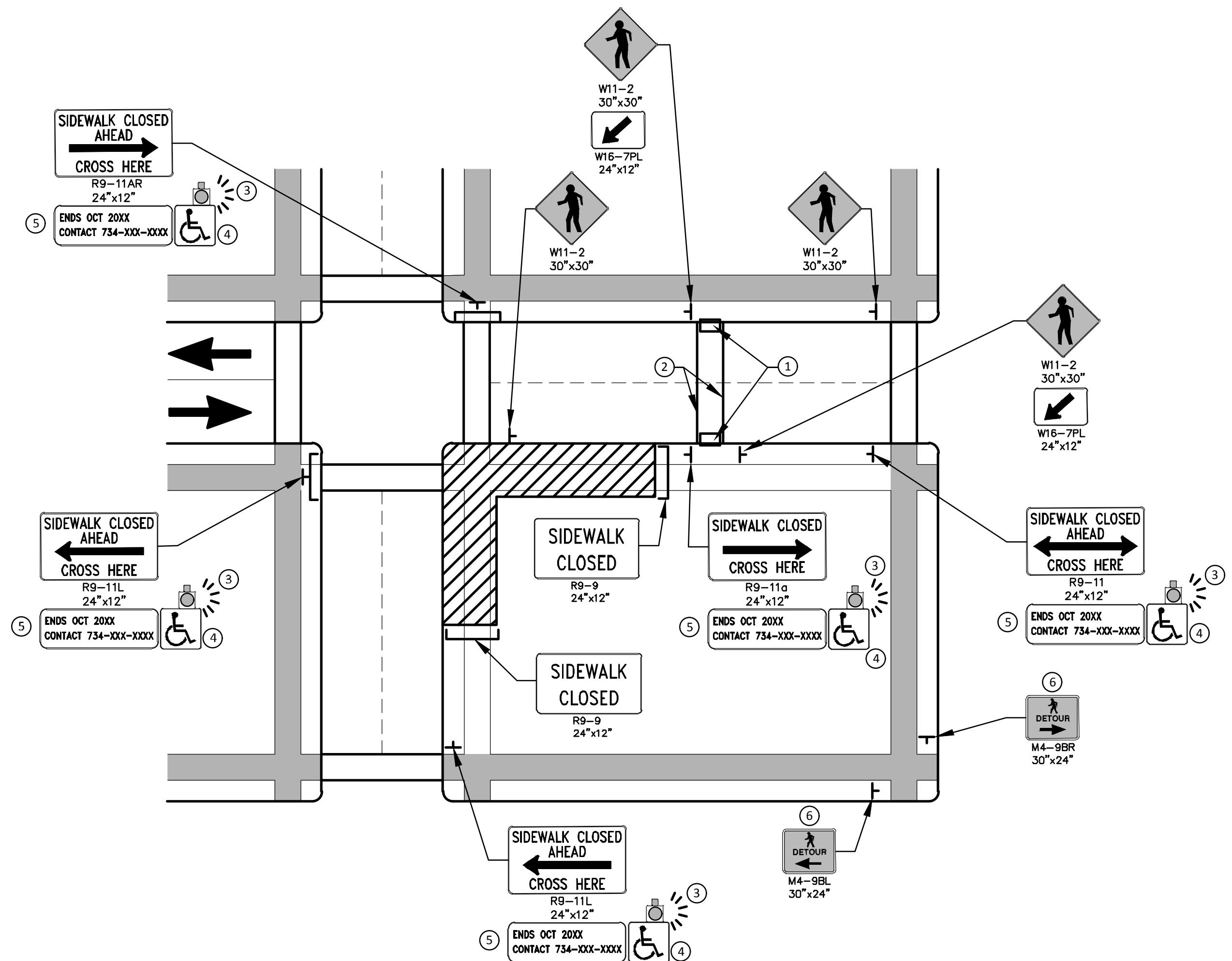
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01	2-13-19	ADDENDUM No. 1	JKA	JKA
00	1-23-19	OUT FOR BID	JKA	JKA

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PEDESTRIAN DETOUR USING OPPOSITE SIDE OF STREET



OTHER SIDE OF STREET DETOUR OR DETOUR WITH TRAILBLAZING SIGNS  
(FOR CORNER SIDEWALK CLOSURE WITH OPTIONAL TEMPORARY CROSSWALK)

**GENERAL NOTES**

WHEN CLOSING OR RELOCATING CROSSWALKS OR SIDEWALKS, THE CONTRACTOR SHALL PROVIDE DETECTABLE TEMPORARY FACILITIES AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH EXISTING PEDESTRIAN FACILITIES.

TEMPORARY TRAFFIC CONTROL DEVICES FOR PEDESTRIANS ARE SHOWN. OTHER DEVICES MAY BE NECESSARY TO CONTROL VEHICULAR TRAFFIC. STAGE WORK, AS NECESSARY, TO PROVIDE AN ALTERNATE PEDESTRIAN ROUTE (APR) AT ALL TIMES. FOR ROADWAYS WITH NO AVAILABLE DETOURS, MAINTAIN ONE OPEN SIDEWALK AT ALL TIMES.

PROVIDE A SMOOTH, CONTINUOUS, HARD SURFACE THROUGH THE LENGTH OF THE APR. COMPACTED GRAVEL, AGGREGATE, OR SLAG MATERIALS ARE NOT ALLOWED. PROVIDE A FIRM, STABLE, AND SLIP RESISTANT TEMPORARY WALKWAY SURFACE TO COVER SHORT SEGMENTS OF ROUGH, SOFT, OR UNEVEN GROUND.

THE PEDESTRIAN TRAFFIC SIGNALS CONTROLLING CLOSED CROSSWALKS SHALL BE COVERED OR DEACTIVATED BY THE CITY OF ANN ARBOR. THE CONTRACTOR SHALL SCHEDULE AND COORDINATE THIS WORK WITH THE ENGINEER A MINIMUM OF 72 HOURS (NOT INCLUDING WEEKENDS & HOLIDAYS) PRIOR TO THE BEGINNING OF WORK THAT REQUIRES A SIDEWALK CLOSURE.

POST MOUNTED SIGNS LOCATED ADJACENT TO A SIDEWALK SHALL HAVE A 7 FOOT MINIMUM CLEARANCE FROM THE BOTTOM OF THE SIGN TO THE SIDEWALK SURFACE.

WHEN THE ENGINEER DETERMINES THAT THE CONTRACTOR'S OPERATIONS OR PLACEMENT OF TRAFFIC CONTROL DEVICES HAS CAUSED A SITUATION THAT THE VISIBILITY OF IS REDUCED ENOUGH TO CREATE A HAZARD, THE TRAFFIC CONTROL DEVICES SHALL BE DELINEATED WITH FLAGS OR OTHER ENGINEER-APPROVED DEVICES AT NO ADDITIONAL COST TO THE PROJECT.

MINIMIZE DISRUPTION TO PEDESTRIANS TO THE MAXIMUM EXTENT FEASIBLE BY PROVIDING AN APR IN THE FOLLOWING ORDER OF PREFERENCE:

1. PROVIDE THE APR ON THE SAME SIDE OF THE STREET AS THE DISRUPTED ROUTE UTILIZING BYPASSES.
2. WHERE IT IS NOT FEASIBLE TO PROVIDE A SAME SIDE APR, PROVIDE A DETOUR ON THE OTHER SIDE OF THE STREET.
3. WHERE IT IS NOT FEASIBLE TO PROVIDE AN APR ON THE OTHER SIDE OF THE ROADWAY, PROVIDE AN APR DETOUR WITH TRAILBLAZING SIGNS AS SHOWN ON THE PROJECT PLANS.

**SPECIFIC NOTES**

1. TEMPORARY CURB RAMPS WITH DETECTABLE WARNINGS.
2. TEMPORARY PAVEMENT MARKING FOR CROSSWALK LINES.
3. AN APPROVED AUDIBLE MESSAGE DEVICE OR TACTILE MESSAGE SHALL BE PROVIDED FOR SIGHT-IMPAIRED PEDESTRIANS.
4. THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHOULD BE DISPLAYED WHEN ANY WALKWAY THROUGH A WORK ZONE HAS BEEN DETERMINED TO BE TPAR COMPLIANT. THE SYMBOL OF ACCESSIBILITY SHALL NOT BE DISPLAYED IF PERSONS WITH DISABILITIES SHOULD NOT USE THE PRIMARY TEMPORARY PEDESTRIAN DETOUR. THE REASON FOR THE NON-COMPLIANCE SHALL BE POSTED AND AN ALTERNATE ROUTE SHALL BE POSTED WHEN THE PRIMARY TEMPORARY PEDESTRIAN DETOUR IS NON-COMPLIANT TO TPAR STANDARDS.
5. TYPICAL SIGN MESSAGE FOR A TEMPORARY PEDESTRIAN DETOUR SHALL INCLUDE INFORMATION SUCH AS THE DURATION OF THE WALKWAY RESTRICTIONS (BEGINNING AND/OR END DATES) AND A PROJECT CONTACT NUMBER FOR 24 / 7 QUESTIONS OR REPORTING HAZARDS.
6. PEDESTRIAN DETOUR TRAILBLAZING SIGNS SHALL BE USED IF THE PEDESTRIAN DETOUR IS IN A LOCATION OTHER THAN ACROSS THE STREET FROM THE SIDEWALK CLOSURE.

**PEDESTRIAN TEMPORARY TRAFFIC CONTROL NOTES**

1. THE CONTRACTOR SHALL MAINTAIN PEDESTRIAN THROUGH MOVEMENTS FROM ONE END OF THE CONSTRUCTION AREA TO THE OTHER, ON AT LEAST ONE SIDE OF THE STREET DURING CONSTRUCTION. ANY SIDEWALK CLOSURES SHALL MEET THE REQUIREMENTS OF THE MMUTCD, PART 6.
2. PEDESTRIAN ACCESS SHALL BE PROVIDED TO ALL ADJACENT PROPERTIES, BUILDINGS, RESIDENCES AND COMMERCIAL PROPERTIES AT ALL TIMES. THIS MAY INCLUDE TEMPORARY WALKWAYS SPANNING THE CONSTRUCTION AREA.
3. IF SIDEWALKS ARE CLOSED, A TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) SHALL BE PROVIDED ON THE SAME SIDE OF THE ROAD AS THE CLOSED SIDEWALK, IF POSSIBLE. SIGNS AND BARRICADES SHALL BE USED TO PROVIDE ADVANCE NOTICE OF THE CLOSURE AND THE ROUTE OF ANY PEDESTRIAN DETOURS. THE TPAR SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4 FEET. IF THE TPAR IS LESS THAN 5 FEET IN WIDTH, A 5 FOOT BY 5 FOOT PASSING SPACE SHALL BE PROVIDED AT LEAST EVERY 200 FEET. THE SURFACE OF THE TPAR SHALL BE SMOOTH AND CONTINUOUS FOR THE LENGTH OF THE TPAR. THE TPAR SHALL MAINTAIN THE SAME LEVEL OF ACCESSIBILITY AND DETECTABILITY AS THE FACILITY THAT IS BEING CLOSED. THE TPAR SHALL NOT LEAD PEDESTRIANS INTO CONFLICTS WITH VEHICLES, EQUIPMENT, OR CONSTRUCTION OPERATIONS.
4. IF THE TPAR IS ADJACENT TO MOVING TRAFFIC, CONSTRUCTION OPERATIONS/EQUIPMENT, OR DROP-OFFS, THEN CRASH WORTHY CHANNELIZING DEVICES THAT MEET THE REQUIREMENTS OF NCHRP 350 AND THE MMUTCD SHALL BE USED.
5. THE CONTRACTOR SHALL NOT STORE OR PLACE ANY CONSTRUCTION MATERIALS, EQUIPMENT OR SIGNS IN THE PEDESTRIAN PATH OF TRAVEL.
6. THE CONTRACTOR'S OPERATIONS SHALL NOT OCCUPY SIDEWALKS EXCEPT WHERE PROPER PROTECTION AND A TPAR HAVE BEEN PROVIDED.
7. WHEN DIRECTED BY THE ENGINEER, OR STATED ON THE PLANS, THE CONTRACTOR SHALL PROVIDE A TEMPORARY PEDESTRIAN TRAFFIC CONTROL PLAN FOR REVIEW AND WRITTEN APPROVAL BY THE ENGINEER A MINIMUM OF THREE WEEKS BEFORE SUCH PLAN IS IMPLEMENTED. THIS PLAN SHALL DETAIL THE CONSTRUCTION PHASING AND SCHEDULE AND THE SPECIFIC METHODS OF MAINTAINING SAFE PEDESTRIAN ACCESS THROUGHOUT THE CONSTRUCTION AREA. THIS PLAN SHALL PROVIDE THE LOCATION AND DETAILS OF TEMPORARY CONSTRUCTION SIGNING, MARKINGS, BARRICADES, CHANNELIZING DEVICES, TPARS AND METHODS TO MAINTAIN ACCESS TO ADJACENT PROPERTIES, BUSINESSES, RESIDENCES, ETC. NO WORK SHALL BE ALLOWED TO BEGIN UNTIL THIS PLAN IS APPROVED BY THE ENGINEER IN WRITING.
8. PROVISION OF THE TPAR AND ALL OF ITS ELEMENTS, INCLUDING BUT NOT LIMITED TO, CREATION OF THE TEMPORARY PEDESTRIAN CONTROL PLAN, SIGNS, CHANNELIZING DEVICES, BARRICADES, TEMPORARY PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROL DEVICES SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE ITEM OF WORK "MINOR TRAF DEVICES."



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00	1-23-19	OUT FOR BID	CC/DF/KEB	JKA

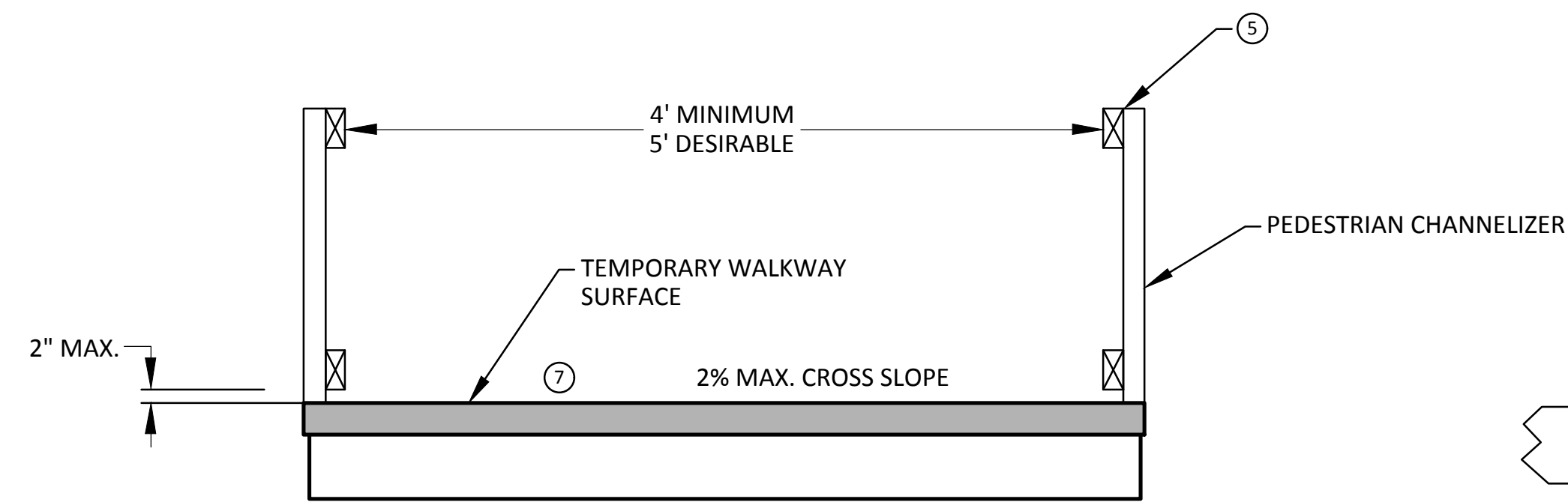
CITY OF ANN ARBOR  
PUBLIC SERVICES  
301 EAST HURON STREET  
ANN ARBOR, MI 48106-8647  
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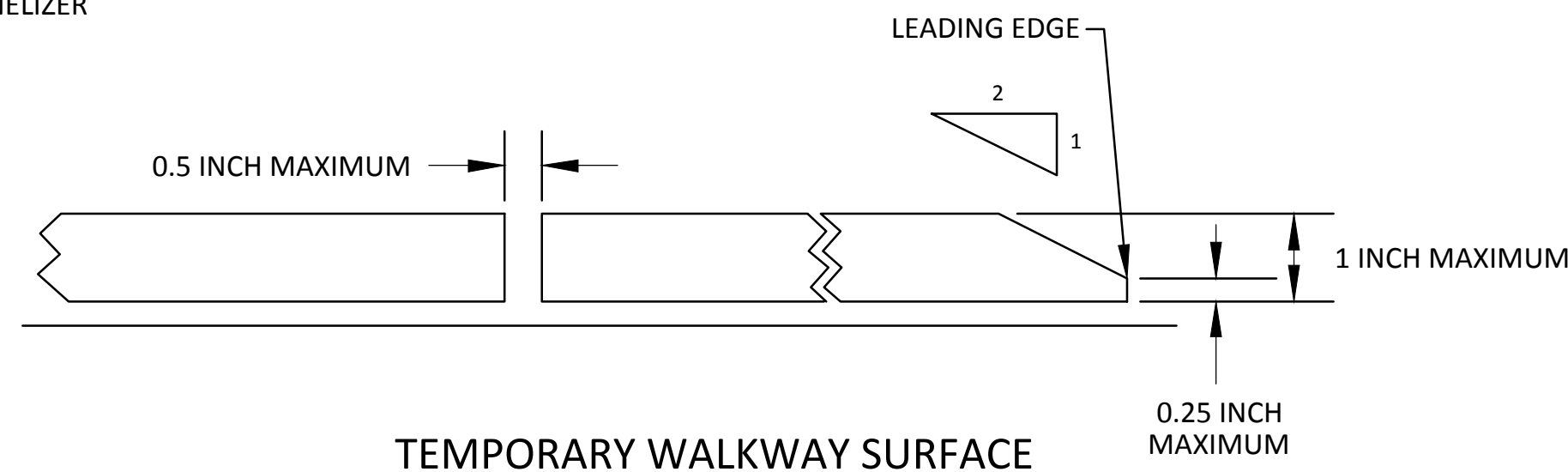
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
ALTERNATE PEDESTRIAN ROUTE (APR) DETOUR  
SCALE: N.T.S.  
DRAWING No. 2018019-12



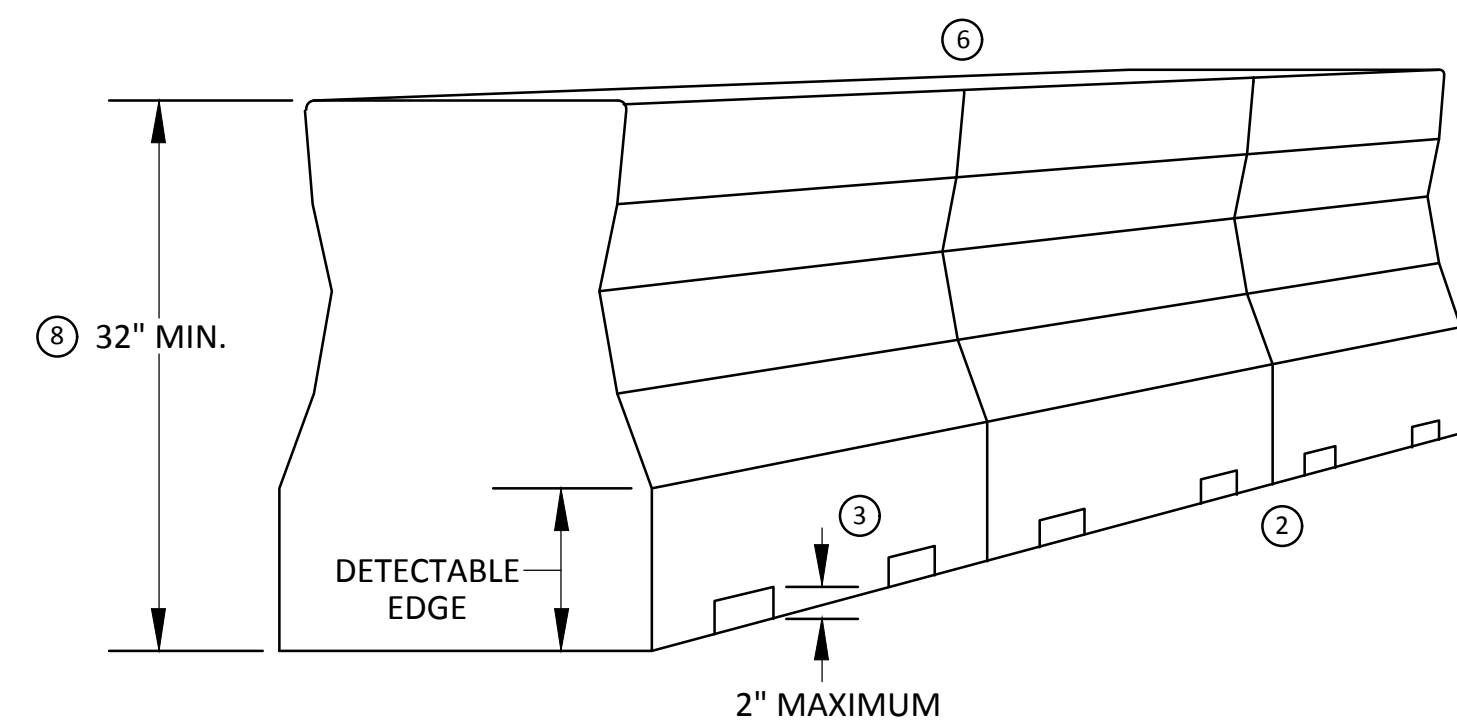
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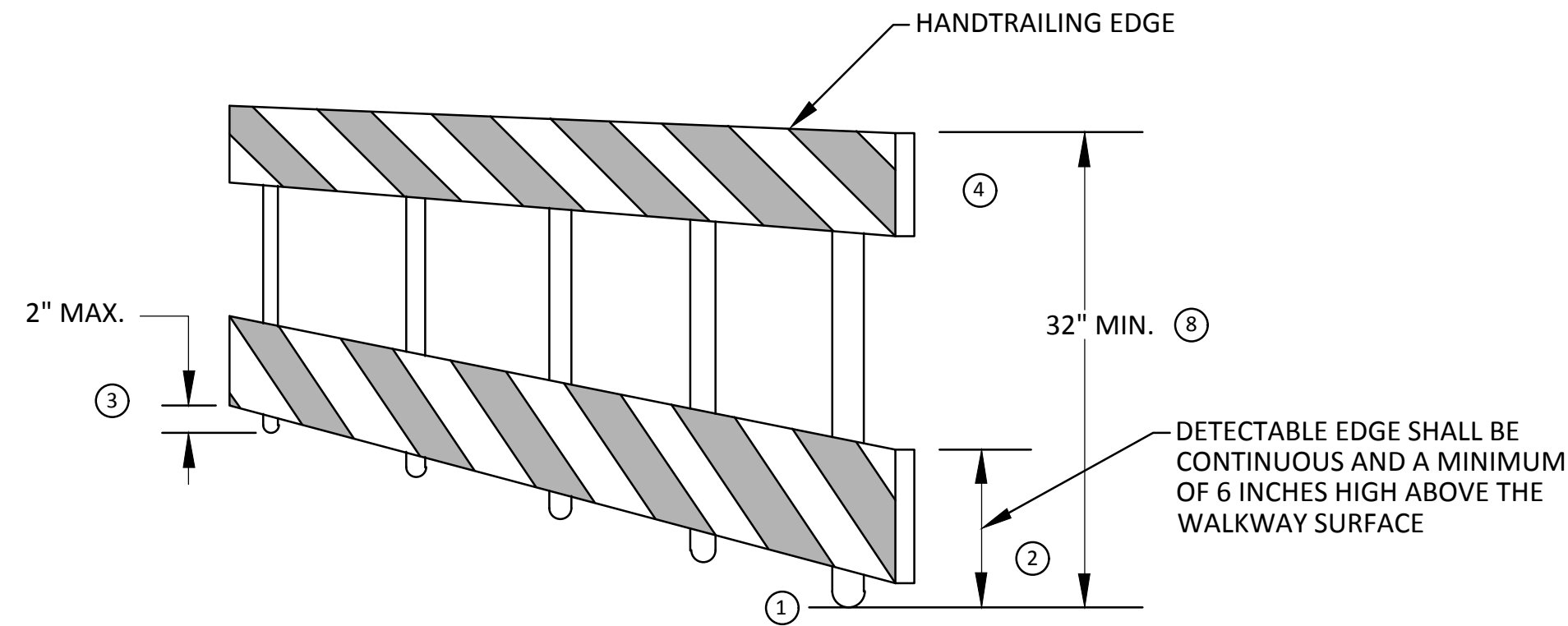
TEMPORARY PEDESTRIAN ACCESS



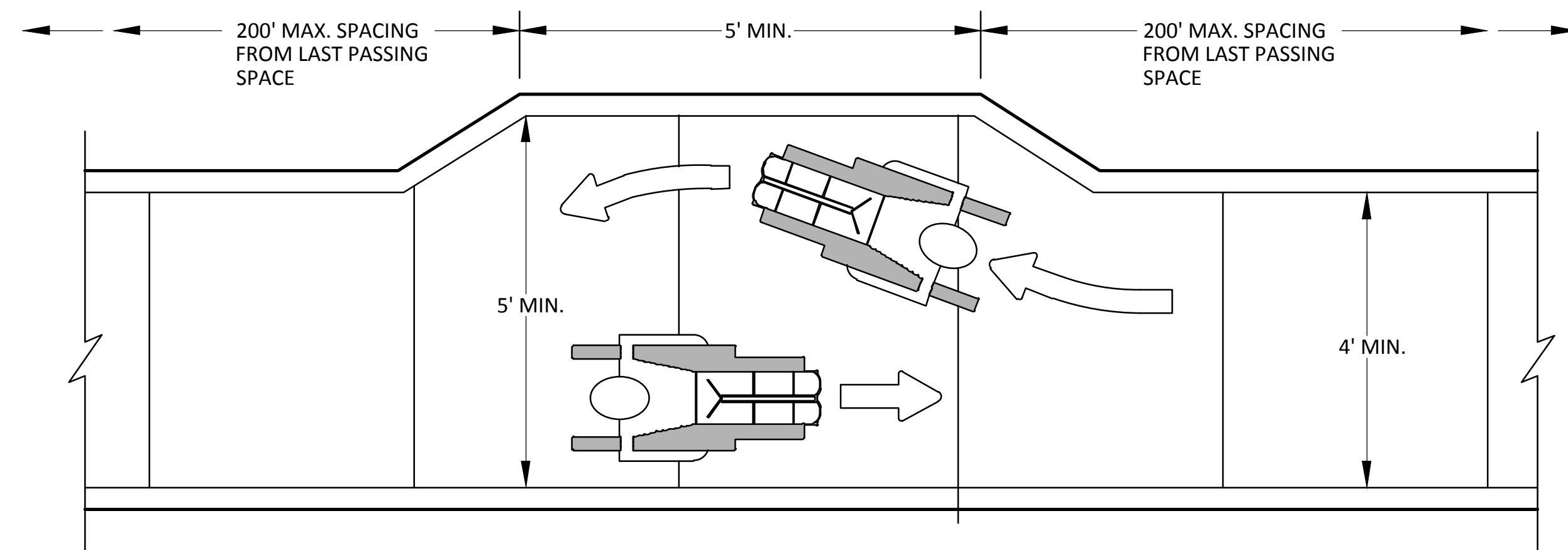
TEMPORARY WALKWAY SURFACE



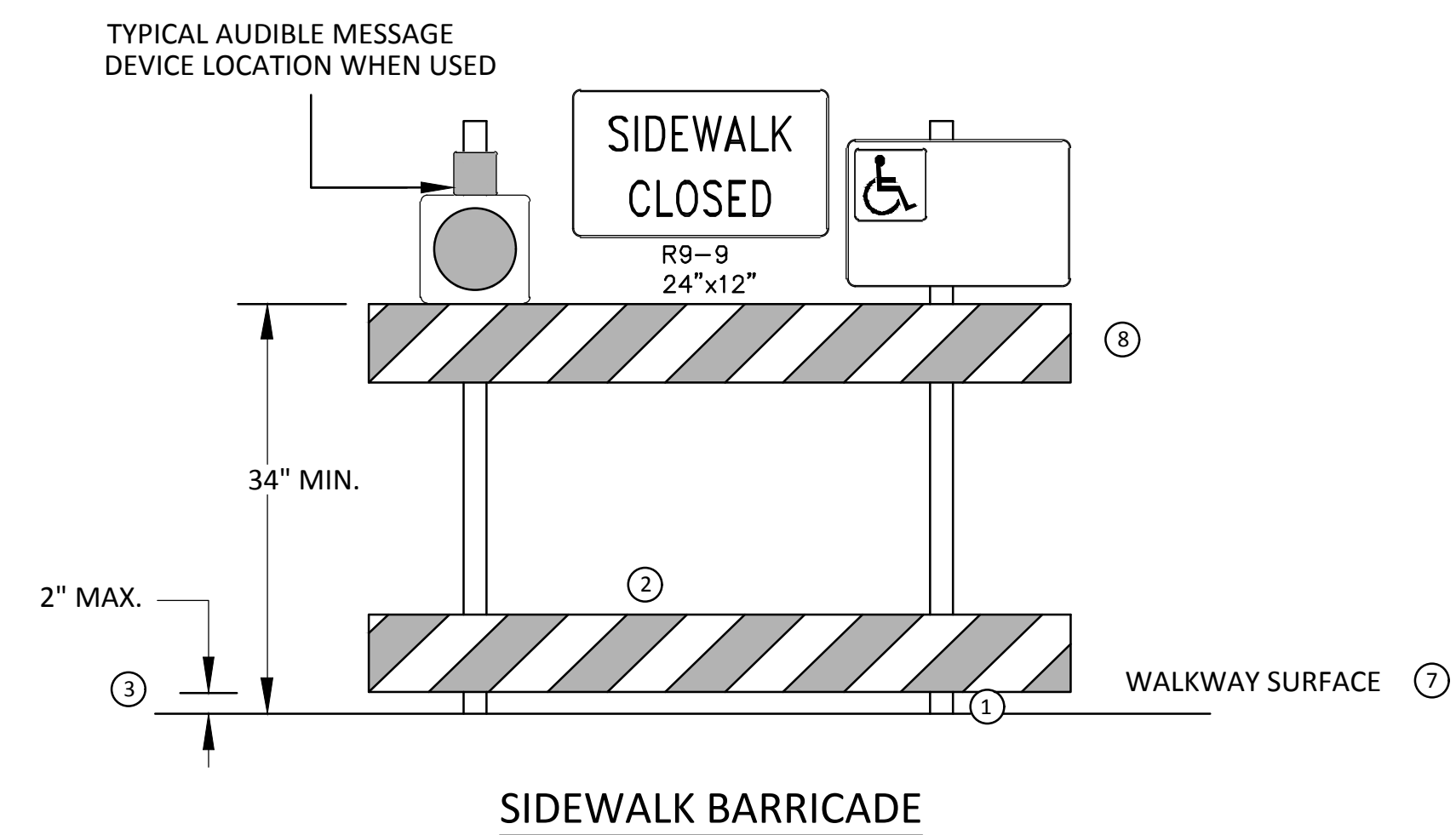
PEDESTRIAN CHANNELIZER USING A BARRIER  
(MINIMUM REQUIREMENTS)



PEDESTRIAN CHANNELIZER  
(MINIMUM REQUIREMENTS)



NARROW TEMPORARY PEDESTRIAN ACCESS ROUTE PASSING DETAIL



SIDEWALK BARRICADE

GENERAL NOTES

RAILINGS OR OTHER OBJECTS MAY PROTRUDE A MAXIMUM OF 4 INCHES INTO THE WALKWAY CLEAR SPACE WHEN LOCATED A MINIMUM OF 27 INCHES ABOVE THE WALKWAY SURFACE.

ANY PEDESTRIAN DEVICES USED TO PROVIDE POSITIVE PROTECTION FOR PEDESTRIANS OR WORKERS SHALL MEET NCHRP 350 CRASHWORTHY REQUIREMENTS APPROPRIATE FOR THE BARRIER'S APPLICATION.

BARRICADES SHALL BE PLACED CONTINUOUSLY ACROSS THE ENTIRE WIDTH OF THE WALKWAY SURFACE BEING CLOSED.

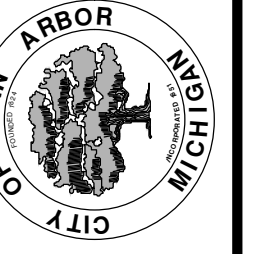
SPECIFIC NOTES

- 1 ANY TRIPPING HAZARD IN THE WALKWAY NEEDS A DETECTABLE EDGE. BALLAST SHALL BE LOCATED BEHIND OR INTERNAL TO THE DEVICE. ANY SUPPORT ON THE FRONT OF THE DEVICE SHALL NOT EXTEND INTO THE 48 INCH MINIMUM WALKWAY CLEAR SPACE AND SHALL NOT EXCEED 0.5 INCHES IN HEIGHT ABOVE THE WALKWAY SURFACE.
- 2 DETECTABLE EDGES SHALL BE CONTINUOUS AND A MINIMUM OF 6 INCHES IN HEIGHT ABOVE WALKWAY SURFACE AND HAVE COLOR MARKINGS CONTRASTING WITH THE WALKWAY SURFACE.
- 3 DEVICES SHALL NOT BLOCK WATER DRAINAGE FROM THE WALKWAY. A GAP HEIGHT OR OPENING FROM THE WALKWAY SURFACE UP TO A MAXIMUM OF 2 INCHES IS ALLOWED FOR DRAINAGE PURPOSES.
- 4 WHEN HAND GUIDANCE IS REQUIRED, THE TOP RAIL OR TOP SURFACE SHALL:
  - BE IN A VERTICAL PLANE PERPENDICULAR TO THE WALKWAY ABOVE THE DETECTABLE EDGE.
  - BE CONTINUOUS AT A HEIGHT OF 34 TO 38 INCHES ABOVE THE WALKWAY SURFACE, AND
  - BE SUPPORTED WITH MINIMAL INTERFERENCE TO THE PEDESTRIAN'S HANDS OR FINGERS.
- 5 ALL DEVICES SHALL BE FREE OF SHARP OR ROUGH EDGES, AND FASTENERS (BOLTS) SHALL BE ROUNDED TO PREVENT HARM TO HANDS, ARMS OR CLOTHING OF PEDESTRIANS.
- 6 ALL DEVICES USED TO CHANNELIZE PEDESTRIAN FLOW SHOULD INTERLOCK SUCH THAT GAPS DO NOT ALLOW PEDESTRIANS TO STRAY FROM THE INTENDED CHANNELIZED PATH.
- 7 A WALKWAY SURFACE SHALL BE FIRM, STABLE, AND SLIP RESISTANT. COMPACTED GRAVEL, AGGREGATE, OR SLAG MATERIALS ARE NOT ALLOWED.
- 8 LONGITUDINAL CHANNELIZING DEVICES FOR PEDESTRIANS SHALL BE 32 INCHES IN HEIGHT OR GREATER.



NO.	DATE	DESCRIPTION	BY	CHECKED
01	2-13-19	ADDENDUM No. 1	CC/DF/AB	JKA
00	1-23-19	OUT FOR BID	CC/DF/AB	JKA
			DATE	DRAWN
				CHECKED

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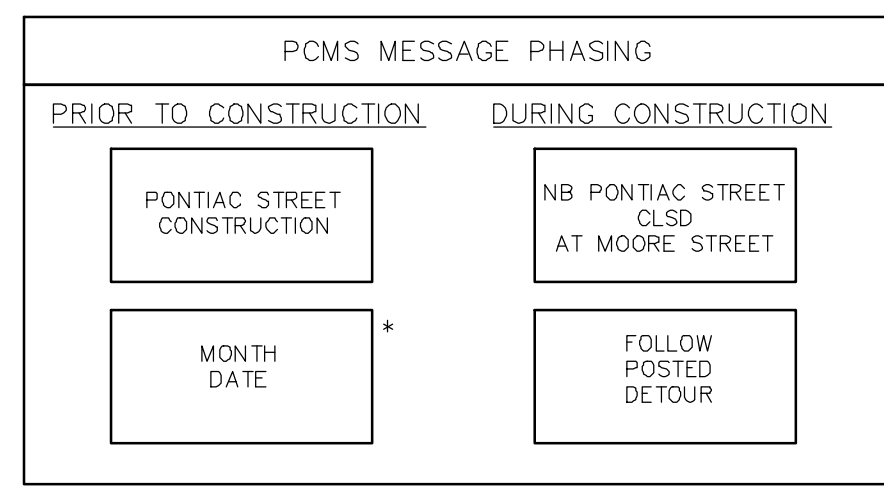
PROJECT MANAGEMENT - PUBLIC SERVICES - CITY OF ANN ARBOR  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
TPAR WALKWAY DEVICES

SCALE: N.T.S.  
DRAWING No. 2018019-13

**DETOUR CONSTRUCTION NOTES:**

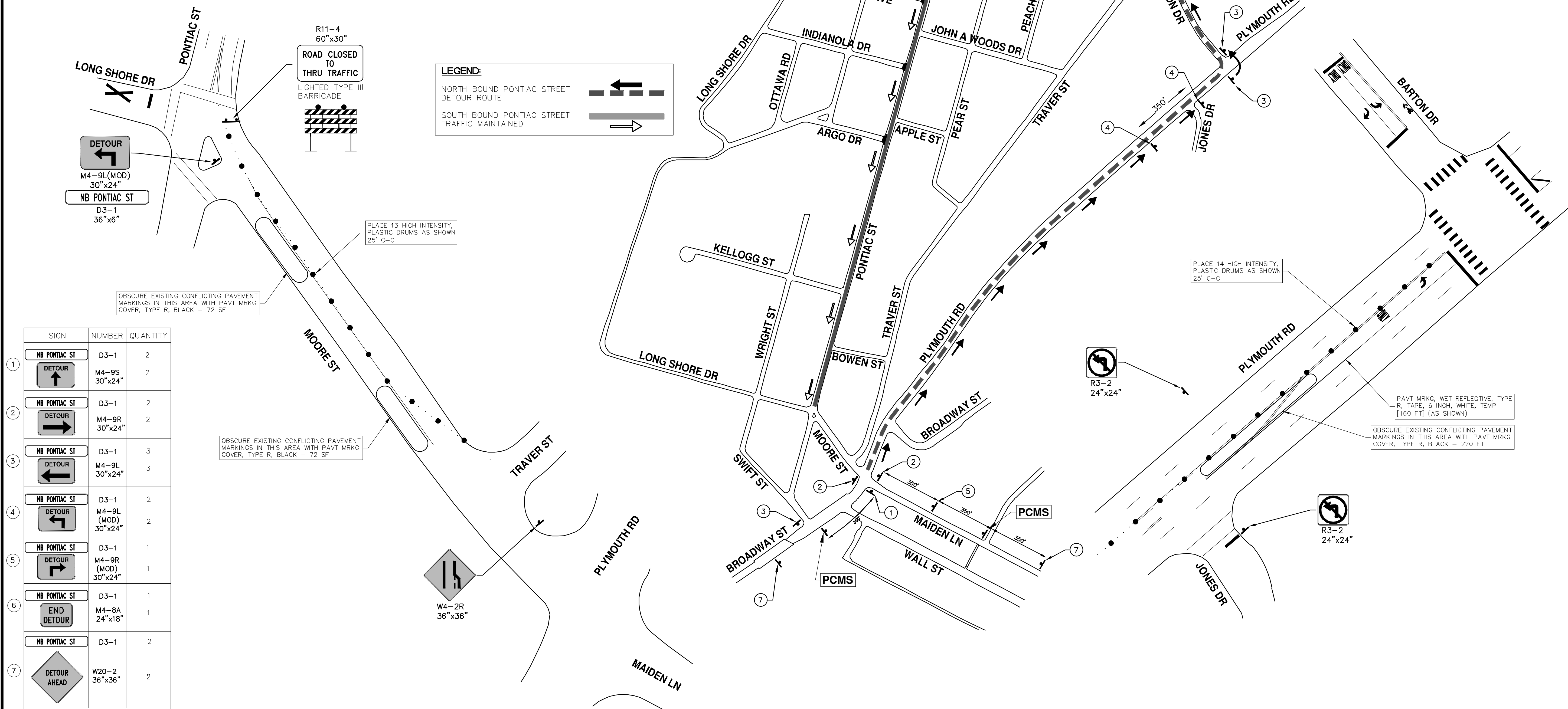
1. DEPENDING ON THE DETOUR ROUTE THAT IS PUT IN PLACE, CONFLICTING SIGNS MAY BE PRESENT. PRIOR TO THE ORDERING OR PLACEMENT OF ANY SIGNS, MEET WITH THE ENGINEER TO VERIFY THE EXACT NUMBER AND LOCATION OF THE SIGNS TO BE PLACED. THE ENGINEER AND THE CONTRACTOR SHALL WORK TOGETHER TO ELIMINATE ALL CONFLICTS.
2. THE CITY RESERVES THE RIGHT TO ORDER ADDITIONAL SIGNS AND PLACE THEM INTO SERVICE IN ORDER TO SAFELY MAINTAIN TRAFFIC. ADJUSTMENTS IN THE UNIT PRICE FOR THESE ITEMS OF WORK SHALL NOT BE ALLOWED FOR THESE OCCURRENCES.
3. THE CONTRACTOR SHALL COORDINATE HIS OPERATIONS WITH THOSE OF THE CITY OF ANN ARBOR'S SIGNS AND SIGNALS UNIT DURING THE COURSE OF THE DETOUR ROUTE ESTABLISHMENT TO EFFECTIVELY AND SAFELY MAINTAIN TRAFFIC. DO NOT ERECT ANY SIGNS UNTIL ITS LOCATION AND PROPOSED DATE OF INSTALLATION IS APPROVED BY THE ENGINEER.
4. THE DETOUR IS TO BE IN PLACE DURING AMHERST AVE., INDIANOLA AVE., AND ARGO AVE. WATER MAIN CONNECTIONS AT PONTIAC ST. AS DIRECTED BY THE ENGINEER, THE CONTRACTOR WILL CLOSE AND DETOUR NORTH BOUND PONTIAC STREET TRAFFIC. SEE "SPECIAL PROVISION FOR MAINTAINING TRAFFIC AND CONSTRUCTION SEQUENCING" FOR DETAILS ON CONSTRUCTION STAGING, SEQUENCING, CLOSURE AND DETOUR LIMITATIONS, AND OTHER DETAILS.
5. REFERENCE THE "SPECIAL PROVISION FOR MAINTAINING TRAFFIC AND CONSTRUCTION SEQUENCING" FOR ADDITIONAL PROJECT REQUIREMENTS. THE CONTRACTOR'S ATTENTION IS SPECIFICALLY DIRECTED TO THE SECTION OF SAME SPECIAL PROVISION REGARDING COORDINATION WITH THE CITY SIGNS AND SIGNALS UNIT FOR MODIFICATIONS TO TRAFFIC SIGNALS FOR THE DETOUR.
6. THE CONTRACTOR SHALL FURNISH, ERECT, AND MAINTAIN SIGNS AS SHOWN ON THE PLANS OR OTHERWISE DIRECTED BY THE ENGINEER.
7. CONSTRUCTION WARNING SIGNS SHALL HAVE AN ORANGE, HIGH-INTENSITY, REFLECTORIZED BACKGROUND.
8. SIGNS SHALL CONFORM TO THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
9. THE CONTRACTOR SHALL DRIVE ALL SIGNS INTO EXPOSED GROUND OR INSERT INTO A BORED HOLE IN PAVEMENT AS NECESSARY TO PERMANENTLY SECURE. ALL HOLES IN PAVEMENT SHALL BE FILLED WITH ENGINEER-APPROVED MORTAR WHEN THE SIGN IS REMOVED AND NO LONGER NEEDED. COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PAY ITEM "SIGN, TYPE B, TEMP, PRISMATIC, FURN" OR "SIGN, TYPE B, TEMP, PRISMATIC, FURN, SPECIAL".

10. ADVANCE WARNING SIGNS SHALL BE PROVIDED WITH TWO (2) TYPE A FLASHING LIGHTS AND ONE (1) DAY-GLOW ORANGE FLAG.
11. CITY TO BE NOTIFIED A MINIMUM OF 7 DAYS PRIOR TO IMPLEMENTING NORTH BOUND PONTIAC STREET DETOUR. MESSAGE BOARDS TO BE PLACED 7 DAYS PRIOR TO IMPLEMENTATION OF DETOUR.



NOTE: PCMS LOCATIONS AND MESSAGES WILL BE AS DIRECTED BY THE ENGINEER. TO BE PLACED ONE WEEK PRIOR TO CONSTRUCTION.

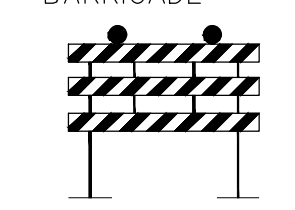
\* THE CONTRACTOR SHALL PLACE THE APPROPRIATE DATE AS APPROVED BY THE ENGINEER.



R11-4  
60"x30"

ROAD CLOSED TO THRU TRAFFIC

LIGHTED TYPE III BARRICADE



PLACE 13 HIGH INTENSITY, PLASTIC DRUMS AS SHOWN 25' C-C

PLACE 14 HIGH INTENSITY, PLASTIC DRUMS AS SHOWN 25' C-C

PAVT MRKG, WET REFLECTIVE, TYPE R, TAPE, 6 INCH, WHITE, TEMP [160 FT] (AS SHOWN)

OBSCURE EXISTING CONFLICTING PAVEMENT MARKINGS IN THIS AREA WITH PAVT MRKG COVER, TYPE R, BLACK - 220 FT

OBSCURE EXISTING CONFLICTING PAVEMENT MARKINGS IN THIS AREA WITH PAVT MRKG COVER, TYPE R, BLACK - 72 SF

OBSCURE EXISTING CONFLICTING PAVEMENT MARKINGS IN THIS AREA WITH PAVT MRKG COVER, TYPE R, BLACK - 72 SF

SIGN	NUMBER	QUANTITY
NB PONTIAC ST	D3-1	2
DETOUR	M4-9S 30"x24"	2
NB PONTIAC ST	D3-1	2
DETOUR	M4-9R 30"x24"	2
NB PONTIAC ST	D3-1	3
DETOUR	M4-9L 30"x24"	3
NB PONTIAC ST	D3-1	2
DETOUR	M4-9L (MOD) 30"x24"	2
NB PONTIAC ST	D3-1	1
DETOUR	M4-9R (MOD) 30"x24"	1
NB PONTIAC ST	D3-1	1
END DETOUR	M4-8A 24"x18"	1
NB PONTIAC ST	D3-1	2
DETOUR AHEAD	W20-2 36"x36"	2

SIGN, PORTABLE, CHANGEABLE MESSAGE - 2 EACH  
VERIFY EXACT QUANTITY AND LOCATION WITH ENGINEER PRIOR TO ORDERING

R:\2018019 Longshore Dr WM\Plan Production\2018019Dtr.dwg Dwg Created: 22-Jan-19 - \_s2 standard bw.stb - Plot Date: 12-Feb-19

**811**  
Know what's below.  
Call before you dig.

DATE: \_\_\_\_\_  
DRAWN: \_\_\_\_\_  
CHECKED: \_\_\_\_\_

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REV. DESCRIPTION

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02	OUT FOR BID	1-23-19	CC/DF/KB

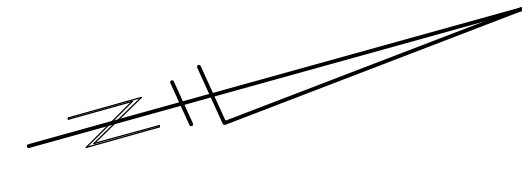
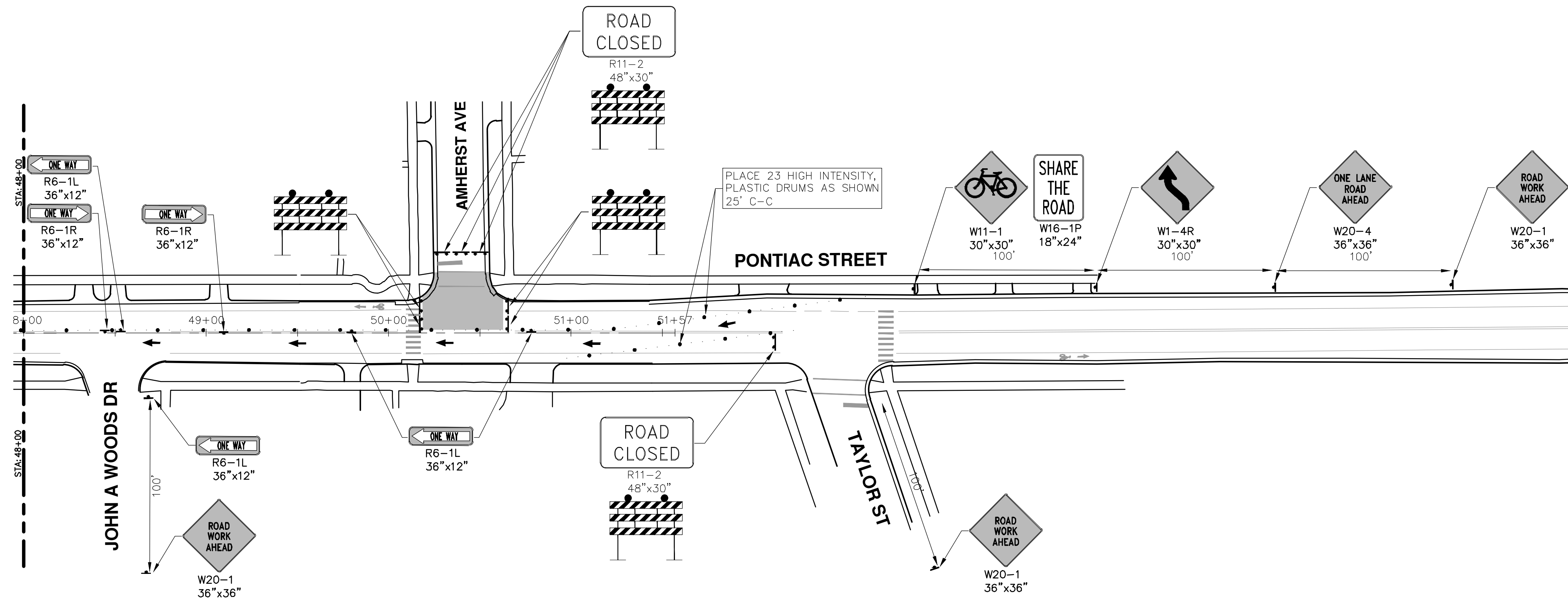
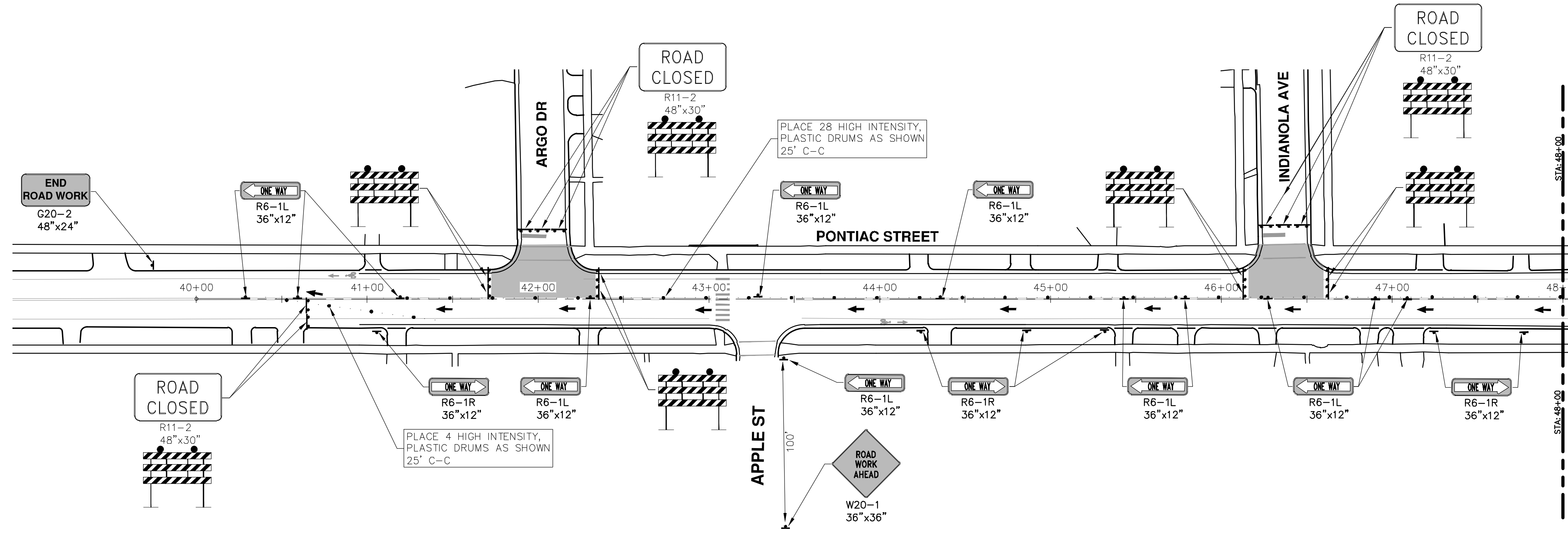
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CITY OF ANN ARBOR - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
TRAFFIC CONTROL  
NORTH BOUND PONTIAC STREET DETOUR

SCALE PLAN: 1" = 300'  
DRAWING No.: 2018019-14  
SHEET No.: 14 OF 54

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REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	JKA	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	CC/DF/KB

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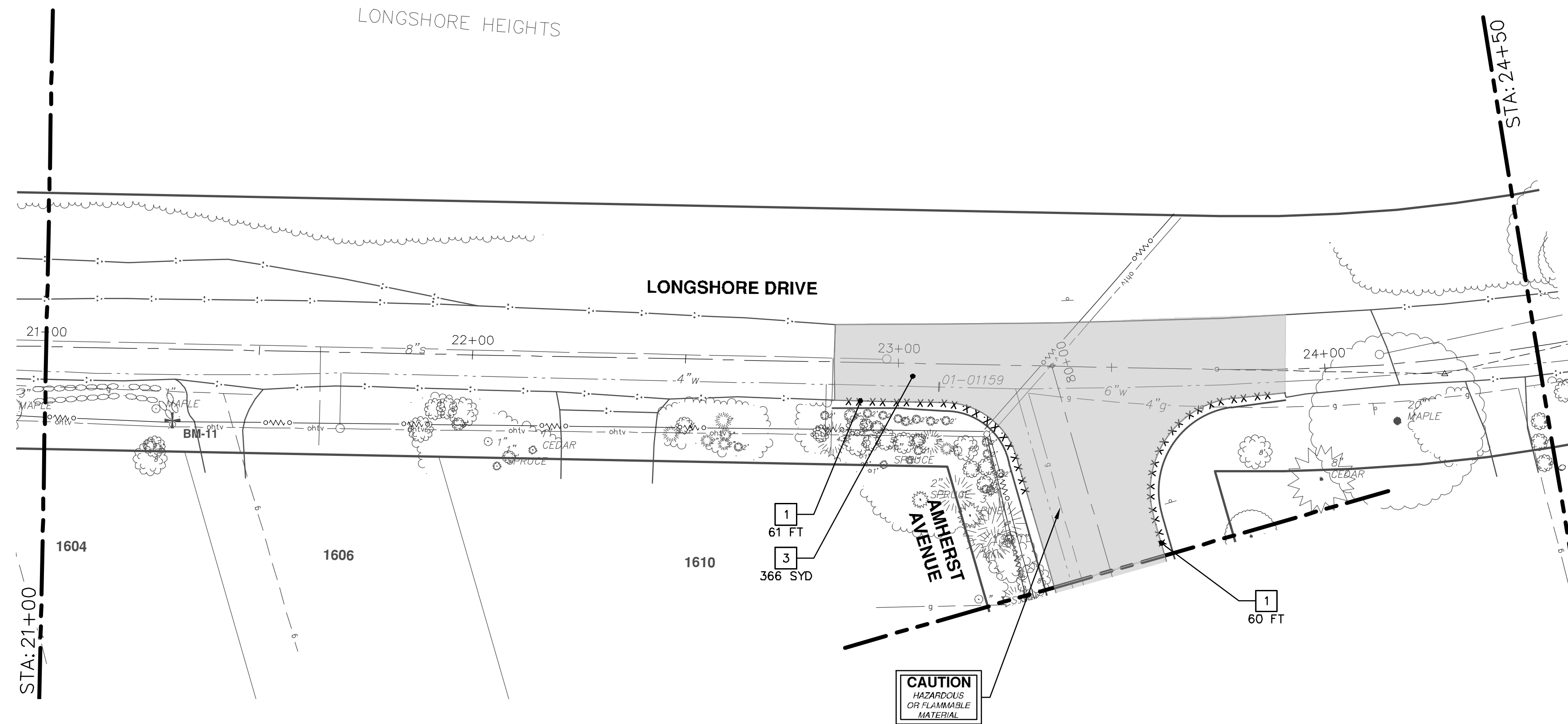
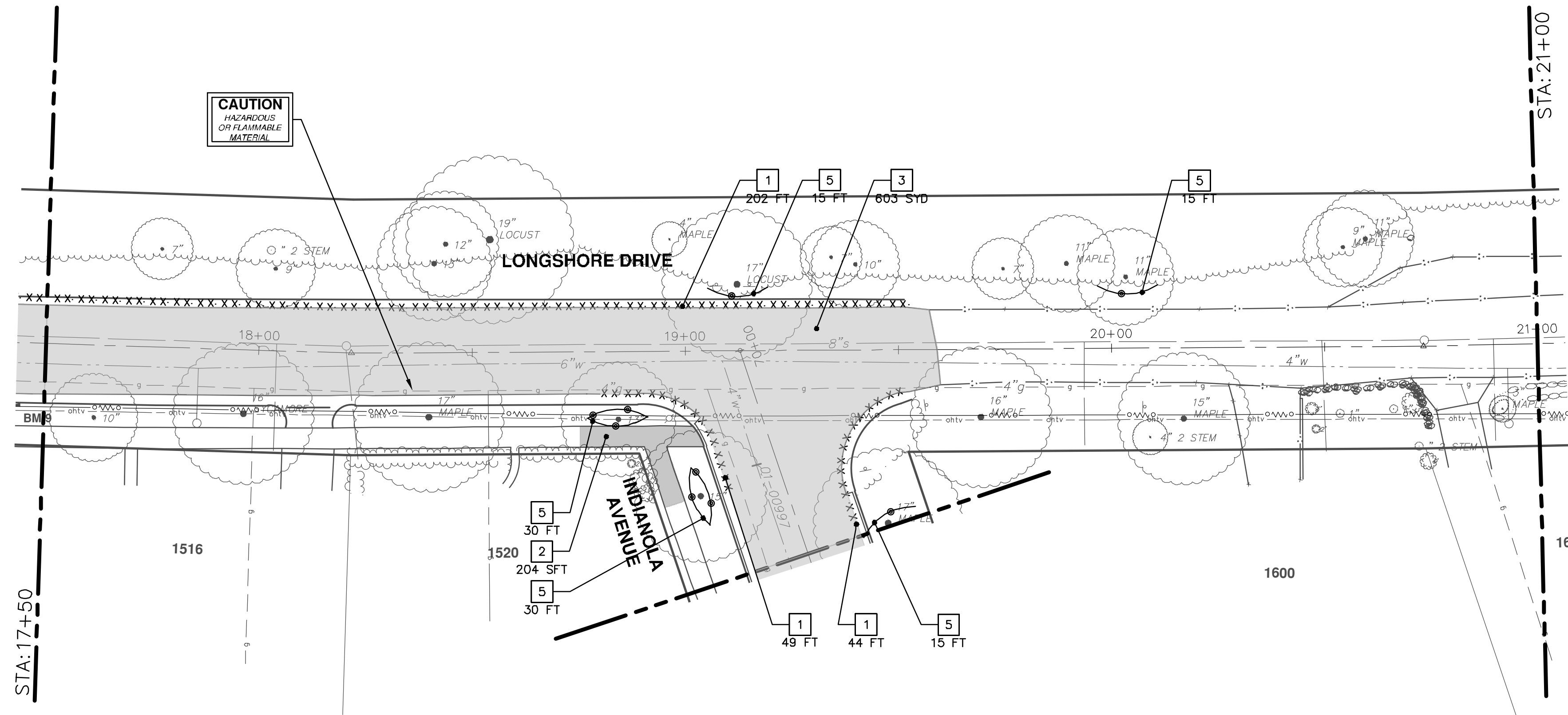


CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
TRAFFIC CONTROL  
WATER MAIN CONNECTION AT PONTIAC STREET

DRAWING No.  
2018019-15

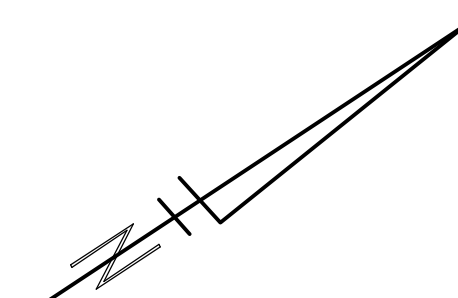


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REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER, - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 8" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

\* SAWCUT FULL DEPTH AT REMOVAL LIMITS



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATERMAIN**

LONGSHORE DRIVE  
REMOVALS - STA. 17+50 - STA. 24+50

17 OF 54

SHEET No.

DRAWING No.  
**2018019-17**

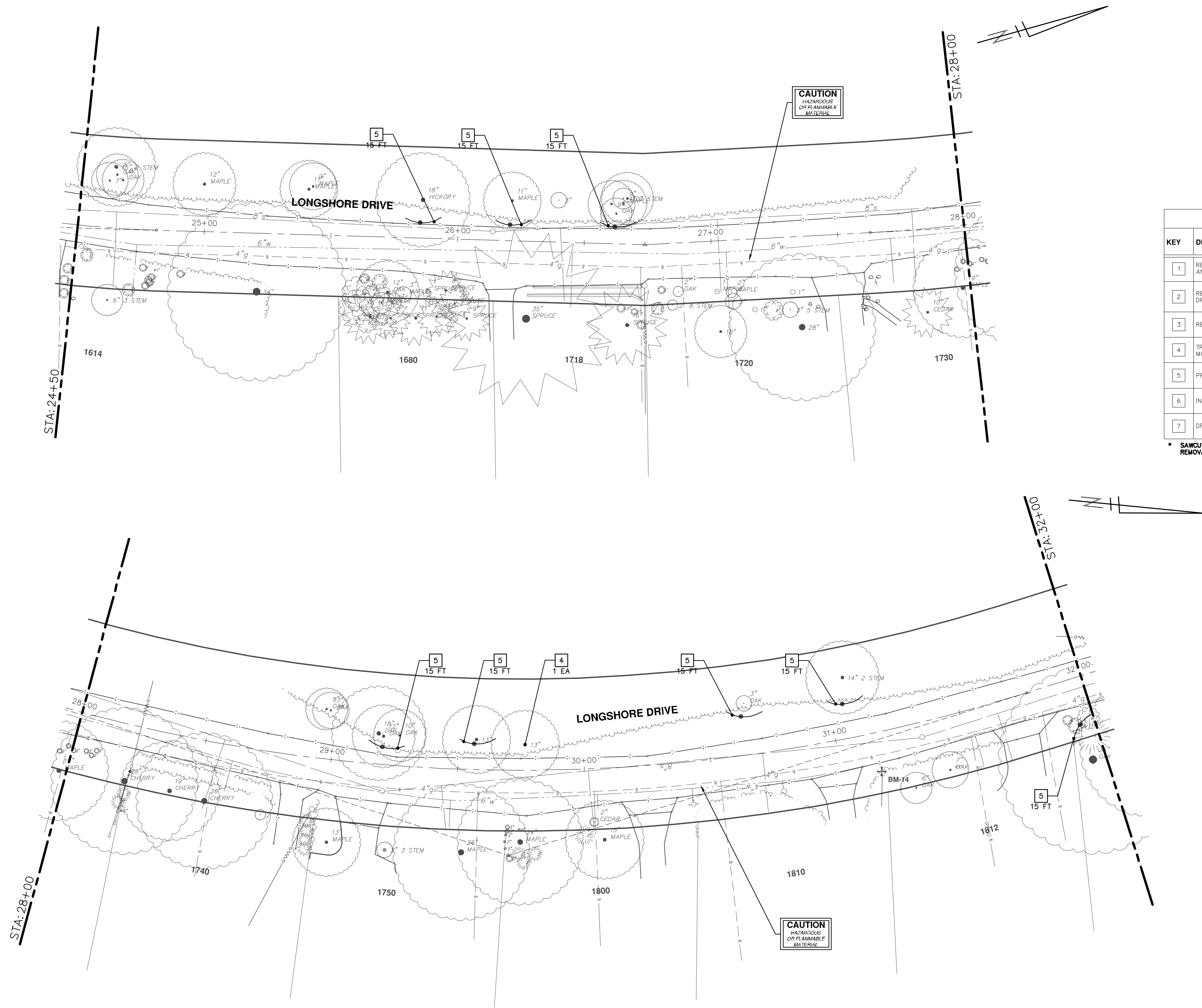
SCALE: 1" = 20'

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01	ADDENDUM No. 1	CC/DF/KB	JKA
02	OUT FOR BID	CC/DF/KB	JKA
03	REV.	DATE	DRAWN
04	2-13-19	1-23-19	CHECKED

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REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 8" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

\* SAWCUT FULL DEPTH AT REMOVAL LIMITS



Know what's below.  
Call Before you dig.

REV.	DATE	DESCRIPTION
01	2-13-19	ADDENDUM No. 1
00	1-23-19	OUT FOR BID
		DRAWN
		CHECKED

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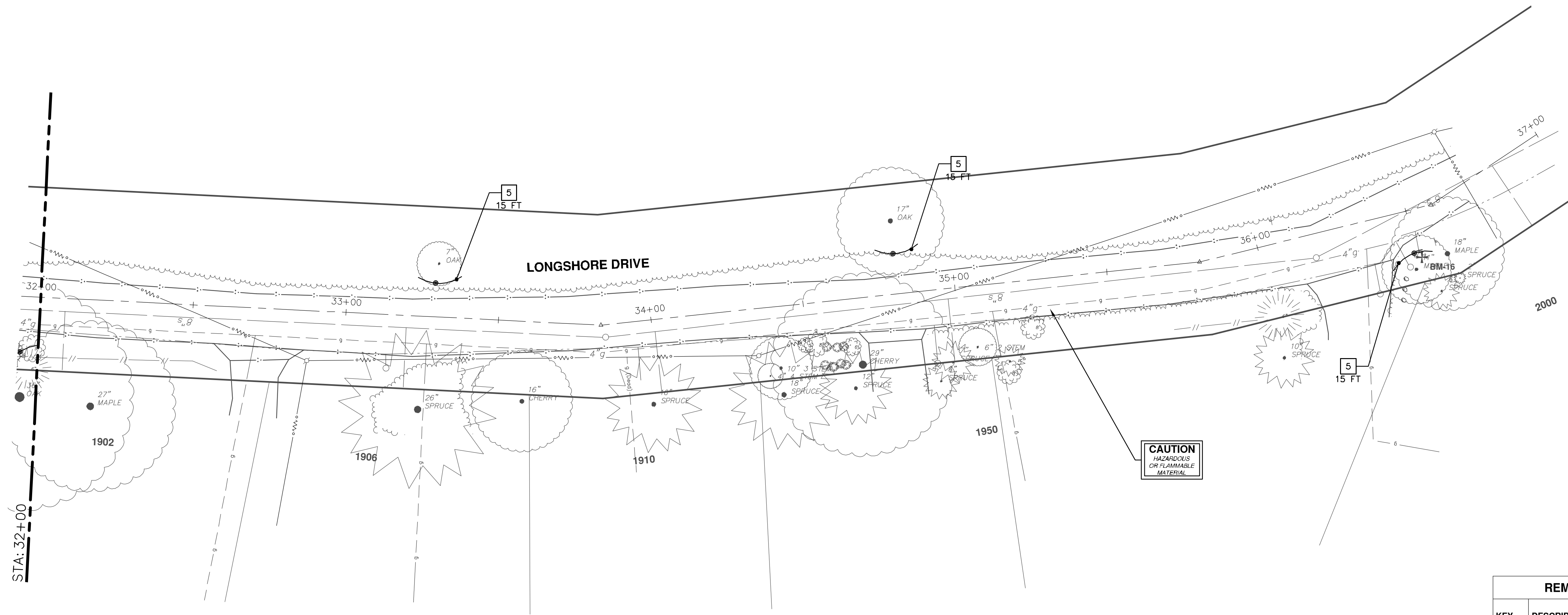


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LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
REMOVALS - STA. 24+50 - STA. 32+00

SCALE: 1" = 20'  
DRAWING No.  
2018019-18

SHEET No.

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**CAUTION**  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER, - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 8" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

\* SAWCUT FULL DEPTH AT REMOVAL LIMITS

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
REMOVALS - STA. 32+00 - P.O.E.

SCALE: 1" = 20'

DRAWING No. 2018019-19

**811**  
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01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA	CHECKED
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA	DRAWN
		DATE			

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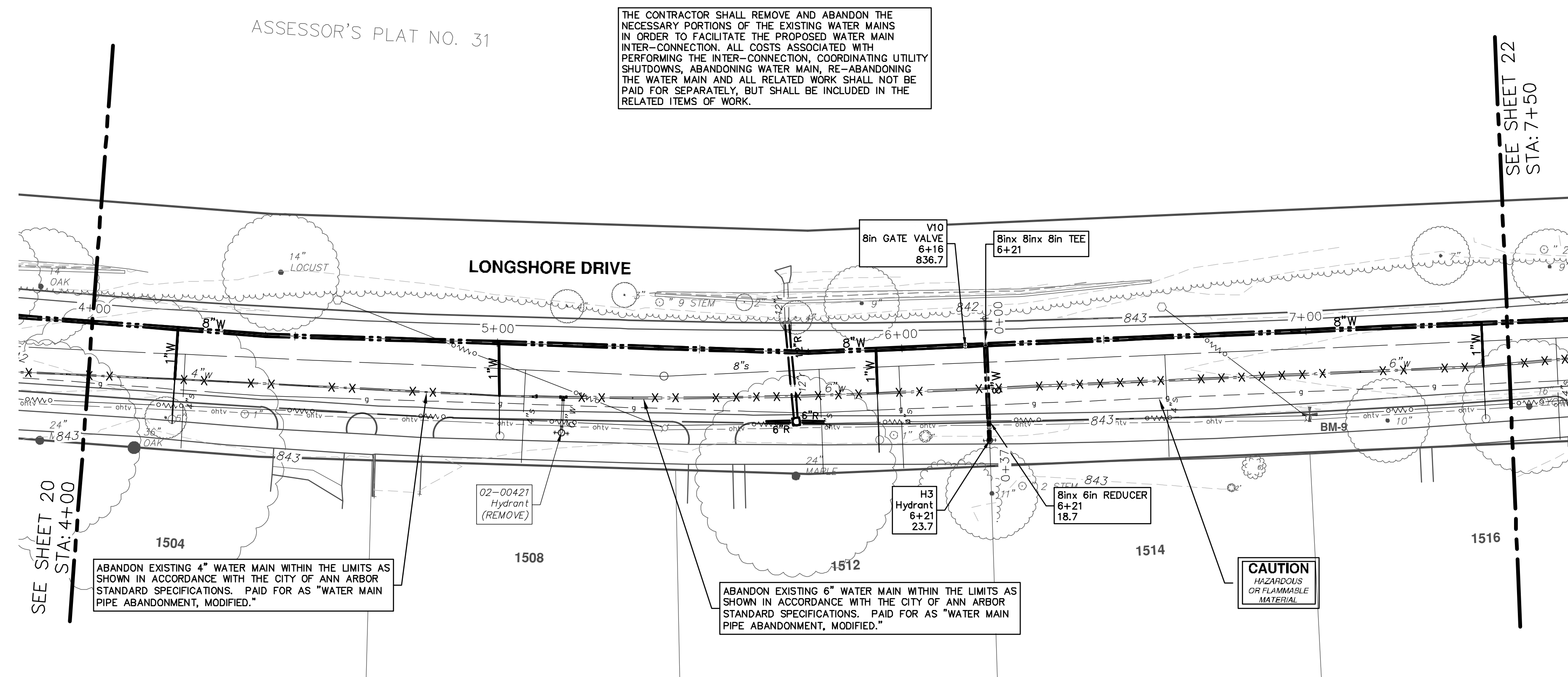
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SHEET No. 19 OF 54





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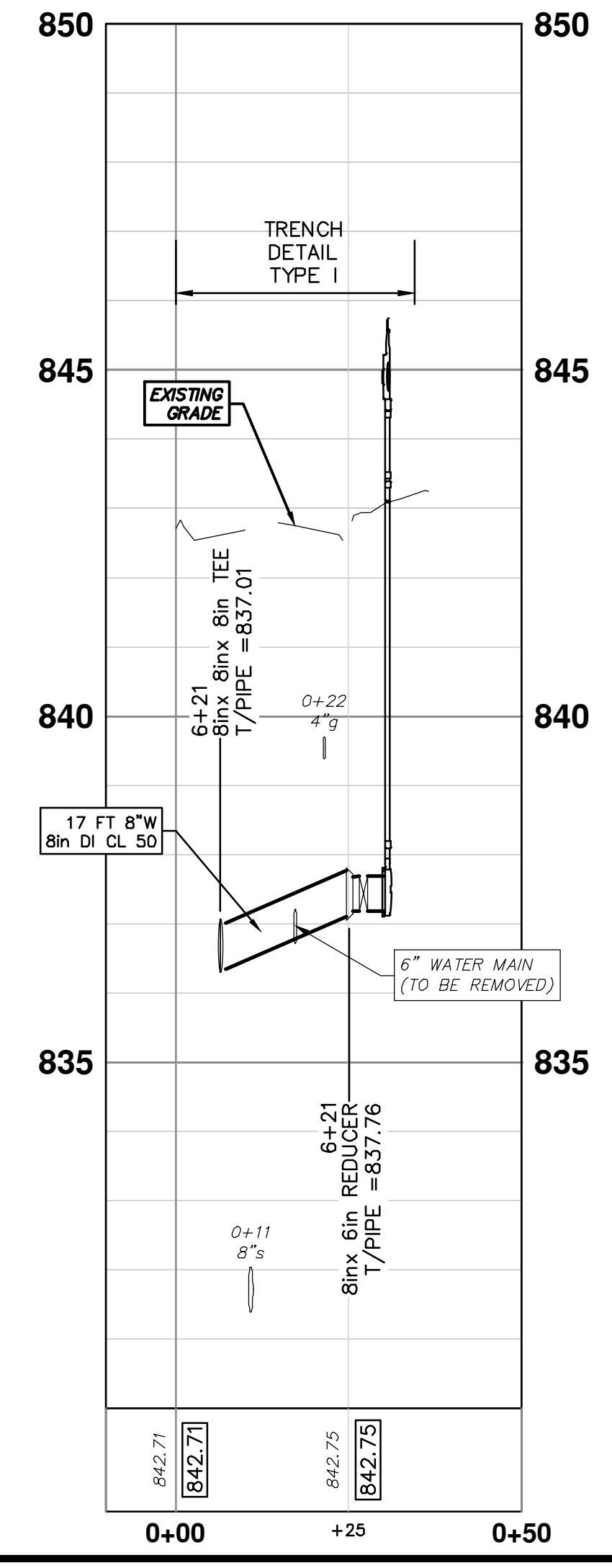
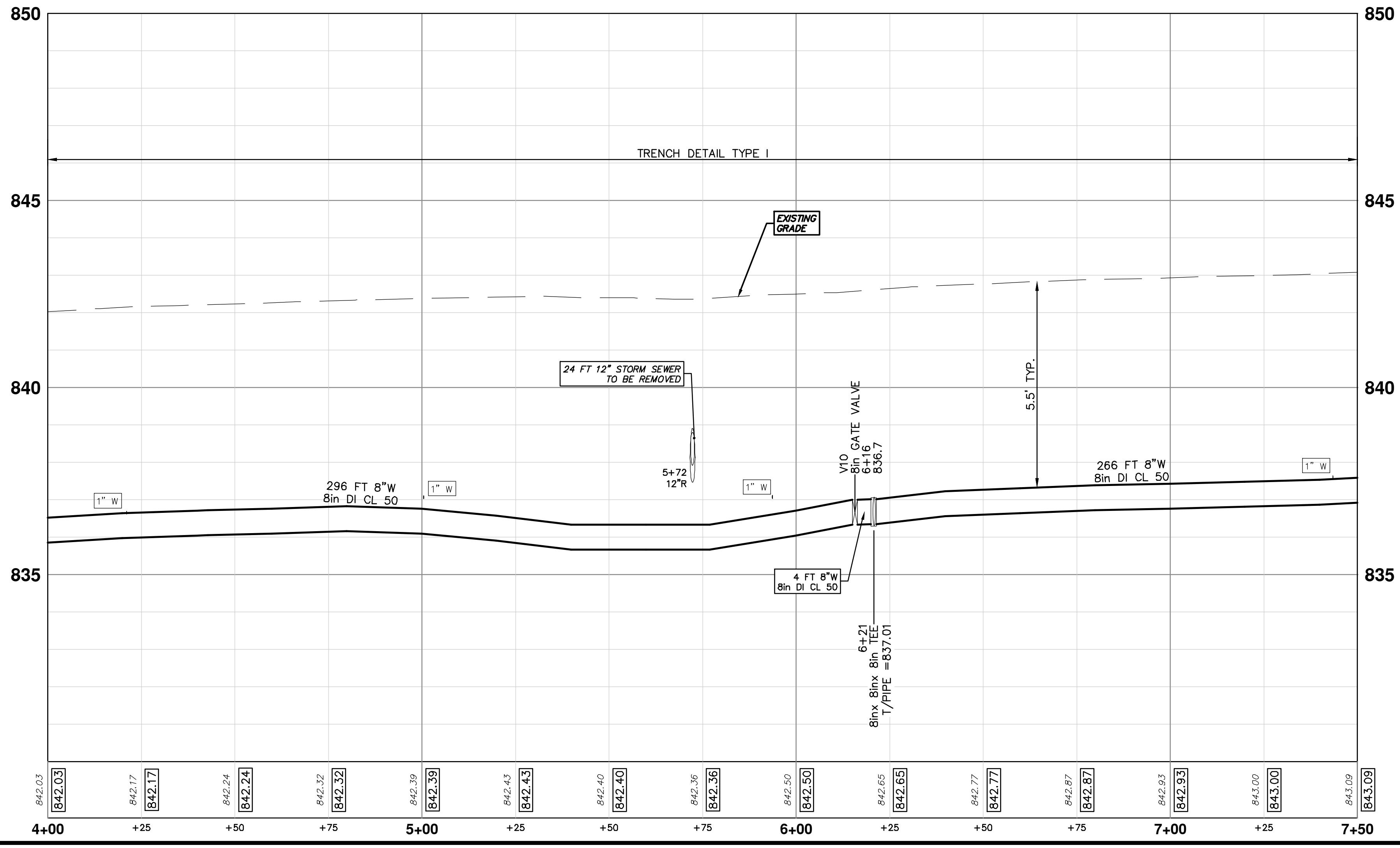
THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 4" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

**CAUTION**  
HAZARDOUS OR FLAMMABLE MATERIAL

STRUCTURE	TYPE	STATION	RIM	DEPTH
H3	Hydrant	6+21	839.87	
V10	8in GATE VALVE	6+16	836.67	



**811**  
Know what's below.  
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REV.	DATE	DESCRIPTION
01	2-13-19	CC/DF/KB
02	1-23-19	CC/DF/KB

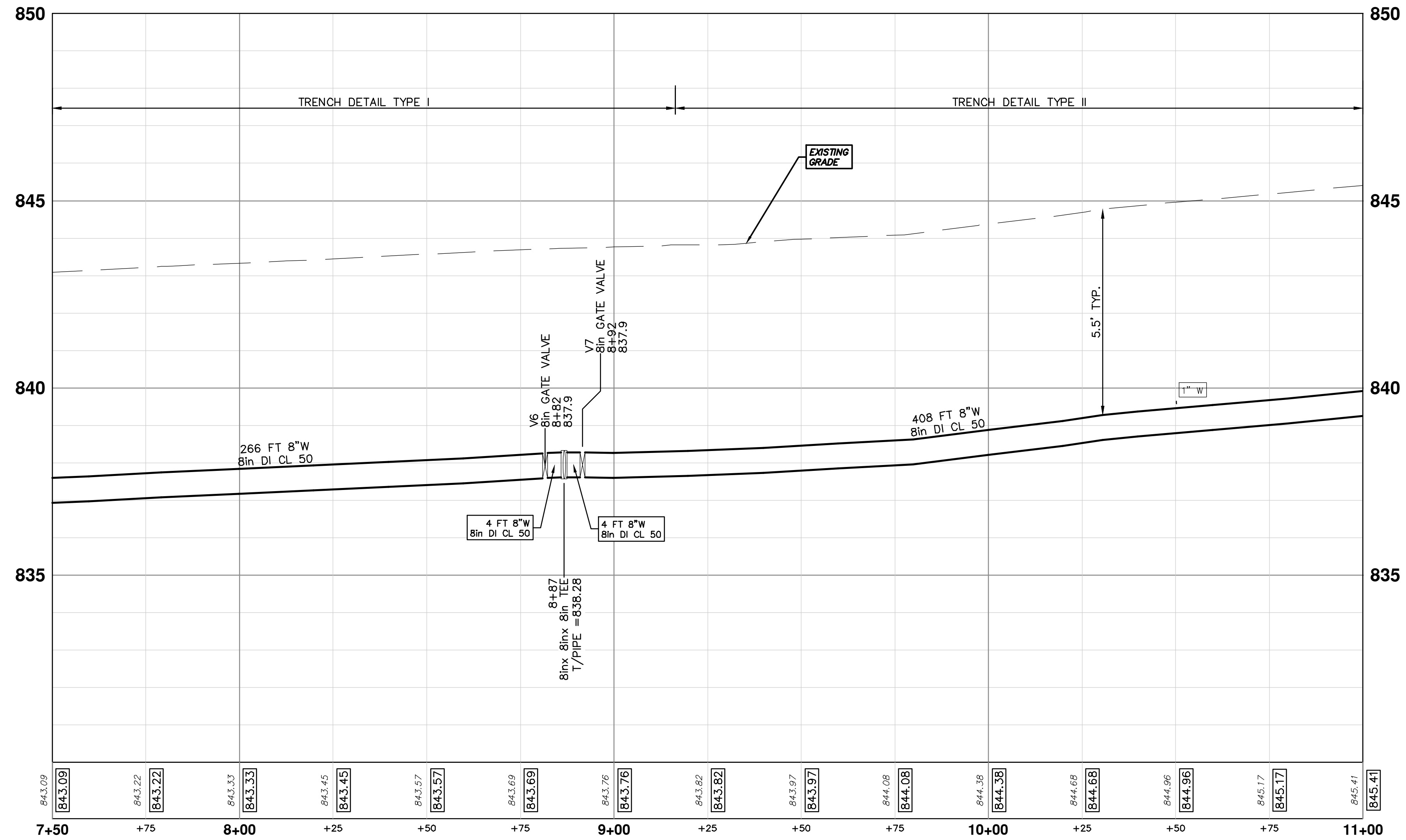
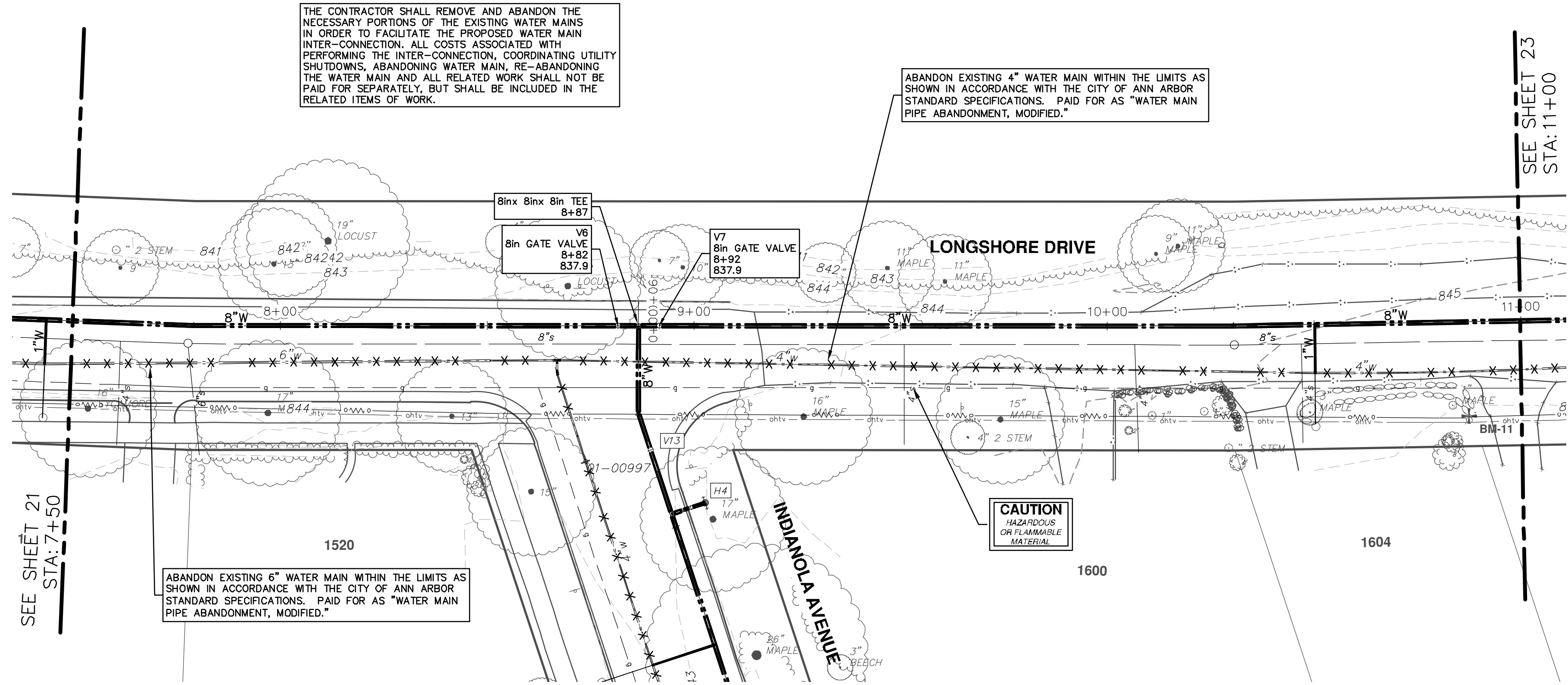
**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
WATER MAIN - STA. 4+00 - STA. 7+50

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

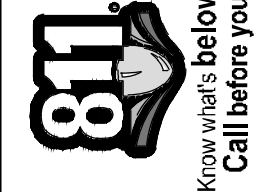
DRAWING No.  
**2018019-21**

SHEET No.  
**21 OF 54**

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WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V7	8in GATE VALVE	8+92		837.94
V6	8in GATE VALVE	8+82		837.92



REV.	DATE	DESCRIPTION
01	2-13-19	CC/DF/KB
00	1-23-19	CC/DF/KB

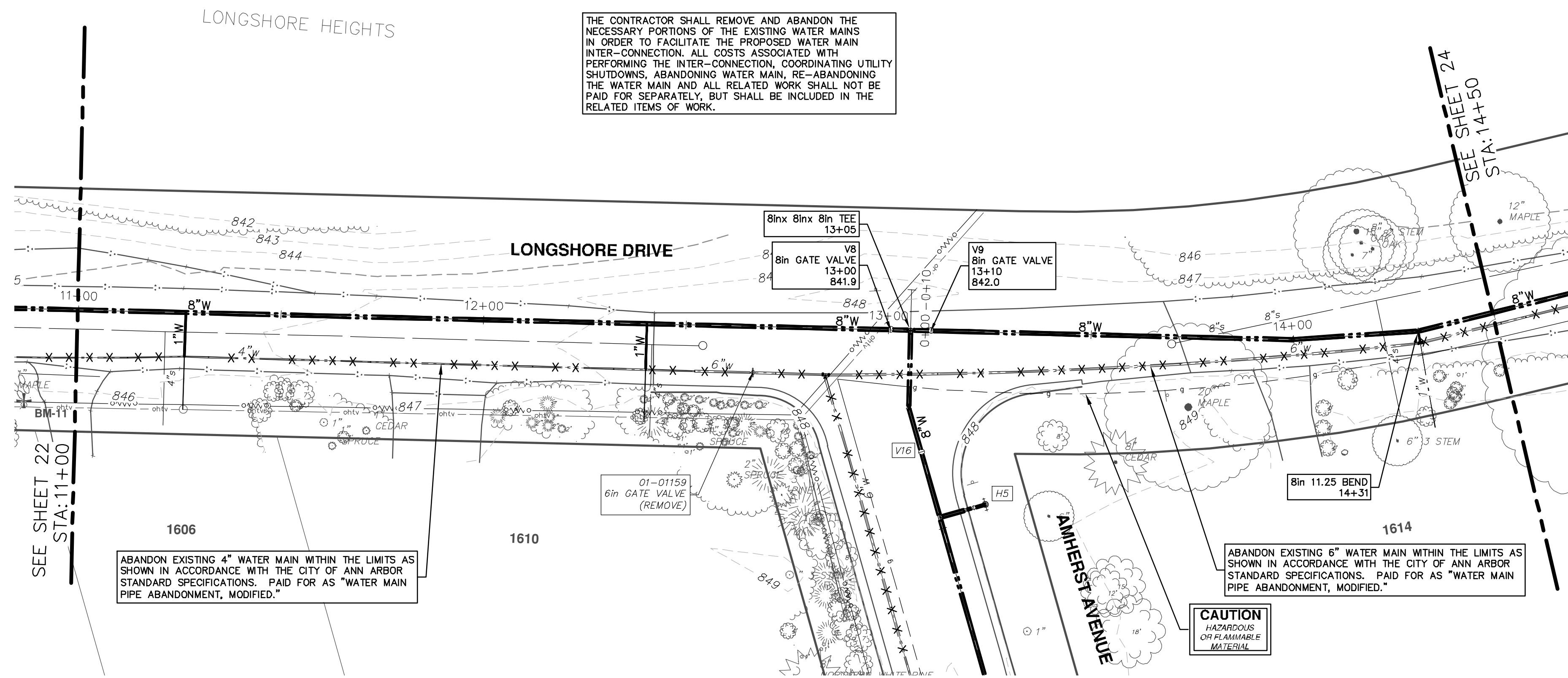
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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
WATER MAIN - STA. 7+50 - STA. 11+00

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'  
DRAWING No. 2018019-22

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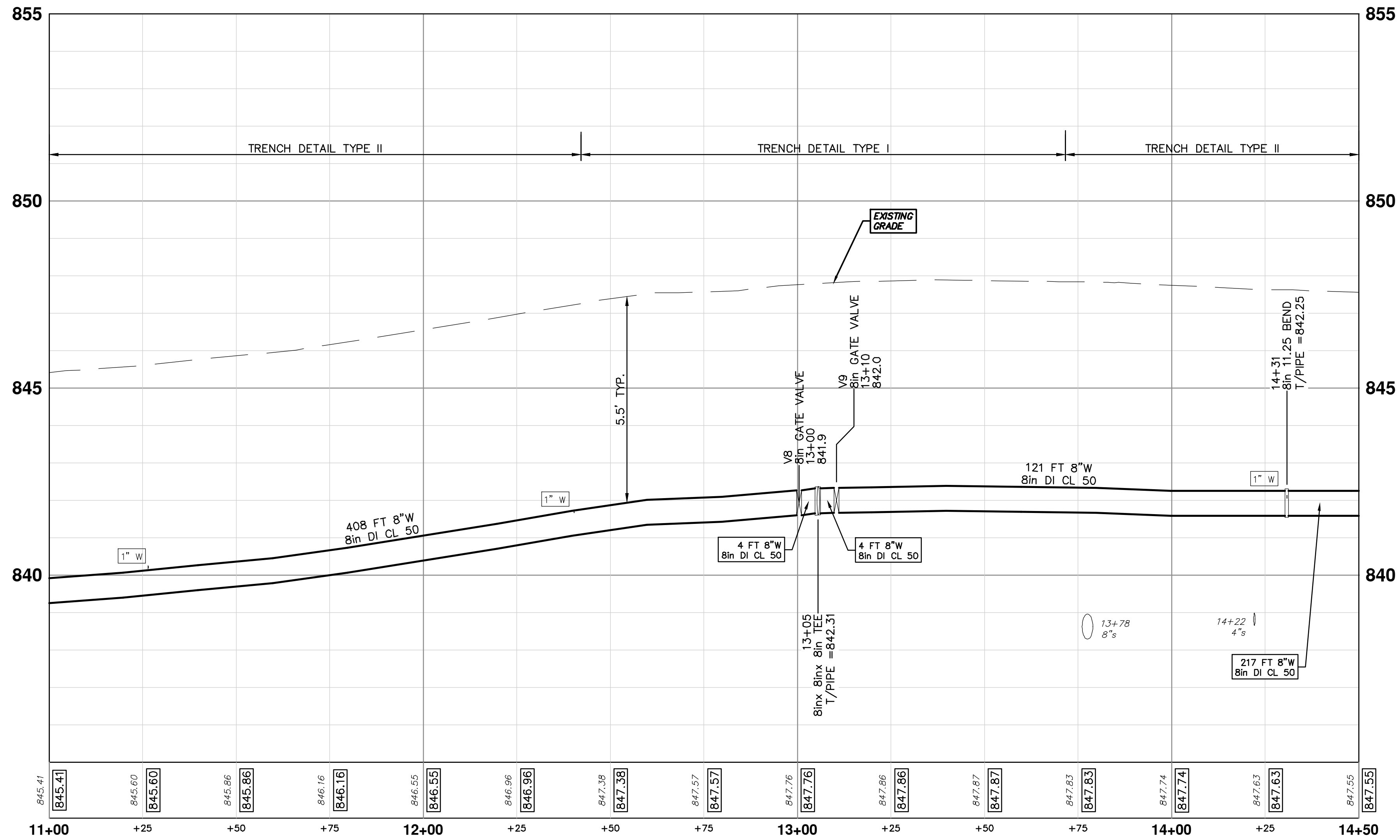
THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 4" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

CAUTION  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

STRUCTURE	TYPE	STATION	RIM	DEPTH
V8	8in GATE VALVE	13+00	841.94	
V9	8in GATE VALVE	13+10	841.99	



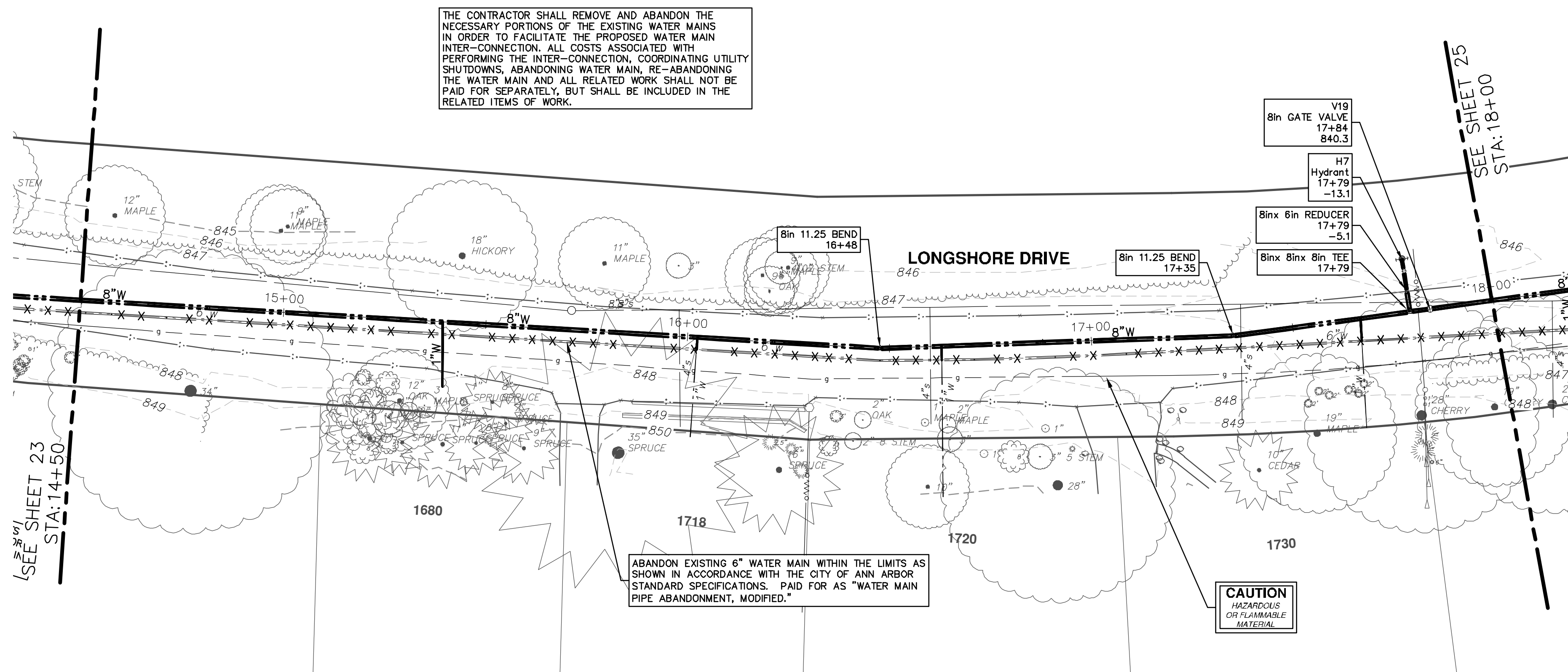
REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA

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CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
WATER MAIN - STA. 11+00 - STA. 14+50

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'  
DRAWING No.  
2018019-23

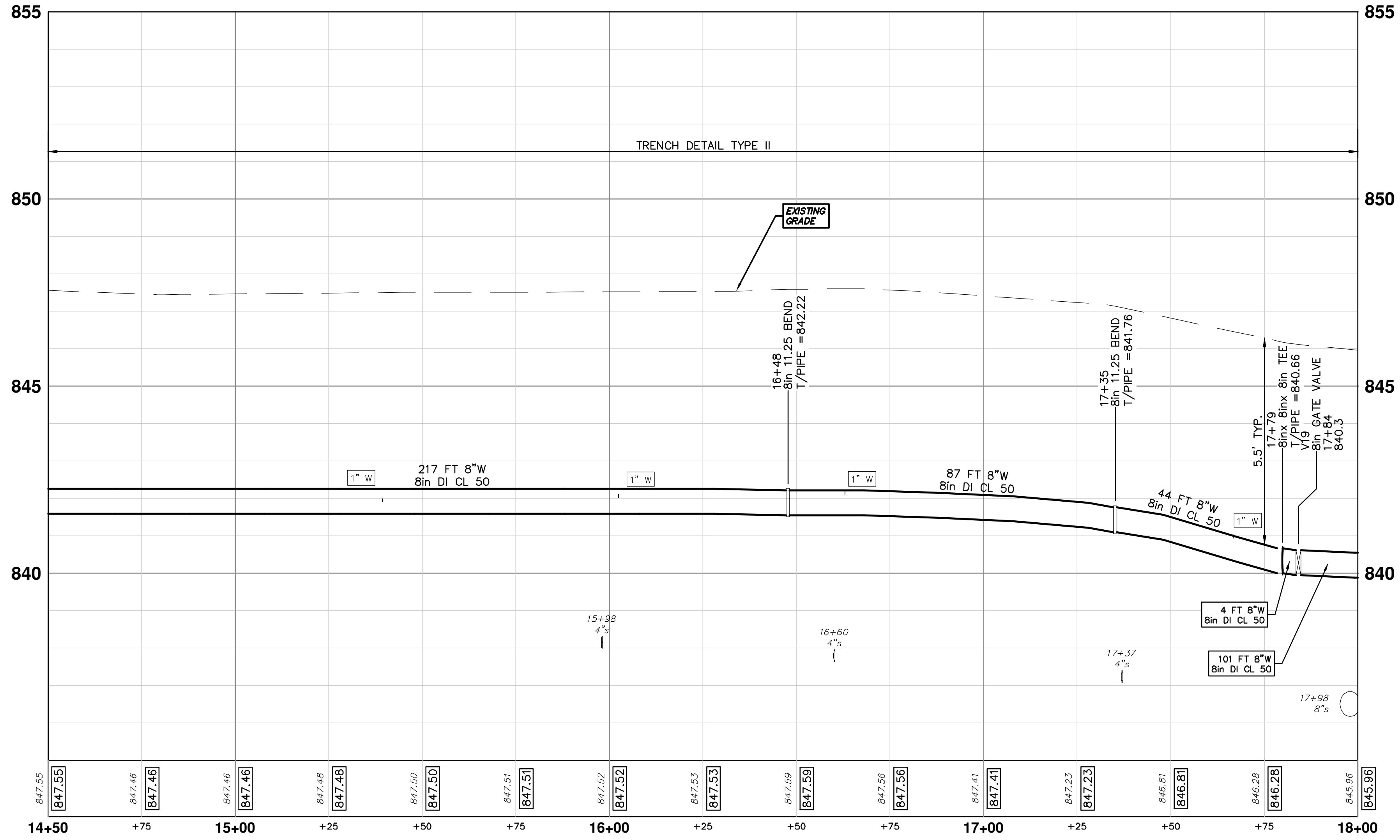


THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

CAUTION  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

STRUCTURE	TYPE	STATION	RIM	DEPTH
V19	8in GATE VALVE	17+84		840.28
H7	Hydrant	17+79		840.98



**811**  
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DATE: 1-23-19  
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CHECKED: JKA

REV. DESCRIPTION

01 ADDENDUM No. 1  
02 OUT FOR BID

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
WATER MAIN - STA. 14+50 - STA. 18+00

SHEET No. 24 OF 54

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

DRAWING No. 2018019-24

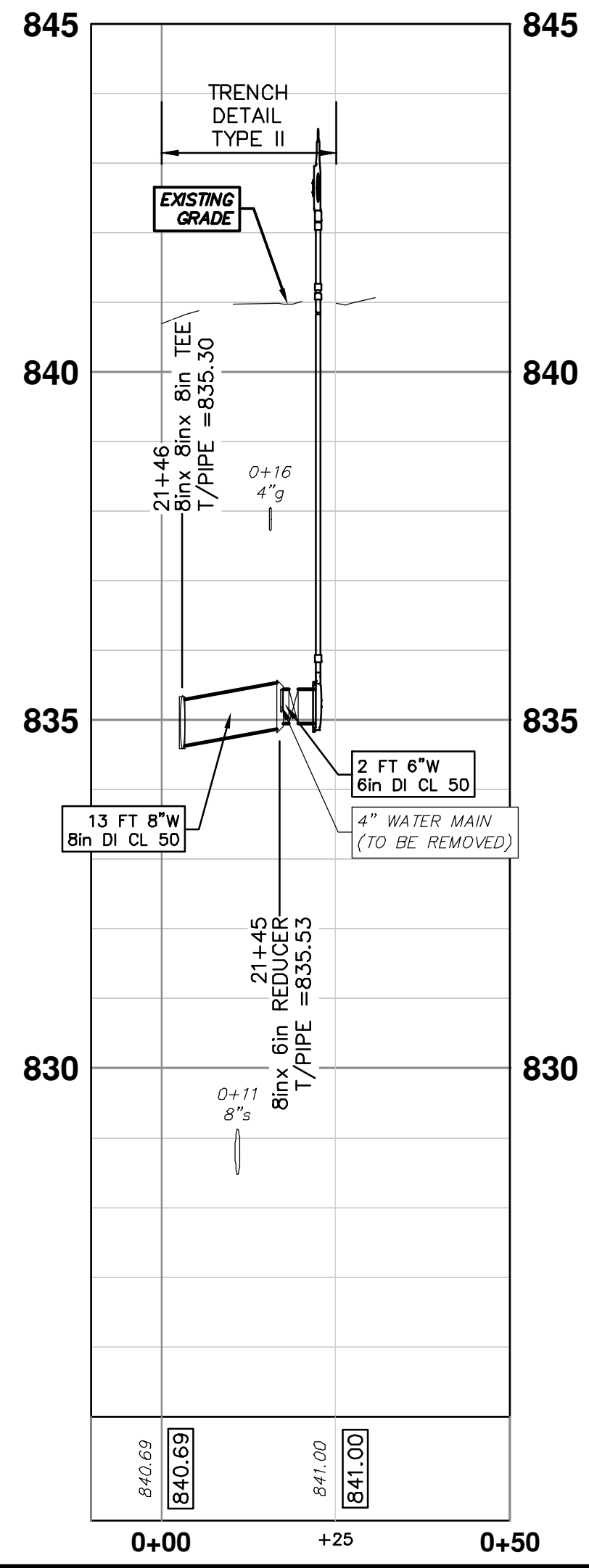
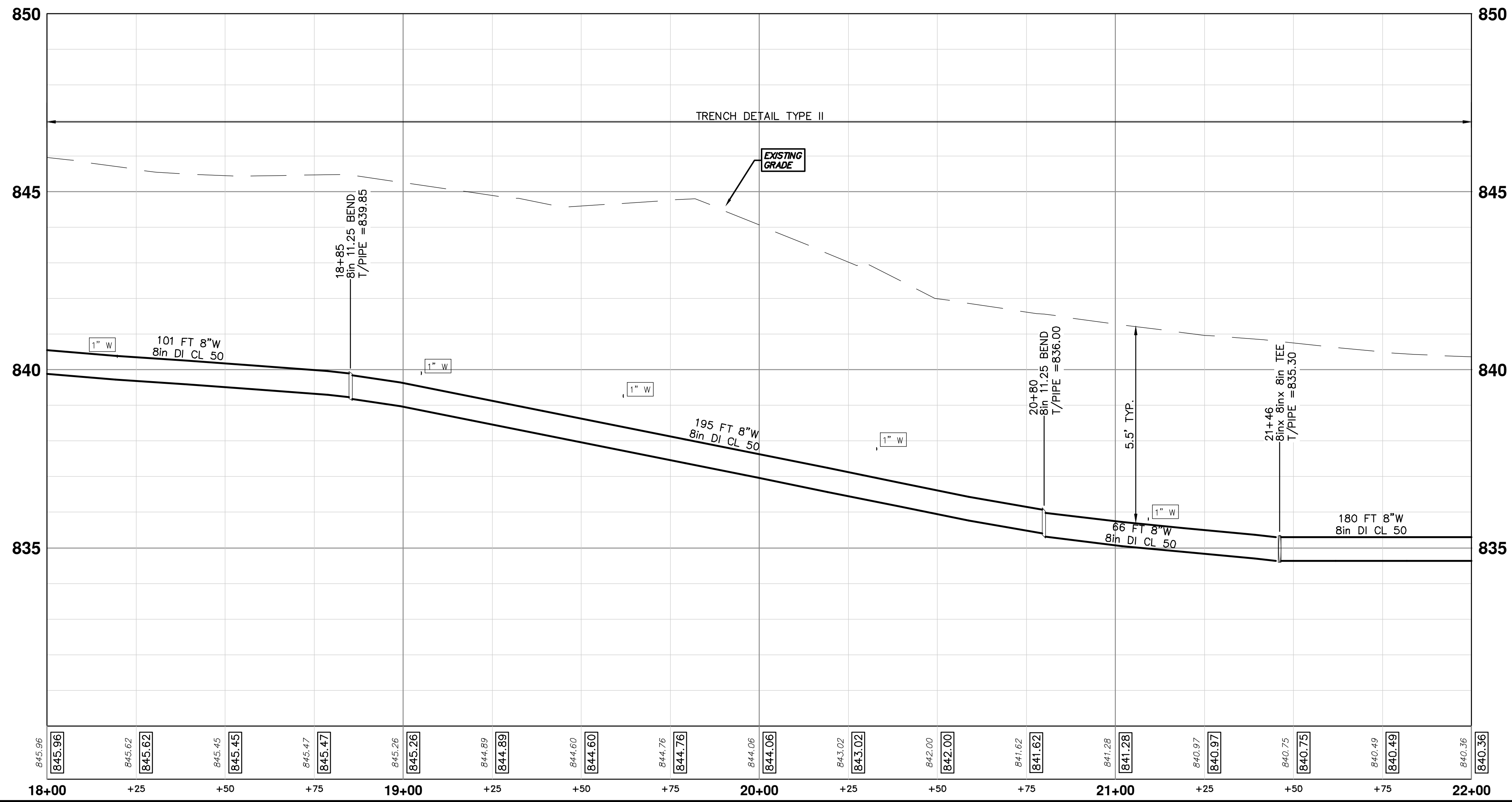
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ANN ARBOR FAX 810-9647  
734-794-4410  
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THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

CAUTION  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
H8	Hydrant	21+45		835.27



REV.	DATE	DESCRIPTION
01	2-13-19	ADDENDUM No. 1
00	1-23-19	OUT FOR BID
		DRAWN
		CHECKED

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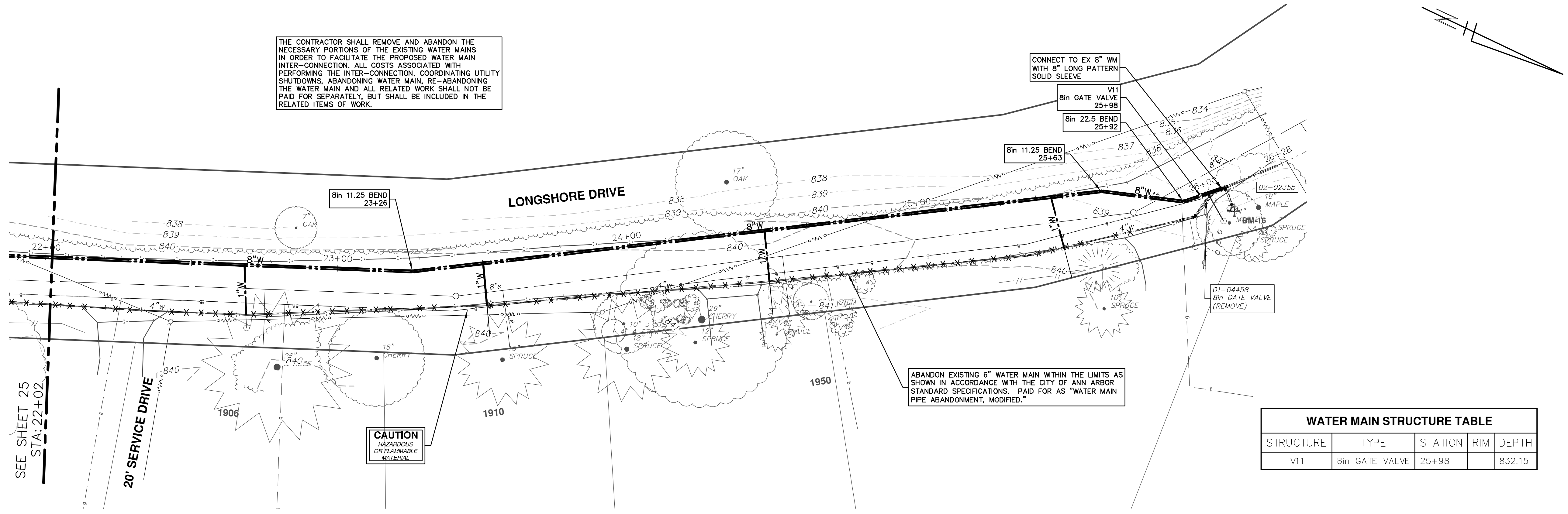


CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
WATER MAIN - STA. 18+00 - STA. 22+00

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'  
DRAWING No.  
2018019-25

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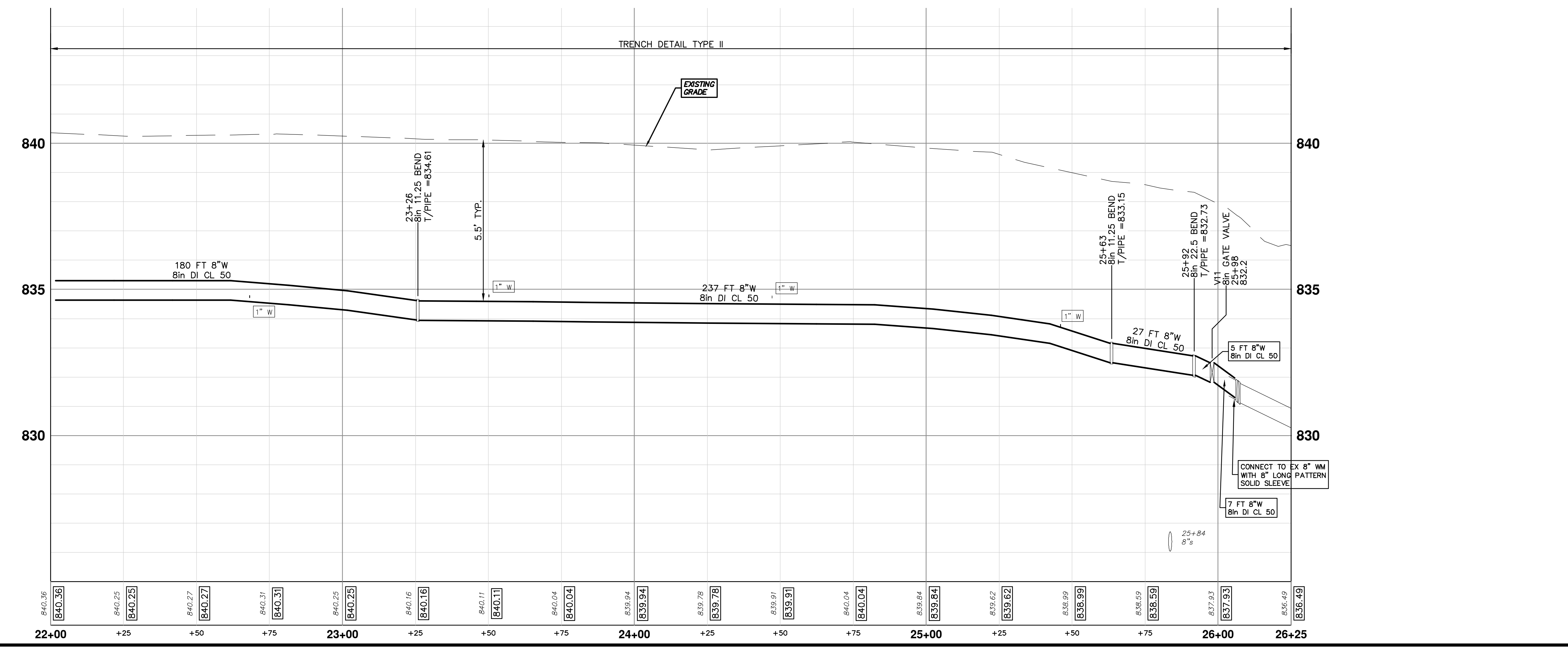
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THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V11	8in GATE VALVE	25+98		832.15



**811**  
Know what's below.  
Call Before you dig.

DATE: 1-23-19  
DRAWN: JKA  
CHECKED: JKA

REV. DESCRIPTION

01 ADDENDUM No. 1  
2-13-19 CC/DF/JKB

00 OUT FOR BID  
1-23-19 CC/DF/JKB

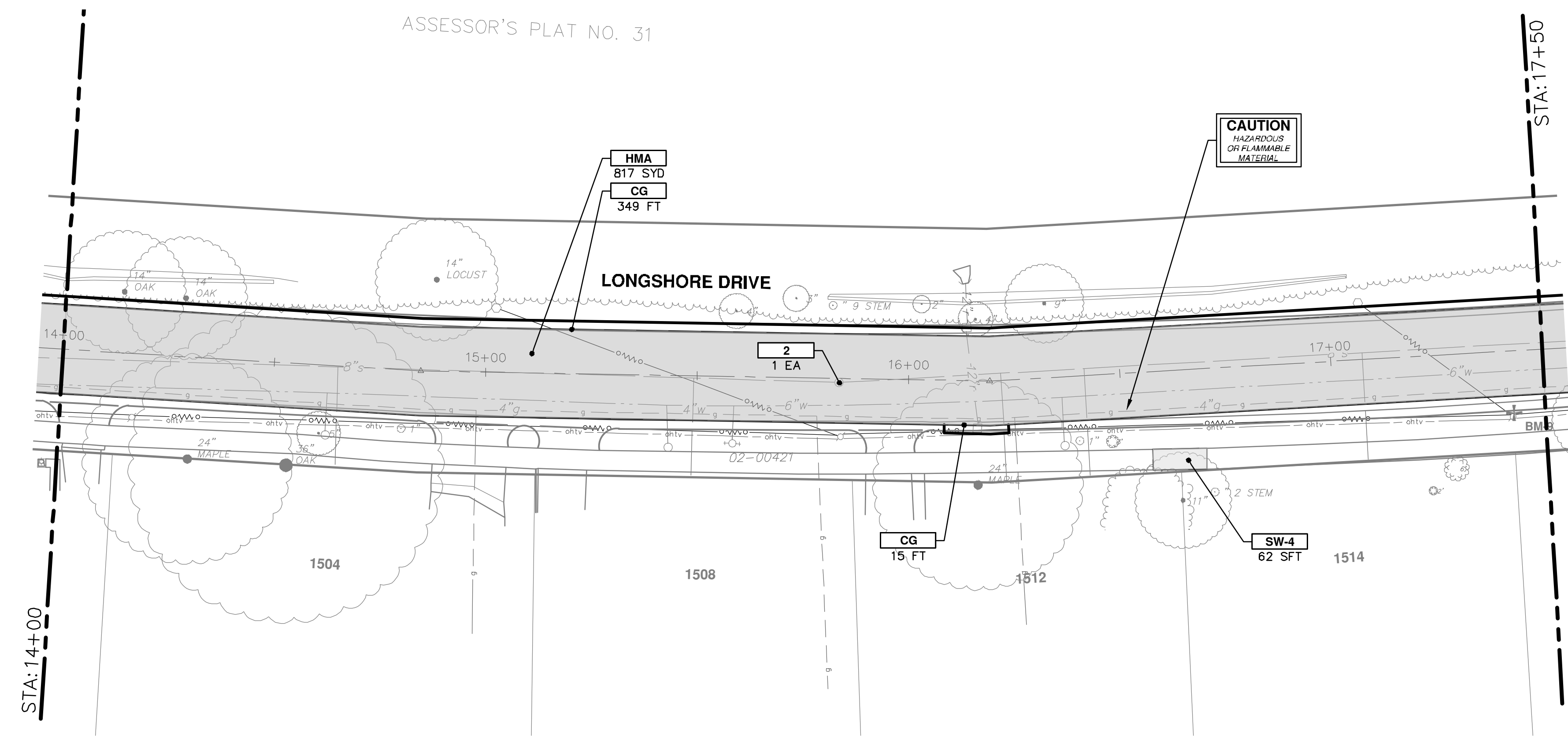
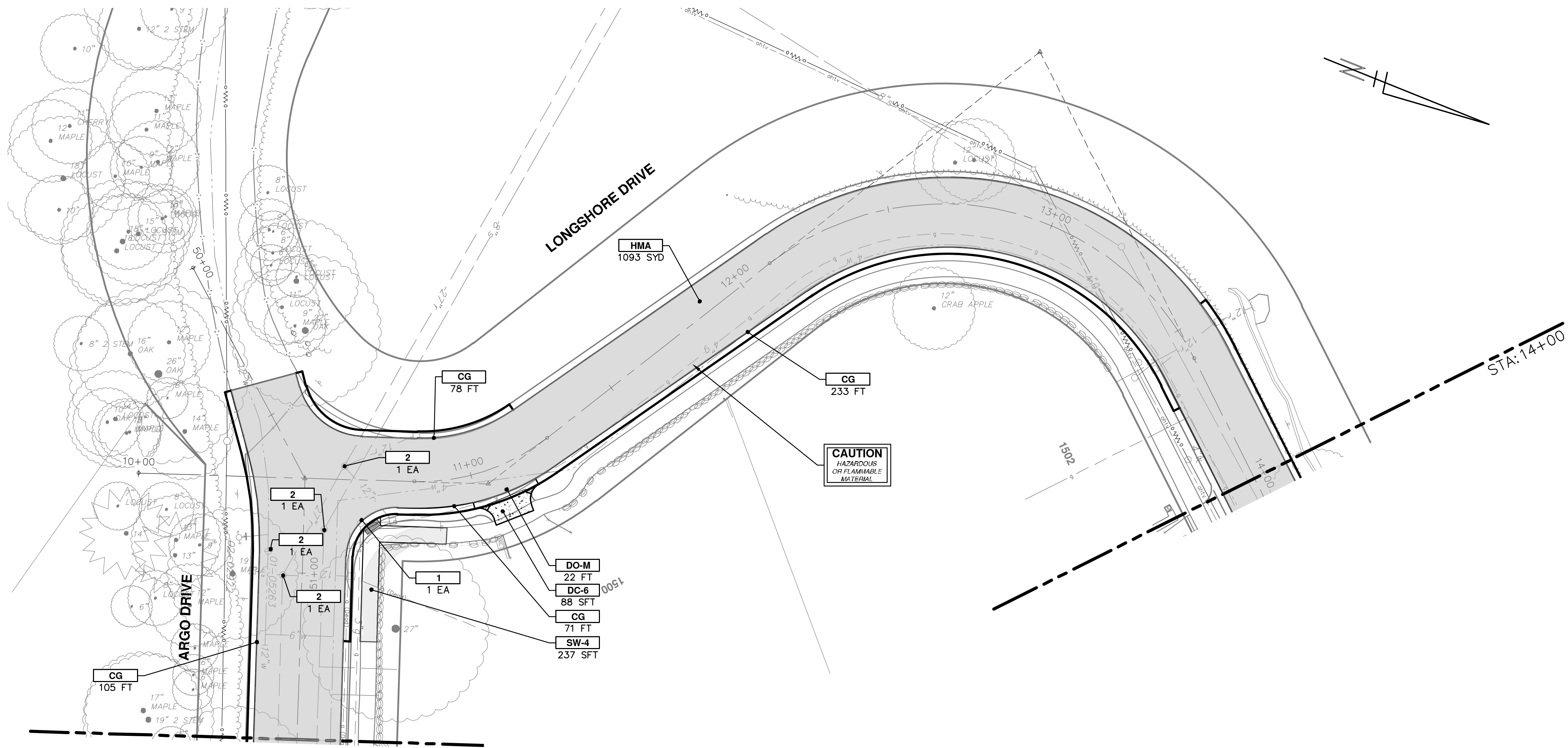
**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
**LONGSHORE INDIANOLA OTTAWA**  
**ARGO AMHERST WATERMAIN**  
 LONGSHORE DRIVE  
 WATER MAIN - STA. 22+00 - STA. 26+25

SHEET No. **26 OF 54**

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

DRAWING No. **2018019-26**

ANN ARBOR PUBLIC SERVICES  
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ANN ARBOR, MI 48106-8647  
734.794.4410  
www.a3gov.org



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP, PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC, F4, SPECIAL.
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC.
DC-6	PLACE CONC. DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED.
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED.
DWS	DETECTABLE WARNING, CAST IN PLACE.
ABO	ADJUST BY OTHERS.
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER.

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATERMAIN**

LONGSHORE DRIVE  
ROAD - STA. 10+00 - STA. 17+50

DRAWING No. **2018019-27**

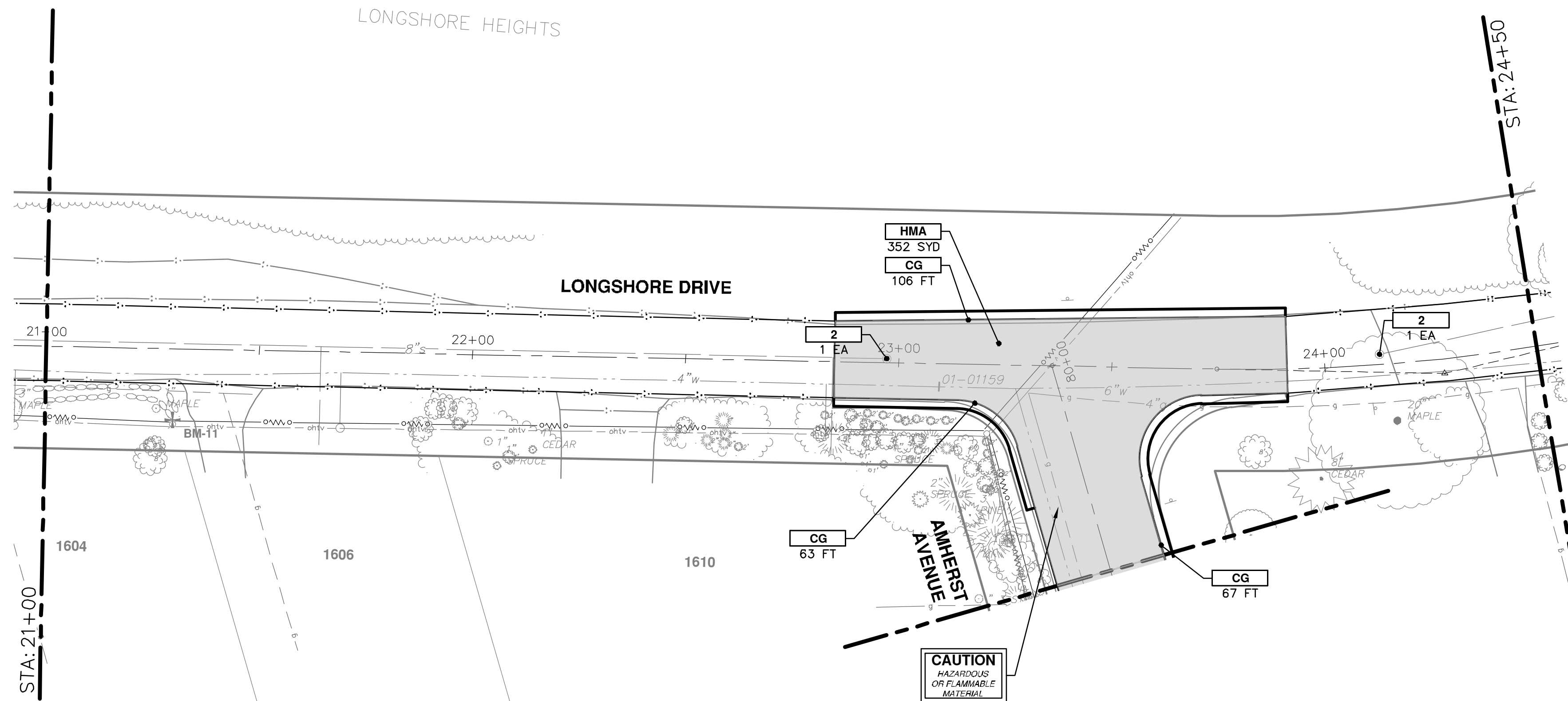
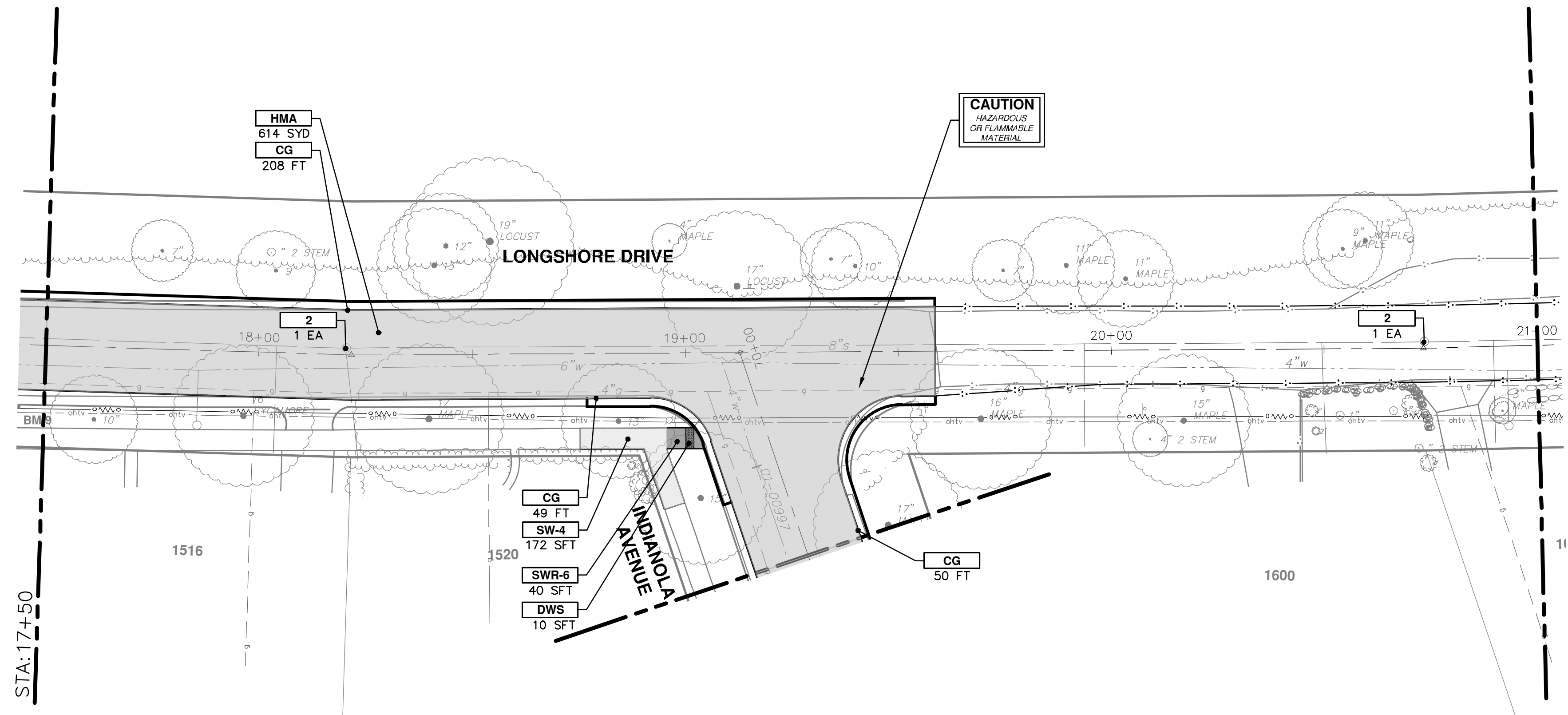
SHEET No. **27 OF 54**

**811**  
Know what's below.  
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REV.	DATE	DESCRIPTION
01	2-13-19	ADDENDUM No. 1
00	1-23-19	OUT FOR BID

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734-794-4410  
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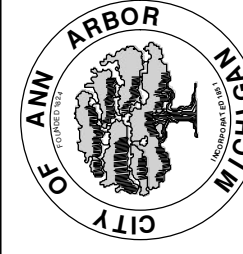
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CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP, PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC, F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC
DC-6	PLACE CONC, DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER



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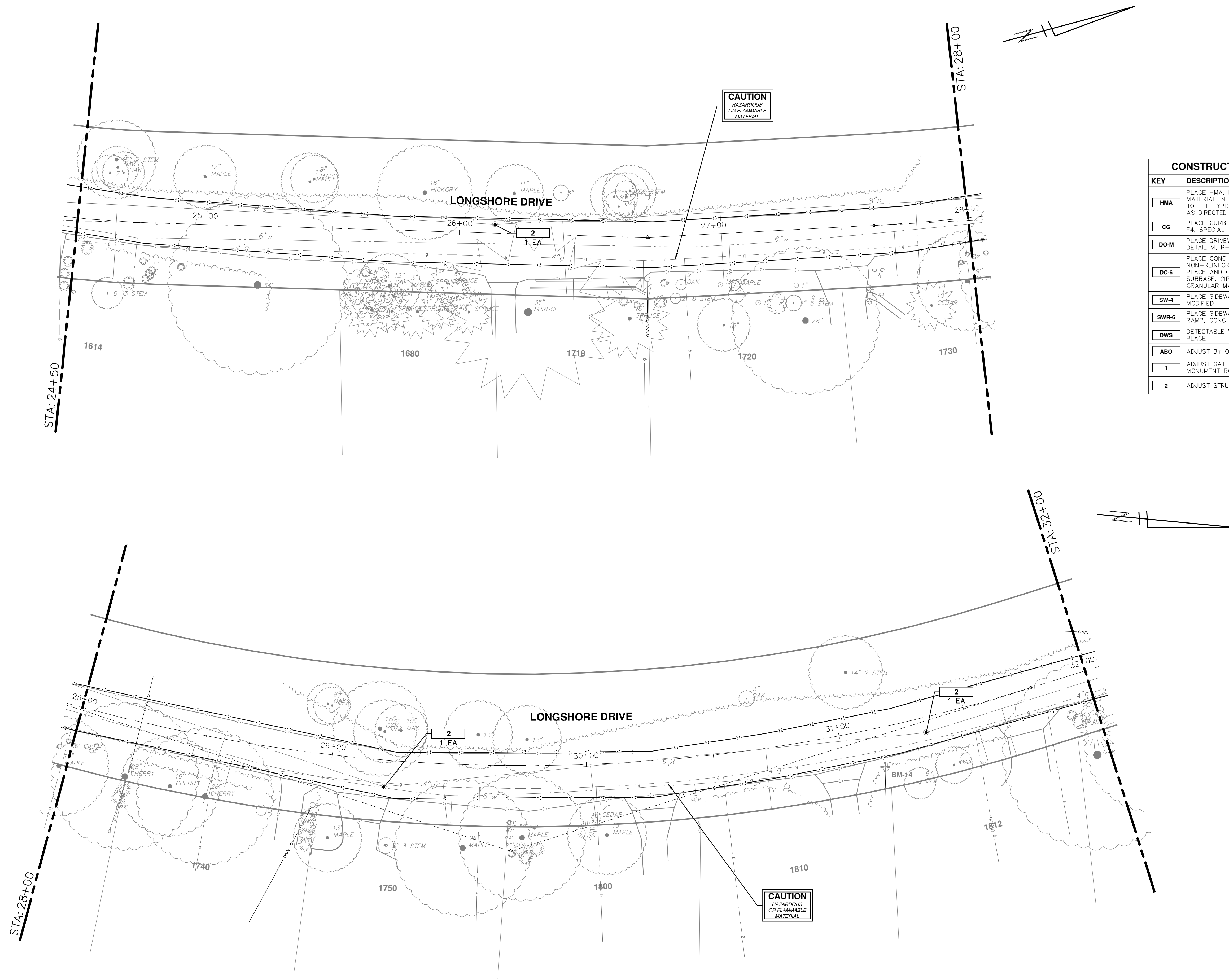
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
LONGSHORE DRIVE  
ROAD - STA. 17+50 - STA. 24+50

SCALE: 1" = 20'  
DRAWING No.  
2018019-28

REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA



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CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC, F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NG
DC-6	PLACE CONC, DRIVE APPROACH, NON-REINFORCED, P-NG, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATERMAIN**

LONGSHORE DRIVE  
ROAD - STA. 24+50 - STA. 32+00

SCALE: 1" = 20'

DRAWING No. **2018019-29**

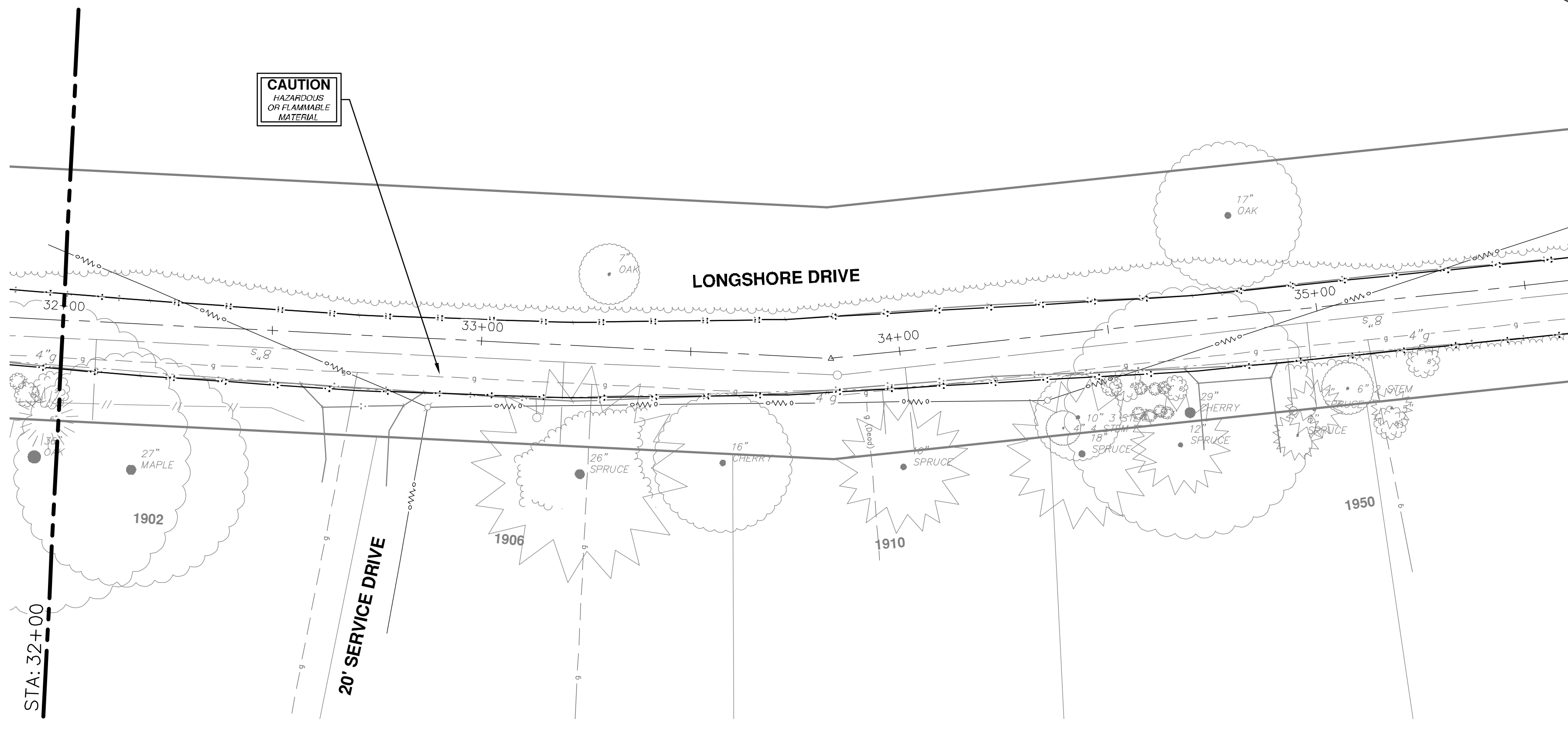
SHEET No. **29 OF 54**

**811**  
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CC/DJ/KB	JKA	
2-13-19		
CC/DJ/KB	JKA	
1-23-19		
DATE	DRAWN	CHECKED

ADDENDUM No. 1  
OUT FOR BID  
DESCRIPTION  
REV.

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**CAUTION**  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

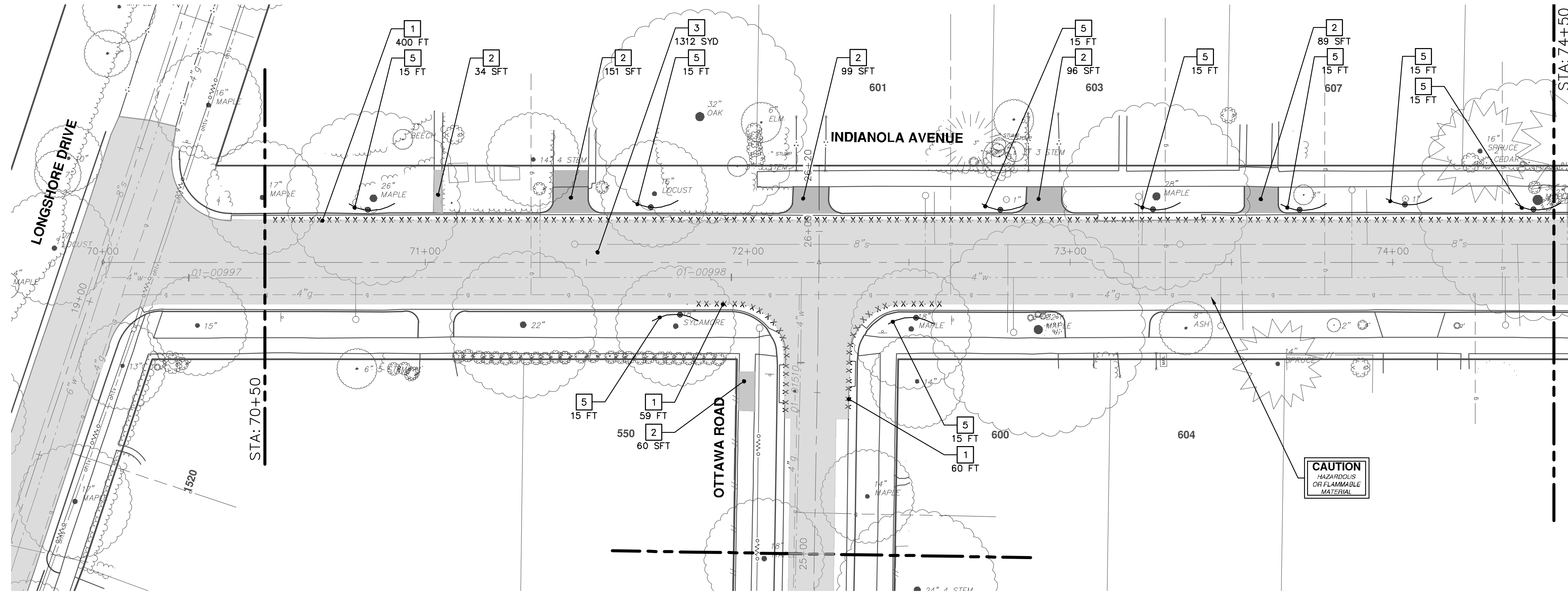
CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC. F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC. DETAIL M, P-NC
DC-6	PLACE CONC. DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER



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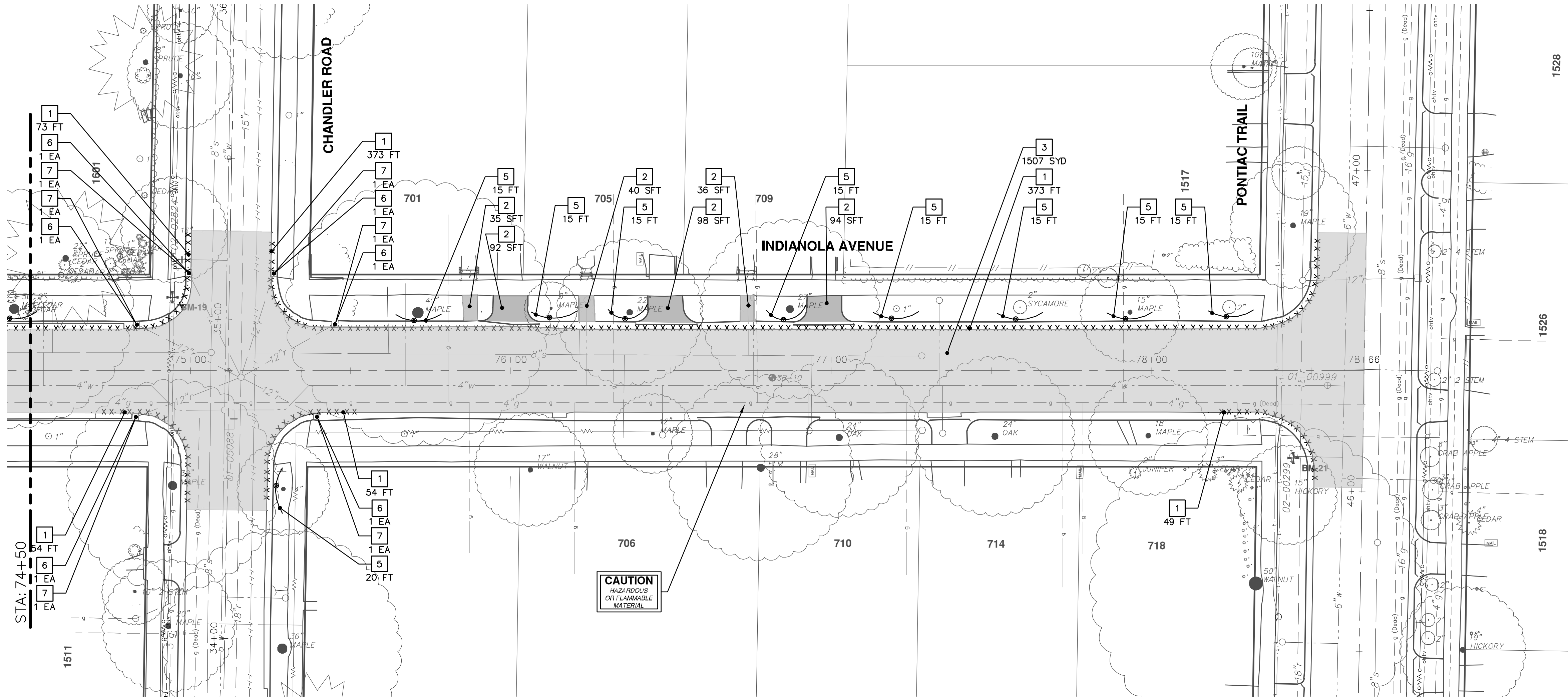
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00	OUT FOR BID	1-23-19	CC/DF/KB	JKA





REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 6" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

• SAWCUT FULL DEPTH AT REMOVAL LIMITS



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATERMAIN**

**INDIANOLA AVENUE**

**REMOVALS**

SCALE: 1" = 20'

DRAWING No. **2018019-31**

SHEET No. **31 OF 54**

REV.	DESCRIPTION	DATE	DRAWN / CHECKED
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00	OUT FOR BID	1-23-19	JKA / JKA

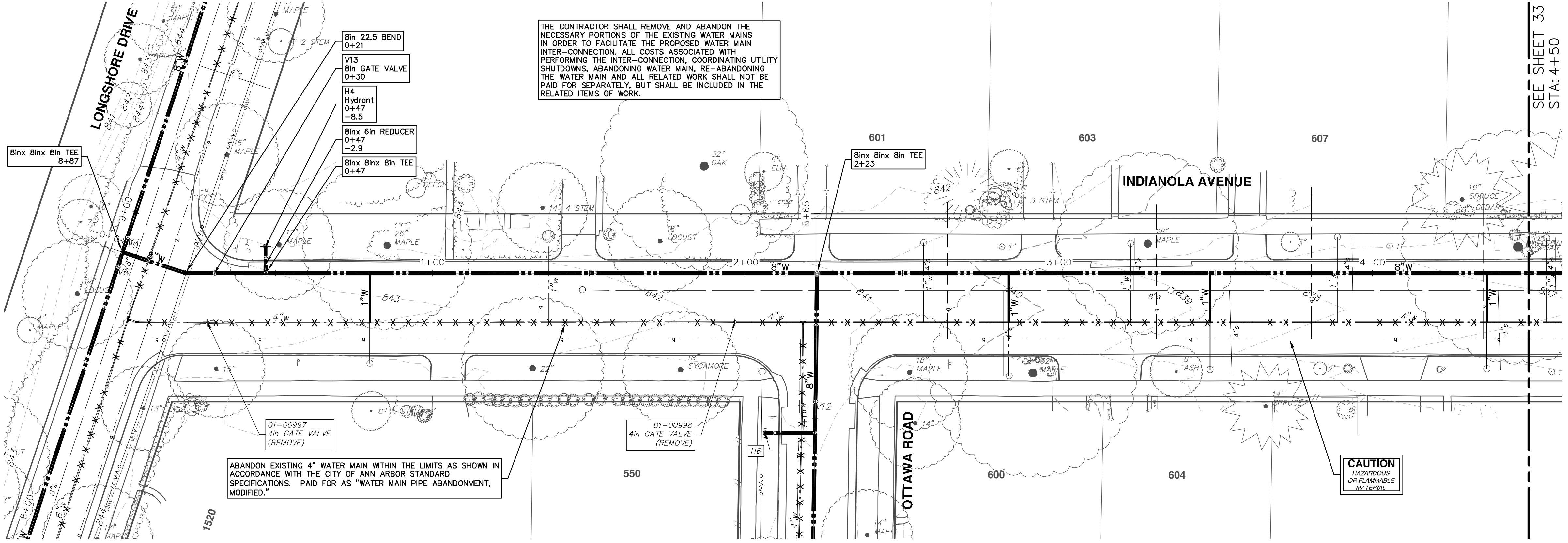
**CITY OF ANN ARBOR**  
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 ANN ARBOR, MI 48106-8647  
 ANN ARBOR, MI 48106-8647  
 www.a2gov.org

**811**  
Know what's below.  
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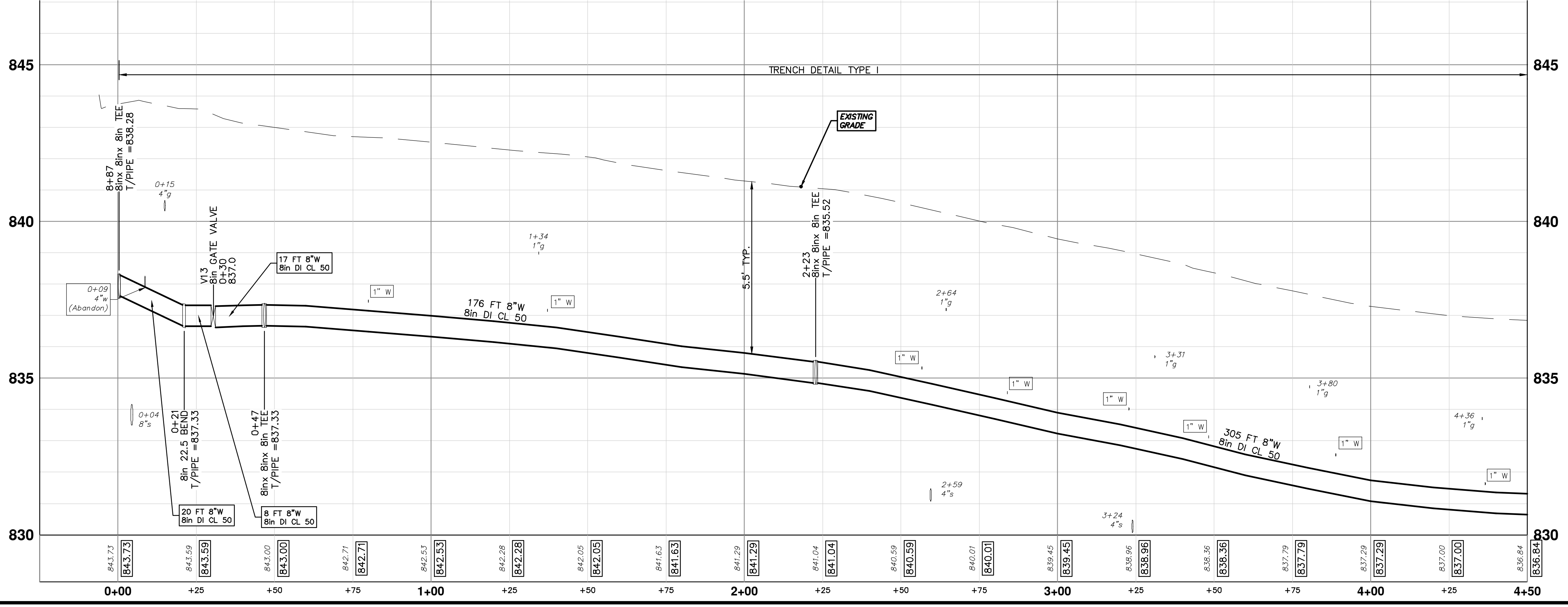
THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 4" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

**CAUTION**  
HAZARDOUS OR FLAMMABLE MATERIAL



WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V13	8in GATE VALVE	0+30		836.97
H4	Hydrant	0+47		837.71



REV.	DATE	DESCRIPTION	DRAWN	CHECKED
01	2-13-19	ADDENDUM No. 1	JKA	JKA
00	1-23-19	OUT FOR BID	JKA	JKA

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ANN ARBOR FAX 810-08647  
734-794-4410  
www.a3gov.org

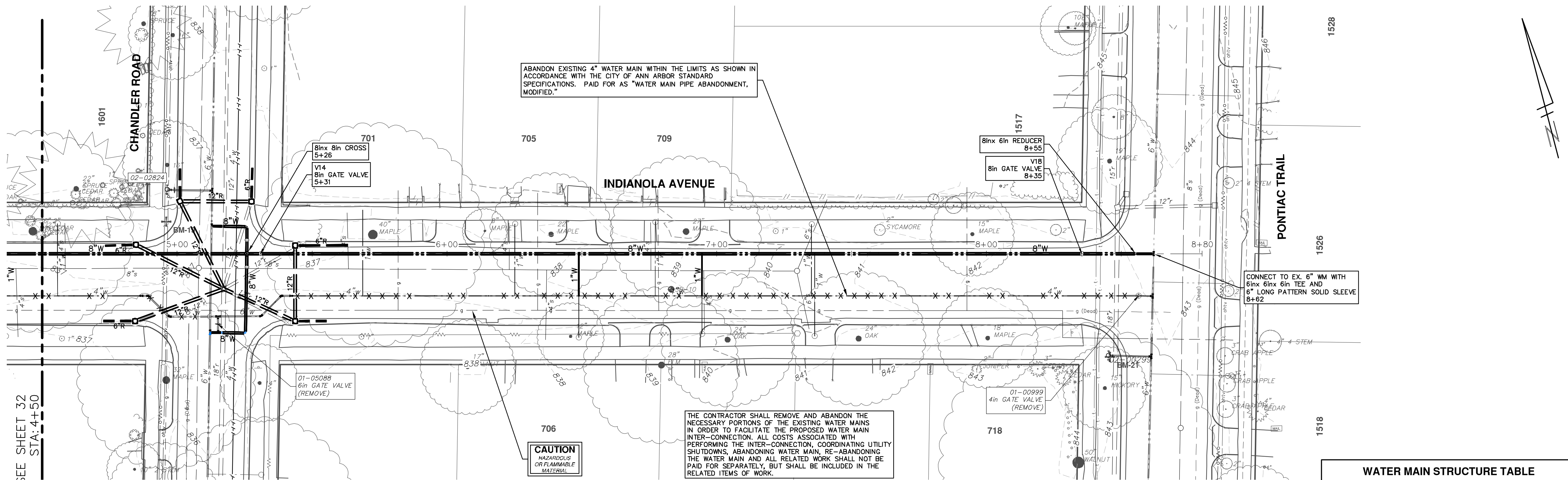


CITY OF ANN ARBOR - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
INDIANOLA AVENUE  
WATER MAIN - STA 0+00 - STA. 4+50

SHEET No. 32 OF 54  
SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'  
DRAWING No. 2018019-32

R:\2018019 Longshore Dr WM\Plan Production\2018019Wtr2.dwg Dwg Created: 22-Jan-19 - \_e2 standard bw.stb - Plot Date: 12-Feb-19

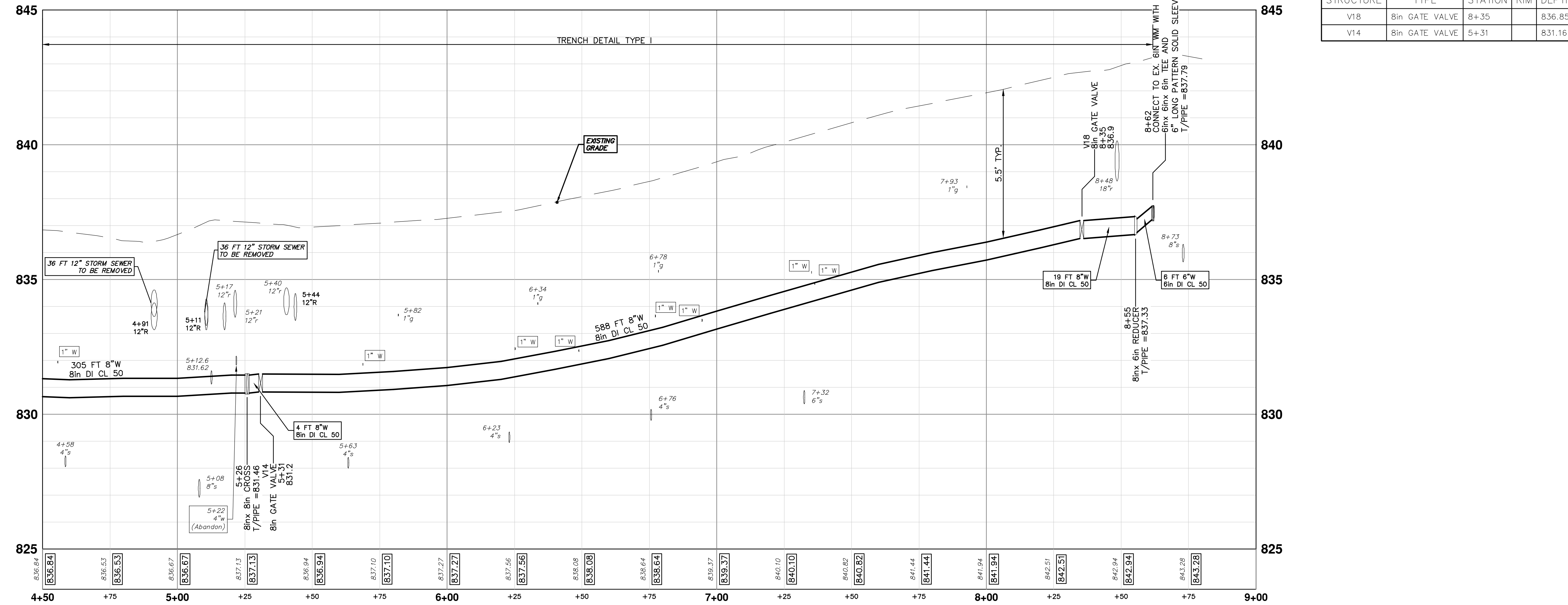
R:\2018019 Longshore Dr WM\Plan Production\2018019Wtr2.dwg Dwg Created: 22-Jan-19 - \_e2 standard bw.stb - Plot Date: 12-Feb-19



ABANDON EXISTING 4" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

**CAUTION**  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL



WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V18	8in GATE VALVE	8+35		836.85
V14	8in GATE VALVE	5+31		831.16

**811**  
Know what's below.  
Call before you dig.

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PUBLIC SERVICES  
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**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN

INDIANOLA AVENUE  
WATER MAIN - STA 4+50 - STA. 8+80

SHEET No. **33 OF 54**

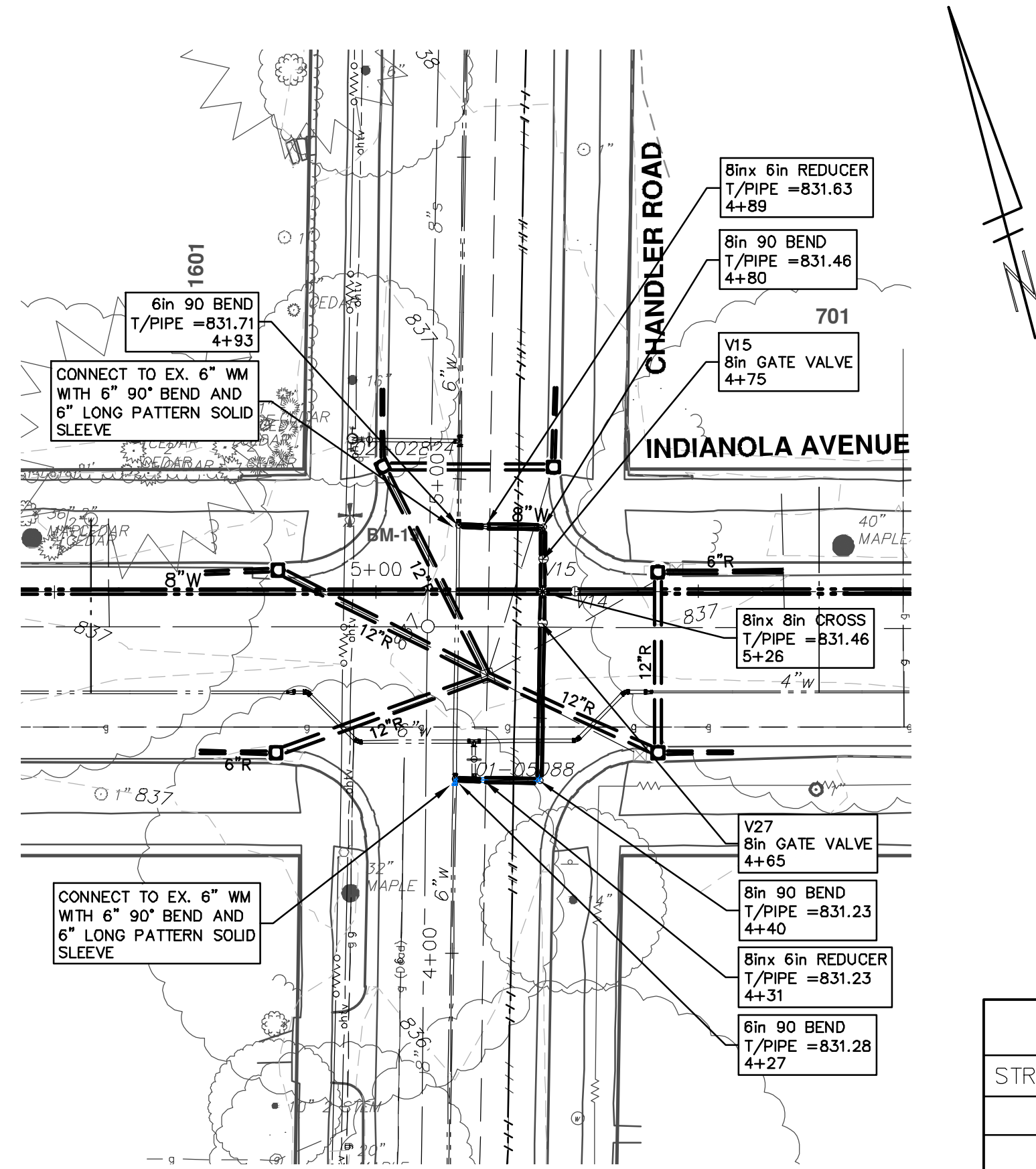
SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

DRAWING No. **2018019-33**

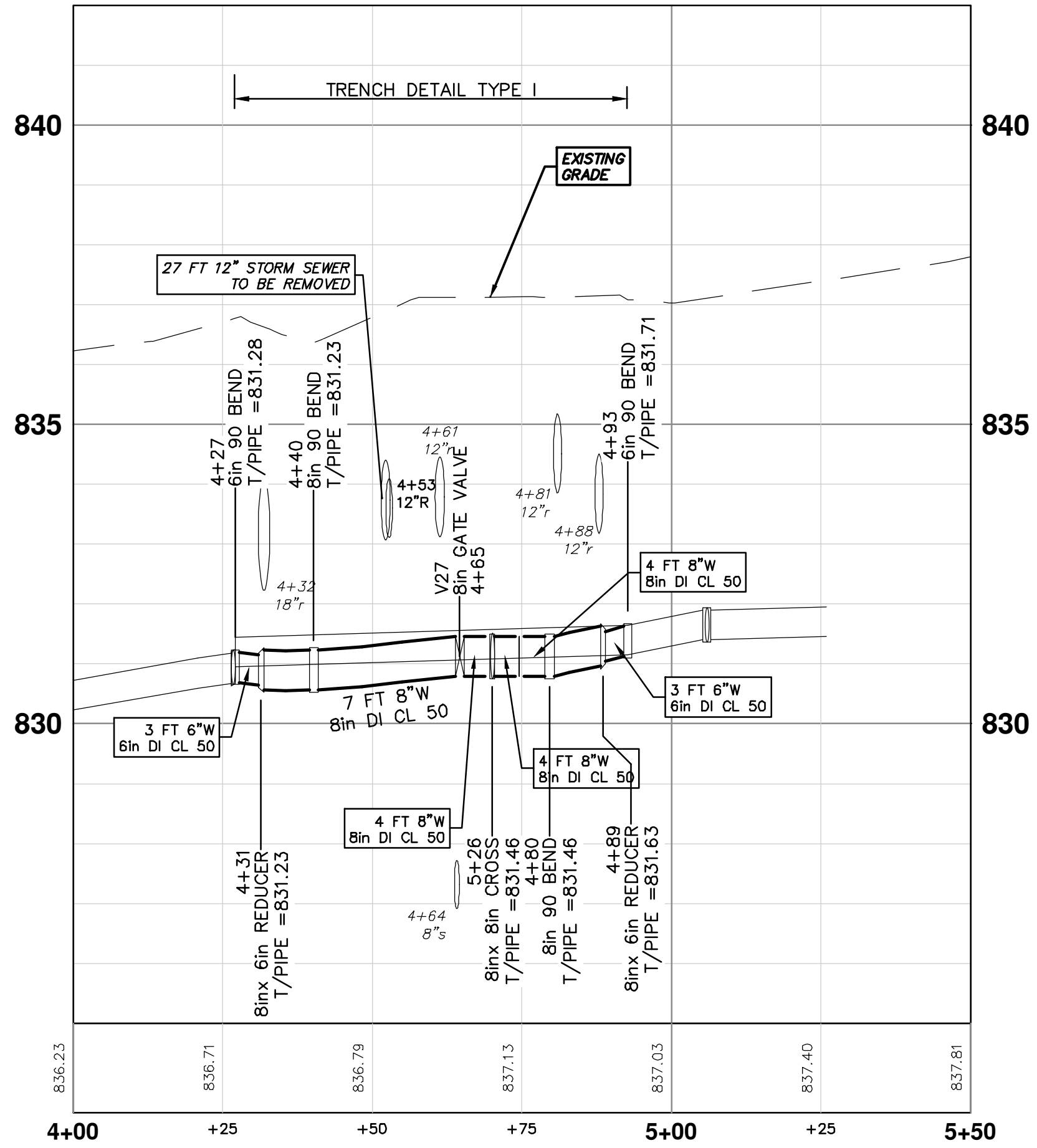
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REV.	DATE	DESCRIPTION	DRAWN	CHECKED
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00	1-23-19	OUT FOR BID	JKA	JKA

THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.



STRUCTURE	TYPE	STATION	RIM	DEPTH
V27	8in GATE VALVE	4+65		831.12
V15	8in GATE VALVE	4+75		831.12



REV.	DATE	DESCRIPTION	DRAWN	CHECKED
01	2-13-19	ADDENDUM No. 1	JKA	JKA
00	1-23-19	OUT FOR BID	JKA	JKA

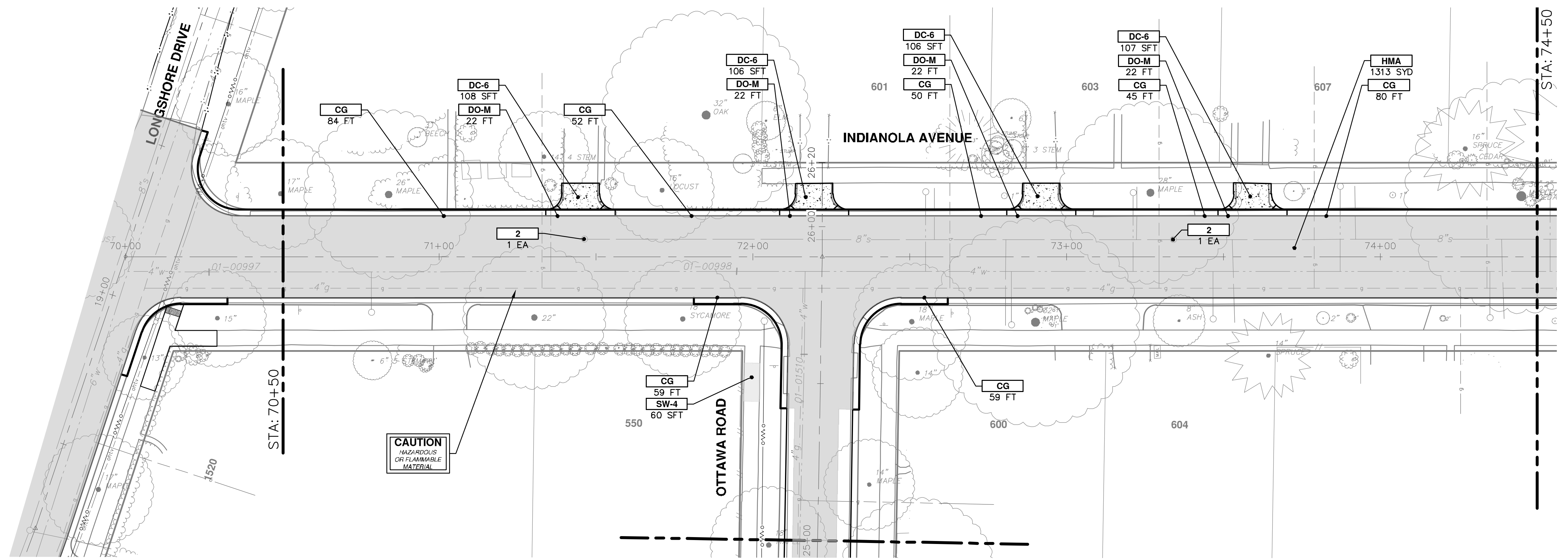
CITY OF ANN ARBOR  
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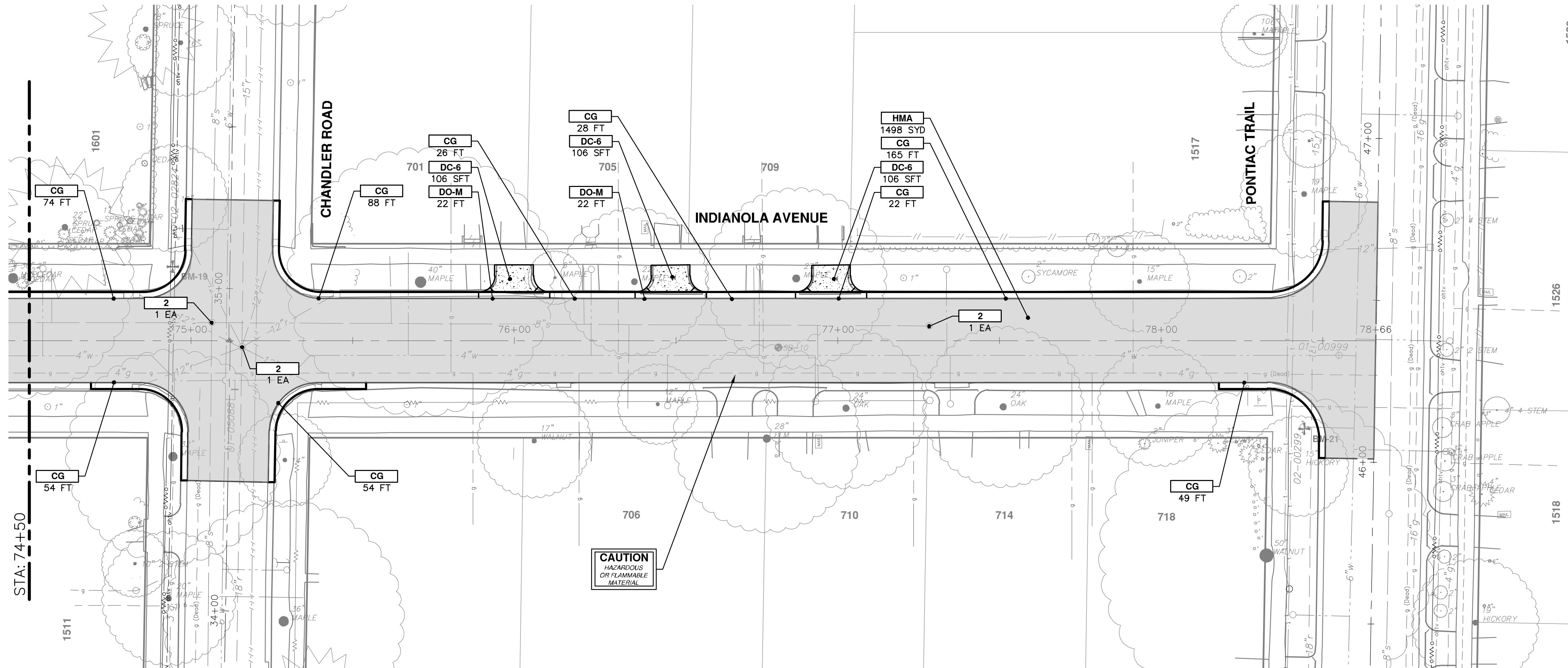
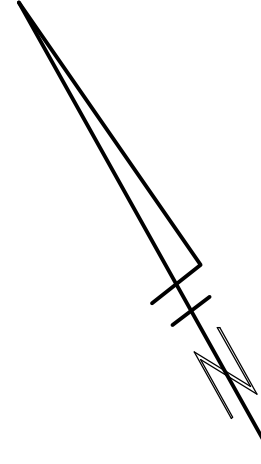
CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
INDIANOLA AVENUE  
WATER MAIN - CHANDLER ROAD CONNECTION

SCALE PLAN: #####  
PROFILE: 1" = 2'  
DRAWING No.  
2018019-34

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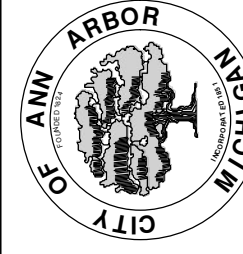


CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC. F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC. DETAIL M, P-NC
DC-6	PLACE CONC. DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH. SUBBASE, CP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC. 4 INCH. MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC. 6 INCH. MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER



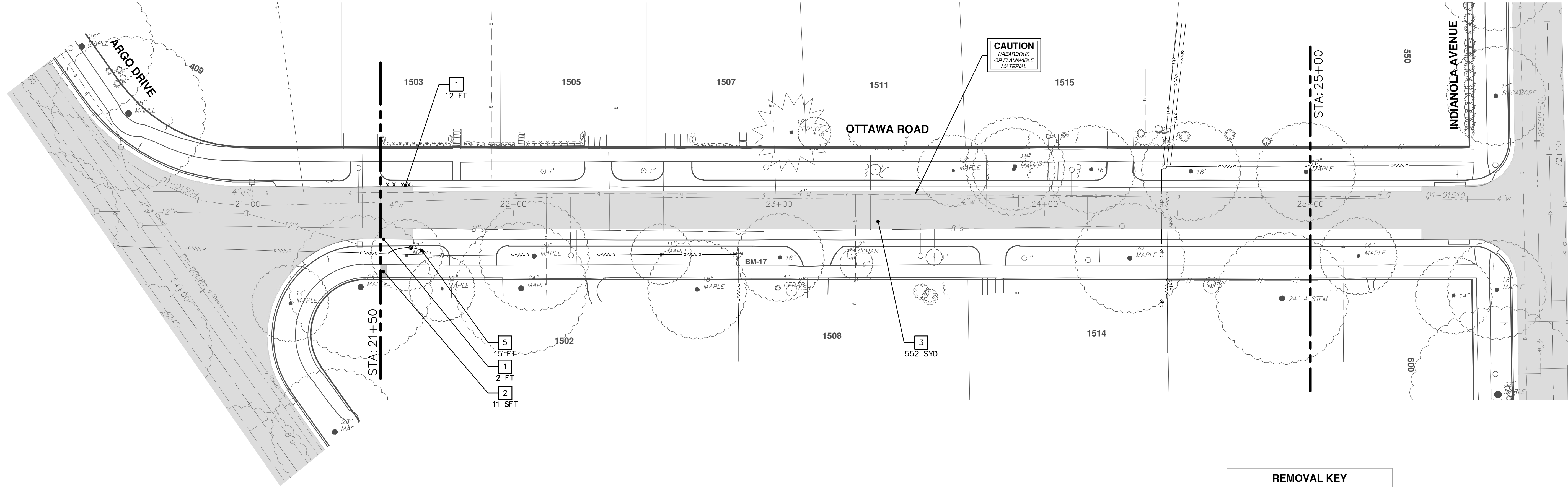
REV.	DATE	DESCRIPTION
01	2-13-19	CC/DF/KB
02	1-23-19	CC/DF/KB

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CITY OF ANN ARBOR - ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
INDIANOLA AVENUE  
ROAD

SCALE: 1" = 20'  
DRAWING No. 2018019-35



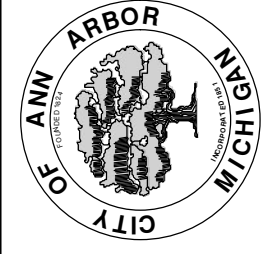
REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER, - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 8" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

\* SAWCUT FULL DEPTH AT REMOVAL LIMITS



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA

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ANN ARBOR, MI 48106-8647  
ANN ARBOR FAX 800-8647  
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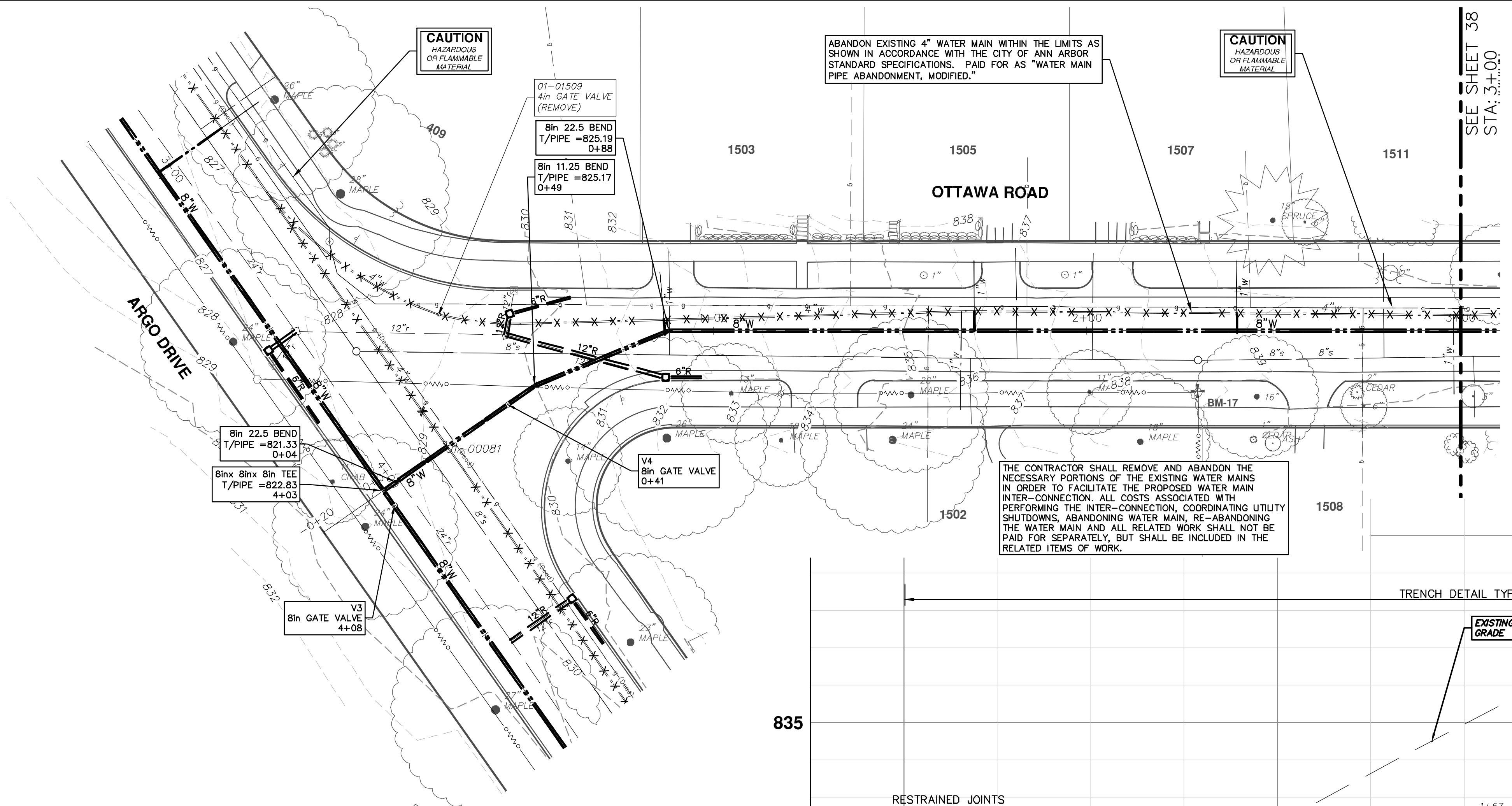


**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
**LONGSHORE INDIANOLA OTTAWA**  
**ARGO AMHERST WATERMAIN**  
**OTTAWA ROAD**  
**REMOVALS**

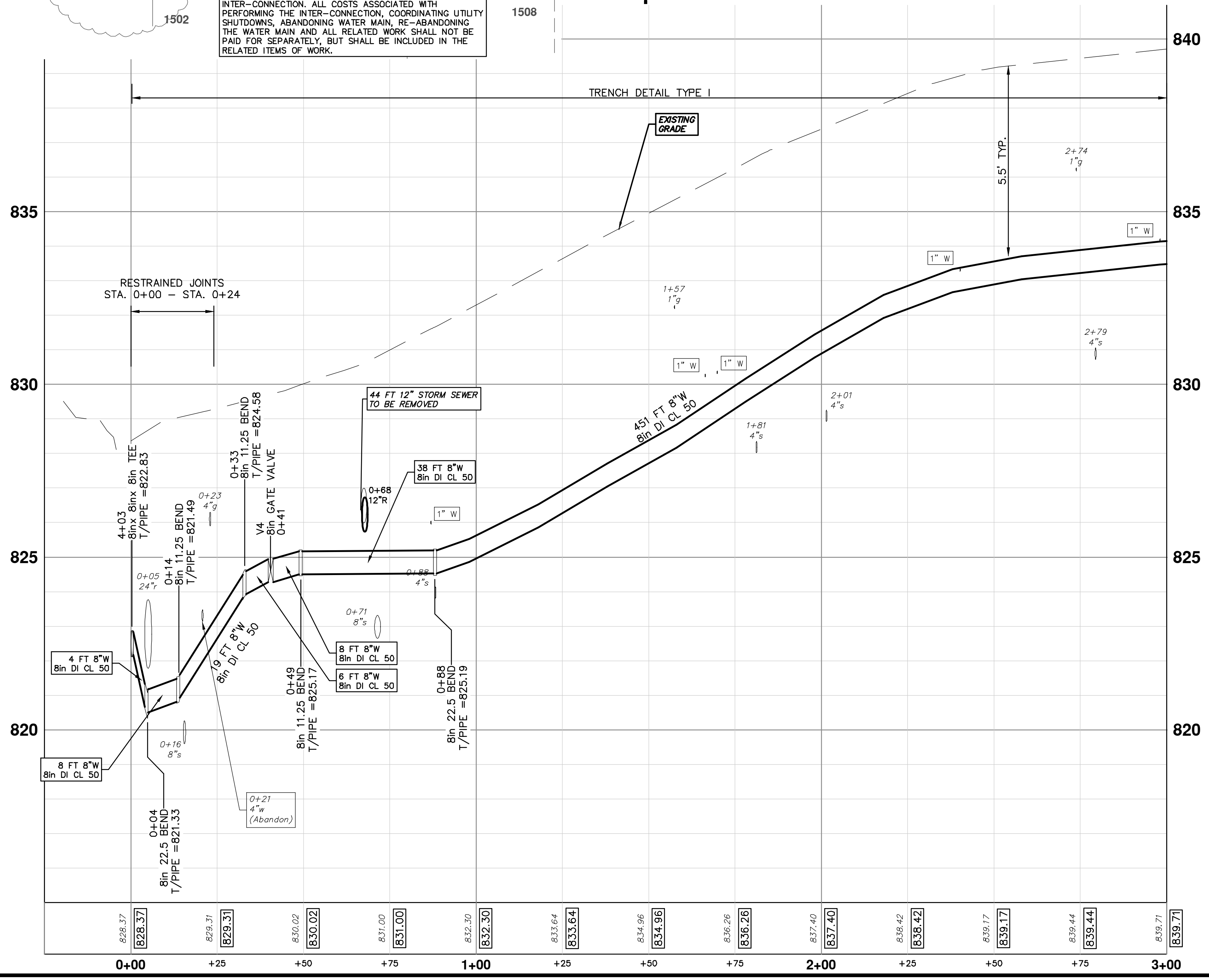
SCALE: 1" = 20'  
DRAWING No.  
**2018019-36**



R:\2018019 Longshore Dr WM\Plan Production\2018019Wtr1.dwg Dwg Created: 22-Jan-19 - \_a2 standard bw.stb - Plot Date: 12-Feb-19



WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V4	8in GATE VALVE	0+41		824.61
V3	8in GATE VALVE	4+08		822.59



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATER MAIN**

OTTAWA ROAD  
WATER MAIN - STA. 0+00 - STA. 3+00

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

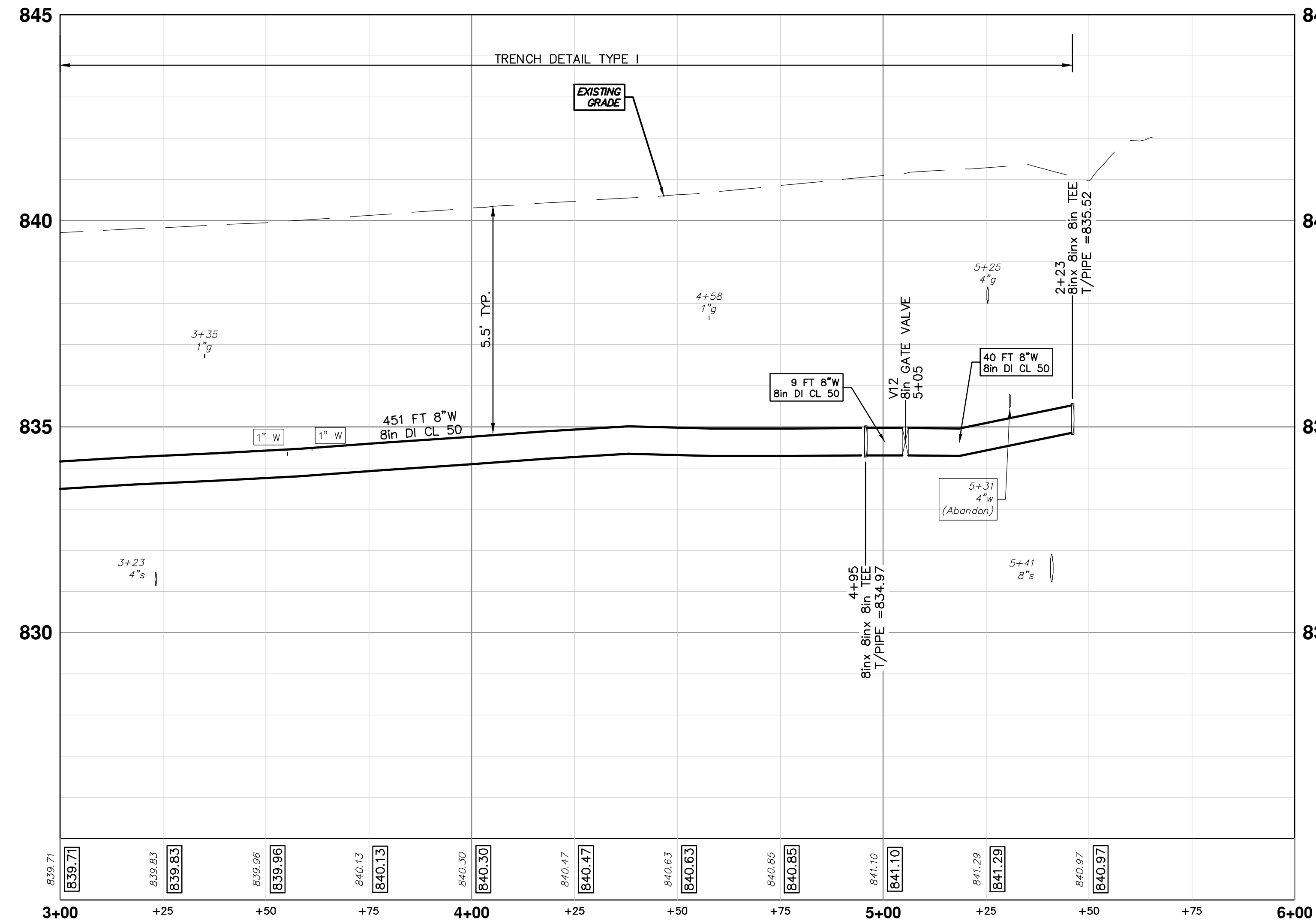
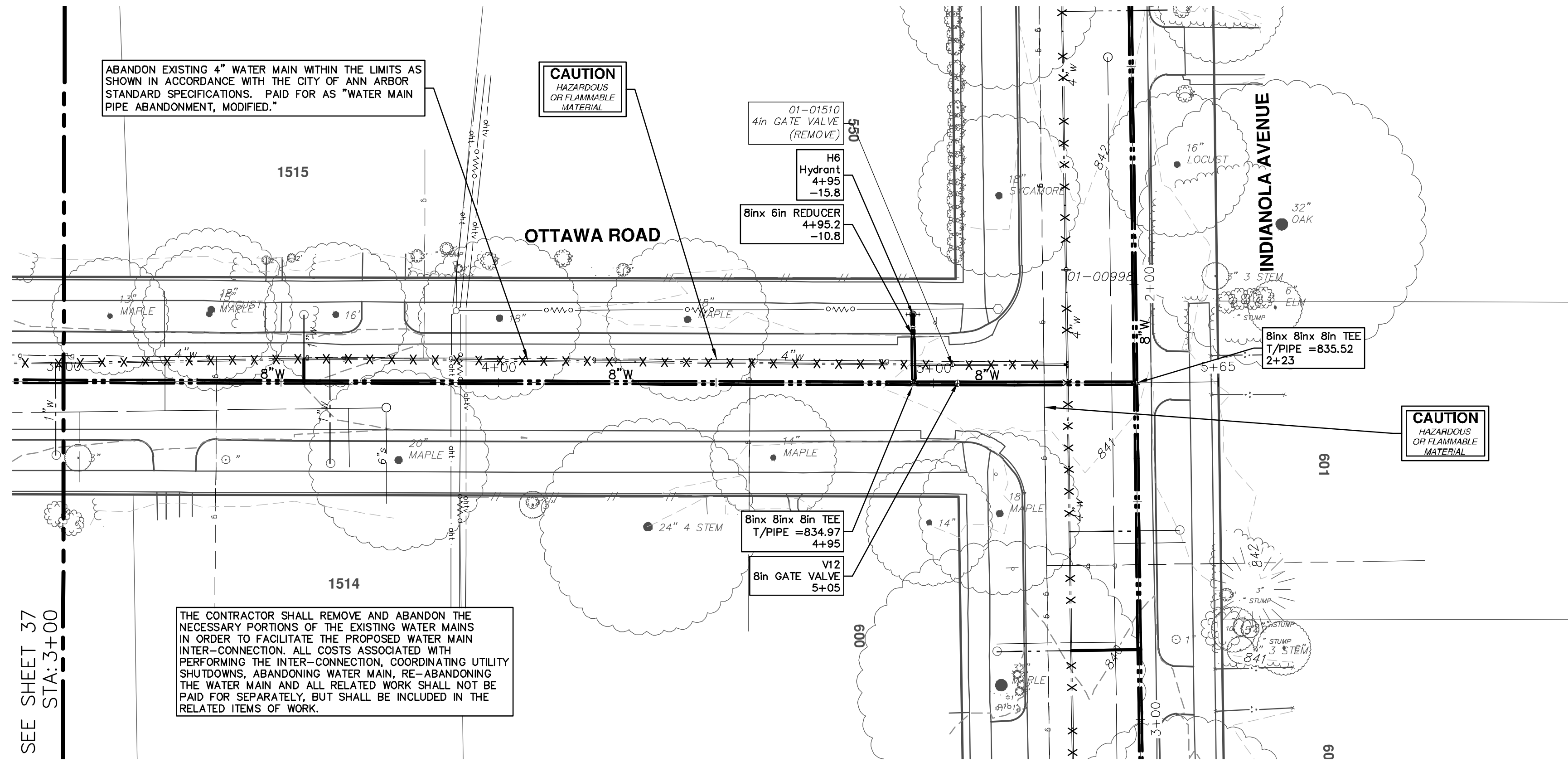
DRAWING NO.: **2018019-37**

SHEET No. **37 OF 54**

**811**  
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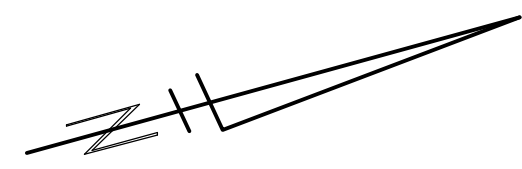
REV.	DATE	DESCRIPTION	DRAWN	CHECKED
01	2-13-19	ADDENDUM No. 1	JKA	JKA
00	1-23-19	OUT FOR BID	JKA	JKA

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WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V12	8in GATE VALVE	5+05		834.64
H6	Hydrant	4+95		835.66

SEE SHEET 37  
STA: 3+00



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN

OTTAWA ROAD  
WATER MAIN - STA. 3+00 - STA. 5+46

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

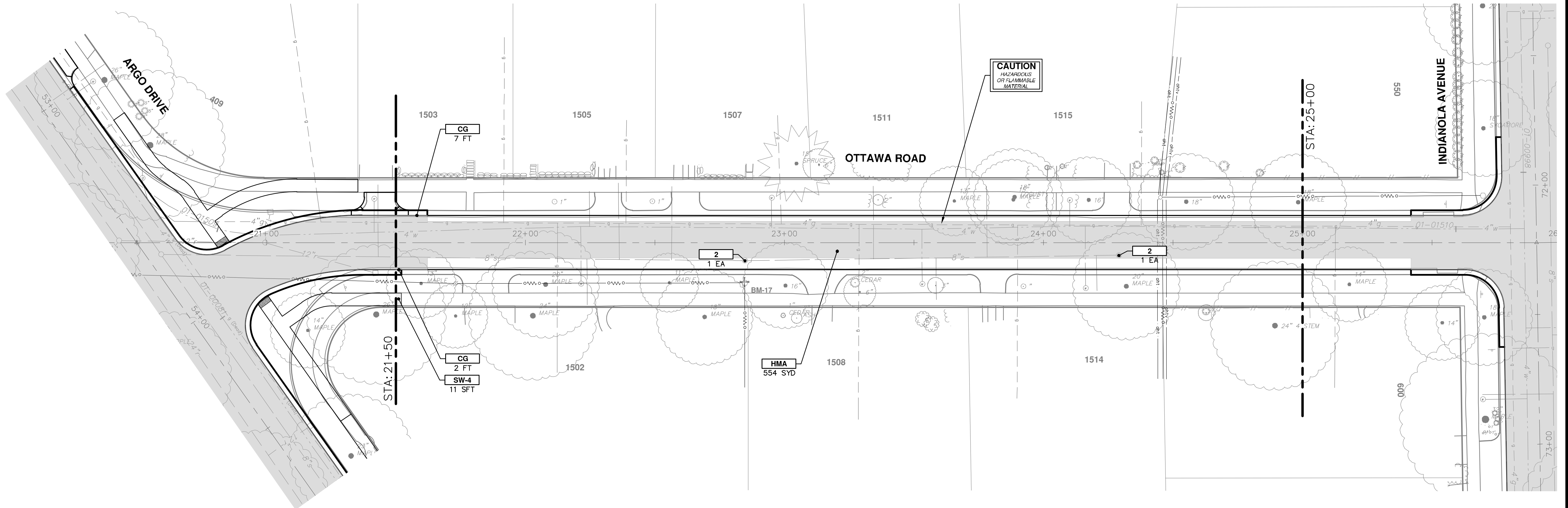
DRAWING No. 2018019-38

SHEET No. 38 OF 54

**811**  
Know what's below.  
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REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	JKA	JKA
00	OUT FOR BID	1-23-19	JKA	JKA

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PUBLIC SERVICES  
301 EAST HURON STREET  
ANN ARBOR, MI 48106-8647  
734-794-4410  
www.a3gov.org

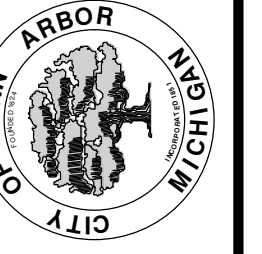


CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC, F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC
DC-6	PLACE CONC, DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
02	OUT FOR BID	1-23-19	CC/DF/KB	JKA

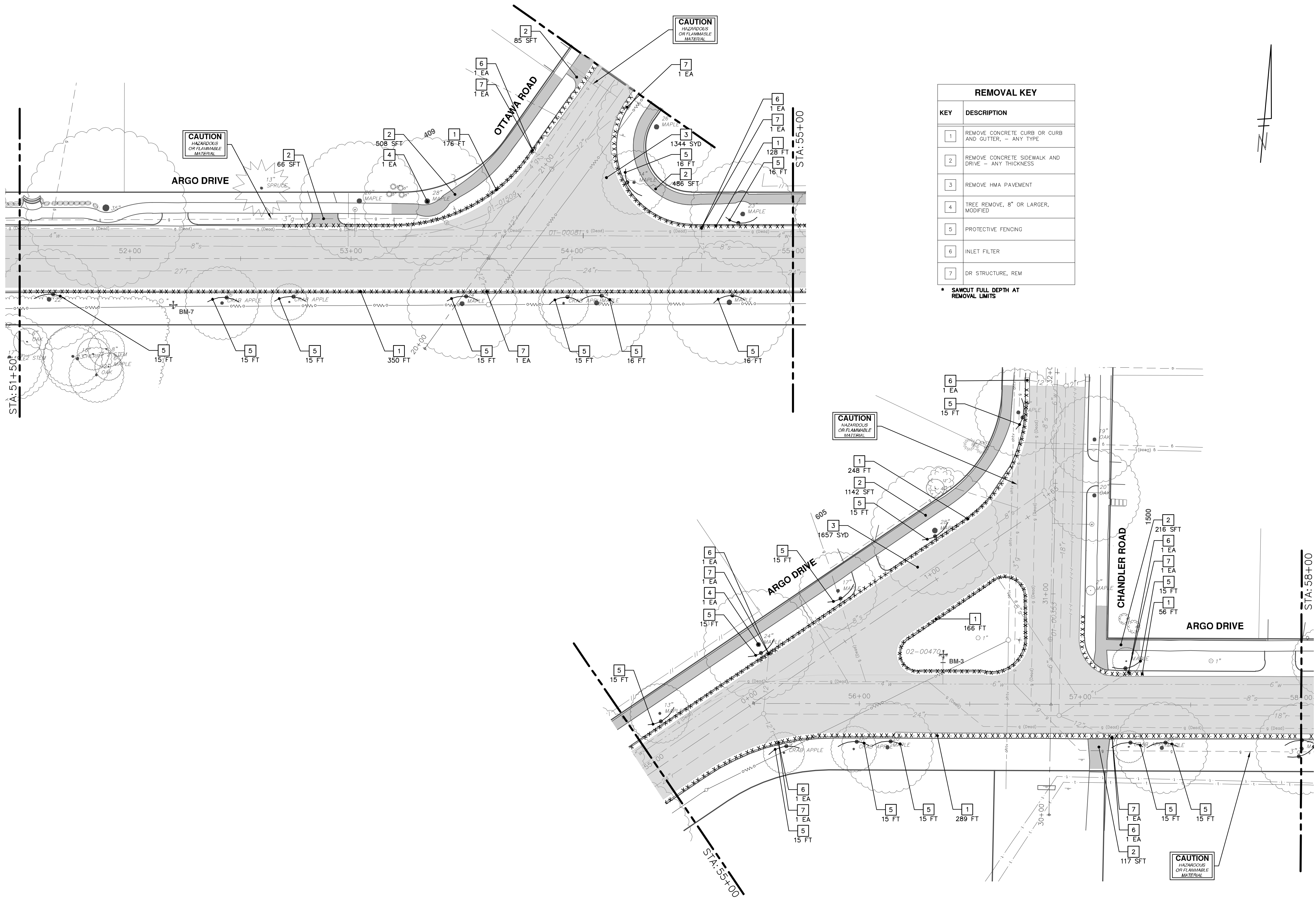
CITY OF ANN ARBOR  
 PUBLIC SERVICES  
 301 EAST HURON STREET  
 ANN ARBOR, MI 48106-8647  
 ANN ARBOR FAX 888-008-8647  
 734-794-4410  
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**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
**LONGSHORE INDIANOLA OTTAWA**  
**ARGO AMHERST WATERMAIN**  
 OTTAWA ROAD  
 ROAD

SCALE: 1" = 20'  
 DRAWING No.  
**2018019-39**

R:\2018019 Longshore Dr. WM\Plan Production\2018019Rem-Argo.dwg Dwg Created: 22-Jan-19 - \_a2 standard bw.stb - Plot Date: 12-Feb-19



**811**  
Know what's below.  
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CC/DF/KB  
2-13-19  
JKA

CC/DF/KB  
1-23-19  
JKA

DATE  
DRAWN  
CHECKED

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PUBLIC SERVICES  
301 EAST HURON STREET  
ANN ARBOR, MI 48106-8647  
www.a2gov.org

DESCRIPTION  
REV.

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**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN

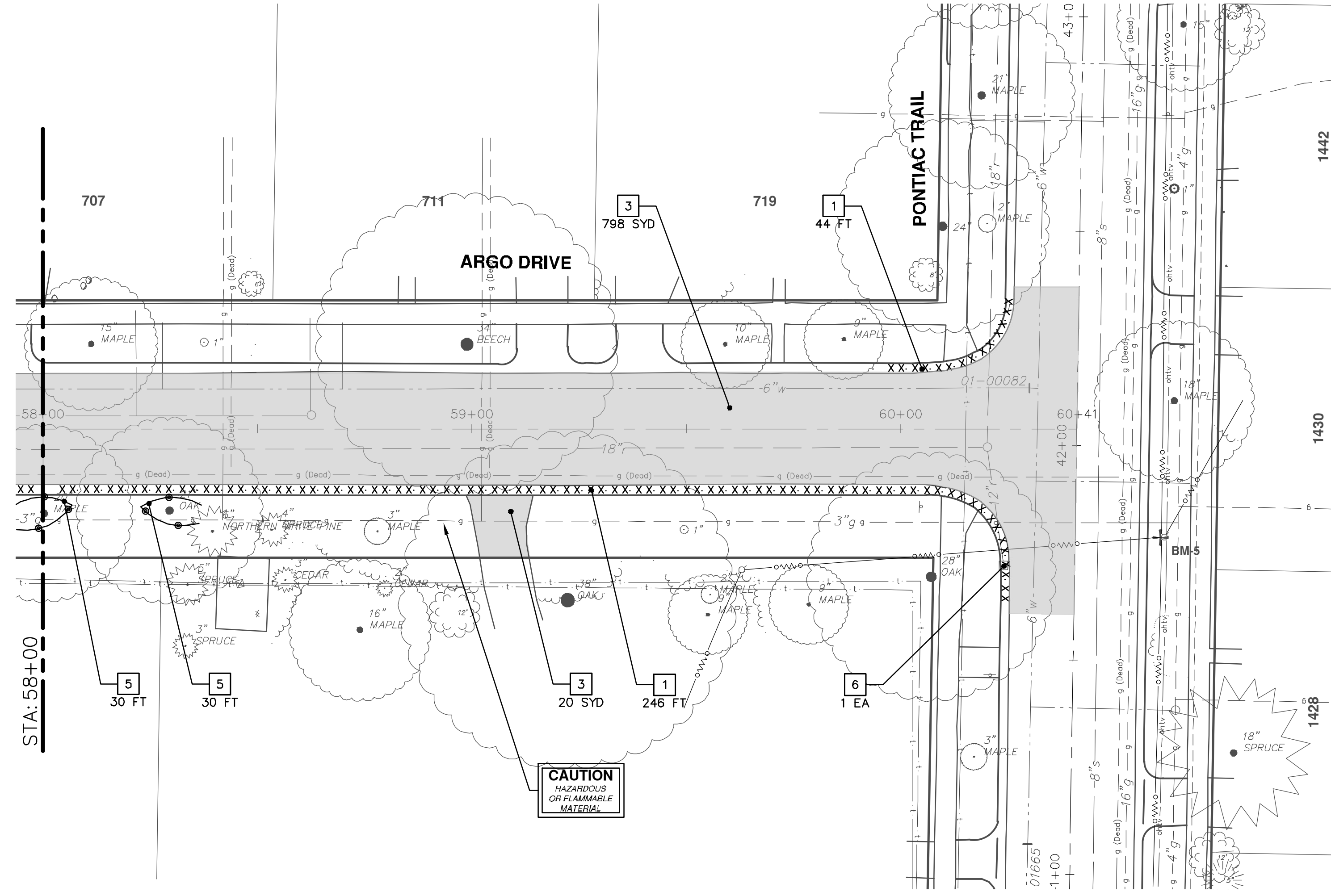
ARGO DRIVE  
REMOVALS - STA. 51+50 - STA. 58+00

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SCALE: 1" = 20'

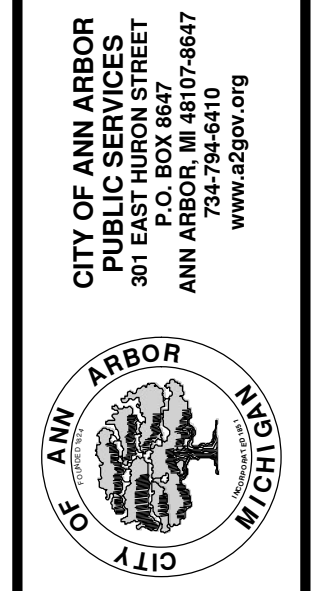
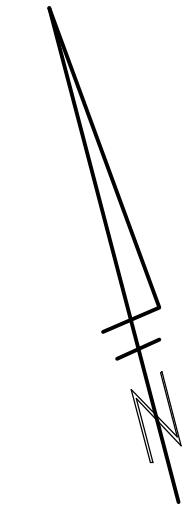
DRAWING No.  
**2018019-40**

SHEET No.  
**40 OF 54**



REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER, - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 8" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

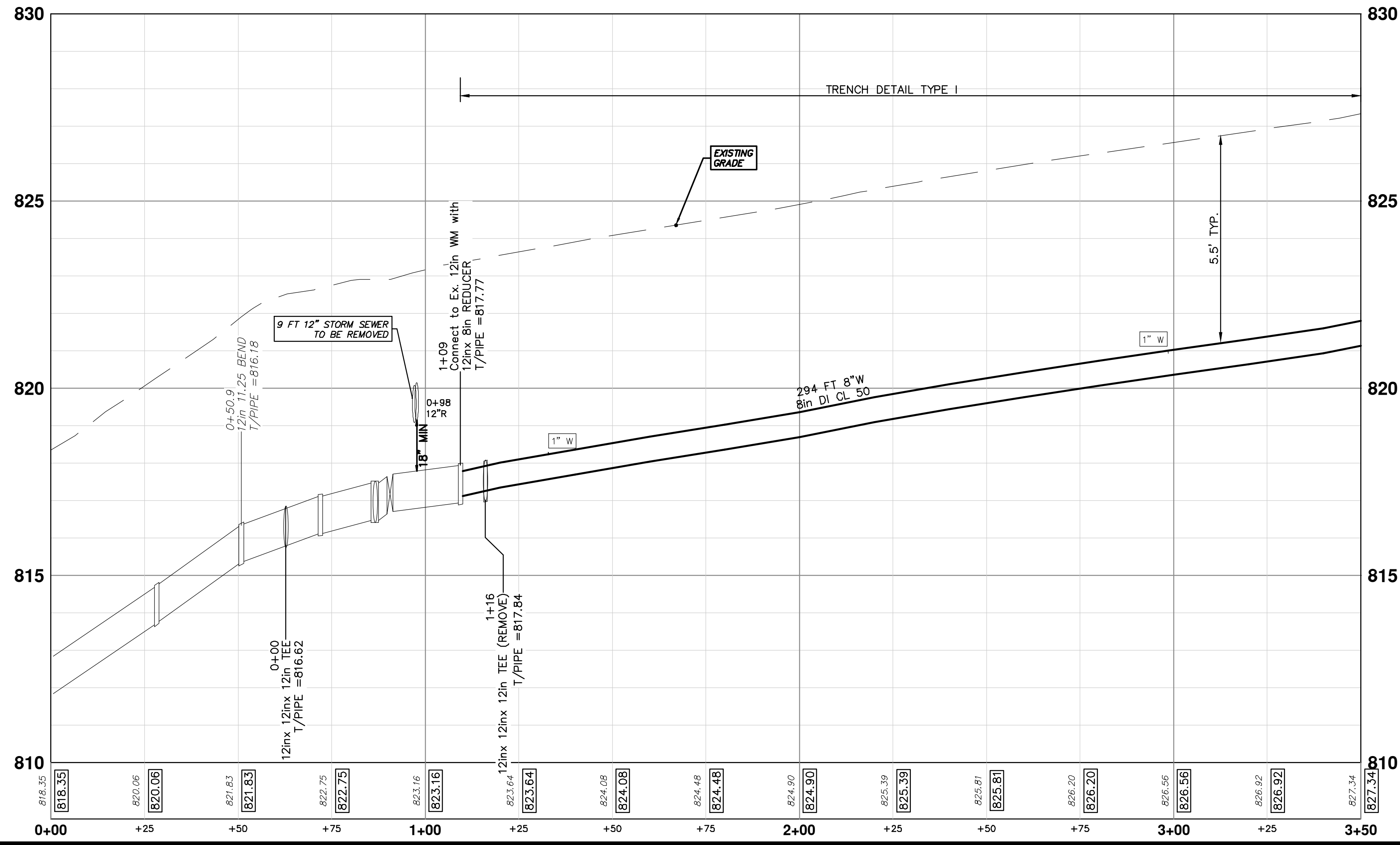
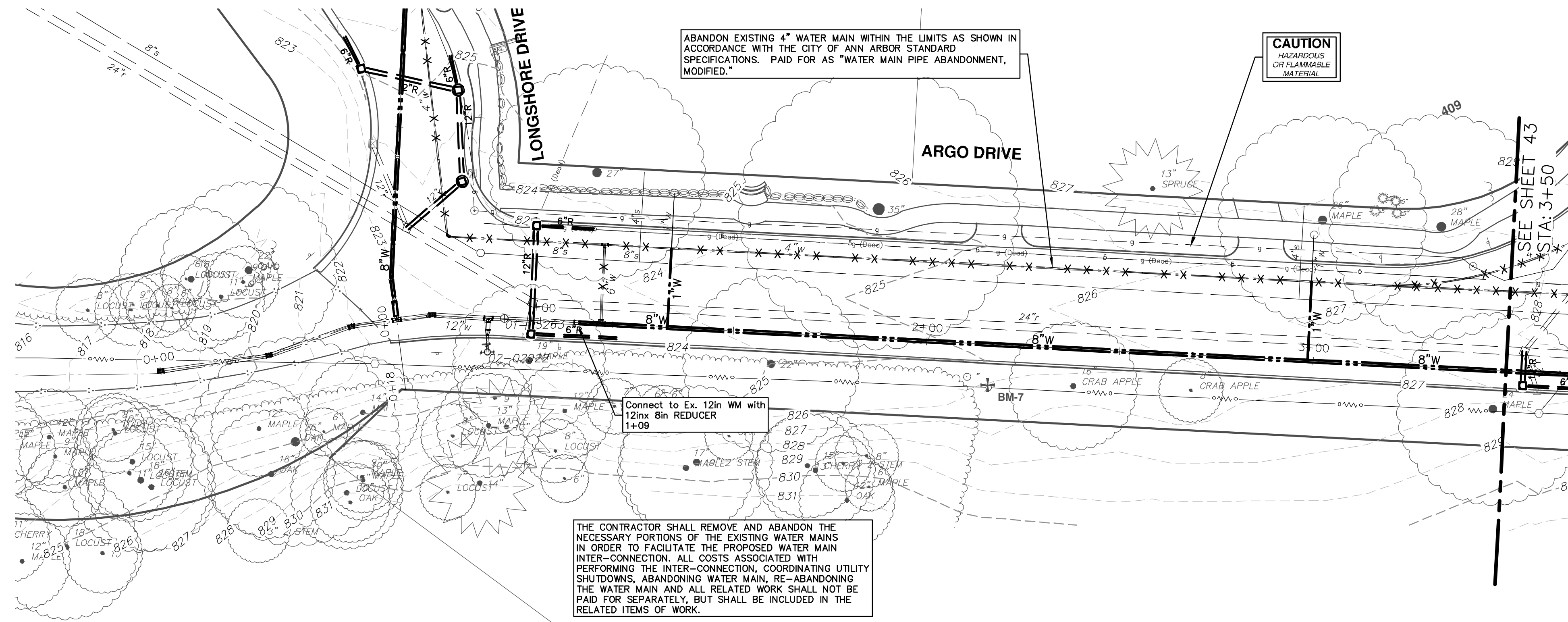
\* SAWCUT FULL DEPTH AT REMOVAL LIMITS



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA



R:\2018019 Longshore Dr WM\Plan Production\2018019Wtr2.dwg Dwg Created: 22-Jan-19 -- 02 standard bw.stb -- Plot Date: 12-Feb-19



**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATER MAIN

ARGO DRIVE  
WATER MAIN - STA. 0+00 - STA. 3+50

SHEET No. **42 OF 54**

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

DRAWING No. **2018019-42**

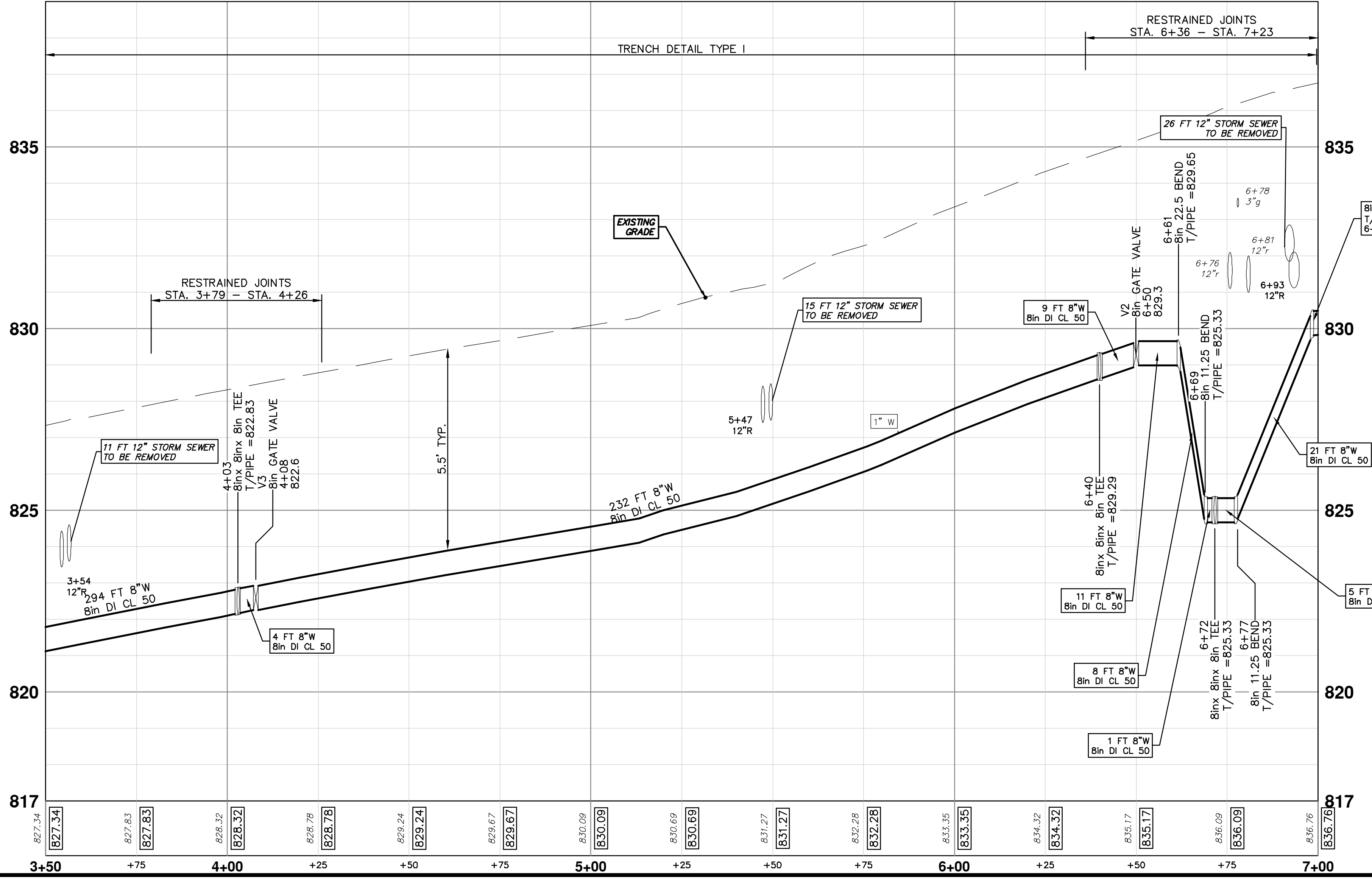
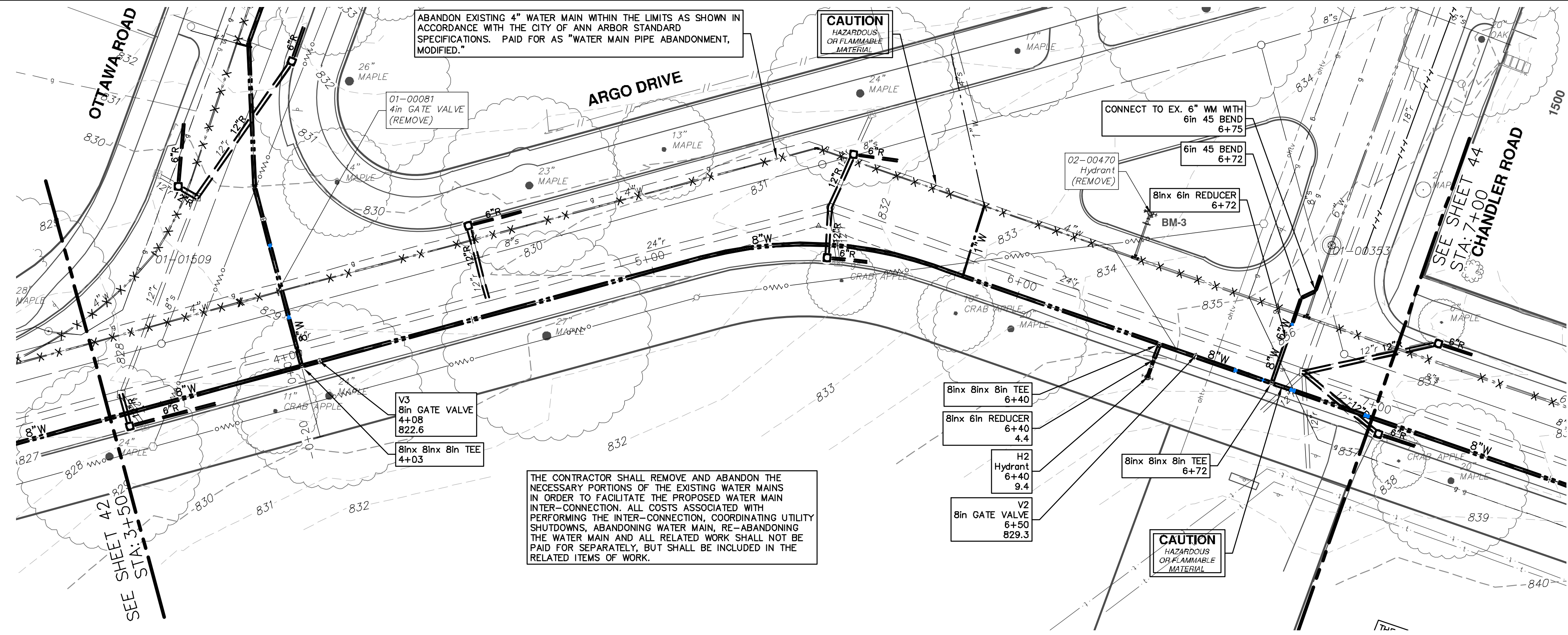
**811**  
Know what's below.  
Call before you dig.

REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA

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**CITY OF ANN ARBOR**  
MICHIGAN

R:\2018019 Longshore Dr WM\Plan Production\2018019Wtr.dwg Dwg Created: 22-Jan-19 - \_a2 standard bw.stb - Plot Date: 12-Feb-19



WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V2	8in GATE VALVE	6+50		829.30
V3	8in GATE VALVE	4+08		822.59
H2	Hydrant	6+40		829.84

**811**  
Know what's below. Call before you dig.

REV. DATE DESCRIPTION DRAWN CHECKED

01 ADDENDUM No. 1 2-13-19 CC/DF/KB JKA

02 OUT FOR BID 1-23-19 CC/DF/KB JKA

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATERMAIN**

ARGO DRIVE  
WATER MAIN - STA. 3+50 - STA. 7+00

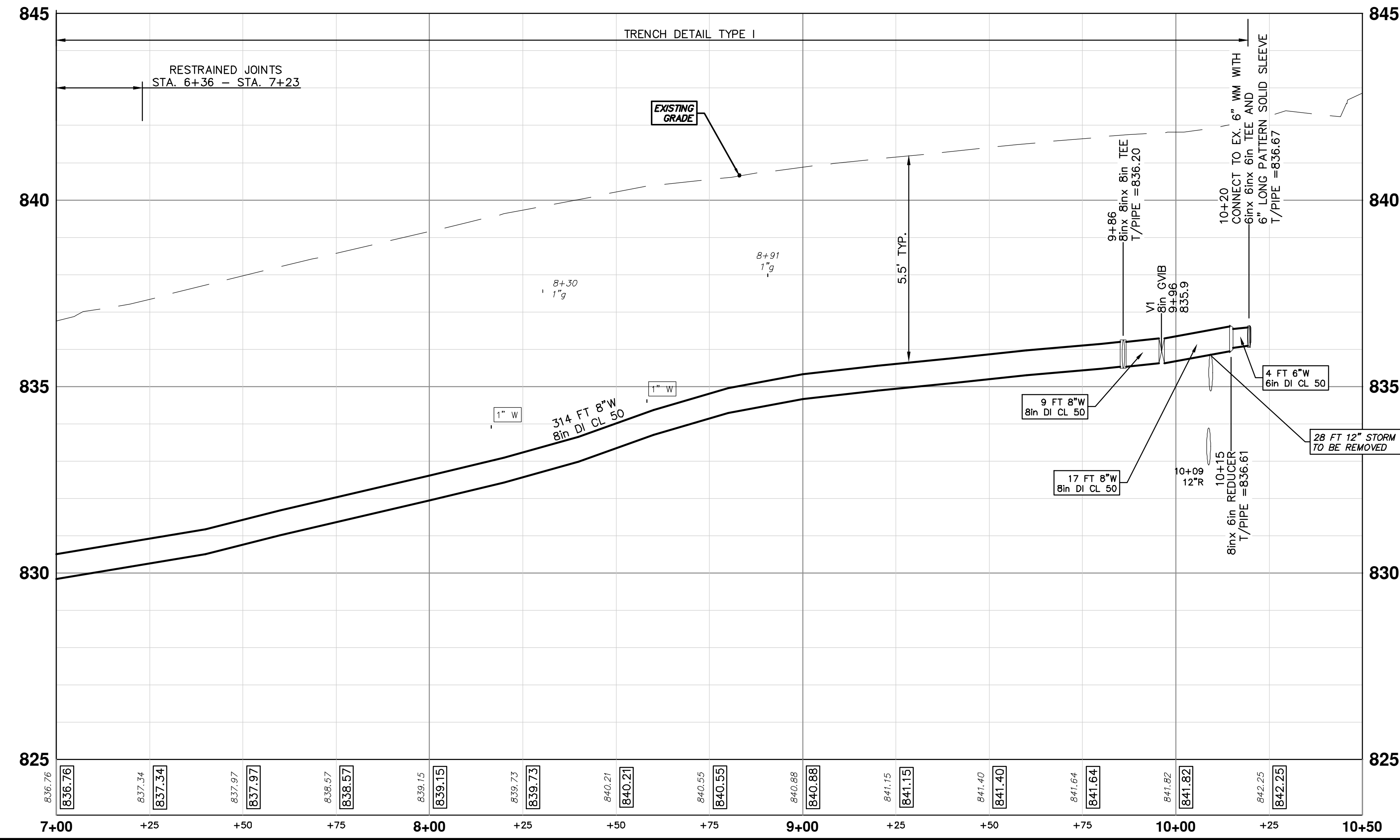
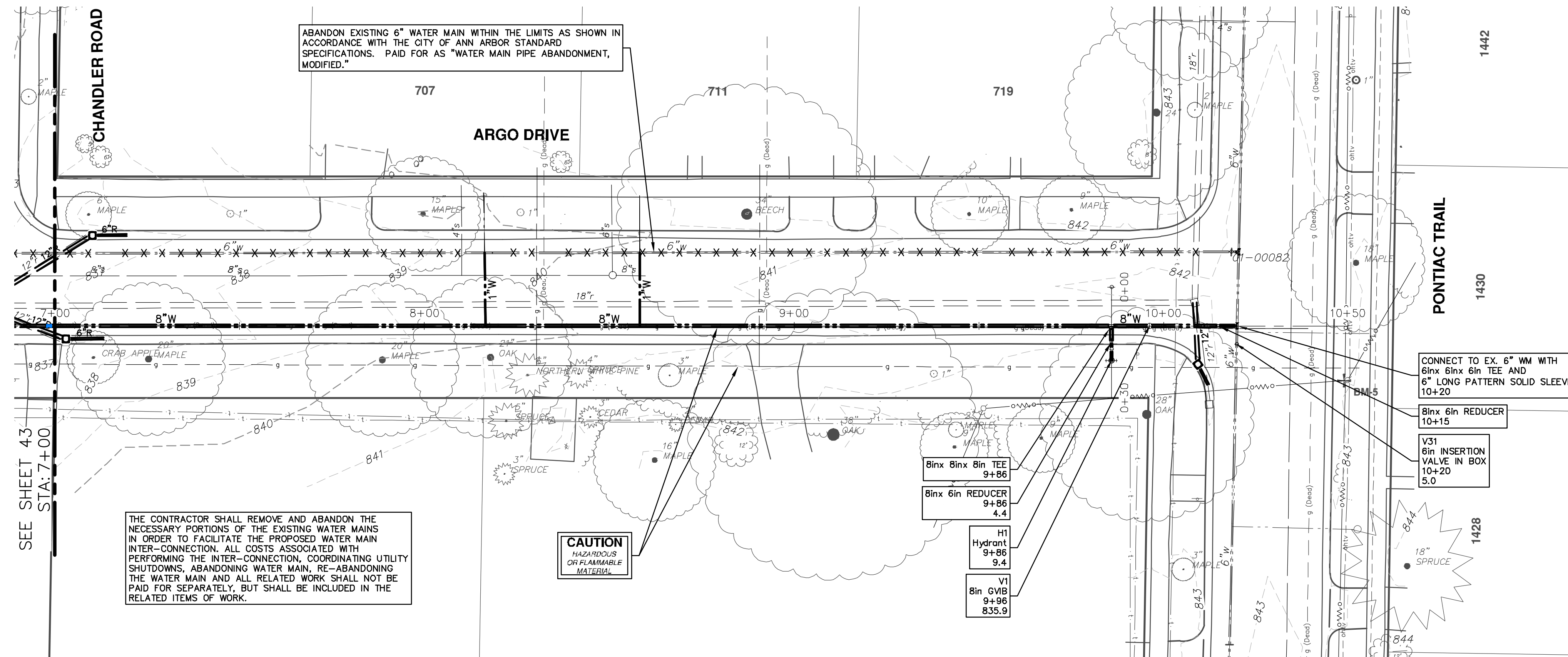
SHEET No. **43 OF 54**

SCALE PLAN: 1" = 20' PROFILE: 1" = 2'

DRAWING No. **2018019-43**

CITY OF ANN ARBOR  
PUBLIC SERVICES  
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R:\2018019 Longshore Dr WM\Plan Production\2018019Wtr2.dwg Dwg Created: 22-Jan-19 -- 02 standard bw.stb -- Plot Date: 12-Feb-19



WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V31	6in INSERTION VALVE IN BOX	10+20		836.43
V1	8in GVIB	9+96		835.95
H1	Hydrant	9+86		836.42

THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

**CAUTION**  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

**811**  
Know what's below.  
Call Before you dig.

DATE: 1-23-19  
DRAWN: JKA  
CHECKED: JKA  
REVISIONS:  
01 ADDENDUM No. 1 CC/DF/JKA 2-13-19  
02 OUT FOR BID CC/DF/JKA 1-23-19

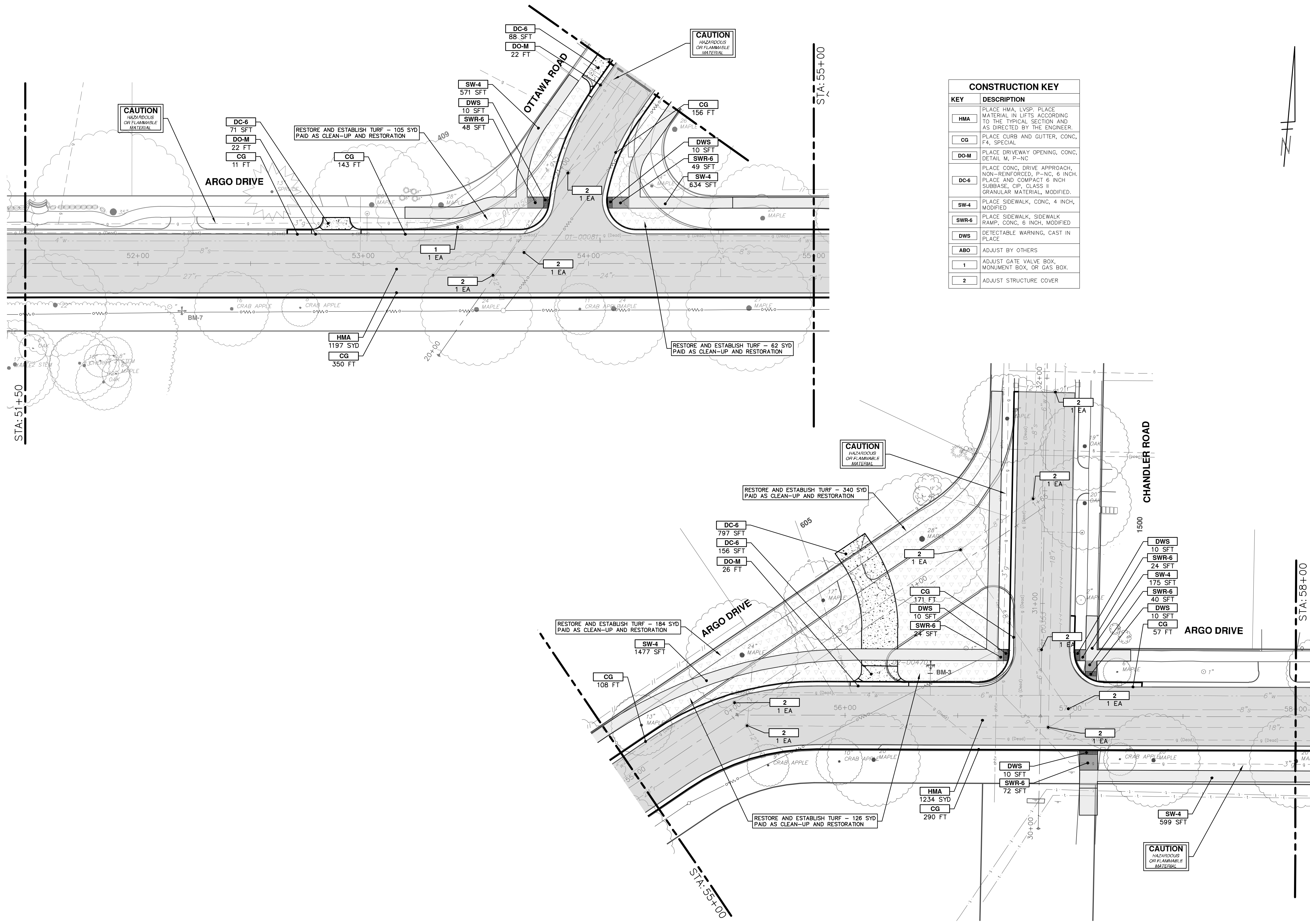
**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
ARGO DRIVE  
WATER MAIN - STA. 7+00 - STA. 10+20

SHEET No. 44 OF 54  
SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

DRAWING No. 2018019-44



R:\2018019 Longshore Dr WMA\Plan Production\2018019Prd-Argo.dwg Dwg Created: 23-Jan-19 -- a2 standard bw.stb -- Plot Date: 12-Feb-19



**CONSTRUCTION KEY**

KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC, F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC
DC-6	PLACE CONC, DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN


ROAD - STA. 51+50 - STA. 58+00

ARGO DRIVE

SCALE: 1" = 20'

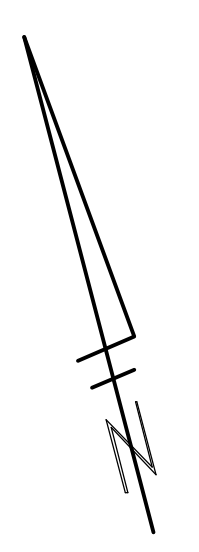
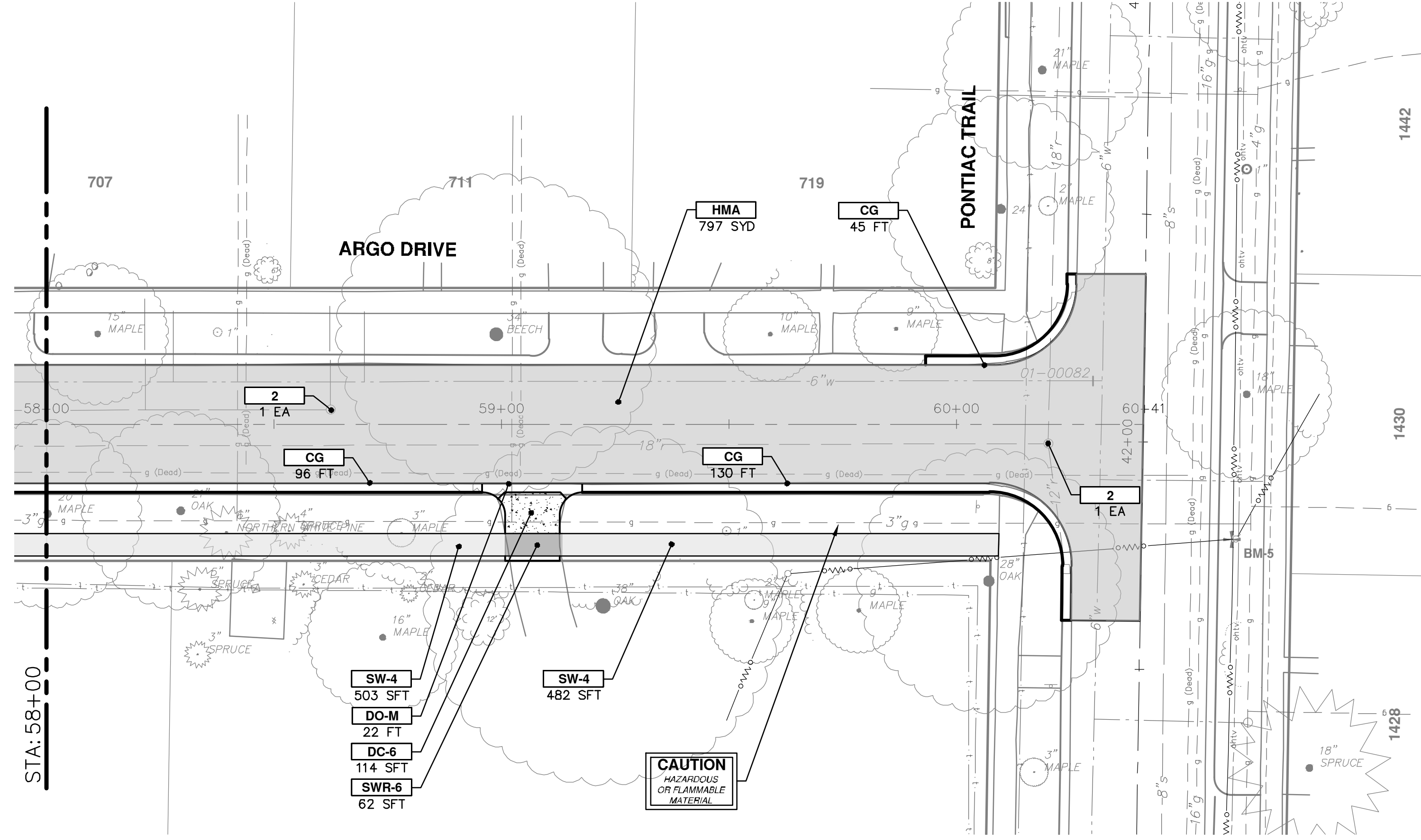
DRAWING No. 2018019-45

SHEET No. 45 OF 54



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REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	JKA	JKA
02	OUT FOR BID	1-23-19	JKA	JKA



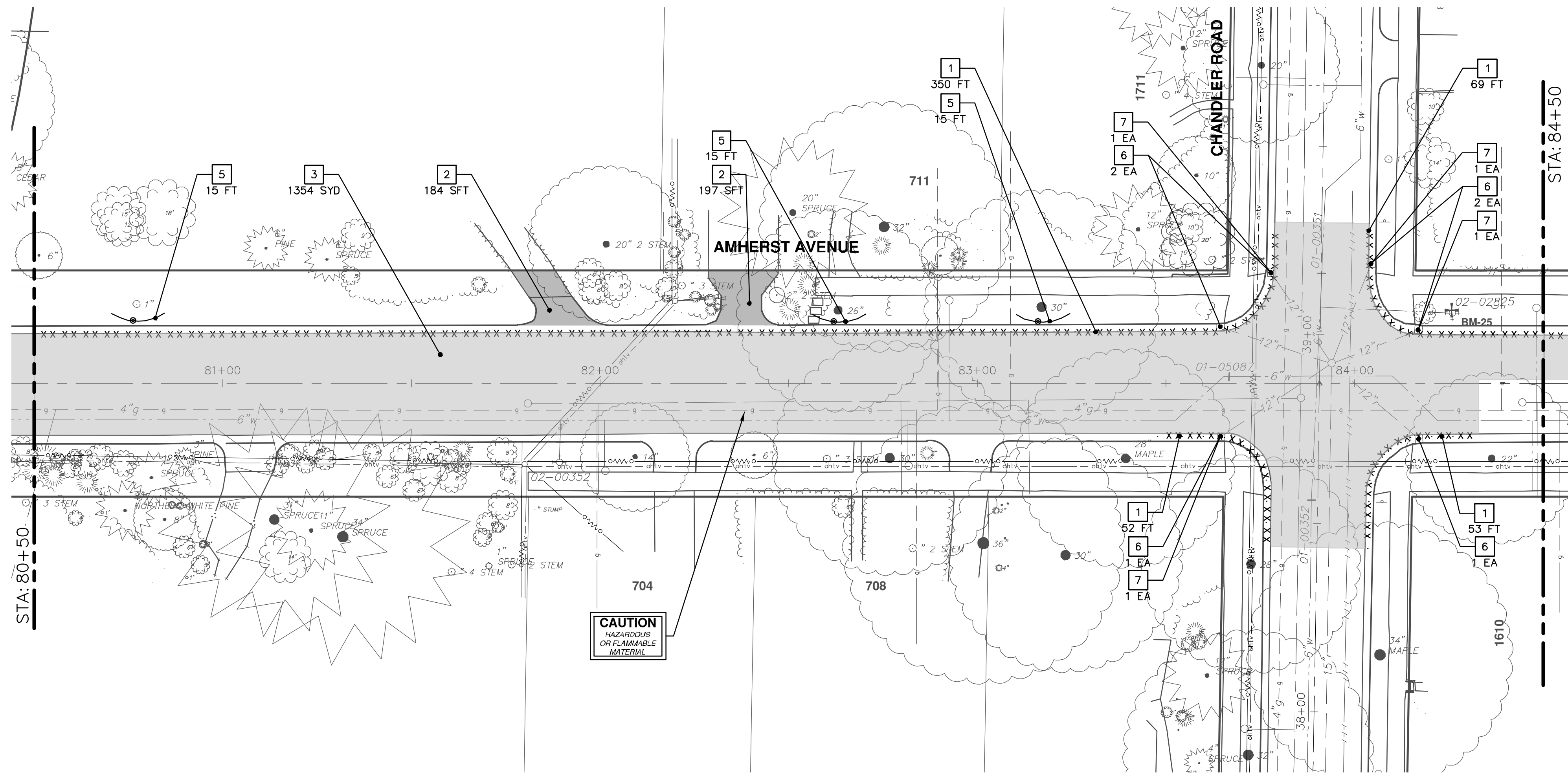
CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC, F4, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC, DETAIL M, P-NC
DC-6	PLACE CONC, DRIVE APPROACH, NON-REINFORCED, P-NG, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER



REV.	DESCRIPTION	DATE	DRAWN	CHECKED
01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA
00	OUT FOR BID	1-23-19	CC/DF/KB	JKA

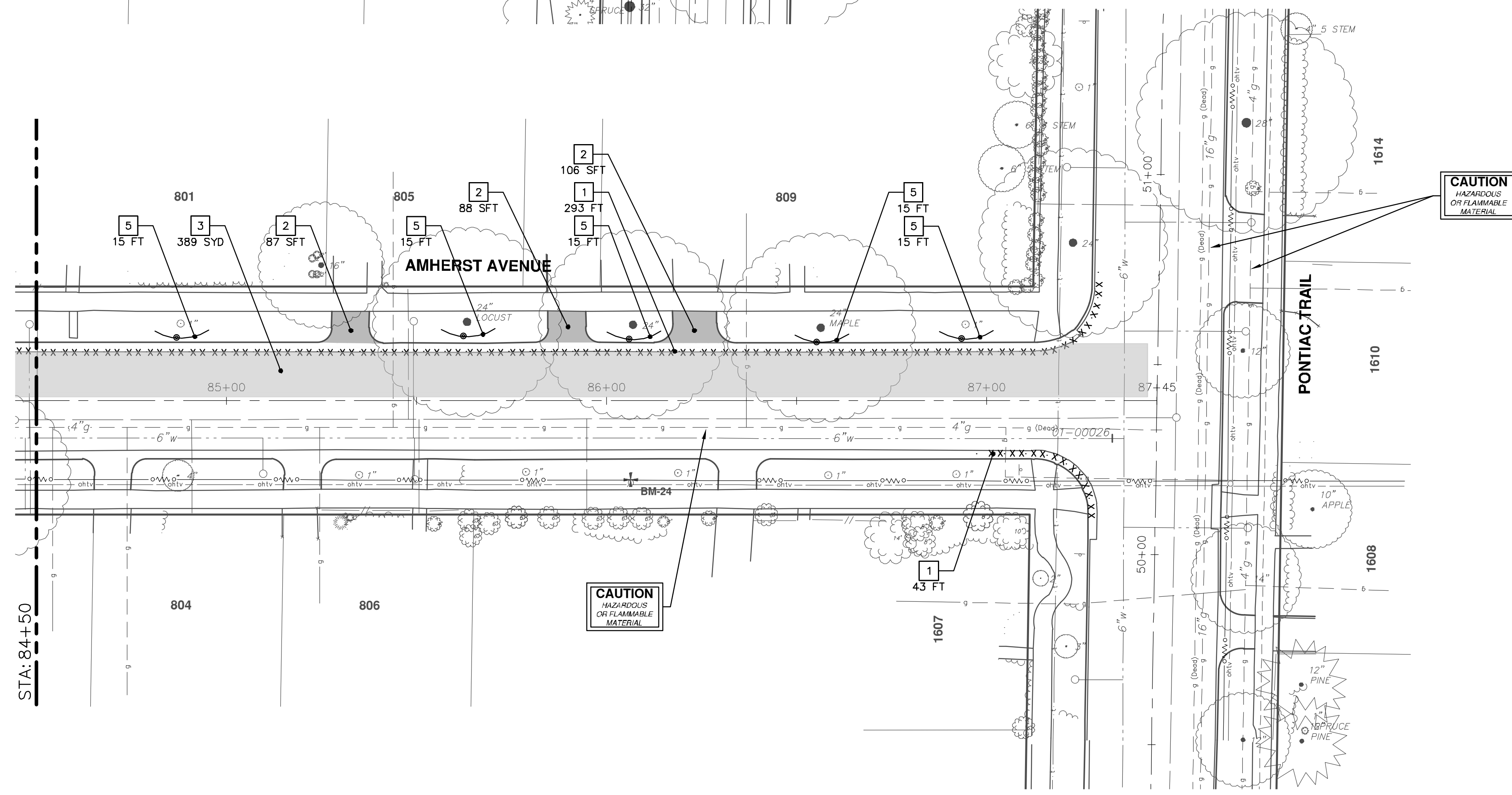


R:\2018019 Longshore Dr WM\Plan Production\2018019Rem-Amherst.dwg Dwg Created: 22-Jan-19 - \_o2 standard bw.stb - Plot Date: 12-Feb-19



REMOVAL KEY	
KEY	DESCRIPTION
1	REMOVE CONCRETE CURB OR CURB AND GUTTER, - ANY TYPE
2	REMOVE CONCRETE SIDEWALK AND DRIVE - ANY THICKNESS
3	REMOVE HMA PAVEMENT
4	TREE REMOVE, 8" OR LARGER, MODIFIED
5	PROTECTIVE FENCING
6	INLET FILTER
7	DR STRUCTURE, REM

• SAWCUT FULL DEPTH AT REMOVAL LIMITS



**811**  
Know what's below.  
Call Before you dig.

DATE: \_\_\_\_\_  
DRAWN: \_\_\_\_\_  
CHECKED: \_\_\_\_\_

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REV. DESCRIPTION

01 ADDENDUM No. 1  
02 OUT FOR BID

DATE: 2-13-19  
DRAWN: JKA  
CHECKED: JKA

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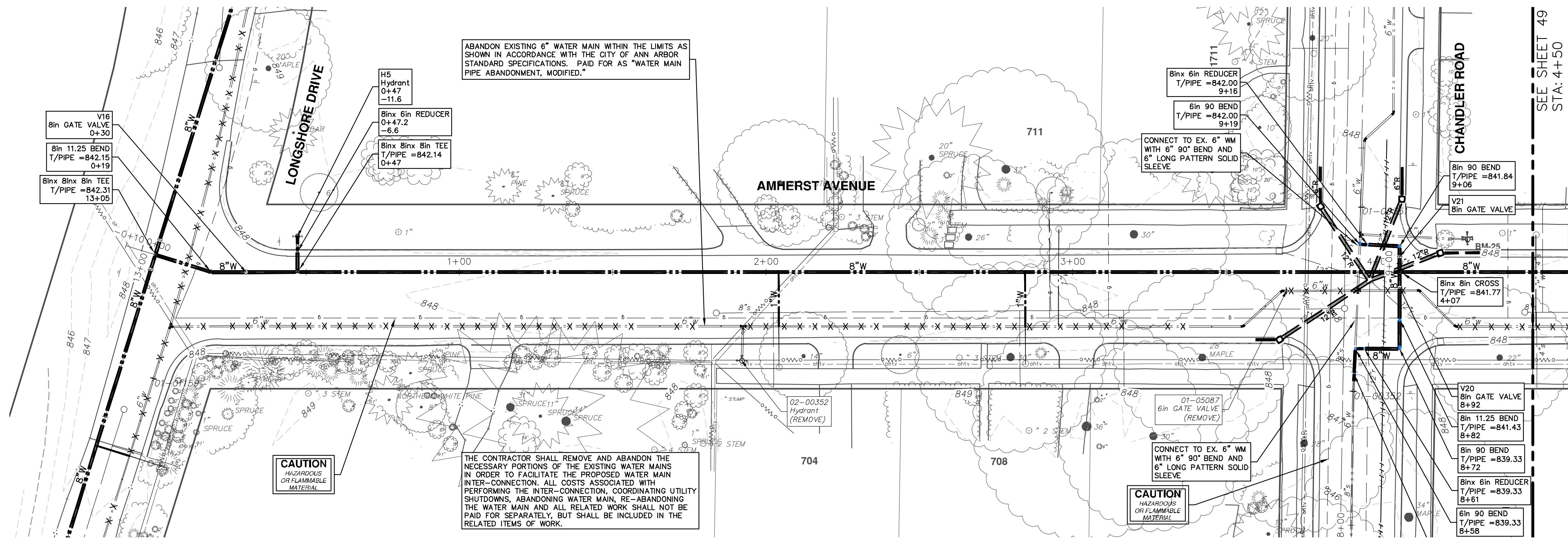
**CITY OF ANN ARBOR**  
ENGINEERING  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
AMHERST DRIVE  
REMOVALS

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SHEET No. 47 OF 54

DRAWING No. 2018019-47

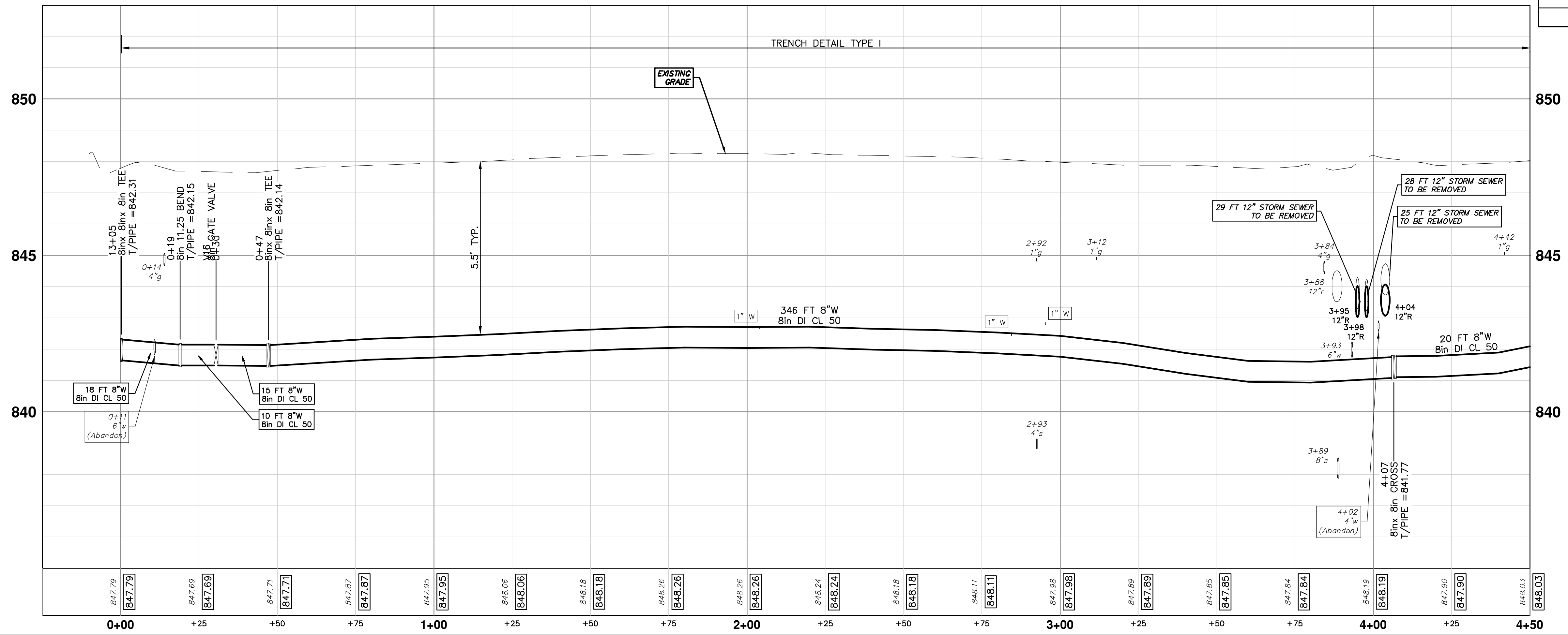
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**CAUTION**  
HAZARDOUS  
OR FLAMMABLE  
MATERIAL

THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAINS INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED MAIN SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

STRUCTURE	TYPE	STATION	RIM	DEPTH
V20	8in GATE VALVE	8+92		841.43
V21	8in GATE VALVE	9+02		841.51
H5	Hydrant	0+47		842.81
V16	8in GATE VALVE	0+30		841.81



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REV.	DATE	DRAWN	CHECKED	DESCRIPTION
01	2-13-19	JKA	JKA	ADDENDUM No. 1
00	1-23-19	JKA	JKA	OUT FOR BID

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN

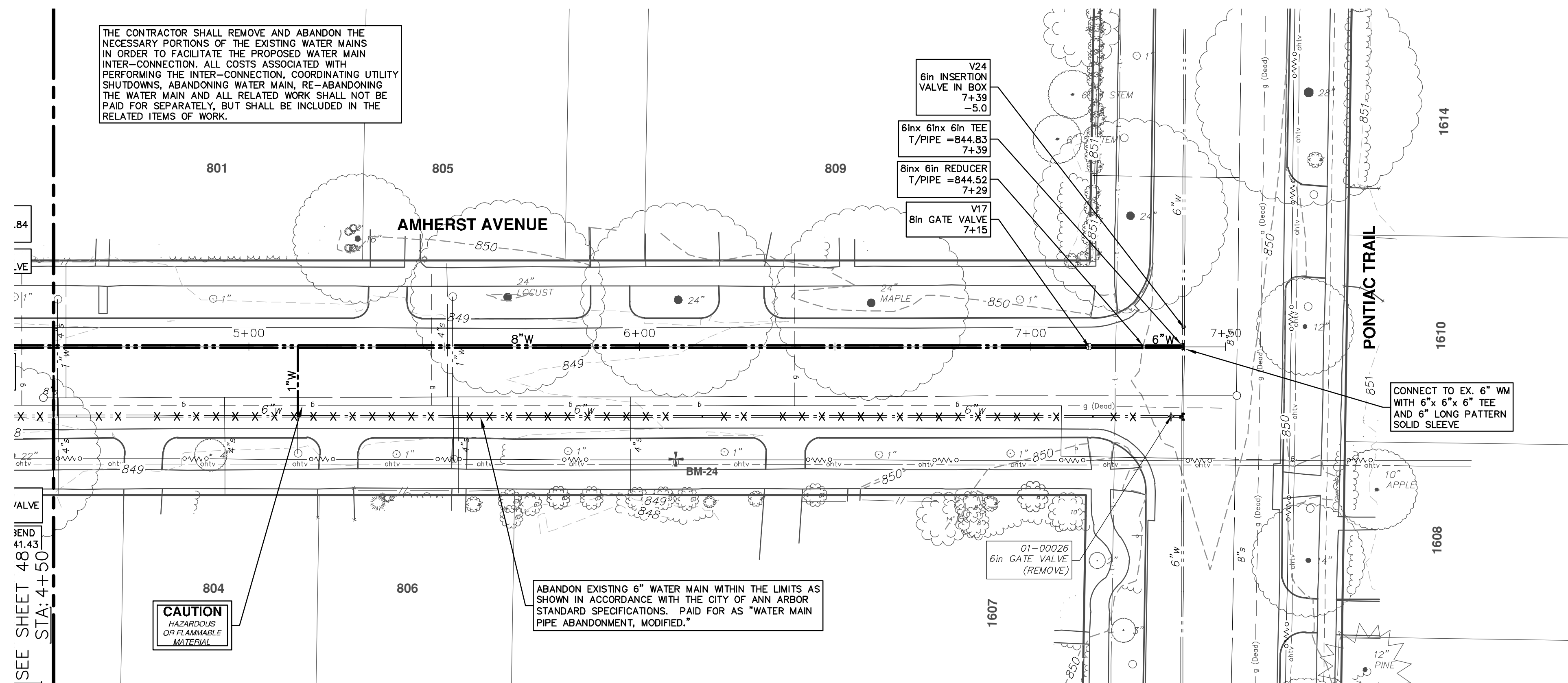
AMHERST DRIVE  
WATER MAIN - STA. 0+00 - STA. 4+50

SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

DRAWING No.  
**2018019-48**

SHEET No. **48 OF 54**

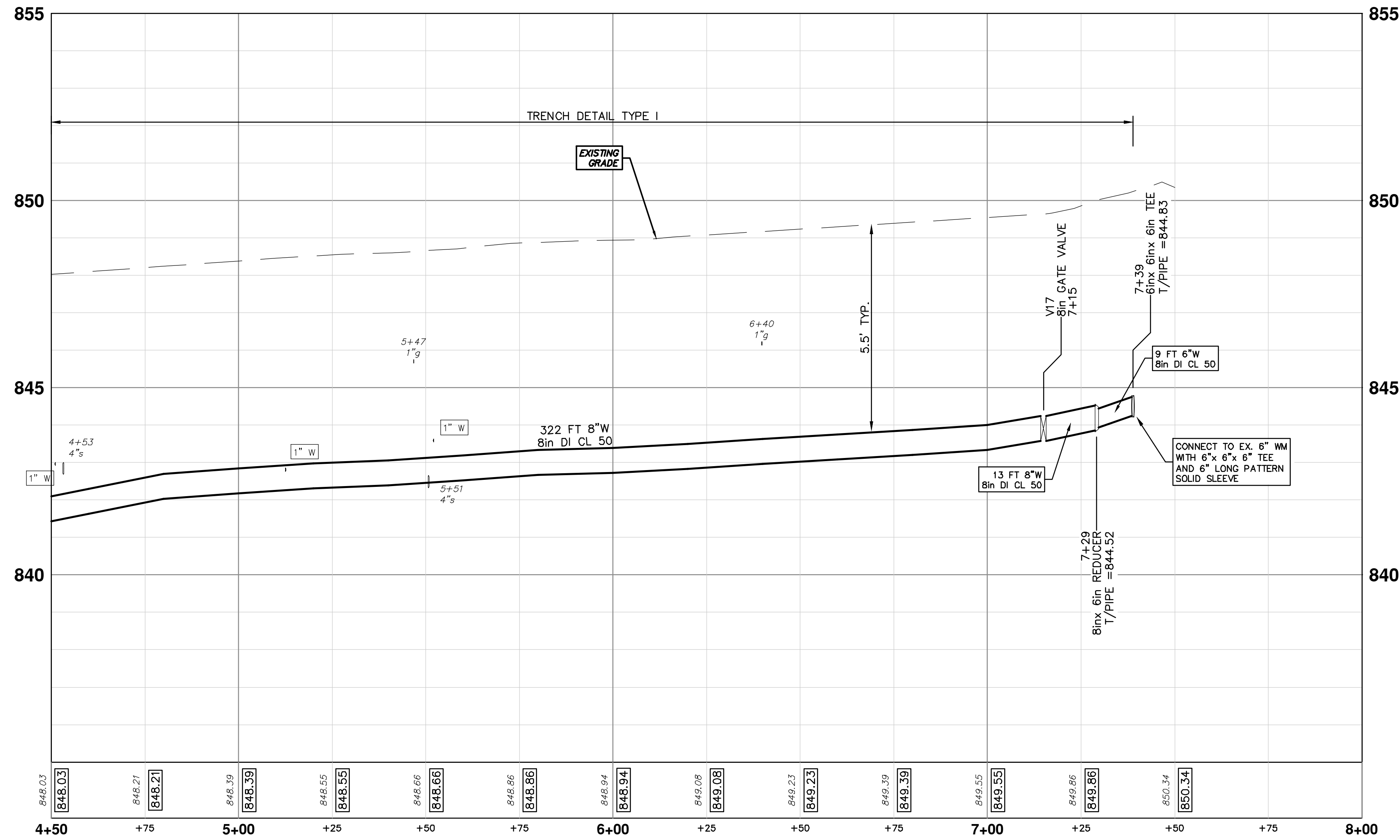
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THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

ABANDON EXISTING 6" WATER MAIN WITHIN THE LIMITS AS SHOWN IN ACCORDANCE WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS. PAID FOR AS "WATER MAIN PIPE ABANDONMENT, MODIFIED."

**CAUTION**  
HAZARDOUS OR FLAMMABLE MATERIAL



WATER MAIN STRUCTURE TABLE				
STRUCTURE	TYPE	STATION	RIM	DEPTH
V24	6in INSERTION VALVE IN BOX	7+39		844.55
V17	8in GATE VALVE	7+15		843.91

**811**  
Know what's below.  
Call before you dig.

01 ADDENDUM No. 1  
2-13-19  
CC/DF/KB

02 REV.  
1-23-19  
CC/DF/KB

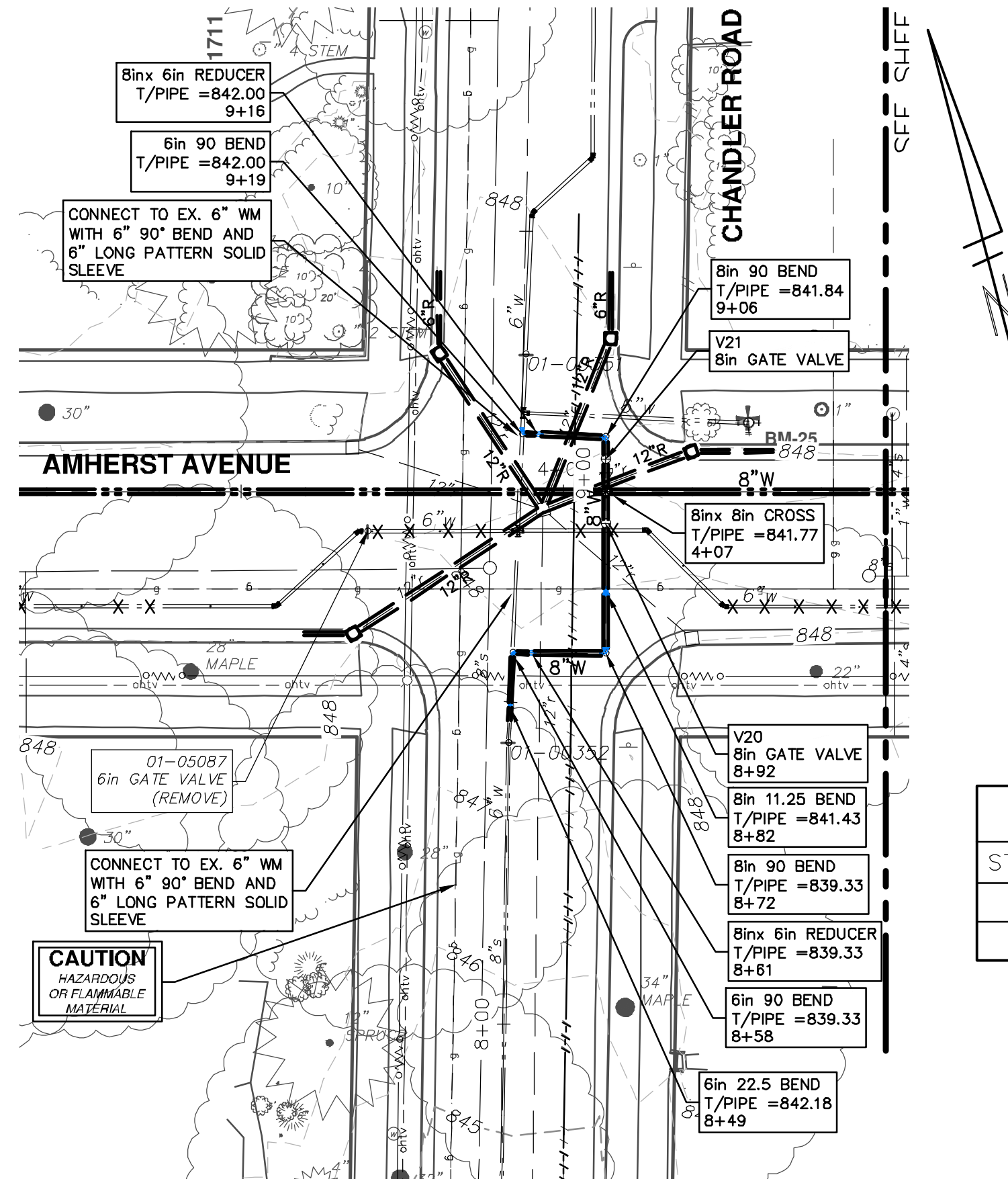
DATE DRAWN CHECKED

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
AMHERST DRIVE  
WATER MAIN - STA. 4+50 - STA. 7+39

CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING  
SCALE PLAN: 1" = 20'  
PROFILE: 1" = 2'

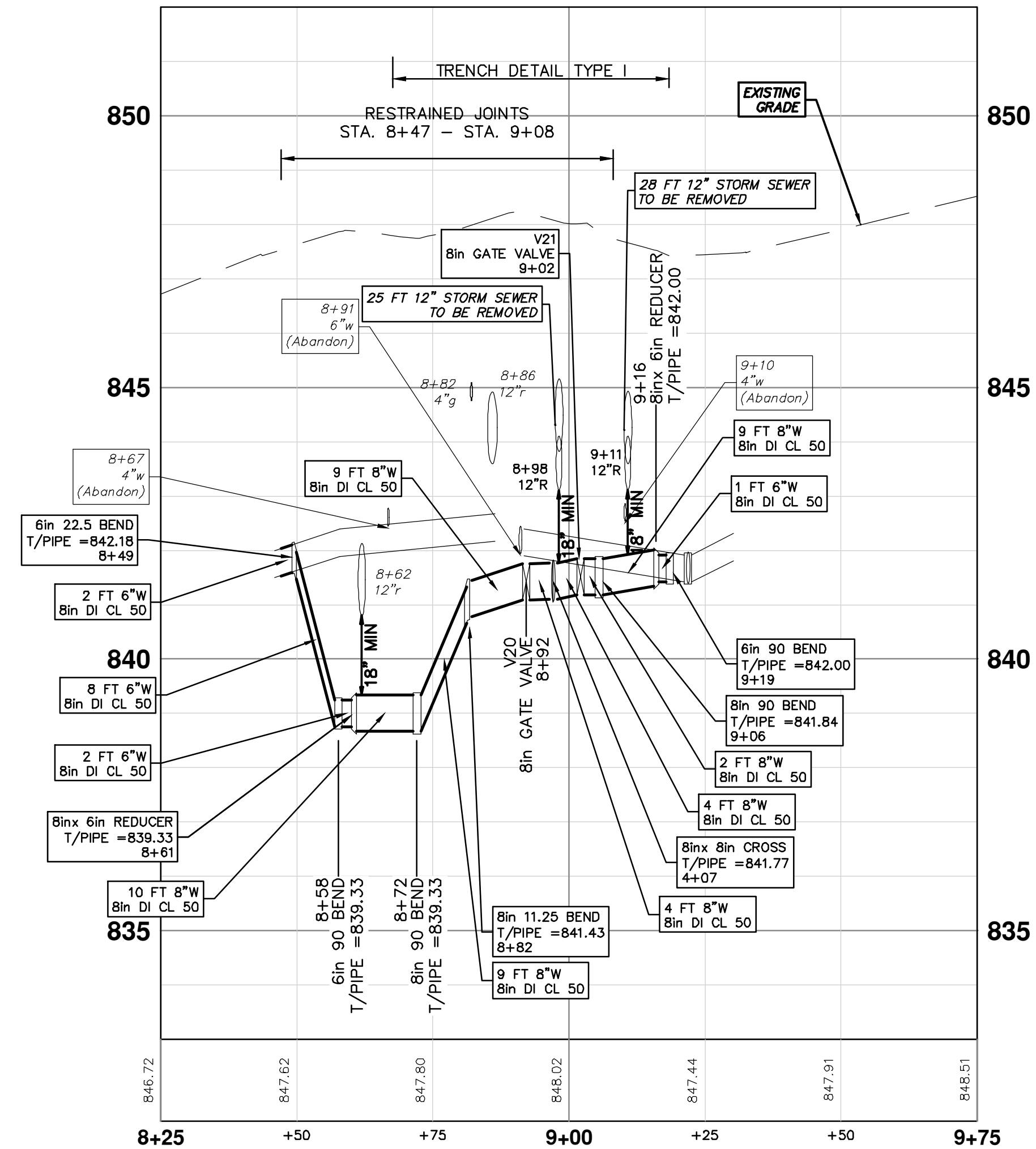
DRAWING No.  
**2018019-49**

SHEET No.  
**49 OF 54**



THE CONTRACTOR SHALL REMOVE AND ABANDON THE NECESSARY PORTIONS OF THE EXISTING WATER MAINS IN ORDER TO FACILITATE THE PROPOSED WATER MAIN INTER-CONNECTION. ALL COSTS ASSOCIATED WITH PERFORMING THE INTER-CONNECTION, COORDINATING UTILITY SHUTDOWNS, ABANDONING WATER MAIN, RE-ABANDONING THE WATER MAIN AND ALL RELATED WORK SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE RELATED ITEMS OF WORK.

STRUCTURE	TYPE	STATION	RIM	DEPTH
V20	8in GATE VALVE	8+92		841.43
V21	8in GATE VALVE	9+02		841.51



**811**  
Know what's below.  
Call Before you dig.

DATE: 1-23-19  
DRAWN: JKA  
CHECKED: JKA

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REV. 01 ADDENDUM No. 1  
00 OUT FOR BID

DESCRIPTION: DRAWN  
DATE: 1-23-19

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**CITY OF ANN ARBOR**  
MICHIGAN

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**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
AMHERST DRIVE

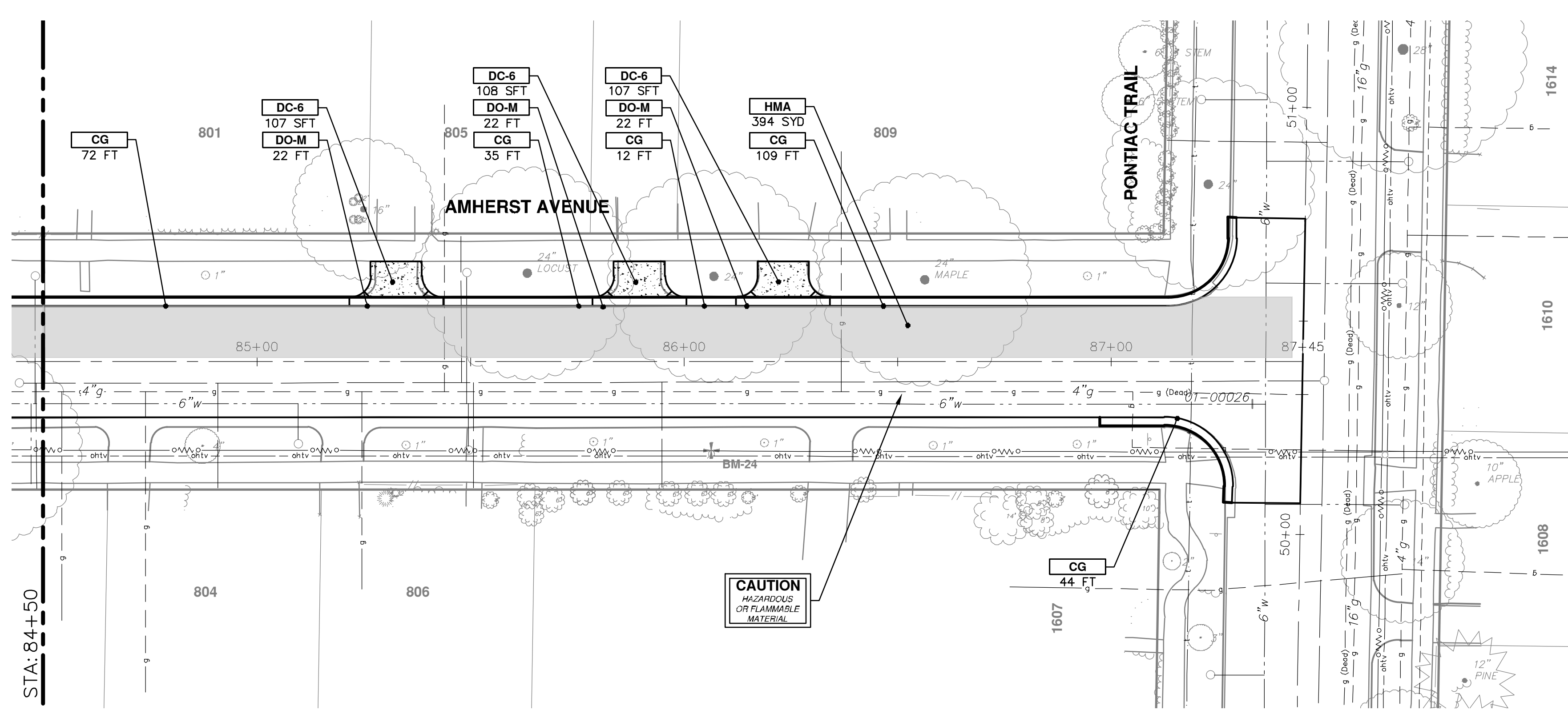
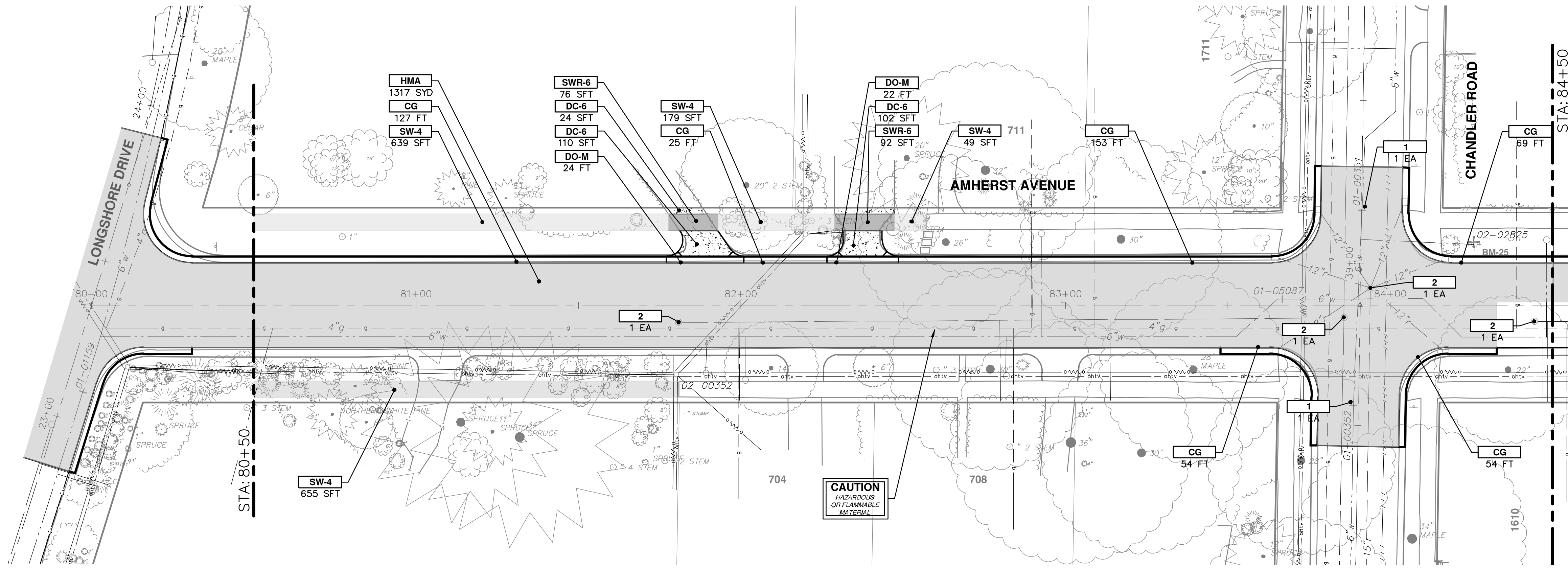
WATER MAIN - CHANDLER ROAD CONNECTION

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SHEET No. 50 OF 54

DRAWING No. 2018019-50  
PROFILE: 1" = 2'  
SCALE PLAN: 1" = 20'

R:\2018019 Longshore Dr WM\Plan Production\2018019Prd-Amherst.dwg Dwg Created: 22-Jan-19 - \_a2 standard bw.stb - Plot Date: 12-Feb-19



CONSTRUCTION KEY	
KEY	DESCRIPTION
HMA	PLACE HMA, LVSP. PLACE MATERIAL IN LIFTS ACCORDING TO THE TYPICAL SECTION AND AS DIRECTED BY THE ENGINEER.
CG	PLACE CURB AND GUTTER, CONC. FA, SPECIAL
DO-M	PLACE DRIVEWAY OPENING, CONC. DETAIL M, P-NC
DC-6	PLACE CONC. DRIVE APPROACH, NON-REINFORCED, P-NC, 6 INCH. PLACE AND COMPACT 6 INCH SUBBASE, CIP, CLASS II GRANULAR MATERIAL, MODIFIED.
SW-4	PLACE SIDEWALK, CONC, 4 INCH, MODIFIED
SWR-6	PLACE SIDEWALK, SIDEWALK RAMP, CONC, 6 INCH, MODIFIED
DWS	DETECTABLE WARNING, CAST IN PLACE
ABO	ADJUST BY OTHERS
1	ADJUST GATE VALVE BOX, MONUMENT BOX, OR GAS BOX.
2	ADJUST STRUCTURE COVER

**811**  
Know what's below.  
Call Before you dig.

01 ADDENDUM No. 1  
2-13-19  
CC/DF/KB JKA

02 OUT FOR BID  
1-23-19  
CC/DF/KB JKA

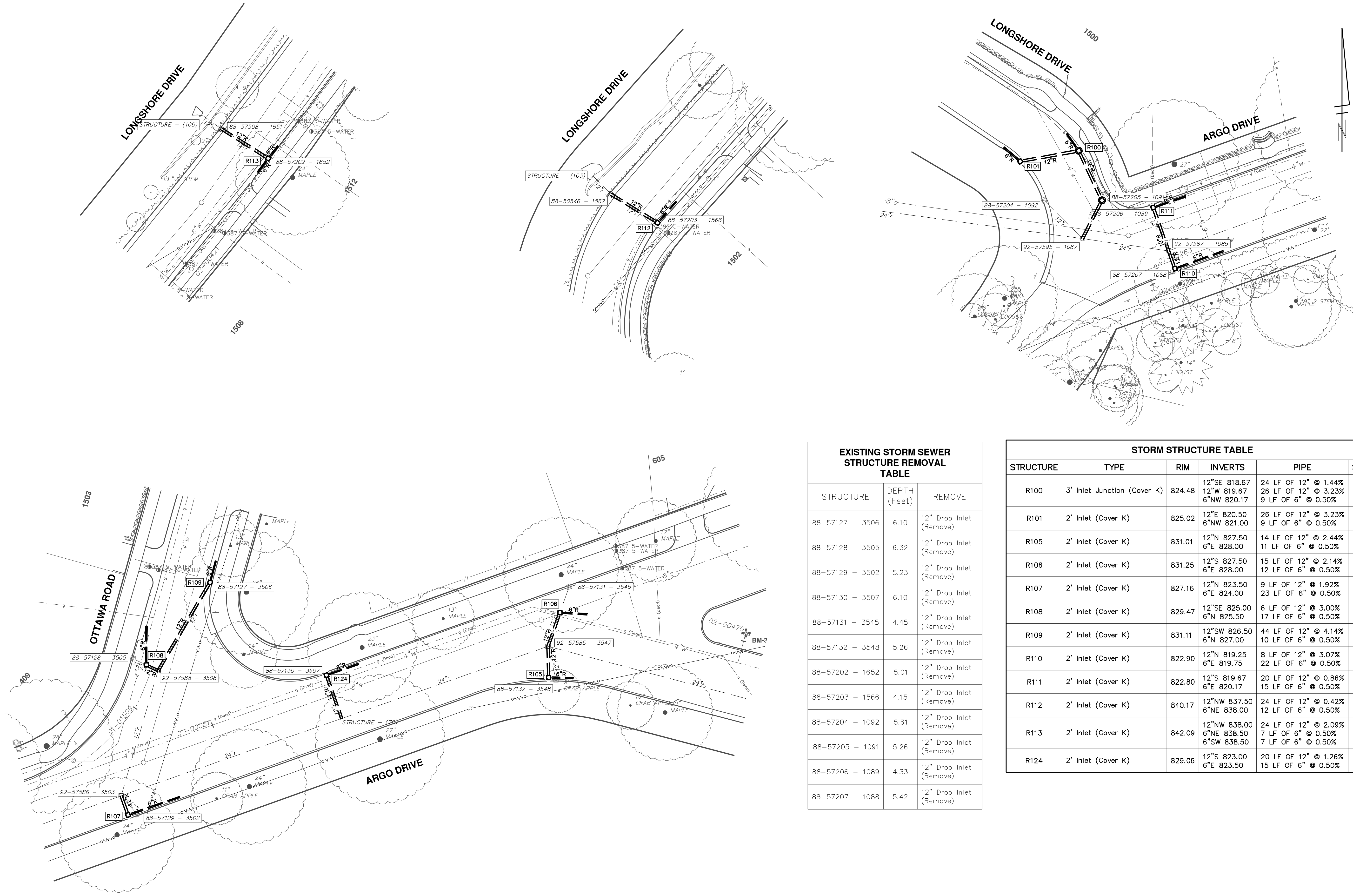
REV. DESCRIPTION DATE DRAWN CHECKED

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
LONGSHORE INDIANOLA OTTAWA  
ARGO AMHERST WATERMAIN  
AMHERST DRIVE  
ROAD

SHEET No. **51 OF 54**

DRAWING No. **2018019-51**

R:\2018019 Longshore Dr WM\Plan Production\2018019Strm.dwg Dwg Created: 22-Jan-19 - a2\_standard.bw.stb - Plot Date: 12-Feb-19



EXISTING STORM SEWER STRUCTURE REMOVAL TABLE		
STRUCTURE	DEPTH (Feet)	REMOVE
88-57127 - 3506	6.10	12" Drop Inlet (Remove)
88-57128 - 3505	6.32	12" Drop Inlet (Remove)
88-57129 - 3502	5.23	12" Drop Inlet (Remove)
88-57130 - 3507	6.10	12" Drop Inlet (Remove)
88-57131 - 3545	4.45	12" Drop Inlet (Remove)
88-57132 - 3548	5.26	12" Drop Inlet (Remove)
88-57202 - 1652	5.01	12" Drop Inlet (Remove)
88-57203 - 1566	4.15	12" Drop Inlet (Remove)
88-57204 - 1092	5.61	12" Drop Inlet (Remove)
88-57205 - 1091	5.26	12" Drop Inlet (Remove)
88-57206 - 1089	4.33	12" Drop Inlet (Remove)
88-57207 - 1088	5.42	12" Drop Inlet (Remove)

STORM STRUCTURE TABLE					
STRUCTURE	TYPE	RIM	INVERTS	PIPE	SUMP
R100	3' Inlet Junction (Cover K)	824.48	12"SE 818.67 12"W 819.67 6"NW 820.17	24 LF OF 12" @ 1.44% 26 LF OF 12" @ 3.23% 9 LF OF 6" @ 0.50%	2'
R101	2' Inlet (Cover K)	825.02	6"E 820.50 6"NW 821.00	26 LF OF 12" @ 3.23% 9 LF OF 6" @ 0.50%	2'
R105	2' Inlet (Cover K)	831.01	12"N 827.50 6"E 828.00	14 LF OF 12" @ 2.44% 11 LF OF 6" @ 0.50%	2'
R106	2' Inlet (Cover K)	831.25	12"S 827.50 6"E 828.00	15 LF OF 12" @ 2.14% 12 LF OF 6" @ 0.50%	2'
R107	2' Inlet (Cover K)	827.16	12"N 823.50 6"E 824.00	9 LF OF 12" @ 1.92% 23 LF OF 6" @ 0.50%	2'
R108	2' Inlet (Cover K)	829.47	12"SE 825.00 6"N 825.50	6 LF OF 12" @ 3.00% 17 LF OF 6" @ 0.50%	2'
R109	2' Inlet (Cover K)	831.11	12"SW 826.50 6"N 827.00	44 LF OF 12" @ 4.14% 10 LF OF 6" @ 0.50%	2'
R110	2' Inlet (Cover K)	822.90	12"N 819.25 6"E 819.75	8 LF OF 12" @ 3.07% 22 LF OF 6" @ 0.50%	2'
R111	2' Inlet (Cover K)	822.80	12"S 819.67 6"E 820.17	20 LF OF 12" @ 0.86% 15 LF OF 6" @ 0.50%	2'
R112	2' Inlet (Cover K)	840.17	12"NW 837.50 6"NE 838.00	24 LF OF 12" @ 0.42% 12 LF OF 6" @ 0.50%	2'
R113	2' Inlet (Cover K)	842.09	12"NW 838.00 6"NE 838.50 6"SW 838.50	24 LF OF 12" @ 2.09% 7 LF OF 6" @ 0.50% 7 LF OF 6" @ 0.50%	2'
R124	2' Inlet (Cover K)	829.06	12"S 823.00 6"E 823.50	20 LF OF 12" @ 1.26% 15 LF OF 6" @ 0.50%	2'

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**

**LONGSHORE INDIANOLA OTTAWA**

**ARGO AMHERST WATERMAIN**

STORM SEWER

SHEET No. **52 OF 54**

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01 ADDENDUM No. 1  
2-13-19  
02 OUT FOR BID  
1-23-19

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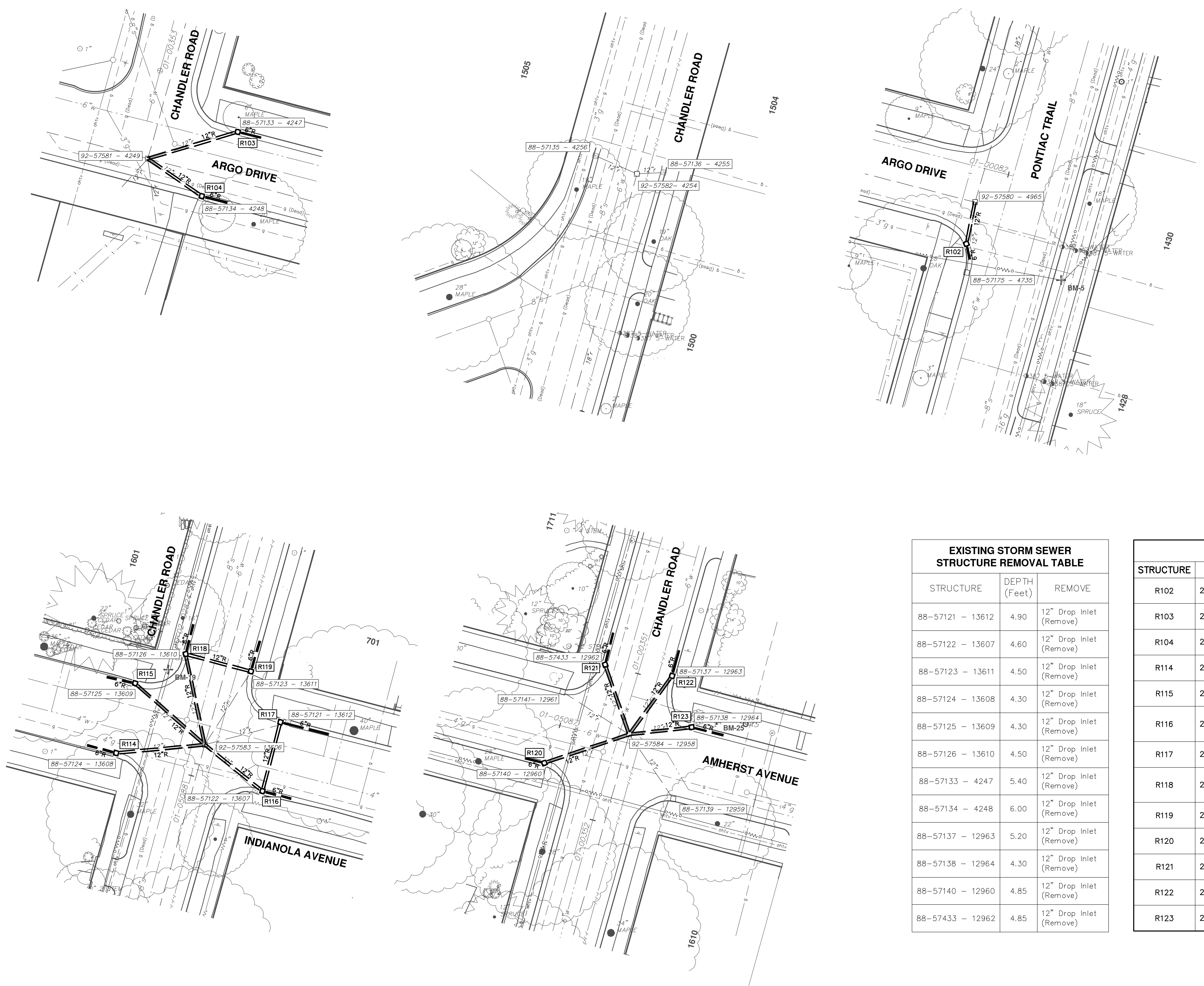
REV.

DESCRIPTION

DESCRIPTION

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EXISTING STORM SEWER STRUCTURE REMOVAL TABLE		
STRUCTURE	DEPTH (Feet)	REMOVE
88-57121 - 13612	4.90	12" Drop Inlet (Remove)
88-57122 - 13607	4.60	12" Drop Inlet (Remove)
88-57123 - 13611	4.50	12" Drop Inlet (Remove)
88-57124 - 13608	4.30	12" Drop Inlet (Remove)
88-57125 - 13609	4.30	12" Drop Inlet (Remove)
88-57126 - 13610	4.50	12" Drop Inlet (Remove)
88-57133 - 4247	5.40	12" Drop Inlet (Remove)
88-57134 - 4248	6.00	12" Drop Inlet (Remove)
88-57137 - 12963	5.20	12" Drop Inlet (Remove)
88-57138 - 12964	4.30	12" Drop Inlet (Remove)
88-57140 - 12960	4.85	12" Drop Inlet (Remove)
88-57433 - 12962	4.85	12" Drop Inlet (Remove)

STORM STRUCTURE TABLE					
STRUCTURE	TYPE	RIM	INVERTS	PIPE	SUMP
R102	2' Inlet (Cover K)	841.65	12"N 833.00 6"S 833.50	17 LF OF 12" @ 1.00% 6 LF OF 6" @ 0.50%	2'
R103	2' Inlet (Cover K)	836.23	12"W 831.50 6"E 818.49	37 LF OF 12" @ 1.63% 9 LF OF 6" @ 0.50%	2'
R104	2' Inlet (Cover K)	836.72	12"NW 831.25 6"E 831.75	26 LF OF 12" @ 1.36% 10 LF OF 6" @ 0.50%	2'
R114	2' Inlet (Cover K)	835.84	12"E 833.33 6"W 833.83	35 LF OF 12" @ 0.94% 12 LF OF 6" @ 0.50%	2'
R115	2' Inlet (Cover K)	836.09	12"SE 833.17 6"W 833.67	36 LF OF 12" @ 0.47% 11 LF OF 6" @ 0.50%	2'
R116	2' Inlet (Cover K)	836.30	12"NW 833.33 12"N 833.33 6"E 833.83	29 LF OF 12" @ 1.14% 28 LF OF 12" @ 0.61% 12 LF OF 6" @ 0.50%	2'
R117	2' Inlet (Cover K)	836.90	12"S 833.50 6"E 834.00	28 LF OF 12" @ 0.61% 19 LF OF 6" @ 0.50%	2'
R118	2' Inlet (Cover K)	836.27	12"S 833.33 12"E 833.33 6"N 833.83	36 LF OF 12" @ 0.91% 27 LF OF 12" @ 0.64% 12 LF OF 6" @ 0.50%	2'
R119	2' Inlet (Cover K)	836.90	12"W 833.50 6"N 834.00	27 LF OF 12" @ 0.64% 12 LF OF 6" @ 0.50%	2'
R120	2' Inlet (Cover K)	847.50	12"E 843.33 6"W 843.83	35 LF OF 12" @ 0.94% 8 LF OF 6" @ 0.50%	2'
R121	2' Inlet (Cover K)	847.86	12"S 843.25 6"N 843.75	29 LF OF 12" @ 0.86% 13 LF OF 6" @ 0.50%	2'
R122	2' Inlet (Cover K)	847.87	12"SW 843.25 6"N 843.75	29 LF OF 12" @ 0.88% 10 LF OF 6" @ 0.50%	2'
R123	2' Inlet (Cover K)	847.52	12"W 843.25 6"E 843.75	25 LF OF 12" @ 1.00% 13 LF OF 6" @ 0.50%	2'

**CITY OF ANN ARBOR - PUBLIC SERVICES - ENGINEERING**  
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SHEET No. **53 OF 54**

SCALE PLAN: 1" = 20'

DRAWING No. **2018019-53**

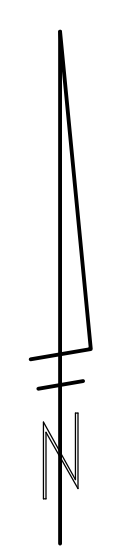
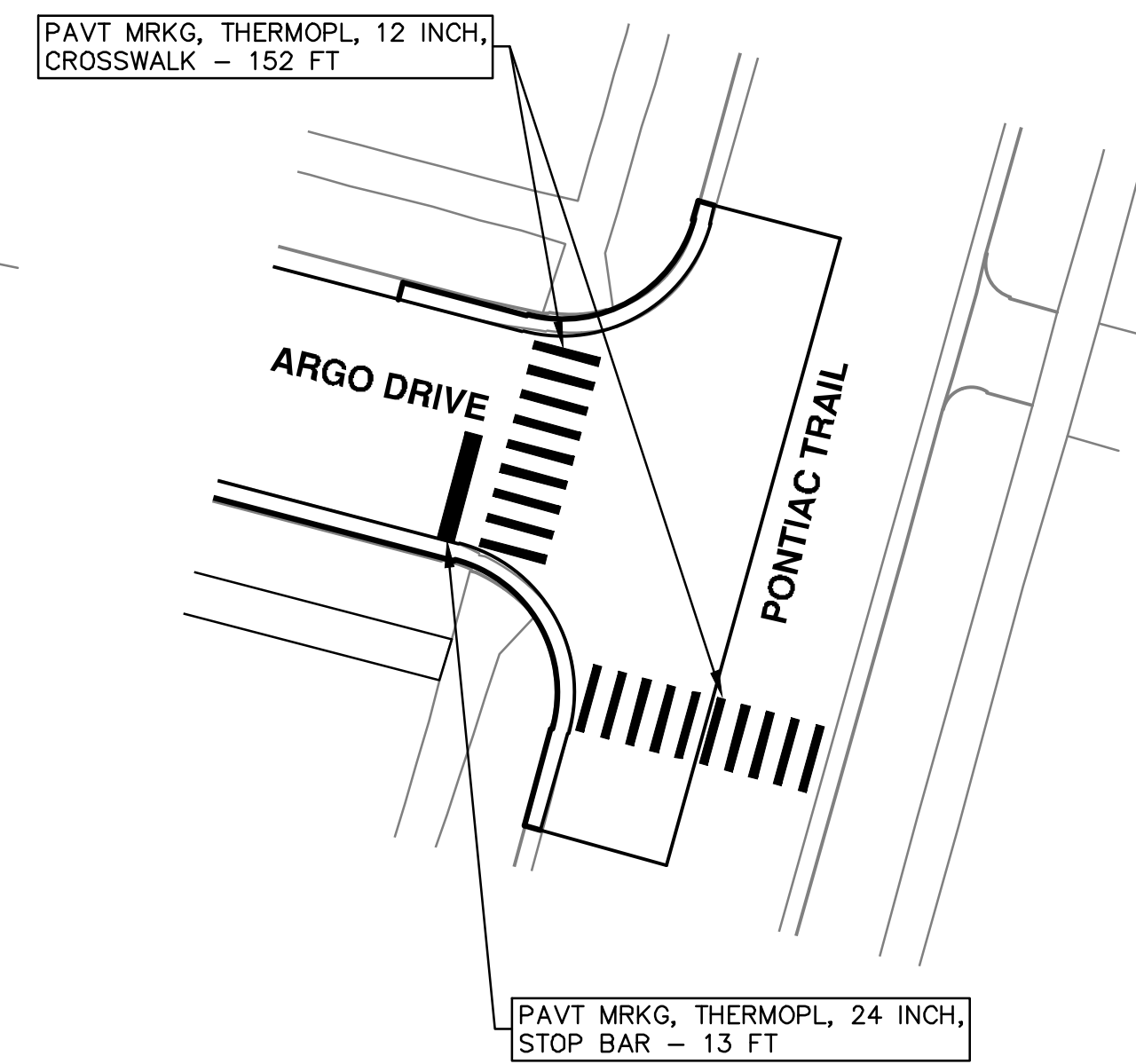
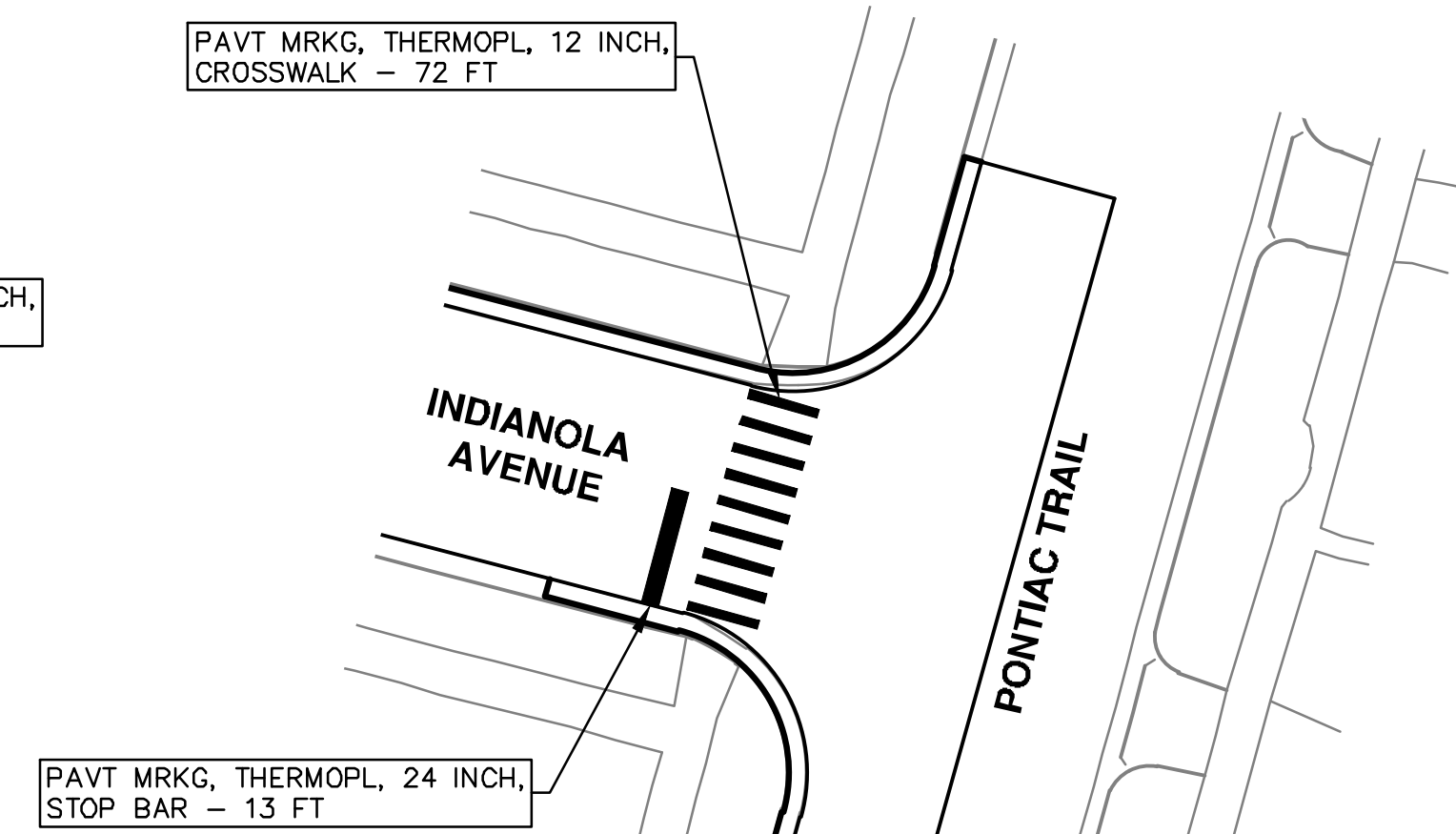
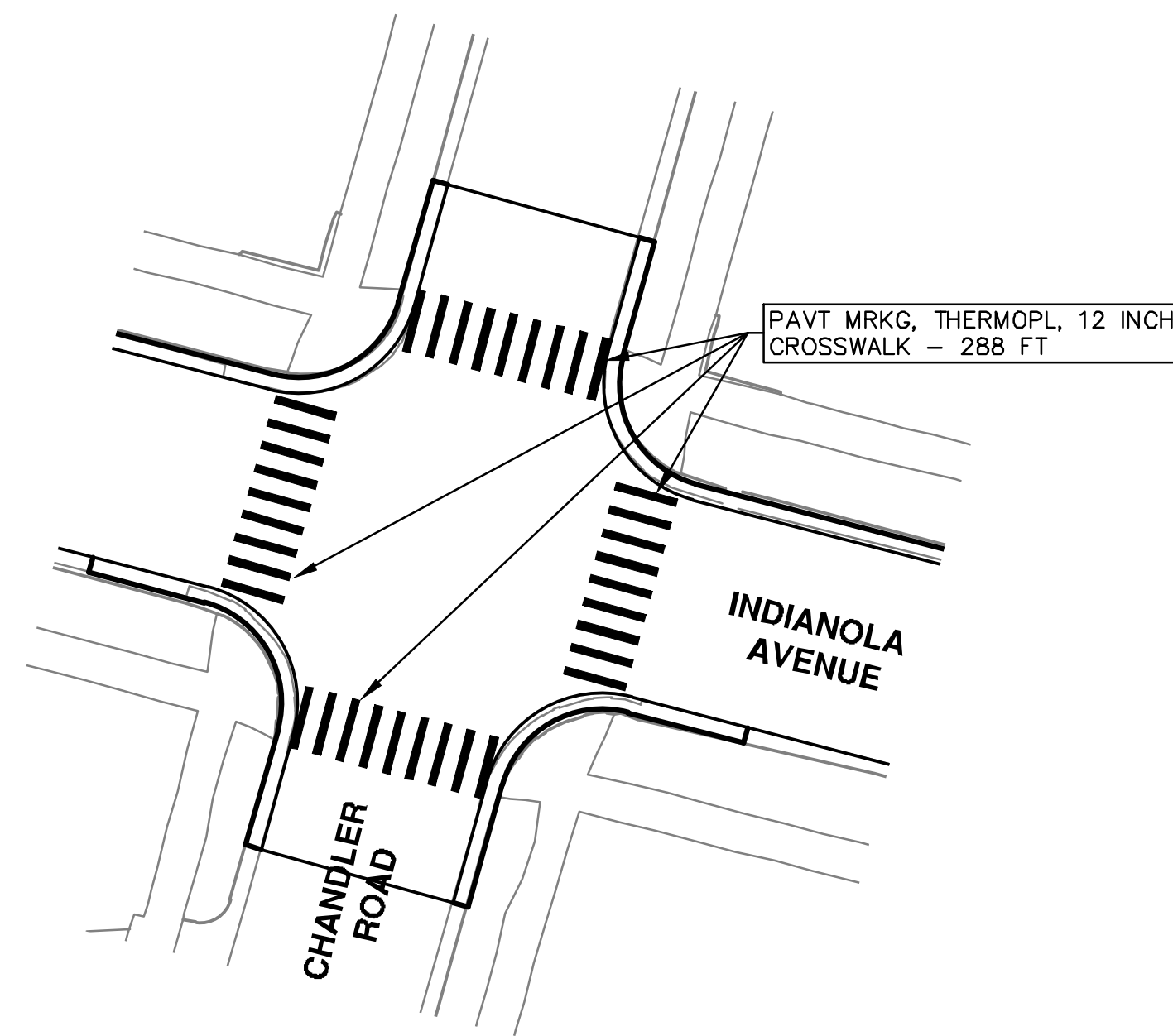
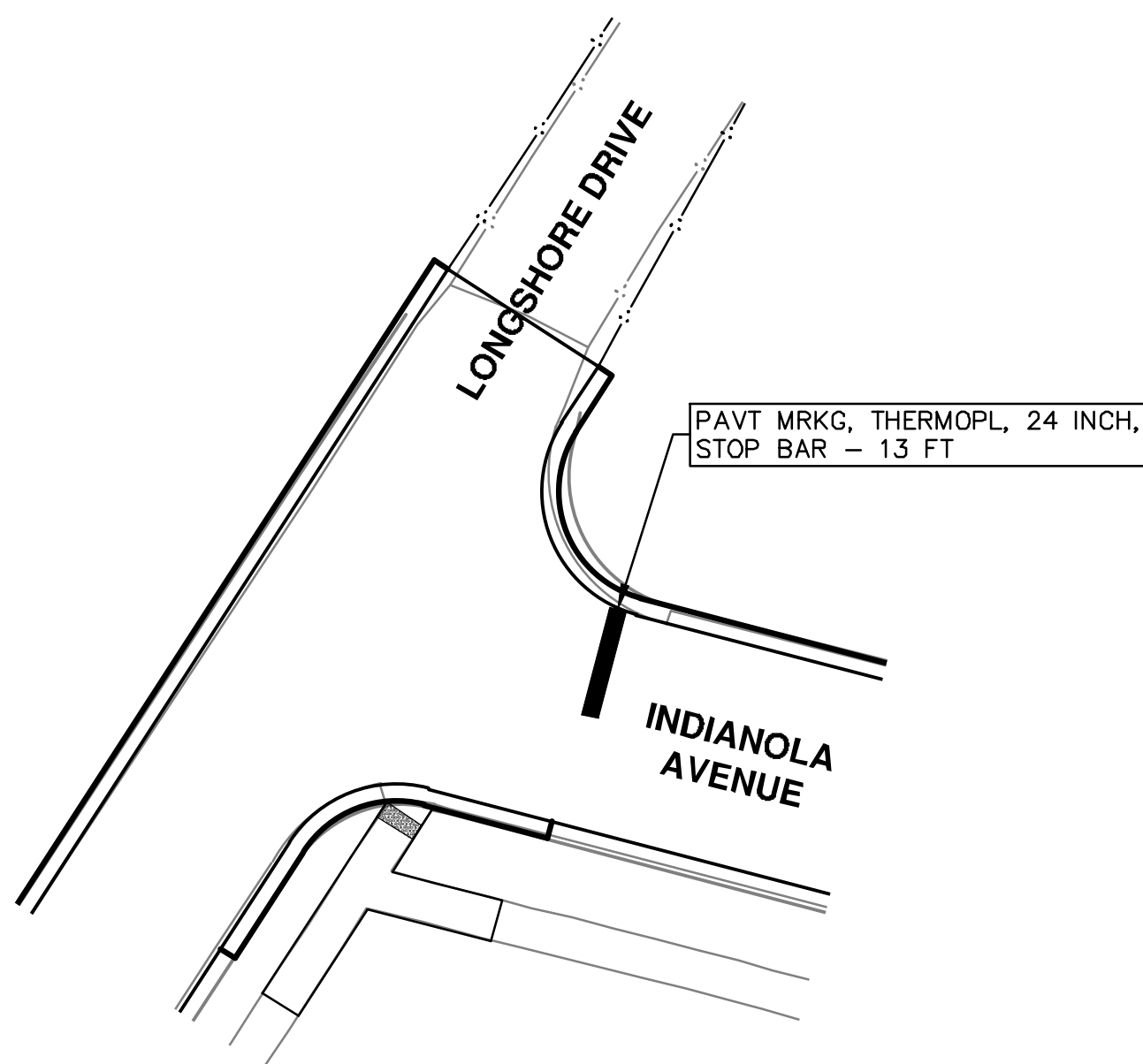
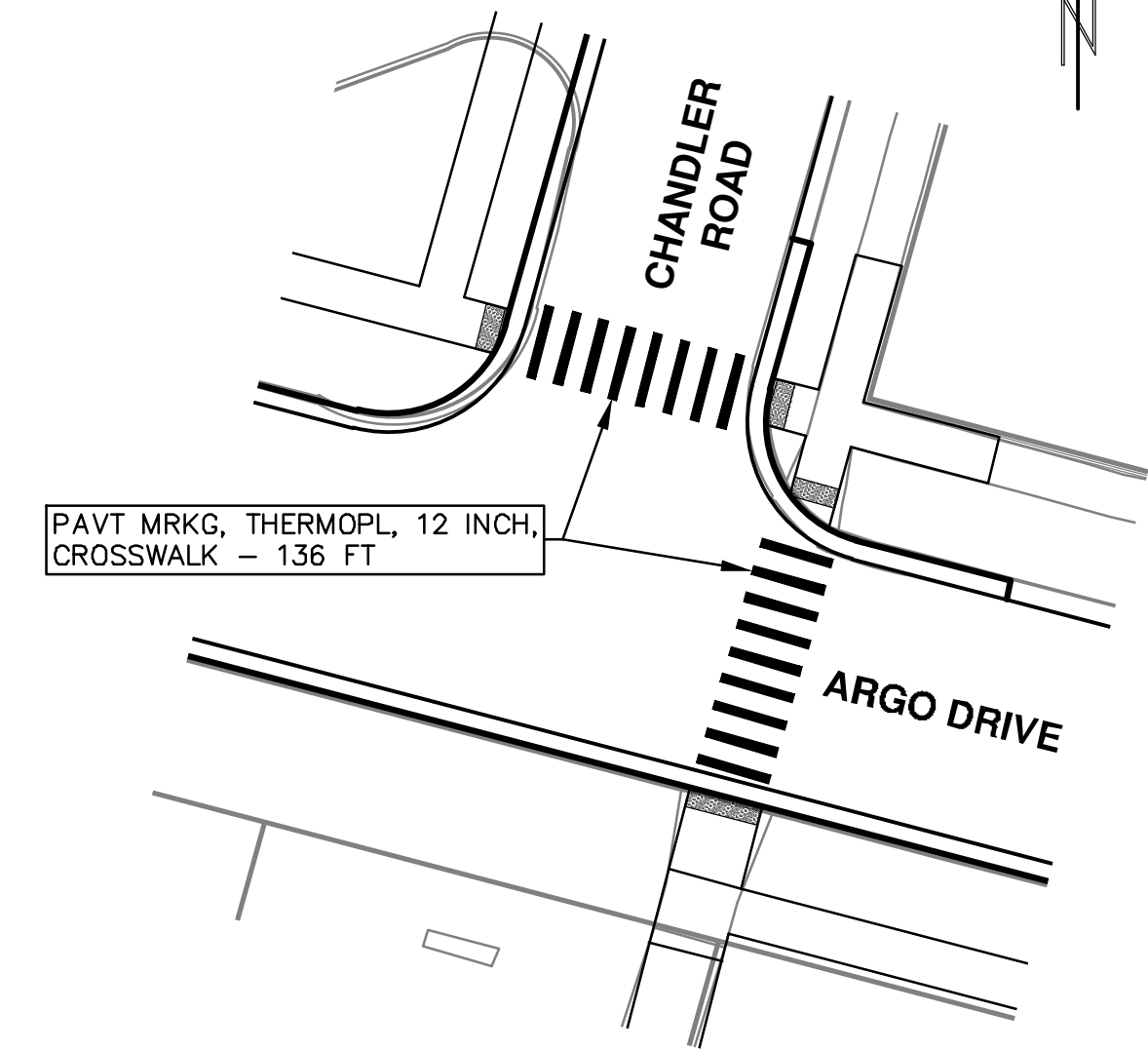
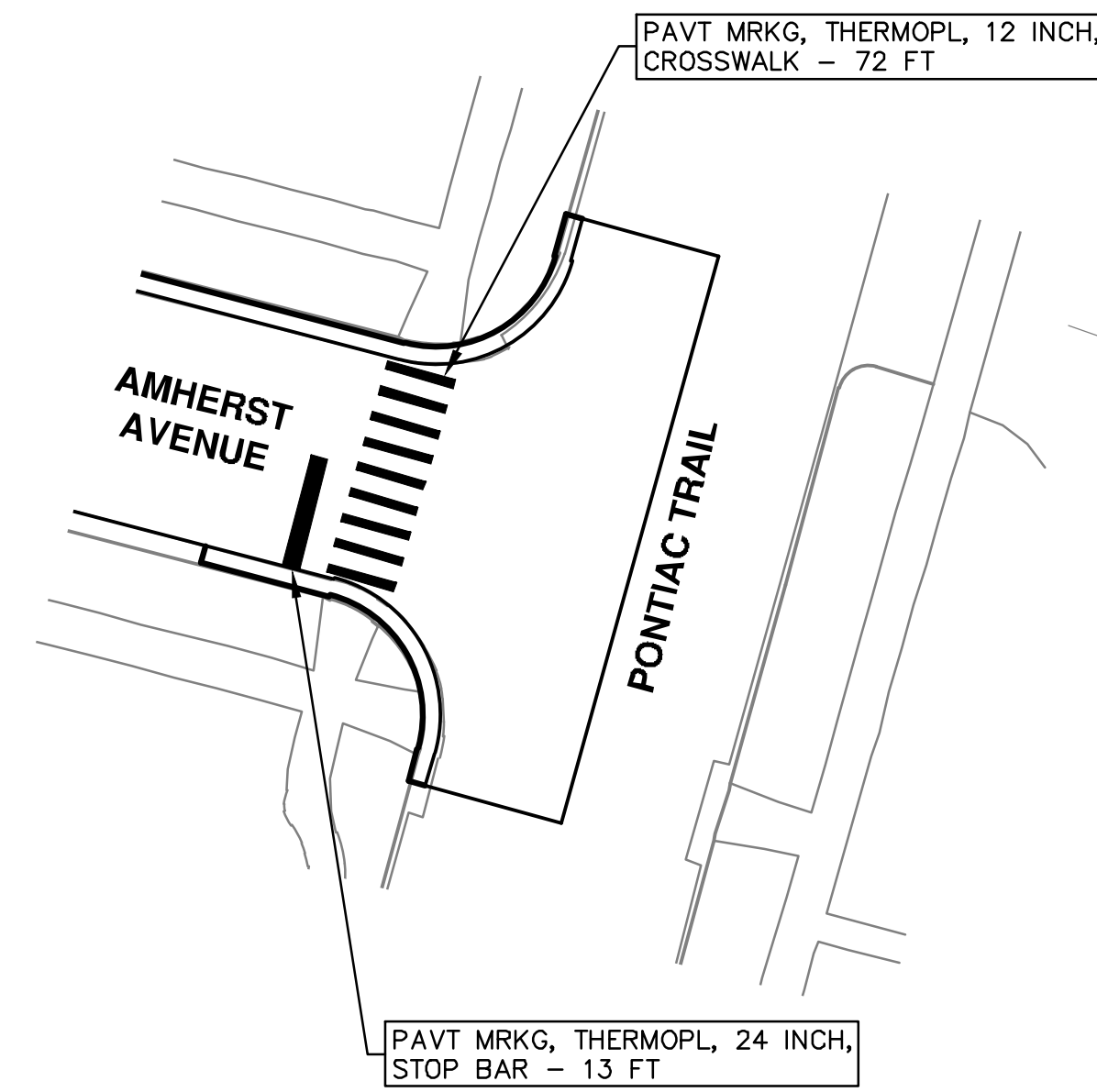
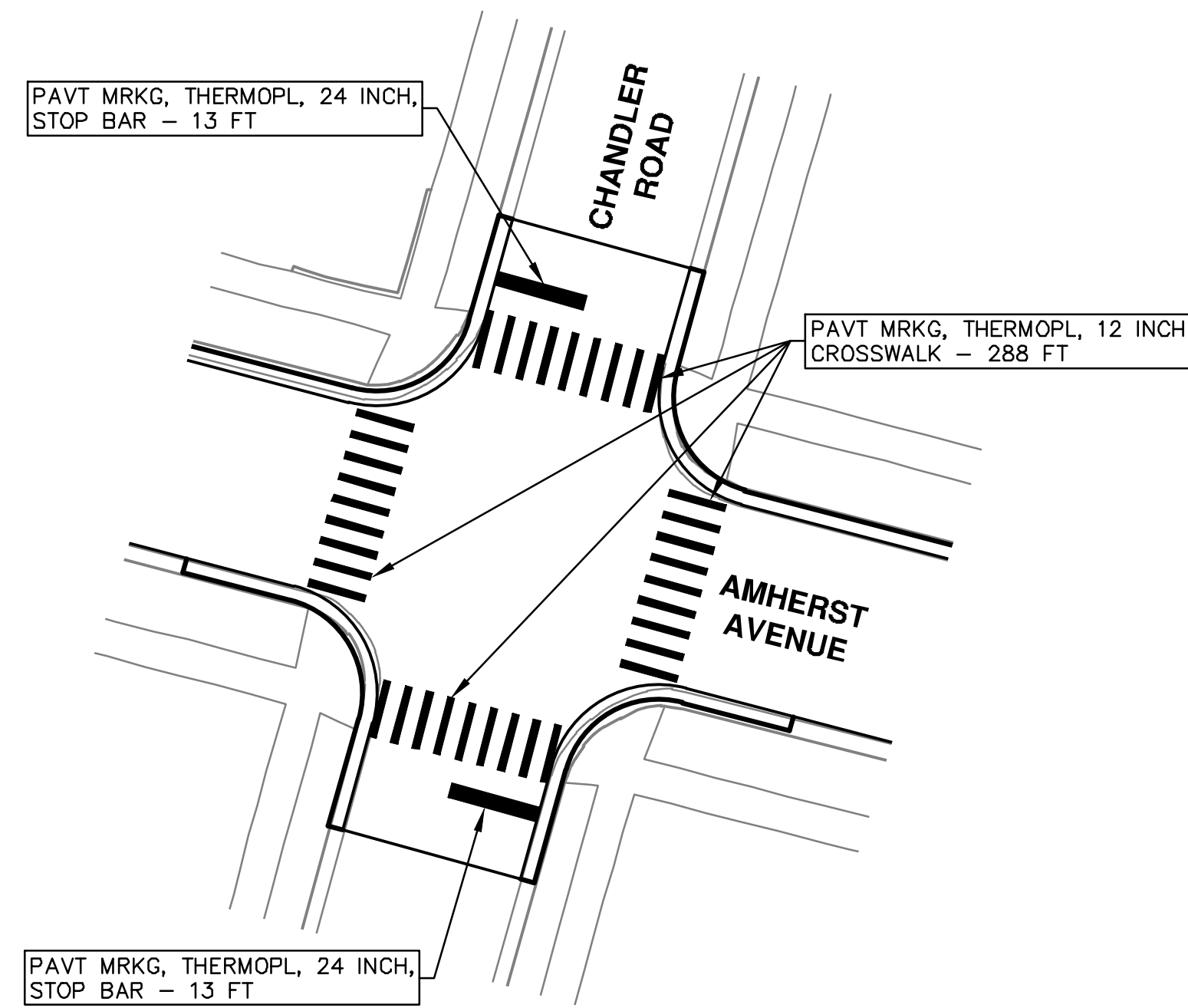
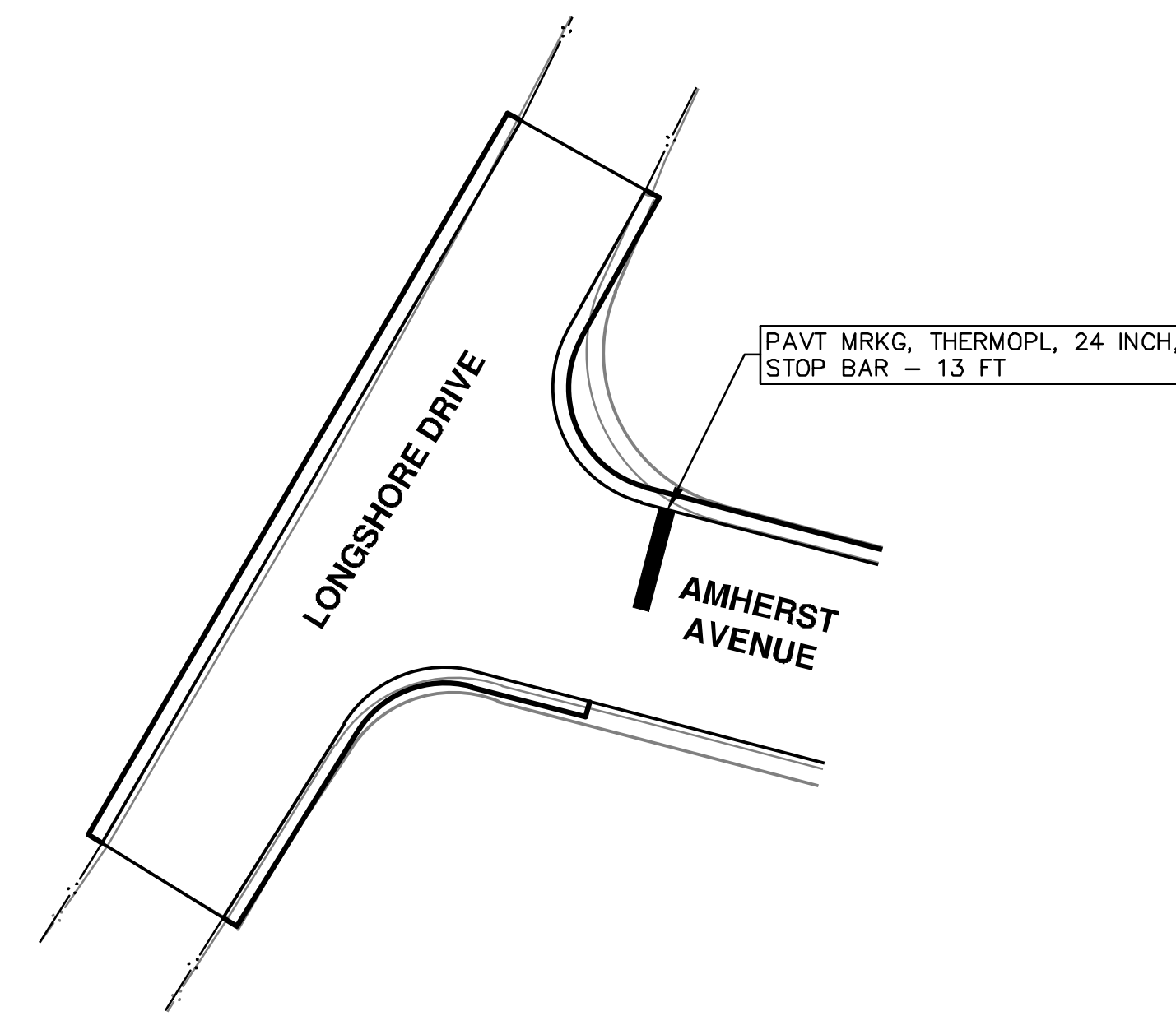
**STORM SEWER**

01	ADDENDUM No. 1	2-13-19	CC/DF/KB	JKA	
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SCALE PLAN: 1" = 20'  
DRAWING No. 2018019-54

REV.	DATE	DESCRIPTION	DRAWN	CHECKED
01	2-13-19	ADDENDUM No. 1	CC/DF/KB	JKA
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