

# ADDENDUM No. 1

## RFP No. 24-23

### Barton/Bandemer Park Pedestrian Tunnel Project

**Due: May 15, 2024 by 11:00 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 seven (7) pages in addition to the sign in sheet (1 page), 29 pages that were updated in the RFP document, and the entire updated plan set (80 pages) for a total of 117 pages.**

The Proposer is to acknowledge receipt of this Addendum No. 1 by signing and submitting Attachment B, including all attachments in its Proposal by so indicating in the proposal that the addendum has been received. Proposals submitted without acknowledgement of receipt of this addendum may be considered non-conforming.

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

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

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

#### I. CORRECTIONS/ADDITIONS/DELETIONS

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

#### Section/Page(s)

#### Change

All mentions

As provided in RFP No. 24-23 Document:  
Proposal Due Date: May 8, 2024 at 11:00 a.m.

As updated herein:  
Proposal Due Date: May 15, 2024 at 11:00 a.m.

*Comment: The Due Date and Time for responses to this RFP has been extended to May 15, 2024 at 11:00 a.m. (local time). Note that all other dates are unchanged.*

Section III

As provided in RFP No. 24-23 Document:  
Form, Section 1 – Schedule of Prices as Pages 15,16,17, 18 and 19.

*Comment: Pay item quantities were changed for the following pay items:*

*Embankment, CIP*  
*Non Haz Contaminated Material Handling and Disposal*  
*Sewer, PVC, 6 inch, Tr Det B*  
*Clean Out*  
*Underdrain, Fdn, 6 inch*  
*Steel Sheet Piling, Permanent*  
*Steel Sheet Piling, Temp, Left in Place, Special*  
*Steel Sheet Piling, Temp, Special*  
*Reinforcement Steel, Epoxy Coated*  
*Modular Block Wall*  
*Fence, Rustic Split Rail*  
*Limestone Cap*  
*Limestone Block*  
*Split Field Stone*  
*Post, Steel, 3 pound*  
*Sign, Type IIIB*  
*Cable, Equipment Ground Wire, 1/C#8*  
*Cable, 600V, 1, 3/C#2*  
*Cable, Grounding Wire, 1/C#12*  
*Cable, 600V, 1, 3/C#12*

*Conduit, Schedule 40, 2 inch was removed*  
*Hh, Round, 3 foot dia was removed*  
*Conduit, Schedule 80, 1 ¼" was removed*  
*Conduit, PVC, ¾" was removed*

*Added a new pay item for Dr Structure, Tap, 6 inch.*  
*Added a new pay item for Corrugated Steel Pipe, Galv, 6 inch*  
*Added a new pay item for Sign, Type IIIA*  
*Added new pay item for Sign, Type III, Rem*  
*Added new pay item for Ground Mtd Sign Support, Rem*  
*Added a new pay item for Conduit, DB, 1, 2 inch*  
*Added a new pay item for Hh, Square*  
*Added a new pay item for Conduit, Schedule 40, 1 inch*

As updated herein:  
Form, Section IV – Attachment A as Page C-4.

*Comment: Updated signatory names for City representatives.*

As updated herein:  
Form, Section IV – Detailed Specifications as noted below.

*Comment: Changes to detailed specifications ad noted below:*

*Progress Clause: Included approval by Amtrak for the actual start and stop times of the track outage.*

*Culvert, Precast Concrete Box, Modified: Changed the limits in which the culvert installed will be paid for in the Measurement and Payment section.*

*Dewatering System for Contaminated Groundwater: Updated language to provide the specific elevation for which point wells, sheeting, etc. cannot extend below.*

*Slotted Drain, Galvanized: Added a pay item for corrugated steel pipe between the sections of slotted drain within the tunnel.*

*Cleanout: Added details for an open grate cover to be used.*

*Decorative Panel, Furnish and Install: Updated Measurement and Payment section to include shipping costs in the Decorative Panel, Furn allowance.*

*Timber Bridge: Removed requirement for shop drawings.*

*Stone Masonry Façade: Updated to include requirement for a mock-up prior to ordering materials.*

Section III Part E	Updated quantity values.
Section IV Attachment A	Update names for signature on Page C-4.
Section IV Detailed Specs	Updated Progress Clause to include approval by Amtrak for outage start and stop times. Updated Culvert, Precast Concrete Box, Modified definition of pay limits. Added requirement for a mock-up of the stone work in the Stone Masonry Façade specification and noted this mock up is not paid for separately.
Plans Page 1 of 80	Replace plan sheet. Added requirement for securing City of Ann Arbor right-of-way permit for work near Huron River Drive. Added reference to additional railroad standards in the third General Note.
Plans Page 3 of 80	Replace plan sheet. Add clarification to end of last note in Utilities section. Added a note in the Railroad Notes section regarding requirement to dispose of excavated materials from railroad right-of-way as non-hazardous contaminated materials.
Plans Page 4 of 80	Replace plan sheet. Added notes for Restoration to reinforce the requirements for slope restoration on railroad right-of-way.
Plans Page 7 of 80	Replace plan sheet. Included line work for a proposed easement.
Plans Page 8 of 80	Replace plan sheet. Revised concrete jointing pattern.
Plans Page 9 of 80	Replace plan sheet. Included line work for a proposed easement. Called out light poles shown in plan view.
Plans Page 11 of 80	Replace plan sheet. Added railroad to view in bottom typical section.
Plans Page 13 of 80	Replace plan sheet. Added sign removal along Huron River Drive.
Plans Page 14 of 80	Replace plan sheet. Added proposed signage along pathway and Huron River Drive. Revised concrete jointing pattern.
Plans Page 15 of 80	Replace plan sheet. Updated grading plan to match revised pedestrian bridge elevation.

Plans Page 16 of 80	Replace plan sheet. Updated profile (slight raise of 2-inches at the timber pedestrian bridge).
Plans Page 17 of 80	Replace plan sheet. Updated miscellaneous quantities and turned off existing fencing in the restoration plan.
Plans Page 18 of 80	Replace plan sheet. Updated profile and turned off existing fencing in plan.
Plans Page 19 of 80	Replace plan sheet. Expanded coverage to include the entirety of the relocated stream. Added notes to remove existing concrete foundations to 1'-0" below finished grade where encountered in the grading. Updated miscellaneous quantities. Updated drainage layout and pipe sizes.
Plans Page 20 of 80	Replace plan sheet. Revised concrete jointing pattern.
Plans Page 21 of 80	Replace plan sheet. Removed sign details. All proposed signs are per the Michigan Standard Highway Signs Manual.
Plans Page 22 of 80	Replace plan sheet. Added work to construct a concrete curb along the path edge for a small portion of the path that parallels the park road (from the existing drainage structure to the north limits of pathway work).
Plans Page 23 of 80	Replace plan sheet. Updated miscellaneous quantity for Embankment, CIP
Plans Page 24 of 80	Replace plan sheet. Updated note in plan view to reflect change in pay item name for pipe between slotted drain sections.
Plans Page 26 of 80	Replace plan sheet. Modified the double bevel spacing in the modular wall cap from 8'-0" maximum to 6'-0" maximum. Updated miscellaneous quantities.
Plans Page 27 of 80	Added minimum section modulus for permanent sheet piling. Updated miscellaneous quantities.
Plans Page 28 of 80	Replace plan sheet. Added dimensions from track centerline to face of fence.
Plans Page 30 of 80	Replace plan sheet. Updated miscellaneous quantities.
Plans Page 31 of 80	Replace plan sheet. Updated miscellaneous quantities.
Plans Page 40 of 80	Replace plan sheet. Added a note (8) to direct Contractor to close down parking lot and close road during installation of conduit under the park road.
Plans Page 43 of 80	Replace plan sheet. Labeled light poles in plan view. Updated miscellaneous quantities.
Plans Page 44 of 80	Replace plan sheet. Labeled light poles in plan view and fencing performed by others in plan view.

Plans Page 45 of 80	Replace plan sheet. Updated profile upwards 2-inches at the timber pedestrian bridge.
Plans Page 47 of 80	Replace plan sheet. Removed grading details from Section A-A. Updated culvert width of walls to be 1'-0" in End Culvert Elevation and clarified where Liner, PVC, 30 Mil, Spec is paid for. Updated miscellaneous quantities.
Plans Page 48 of 80	Replace plan sheet. Added dimension of Fence, Protective, Special.
Plans Page 49 of 80	Replace plan sheet. Updated miscellaneous quantities.
Plans Page 52 of 80	Replace plan sheet. Updated size of panels inside culvert.
Plans Page 53 of 80	Replace plan sheet. Updated details for pedestrian bridge including member sizes and dimensions.
Plans Page 54 of 80	Replace plan sheet. Updated details for pedestrian bridge including member sizes and dimensions.
Plans Page 55 of 80	Replace plan sheet. Updated quantities and added size and depth to light pole base.
Plans Page 59 of 80	Replace plan sheet. Updated miscellaneous quantities and clarified location of electrical conduit along proposed split rail fencing.

## II. QUESTIONS AND ANSWERS

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

Question 1:

Considering the amount of work that needs to take place after the railroad crossing is installed and the seasonal limitations for concrete, HMA and masonry work, I believe the project completion date of 12.20.24 is extremely aggressive. Has any consideration been given to extending the completion date into the late spring / early summer of 2025?

Answer 1:

A second addendum will be provided which will move the construction to 2025. Please note that the liquidated damages for the track outage only apply once the outage has started and would not apply in the case the track outage itself is delayed.

Question 2:

Is there a sheeting section for the curved run of sheets "north" of the tunnel?

Answer 2:

The plan details have been updated to specify this minimum sheeting section.

Question 3:

Given the timeline, there is no guarantee of hitting the shutdown date. What is the backup plan if the date can't be met? Is there an option to expedite ordering the box culvert? What is the contractor's responsibility if the date isn't met for a timeline out of their control?

Answer 3:

See answer to Question 1.

Question 4:

Will the owner consider revising the progress schedule to allow for a June of 2025 completion date for the completion of the path and associated architectural/ restoration items? If the owner will not revise the progress schedule, should the contractor cost in liquidated damages and winter heating costs into our proposal for the post tunnel/Amtrak work being delayed until the spring of 2025?

Answer 4:

See answer to Question 1.

Question 5:

For the artwork, could you clarify what the contractor's scope of work is and how they are compensated?

Answer 5:

Since the actual treatment and material is not yet known, we utilized an allowance dollar item that covers the material itself, actual artwork etching, and shipping costs. The LS item covers erecting the panels and all of the hardware. Please note, the dimensions for the panels were updated to be 4-feet wide by 5-feet tall.

Question 6:

Is there a recent bridge load rating for the vehicular/ped bridge over the Huron River? It's the bridge off Barton Shore Drive.

Answer 6:

The recent load rating can be made available for viewing at the City's offices. Note that the bridge is posted. The decking was not load rated, however, the bridge truss is posted and cannot take all legal loads. A note will be added to the plans to ensure the existing decking is not damaged during Contractor use (i.e. provide a plan for protecting the deck when equipment is to be used over the decking for approval by the City). Please note that the clear width between rails on the existing bridge is limited to 12-feet. Also, please note that the plans indicate there is access along the RR R/W provided for under certain restrictions by Amtrak.

Question 7:

Can you provide the City's agreement with Amtrak?

Answer 7:

The draft agreement can be viewed at the City's offices. This agreement is anticipated for approval at the May 6 City Council Meeting. The packet for this meeting can be viewed online and is public information. Link to the packet is below.

<https://a2gov.legistar.com/LegislationDetail.aspx?ID=6646091&GUID=F4E726B1-F787-44AD-B2C4-CB6C9B4147CF>

Question 8:

Will the clearing that has taken place be addressed in the Addendum #1? Any further clearing can't happen until after October 1.

Answer 8:

Trees have been removed for the footprint of this project. If trees need to be removed, they may need to be removed after the October 1 date and concerns should be addressed with Addendum 2.

Question 9:

Would the City consider moving the bid date back a week to May 15<sup>th</sup>?

Answer 9:

The deadline will be moved back one week to May 15<sup>th</sup>.

Question 10:

Please clarify call outs in timber bridge details.

Answer 10:

Timber bridge details have been updated in this addendum.

Question 11:

The SP for the timber bridge requires shop drawings, what is this intended for? The timber bridge will be constructed in place per the plan details.

Answer 11:

The SP will be modified to eliminate the need for shop drawings.

Question 12:

It appears that directional boring will be necessary from the power pole across the road. Is this included in the Conduit, Schedule 40, 2 inch item?

Answer 12:

The intent is to open cut the roadway and install the conduit. The plans have been updated to call out the HMA Surface, Rem and Hand Patching items in that area for this purpose. Be advised the Sch 40 conduit has changed to Sch 80. Also be advised that we have added an update to the maintaining traffic sheets to close the roadway down (no park access) for the installation of this culvert under the park roadway.

Question 13:

On Plan Sheet 59, it shows just the 13x24 pull boxes and doesn't show the 3' round hand holes. Please verify.

Answer 13:

Hand holes were changed to square and are needed at the exterior/base of the tunnel to splice the cable and provide 2-conduit paths. One to the lights in the tunnel and the second to the surface mount light.

Question 14:

What are the dimensions of the light pole bases?

Answer 14:

These have been added to the plan details (4' deep by 1'-8" dia.).

Question 15:

I assume the 3/4" PVC is for the tunnel lighting? Is this schedule 40 or 80? Is there a detail for the mounting (does it need to be cast inside the culvert walls?), The qty seems high, please verify.

Answer 15:

Quantities have been updated. The conduit does not need to be cast in the culvert walls because it will be behind the decorative panels. However, we will want to have it buried underground until it gets into the tunnel to feed the light (coming up from the aggregate base inside the tunnel). Furthermore, the conduit may need to run along the backside of the wingwall and headwall and then run through a sleeve in the headwall to feed the exterior mounted light fixtures.

Question 16:

Is the pre-proposal conference sign-in sheet available?

Answer 16:

Yes it is provided in this addendum.

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





# **PUBLIC IMPROVEMENT REQUEST FOR PROPOSAL**

**RFP# 24-23**

## **Barton/Bandemer Park Pedestrian Tunnel Project**

City of Ann Arbor  
PARKS AND RECREATION SERVICES/COMMUNITY  
SERVICES AREA



**Due Date: May 15, 2024 by 11:00 a.m. (local time)**

Issued By:

City of Ann Arbor  
Procurement Unit  
301 E. Huron Street  
Ann Arbor, MI 48104

#### **D. PRE-PROPOSAL MEETING**

A pre-proposal conference for this project will be held on **Thursday April 23, 2024 at 10:00 a.m. (local time)** at the Bandemer Park Parking Lot, 2001 Whitmore Lake Road, Ann Arbor, MI 48105.

Attendance at this conference is highly recommended. Administrative and technical questions regarding this project will be answered at this time. The pre-proposal conference is for information only. Any answers furnished will not be official until verified in writing by the Financial Service Area, Procurement Unit. Answers that change or substantially clarify the proposal will be affirmed in an addendum.

#### **E. PROPOSAL FORMAT**

To be considered, each firm must submit a response to this RFP using the format provided in Section III. No other distribution of proposals is to be made by the prospective bidder. An official authorized to bind the bidder to its provisions must sign the proposal. Each proposal must remain valid for at least one hundred and twenty (120) days from the due date of this RFP.

Proposals should be prepared simply and economically providing a straightforward, concise description of the bidder's ability to meet the requirements of the RFP. No erasures are permitted. Mistakes may be crossed out and corrected and must be initialed in ink by the person signing the proposal.

#### **F. SELECTION CRITERIA**

Responses to this RFP will be evaluated using a point system as shown in Section III. A selection committee comprised primarily of staff from the City will complete the evaluation.

If interviews are desired by the City, the selected firms will be given the opportunity to discuss their proposal, qualifications, past experience, and their fee proposal in more detail. The City further reserves the right to interview the key personnel assigned by the selected bidder to this project.

All proposals submitted may be subject to clarifications and further negotiation. All agreements resulting from negotiations that differ from what is represented within the RFP or in the proposal response shall be documented and included as part of the final contract.

#### **G. SEALED PROPOSAL SUBMISSION**

**All proposals are due and must be delivered to the City on or before May 15, 2024 11:00 a.m. (local time).** Proposals submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

appropriate instructions for filing the protest. The protest shall be reviewed by the City Administrator or designee, whose decision shall be final.

Any inquiries or requests regarding this procurement should be only submitted in writing to the Designated City Contacts provided herein. Attempts by the bidder to initiate contact with anyone other than the Designated City Contacts provided herein that the bidder believes can influence the procurement decision, e.g., Elected Officials, City Administrator, Selection Committee Members, Appointed Committee Members, etc., may lead to immediate elimination from further consideration.

**P. SCHEDULE**

The following is the schedule for this RFP process.

<b>Activity/Event</b>	<b>Anticipated Date</b>
Pre-Proposal Conference	April 23, 2024, 10:00 a.m. (Local Time)
Written Question Deadline	April 26, 2024, 2:00 p.m. (Local Time)
Addenda Published (if needed)	Week of April 29, 2024
Proposal Due Date	May 15, 2024, 11:00 a.m. (Local Time)
Selection/Negotiations	May/June 2024
Expected City Council Authorizations	July 2024

The above schedule is for information purposes only and is subject to change at the City's discretion.

**Q. IRS FORM W-9**

The selected bidder will be required to provide the City of Ann Arbor an IRS form W-9.

**R. RESERVATION OF RIGHTS**

1. The City reserves the right in its sole and absolute discretion to accept or reject any or all proposals, or alternative proposals, in whole or in part, with or without cause.
2. The City reserves the right to waive, or not waive, informalities or irregularities in terms or conditions of any proposal if determined by the City to be in its best interest.
3. The City reserves the right to request additional information from any or all bidders.
4. The City reserves the right to reject any proposal that it determines to be unresponsive and deficient in any of the information requested within RFP.
5. The City reserves the right to determine whether the scope of the project will be entirely as described in the RFP, a portion of the scope, or a revised scope be implemented.
6. The City reserves the right to select one or more contractors or service providers to perform services.

**E. Schedule of Pricing/Cost – 20 Points**

Company: \_\_\_\_\_

**Unit Price Bid –**

<u>Item Description</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
Certified Payroll Compliance and Reporting	1	LSUM	_____
Mobilization, Max	1	LSUM	_____
Clearing, Modified	0.25	Acre	_____
Tree, Rem, 19 inch to 36 inch	6	Ea	_____
Tree, Rem, 37 inch or Larger	2	Ea	_____
Tree, Rem, 6 inch to 18 inch	10	Ea	_____
Fence, Rem	117	Ft	_____
Exploratory Investigation, Vertical	150	Ft	_____
Embankment, CIP	20	Cyd	_____
Excavation, Earth	2360	Cyd	_____
Non Haz Contaminated Material Handling and Disposal, LM	7060	Cyd	_____
Subgrade Undercutting, Type I	100	Cyd	_____
Subgrade Undercutting, Type II	100	Cyd	_____
Subgrade Undercutting, Type IV	100	Cyd	_____
Backfill, Structure, CIP	5050	Cyd	_____
Excavation, Fdn	5830	Cyd	_____
Aggregate, 6A	16	Cyd	_____
Dewatering System, Excavation	1	LSUM	_____
Erosion Control, Filter Bag	2	Ea	_____
Erosion Control, Gravel Access Approach	2	Ea	_____
Erosion Control, Inlet Protection, Fabric Drop	5	Ea	_____
Erosion Control, Silt Fence	1739	Ft	_____
Subbase, CIP	3	Cyd	_____
Aggregate Base, 8 inch, Modified	365	Syd	_____
Maintenance Gravel	100	Ton	_____
Geotextile, Separator, Non-Woven	245	Syd	_____
Culv End Sect, Conc, 12 inch	3	Ea	_____
Sewer, CI E, 12 inch, Tr Det B	95	Ft	_____

Slotted Drain, Galv, 6 inch	42	Ft	_____	_____
Sewer, PVC, 6 inch, Tr Det B	153	Ft	_____	_____
Dr Structure Cover, Type C	1	Ea	_____	_____
Dr Structure, 24 inch dia	1	Ea	_____	_____
Clean Out	3	Ea	_____	_____
Underdrain, Fdn, 6 inch	324	Ft	_____	_____
Culv Bedding, Box Culv	81	Cyd	_____	_____
Culv, Precast Conc Box, 16 foot by 12 foot	60	Ft	_____	_____
HMA Surface, Rem	215	Syd	_____	_____
Hand Patching	16	Ton	_____	_____
HMA, 4EML	33	Ton	_____	_____
HMA, 5EML	33	Ton	_____	_____
Joint, Expansion, E3	39	Ft	_____	_____
Steel Sheet Piling, Permanent	2940	Sft	_____	_____
Steel Sheet Piling, Temp, Left in Place, Special	1160	Sft	_____	_____
Steel Sheet Piling, Temp, Special	460	Sft	_____	_____
Elec Grounding System	1	Ea	_____	_____
Reinforcement, Steel, Epoxy Coated	2810	Lb	_____	_____
Substructure Conc, High Performance	39	Cyd	_____	_____
Liner, PVC, 30 mil	415	Syd	_____	_____
Timber Bridge	1	LSUM	_____	_____
Joint Waterproofing	160	Sft	_____	_____
Modular Block Wall, Cap	254	Ft	_____	_____
Modular Block Wall	857	Sft	_____	_____
Railroad Protection, Amtrak	20000	Dlr	_____	_____
Curb, Conc, Det E1	735	Ft	_____	_____
Curb and Gutter, Conc, Det D2	207	Ft	_____	_____
Detectable Warning Surface	13	Ft	_____	_____
Sidewalk, Conc, 4 inch	157	Sft	_____	_____
Shared use Path, Grading, Modified	739	Ft	_____	_____
Shared use Path, Aggregate, 8 inch, Modified	1591	Syd	_____	_____
Shared use Path, Concrete, 6 inch	953	Syd	_____	_____
Shared use Path, Concrete, 6 inch, Decorative	148	Syd	_____	_____
Shared use Path, Aggregate, Tunnel	66	Cyd	_____	_____

Fence, Protective	1000	Ft	_____	_____
Fence, Rustic Split Rail	309	Ft	_____	_____
Ornamental Aluminum Fence, 72 inch	152	Ft	_____	_____
Fence Gate, 12 foot, for 72 inch Chain Link Fence, Special	14	Ft	_____	_____
Fence, Chain Link, 72 Inch, Special	206	Ft	_____	_____
Ornamental Aluminum Fence, 48 inch	124	Ft	_____	_____
Fence, Protective, Special	800	Sft	_____	_____
Post, Steel, 3 pound	177	Ft	_____	_____
Sign, Type IIIB	2	Sft	_____	_____
Pavt Mrkg, Polyurea, 4 inch, Yellow	278	Ft	_____	_____
Pavt Mrkg, Polyurea, 12 inch, Cross Hatching, Yellow	270	Ft	_____	_____
Pavt Mrkg, Preformed Thermopl, Accessible Sym	1	Ea	_____	_____
Pavt Mrkg, Waterborne, for Rest Areas, Parks, and Lots, 4 inch, Blue	75	Ft	_____	_____
Barricade, Type III, High Intensity, Double Sided, Lighted, Furn	10	Ea	_____	_____
Barricade, Type III, High Intensity, Double Sided, Lighted, Oper	10	Ea	_____	_____
Pedestrian Type II Barricade, Temp	10	Ea	_____	_____
Pedestrian Type II Channelizer, Temp	50	Ft	_____	_____
Lighted Arrow, Type C, Furn	2	Ea	_____	_____
Lighted Arrow, Type C, Oper	2	Ea	_____	_____
Ltg for Night Work	1	LSUM	_____	_____
Minor Traf Devices	1	LSUM	_____	_____
Plastic Drum, Fluorescent, Furn	35	Ea	_____	_____
Plastic Drum, Fluorescent, Oper	35	Ea	_____	_____
Sign Cover	5	Ea	_____	_____
Sign, Type B, Temp, Prismatic, Furn	316	Sft	_____	_____
Sign, Type B, Temp, Prismatic, Oper	316	Sft	_____	_____
Sign, Type B, Temp, Prismatic, Spec, Furn	96	Sft	_____	_____
Sign, Type B, Temp, Prismatic, Spec, Oper	96	Sft	_____	_____
Traf Regulator Control	1	LSUM	_____	_____
Check Dam, Cobblestone	20	Ft	_____	_____

Riprap, Cobblestone	21	Syd	_____	_____
Site Preparation, Max	1	LSUM	_____	_____
Watering and Cultivating, First Season, Min	1	LSUM	_____	_____
Watering and Cultivating, 2nd Season, Min	1	LSUM	_____	_____
Aronia melanocarpa, #5 cont.	10	Ea	_____	_____
Hamamelis virginiana, #5 cont.	10	Ea	_____	_____
Viburnum acerifolium, #5 cont.	5	Ea	_____	_____
Viburnum lentago, #5 cont.	10	Ea	_____	_____
Platanus occidentalis, 3 inch	5	Ea	_____	_____
Tilia americana, 3 inch	5	Ea	_____	_____
Acer saccharum 'Bailsta' FALL FIESTA, 3 inch	5	Ea	_____	_____
Nyssa sylvatica, 3 inch	3	Ea	_____	_____
Quercus bicolor, 3 inch	3	Ea	_____	_____
Cercis canadensis, 2 1/2 inch, multi-stem	8	Ea	_____	_____
Cornus florida, 2 1/2 inch	8	Ea	_____	_____
Amelanchier x grandiflora 'Autumn Brilliance', 8 foot	6	Ea	_____	_____
Cephalanthus occidentalis, #5 cont.	5	Ea	_____	_____
Cornus stolonifera 'Farrow', #5 cont.	30	Ea	_____	_____
Lindera benzoin, #5 cont.	10	Ea	_____	_____
Calamagrostis x acutiflora 'Karl Foerster', #3 cont.	15	Ea	_____	_____
Panicum virgatum 'Shenandoah', #3 cont.	15	Ea	_____	_____
Schizachyrium scoparium, #3 cont.	15	Ea	_____	_____
Live Staking	250	Syd	_____	_____
Turf Establishment, Turf Grass, Performance	734	Syd	_____	_____
Turf Establishment, Native Seed Mix, Mesic Woodland Mix, Performance	6404	Syd	_____	_____
Conduit, PVC Schedule 80, 2 inch, Structure	150	Ft	_____	_____
Cable, Equipment Grounding Wire, 1/C#8	850	Ft	_____	_____
Hh, Square	2	Ea	_____	_____
Conduit, DB, 1, 2 inch	550	Ft	_____	_____

Cable, 600V, 1, 3/C#2	2500	Ft	_____	_____
Conduit, Schedule 40, 1 inch	600	Ft	_____	_____
Cable, 600V, 1, 2/C#12	1350	Ft	_____	_____
Cable, Grounding Wire, 1/C#12	700	Ft	_____	_____
13"x24" Pull Box	2	Ea	_____	_____
Lighting Control Panel	1	Ea	_____	_____
Luminaire, Wall Mount, Type A	2	Ea	_____	_____
Luminaire, Linear, Type B	28	Ea	_____	_____
Luminaire, Linear, Type C	28	Ea	_____	_____
Luminaire, Pole Mount, Type D	13	Ea	_____	_____
Light Pole Foundation	13	Ea	_____	_____
Light Pole, Type D Pole	13	Ea	_____	_____
Electrical Utility Service	20000	Dir	_____	_____
Gate Valve and Box, 6 inch	1	Ea	_____	_____
Contractor Staking	1	LSUM	_____	_____
Railroad Track Monitoring	1	LSUM	_____	_____
Utility Work, Amtrak	1	LSUM	_____	_____
Utility Work, Lumen	1	LSUM	_____	_____
Limestone Cap	117	Ft	_____	_____
Limestone Block	132	Sft	_____	_____
Split Field Stone	637	Sft	_____	_____
Limestone Sign, "Bandemer"	1	Ea	_____	_____
Limestone Sign, "Barton"	1	Ea	_____	_____
Limestone Sign, "2024"	2	Ea	_____	_____
Decorative Panel, Install	1	LSUM	_____	_____
Dewatering System for Contaminated Groundwater, Site	100000	Dir	_____	_____
Decorative Panel, Furn	100000	Dir	_____	_____
Dr Structure, Tap, 6 inch	2	Ea	_____	_____
Sign, Type III, Rem	1	Ea	_____	_____
Ground Mtd Sign Support, Rem	1	Ea	_____	_____
Sign, Type IIIA	4	Sft	_____	_____
Corrugated Steel Pipe, Galv, 6 inch	48	Ft	_____	_____

**ESTIMATED TOTAL**

**\$ \_\_\_\_\_**



**ARTICLE X - Entire Agreement**

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations, negotiations, agreements, or understandings whether written or oral. Neither party has relied on any prior representations in entering into this Contract. No terms or conditions of either party’s invoice, purchase order or other administrative document shall modify the terms and conditions of this Contract, regardless of the other party’s failure to object to such form. This Contract shall be binding on and shall inure to the benefit of the parties to this Contract and their permitted successors and permitted assigns and nothing in this Contract, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

**ARTICLE XI – Electronic Transactions**

The City and Contractor agree that signatures on this Contract may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Contract. This Contract may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

**FOR CONTRACTOR**

By \_\_\_\_\_

Its: \_\_\_\_\_

**FOR THE CITY OF ANN ARBOR**

By \_\_\_\_\_  
Christopher Taylor, Mayor

By \_\_\_\_\_  
Jacqueline Beaudry, City Clerk

**Approved as to substance**

By \_\_\_\_\_  
Milton Dohoney, Jr.  
City Administrator

By \_\_\_\_\_  
Derek Delacourt  
Community Services Area Administrator

**Approved as to form and content**

\_\_\_\_\_  
Atleen Kaur, City Attorney

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**PROGRESS CLAUSE**

BBT:CED

1 of 2

3/12/24

The Engineer anticipates that construction can begin no earlier than ten (10) calendar days after award or as directed by the Engineer.

In no case can any work be commenced prior to receipt of formal notice of award by the Department.

Prepare and submit a complete, detailed, signed Progress Schedule to the Engineer.

The Progress Schedule shall include, at minimum, the controlling work items for the completion of the project, as well as the planned dates or work days that these work items will be controlling operations. All contract dates including open to traffic, project completion, interim completion and any other controlling dates in the Contract, must be included in the Progress Schedule. If the bidding Proposal specifies other controlling dates, these shall also be included in the Progress Schedule.

The project shall be completed in its entirety including final site restoration and clean-up on or before **December 20<sup>th</sup>, 2024** excluding the acceptance of slope restoration, tree plantings, and watering & cultivating. Slope restoration and watering & cultivating requirements must be met prior to final acceptance of the project. A 36-hour track outage has been scheduled on, or about, **October 9<sup>th</sup>, 2024** for the purposes of constructing the project under the railroad tracks. If inclement weather occurs during the original track outage date, a back-up track outage date scheduled approximately 2 weeks after the originally scheduled outage must be coordinated with the Engineer. All work required for preparation for this outage must be done prior to **October 9<sup>th</sup>, 2024**. The actual outage start and stop times will be provided by the Engineer and approved by Amtrak. The Contractor will be given a 30-hour uninterrupted time for which to construct the work required during the track outage.

The Contractor shall include an hour-by-hour schedule for the work planned during the track outage to be approved by the Engineer. The hour-by-hour schedule shall include the Contractor coordinating with Amtrak to show durations for the work tasks Amtrak will be responsible for during the track outage. The hour-by-hour schedule shall indicate an emergency stop work plan indicating the point at which the Contractor will no longer be able to stop and return the site to a condition ready for Amtrak to perform their work in reopening to rail traffic within the planned outage timeframe.

Unless specific pay items are provided in the contract, any extra costs incurred by the Contractor due to cold-weather protection and winter grading will not be paid for separately, but will be included in the payment of other pay items in the contract.

After award and prior to start of work, the Contractor must attend a preconstruction meeting with the Engineer. The Engineer will determine the date, time, and place for the preconstruction

meeting. The meeting will be conducted after project award and may be rescheduled if there are delays in the award of the project.

The named subcontractor(s) for Designated and/or Specialty Items, as shown in the Proposal, should attend the preconstruction meeting if such items materially affect the work schedule.

For compliance with threatened and endangered bats, tree clearing must be completed between October 1 and March 31.

Failure by the Contractor to meet interim completion, open to traffic, and/or final completion dates will result in the assessment of liquidated damages in accordance with subsections 108.10.C.1 and 108.10.C.2 of the Standard Specifications for Construction.

Failure by the Contractor to reopen the rail line to rail traffic within the track outage timeframe defined above will result in the assessment of liquidated damages in accordance with the Special Provision for Liquidated Damages for Other Department Costs.

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**CULVERT, PRECAST CONCRETE BOX, MODIFIED**

BBT:CED

1 of 2

3/7/24

**a. Description.** This work consists of designing, load rating, manufacturing, and installing precast concrete box culvert segments with galvanized metal tie rods, plate washers, lock washers, and acceptable soil and watertight sealant as filler to access holes on the final three section/2 joints of box culverts as shown on the plans, this specification, and according to the current (as of bid letting date for this project) *American Railway Engineering and Maintenance-of-Way Association* (AREMA) specifications, Cooper E80 loading and section 406 of the Standard Specification for Construction.

Do not manufacture the precast concrete elements on the jobsite. All precast elements must be manufactured at a commercial precast plant listed in subsection 909.04 of the Approved Manufacturers section of MDOTs Materials Source Guide.

**b. Materials.** Provide materials in accordance with subsection 406.02 of the Standard Specifications for Construction.

Provide the following materials to construct the joint tie assemblies:

1. One inch diameter threaded rods meeting the requirements of ASTM F1554, Grade 36.
2. Two inch by two inch by 5/16 inch plate washers meeting the requirements of ASTM A36/A36M.
3. Flat circular washers meeting the requirements of ASTM F436/F436M to be placed over the plate washer and under the lock washer.
4. Lock washers meeting the requirements of ANSI B18.21.1.
5. Heavy hex nuts meeting the requirements of ASMT A563, Grade A.
6. Select and apply watertight and soil tight hole filler in accordance with subsection 713.02.B of the Standard Specifications for Construction.

Ensure all hardware is galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M, as applicable.

Provide PVC liner for the culvert joints that is 30 mils thick. Use resins to manufacture the PVC liner that are 100 percent first quality virgin PVC. Ensure the PVC liner is resistant to UV degradation, construction damage and all forms of biological and chemical degradation normally encountered in highway construction applications. Satisfy the physical properties contained in Table 1.

**Table 1: PVC Liner Physical Requirements**

Property	Test Method	Requirement
Thickness Tolerance	ASTM D1593	+/- 5 percent
100 Percent Modulus	ASTM D882	1000 psi (minimum)
Elongation @ Break	ASTM D882	300 percent (minimum)
Dimensional Stability	ASTM D1204 (212 degrees F, 15 minutes)	5 percent change (maximum)

Provide test data certification from the manufacturer with each material shipment, which includes a certified report of quality control test results obtained from the lot(s) of material in the shipment. Label each unit of material to provide product identification sufficient for field identification and correlation to certified test results. Certify the specified physical properties as minimum average roll values (MARV).

**c. Construction.** Design and load rate precast box culverts in accordance with current AREMA specifications and Cooper E80 loading and provide calculations to the Engineer for review that are sealed by a Professional Engineer in the State of Michigan. All other construction methods must be in accordance with subsection 406.03 of the Standard Specifications for Construction.

Install and maintain joint tie assemblies and hole filler during construction and backfilling activities. Use caution when placing and compacting backfill materials adjacent to the assemblies. Ensure damage to the joint tie assemblies or box culvert around the assemblies caused by the Contractor’s operation is repaired or replaced at the Contractor’s expense.

Joint tie assemblies are intended to hold the box culvert sections in place throughout the design life and must not be used to pull the sections together during construction.

Apply tie rod hole filler in accordance with subsection 713.03.F of the Standard Specifications for Construction.

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

<b>Pay Item</b>	<b>Pay Unit</b>
Culv, Precast Conc Box, ___ foot by ___ foot, Modified .....	Foot

**Culv, Precast Conc Box, \_\_\_ foot by \_\_\_ foot, Modified,** will be measured along the culvert centerline from reference point to reference point as detailed on the plans. The unit price for **Culv, Precast Conc Box, \_\_\_ foot by \_\_\_ foot, Modified** includes all labor, equipment and materials necessary to design, manufacture, load rate and install all precast elements including tie rod assemblies, wingwalls, headwalls, and aprons. Payment includes, PVC liner, cold-applied culvert joint sealer, treated plywood at top joints, closed-cell rubber extrusion type gaskets, 36-inch wide geotextile filter fabric, inserts and leveling shims.

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**DEWATERING SYSTEM FOR CONTAMINATED GROUNDWATER**

BBT:CED

1 of 3

4/2/24

**a. Description.** This work consists of all labor, equipment and materials required to lower the groundwater table to facilitate construction in the area of the excavation for the proposed culverts and pathway construction in the event the groundwater is found to be contaminated.

If the groundwater removed during the dewatering process is contaminated, it cannot be discharged directly to the ground surface or a surface water body. Dispose of groundwater removed in one of three ways:

1. To a sanitary sewer system, if permission is granted by the system owner (note that there is a permit fee and a per 100 cubic feet charge for the local sewer system);
2. To a surface water body under a National Pollutant Discharge Elimination System (NPDES) permit, or
3. Collected and hauled to an acceptable treatment facility.

The operation, monitoring, sampling and analysis of any treatment system used for discharge to a sanitary sewer or surface water body, or hauling to a treatment facility as needed is included in this work.

Groundwater throughout the project site may be contaminated, however, a sample was taken in 2022 just south/west of the railroad tracks near the proposed box culvert. This sample was tested which indicated it was not contaminated with dioxane, however, additional tests were not run.

Handle contaminated water in accordance with the Michigan Occupational Safety and Health Administration (MIOSHA) Standard for Hazardous Waste Operations and Emergency Response (HAZWOPER). Applicable workers must work under the direction of an on-site supervisor and a site-specific safety and health plan and must be trained and protected pursuant to the HAZWOPER Standard.

Provide to the Department, at the pre-construction meeting, documentation verifying the qualifications of Contractor personnel who will be performing the sampling and handling work. Provide a Safety and Health Plan as required by the MIOSHA standard.

Provide training for such sampling and handling for up to two Department designated employees as described in the MIOSHA standard, unless not required by the Engineer. If required, employees selected by the Engineer, must receive the 40 hour HAZWOPER training.

Provide personal protective equipment (as required by MIOSHA) for two Department designated employees with the exception of air purifying respirators. Department employees will provide their own fit tested air purifying respirators, if necessary.

Dewatering and disposal of groundwater that is not contaminated is considered included in other items of work.

**b. Well Points and Deep Wells.** Do not damage property or structures or interfere with the rights of the public, owners of private property, pedestrians, vehicular traffic and the work of other contractors should groundwater control be performed by deep well and/or well point pumping systems. Provide properly designed filters for any pumping methods used to ensure that adjacent soil will not be pumped with the water, thus creating voids underground around the face of the excavation or under existing structures. Submit filter design for review and approval by the Engineer before placement.

Perform the dewatering operation in a proper and predetermined sequence with the excavation operation such that the perimeter and face of the excavation is stable. Dewatering well diameter, pumping rate and well spacing must provide adequate drawdown of the water level. Locate wells to intercept groundwater that otherwise would enter the excavation and interfere with the work. Install observation wells at key locations for observation of groundwater levels during the excavation. The anticipated observation wells are, but not limited to, one per each 200 foot of trenching required for the dewatering system. Submit a plan for locations and monitoring frequency of the observation wells to the Engineer a minimum of 7 days in advance of placement of the dewatering system.

Discharge deep wells and/or well points in the area of contamination into header or collection pipes prior to entering the treatment system.

**c. Treatment System.** Filters or settling devices may be required before treatment to ensure that neither the treatment and sanitary sewer systems or surface waters are adversely affected by construction debris or increased sediment load.

Contaminated water must be treated to reduce contaminants to levels acceptable to the sanitary sewer system owner or NPDES permit. Base the treatment system on the contaminant to be treated, upon concentrations of contaminants found in the groundwater, the flow required to adequately dewater the trench as specified above, and an effluent concentration that meets the requirements of the sanitary sewer system owner or the NPDES permit. Submit the proposed system to the Engineer for approval prior to starting the work.

**d. Sanitary Sewer or Surface Water Discharge.** Monitor the volume of treated water discharged to the sanitary sewer system or as surface water discharge by using a totalizing turbine type flow meter. Place the flow meter inline on the treatment system effluent line. Design the flow meter for high flow applications and it must have a flow totalizing register that is adequately sealed to eliminate fogging and condensation. Submit the type of meter proposed to be used to the Engineer for review and approval prior to placement.

Supply a copy of the written authorization from the wastewater treatment plant authority to the Engineer prior to discharging any water to the sanitary sewer system.

Secure a NPDES permit from the Environment, Great Lakes, and Energy (EGLE) prior to any discharge to a surface water body.

Monitor and document daily the volume of flow being discharged to the sanitary sewer or the surface water by reading the register on the flow meter. Provide this information to the Engineer daily or as otherwise approved.

**e. Hazardous/Nonhazardous Material Handling.** Load and transport all hazardous and nonhazardous waste using properly trained personnel and placarded vehicles having a hazardous or liquid industrial waste manifest, as required. All manifests are to be signed by the Engineer or their representative. The terms hazardous and nonhazardous, as used in this document, are defined in 1994 PA 451, Parts 111 and 121, of the Natural Resources and Environmental Protection Act.

**f. Construction.** Determine the methods and materials required to accomplish this work, subject to approval by the Engineer before initiation or installation of the dewatering system.

Dewatering System for Contaminated Groundwater must be independent of other dewatering operations by a separate installation. Use the system for as short of time as necessary. Take all appropriate precautions to prevent exacerbation of contamination.

The Engineer may order corrective actions to the dewatering or treatment system at any time due to deficiencies in the system at no additional cost to the Department.

Artesian conditions exist in the area. Do not install wells deeper than elevation 760.00.

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

<b>Pay Item</b>	<b>Pay Unit</b>
Dewatering System for Contaminated Groundwater, Site .....	Dollar

**Dewatering System for Contaminated Groundwater, Site** includes all labor, equipment, materials, wells, piping, supplies, power, training, permit fees, filters, and fuel necessary for the installation, operation, maintenance, removal and the disposal of all surplus materials as described herein. This pay item includes the cost over and above the costs for Dewatering System, Excavation for treatment of all water pumped from below ground to facilitate underground construction if the water is found to be contaminated.

Disposal of contaminated soil or sediment excavated or displaced during the installation of this system, will be included in the pay item of **Non-hazardous Contaminated Material Handling and Disposal (LM)**.



CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**SLOTTED DRAIN, GALVANIZED**

BBT:CED

1 of 2

3/7/24

**a. Description.** This work consists of furnishing and installing a 6 inch diameter galvanized slotted drain and 6 inch diameter corrugated galvanized steel pipe connecting the discontinuous slotted drain sections including all necessary hardware at the location(s) shown on the plans. Complete this work in accordance with section 402 of the Standard Specifications for Construction, the details shown on the plans and this special provision.

**b. Materials.** Provide slotted drain fabricated from galvanized corrugated steel pipe. The materials must meet the applicable requirements specified in the following subsection and section of the Standard Specifications for Construction:

Corrugated Steel Pipe and Pipe Fittings.....	909.05
(6 inch dia., 16 gauge, galvanized, per AASHTO M 36)	
Concrete.....	601

Provide all associated items, such as steel grates, spacer plates, bolts, nuts, and washers as recommended by the manufacturer of the slotted drain and as approved by the Engineer and galvanized in accordance with AASHTO M 232.

The slotted opening must be 1¾ inches wide and a minimum 2-1/2 inches deep with a trapezoidal grate. The finish surface grating must be ADA compliant. The trapezoidal grate must have reinforcing spacer plates a minimum of 3/16 inch thick spaced 6 inches on center. The spacer plates must be slanted to direct flow toward the drainage structure.

All slotted drain is subject to visual inspection prior to acceptance and must conform to the requirements in the proposal.

**c. Construction.** Install the slotted drain to the line and grade shown on the plans or as directed by the Engineer. The slotted drain must be completely encased in concrete and poured monolithically as shown on the plans.

Prior to placing concrete and backfilling operations, the upgrade end of the slotted drain must be plugged with a metal cap. The slots (grate assembly) must be covered during encasement operations to prevent infiltration of concrete and other foreign material into the pipe.

Prior to placing the concrete, the slotted drain pipe must be secured in the proposed line and grade to prevent shifting or floating during the encasement stage of construction.

If positive flow or the final grade of the slotted drain is not maintained during the encasement stage of construction, the drain must be removed and replaced at the Contractor's expense.

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

<b>Pay Item</b>	<b>Pay Unit</b>
Slotted Drain, Galv, 6 inch .....	Foot
Corrugated Steel Pipe, Galv, 6 inch.....	Foot

**Slotted Drain, Galv, 6 inch** will be measured in place by length in feet for the limits of the concrete encasement. Payment includes excavation, drainage structure taps, fittings, concrete encasement, and all necessary hardware, including metal caps, elbows, and the length of galvanized pipe required for the connection to drainage structures.

**Corrugated Steel Pipe, Galv, 6 inch** will be measured in place by length in feet used to connect the sections of Slotted Drain, Galv, 6 inch within the box culvert. Payment includes all connections between the slotted drain.

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**CLEAN OUT**

BBT:CED

1 of 1

4/2/24

**a. Description.** This work consists of providing all labor, equipment, and materials for furnishing and installing clean out structures at the locations and elevations shown on the plans.

**b. Materials.** The materials must meet the applicable requirements specified in Section 909 of the Standard Specifications for Construction. The clean out diameter shall be 6 inches, length varies per plans. The clean out structure cover shall be a drop in grate with open slots generally in conformance with the details below.

**c. Construction.** Install the clean out structures at the locations and elevations shown on the plans or as directed by the Engineer in accordance with Section 403 of the Standard Specifications for Construction.

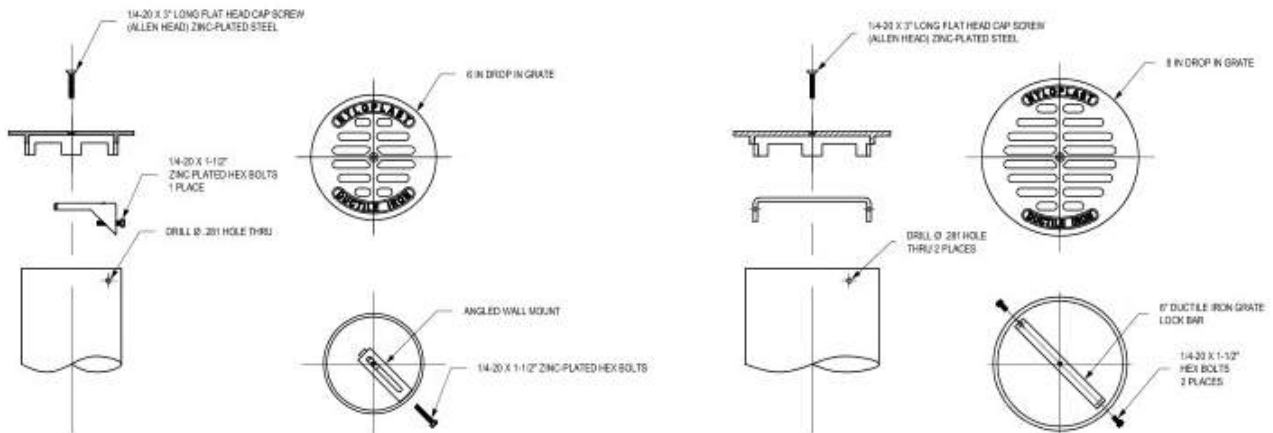
Prior to backfilling operations, the covers shall be placed on top of the clean out structures to prevent backfill material from entering the drainage system.

The clean out structures are to be installed simultaneously with the pipes they are connected to. If positive flow is not maintained during the backfilling stage of construction, the drainage system must be removed and replaced at the Contractor's expense.

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

Pay Item	Pay Unit
Clean Out .....	Each

**Clean Out** will be paid for each clean out installed as shown on the plans.



CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**DECORATIVE PANEL, FURNISH AND INSTALL**

BBT:CED

1 of 2

3/19/24

**a. Description.** This work consists of furnishing decorative panels including all anchors, fasteners, equipment and labor to install decorative panels inside the box culvert. This work also includes coordinating with an artist for specific hole pattern and etching on the individual panels.

**b. Materials.**

1. Structural Steel Angle Connections. Furnish materials per subsections 906.04 and 906.08 of the Standard Specifications for Construction. Use Gr. 36 steel, galvanized. Coat the panels in accordance with Section 707 of the Standard Specifications for Construction. Color to be determined by Owner.
2. Decorative Panels. Furnish materials per subsections 906.04 and 906.08 of the Standard Specifications for Construction. Use galvanized 11 gauge steel. Coat the panels in accordance with Section 707 of the Standard Specifications for Construction. Color to be determined by Owner. Provide flat panels with finished end pattern and perforations as directed by the Owner (pattern and hole sizing to be determined by the Owner). Example images of intent for these panels are included in this Special Provision.
3. Adhesive Anchors. Use adhesive anchors from MDOT's Qualified Products List.
4. Fasteners. Furnish materials per subsection 906.07 of the Standard Specifications for Construction.

**c. Submittals.** Prepare complete working drawings of connection supports and fasteners to support the panels. Coordinate with the Owner regarding hole pattern, sizing, and finish. Do not begin working drawings until the panels are supplied to verify connection details.

Coordinate adhesive anchor holes within the box culvert with the box culvert manufacturer to avoid conflict with steel reinforcement. Confirm rebar locations in culvert prior to fabricating connection supports. Use a pachometer to mark reinforcement in culvert if other identifying methods are not used.

Show proposed curb, lighting conduit, and fixtures on the working drawings to ensure no conflicts. Ensure there is adequate room between the culvert wall and the panels for the proposed lighting fixtures and conduit. Ensure connection supports do not conflict with proposed lighting conduit or fixtures.

Connection supports must be concealed behind the decorative panel with only visibility being through designed perforations in the panels.

**d. Construction.** Take field measurements within the completed box culvert installed in the field to verify location of connection supports and layout of decorative panels.

Locate rebar within the box culvert concrete using a pachometer prior to drilling holes for

adhesive anchors connection supports. Do not cut rebar during drilling.

Coordinate connection supports and panel installation with the proposed lighting conduit and fixtures.

Adjust the connections as necessary to provide a level and plumb decorative panel. Readjust for any variation out of level greater than 1/4-inch between adjoining panels. Readjust for any variation out of plumb greater than 1/8-inch between adjoining panels.

**e. 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>
Decorative Panel, Install.....	Lump Sum
Decorative Panel, Furn.....	Dollar

**Decorative Panel, Install** includes all labor, materials and equipment to install the decorative panels as shown on the plans, including the shop drawings and layout of the panels and installation components. **Decorative Panel, Furn** will include the panels, aesthetic treatment applied to them, shipping, and coordinating with the Owner's designer/artist. Art work design will be provided by the owner to the Contractor's fabricator for production.



*Example images for intent of the product to be provided*

CITY OF ANN ARBOR

SPECIAL PROVISION  
FOR  
**TIMBER BRIDGE**

BBT:CED

1 of 2

3/20/2024

**a. Description.** This work consists of furnishing materials for, and constructing a timber bridge in accordance with Sections 709, 908, and 912 of the Standard Specifications for Construction, the project plans and this special provision.

**b. Materials.**

1. Wood. Provide wood members that are Coast Region Douglas Fir or Southern Yellow Pine species. Provide commercial grade lumber for beams, joists, blocking and deck panels that are similar to 2400f-1.6E(MSR). For all other members, provide lumber similar to 1200f-1.2E(MSR). All lumber sizes are nominal. Provide lumber that is conditioned and pressure-treated in accordance with the requirements of AWPA C2 with the preservative chemical used meeting applicable EPA requirements. The use of waterborne chemicals will not be allowed.

Handrails and posts must be conditioned and pressure-treated with a clean preservative such as pentachlorophenol.

Field cutting and drilling of wood members will not be allowed unless all cuts and field-drilled holes are brush treated with a 5% pentachlorophenol solution or other approved field-treatment. Creosote solutions will not be approved for field-treatment.

All wood members must have a smooth surface finish.

Manufacturer must submit a certificate attesting to compliance with preservative specifications.

2. Hardware. Provide hardware that is hot-dip galvanized and conforms to section 908.

Provide bolts, nuts, and washers used for assembly that conform to the requirements of ASTM A 325 and are hot-dip galvanized in accordance with ASTM A 153 or are stainless steel.

Provide steel plate brackets in accordance with ASTM A36 steel with hot-dip galvanized coating conforming to the requirements of ASTM A 153.

Provide nails that are galvanized 60d (6") spiral shank.

Provide all hardware and accessories required to properly and completely execute the carpentry for this project, including, but not limited to: screws, bolts, nuts, washers, straps, and similar items, whether specifically mentioned herein or not.

**c. Construction.** Construction must conform to sections 709 and 912 of the Standard Specifications for Construction except as described herein.

Furnish all lumber and install making sure all carpentry work is plumb, level and true to line and grade, and meets standard industry practices. All railings and caps must be sanded smooth and have rounded edges. Ensure all exposed edges are free from splinters and that sharp edges are sanded smooth. Pre drill toe nailed and lumber ends to prevent splitting. Nails must not protrude through the backside of any member.

Timber bridge is to be built at the location shown on the plans.

The approaches and bridge surface must meet all American with Disabilities Act criteria.

The low chord of the bridge must not be below that shown on the plans.

**d. Measurement and Payment.** The completed work as described will be measured as a lump sum and paid for at the contract unit price using the following pay items:

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Timber Bridge.....	Lump Sum

**Timber Bridge** includes all labor, equipment and materials for furnishing and installing the timber bridge, including all wood members, posts, railing, hardware and fasteners, required to perform the completed work herein as described and shown on the contract documents. Miscellaneous metals and hardware will not be paid for separately, but will be included in the payment for **Timber Bridge**.

Substructure concrete, reinforcement steel, excavation and backfill will be paid separately.

CITY OF ANN ARBOR  
SPECIAL PROVISION  
FOR  
**STONE MASONRY FACADE**

BBT:CED

1 of 6

3/19/24

**a. Description.** This work consists of furnishing all materials, equipment and labor to furnish and install a stone façade, caps, and signs as shown on the plans and as specified herein.

**b. Materials.**

1. Split Field Stone. Provide split field stone products below from the following manufacturer or an approved equal:
  - a. Thin veneer split field stone from the Boulder Collection
  - b. Supplier: Halquist Stone
    - i. [www.halquiststone.com](http://www.halquiststone.com)
    - ii. (262) 246-9000
2. Limestone. Provide limestone products below from the following manufacturer or an approved equal for the block veneer, wall caps, and decorative signs.
  - a. Thin veneer Indiana "Bedford" Buff from the Cut Stone Collection
  - b. Supplier: Halquist Stone
    - i. [www.halquiststone.com](http://www.halquiststone.com)
    - ii. (262) 246-9000
3. Cement Masonry Units (CMU's). Provide 6-inch x 8-inch x 16-inch normal weight hollow concrete masonry block units in accordance with ASTM C 90. Store CMS's on elevated platforms in a dry location. If not in an enclosed location, cover tops and sides of stacks with securely tied waterproof sheeting. Provide units with a minimum compressive strength of 2000 psi.
4. Mortar and Grout.
  - a. Cement. Provide masonry cement material meeting ASTM C91/C91M. Provide mortar cement material meeting ASTM C1329/C1329M.
  - b. Aggregate. Provide aggregate meeting ASTM C144. Use washed aggregate consisting of natural sand or crushed stone for mortar that is exposed to view. Provided aggregate for grout meeting ASTM C404.
  - c. Mortar. Provide mortar consisting of Portland cement meeting ASTM C150, Type I, or Federal Specification SS-C-1292, Type I. Masonry cements must be manufacturer prepared or site prepared to meet or exceed the requirements of ASTM C-270. Provide lime meeting ASTM C207, Type S or ASTM C5 (quicklime). Provide mortar sand meeting ASTM C144, except that for joints ¼-inch or less in thickness, 100% must pass a No. 16 sieve. Provide clean, potable water free from deleterious amounts of acids, alkalis or organic materials.
  - d. Do not use calcium chloride in mortar or grout.
  - e. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
  - f. Water. Use potable water.
  - g. Grout. Provide grout in accordance with ASTM C-476 with aggregates in



- accordance with ASTM C-404. Mix grout with 1 part Portland cement by volume, 0 to 1/10 part lime or lime putty by volume, fine aggregate (measured in damp, loose condition) 2 ¼ to 3 times the sum of volumes of cementitious materials, coarse aggregate (measured in a damp, loose condition) 1 to 2 times the sum of volumes of cementitious materials, potable water sufficient to obtain 8 to 10 inch slump.
- h. Store masonry cement, Portland cements, and lime on wooden pallets or other material that will not collect condensation and off the ground in a dry condition. Keep sand clean.
  - i. Machine mix mortar materials in a batch, drum-type mixer for not less than 5 minutes. Use of a continuous mortar mixer is acceptable. Measure quantities by the box and do not use shovel measurements. Adjust mix due to climate conditions for best workability. Do not use anti-freeze materials.
  - j. Provide masonry cement according to the manufacturer's recommendations. Field prepared mortar must be proportioned within the limits, by volume, provided below:
    - i. Type M; 1 part Portland cement, ¼ part hydrated lime, not less than 2 ¼ and not more than 3 times the sum of the volumes of cement and lime used.
    - ii. Type S; 1 part Portland cement, ½ part hydrated lime, not less than 2 ¼ and not more than 3 times the sum of the volumes of cement and lime used.
    - iii. Type N; 1 part Portland cement, 1 part hydrated lime, not less than 2 ¼ and not more than 3 times the sum of the volumes of cement and lime used.
    - iv. Non-Staining; 1 part Portland cement, 1 part hydrated lime, 6 parts sand.
  - k. Prehydrate all mortars used for tuck pointing. Thoroughly mix all ingredients except water; then mix again, adding only enough water to produce a damp workable mix which will retain its form when pressed into a ball. After 1 to 2 hours, add sufficient water to bring it to the proper consistency; that is, somewhat drier than conventional masonry mortars.
  - l. Retemper mortars that have stiffened because of evaporation of water from the mortar as frequently as needed to restore the required consistency. Use mortars and place in final position within 2 ½ hours after initial mixing.
  - m. Use the same brands of cementitious materials and source of supply of sand throughout the entire project.
5. Masonry Joint Reinforcement. Install entire length of longitudinal side rods with a minimum cover of 5/8 inch on exterior side of walls and ½ inch elsewhere. Lap reinforcement a minimum of 6 inches Cut and bend reinforcing units as directed by the manufacturer for continuity at corners, returns, offsets, and other special conditions.
  6. Steel Lintel. Provide lintel support for stonework in accordance with Section 707 of the Standard Specifications for Construction. Provide materials meeting the requirements of Section 906 of the Standard Specifications for Construction. Use Gr. 36 steel. Galvanize materials according to subsection 707.03.C.17 of the Standard Specifications for Construction.
  7. Stone Trim Anchors. Fabricate anchors form stainless steel, ASTM A240/A240M or ASTM A666 Type 304. Use annealed stainless steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1. Use chemical anchors, torque controlled expansion anchors, or undercut anchors made from stainless steel components complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2 for bolts

- and nuts, ASTM 666 or ASTM A276, Type 304 or Type 316, for post-installed anchors.
8. Stone Dowels. Fabricate dowels from stainless steel, ASTM A276, Type 304.
  9. Reinforcing Steel. Provide plain reinforcement steel in accordance with Section 706 of the Standard Specifications for Construction.
  10. Metal Flashing. Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual". Use Stainless Steel ASTM A240/A240M or ASTM A666, Type 304 that is 0.016 inches thick. Fabricate continuous flashings in sections 8-feet long minimum, but not exceeding 12-feet. Provide splice plates at joints of formed, smooth metal flashing. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing. Fabricate metal drip edges from stainless steel that extend at least 3-inches into the wall and ½-inch out from the wall, with outer edge bend down 30 degrees and hemmed. Soder metal items at corners.
  11. Flexible Flashing. Use rubberized asphalt consisting of a pliable, adhesive rubberized asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030-inches. Use a manufacturer from one of the following, or approved equal:
    - a. Carlisle Coatings & Waterproofing Inc.
    - b. Heckmann Building Products, Inc.
    - c. Hohmann & Barnard, Inc.
    - d. W.R. Meadows, Inc.
    - e. Williams Products, Inc.
    - f. Wire-Bond.
  12. Butyl Rubber Flashing. Use composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.030 inch. Use a manufacturer from one of the following, or approved equal:
    - a. DuPont Safety & Construction.
    - b. GCP Applied Technologies Inc.
    - c. Protecto Wrap Company.
    - d. Raven Industries, Inc.
    - e. Wire-Bond.
  13. EPDM Flashing. Use a sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D4637/D4637M, 0.040 inch thick. Use a manufacturer from one of the following, or approved equal.
    - a. Carlisle Coatings & Waterproofing Inc.
    - b. Firestone Specialty Products.
    - c. Heckmann Building Products, Inc.
    - d. Hohmann & Barnard, Inc.
    - e. Wire-Bond.

**c. Submittals.** Prepare complete working drawings of all masonry details including split field stone, stone signage, limestone blocks and caps, CMU's, lintels, joint reinforcement, anchors, ties, and flashing. Indicate location and details for lighting conduit and fixtures.

Coordinate adhesive anchor holes in lintel plates with the box culvert manufacturer to avoid conflict with steel reinforcement. Confirm rebar locations in culvert prior to fabricating lintel plates. Use a pachometer to mark reinforcement in culvert if other identifying methods are not used.

**d. Construction.** Take field measurements as necessary to verify or supplement, or both, dimensions indicated in this special provision and on the contract plans.

Construction a 3-foot by 3-foot mock-up of the split field stone with a limestone cap at a location agreeable to the Engineer and the Contractor for review and approval by the Engineer prior ordering materials for full scale construction.

Clean the exposed surfaces of partially set or totally set fresh masonry and wet it lightly so as to obtain the best possible bond with the new work. Remove all loose stone and mortar.

Remove laitance, loose aggregate and other materials that prevent mortar from bonding to the foundation/concrete wingwall.

Construct all walls and facades plumb and level.

Provide ties in the full bed of mortar at 16-inches vertically and 24-inches horizontally and protect at least 2-inches into the stone veneer and block back-up or concrete back up. Do not place the ties closer than  $\frac{3}{4}$  inch from the exterior face of the stone veneer.

Wet stone surfaces having ASTM C67 absorption rate over 0.025 ounces per square foot per minute. Use wetting method which ensures that each unit is nearly saturated but surface dry when laid. Use warm water in cold weather.

Cut stone units with motor driven saw design to cut with clean sharp, unchipped edges. Cut units as required to provide the stonework that is continuous across bends in the wall and to fit adjoining work neatly. Use full units with cutting wherever possible.

Heat either sand or mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F when working in air temperatures of 40 degrees F to 32 degrees F. Protect masonry from rain for 24-hours by covering with weather-resistant membrane.

Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F when working in air temperatures of 32 degrees F to 25 degrees F. Maintain temperature of mortar on boards above freezing. Completely cover masonry for 24-hours.

Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F when working in air temperatures of 24 degrees F to 20 degrees F. Maintain temperature of mortar on boards above freezing. Completely cover masonry with insulation blankets for 24-hours and provide heat sources on both sides of masonry construction. Provide wind breaks when wind velocity exceeds 15 mph.

Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F when working in air temperatures below 20 degrees F. Maintain minimum temperature of 30 degrees F of masonry units when they are laid. Maintain masonry temperature above 32 degrees F for 24 hours by enclosure and approved heat source, by electric blankets, by infrared lamps, or by other approved methods.

Mortar Bedding. Lay solid masonry units with completely filled mortar joints. Do not furrow bed joints. Butter ends of masonry units with sufficient mortar to fill head joints. Rock closures in place with head joints thrown against 2 adjacent masonry units in place. Fill vertical, longitudinal joints by parging either face of backing or back of facing. Do not pound corners and jambs to fit stretcher units after they are set in position. Where an adjustment must be made after mortar as started to harden, remove mortar and replace with fresh mortar.

Jointing. Provide a nominal 3/8-inch joint around split field stone and limestone blocks adjusted to unit shape and size. Tool mortar joints in exposed masonry when "thumbprint" hard with round or other approved jointer. Mortar joints must be cut flush in surfaces to be concealed by finished construction.

CMU's. Do not install wet units.

Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar pointed to eliminate evidence of replacement. Perform work at no additional cost to the Department.

Solidly point all voids and holes. Cut out defective mortar joints and point with mortar.

Thoroughly clean face of stone. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels. Test cleaning methods on sample wall panel approximately 10 square feet in area as determined by the Engineer; leave half panel uncleaned for comparison purposes. Obtain Engineer's approval of sample cleaning before proceeding with cleaning of masonry. Protect other surfaces during the cleaning process.

Dry brush exposed masonry at the end of each day's work.

Use of wire brushes, acids, or solutions which might cause discoloration and/or damage to the masonry is expressly prohibited.

Pre-soak or saturate area to be cleaned. Flush the wall with water, from the top down. Starting at the top of wall, apply job-mixed detergent solution by means of the bucket and brush hand-cleaning method. When the use of proprietary masonry cleaning compound is approved by the Engineer, apply compound in compliance with the directions of the compound manufacturer. Rinse wall surfaces thoroughly with clean water after cleaning.

Cover the top of the wall(s) with a strong non-staining waterproof membrane at the end of each day or shut down. Cover partially completed walls when work is not in progress. Extend cover minimum 24-inches down both sides. Hold cover securely in place. When work is resumed, top surface of work must be cleaned of all loose mortar and in drying weather thoroughly wet.

Galvanize and apply the tie coat, intermediate coat, and top coat to the lintel steel material in the shop. Field repair damaged coatings in accordance with subsection 716.03.D.

Use metal flashing where it is indicated to be turned down at or beyond the wall face.

Use metal flashing with a drip edge or flexible flashing with a metal drip edge where flashing is partially exposed and is indicated to terminate at the wall face.

Use flexible flashing where it is fully concealed.

Solder stainless steel flashing using ASTM B32, Grade Sn60 Grade Sn96 with acid flux of type recommended by stainless steel sheet manufacturer.

Use elastomeric sealant conforming to ASTM C920, chemically curing urethane polysulfide silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal

flashing and remain watertight.

Use adhesives, primers, and seam tape for flashings as recommended by the manufacturer of the flashing for bonding flashing sheets to each other and to substrates.

**e. 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>
Split Field Stone .....	Square Foot
Limestone Block.....	Square Foot
Limestone Cap.....	Foot
Limestone Sign, "BANDEMÉR".....	Each
Limestone Sign, "BARTON".....	Each
Limestone Sign, "2024".....	Each

**Split Field Stone**, includes furnishing all labor, materials and equipment as specified herein and/or as shown on the plans to install the façade and includes CMU's to support it, mortar, properly coated lintel supports, and protection of materials regardless of weather conditions. The quantity will be measured based on the exposed stone surface area. The area of the CMU's below grade is not included in the measurement but is included in the cost of this item.

**Limestone Block** includes furnishing all labor, materials and equipment as specified herein and/or as shown on the plans to install the façade and includes CMU's to support it, mortar, properly coated lintel supports, and protection of materials regardless of weather conditions. The quantity will be measured based on the exposed stone surface area. The area of the CMU's below grade is not included in the measurement but is included in the cost of this item.

**Limestone Cap** includes furnishing all labor, materials and equipment as specified herein and/or as shown on the plans to install the cap and includes mortar and protection of materials regardless of weather conditions. The quantity will be measured based the linear foot installed along the top of the culvert headwall and wingwalls.

**Limestone Sign**, \_\_\_ includes furnishing all labor, materials and equipment as specified herein and/or as shown on the plans to install the sign and includes CMU's to support it, mortar, properly coated lintel supports, and protection of materials regardless of weather conditions. The quantity will be measured for each sign installed of the specified type.

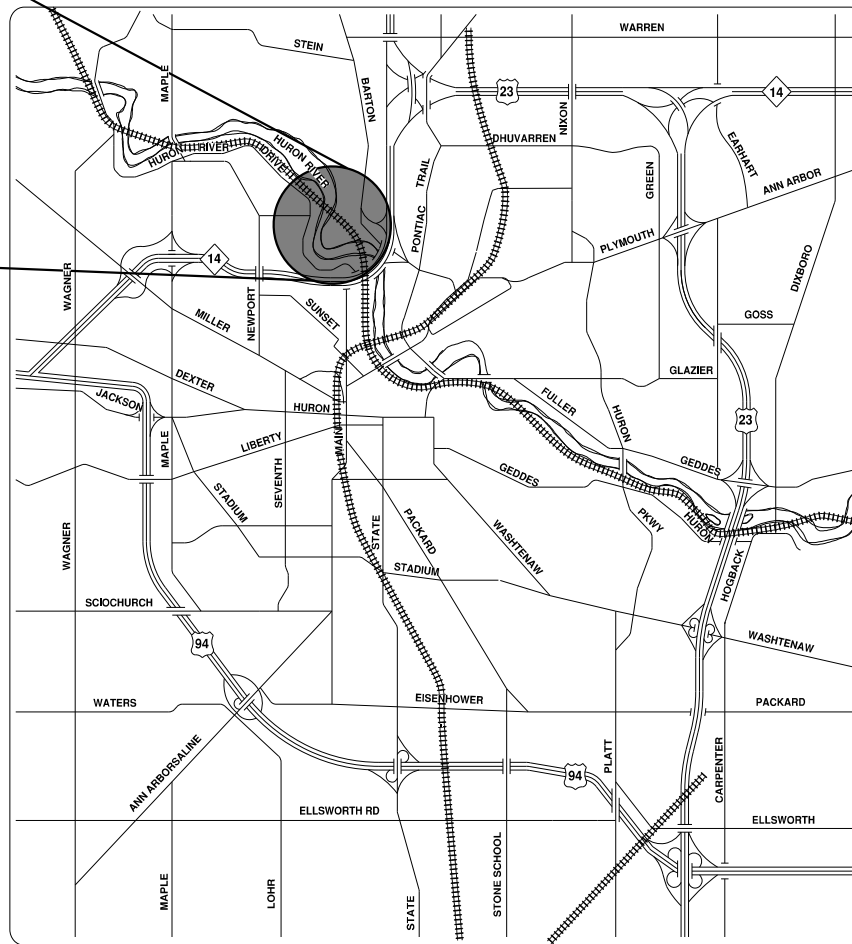
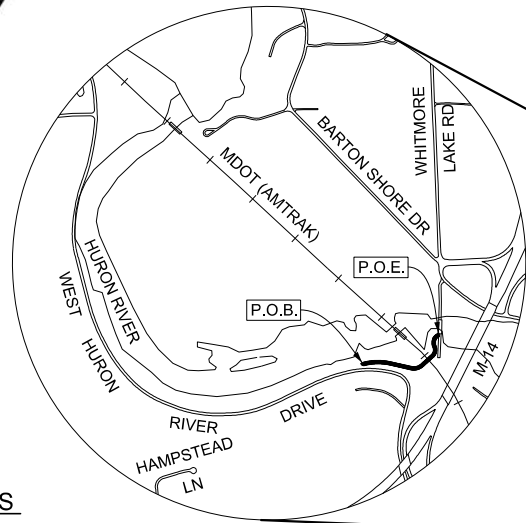
Cost of mock-up is not paid for separately and is considered included in other items of work.



# BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

## CITY OF ANN ARBOR PARKS AND RECREATION SERVICES & WASHTENAW COUNTY PARKS AND RECREATION COMMISSION

### CITY RFP# 24-23



**LOCATION MAP**

N.T.S.

**GENERAL NOTES**

ANDREW W. SCHRIPEMA (PS NO. 4001055483) IS THE MICHIGAN LICENSED SURVEYOR ON THIS PROJECT. SURVEY WAS COMPLETED JANUARY 8-17, 2019 AND SUPPLEMENTAL SURVEY WAS CONDUCTED MAY 10, 2022, JUNE 2-3, 2022, AND JANUARY 23-24, 2023.

THE RECONSTRUCTION DESIGN IS BASED ON 1.2 TIMES THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATION HL-93 LOADING WITH THE EXCEPTION THAT THE DESIGN TANDEM PORTION OF THE HL-93 LOAD DEFINITION SHALL BE REPLACED BY A SINGLE 60 KIP AXLE LOAD BEFORE APPLICATION OF THIS 1.2 FACTOR. THE RESULTING LOAD IS DESIGNATED HL-93 MOD. LIVE LOAD PLUS DYNAMIC LOAD ALLOWANCE DEFLECTION DOES NOT EXCEED 1/800 OF SPAN LENGTH. THE ORIGINAL STRUCTURE DESIGN LOADING IS HS-20.

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS, OR IN THE PROPOSAL AND SUPPLEMENTAL SPECIFICATIONS CONTAINED HEREIN, PERFORM ALL WORK ACCORDING TO THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION 2020 EDITION, THE CURRENT AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION SPECIFICATIONS, THE 2015 MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR RAILROAD WORK, AMTRAK MW1000 STANDARDS, AASHTO'S 2011 A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, THE 2011 MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, AND AASHTO'S 2012 GUIDE TO THE DEVELOPMENT OF BICYCLE FACILITIES.

THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:  
 CONCRETE: GRADE 3500HP  $f_c = 3,000$  psi  
 CONCRETE: GRADE 4500HP  $f_c = 4,000$  psi  
 STEEL REINFORCEMENT:  
 GRADE 60  $f_y = 60,000$  psi

UNLESS OTHERWISE SHOWN ON THE PLANS PROVIDE MINIMUM CONCRETE CLEAR COVER FOR REINFORCEMENT ACCORDING TO THE FOLLOWING:  
 CONCRETE CAST AGAINST EARTH: 3 IN.  
 ALL OTHER UNLESS SHOWN ON PLANS: 2 IN.

BEVEL ALL EXPOSED CONCRETE CORNERS SHOWN SQUARE ON THE PLANS WITH 1/2" TRIANGULAR MOLDINGS EXCEPT AS OTHERWISE NOTED.

THIS PROJECT HAS BEEN EVALUATED USING THE FAA NOTICE CRITERIA TOOL FOR THE FOLLOWING STRUCTURE HEIGHTS ABOVE GROUND LEVEL ELEVATIONS AND NO PERMITS ARE REQUIRED.

THE LOCATION OF ALL PUBLIC UTILITIES SHOWN ON THESE PLANS IS TAKEN FROM THE BEST AVAILABLE DATA. THE CITY OF ANN ARBOR, AND WASHTENAW COUNTY PARKS AND RECREATION COMMISSION WILL NOT BE RESPONSIBLE FOR ANY OMISSION OR VARIATION FROM THE LOCATIONS SHOWN. PURSUANT TO ACTS 173 & 174 OF THE P.A. OF 2013, AS A CONDITION OF THIS CONTRACT, NOTICE SHALL BE GIVEN TO MISS DIG PRIOR TO UNDERGROUND WORK TO BE PERFORMED IN ACCORDANCE WITH THIS CONTRACT, PHONE (800) 482-7171 OR 811. UTILITY SERVICE CONNECTIONS ARE NOT SHOWN ON THE PLANS AND ARE NOT THE RESPONSIBILITY OF THE OWNER.

THE ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON NAVD 1988 VERTICAL DATUM.

APPLICATION DATE	PERMITS	APPROVAL DATE
04/05/2024	EGLI JOINT PERMIT	
BY CONTRACTOR	CITY OF ANN ARBOR SESC PERMIT	
BY CONTRACTOR	CITY OF ANN ARBOR ROW PERMIT	
BY CONTRACTOR	AMTRAK PERMIT TO ENTER (PTE)	

CONTRACT FOR:  
PEDESTRIAN TUNNEL UNDER THE MDOT RAILROAD RIGHT-OF-WAY.



7050 W. SAGINAW HWY., SUITE 200  
LANSING, MI 48917

P (517) 272-9835  
F (517) 272-9836

PREPARED UNDER THE SUPERVISION OF:



50409  
Registration No.

APRIL 12, 2024  
Date

JEREMY A. HEDDEN, P.E.



34000 PLYMOUTH ROAD  
LIVONIA, MI 48150

P (734) 522-6711  
F (734) 522-6427

PREPARED UNDER THE SUPERVISION OF:



6201056730  
Registration No.

APRIL 12, 2024  
Date

CHRISTOPHER J. ELENBAAS, P.E.



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

REVISIONS

PROJECT NO.  
1022-18-0011

SHEET NO.  
1 OF 80

**PUBLIC UTILITIES**

The existing utilities listed below and shown on these plans represent the best information available as obtained on our surveys. This information does not relieve the contractor of the responsibility to be satisfied as to its accuracy and the location of the existing utilities.

<b><u>Name Of Owner</u></b>	<b><u>Type of Utility</u></b>
CITY OF ANN ARBOR UTILITIES 4251 STONE SCHOOL ROAD ANN ARBOR, MI 48108 ATTN: JASON MCDONALD – WATER MARK SIRLS – STORMWATER TRAVIS CONLEY – SANITARY NICHOLAS JACOB – FORESTRY MARK MARENO – SIGNS/SIGNALS PHONE: 734-794-6350	MUNICIPAL
DTE ELECTRIC 1 ENERGY PLAZA DETROIT, MI 48226 ATTN: STEVE MCCLEAR PHONE: 313-235-4000 EMAIL: STEPHEN.MCCLEAR@DTEENERGY.COM	ELECTRIC
DTE GAS 1 ENERGY PLAZA – WCB 1710 DETROIT, MI 48226 ATTN: ANDREW CAIRO PHONE: 586-291-4265 EMAIL: ANDREW.CAIRO@DTEENERGY.COM	GAS
AT&T 550 S. MAPLE RD ANN ARBOR, MI 48103 ATTN: MICHAEL JAREMA PHONE: 734-996-5385 EMAIL: MJ1749@ATT.COM	TELEPHONE
LUMEN 1025 ELDORADO BLVD BROOMFIELD, OH 80021 ATTN: DAVID HUCKFELDT PHONE: 517-812-2592 EMAIL: DAVE.HUCKFELDT@LUMEN.COM	FIBER OPTIC
RAILROAD UTILITIES AMTRAK ENGINEERING DEPT 2330 BROOKLYN RD JACKSON, MI 49203 ATTN: RAY WEINEL PHONE: EMAIL: WEIN2535@AMTRAK.COM	RAILROAD UTILITIES

**NOTES APPLYING TO STANDARD PLANS**

Where the following items are called for on plans, they are to be constructed according to the standard plan given below opposite each item unless otherwise indicated.

<b>Title</b>	<b>Plan No.</b>
<b>ROAD</b>	
DRAINAGE STRUCTURES	R-1-G
COVER K	R-15-G
CURB RAMP AND DETECTABLE WARNING DETAILS	R-28-K *
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK	R-29-J *
CONCRETE CURB AND CONCRETE CURB & GUTTER	R-30-G
ISOLATION JOINT DETAILS	R-37-B
LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT	R-43-J *
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS	R-80-F *
UTILITY TRENCHES	R-83-C
BOX CULVERT JOINT TIE ASSEMBLIES	R-84-A
PRECAST CONCRETE END SECTION FOR PIPE CULVERT	R-86-F
SOIL EROSION & SEDIMENTATION CONTROL MEASURES	R-96-E
CHAIN LINK FENCE (USING TENSION WIRE)	R-98-B
SEEDING AND TREE PLANTING	R-100-I
LIGHT STANDARD DETAILS	R-130-A *
<b>BRIDGE</b>	
MOLDING, BEVEL, LIGHT STANDARD ANCHOR BOLT ASSEMBLY AND NAME PLATE DETAILS	B-103-F *
<b>PAVEMENT MARKINGS</b>	
LONGITUDINAL LINE TYPES & PLACEMENT	PAVE-905-E
INTERSECTION, STOP BAR & CROSSWALK MARKINGS	PAVE-945-D
<b>SIGNING</b>	
STANDARD SIGN INSTALLATIONS	SIGN-100-G
SIGN SUPPORT SELECTION CHARTS	SIGN-150-D
STEEL POSTS	SIGN-200-E
MISCELLANEOUS SIGN CONNECTION DETAILS	SIGN-740-B

- Indicates a Special Detail which is included in this plan set.

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7050 W. SAGINAW HWY., SUITE 200  
LANSING, MI 48917  
P (517) 272-9835 | F (517) 272-9838

REVISIONS:

VERT DATUM:

HORIZ DATUM:

SCALE:

PROJ NUMBER:

DATE:

PROJ NAME:

CITY/VILLAGE/TOWNSHIP:

COUNTY:

STATE:

PROJECT:

DATE:

PROJ NUMBER:

SHEET:

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
PROJECT INFORMATION

O:\WCP\015514.00 WCP\PC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_proj\_001.dgn

**RAILROAD NOTES**

The railroad will furnish all ties, ballast, rails, and all necessary materials and labor for all track work on a force account basis.

The train movement and speed information shown in the proposal does not represent a commitment by the Amtrak railroad and is subject to change without notice.

The ground adjacent to the tracks and structure shall be graded by the contractor to provide drainage.

Design and construction must comply with Amtrak EP3005 – Pipeline Occupancy and EP3014 (available from Amtrak). Prior to construction operations, contractor must submit, at a minimum, the following to Amtrak for review and approval: construction procedure means and methods, schedule, dewatering system, and calculations, as applicable. All calculations must be signed and stamped/sealed by a licensed engineer registered in the State of Michigan.

Design and construction must comply with Amtrak EP2031 – Track Monitoring for Work Disturbing Roadbed (available from Amtrak). In addition, see Special Provision for Railroad Track Monitoring.

All underground utilities, cable, and facilities must be located and protected before any excavating, drilling, boring/directional drilling, ground penetrating activities, or construction takes place. This includes railroad and commercial utilities, cables, duct lines, and facilities. These activities will not be performed in close proximity to the railroad duct lines unless monitored by on-site Amtrak Communications and Signal (C&S) department personnel. Hand digging may be required, as directed by Amtrak through the on-site Amtrak C&S support personnel. Amtrak maintains the right to access all existing cables and conduits throughout construction. Amtrak also reserves the right to upgrade and install new cables and conduits in the affected area. The "MISS DIG" process must be followed. Please note that Amtrak is not a part of the MISS DIG process; contact Amtrak Engineering to have all railroad underground utilities and assets located. If requested by Amtrak, existing depths of utilities being crossed must be verified through test pits performed by the Contractor as directed by and under the direct supervision of Amtrak C&S support personnel. Precautions must be taken to prevent any interruption to MDOT Michigan Line operation.

Contractor must hand dig test pits to locate existing utility lines.

All contractors must execute the then-current version of Amtrak's "Temporary Permit to Enter Upon Property" which requires all persons that are on or adjacent to MDOT Michigan Line property successfully complete the Contractor Orientation Training. All Contractors must carry their "Amtrak Contractor Roadway Worker Protection" card with them at all times while on or adjacent to MDOT Michigan Line property. This will not be paid for separately.

Any work (or equipment being staged onsite during construction) performed at or near a railroad crossing must not obstruct the view of flashing light units or gates to oncoming traffic.

Any debris or damage resulting from work shall be immediately reported to the railroad. Railroad shall be repaired by railroad forces at project expense. Track removal and installation to be performed by Amtrak forces.

Track removal and installation to be performed in coordination with Amtrak forces. Contractor equipment and labor to be used as directed by Amtrak forces. This will not be paid for separately.

If work shall be performed on Railroad property that involves heavy trucks, equipment, or machinery along the right-of-way, duct lines and pull boxes shall be inspected by onsite Amtrak personnel and the equipment operator to insure they can withhold the appropriate weight as outlined in the Amtrak Tier Table Document.

Amtrak AMT-23 Section 5 Track Circuits Part 153: Before the tracks are returned to service, track circuits shall be adjusted and tested/maintained in accordance with Amtrak instructions (or appropriate manufacturer's instructions for audio frequency overlay circuits and/or proximity type detectors), as applicable. A check must be made of relay current and CAB signal axle current (in CAB signal territory) when tracks are raised, cleaned, or welded rail is installed, to prevent over energized condition, loss of shunting sensitivity and decrease in broken rail protection.

Amtrak AMT-23 Section 6 Wire and Cable Part 211: Cable and wire installed within the track structure must be at a minimum depth of 30 inches below the bottom of the tie and within conduit where possible and practical unless otherwise shown on plans. The ballast contours must be maintained during an excavation adjacent to or parallel to track structure.

All signal equipment to be relocated must be reviewed onsite by the Division Engineer to ensure that relocated equipment is satisfactory to both Amtrak & the designer.

The Division Engineer shall contact John Mariotti, Senior Manager Engineering, signal design and standards for support during the design phase.

Amtrak C&S personnel must field-verify that there is no signal equipment in the way of the project and that signal preview is not being obstructed.

Signal preview must not be obstructed. Contractor/Consultant performing work on railroad property must show that there is adequate signal preview. In addition, all temporary structures, formwork, equipment, etc. must comply during construction.

The railroad will permit the contractor to utilize the maintenance of way on the north side of the tracks for transporting materials and equipment to the site with access at Lake Shore Drive located ½ mile to the southeast. Use of the railroad R/W must be coordinated with Amtrak, requires flagging, and may have restrictions based on Amtrak operations.

The design calculations for the box culvert and wingwalls shall be submitted to Amtrak for review and approval in addition to the reviews performed by the Engineer. The calculations must be stamped by a registered Engineer in the State of Michigan. This will not be paid for separately.

All earth excavation located on railroad right-of-way shall be treated as non-hazardous contaminated material and disposed of at a licensed facility. Documentation of this disposal shall be provided by the Contractor to the Engineer.

**PROPERTY CORNERS**

Any property corners within the front or back slope shall be staked and protected by ribbon. The replacement of any property corners that are damaged unnecessarily by the Contractor's operations will be the financial responsibility of the Contractor. Re-establishment of all property corners will be performed by a Michigan licensed professional surveyor at the Contractor's expense.

**BENCHMARK ELEVATIONS**

Benchmark elevations shown on these plans are based on NAVD 1988.

**CONSTRUCTION & SOIL EROSION CONTROL SCHEDULE**

Place silt fence and inlet protection as indicated on the plans or as directed by the Engineer.

Remove existing pavement and storm sewers. Grade construction areas. Install new storm sewer and construct curb and gutter. Immediately after construction, finish grade construction area to provide positive drainage; then topsoil and seed all disturbed grassed areas. Place seeding as shown in Typcals.

Remove inlet filters as pavement is installed. After paving, reinstall stone filters at all pavement storm inlet structures, and clean storm sewer of all accumulated debris and sediment.

Remove temporary erosion controls after the site is approved by the Engineer.

It shall be the Contractor's responsibility to insure that temporary erosion controls are maintained as required throughout construction and that the roadways are kept free of mud and construction debris.

**UTILITIES**

For protection of underground utilities and in conformance with Public Act 74, 2013, the Contractor shall dial 1-800-482-7171 (or 811) 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, such as fiber optic carriers and Amtrak utilities in the railroad right-of-way.

The location of all public utilities shown on the plans are taken from the best available data. The Washtenaw County Parks and Recreation Commission will not be responsible for any omission or variations from the locations shown.

Construction operations shall be conducted in a manner as to insure that those utilities not requiring relocation will not be disturbed. Repairs of utilities damaged during construction by the Contractor shall be the full responsibility of the Contractor in accordance with the affected utility owners' requirements.

All private utility structures will be adjusted to grade by the owner of the facility. The Contractor shall provide the Engineer with three (3) working days notice prior to the start of such work. All costs incurred by utilities that have permission to utilize the railroad right-of-way shall be the responsibility of the Contractor except for any utility work shown on these plans.

**CONSTRUCTING RIPRAP**

Riprap shall be placed in accordance with the Michigan Department of Transportation 2020 Standard Specifications for Construction Subsection 813.03.E and shall include furnishing and placing a geotextile liner as specified. This liner will be included in the contract unit price bid for the riprap item(s). All riprap shall be natural cobble. Crushed concrete is prohibited.

**COVERS AND CASTINGS**

Castings damaged by the Contractor shall be replaced at the expense of the Contractor, with material approved by the Engineer.

**CULVERTS AND SEWERS**

Culvert and sewer lengths shown on the plans are approximate lengths needed for placement. The pay quantity is less the "C" dimension (see Standard Plan R-86-Series). Payment shall be measured in the field.

**FINISH EARTH GRADING**

Construction of earth grades shall be Class "A". Refer to Section 205.03 of the 2020 MDOT Standard Specifications for Construction.

**LANDSCAPING**

The Contractor shall not disturb any landscaping features protected by fencing or located outside of the slope stake limits. Any landscaping that is damaged or destroyed during construction will become the financial responsibility of the Contractor.

**OPEN EXCAVATIONS**

The placement of protective fencing meeting MIOSHA Standards is required around all open excavations. This will not be paid for separately but will be considered as having been included in the Contract unit price bid for the item under construction.

**PROPERTY OWNERS**

Property owners' names, shown on the plans, are for information only and their accuracy is not guaranteed.



7050 W. SAGINAW HWY., SUITE 200  
LANSING, MI 48917  
P (517) 272-9835 | F (517) 272-9838

REVISIONS

HORIZ DATUM VERT DATUM  
NA83 NA08

SCALE V: NONE  
H: NONE

CITY/VILLAGE/TOWNSHIP  
CITY OF ANN ARBOR

COUNTY  
WASHTENAW

CAO

PROJ/NO

ENG

DATE

4/7/2024

SHEET

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
PROJECT INFORMATION

O:\WCP\PRC\015514.00 WCP\PRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_proj\_002.dgn



**TREE STUMP REMOVAL**

The Contractor shall remove tree stumps and backfill holes that are within the grading limits. This work is included in the item "Shared use Path, Grading, Modified". Numerous trees were removed as part of another project and any remaining stumps to be removed are included in this contract with the pay item "Shared use Path, Grading, Modified".

**AGGREGATE BASE**

Aggregate bases for trail, road, and gravel path construction shall use aggregate 21AA limestone, unless otherwise specified. The use of crushed concrete is prohibited. Compact all aggregate bases to at least 95% of the maximum unit weight at a moisture content no greater than optimum moisture content.

**SIDEWALK AND CURB RAMP GRADES**

All sidewalk and curb ramp grades shall be staked according to standard plan R-28 Series and as shown on the plans. It is the Contractor's responsibility to install sidewalk to ADA standards and to ensure ADA standards are met after sidewalk placement. Any sidewalk or ramps not in compliance shall be replaced at the Contractor's expense.

**CLEARING**

Clear and remove all brush, debris, stumps, and trees less than six (6) inches DBH as shown within the grading limits or as directed by the Engineer. Paid for as "Shared use Path, Grading, Modified".

**SITE ACCESS**

Site access to the proposed tunnel and pathway construction is limited by the Huron River and the existing MDOT Rail Right-of-Way. Use of the Bandemer Park bridge over the Huron River is limited to weight restrictions posted for this bridge. The Contractor shall provide a plan to protect the existing decking and calculations indicating their equipment will not exceed the existing structure load rating if it will be used. The plan and calculations must be approved by the Engineer prior to use of this structure. Use of the pedestrian bridge(s) over the Huron River is not permitted. Refer to the Railroad Notes above regarding available access along the railroad corridor from Lake Shore Dr.

**SOIL BORINGS**

Soil borings on the construction sheets represent point information. Presentation of this information in no way infers that subsurface conditions are the same at locations other than the exact location of the boring.

**EXISTING SIGN RELOCATION**

All permanent signs requiring relocation due to Contractor operations shall be salvaged and reset by the Contractor at locations determined by the Engineer. Signs and posts damaged during the removal and storage operations shall be replaced with new signs and posts. The cost of this work shall be borne by the Contractor.

**SIGN INSTALLATION**

When attaching signs to supports, tighten the nut, not the bolt head.

Nylon washers shall be placed between steel washers and the sign face sheeting. The nylon washers are to be considered part of the attaching devices and hardware. Nylon washers shall have a 3/8 inch inner diameter, a 7/8 inch outer diameter and a 1/16 inch thickness.

**UNDERGROUND CONFLICTS**

The Contractor shall expose existing storm sewers, sanitary sewers, water main and private utilities to verify existing elevations before commencing work on a proposed

storm sewer or water main that is to cross other utilities. This work will not be paid as exploratory excavation unless previously authorized by the Engineer.

**CONCRETE JOINTS**

Tooled joints are not allowed, sawcut contraction joints in all concrete pavement in accordance with the standard plan series R-39. For irregular concrete pavement shapes, review the jointing plan with the Engineer prior to sawcutting. Provide isolation joints in accordance with the standard plan series R-37.

**CLEANING PAVEMENT**

Before placing any HMA mixture, the surface of the existing pavement including all curbs, cracks, joints, and the surface of the new base and leveling courses, shall be thoroughly cleaned of all debris and dirt. This work will not be paid for separately, but will be considered as having been included in the contract unit price bid for other HMA items.

**CASTINGS FOR INLETS AND CATCH BASINS**

All MDOT Castings except Type B shall have the words "DUMP NO WASTER, DRAINS TO WATERWAYS" permanently casted to the cover.

Existing structures to remain shall receive new castings as shown in the plans.

**TREE REMOVALS**

Miscellaneous tree removal quantities may be used only as directed by the Engineer. Removals and branch trimming shall only occur between October 1 and March 31. The Contractor shall consult with a certified arborist if removals are necessary outside this window. Tree sizes are shown on the plan sheets. Some trees are tagged in the field and these tag numbers are shown on the plan sheets where applicable.

A walkthrough shall be scheduled to identify final tree removals with the Engineer and Owner prior to starting any tree removals.

**TREE PLANTING**

Plant trees in accordance with MDOT Standard Plan R-100 Series. Water and cultivate trees in accordance with Section 815 of the 2020 Standard Specifications for Construction. The location of all trees shall be determined by the Engineer.

**RESTORATION**

The following pay items are included in the Contract:

- Turf Establishment, Turf Grass, Performance
- Turf Establishment, Native Seed Mix, Mesic Tallgrass, Performance

Restore areas as directed by the Engineer in the field. The following station ranges provide a rough estimation of restoration limits. Verify with the Engineer prior to the start of restoration.

Turf Grass – Entire length of project within 8-feet of edge of path to limits of grading, whichever is less except that Turf Grass will be used for the entire grading limits from Station 140+94 to the POE along the east side of the path the entire grading limits.

Mesic Tallgrass – Station 137+00 to 140+34 beyond the limits of the Turf Grass noted above and from Sta 140+94 to the start of the permanent sheet piling wall on the west side of the path beyond the limits of the Turf Grass noted above.

Side slopes vary throughout the project. Ensure that the proposed mulch blanket is suitable for the given side slopes. Provide shop drawings for all proposed restoration materials.

On railroad right-of-way, the Contractor shall be responsible for the following slope restoration activities:

- 1) The Engineer will inspect the seeded turf to ensure the end product is well established, in a vigorous growing condition, and contains the species called for in the seeding mixture.
- 2) If an area washes out for reasons attributable to the Contractor's operation or failure to take proper precautions, replacement will be at the Contractor's expense.

**MISCELLANEOUS QUANTITIES**

The following items of work shall be done as they apply throughout the project. These items are not detailed or shown on subsequent plan sheets and should be used only as directed by the Engineer.

MISCELLANEOUS QUANTITIES		
1	LSUM	Certified Payroll Compliance and Reporting
1	LSUM	Mobilization, Max
0.25	Acre	Clearing, Modified
6	Ea	Tree, Rem, 19 inch to 36 inch
2	Ea	Tree, Rem, 37 inch or Larger
10	Ea	Tree, Rem, 6 inch to 18 inch
100	Cyd	Subgrade Undercutting, Type I
100	Cyd	Subgrade Undercutting, Type II
100	Cyd	Subgrade Undercutting, Type IV
100	Ton	Maintenance Gravel
15	Ton	Hand Patching
20	Ft	Check Dam, Cobblestone
1	LSUM	Contractor Staking

MISCELLANEOUS QUANTITIES		
1	LSUM	Site Preparation, Max
1	LSUM	Watering and Cultivating, First Season, Min
1	LSUM	Watering and Cultivating, 2nd Season, Min
10	Ea	Aronia melanocarpa, #5 cont.
10	Ea	Hamamelis virginiana, #5 cont.
5	Ea	Viburnum acerifolium, #5 cont.
10	Ea	Viburnum lentago, #5 cont.
5	Ea	Platanus occidentalis, 3 inch
5	Ea	Tilia americana, 3 inch
5	Ea	Acer saccharum 'Bailsta' FALL FIESTA, 3 inch
3	Ea	Nyssa sylvatica, 3 inch
3	Ea	Quercus bicolor, 3 inch
8	Ea	Cercis canadensis, 2 1/2 inch, multi-stem
8	Ea	Cornus florida, 2 1/2 inch
6	Ea	Amelanchier x grandiflora 'Autumn Brilliance', 8 foot
5	Ea	Cephalanthus occidentalis, #5 cont.
30	Ea	Cornus stolonifera 'Farrow', #5 cont.
10	Ea	Lindera benzoin, #5 cont.
15	Ea	Calamagrostis x acutiflora 'Karl Foerster', #3 cont.
15	Ea	Panicum virgatum 'Shenandoah', #3 cont.
15	Ea	Schizachyrium scoparium, #3 cont.

MISCELLANEOUS QUANTITIES		
2	Ea	Erosion Control, Filter Bag
2	Ea	Erosion Control, Gravel Access Approach
5	Ea	Erosion Control, Inlet Protection, Fabric Drop

**WATER & SEWER UTILITY SYMBOLS**

- EXISTING**
- <sub>ST</sub> STORM MANHOLE
  - SQUARE CATCH BASIN
  - ⊕ ROUND CATCH BASIN
  - == CULVERT
  - ⊖ CULVERT W/O END SECTION
  - ) CULVERT W/END SECTION
  - <sub>S</sub> SANITARY MANHOLE
  - ⊙ CLEAN OUT
  - ⊗<sub>GW</sub> GATE VALVE & WELL
  - GATE VALVE & BOX
  - ⊖<sub>W</sub> WATER STOP BOX
  - ⊙ FIRE HYDRANT
  - ⊖<sub>MP</sub> METER PIT
  - ⊙ WATER METER
  - ⊙<sub>SH</sub> SPRINKLER HEAD
  - ⊙<sub>IR</sub> IRRIGATION VALVE

- PROPOSED**
- STORM MANHOLE
  - INLET/CATCH BASIN
  - ) CULVERT END SECTION
  - SANITARY MANHOLE
  - ⊗<sub>GW&W</sub> GATE VALVE & WELL
  - ⊗<sub>GW&B</sub> GATE VALVE & BOX
  - ⊗<sub>TS&W</sub> TAPPING SLEEVE VALVE & WELL
  - ⊗<sub>TS&B</sub> TAPPING SLEEVE VALVE & BOX
  - ⊙ FIRE HYDRANT

**REAL ESTATE SYMBOLS**

- ↔ CONTIGUOUS PROPERTY SYMBOL
- ⊞ PARCEL NUMBER BOX
- ⊞ NO ROW IMPACTS

**MISCELLANEOUS UTILITY SYMBOLS**

- EXISTING**
- ⊖ GUY WIRE
  - ⊖<sub>OP</sub> GUY POLE
  - ⊖<sub>U</sub> UTILITY POLE
  - ⊙<sub>TU</sub> UTILITY POLE W/LIGHT
  - ⊙<sub>L</sub> LIGHT/DECOR LAMP POLE
  - ⊙ FLOOD LIGHT
  - ⊖ GAS VALVE
  - ⊖ GAS VENT
  - ⊖<sub>G</sub> GAS METER
  - ⊖<sub>G</sub> GAS RISER
  - ⊖ TRAFFIC SIGNAL
  - ⊖ PEDESTRIAN RISER
  - ⊖<sub>E</sub> TRANSFORMER PAD
  - ⊖<sub>U</sub> PRIVATE UTILITY MANHOLE
  - ⊖<sub>R</sub> RAILROAD CROSSING
  - ⊖<sub>E</sub> ELECTRIC METER
  - ⊖<sub>PB</sub> PHONE BOOTH
  - ⊖<sub>TS</sub> TRAFFIC SIGNAL CONTROLLER
  - ⊖ HAND HOLE
  - ⊖<sub>E</sub> ELECTRIC RISER
  - ⊖<sub>T</sub> TELEPHONE RISER
  - ⊖<sub>C</sub> CABLE TV RISER
  - ⊖<sub>W</sub> MONITORING WELL
  - ⊖ UNDERGROUND MARKER

**MISCELLANEOUS SYMBOLS**

- EXISTING**
- ⊖ RIPRAP
  - ⊖ SIGN
  - FLOW DIRECTION
  - ⊖ STUMP
  - ⊖ WETLAND
  - ⊖ CONIFEROUS TREE } CL 1 1" TO 5"
  - ⊖ DECIDUOUS TREE } CL 2 6" TO 17"
  - ⊖ CONIFEROUS SHRUB
  - ⊖ DECIDUOUS SHRUB
  - ⊖<sub>SB#</sub> SOIL BORING
  - ⊖ SECTION CORNER
  - MONUMENT
  - IRON ROD/PIPE
  - ⊖<sub>PK</sub> PK NAIL
  - <sub>BM#</sub> BENCHMARK
  - ⊖<sub>TP#</sub> TRAVERSE POINT
  - ⊖ MAIL/NEWSPAPER BOX
  - ⊖<sub>FP</sub> FLAG POLE
  - ⊖ POST

**HAZARDOUS OR FLAMMABLE MATERIAL** USED WITH UNDERGROUND GAS & ELECTRICAL LINES

**CAUTION - CRITICAL UNDERGROUND UTILITY** USED WITH TELEPHONE & FIBER OPTIC LINES

- PROPOSED**
- ⊖ RIPRAP
  - ⊖ SIGN
  - FLOW DIRECTION
  - ⊖<sub>WM</sub> STRUCTURE NUMBER WM
  - ⊖<sub>SAN</sub> SAN
  - ⊖<sub>STM</sub> STM
  - ⊖ ADA SIDEWALK RAMP
  - ⊖ GRAVEL

**UTILITY PATTERN**

- EXISTING**
- ⊖<sub>ELEC</sub> ELECTRICAL \*
  - ⊖<sub>6" (COMPANY) GAS</sub> GAS/OIL
  - ⊖<sub>(COMPANY) CABLE/TEL</sub> CABLE/TELEPHONE \*
  - ⊖<sub>FIBER OPTIC</sub> FIBER OPTIC \*
  - ⊖<sub>12" WM</sub> WATER
  - ⊖<sub>12" SAN</sub> SANITARY
  - ⊖<sub>12" STM</sub> STORM
- PROPOSED**
- ⊖<sub>12" →</sub> STORM/SANITARY/WATER
  - ⊖<sub>12"</sub> PRIMARY UTILITY WILL HAVE A CONTINUOUS LIFESTYLE, WITH THE SECONDARY UTILITY MATCHING ITS RESPECTIVE EXISTING UTILITY LIFESTYLE.
- \*OH = OVERHEAD , UG = UNDERGROUND

**ROW PATTERN**

- EXISTING**
- ⊖<sub>ROW</sub> ROW
  - ⊖ SECTION
  - ⊖<sub>PROPERTY/PARCEL</sub> PROPERTY/PARCEL
- PROPOSED**
- ⊖<sub>ROW</sub> ROW

**TOPO PATTERN**

- EXISTING**
- ⊖ HEDGE/TREE
  - ⊖ FENCE
  - ⊖ GUARDRAIL
  - ⊖ CENTERLINE OF DITCH
  - ⊖ RAILROAD
  - ⊖ WETLAND/EDGE OF WATER
  - ⊖ 100 YEAR FLOODPLAIN
- PROPOSED**
- ⊖ GRADING LIMIT (SLOPE STAKE)
  - ⊖ CENTERLINE OF DITCH
  - ⊖ TREE LINE
  - ⊖ FENCE
  - ⊖ EROSION CONTROL, SILT FENCE
  - ⊖ EROSION CONTROL, WATTLES

**REMOVAL LEGEND**

- ⊖ SIDEWALK REMOVAL
- ⊖ HMA SURFACE REMOVAL
- ⊖ PAVEMENT REMOVAL
- ⊖ COLD MILLING HMA SURFACE
- ⊖ HMA BASE CRUSHING AND SHAPING
- ⊖ EXCAVATION, EARTH, MODIFIED
- ⊖ REMOVE GRAVEL & PLANT SEED
- ⊖ CURB AND GUTTER, REM
- ⊖ TREE, REM
- ⊖<sub>S</sub> SALVAGE
- ⊖<sub>B</sub> BULKHEAD
- ⊖<sub>A</sub> ABANDON
- ⊖<sub>R</sub> REMOVE
- ⊖<sub>ADJ</sub> ADJUST
- ⊖<sub>REL</sub> RELOCATE
- ⊖<sub>REC</sub> RECONSTRUCT
- ⊖<sub>R B/O</sub> REMOVE BY OTHERS
- ⊖<sub>ADJ B/O</sub> ADJUST BY OTHERS
- ⊖<sub>REL B/O</sub> RELOCATE BY OTHERS

**IF NECESSARY FOR CLARITY**

- ⊖<sub>S</sub> SALVAGE
- ⊖<sub>B</sub> BULKHEAD
- ⊖<sub>A</sub> ABANDON
- ⊖<sub>C</sub> CLEARING
- ⊖<sub>R</sub> REMOVE
- ⊖<sub>REL</sub> RELOCATE
- ⊖<sub>REC</sub> RECONSTRUCT
- ⊖<sub>REL B/O</sub> RELOCATE BY OTHERS
- ⊖<sub>ADJ B/O</sub> ADJUST BY OTHERS

**SPECIAL LEGEND**

- ⊖ Riprap, Cobblestone
- ⊖ Infiltration Trench, Det A

**OHM**  
ARCHITECTS ENGINEERS PLANNERS  
34000 Plymouth Road  
Livonia, MI 48150  
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REVISIONS

NO. 1

DATE

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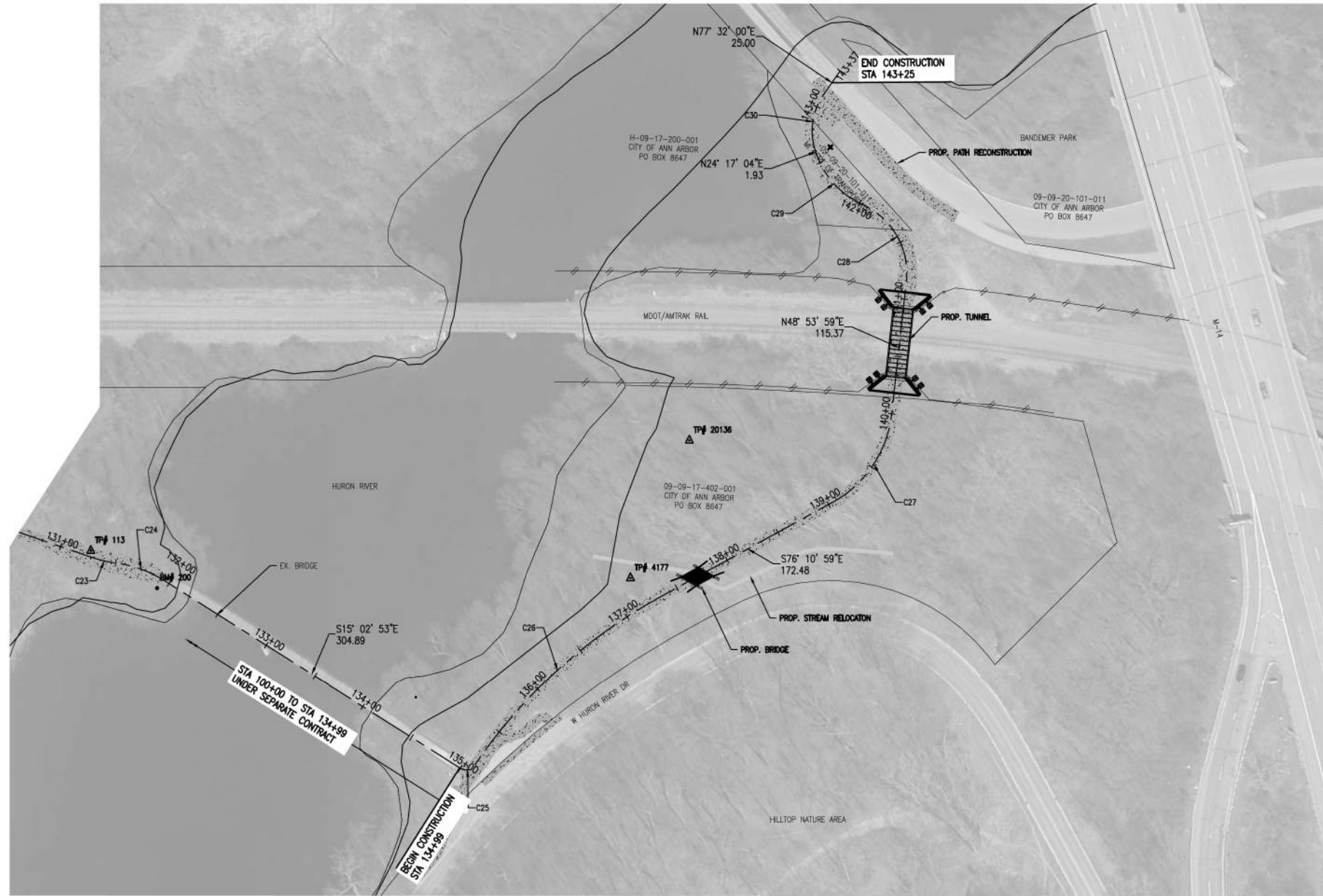
BY

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
LEGEND SHEET

DRAWING PATH: P:\1000\_1999\1022180210\_Bandemer-Barton\_TrafficDrawings\Civil\Misc\180010.EC.dwg Apr 12, 2024 - 9:28am

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ALIGNMENT CURVE DATA													
Curve #	Δ	R (Ft)	L (Ft)	T	PC STATION	NORTHING	EASTING	PI STATION	NORTHING	EASTING	PT STATION	NORTHING	EASTING
C23	11°51'02"	100.000	20.683	10.38	131+29.62	293362.52	13290379.25	131+40.00	293353.40	13290384.20	131+50.31	293345.49	13290390.82
C24	25°17'15"	100.000	44.135	22.43	131+50.31	293345.49	13290390.92	131+72.74	293328.39	13290405.44	131+94.44	293306.72	13290411.26
C25	91°37'02"	9.151	14.633	9.41	134+99.33	293012.29	13290490.42	135+08.74	293003.06	13290492.27	135+13.96	293005.16	13290501.44
C26	27°05'29"	465.282	220.000	112.10	135+13.96	293005.16	13290501.44	136+26.06	293030.77	13290610.58	137+33.96	293003.86	13290719.40

**NOTE:** SEE TUNNEL ALIGNMENT PLAN FOR CURVE INFORMATION FROM STA 138+00 TO P.O.E.



Know what's below.  
Call before you dig.

REVISIONS

NO. 1

DATE

BY

APP'D

SCALE

PROJECT

CITY/VILLAGE/TOWNSHIP

CITY OF ANN ARBOR

COUNTY

WASHTENAW

STATE

MI

PROJ. NO.

1022-14-0011

DATE

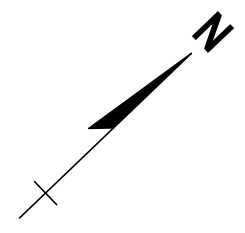
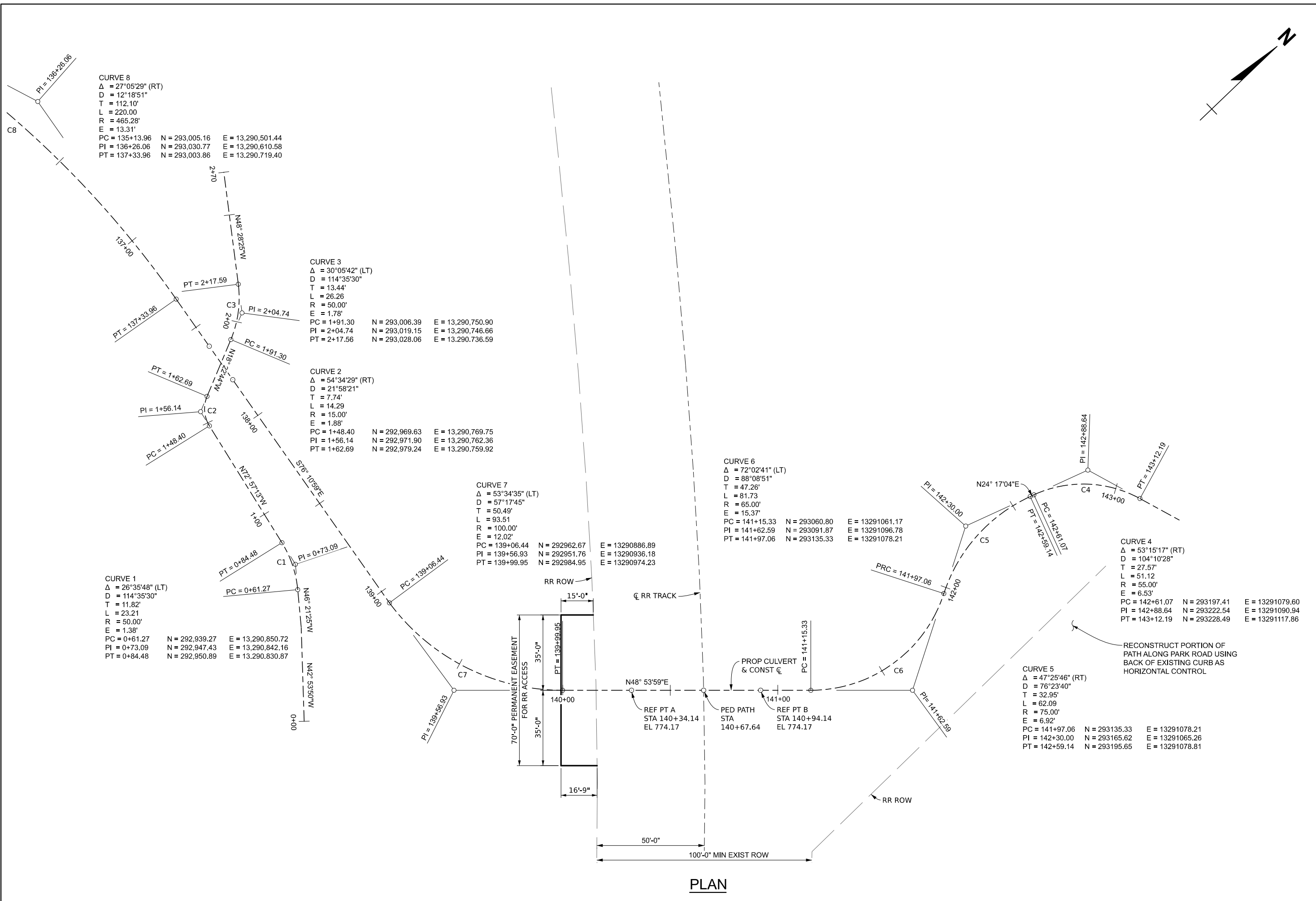
04/08/2024

SHEET

6 of 80

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REVISIONS:

NO.	DATE	DESCRIPTION

SCALE: HORIZ. DATUM: VERT. DATUM: NAD83

CITY/VILAGE/TOWNSHIP: WASHINGTON COUNTY, WASHINGTON COUNTY, WASHINGTON COUNTY

CITY OF ANN ARBOR

**CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC**  
**BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT**

ALIGNMENT PLAN

**PLAN**

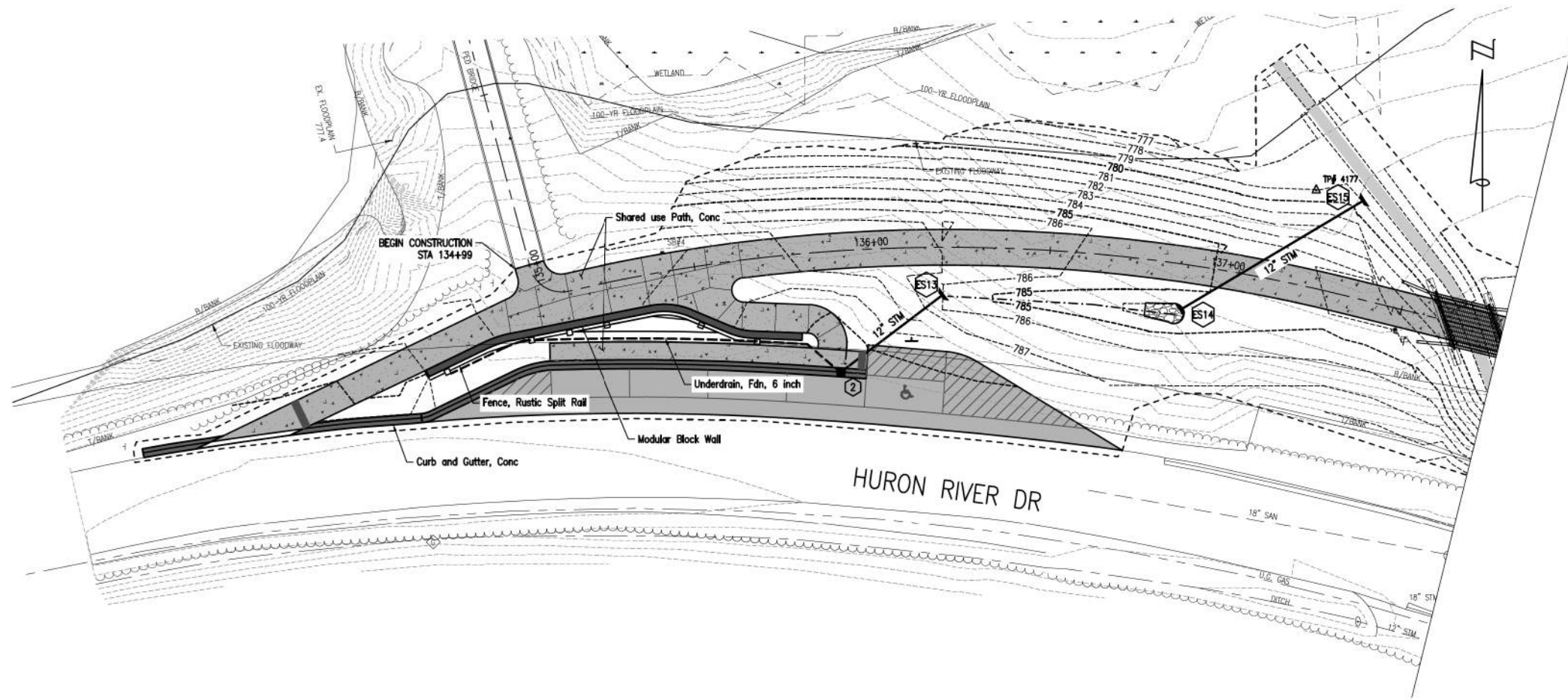


ARCHITECTS ENGINEERS PLANNERS

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# GENERAL PLAN OF SITE POB TO STA 137+79



NOTES:  
THE WORK COVERED BY THESE PLANS INCLUDES FURNISHING ALL MATERIALS AND CONSTRUCTION OF THE PROPOSED PRECAST CONCRETE BOX CULVERTS WITH HEADWALLS, WINGWALLS, APRONS, AND CONNECTING THE B2B PEDESTRIAN PATH TO THE LIMITS SHOWN. ALL OTHER WORK IS INCLUDED IN THE PATHWAY PLANS THAT ARE A PART OF THIS CONTRACT.

LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND CONDUCT OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

WATER LEVEL IS SUBJECT TO CHANGE. MAKE A DETERMINATION OF WATER LEVELS THAT MAY EXISTING DURING CONSTRUCTION.

- LEGEND**
- CONCRETE SHARED USE PATH  
SEE DETAIL SHEET 6
  - REINFORCED CONCRETE PAVEMENT  
SEE DETAIL SHEET 6
  - HEAVY DUTY AGGREGATE SURFACE COURSE  
SEE DETAIL SHEET 6
  - Aggregate Surface Cse, 6 inch, Modified



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DATE	PROJ NUMBER	ENG	PROJ LEAD	CADD	COUNTY	CITY/TOWNSHIP	SCALE	DATE	BY	CHKD	APP'D
02/20/22	2022-04-011	MB		JK	WASHTENAW	CITY OF ANN ARBOR	N 1"=10'				

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
Subset 2\_RFP 24-xx

DRAWING PATH: P:\1000\_1999\10221800\10\_Bandemer-Barton\_Trail\Drawings\Civil\Grading\180010GRD.dwg May 01, 2024 - 2:22pm

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**TIMBER BRIDGE COORDINATES**

REF PT	NORTH	EAST	ELEV
A	292997.47	13290745.39	783.08
B	292992.93	13290763.84	782.57

COORDINATES PROVIDED ARE TO ESTABLISH THE GEOGRAPHIC LOCATION OF THE STRUCTURE, HOWEVER SHALL NOT TAKE PRECEDENCE OVER STRUCTURAL DIMENSIONS.

**PED CULVERT COORDINATES**

REF PT	NORTH	EAST	ELEV
A	293006.02	13290998.37	774.16
B	293045.46	13291043.59	774.16

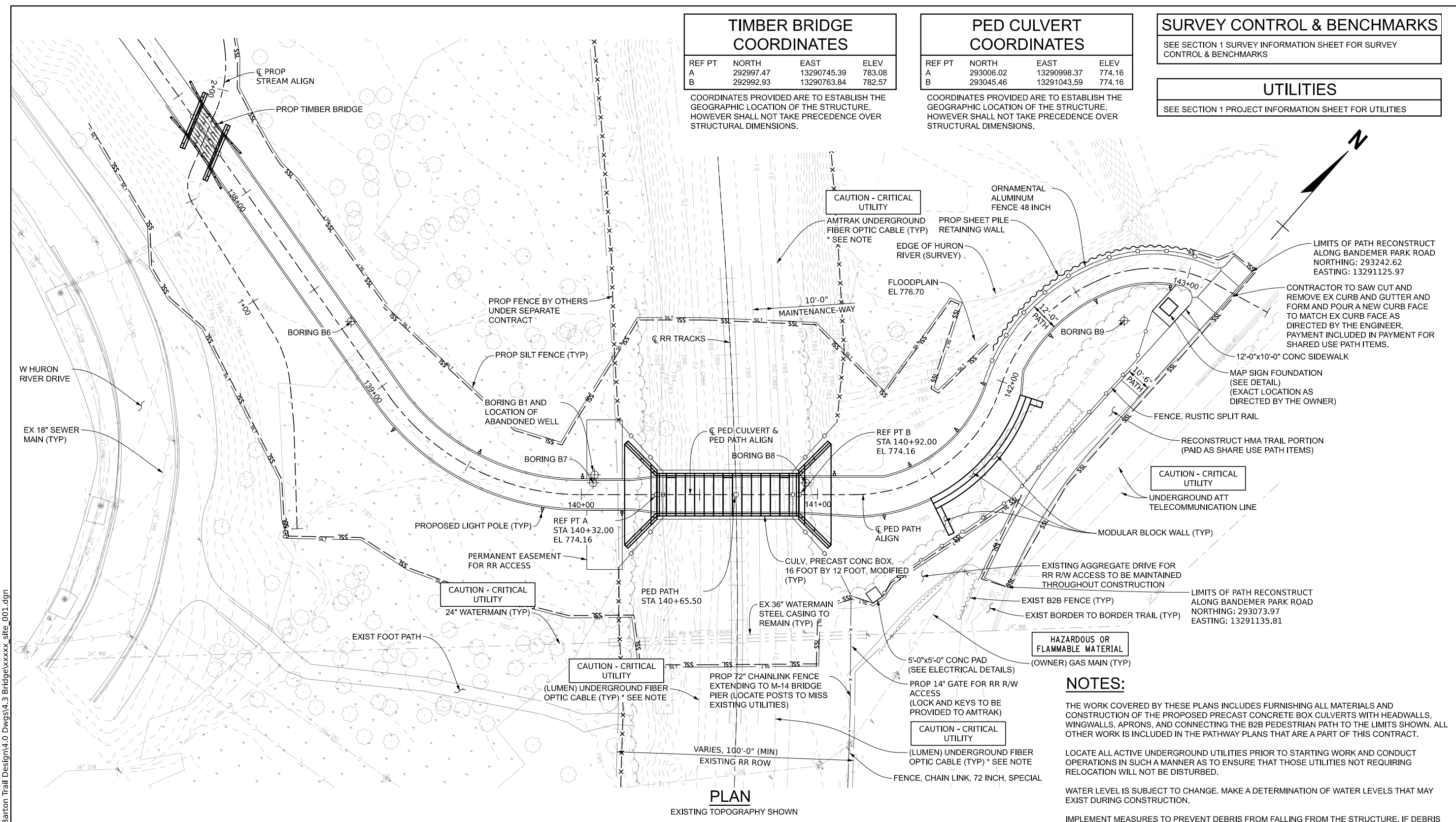
COORDINATES PROVIDED ARE TO ESTABLISH THE GEOGRAPHIC LOCATION OF THE STRUCTURE, HOWEVER SHALL NOT TAKE PRECEDENCE OVER STRUCTURAL DIMENSIONS.

**SURVEY CONTROL & BENCHMARKS**

SEE SECTION 1 SURVEY INFORMATION SHEET FOR SURVEY CONTROL & BENCHMARKS

**UTILITIES**

SEE SECTION 1 PROJECT INFORMATION SHEET FOR UTILITIES



**PLAN**  
EXISTING TOPOGRAPHY SHOWN

**LEGEND**

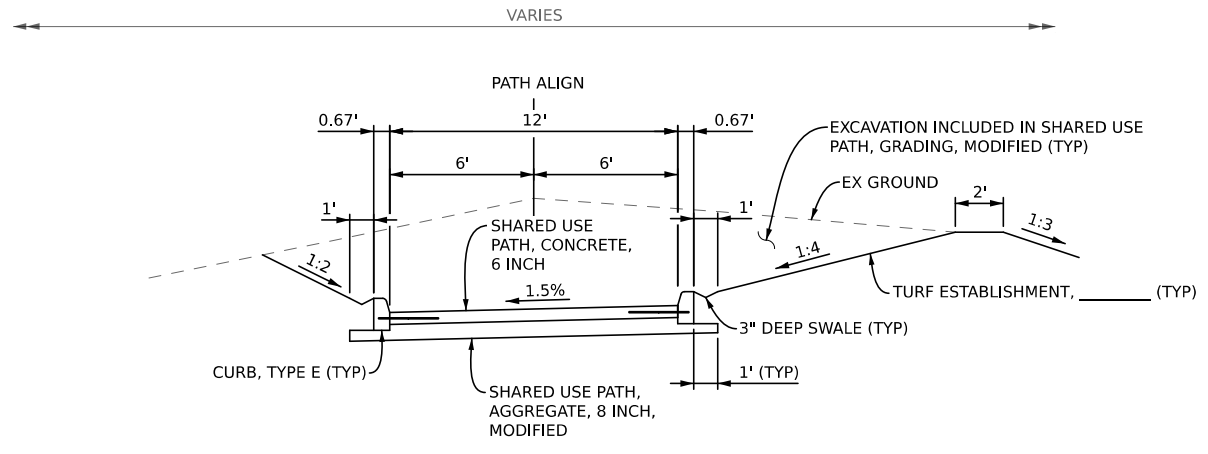
- SILT —
- SSL —
- SILT FENCE —
- SLOPE STAKE LINE —

**NOTES:**

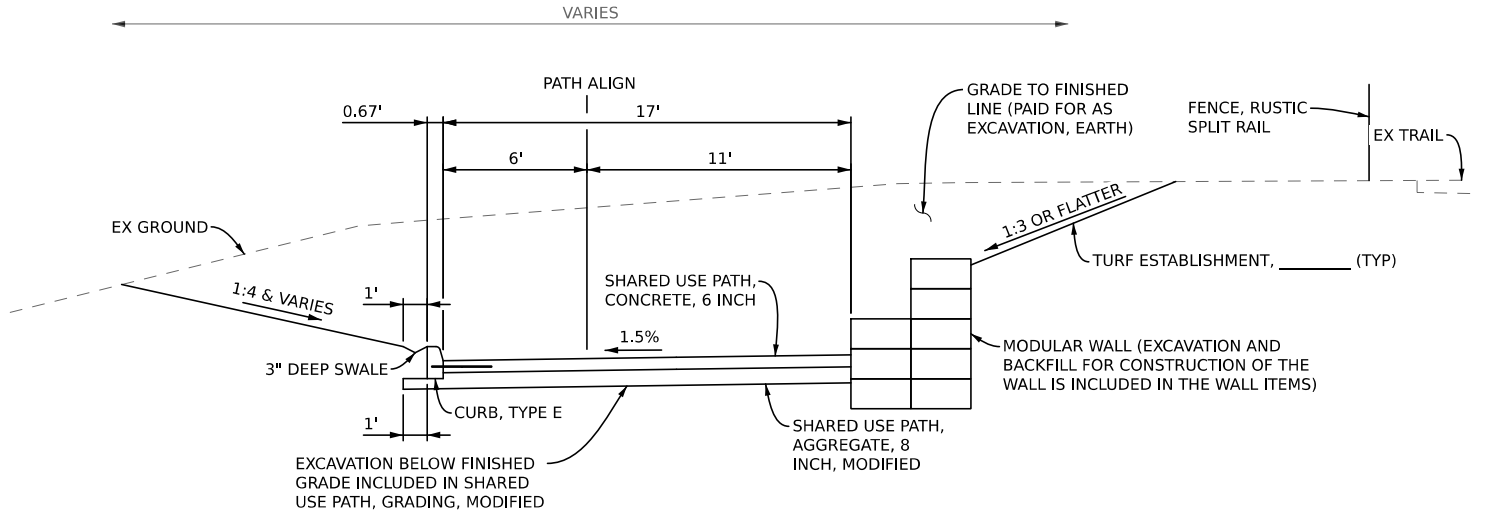
- THE WORK COVERED BY THESE PLANS INCLUDES FURNISHING ALL MATERIALS AND CONSTRUCTION OF THE PROPOSED PRECAST CONCRETE BOX CULVERTS WITH HEADWALLS, WINGWALLS, APRONS, AND CONNECTING THE B2B PEDESTRIAN PATH TO THE LIMITS SHOWN. ALL OTHER WORK IS INCLUDED IN THE PATHWAY PLANS THAT ARE A PART OF THIS CONTRACT.
- LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND CONDUCT OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.
- WATER LEVEL IS SUBJECT TO CHANGE. MAKE A DETERMINATION OF WATER LEVELS THAT MAY EXIST DURING CONSTRUCTION.
- IMPLEMENT MEASURES TO PREVENT DEBRIS FROM FALLING FROM THE STRUCTURE. IF DEBRIS FALLS INTO THE WATERWAY, REMOVE IT WITHIN 24 HOURS. SINCE DISTURBANCE OF THE WATERWAY BOTTOM MAY BE AS HARMFUL AS THE DEBRIS ITSELF, THE PREVENTIVE MEASURES MUST BE EFFECTIVE. REMOVAL OF DEBRIS IS INCLUDED IN RELATED ITEMS OF WORK.
- IMMEDIATELY AFTER THE CONSTRUCTION OF A CULVERT STAGE IS COMPLETED, PLACE SLOPE PROTECTION AND SEEDING OR SODDING ON THE ADJACENT EMBANKMENT SLOPES.
- \* FIBER OPTIC LINES WILL REMAIN. CONTRACTOR TO TEMPORARILY SUPPORT THE FIBER OPTIC LINES WHILE EXCAVATING AND PLACING CULVERT. ONCE CULVERTS ARE IN PLACE, FIBER OPTIC OWNER WILL PLACE THE LINES INSIDE SPLIT STEEL CONDUIT. PAYMENT FOR TEMPORARILY SUPPORTING AND PROTECTING THE FIBER OPTIC CABLE IS INCLUDED IN UTILITY WORK.
- THE RAILROAD WILL PERMIT THE CONTRACTOR TO UTILIZE THE MAINTENANCE OF WAY ON THE NORTH SIDE OF THE TRACKS FOR TRANSPORTING MATERIALS AND EQUIPMENT TO THE SITE WITH ACCESS AT LAKE SHORE DRIVE LOCATED 1/2 MILE TO THE SOUTHEAST. USE OF THE RW MUST BE COORDINATED WITH AMTRAK, REQUIRES FLAGGING, AND MAY HAVE RESTRICTIONS BASED ON AMTRAK OPERATIONS.

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
GENERAL PLAN OF SITE

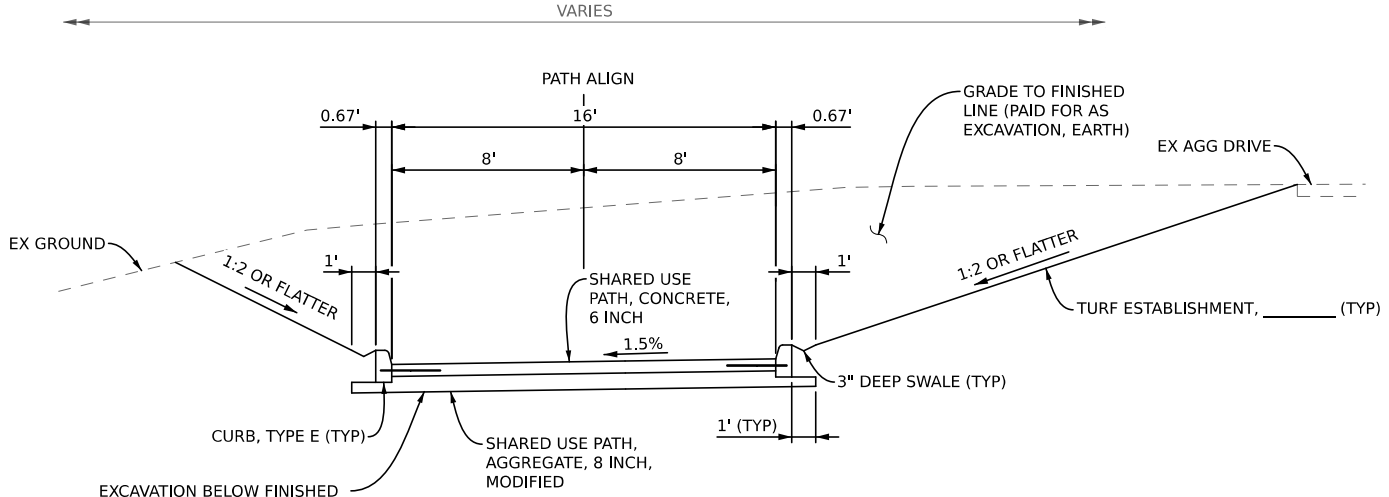
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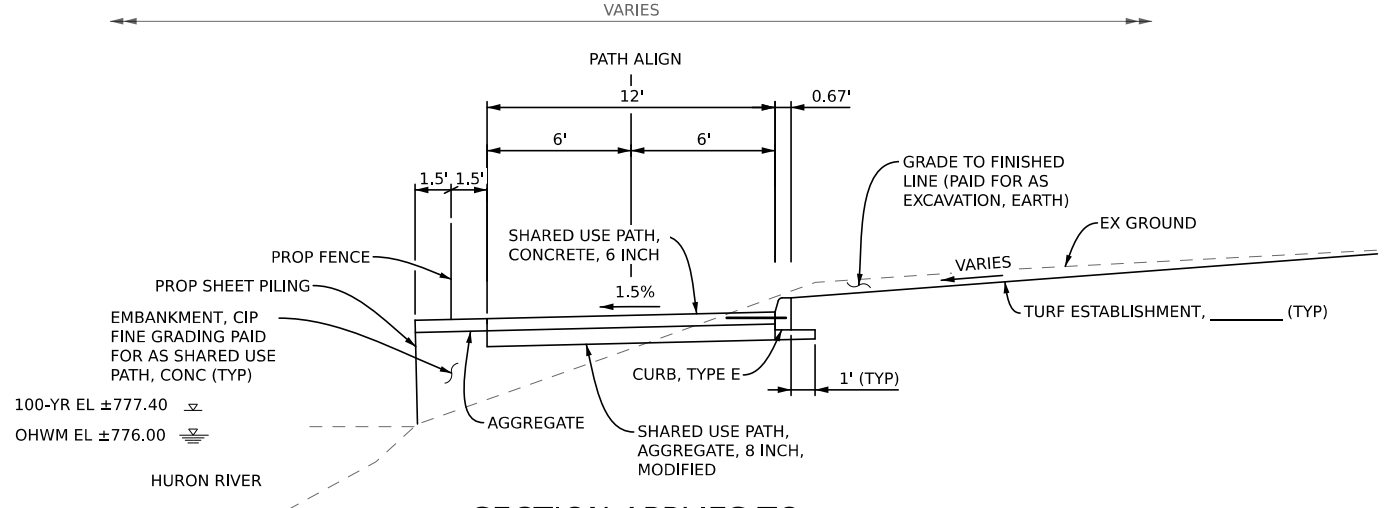
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STA 137+79 TO STA 140+18.33  
12' PATH CUT**



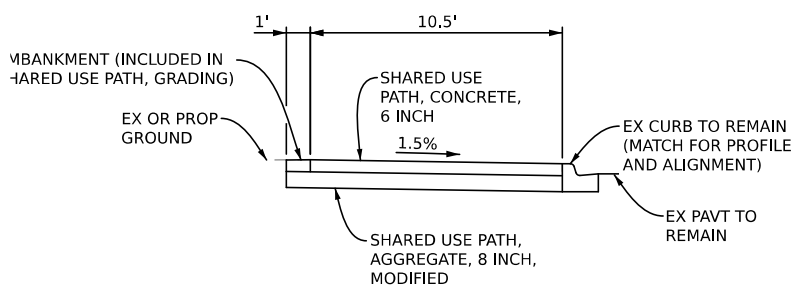
**SECTION APPLIES TO:  
STA 141+45 TO STA 141+97  
PATH WITH STEPPED WALL**



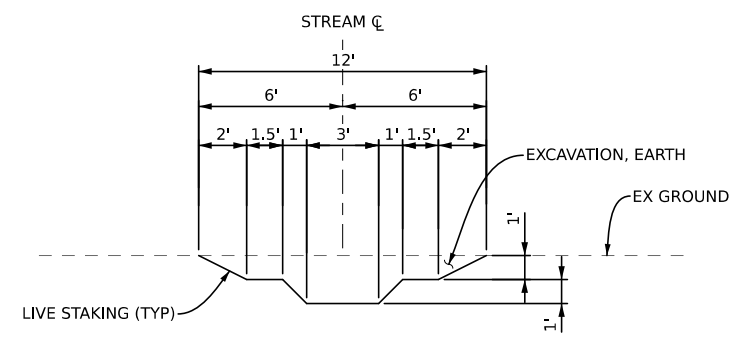
**SECTION APPLIES TO:  
STA 141+5.66 TO STA 141+45  
16' PATH CUT**



**SECTION APPLIES TO:  
STA 141+97 TO STA 142+99  
12' PATH WITH SHEET PILE**

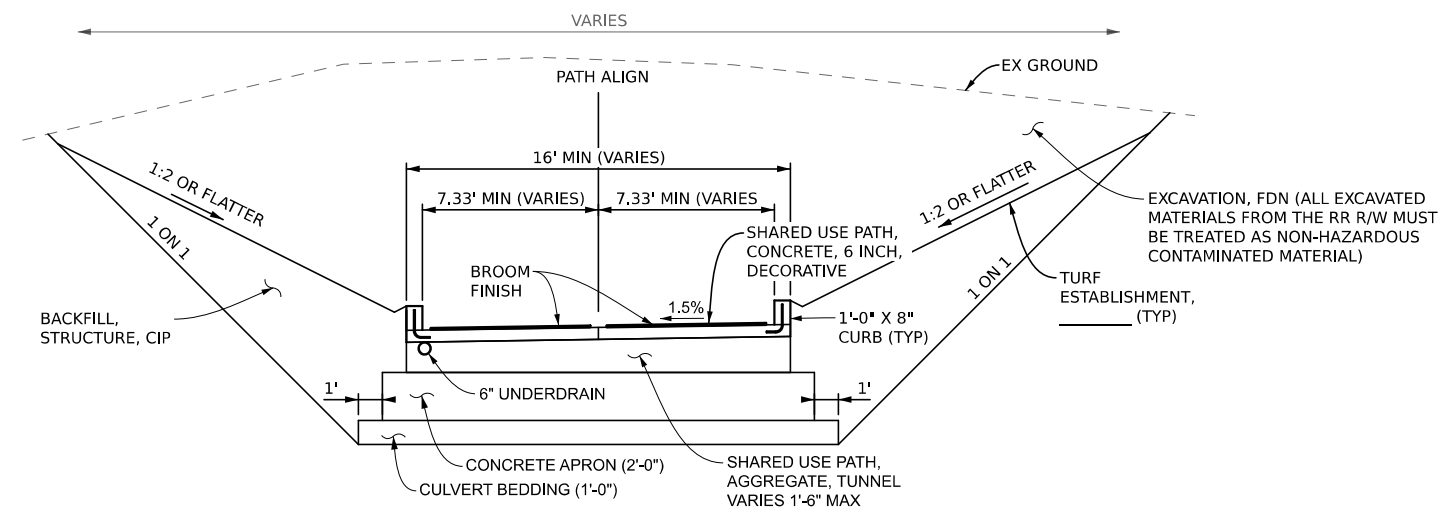


**SECTION APPLIES TO:  
RECONSTRUCTED B2B TRAIL  
ALONG BANDEMER PARK ROAD**

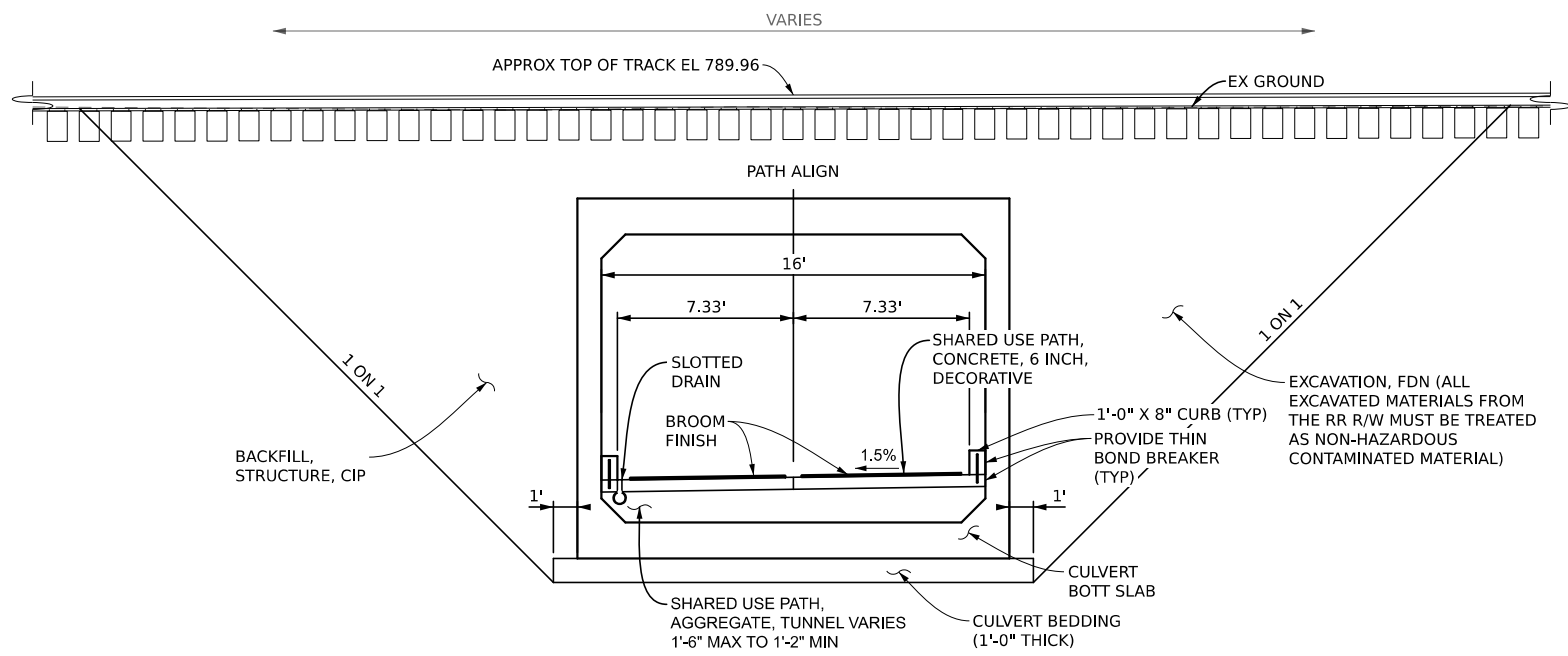


**SECTION APPLIES TO:  
STA 0+00 TO STA 2+70  
PROPOSED STREAM**

O:\WCP\1015514.00 WCP\PC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_sections\_001.dgn



**SECTION APPLIES TO:  
STA 140+18.33 TO STA 140+32 AND  
STA 140+92 TO STA 141+5.66  
CULVERT APRON SECTION**



**SECTION APPLIES TO:  
STA 140+32 TO STA 140+92  
CULVERT SECTION**

REVISIONS:

NO. 1

DATE

BY

SCALE

H. AS SHOWN

V. AS SHOWN

CITY/VILLAGE/TOWNSHIP

CITY OF ANN ARBOR

COUNTY

WASHTENAW

PROJ/MGR

JAH

ENG

JAH

PROJ/NUMBER

4172024

DATE



CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

SECTIONS



REVISIONS

DATE

BY

SCALE

CITY/TOWNSHIP

COUNTY

STATE

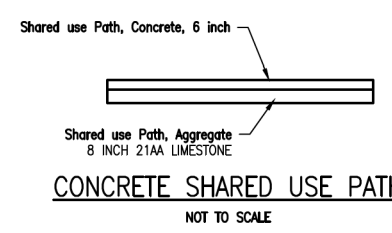
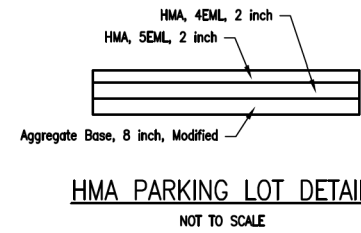
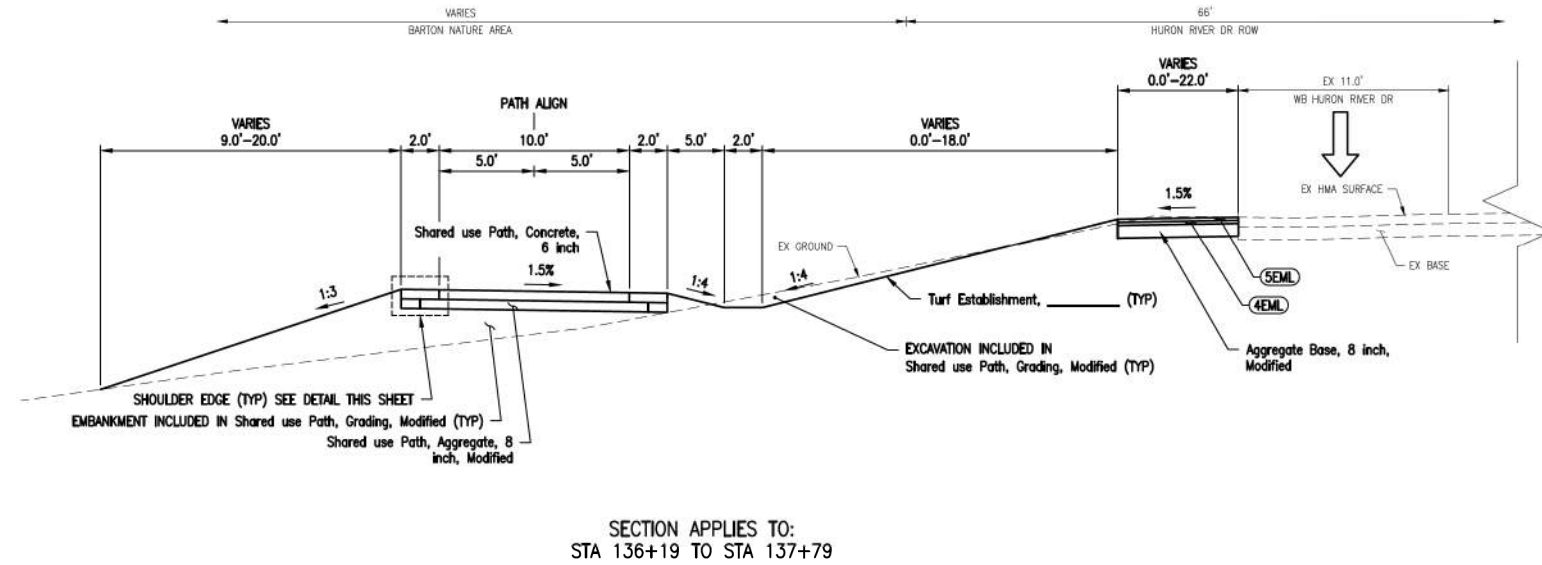
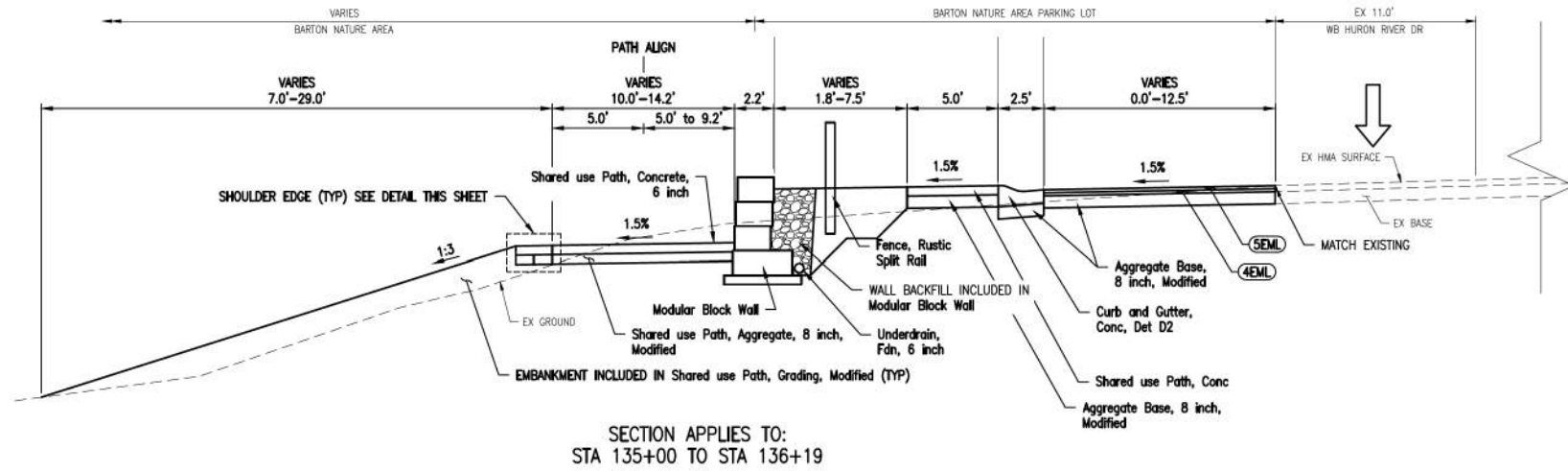
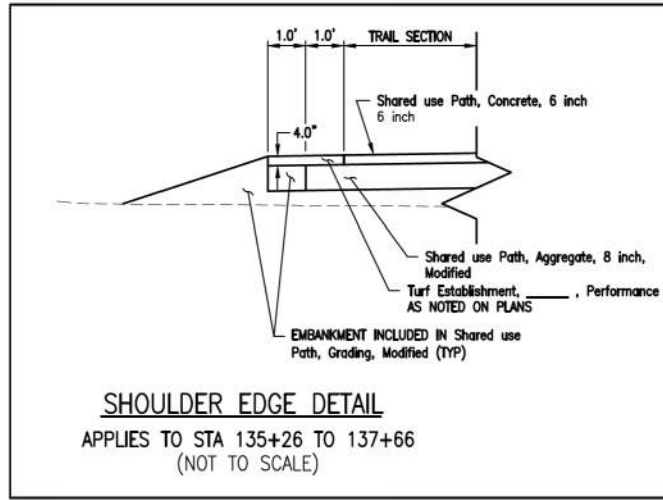
PROJECT

DATE

BY

SHEET

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 TYPICAL SECTIONS



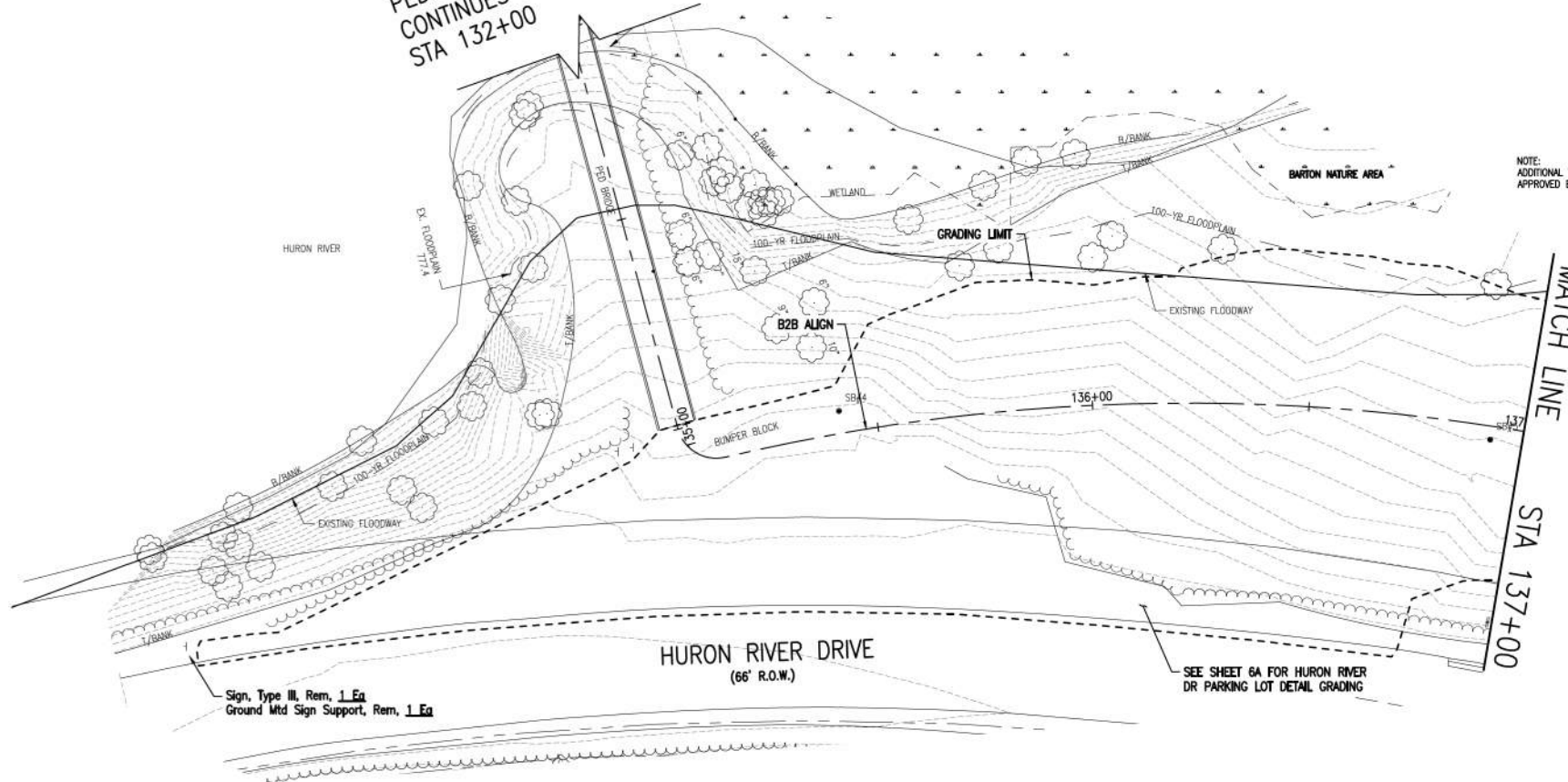
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SOIL BORING #4  
 N 293018.00  
 E 13290528.00 ELEV 787.86

PEDESTRIAN BRIDGE  
 CONTINUES TO MATCHLINE  
 STA 132+00

REMOVAL PLAN



NOTE:  
 ADDITIONAL TREE REMOVALS SHALL BE  
 APPROVED BY THE OWNER

QUANTITIES THIS SHEET

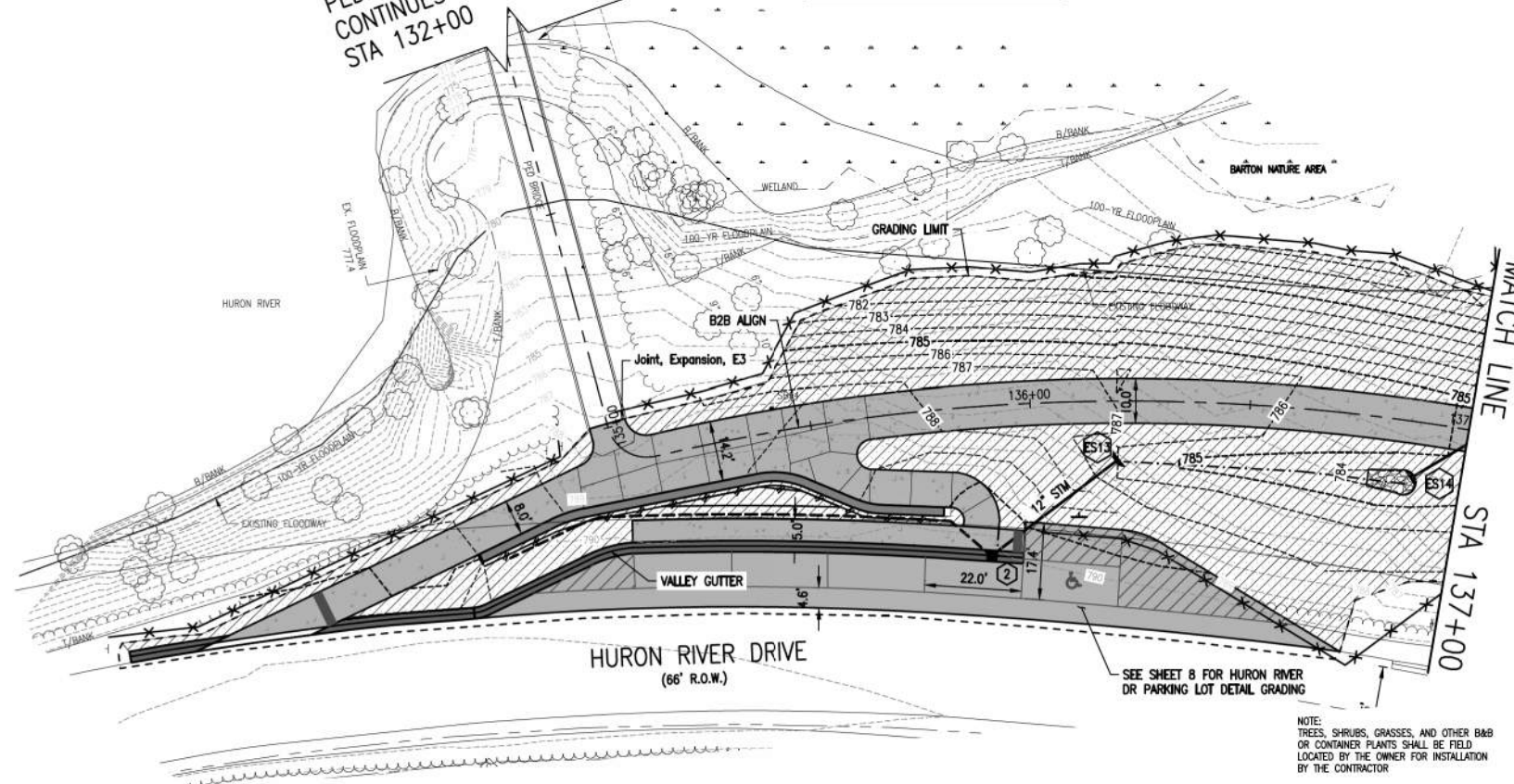
TOTAL	UNIT	DESCRIPTION
1	Ea	Sign, Type III, Rem
1	Ea	Ground Mtd Sign Support, Rem

LEGEND

- Tree, Rem, \_\_\_\_\_
- Erosion Control, Inlet Protection, Fabric Drop
- Erosion Control, Silt Fence
- TURF ESTABLISHMENT
- CONCRETE SHARED USE PATH  
SEE DETAIL SHEET 6

PEDESTRIAN BRIDGE  
 CONTINUES TO MATCHLINE  
 STA 132+00

RESTORATION PLAN



NOTE:  
 TREES, SHRUBS, GRASSES, AND OTHER B&B  
 OR CONTAINER PLANTS SHALL BE FIELD  
 LOCATED BY THE OWNER FOR INSTALLATION  
 BY THE CONTRACTOR

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
454	Ft	Erosion Control, Silt Fence
704	Syd	Turf Establishment, Native Seed Mix, Mesic Woodland Mix, Performance
284	Syd	Turf Establishment, Turf Grass, Performance



Know what's below.  
 Call before you dig.

**OHM**  
 ARCHITECTS ENGINEERS PLANNERS  
 34000 Plymouth Road  
 Livonia, MI 48150  
 P (734) 522-6711 | F (734) 522-6427  
 OHM-ADVISORS.COM

REVISIONS

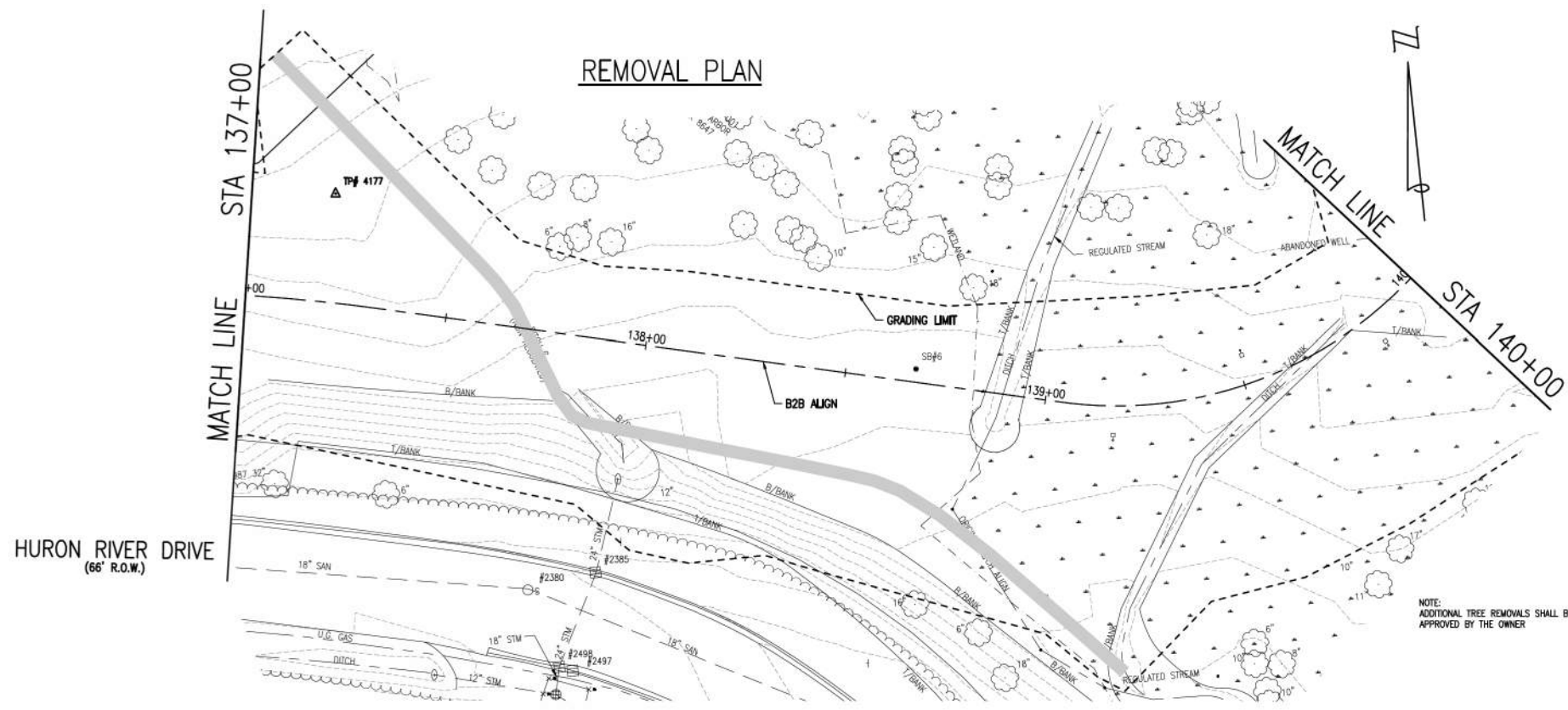
NO.	DATE	DESCRIPTION

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 GRADING AND RESTORATION PLAN  
 STA ##### TO STA #####

DRAWING PATH: P:\1000\_1999\1022180210\_Bandemer-Barton\_TrafficDrawings\CivilPlans\_Consult\180106000\_PRES\_03.dwg Apr 29, 2024 - 5:41pm



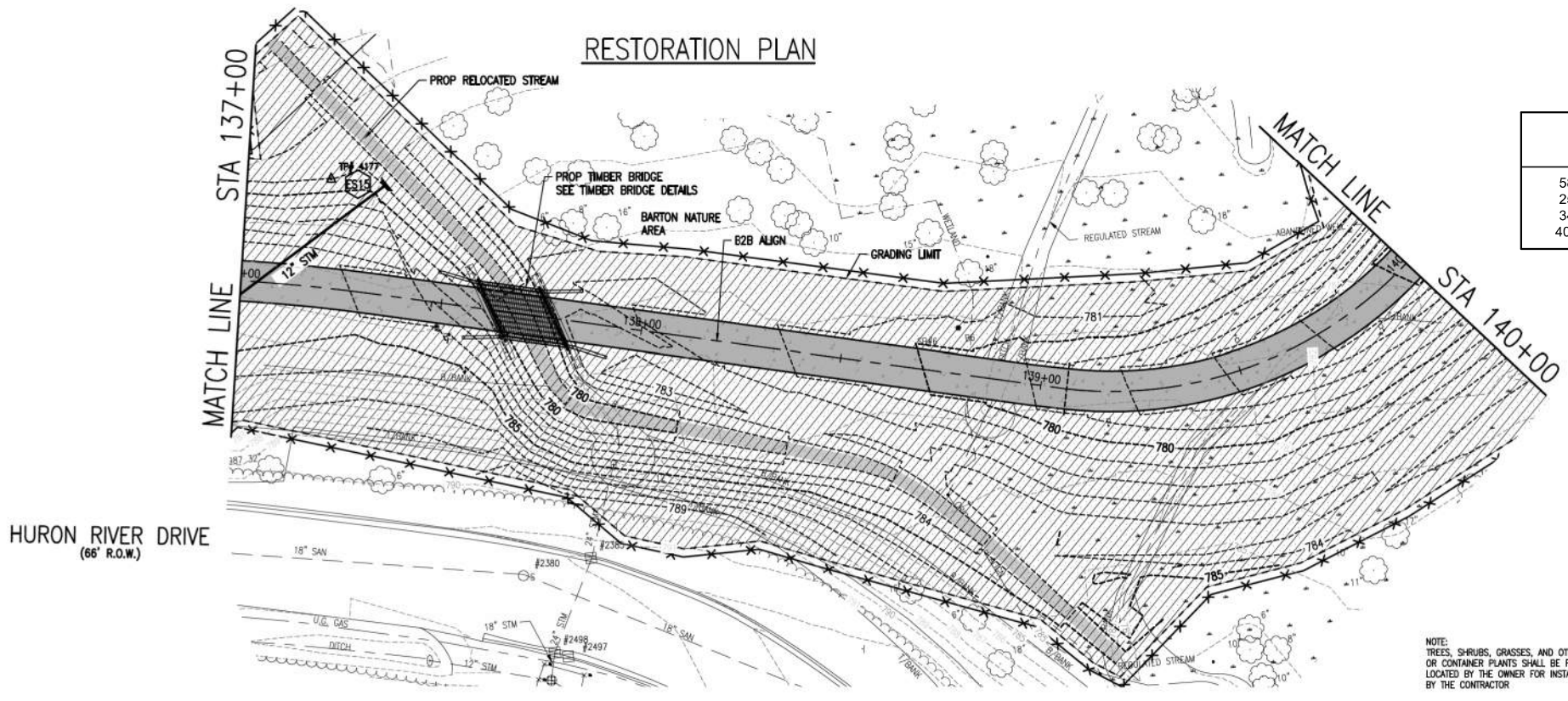
SOIL BORING #5  
 N 293009.00  
 E 13290678.00 ELEV 781.05  
 SOIL BORING #6  
 N 292975.00  
 E 13290849.00 ELEV 782.53



MISCELLANEOUS QUANTITIES		
1100	Cyd	Excavation, Earth

NOTE:  
 ADDITIONAL TREE REMOVALS SHALL BE  
 APPROVED BY THE OWNER

- LEGEND**
- Tree, Rem, \_\_\_\_\_
  - Erosion Control, Inlet Protection, Fabric Drop
  - Erosion Control, Silt Fence
  - TURF ESTABLISHMENT
  - CONCRETE SHARED USE PATH  
SEE DETAIL SHEET 6



MISCELLANEOUS QUANTITIES		
582	Ft	Erosion Control, Silt Fence
250	Syd	Live Staking
340	Syd	Turf Establishment, Turf Grass, Performance
4000	Syd	Turf Establishment, Native Seed Mix, Mesic Woodland Mix, Performance

NOTE:  
 TREES, SHRUBS, GRASSES, AND OTHER B&B  
 OR CONTAINER PLANTS SHALL BE FIELD  
 LOCATED BY THE OWNER FOR INSTALLATION  
 BY THE CONTRACTOR

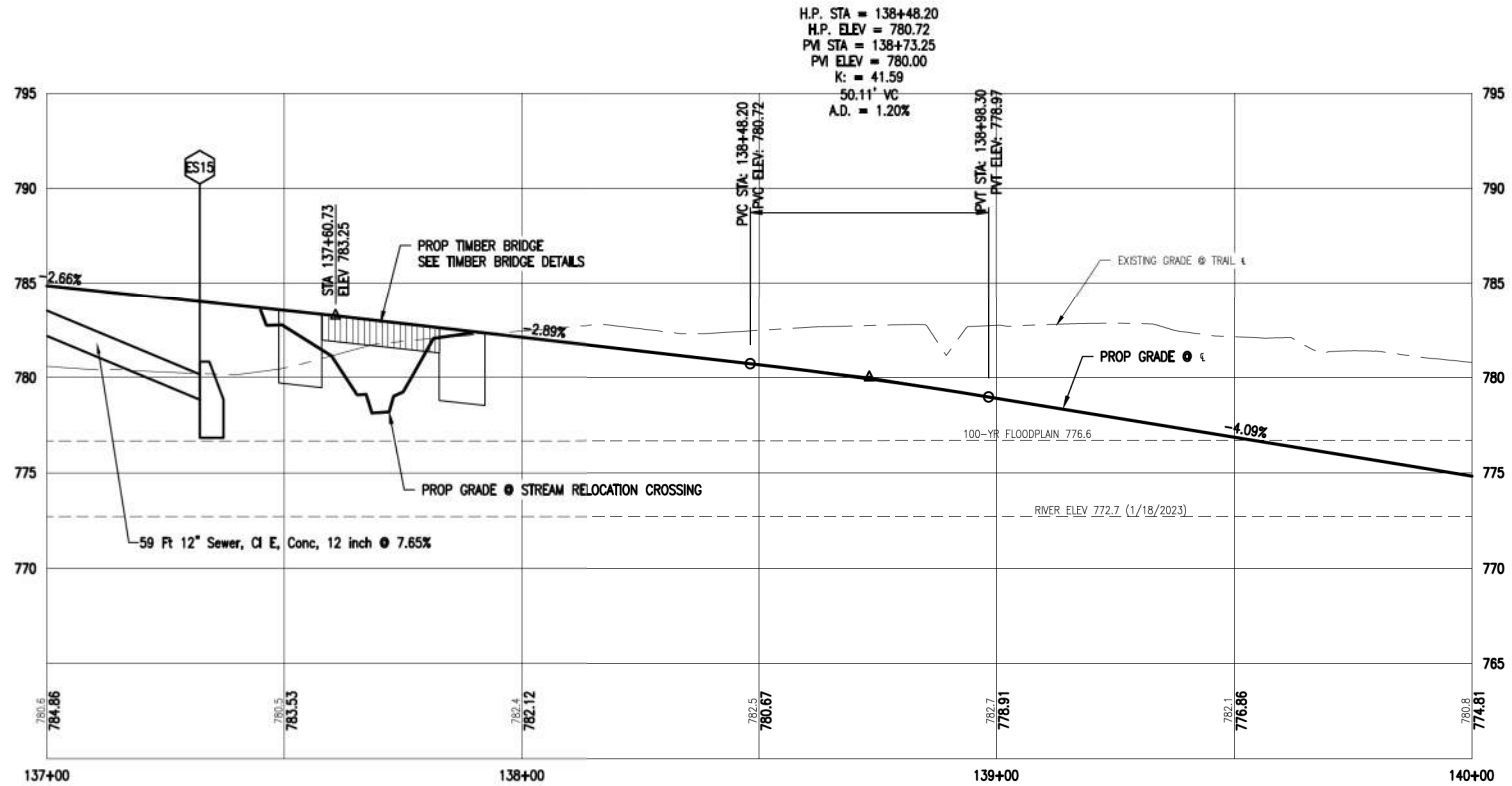
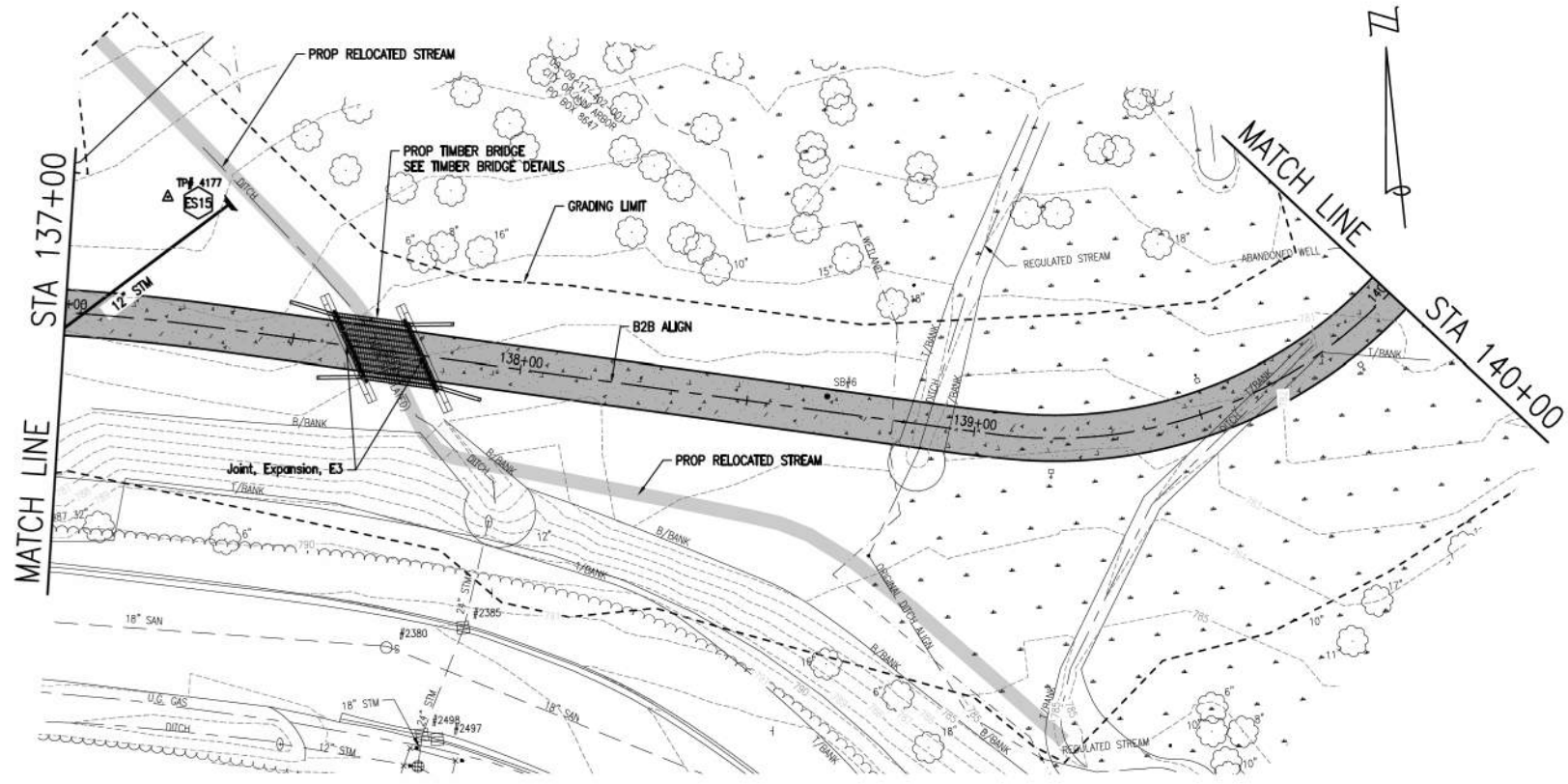
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SHEET NO. 15 OF 80  
 PROJECT: CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 GRADING AND RESTORATION PLAN  
 STA 137+00 TO STA 140+00  
 DATE: 10/20/23  
 PROJECT NUMBER: 1022-24-011  
 ENGINEER: MB  
 PROJECTIONS: CE  
 COUNTY: WASHTENAW  
 CITY: ANN ARBOR  
 SCALE: N. 1"=20'  
 METRIC DATUM: NAD83  
 HORIZONTAL METRIC DATUM: NAD83  
 VERTICAL METRIC DATUM: NAVD83  
 REVISIONS:



SOL BORING #5  
 N 293009.00  
 E 13290678.00 ELEV 781.05

SOL BORING #6  
 N 292975.00  
 E 13290849.00 ELEV 782.53



ES15 STA 137+32.16, -26.8' L  
 Curb End Section, Conc, 12 inch  
 12" INV SW 779.00

NOTE  
 SEE GENERAL PLAN OF STRUCTURE  
 SHEETS FOR DETAILS AND QUANTITIES  
 ASSOCIATED WITH STA 137+00 TO POE.

### MISCELLANEOUS QUANTITIES

30	Ft	Joint, Expansion, E3
430	Ft	Curb, Conc, Det E1
300	Ft	Shared use Path, Grading, Modified
467	Syd	Shared use Path, Aggregate, 8 inch, Modified
400	Syd	Shared use Path, Concrete, 6 inch

DRAWING PATH: P:\1000\_1999\1022180210\_Bandemer-Barton\_TrailDrawings\CityPlans\_Consult\18010003.dwg Apr 29, 2024 - 3:41 pm

REVISIONS

NO. 1

DATE

BY

SCALE

DATE

BY

SCALE

DATE

BY

SCALE

DATE

BY

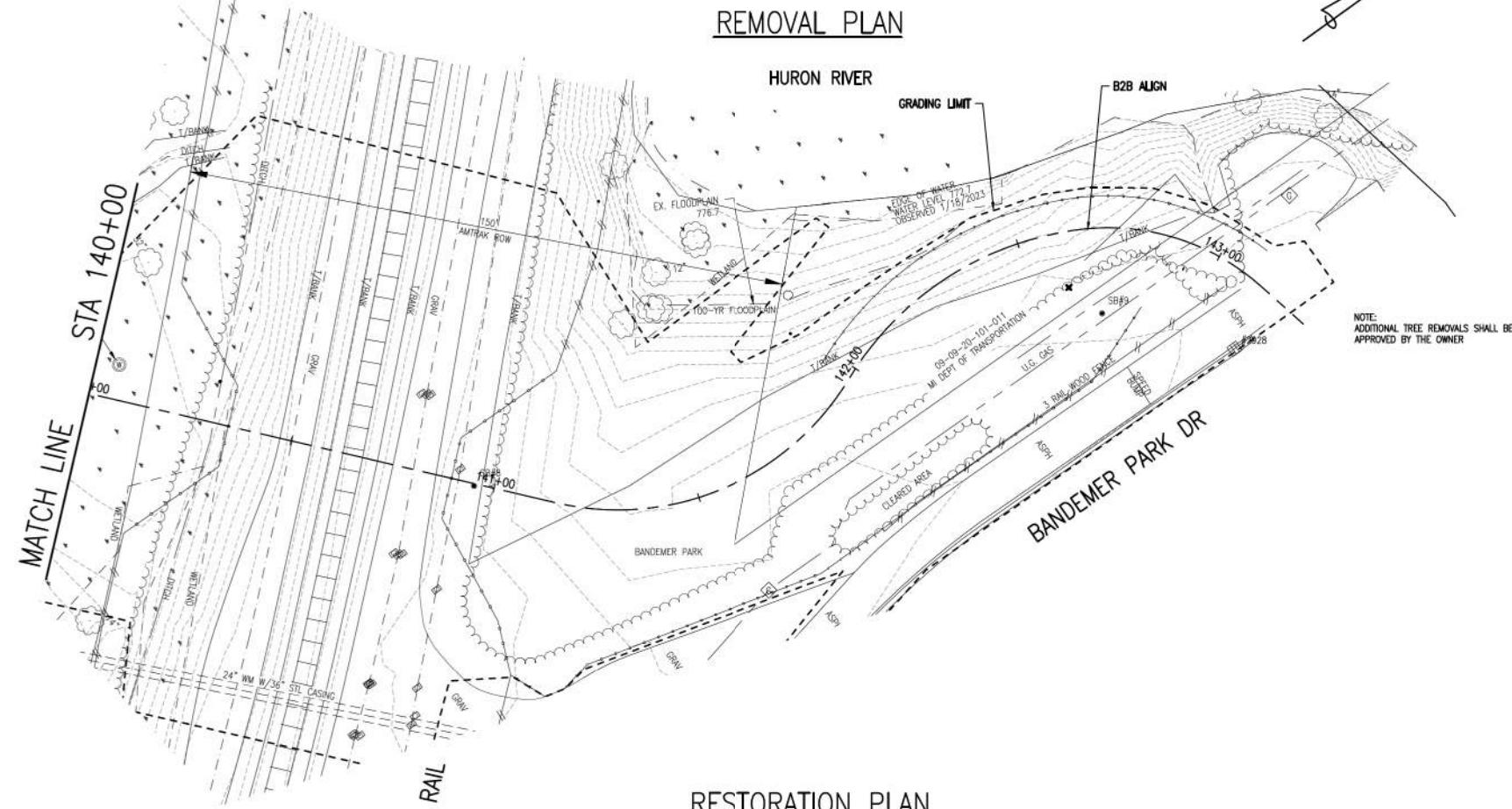
SCALE

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 CONSTRUCTION PLAN  
 STA 137+00 TO STA 140+00



Know what's below.  
 Call before you dig.

SOL BORING #8  
 N 293047.00  
 E 13291046.00 ELEV 787.46  
 SOL BORING #9  
 N 293194.00  
 E 13291101.00 ELEV 783.64

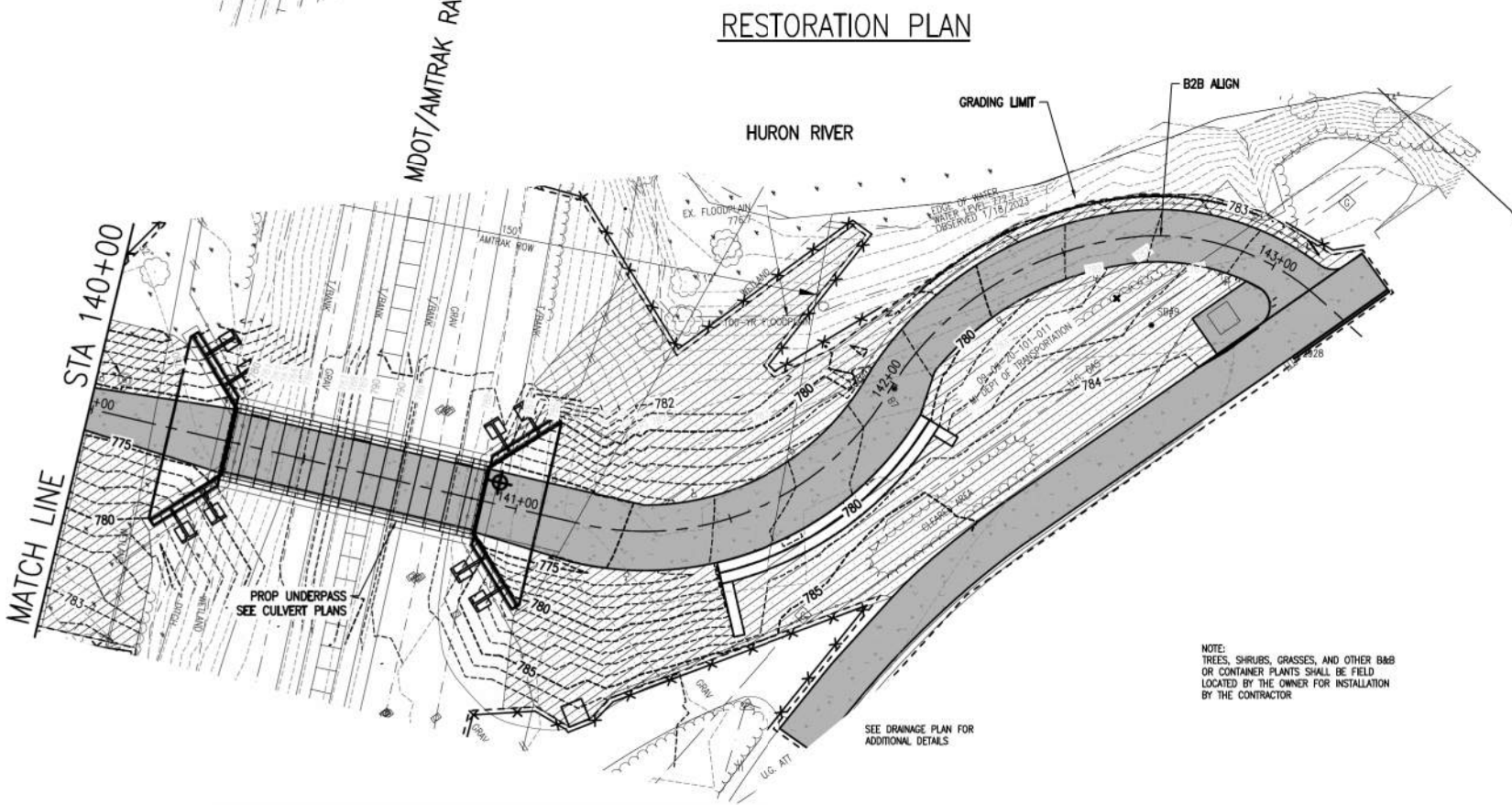


**MISCELLANEOUS QUANTITIES**

117	Ft	Fence, Rem
1260	Cyd	Excavation, Earth
215	Syd	HMA Surface, Rem *

\* BID ITEM "Hma Surface, Rem" INCLUDES PARTIAL CURB REMOVAL TO THE LIMITS SHOWN ON THE DETAILS. ADDITIONAL REMOVALS SHALL BE APPROVED BY OWNER.

- LEGEND**
- Tree, Rem, \_\_\_\_\_
  - Erosion Control, Inlet Protection, Fabric Drop
  - Erosion Control, Silt Fence
  - TURF ESTABLISHMENT
  - CONCRETE SHARED USE PATH  
SEE DETAIL SHEET 6



**MISCELLANEOUS QUANTITIES**

703	Ft	Erosion Control, Silt Fence
110	Syd	Turf Establishment, Turf Grass, Performance
1700	Syd	Turf Establishment, Native Seed Mix, Mesic Woodland Mix, Performance

NOTE:  
 TREES, SHRUBS, GRASSES, AND OTHER B&B OR CONTAINER PLANTS SHALL BE FIELD LOCATED BY THE OWNER FOR INSTALLATION BY THE CONTRACTOR



Know what's below.  
 Call before you dig.

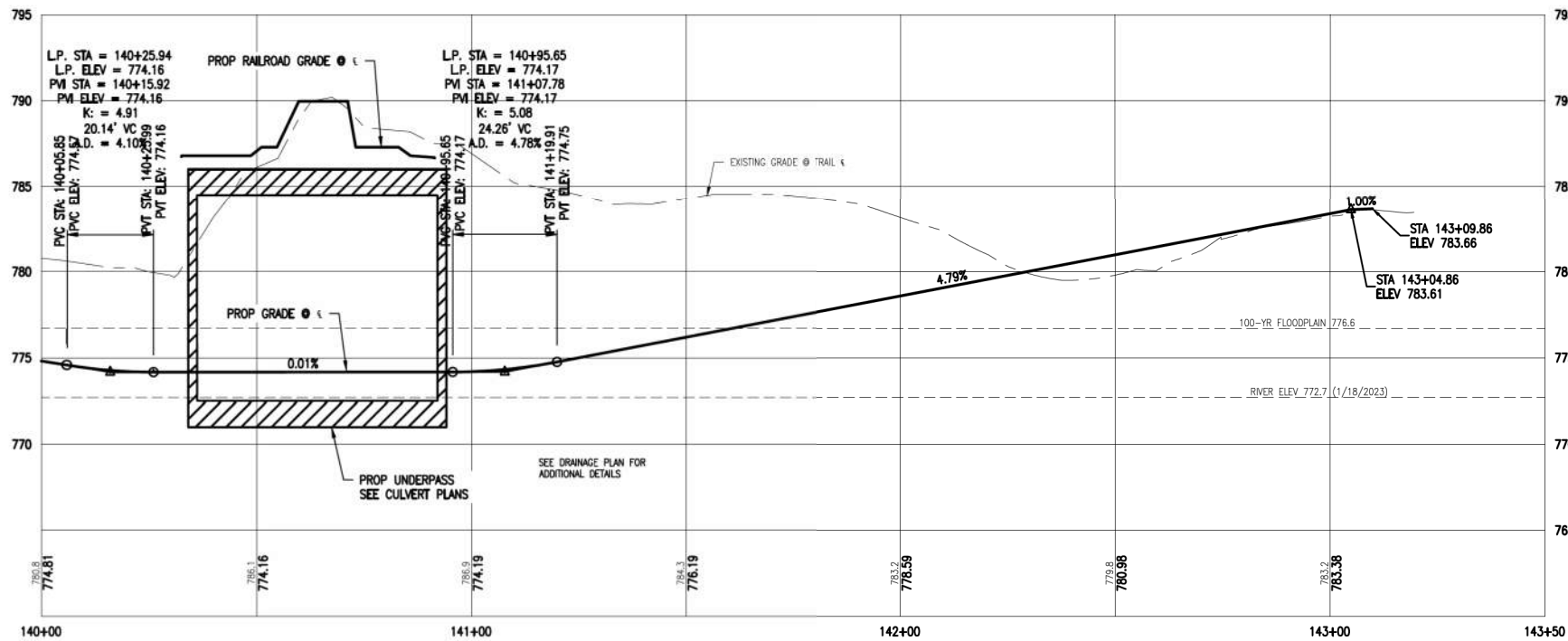
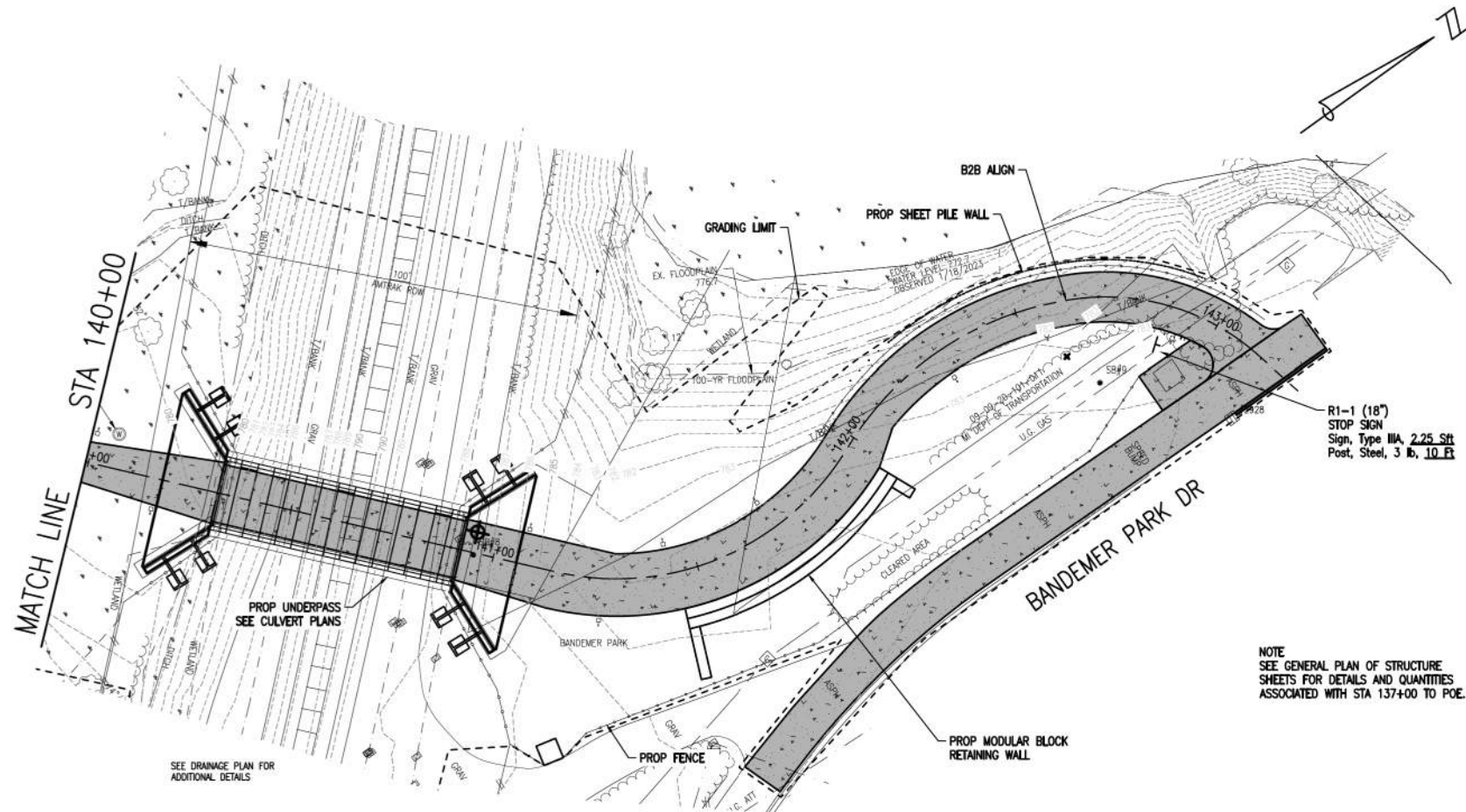
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DATE: 02/12/2024 PROJECT: 1022180210 MDOT/AMTRAK RAIL CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR COUNTY: WASHTENAW STATE: MI SCALE: N 1"=20' SHEET: 17 OF 80

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 GRADING AND RESTORATION PLAN  
 STA 140+00 TO POE

SOL BORING #8  
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 E 13291046.00 ELEV 787.46

SOL BORING #9  
 N 293194.00  
 E 13291101.00 ELEV 783.64



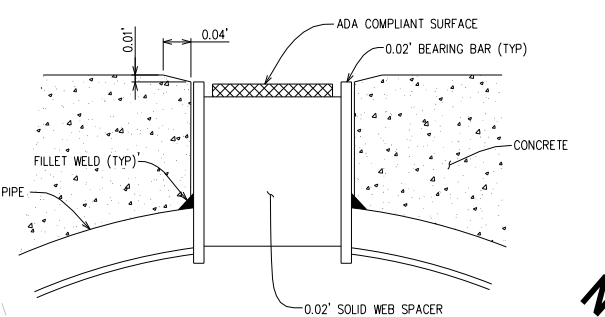
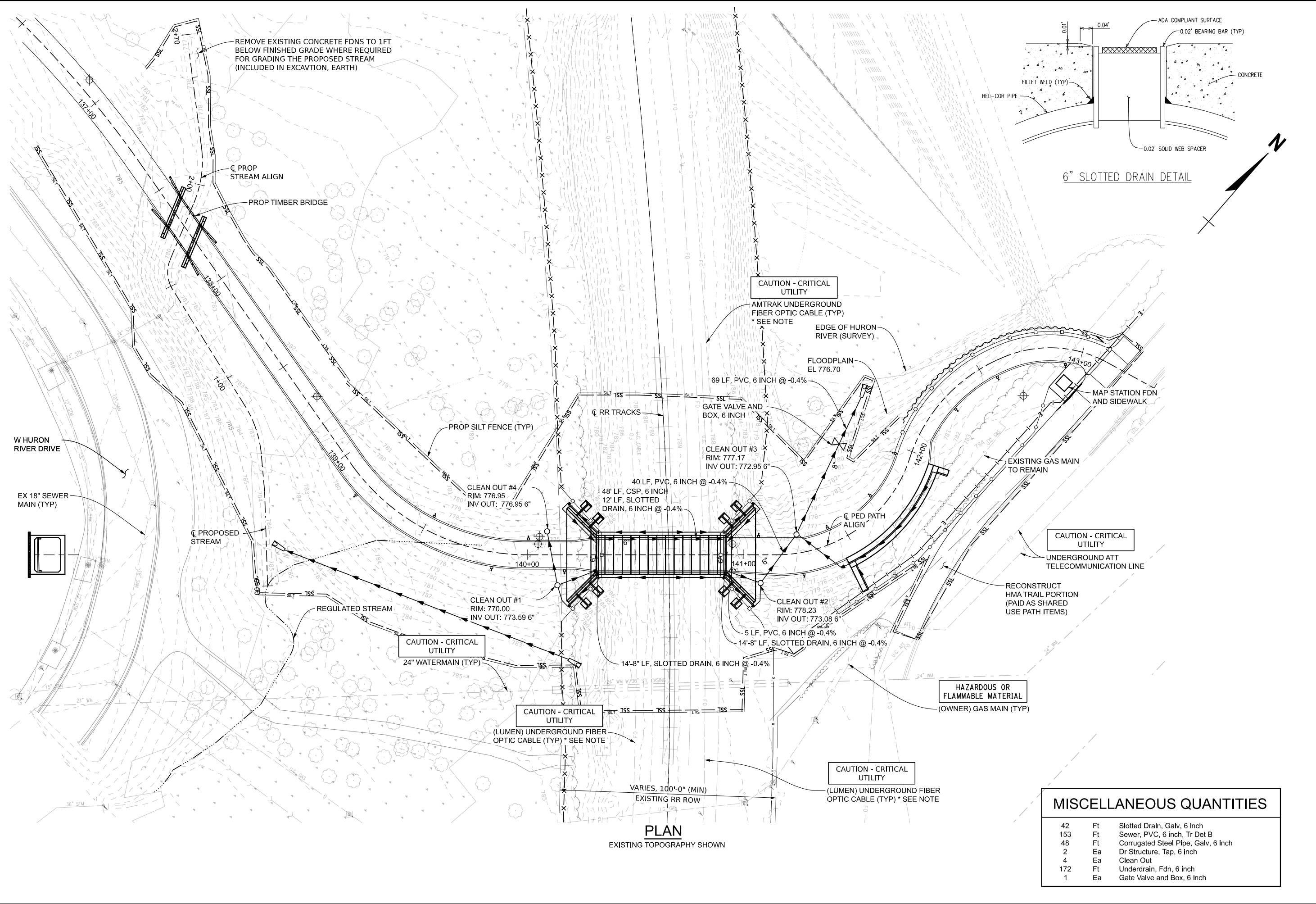
305	Ft	Curb, Conc, Det E1
394	Ft	Shared use Path, Grading, Modified
698	Syd	Shared use Path, Aggregate, 6 inch, Modified
542	Syd	Shared use Path, Concrete, 6 inch
148	Syd	Shared use Path, Concrete, 6 inch, Decorative
66	Cyd	Shared use Path, Aggregate, Tunnel



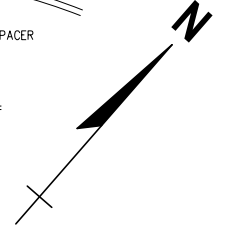
Know what's below.  
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6" SLOTTED DRAIN DETAIL



**PLAN**

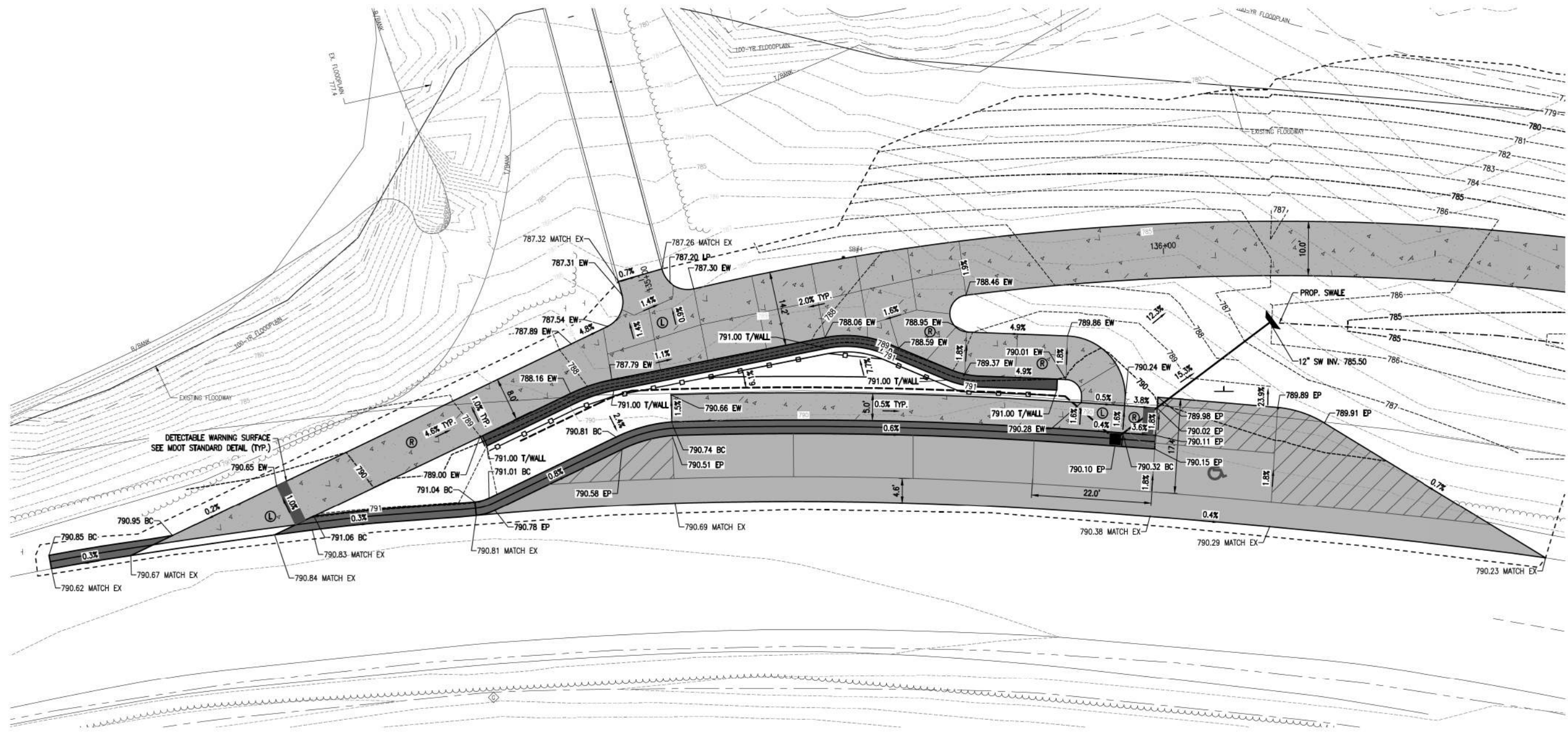
EXISTING TOPOGRAPHY SHOWN

**MISCELLANEOUS QUANTITIES**

42	Ft	Slotted Drain, Galv, 6 inch
153	Ft	Sewer, PVC, 6 inch, Tr Det B
48	Ft	Corrugated Steel Pipe, Galv, 6 inch
2	Ea	Dr Structure, Tap, 6 inch
4	Ea	Clean Out
172	Ft	Underdrain, Fdn, 6 inch
1	Ea	Gate Valve and Box, 6 inch



# HURON RIVER DR PARKING LOT



**LEGEND**

TC	TOP OF CURB
EP	EDGE OF PAVEMENT
ES	EDGE OF SHOULDER
G	GUTTER
EW	EDGE OF WALK
T/CAST	TOP OF CAST
HP/LP	HIGH POINT/LOW POINT
FL	FLOW LINE
Ⓡ	RAMP
Ⓛ	LEVEL LANDING



Know what's below.  
Call before you dig.

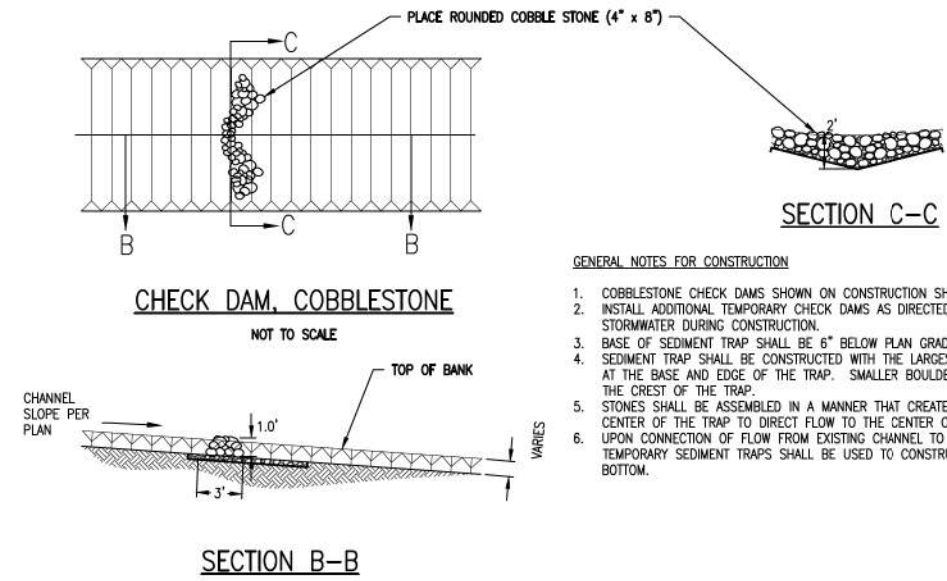
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTONBANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 DETAILED GRADING PLAN

DRAWING PATH: P:\1000\_1999\102180\10\_Bandemer-Barton\_TrailDrawings\Civil\Grading\80010GRD.dwg, May 01, 2024 - 2:27pm

DRAWING PATH: P:\1000\_1999\1022160010\_Bandana-Benton\_Trail\Drawings\Civil\Details\180010DET.dwg May 01, 2024 - 2:21pm

STORM END SECTION SCHEDULE			
END SECTION NAME	END SECTION DETAILS	STATION	OFFSET
ES13 Culv End Section, Conc, 12 inch	12" SW INV = 785.50	136+19.47	13.60' R
ES14 Culv End Section, Conc, 12 inch	12" NE INV = 783.50	136+88.95	12.44' R
ES15 Culv End Section, Conc, 12 inch	12" SW INV = 779.00	137+32.16	-26.79' L

STORM STRUCTURE SCHEDULE			
STRUCTURE NAME	STRUCTURE DETAILS	STATION	OFFSET
2 Dr Structure, 48 inch dia	RIM = 790.00 COVER = TYPE K 2' SUMP BOT = 784.50 6" NW INV = 788.00 12" NE INV = 786.50	135+88.77	33.99' R



GENERAL NOTES FOR CONSTRUCTION

1. COBBLESTONE CHECK DAMS SHOWN ON CONSTRUCTION SHEETS ARE PERMANENT.
2. INSTALL ADDITIONAL TEMPORARY CHECK DAMS AS DIRECTED BY ENGINEER TO MANAGE STORMWATER DURING CONSTRUCTION.
3. BASE OF SEDIMENT TRAP SHALL BE 6" BELOW PLAN GRADE.
4. SEDIMENT TRAP SHALL BE CONSTRUCTED WITH THE LARGEST BOULDERS BEING PLACED AT THE BASE AND EDGE OF THE TRAP. SMALLER BOULDERS SHALL BE USED NEAR THE CREST OF THE TRAP.
5. STONES SHALL BE ASSEMBLED IN A MANNER THAT CREATES A LOW POINT AT THE CENTER OF THE TRAP TO DIRECT FLOW TO THE CENTER OF CHANNEL.
6. UPON CONNECTION OF FLOW FROM EXISTING CHANNEL TO PROPOSED CHANNEL, TEMPORARY SEDIMENT TRAPS SHALL BE USED TO CONSTRUCT THE PROPOSED CHANNEL BOTTOM.

REVISIONS

NO. 1

NO. 2

NO. 3

NO. 4

NO. 5

NO. 6

NO. 7

NO. 8

NO. 9

NO. 10

NO. 11

NO. 12

NO. 13

NO. 14

NO. 15

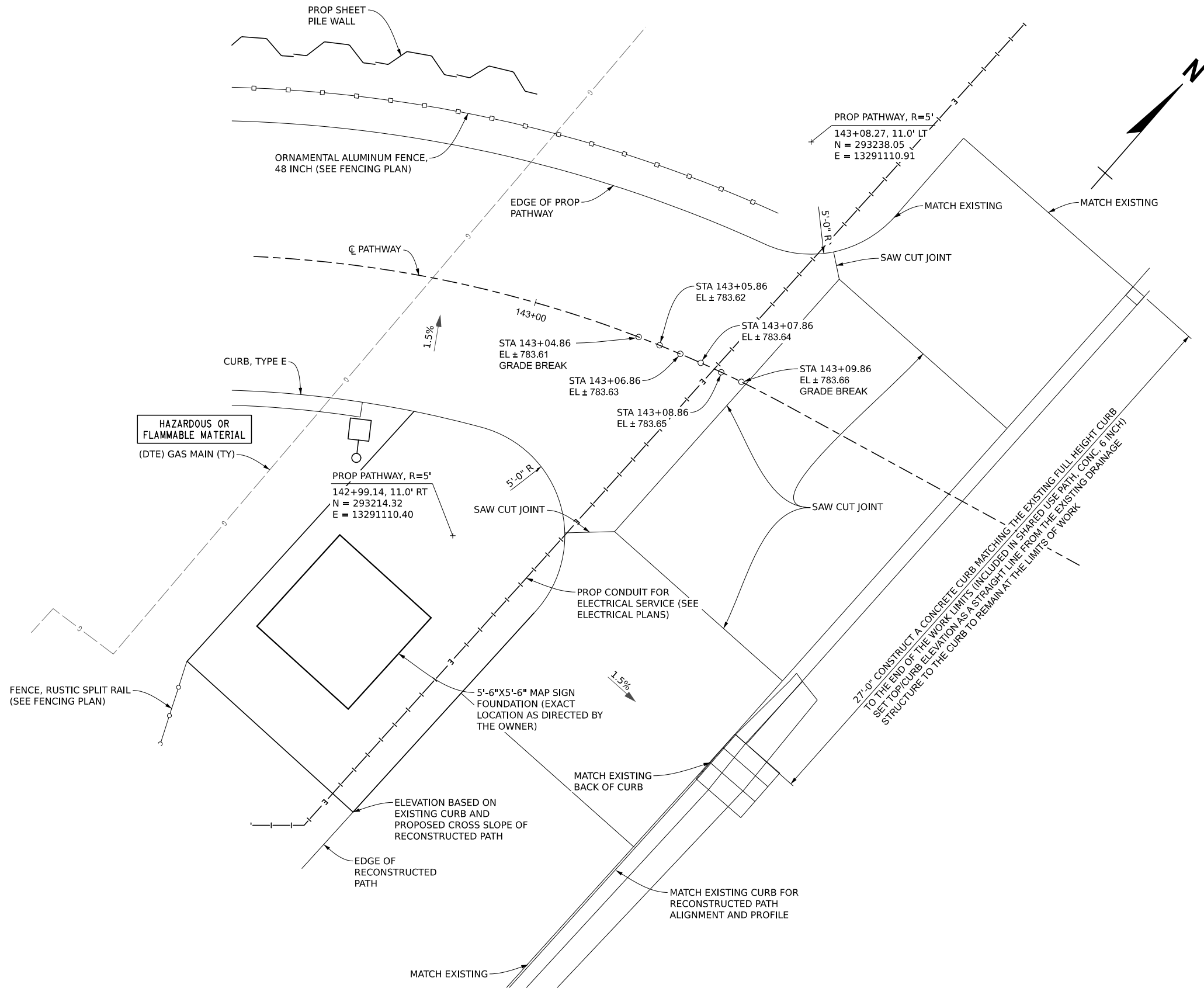
DATE PROJECT NUMBER ENG PROJECT NO. COUNTY CITY/TOWNSHIP CITY OF ANN ARBOR SCALE H 1"=1' V: CITY OF ANN ARBOR & WASHTENAW COUNTY PRC BARTON NATURE AREA BORDER TO BORDER TRAIL MISCELLANEOUS DETAILS

SHEET

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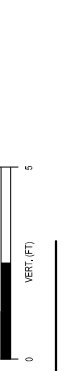
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REVISIONS:

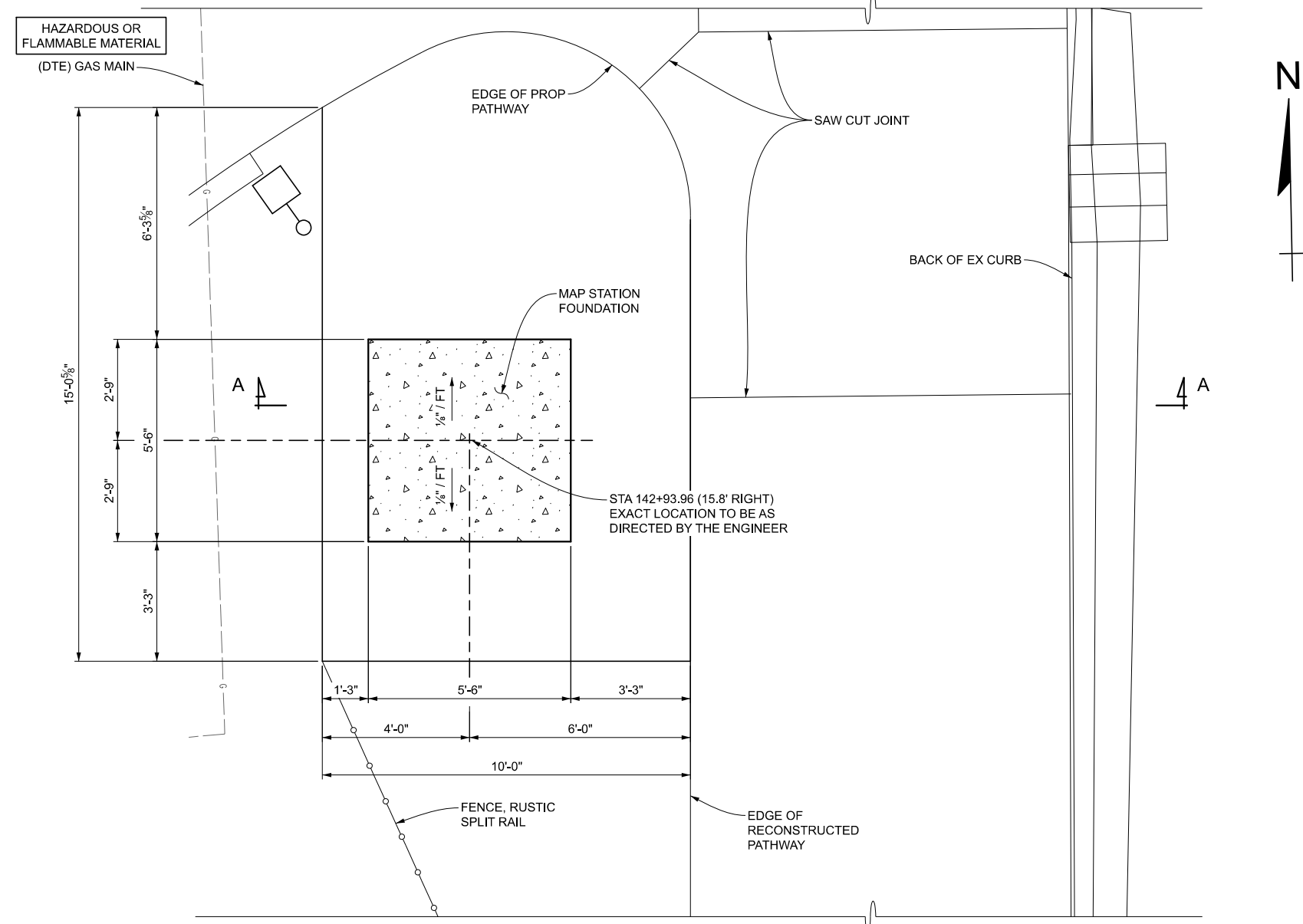
DATE: 4/12/2024  
PROJ NUMBER: 015514.00  
ENG: JAH  
PROJIMER: JAH  
CADD: JAH  
COUNTY: WASHTENAW  
CITY/TOWNSHIP: CITY OF ANN ARBOR

SCALE: H: 1"=5' V: 1"=5'

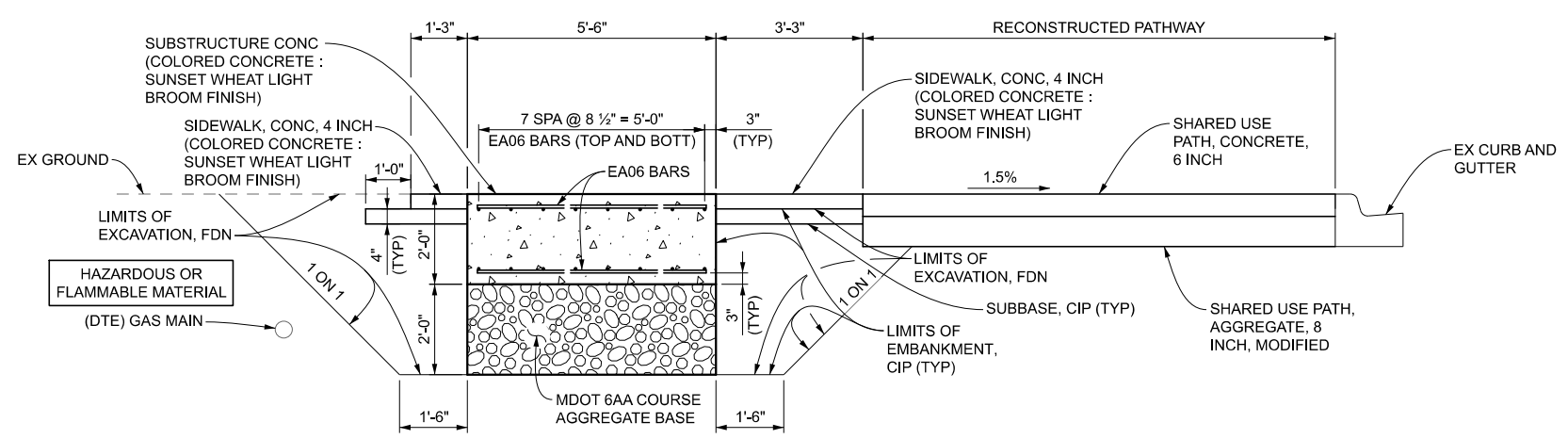


CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

PATH DETAILS



**MAP STATION FOUNDATION PLAN**



**SECTION A-A**

MISCELLANEOUS QUANTITIES		
20	Cyd	Embankment, CIP
30	Cyd	Excavation, Fdn
8	Cyd	Aggregate, 6A
2	Cyd	Subbase, CIP
240	Lb	Reinforcement, Steel, Epoxy Coated
3	Cyd	Substructure Conc, High Performance
132	Sft	Sidewalk, Conc, 4 inch

REVISIONS: \_\_\_\_\_

HORIZ. DATUM: NAVD83

VERT. DATUM: NAVD83

SCALE: H: 1" = 4' V: 1" = 4'

CITY/VILLAGE/TOWNSHIP: WASHTENAW

CITY OF ANN ARBOR

COUNTY: WASHTENAW

PROJ. NO.: JAH

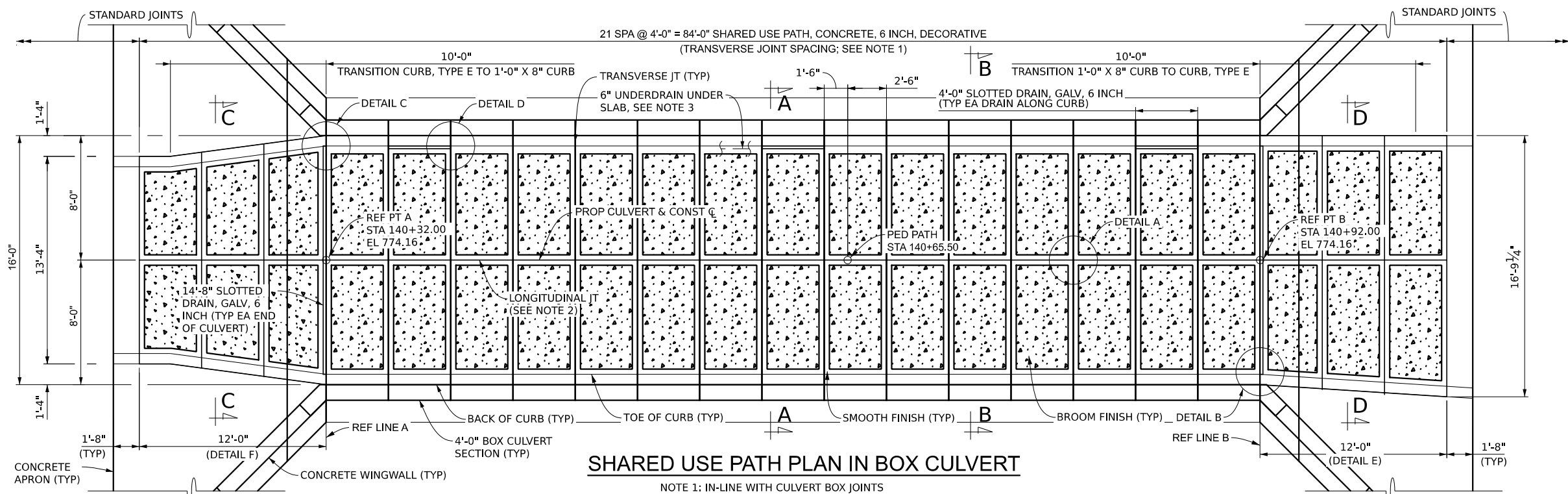
PROJ. NAME: JAH

DATE: 4/12/2024

PROJECT: CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

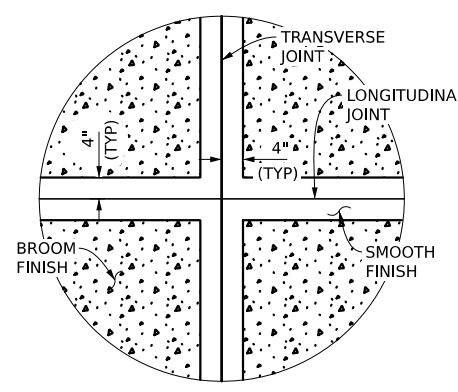
PATH DETAILS

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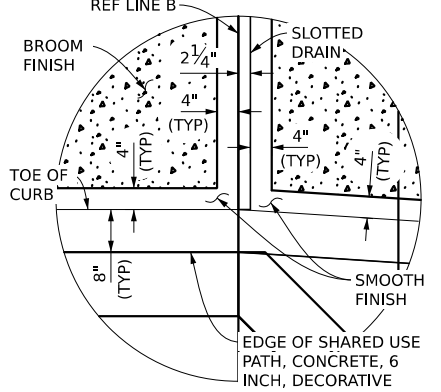


**SHARED USE PATH PLAN IN BOX CULVERT**

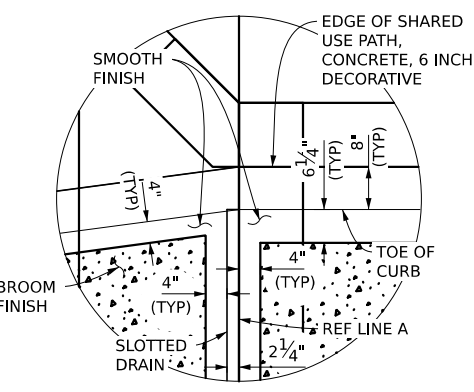
NOTE 1: IN-LINE WITH CULVERT BOX JOINTS  
NOTE 2: IN-LINE WITH PROP CULVERT & CONST C  
NOTE 3: UNDERDRAIN RUNNING BETWEEN SLOTTED DRAIN INCLUDED IN PAY ITEM "Corrugated Steel Pipe, Galv, 6 inch", SEE drain\_001.dgn FOR PAY LIMITS AND QUANTITY.



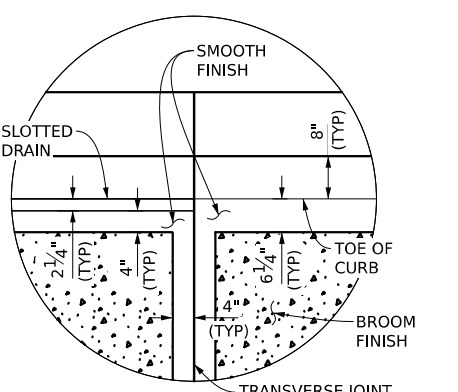
**DETAIL A**



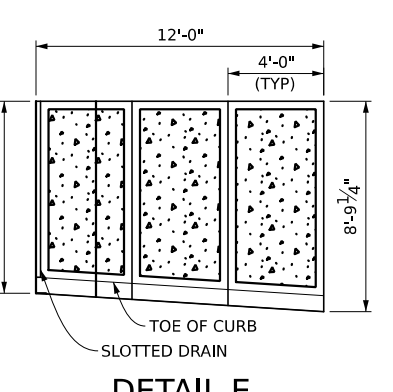
**DETAIL B**



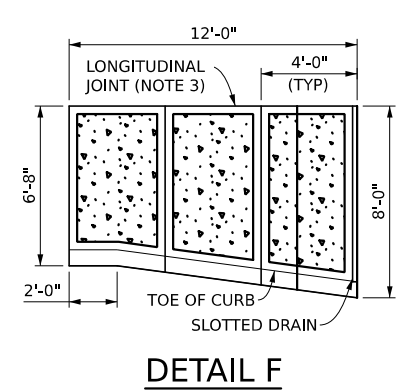
**DETAIL C**



**DETAIL D**

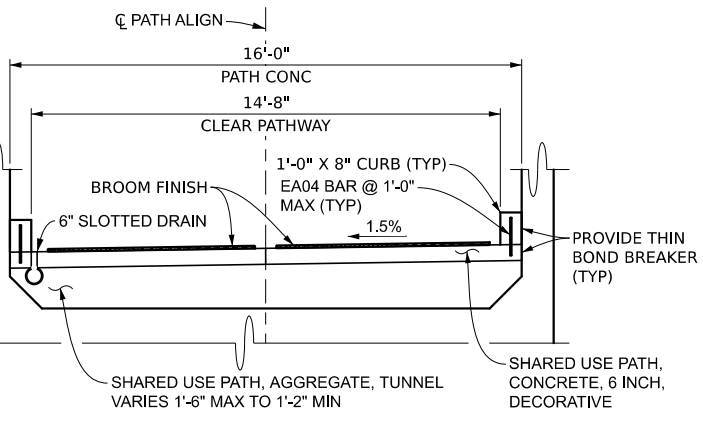


**DETAIL E**



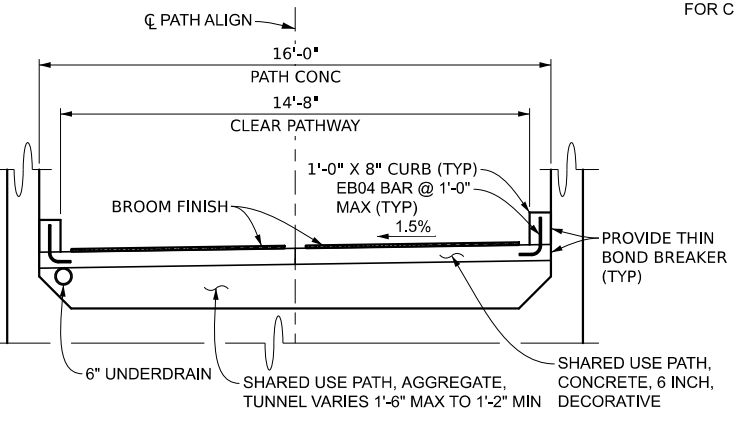
**DETAIL F**

NOTE 3: DIMENSIONS SYMMETRICAL ABOUT LONGITUDINAL JOINT



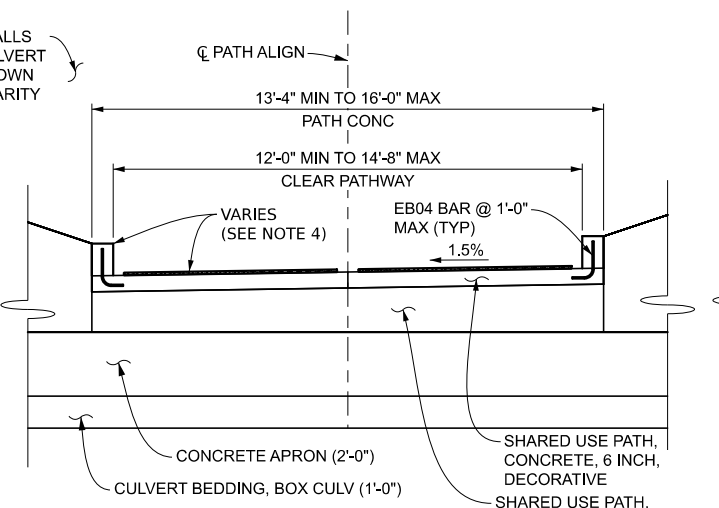
**SECTION A-A**

TYPICAL PATH SECTION INSIDE CULVERT WITH SLOTTED DRAIN



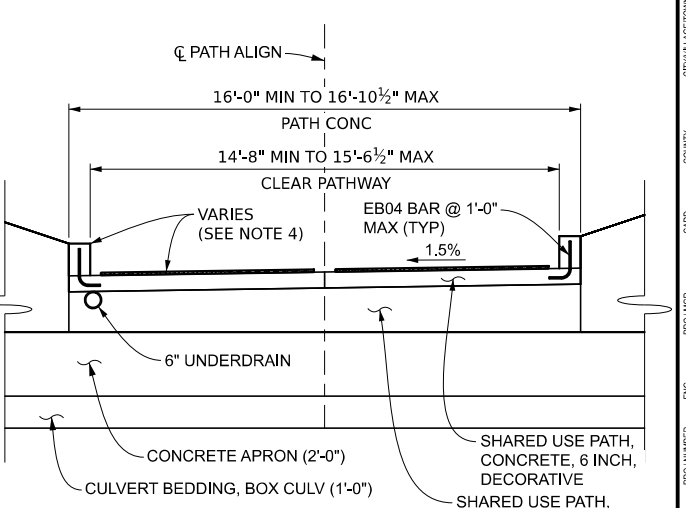
**SECTION B-B**

TYPICAL PATH SECTION INSIDE CULVERT WITHOUT SLOTTED DRAIN



**SECTION C-C**

TYPICAL PATH SECTION ON APRON  
NOTE 4: SEE LIMITS IN SHARED USE PATH PLAN



**SECTION D-D**

TYPICAL PATH SECTION ON APRON

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REVISIONS: CITY/VILLAGE/TOWNSHIP: WASHINGTON COUNTY: ANN ARBOR DATE: 4/17/2024

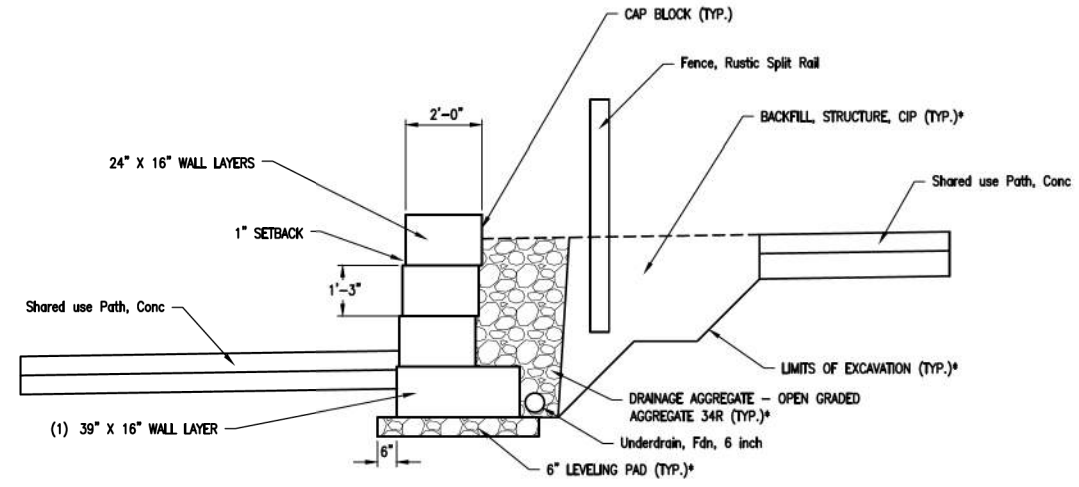
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
PATH DETAILS



ARCHITECTS ENGINEERS PLANNERS

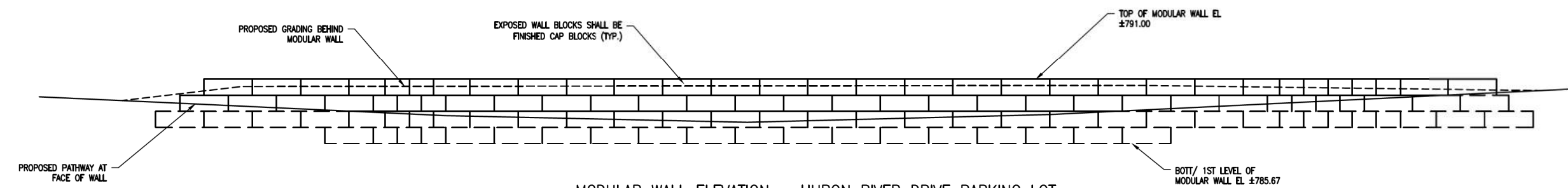
34000 Plymouth Road  
Livonia, MI 48150  
P (734) 522-6711 | F (734) 522-6427

OHM-ADVISORS.COM



**MODULAR WALL SECTION – HURON RIVER DRIVE PARKING LOT**

\*COST INCLUDED IN THE PAY ITEM "MODULAR BLOCK WALL"  
(NOT TO SCALE)



**MODULAR WALL ELEVATION – HURON RIVER DRIVE PARKING LOT**

(NOT TO SCALE)

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
111	Ft	Modular Block Wall, Cap
535	Sft	Modular Block Wall

DRAWING PATH: P:\1000\_1999\1022180210\_Bandemer-Benton\_TrailDrawings\CivilTypical\180210TYP.dwg Apr 12, 2024 - 9:21am

REVISIONS

NO. 1

DATE

BY

SCALE

NO. 1

DATE

BY

SCALE

NO. 1

DATE

BY

SCALE

NO. 1

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 MODULAR WALL DETAILS - HURON RIVER DRIVE PARKING LOT

SHEET

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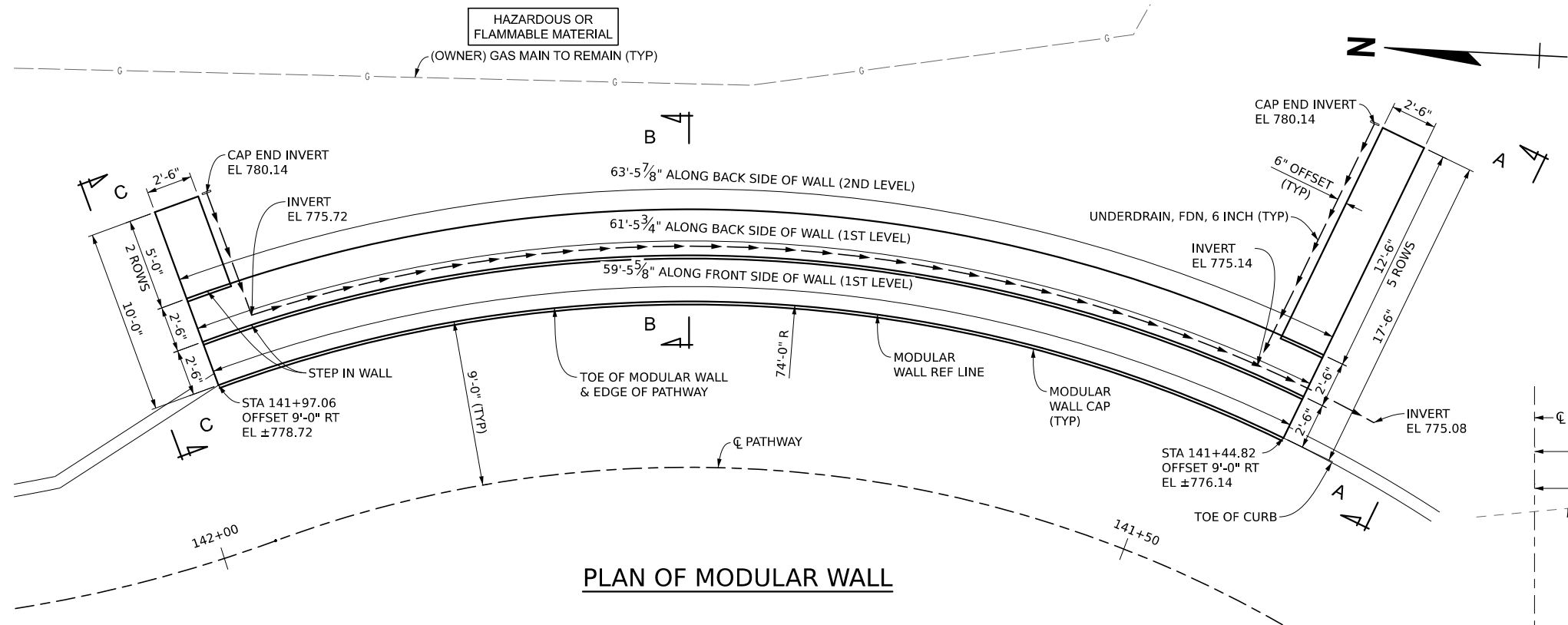
**TEXTURING NOTES:**

BLOCK TEXTURE TO MATCH 'NORTHSHORE GRANITE' AS SUPPLIED BY REDI-ROCK. FINISH COLOR TO BE SELECTED BY OWNER AND WILL BE OF A WATERBORNE TYPE. SUBMIT SAMPLES OF EACH BLOCK UNIT FOR APPROVAL. COST IS INCLUDED IN "MODULAR BLOCK WALL" BID ITEMS.

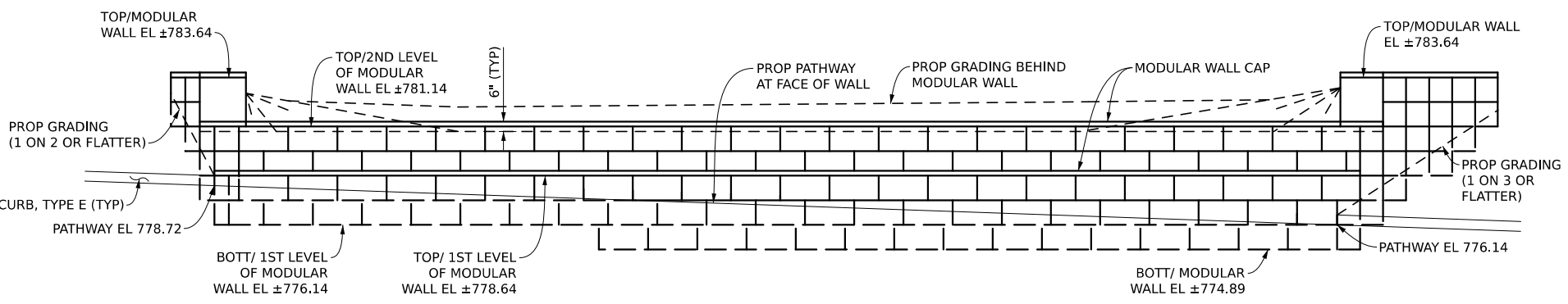
PROVIDE A 1/2 INCH DOUBLE BEVEL JOINT IN THE EXPOSED HORIZONTAL AND VERTICAL FACE OF THE WALL CAP AT EACH WALL JOINT. PROVIDE JOINTS IN THE WALL CAP AT 6'-0" MAXIMUM SPACING.

**MISCELLANEOUS QUANTITIES**

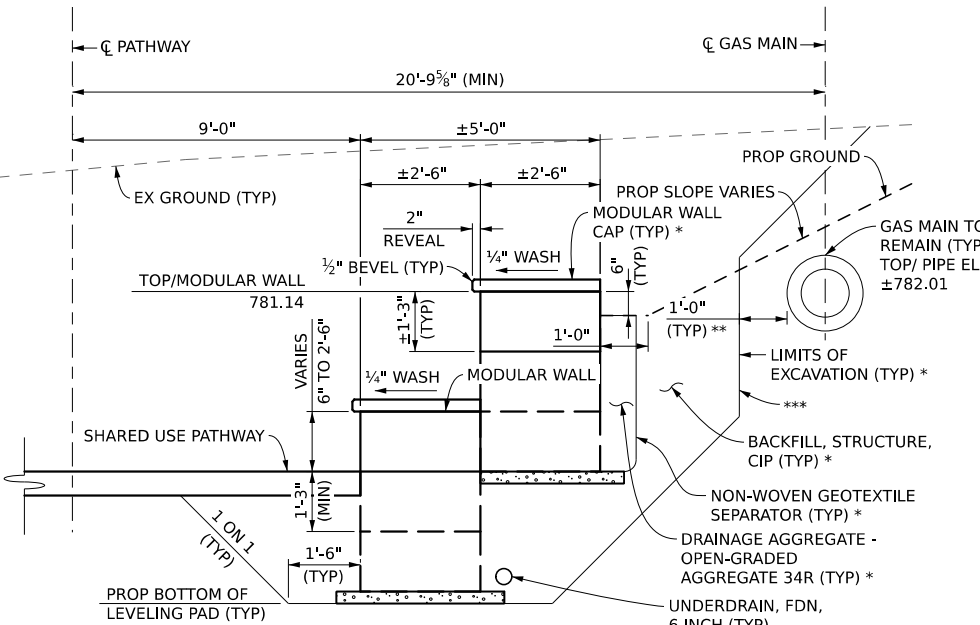
143	Ft	Modular Block Wall Cap
322	Sft	Modular Block Wall



**PLAN OF MODULAR WALL**

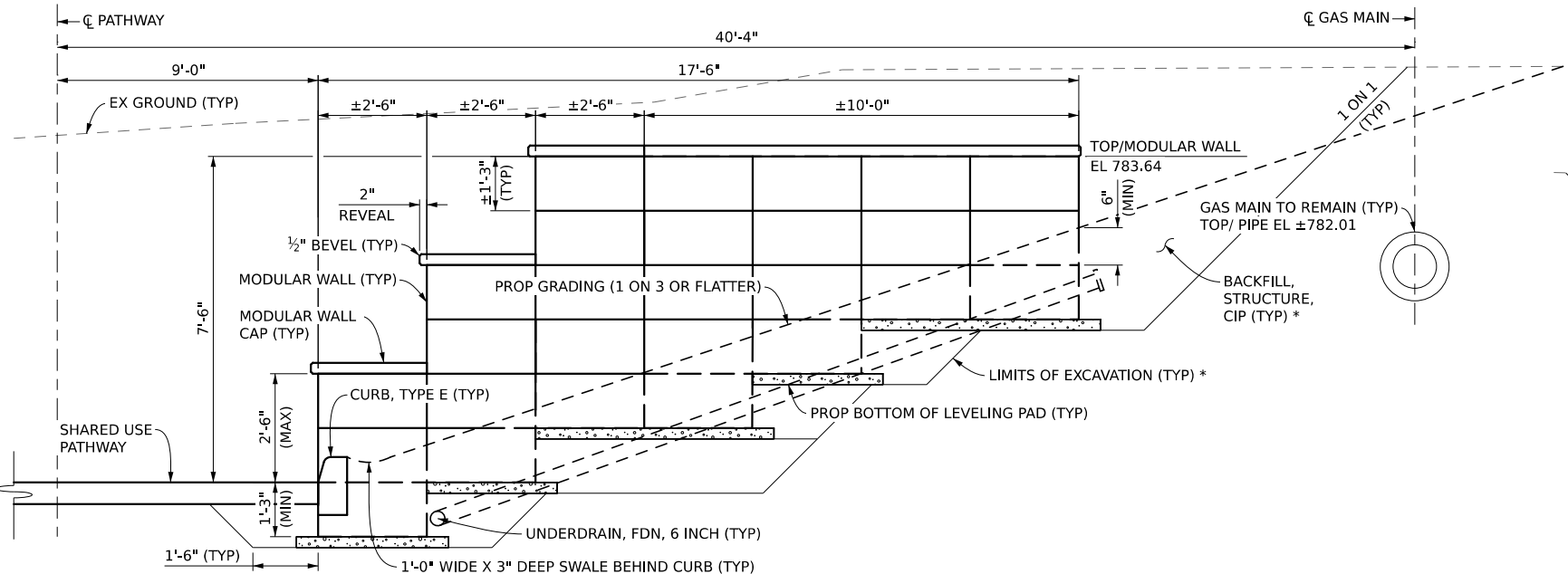


**MODULAR WALL ELEVATION**



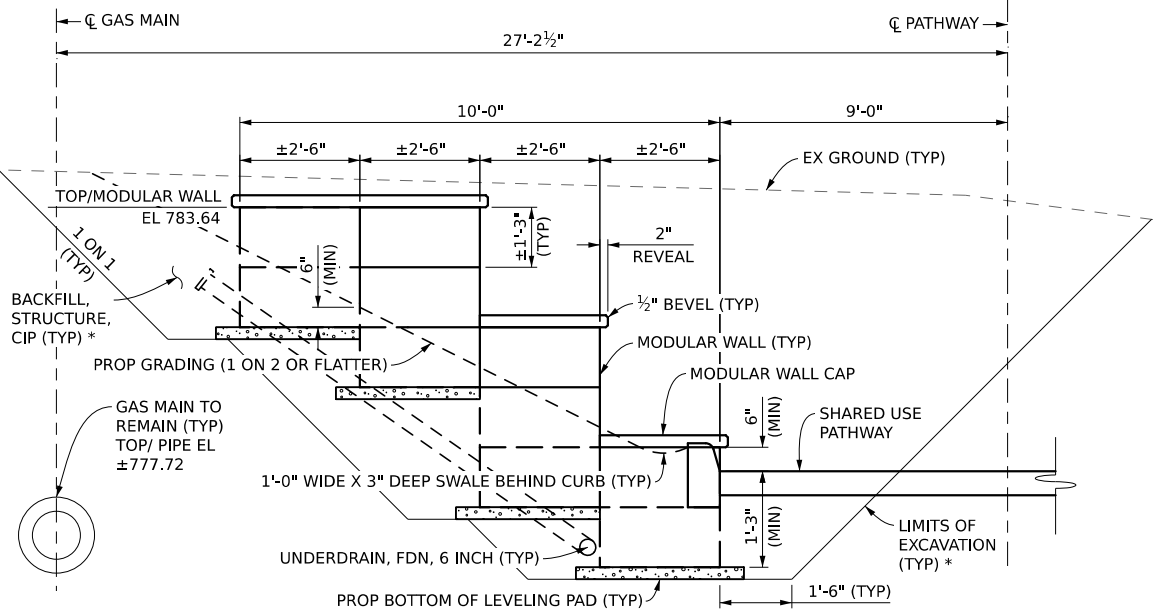
**SECTION B-B THRU MODULAR WALL**

\* COST INCLUDED IN THE PAY ITEM "MODULAR BLOCK WALL"  
\*\* ADJUST LIMITS OF EXCAVATION TO MAINTAIN A MINIMUM 1'-0" OFFSET FROM EDGE OF GAS MAIN  
\*\*\* BRACE EXCAVATION AS REQUIRED TO ACCOMMODATE WALL DIMENSIONS. COST INCLUDED IN THE MODULAR BLOCK WALL ITEM.



**SECTION A-A MODULAR WALL END**

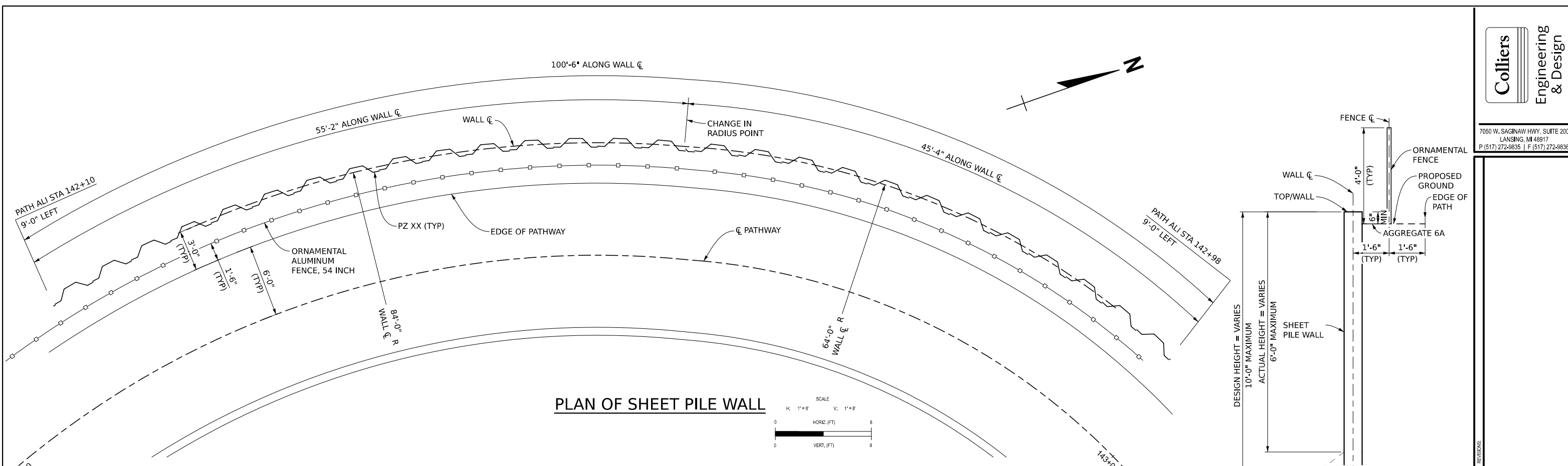
\* COST INCLUDED IN THE PAY ITEM "MODULAR BLOCK WALL"



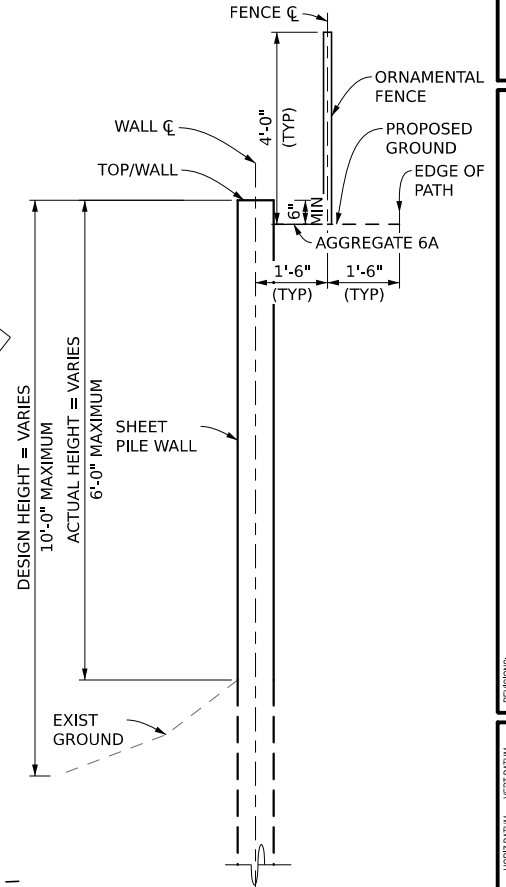
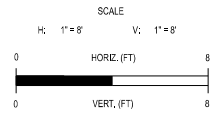
**SECTION C-C MODULAR WALL END**

\* COST INCLUDED IN THE PAY ITEM "MODULAR BLOCK WALL"

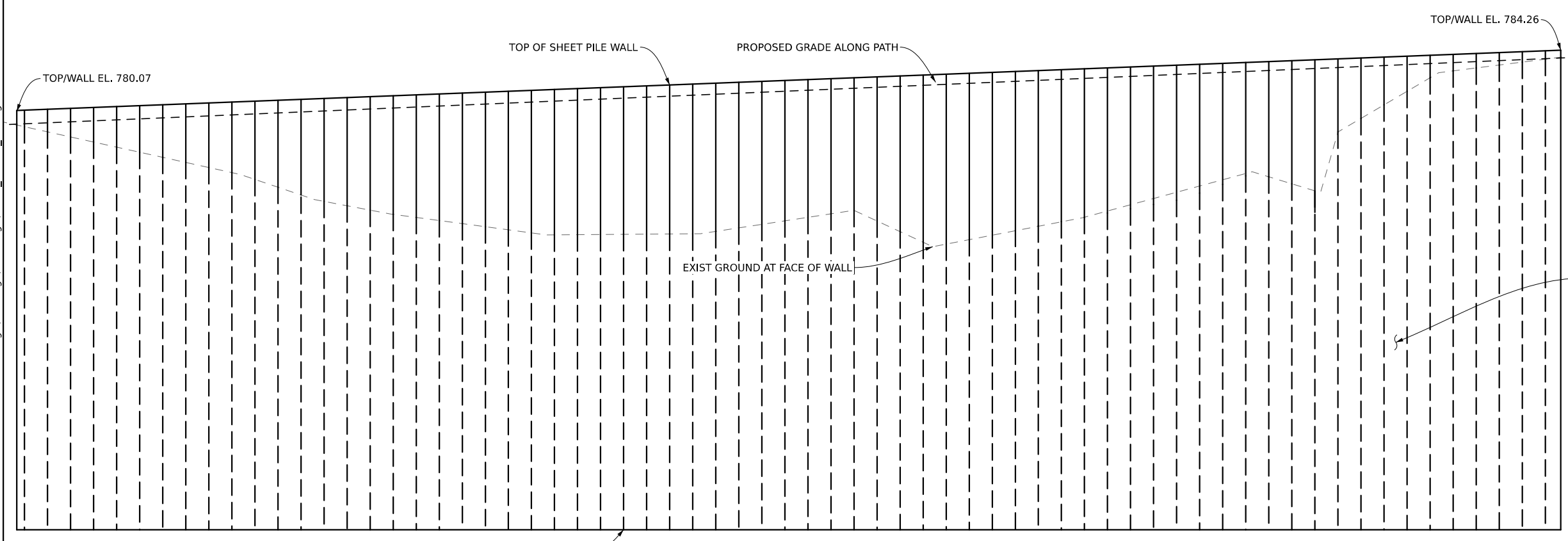
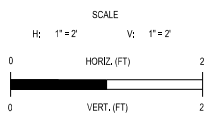
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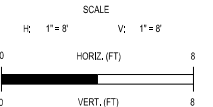
**PLAN OF SHEET PILE WALL**



**SECTION A-A THRU SHEET PILE WALL**



**SHEET PILE WALL ELEVATION**



**MISCELLANEOUS QUANTITIES**

2940	Sft	Steel Sheet Piling, Permanent
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REVISIONS:

NO.	DATE	DESCRIPTION

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SHEET PILE WALL DETAILS

DATE: 4/12/2024  
PROJ. NUMBER: 2940  
PROJ. NAME: BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CADD: JAH  
COUNTY: WASHTENAW  
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
SCALE: H: AS SHOWN V: AS SHOWN  
HORIZ. DATUM: NAD83  
VERT. DATUM: NAD83

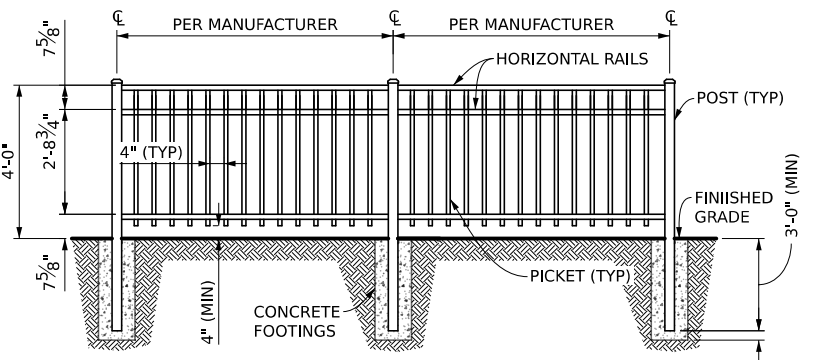
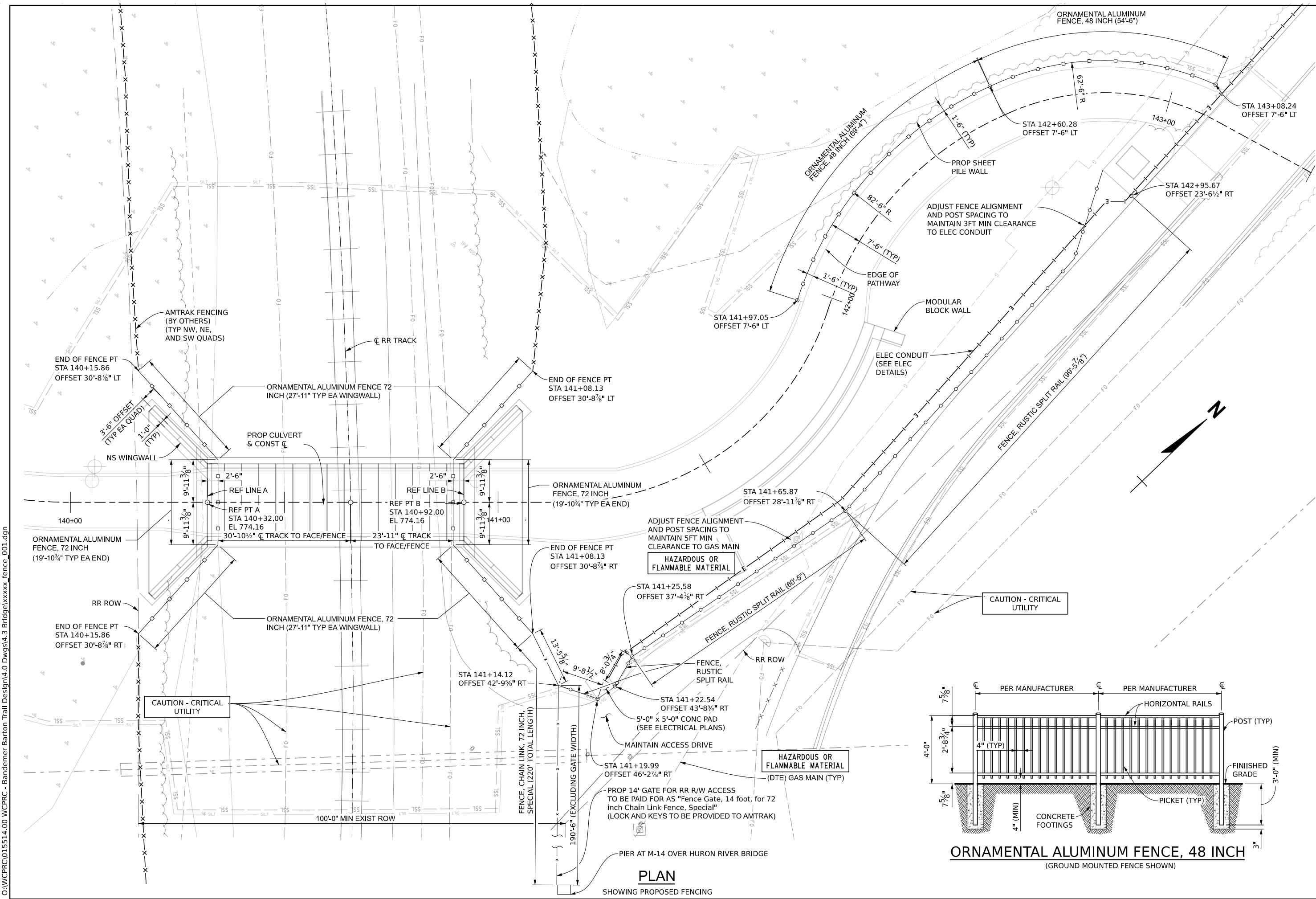
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REVISIONS	DATE	BY	DESCRIPTION

PROJ. NUMBER	ENG	PROJ. LEAD	CADD	COUNTY	CITY/TOWNSHIP	SCALE	VERT. DATUM	VERT. DATUM	SCALE	VERT. DATUM
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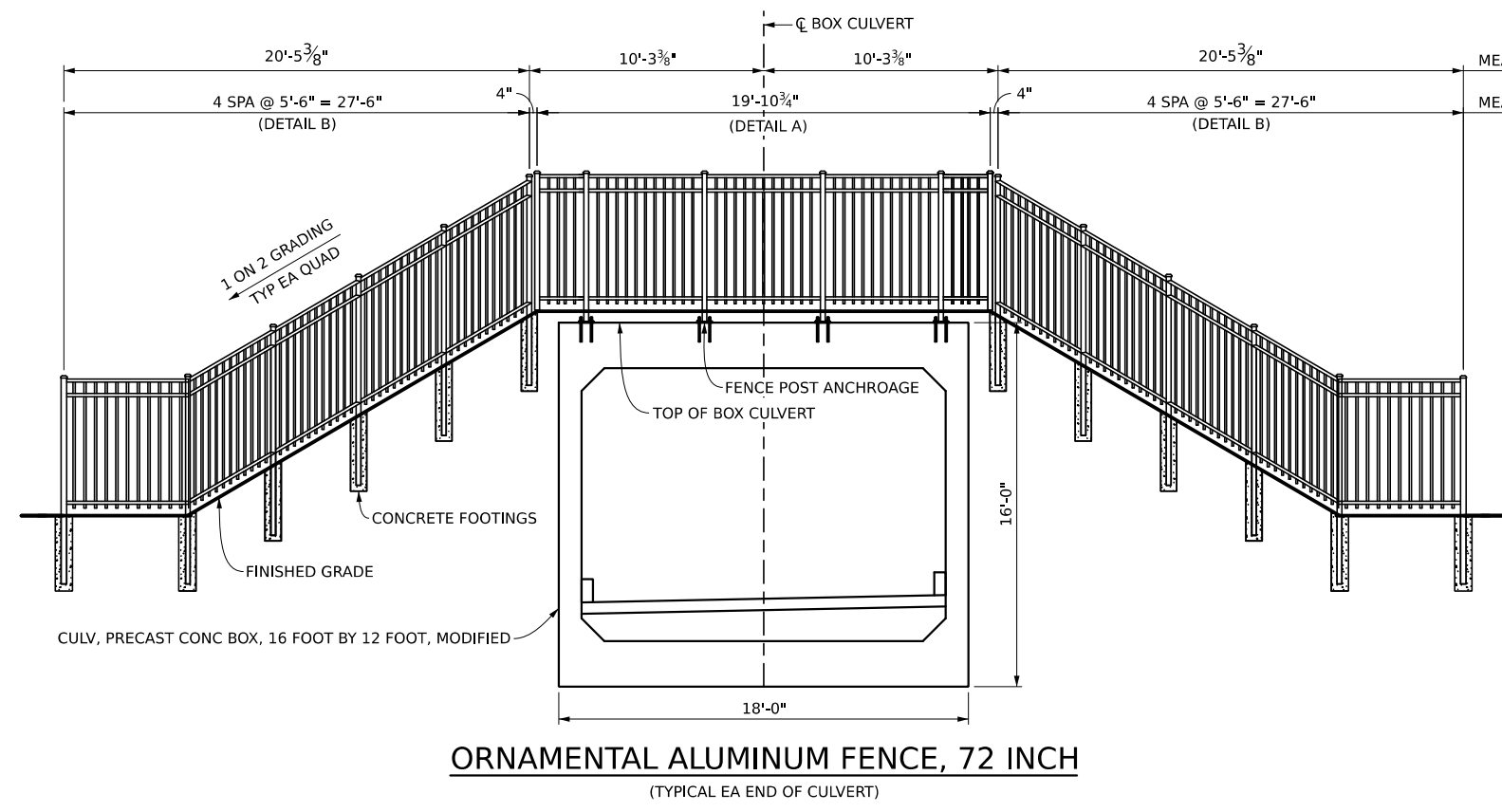
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
FENCING PLAN



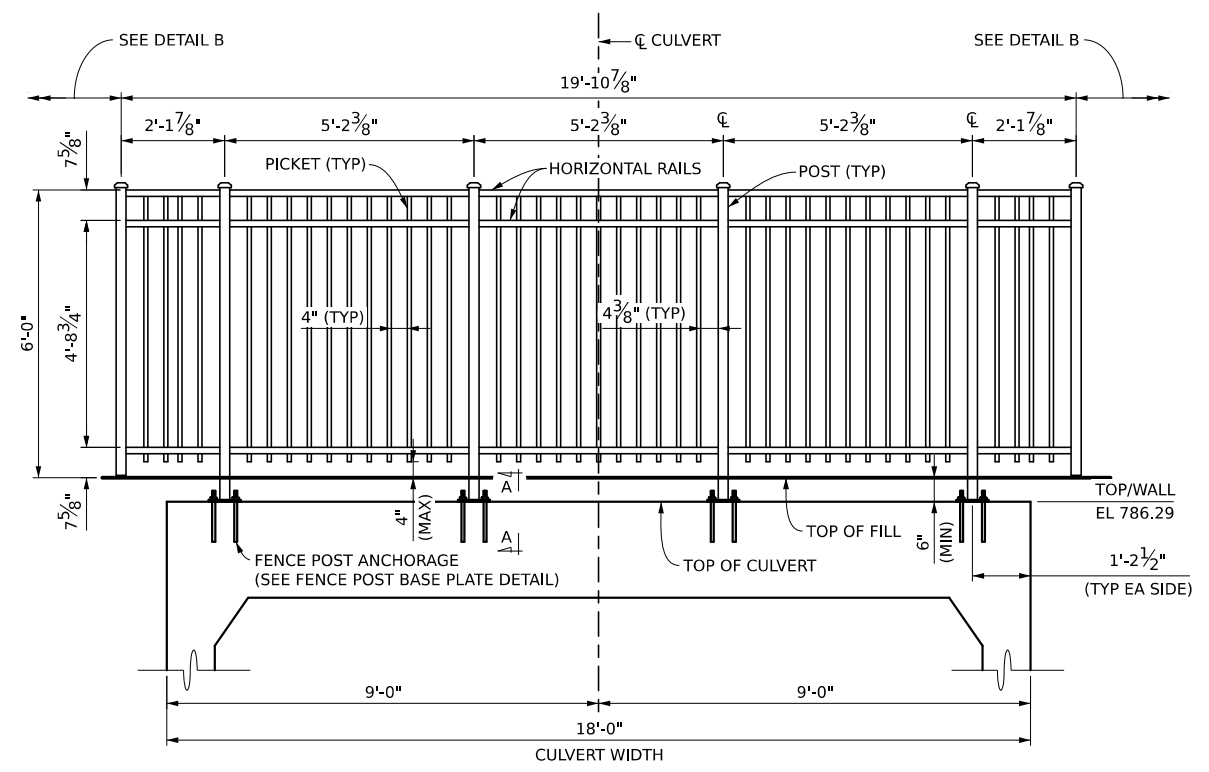
**ORNAMENTAL ALUMINUM FENCE, 48 INCH**  
(GROUND MOUNTED FENCE SHOWN)

**PLAN**  
SHOWING PROPOSED FENCING

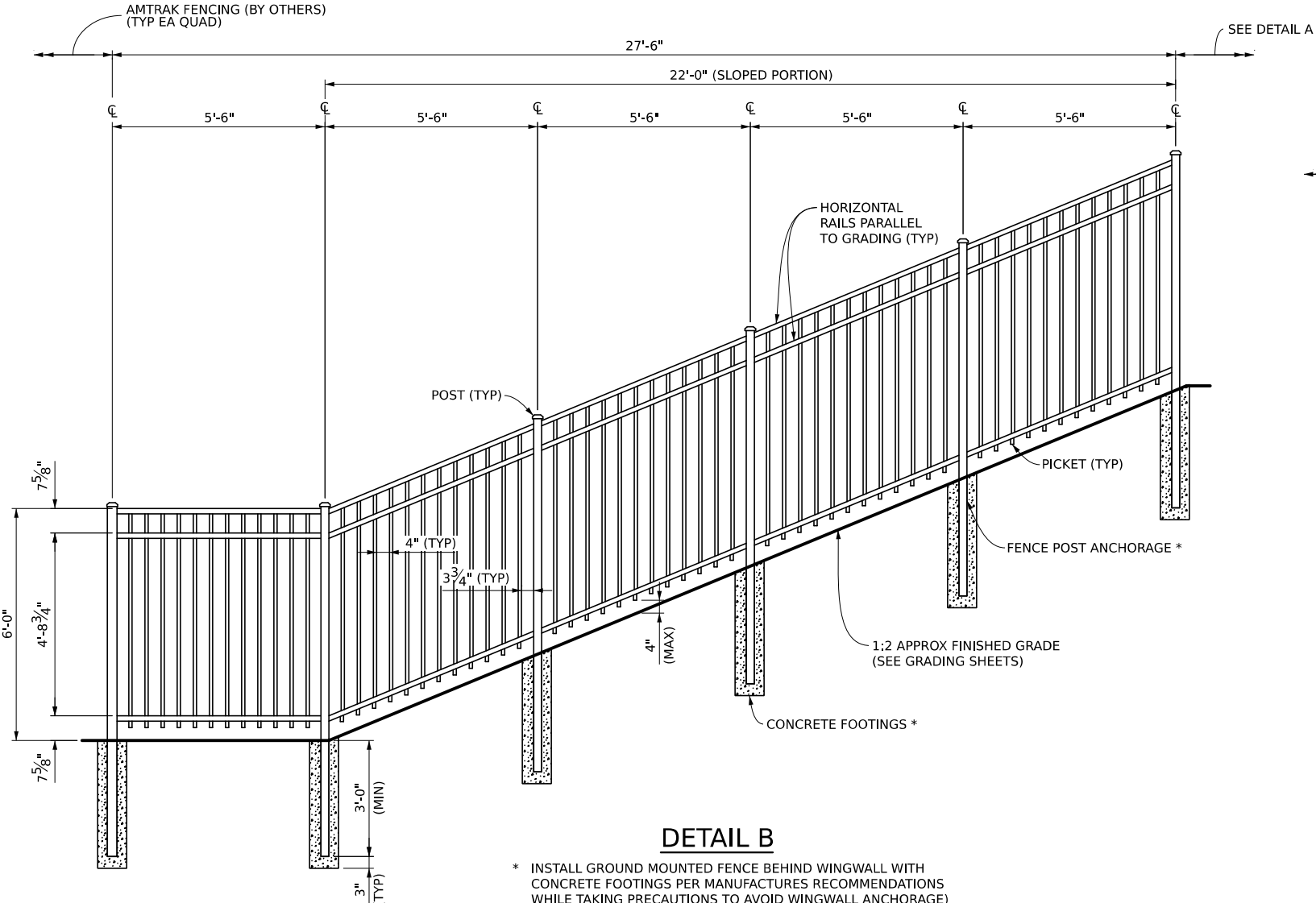
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**ORNAMENTAL ALUMINUM FENCE, 72 INCH**  
(TYPICAL EA END OF CULVERT)

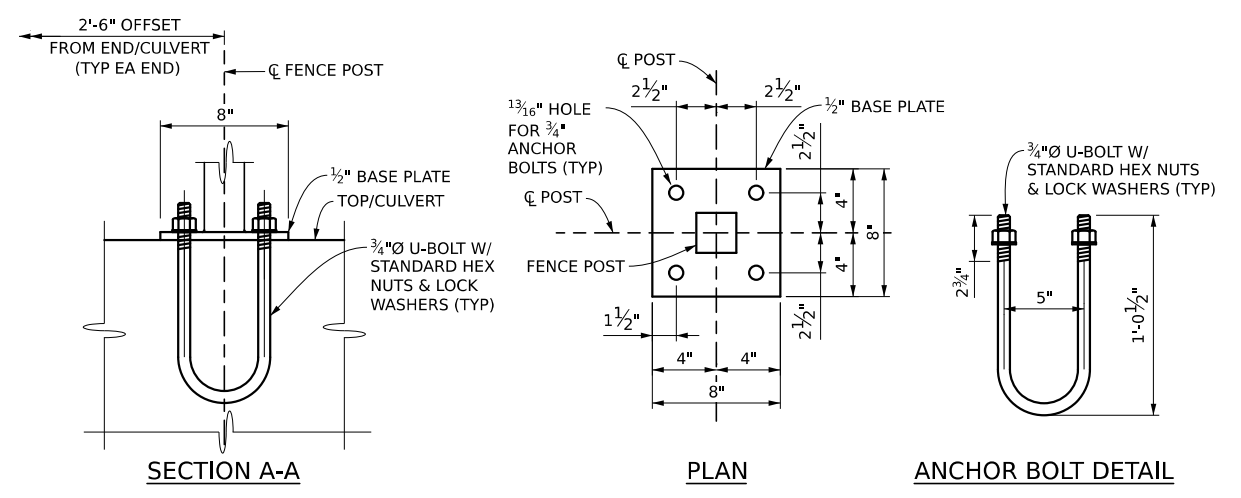


**DETAIL A**  
(CONCRETE MOUNTED FENCE ALONG TOP/CULVERT; TYPICAL EACH END)



**DETAIL B**

\* INSTALL GROUND MOUNTED FENCE BEHIND WINGWALL WITH CONCRETE FOOTINGS PER MANUFACTURES RECOMMENDATIONS WHILE TAKING PRECAUTIONS TO AVOID WINGWALL ANCHORAGE)



**FENCE POST BASE PLATE DETAIL**

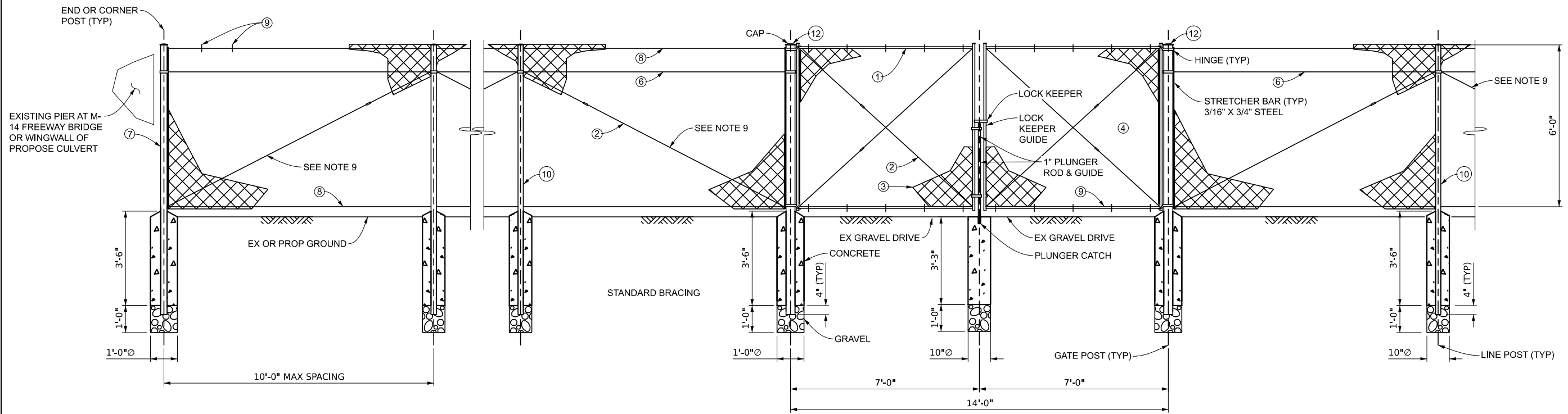
**NOTES:**

- ALL CONCRETE ANCHORS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- ALL HARDWARE (BOLTS, BRACKETS, ETC.) TO MATCH THE RAIL COLOR.
- THE FABRICATOR SHALL DESIGN ALL CONNECTIONS AND MEMBERS NOT PROVIDED ON THESE PLANS.

REVISIONS: [Table with 4 columns: NO, DATE, DESCRIPTION, BY]

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
FENCE DETAILS

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Bridgexxxxxx\_fence\_002.dgn



**ELEVATION OF FENCE (72" CHAINLINK & 14'-0" GATE)**

FROM NEW CULVERT WINGWALL TO M-14 FREEWAY BRIDGE PIER

**MISCELLANEOUS QUANTITIES**

196	Ft	Fence, Rustic Split Rail
152	Ft	Ornamental Aluminum Fence, 72 inch
14	Ft	Fence Gate, 12 foot, for 72 inch Chain Link Fence, Special
206	Ft	Fence, Chain Link, 72 Inch, Special
124	Ft	Ornamental Aluminum Fence, 48 inch

**GENERAL REQUIREMENTS:**

- ① FRAME - 2" O.D.
- ② BRACE - 3/8" ROD. (SEE NOTE 9)
- ③ 9 GA. 2" MESH CHAIN LINK FABRIC, BARBED SELVAGE TOP & BOTTOM.
- ④ ADJUSTABLE TIGHTENER AND FITTING.
- ⑤ FRAME 1 1/2" O.D.
- ⑥ BRACE RAIL 1.66" O.D. AT 2.27#/L.F.
- ⑦ CORNER POST OR END POST 2 7/8" O.D. PIPE AT 5.79 #/L.F.
- ⑧ TENSION WIRE - 7 GA.
- ⑨ HOG RING 12 GA. WIRE AT 1'-6" O.C. ±.
- ⑩ LINE POST 2 3/8" O.D. PIPE AT 3.65 #/L.F.
- ⑪ SINGLE-GATE POSTS - 3" O.D. PIPE AT 5.79 #/L.F.
- ⑫ DOUBLE-GATE POSTS - 4" O.D. PIPE AT 9.1 #/L.F.

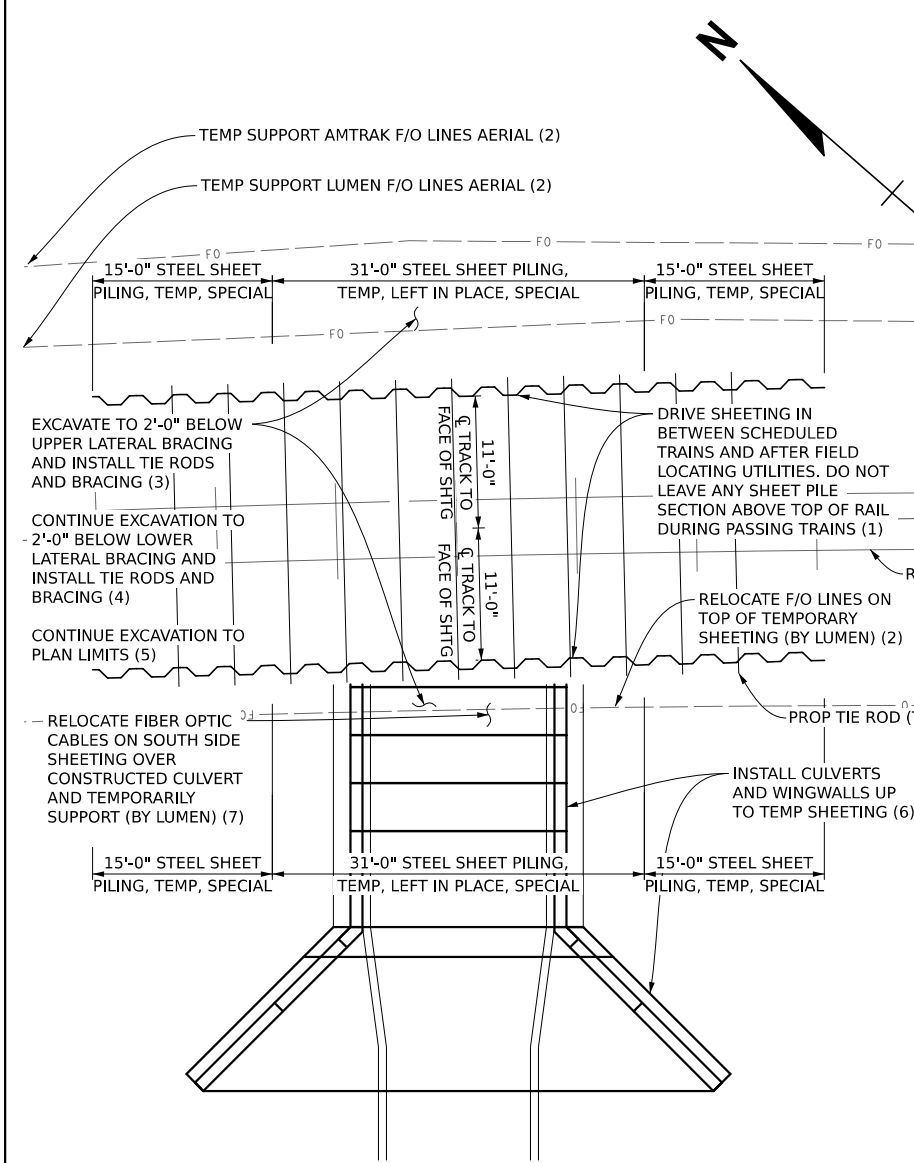
**NOTES:**

1. AMTRAK TO PROVIDE TWO 20" LONG CHAINS AND PADLOCK. ONE END OF THE CHAIN SHALL BE SECURELY BOLTED TO THE FACE OF THE GATE FRAME.
2. ALL FENCE COMPONENTS SHALL BE GALVANIZED AND POWDER COATED BLACK.
3. ALL LINE POSTS SHALL BE SAME LENGTH UNLESS OTHERWISE SPECIFIED.
4. TENSION WIRE CLIPS AT 1'-6" O.C. 12 GA. WIRE.
5. CORNER POST SHALL BE INSTALLED WHERE CHANGE IN FENCE HORIZONTAL ALIGNMENT EXCEEDS 15 DEGREES.
6. THE STRUCTURAL FRAMEWORK IN EACH FENCE CONTRACT SECTION SHALL BE UNIFORM AND SHALL CONSIST OF ROUND TUBULAR SHAPES FOR LINE, END, AND CORNER POSTS AS INDICATED.
7. ALL CONCRETE SHALL BE GRADE S2.
8. GRAVEL AT THE BOTTOM OF THE TUBULAR POSTS SHALL BE AGGREGATE, 6A.
9. DIAGONAL BRACING FOR TWO PANELS ON EACH SIDE OF GATE OPENING AND CORNERS.
10. DETAILS ARE BASED ON AMTRAK STANDARDS FOR RIGHT-OF-WAY FENCING CHAIN LINK 6' HIGH-NO BARBED WIRE. SEE AMTRAK DRAWING SP3003.

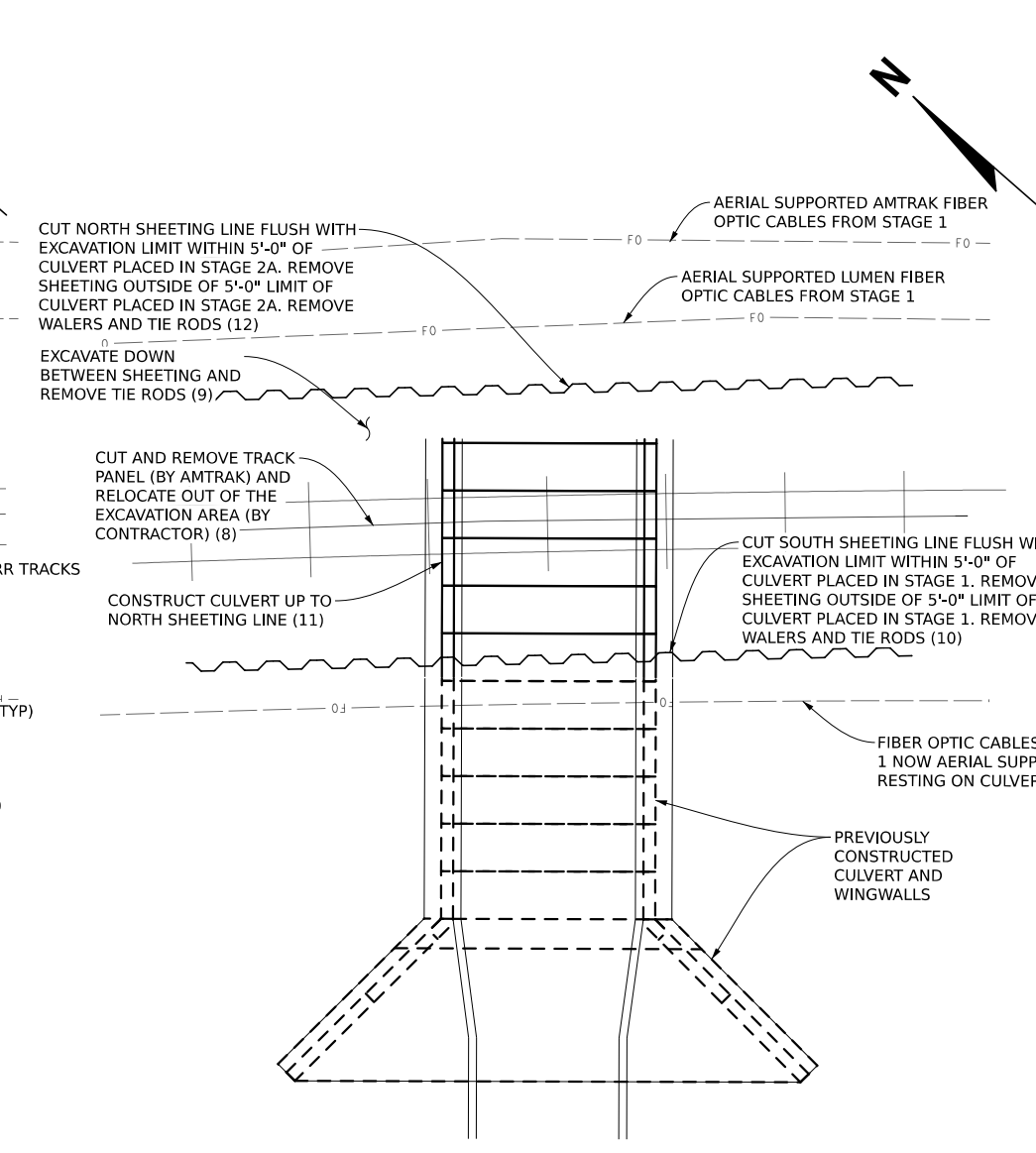
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 DATE: 4/12/2024  
 PROJ. NUMBER: ENG  
 PROJ. NAME: JAH  
 CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
 COUNTY: WASHTENAW  
 CAD: JAH  
 SCALE: H: NONE V: NONE  
 HORZ. DATUM: NAVD83  
 VERT. DATUM: NONE  
 HORZ. (FT): 0  
 VERT. (FT): 0

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 FENCE DETAILS

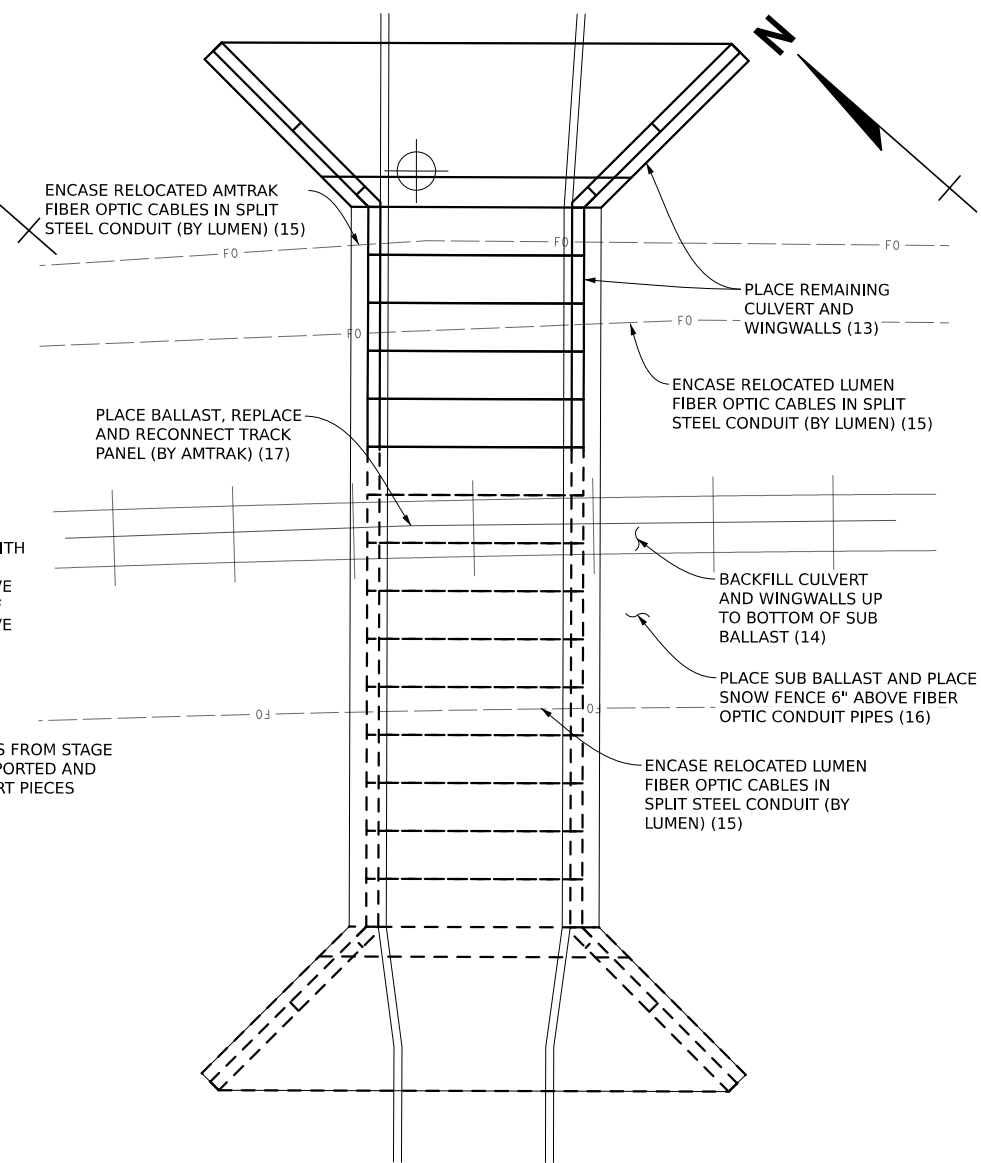
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**STAGE 1 - PLAN (ALTERNATIVE A)**  
WORK PERFORMED BETWEEN TRAINS PRIOR TO TRAIN OUTAGE



**STAGE 2A (TRACK OUTAGE) - PLAN (ALTERNATIVE A)**  
WORK PERFORMED DURING TRAIN OUTAGE



**STAGE 2B (TRACK OUTAGE) - PLAN (ALTERNATIVE A)**  
WORK PERFORMED DURING TRAIN OUTAGE

MISCELLANEOUS QUANTITIES			
1160	Sft	Steel Sheet Piling, Temp, Left in Place, Special	
460	Sft	Steel Sheet Piling, Temp, Special	

**NOTES:**

CONTRACTOR SHALL SUBMIT A WRITTEN WORK PLAN FOR DRIVING SHEETING ADJACENT TO THE TRACKS IN ACCORDANCE WITH AMTRAK'S EP3014 AND OBTAIN APPROVAL PRIOR TO MOBILIZING EQUIPMENT AND DRIVING SHEETING.

VIBRATORY HAMMERS ARE NOT PERMITTED.

ALTERNATIVE A AND B ARE PROVIDED HERE WHICH THE CONTRACTOR CAN CHOOSE FOR HIS OPERATIONS. QUANTITIES WILL BE BASED ON ALTERNATIVE A REGARDLESS OF THE METHOD USED BY THE CONTRACTOR.

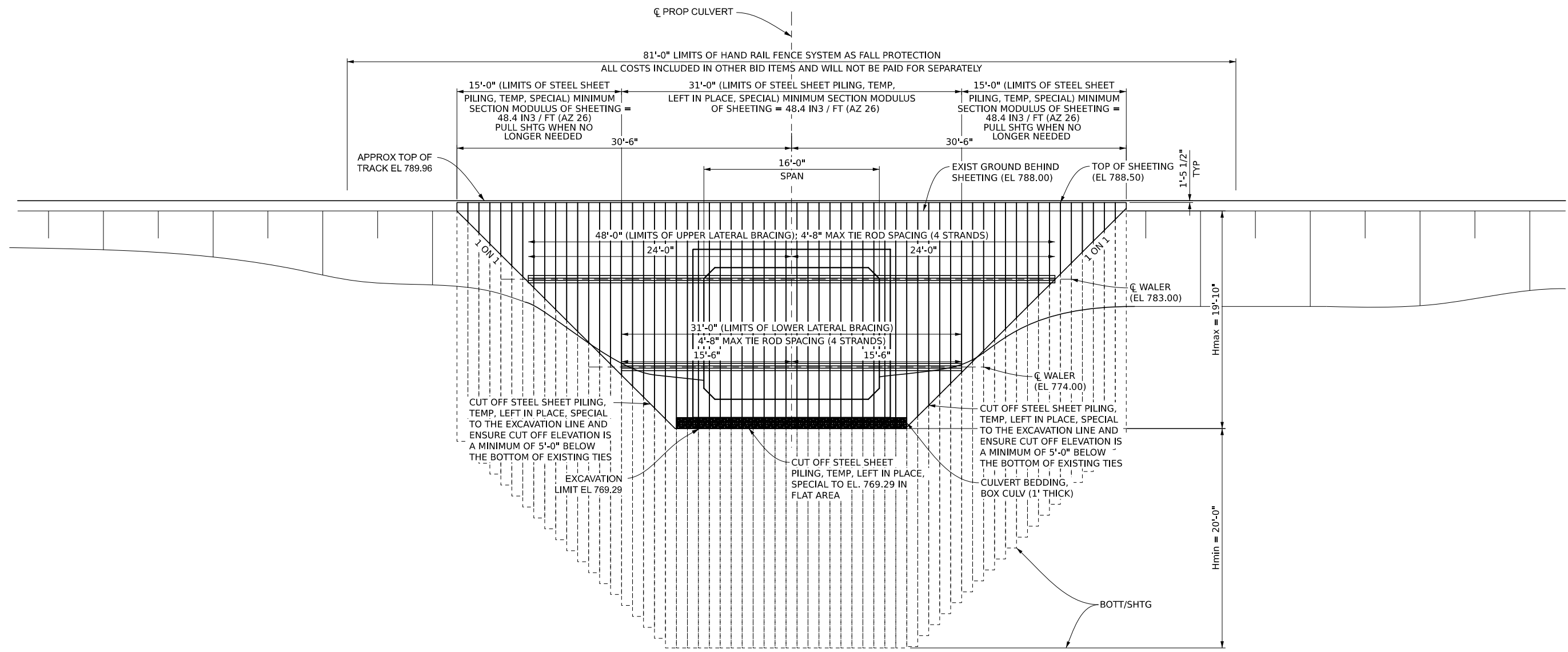
THE SEQUENCE SHOWN IS INDICATED BY NUMBERS IN PARENTHESIS ANTICIPATED FOR EACH STEP OF CONSTRUCTION. DEVIATIONS FROM THIS PLAN REQUIRES APPROVAL BY AMTRAK. THE CONTRACTOR MUST SUBMIT UPDATED PLANS AND CALCULATIONS FOR ANY DEVIATIONS TO AMTRAK IN ACCORDANCE WITH AMTRAK ENGINEERING PRACTICES EP3014. NO ADDITIONAL TIME WILL BE GRANTED DUE TO REVISIONS AND APPROVAL TIME FROM AMTRAK.

REVISIONS: \_\_\_\_\_  
 HORZ. DATUM: \_\_\_\_\_ VERT. DATUM: \_\_\_\_\_  
 SCALE: \_\_\_\_\_  
 CITY/VILLAGE/TOWNSHIP: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_  
 CADD: \_\_\_\_\_  
 PROJ./MGR: \_\_\_\_\_  
 DATE: \_\_\_\_\_

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

CONSTRUCTION STAGING DETAILS

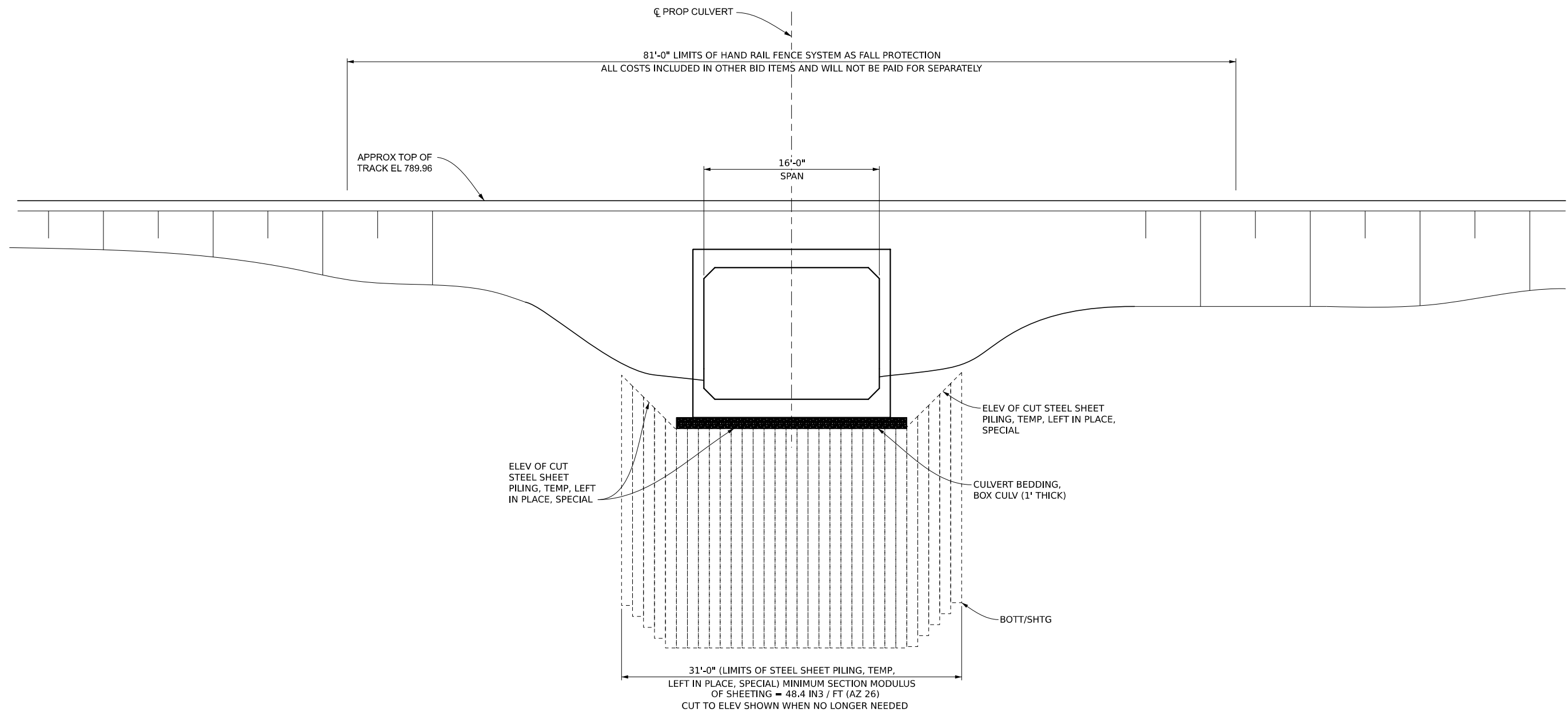
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DATE: 4/12/2024    PROJ/NUMBER: 4172024    PROJ/NAME: JAH    CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR    COUNTY: WASHTENAW    CAD: JAH    SCALE: H: 1" = 10'    V: 1" = 10'    REVISIONS:

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 CONSTRUCTION STAGING DETAILS

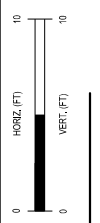


**STEEL SHEETING PILING - ELEVATION (ALTERNATIVE A)**

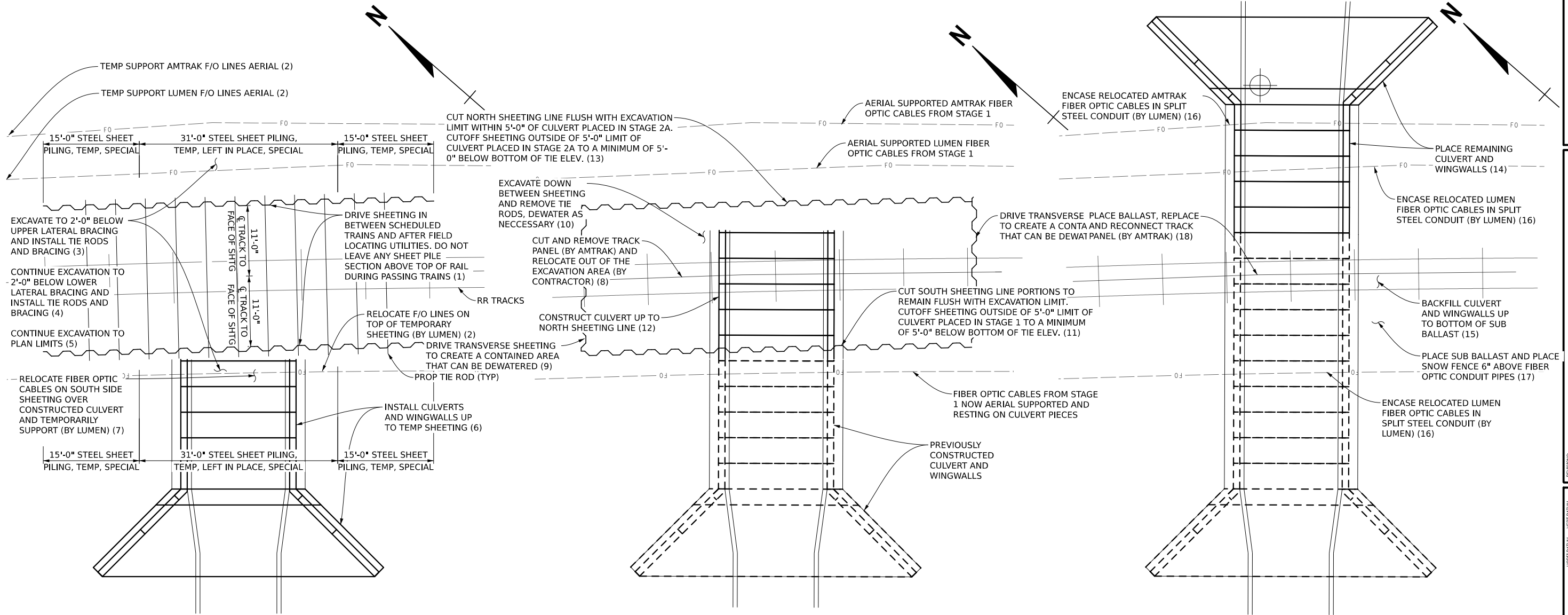
TYPICAL NORTH SIDE AND SOUTH SIDE SHEETING LINES AFTER SHEETING IS PULLED AND SHEETING LEFT-IN-PLACE IS CUT

REVISIONS:

DATE: 4/12/2024  
 PROJ/NUMBER: ENG - JAH  
 PROJ/NAME: BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
 COUNTY: WASHTENAW  
 CAD: JAH  
 SCALE: H: 1" = 10', V: 1" = 10'  
 HORZ DATUM: NAVD83  
 VERT DATUM: NAVD83



CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 CONSTRUCTION STAGING DETAILS



**STAGE 1 - PLAN (ALTERNATIVE B)**  
WORK PERFORMED BETWEEN TRAINS PRIOR TO TRAIN OUTAGE

**STAGE 2A (TRACK OUTAGE) - PLAN (ALTERNATIVE B)**  
WORK PERFORMED DURING TRAIN OUTAGE

**STAGE 2B (TRACK OUTAGE) - PLAN (ALTERNATIVE B)**  
WORK PERFORMED DURING TRAIN OUTAGE

**NOTES:**

CONTRACTOR SHALL SUBMIT A WRITTEN WORK PLAN FOR DRIVING SHEETING ADJACENT TO THE TRACKS IN ACCORDANCE WITH AMTRAK'S EP3014 AND OBTAIN APPROVAL PRIOR TO MOBILIZING EQUIPMENT AND DRIVING SHEETING.

VIBRATORY HAMMERS ARE NOT PERMITTED.

ALTERNATIVE A AND B ARE PROVIDED HERE WHICH THE CONTRACTOR CAN CHOOSE FOR HIS OPERATIONS. QUANTITIES WILL BE BASED ON ALTERNATIVE A REGARDLESS OF THE METHOD USED BY THE CONTRACTOR.

THE SEQUENCE SHOWN IS INDICATED BY NUMBERS IN PARENTHESIS ANTICIPATED FOR EACH STEP OF CONSTRUCTION. DEVIATIONS FROM THIS PLAN REQUIRES APPROVAL BY AMTRAK. THE CONTRACTOR MUST SUBMIT UPDATED PLANS AND CALCULATIONS FOR ANY DEVIATIONS TO AMTRAK IN ACCORDANCE WITH AMTRAK ENGINEERING PRACTICES EP3014. NO ADDITIONAL TIME WILL BE GRANTED DUE TO REVISIONS AND APPROVAL TIME FROM AMTRAK.

REVISIONS:

HORIZ. DATUM: NAD83  
VERT. DATUM: NAD83

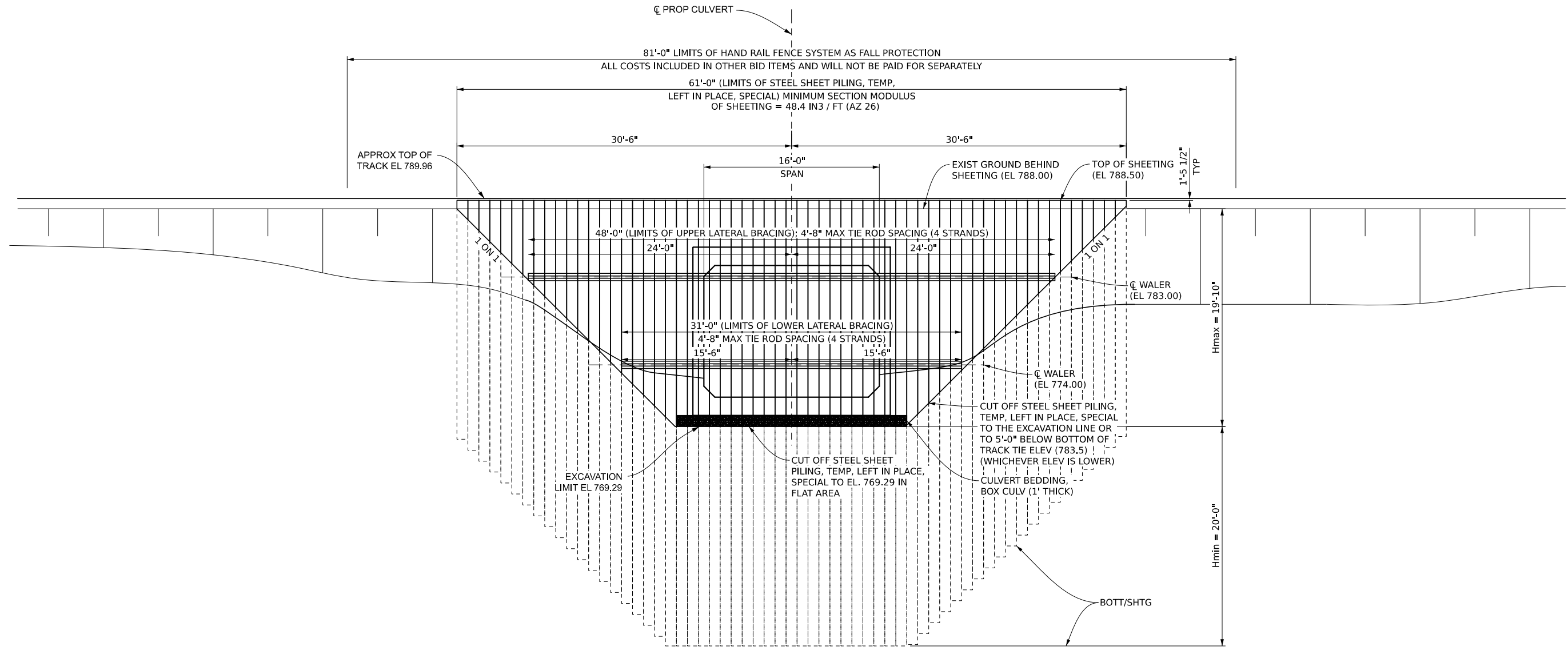
SCALE: 1" = 8'  
HORIZ. (FT): 0, 8, 16  
VERT. (FT): 0, 8, 16

CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH  
PROJECT: JAH  
DATE: 4/12/2024

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CONSTRUCTION STAGING DETAILS

O:\WCP\PRC\015514.00 WCP\PRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_constg\_004.dgn

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_constg\_005.dgn

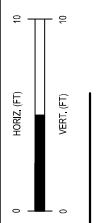


**STEEL SHEETING - ELEVATION (ALTERNATIVE B)**

TYPICAL NORTH SIDE AND SOUTH SIDE SHEETING LINES

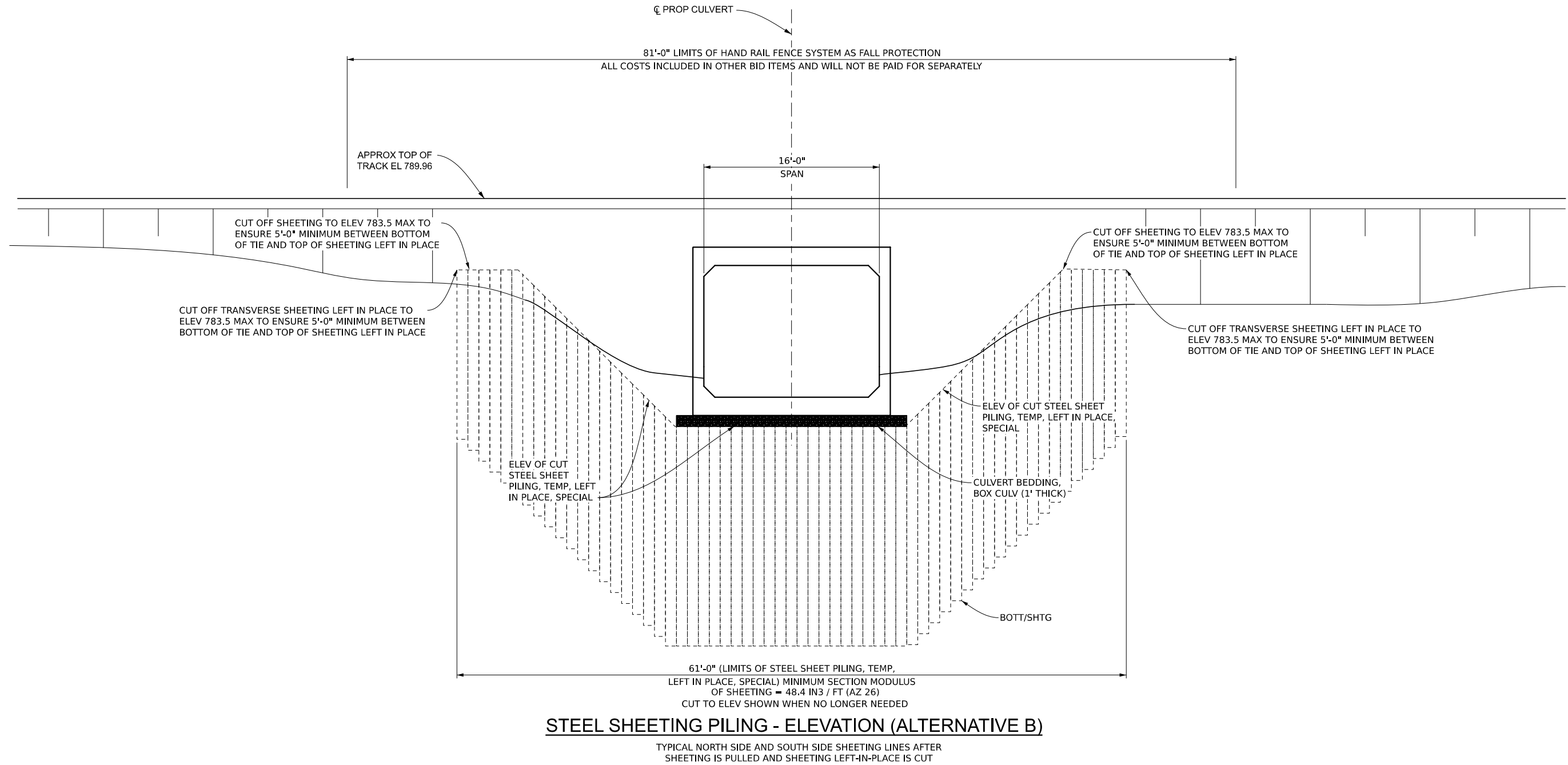
REVISIONS:

DATE: 4/12/2024  
 PROJ/NUMBER: ENG JAH  
 PROJ/MGR: JAH  
 CADD: JAH  
 COUNTY: WASHTENAW  
 CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
 SCALE: H: 1" = 10' V: 1" = 10'  
 HORZ. DATUM: NAVD83  
 VERT. DATUM: NAVD83



CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 CONSTRUCTION STAGING DETAILS



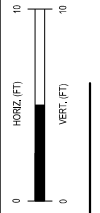


**STEEL SHEETING PILING - ELEVATION (ALTERNATIVE B)**

TYPICAL NORTH SIDE AND SOUTH SIDE SHEETING LINES AFTER SHEETING IS PULLED AND SHEETING LEFT-IN-PLACE IS CUT

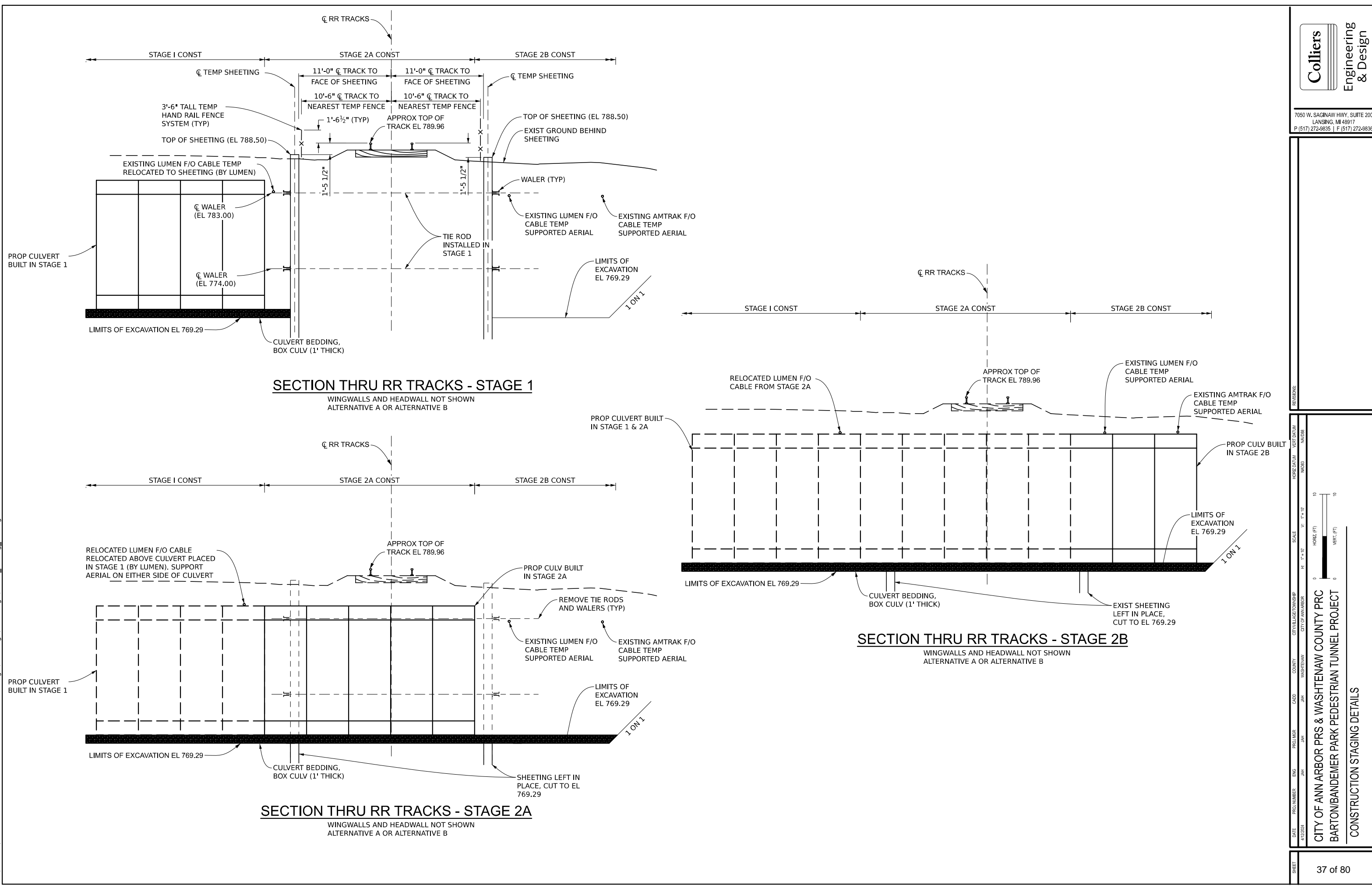
REVISIONS:

DATE: 4/12/2024  
PROJ NUMBER: 4172024  
PROJ NAME: BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH  
SCALE: H: 1" = 10', V: 1" = 10'  
HORIZ DATUM: NAVD83  
VERT DATUM: NAVD83



CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CONSTRUCTION STAGING DETAILS

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_constg\_006.dgn



**SECTION THRU RR TRACKS - STAGE 1**

WINGWALLS AND HEADWALL NOT SHOWN  
ALTERNATIVE A OR ALTERNATIVE B

**SECTION THRU RR TRACKS - STAGE 2B**

WINGWALLS AND HEADWALL NOT SHOWN  
ALTERNATIVE A OR ALTERNATIVE B

**SECTION THRU RR TRACKS - STAGE 2A**

WINGWALLS AND HEADWALL NOT SHOWN  
ALTERNATIVE A OR ALTERNATIVE B

REVISIONS:

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

NO. DATE

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CONSTRUCTION STAGING DETAILS

O:\WCP\1514.00 WCP\PRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_constg\_007.dgn



**QUANTITIES TEMPORARY TRAFFIC CONTROL**

1000	Ft	Fence, Protective
106	Ft	Post, Steel, 3 pound
10	Ea	Barricade, Type III, High Intensity, Double Sided, Lighted, Furn
10	Ea	Barricade, Type III, High Intensity, Double Sided, Lighted, Oper
10	Ea	Pedestrian Type II Barricade, Temp
50	Ft	Pedestrian Type II Channelizer, Temp
2	Ea	Lighted Arrow, Type C, Furn
2	Ea	Lighted Arrow, Type C, Oper
1	LSUM	Minor Traf Devices
35	Ea	Plastic Drum, Fluorescent, Furn
35	Ea	Plastic Drum, Fluorescent, Oper
5	Ea	Sign Cover
316	Sft	Sign, Type B, Temp, Prismatic, Furn
316	Sft	Sign, Type B, Temp, Prismatic, Oper
96	Sft	Sign, Type B, Temp, Prismatic, Spec, Furn
96	Sft	Sign, Type B, Temp, Prismatic, Spec, Oper
1	LSUM	Traf Regulator Control

SIGNS SHALL BE PLACED ON THE NORTH SIDE OF ROWING CLUB PARKING LOT AT THE TRAIL HEADING NORTH. DISTANCE AHEAD SIGN SHALL STATE 0.29 MILES AHEAD.

SEE TTCP PLN2A AND PLN2B FOR DETAILS

SOUTH BARTON PEDESTRIAN BRIDGE

MICHIGAN LINE AMTRAK

N MAIN ST

W HURON RIVER DR

SEE TTCP PLN1 FOR DETAILS

SIGNS SHALL BE PLACED ON THE WEST SIDE OF ARGO DAM AT THE TRAIL HEADING NORTH. DISTANCE AHEAD SIGN SHALL STATE 0.83 MILES AHEAD.

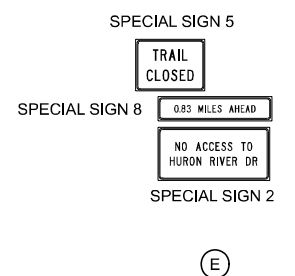
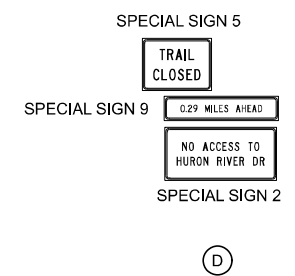
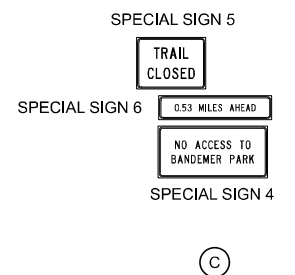
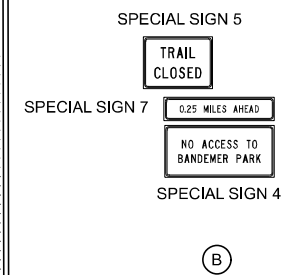
SIGNS SHALL BE PLACED ON THE TRAIL BETWEEN THE RIVER CROSSING AT THE SOUTHERNMOST TRAIL SPLIT HEADING SOUTH. DISTANCE AHEAD SIGN SHALL STATE 0.25 MILES AHEAD.

MICHIGAN LINE AMTRAK

NORTH BARTON PEDESTRIAN BRIDGE

BANDEMER BARTON TRAIL CONNECTION  
(OWNER SUPPLIED PROJECT BANNER)

PLACE WASHTENAW COUNTY PARKS & RECREATION COMMISSION BANNERS USING COMMON TETHERING METHODS TO 3 LB POSTS BANNER PROVIDED BY OWNER POST AND TETHERING INCLUDED IN ITEM: POST, STEEL, 3 POUND FURNISH AND OPERATION INCLUDED IN ITEM: MINOR TRAF DEVICES

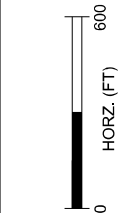


SIGNS SHALL BE PLACED ON THE NORTHERN SIDE OF THE HURON RIVER CROSSING HEADING SOUTH. DISTANCE AHEAD SIGN SHALL STATE 0.53 MILES AHEAD.

**NOTES:**

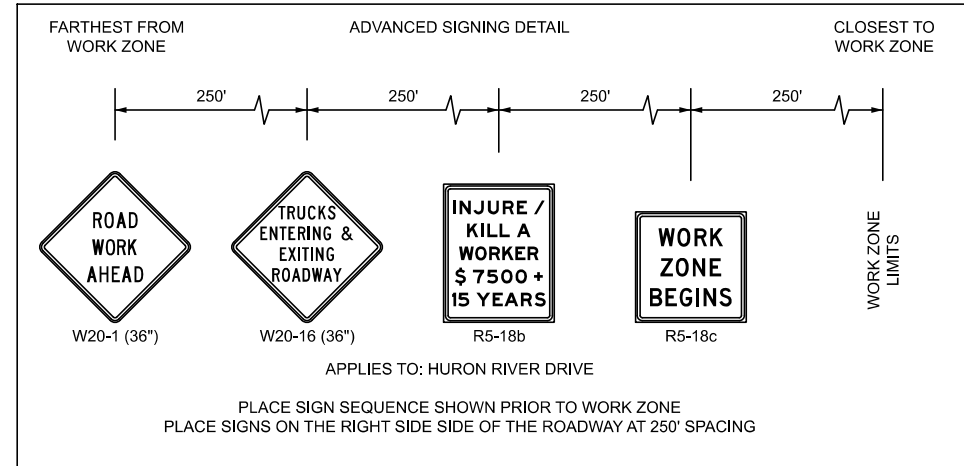
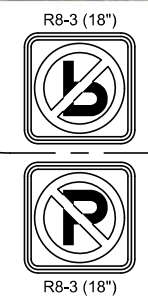
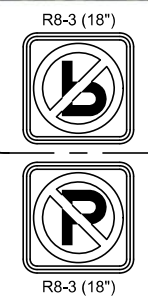
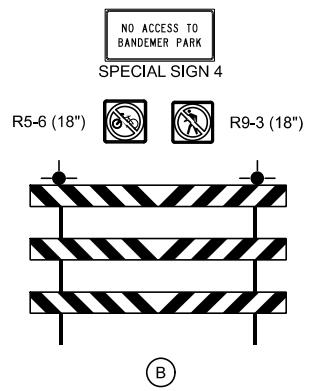
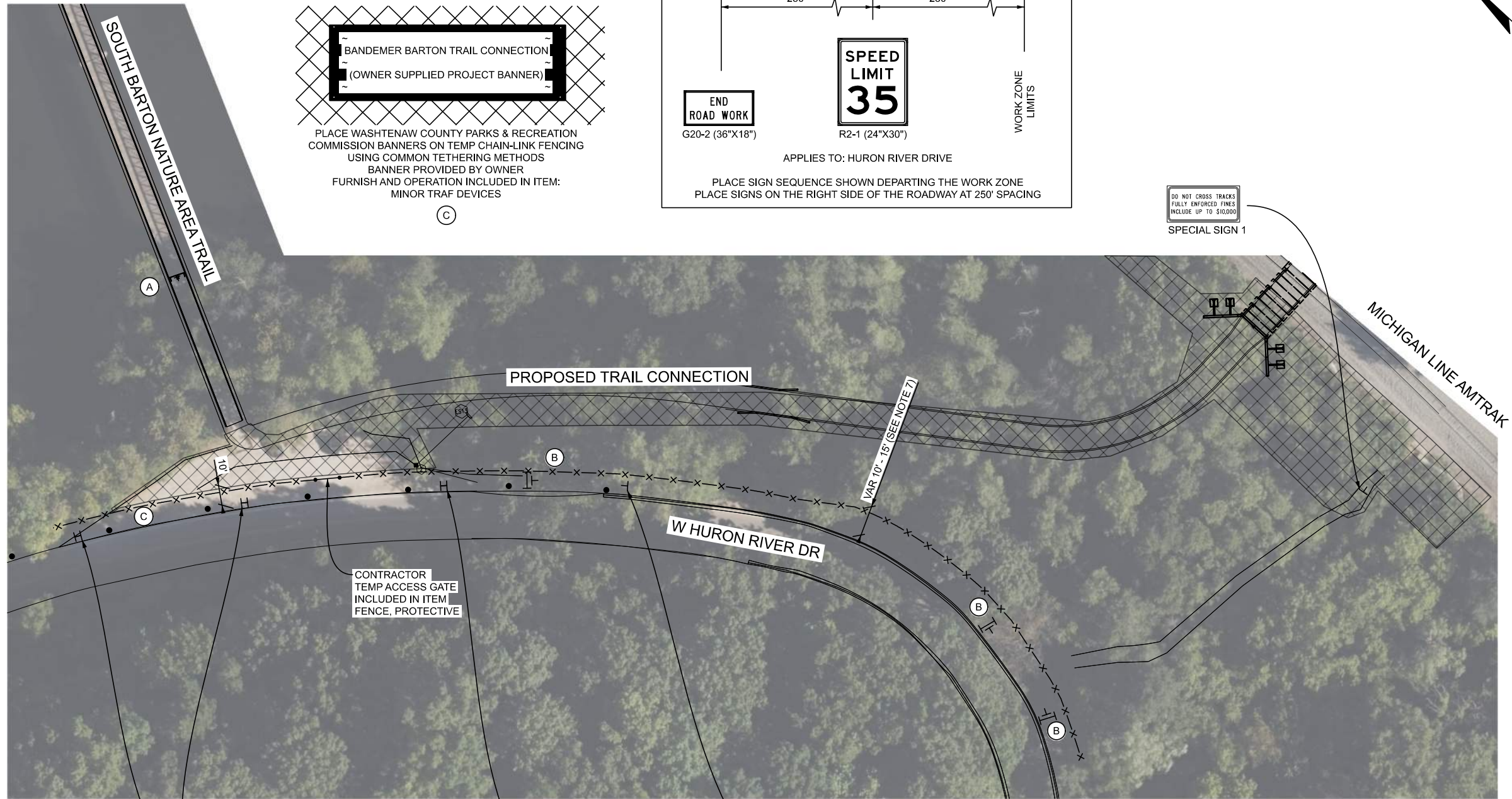
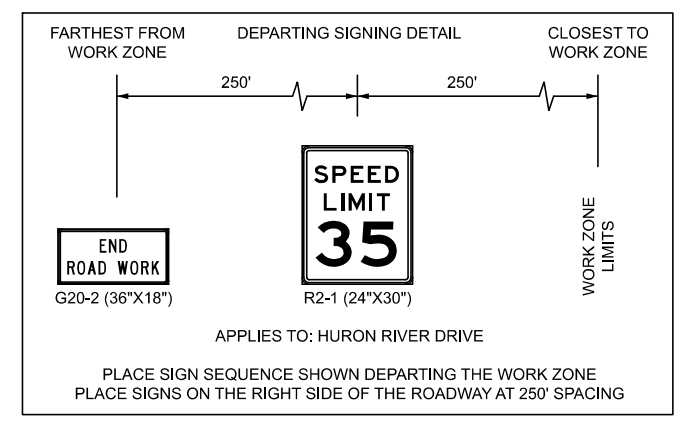
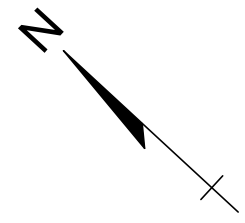
1. THE SOUTH BARTON NATURE TRAIL PEDESTRIAN STRUCTURE SHALL BE CLOSED TO ALL TRAFFIC DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF PROPOSED WORK.
3. RETAIN ALL EXISTING PATHWAY SIGNS. COVER ANY CONFLICTING ROAD OR TRAIL SIGNS
4. PLACE TEMPORARY SIGNING AND BANNERS IN LOCATIONS DESIGNATED ON THESE PLANS AND BY THE TRAIL OWNER.
5. LIMIT IMPACT TO TREES AND PATHWAY WHEN PLACING TRAFFIC CONTROL DEVICES.

REVISIONS: SCALE: 1"=100' CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR COUNTY: WASHTENAW CAD: JAH PROJ: MUR PROJ: JAH ENG: JAH DATE: 04/23/24



CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
TRAFFIC CONTROL DETAILS

C:\WPC\015641\_03\WPC\Barton Trail Design\A.D\Drawings\1\_TemporaryTrafficControlSheet\Plan\0351002\_WPC\TRC\_TTCP\_MCT\_ColliersEng.dwg



**TRAFFIC CONTROL DEVICE LEGEND:**

- PLASTIC DRUMS
- x- FENCE, PROTECTIVE (8' CHAIN-LINK)
- ▤ TYPE II PEDESTRIAN BARRICADE/CHANNELIZER
- ▬ TYPE III BARRICADE
- ┆ TEMPORARY TRAFFIC CONTROL SIGN

**NOTES:**

1. THE SOUTH BARTON NATURE TRAIL PEDESTRIAN STRUCTURE SHALL BE CLOSED TO ALL TRAFFIC DURING CONSTRUCTION.
2. THE CONTRACTOR MAY USE AN AREA OF THE PARKING LOT IMMEDIATELY SOUTH OF THE BARTON NATURE TRAIL STRUCTURE FOR EQUIPMENT, MATERIAL STORAGE, AND EMPLOYEE PARKING. THE USE OF ANY TRAILS OR GRASS AREAS FOR THESE PURPOSES IS STRICTLY FORBIDDEN.
3. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF PROPOSED WORK.
4. THE CONTRACTOR SHALL RESTRICT ACCESS INTO THE DESIGNATED WORK AREA WITH 8' CHAIN-LINK FENCE AND LOCKED GATE ACCESS.
5. FINES AND PENALTIES FOR UNAUTHORIZED CROSSING OF RAILROAD TRACKS SHALL BE POSTED IN ACCORDANCE WITH MICHIGAN AND FEDERAL LAW.
6. RETAIN ALL EXISTING ROADSIDE SIGNS. COVER ANY CONFLICTING ROAD OR TRAIL SIGNS.
7. PLACE 8' CHAIN-LINK FENCING TO LIMIT IMPACT TO TREES AND EXISTING SIGNS. NO TREE REMOVAL OR CLEARING IS ANTICIPATED FOR CONSTRUCTION OF TEMPORARY FENCING.
8. TRAFFIC REGULATOR CONTROL TO BE USED ON HURON RIVER DR WHEN WORK CANNOT BE PERFORMED OUTSIDE OF THE SHOULDER OR BEHIND CURB. WORK ITEMS INCLUDE, BUT ARE NOT LIMITED TO, DELIVERY OF MATERIALS, TRAFFIC CONTROL SETUP / TAKEDOWN, AND PAVING. SEE MDOT MAINTAINING TRAFFIC TYPICAL (110-TR-NFW-2L) FOR SIGN SEQUENCE.

SHEET: DATE: 4/12/2024 PROJ: NUMBER: ENG: PROJ: LEAD: CADD: COUNTY: CITY/VILLAGE/TOWNSHIP: WASHTEENAW CITY OF ANN ARBOR SCALE: 1"=100' HORIZ: DATUM: VERT: DATUM: NAD83 NAD83

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

TRAFFIC CONTROL DETAILS

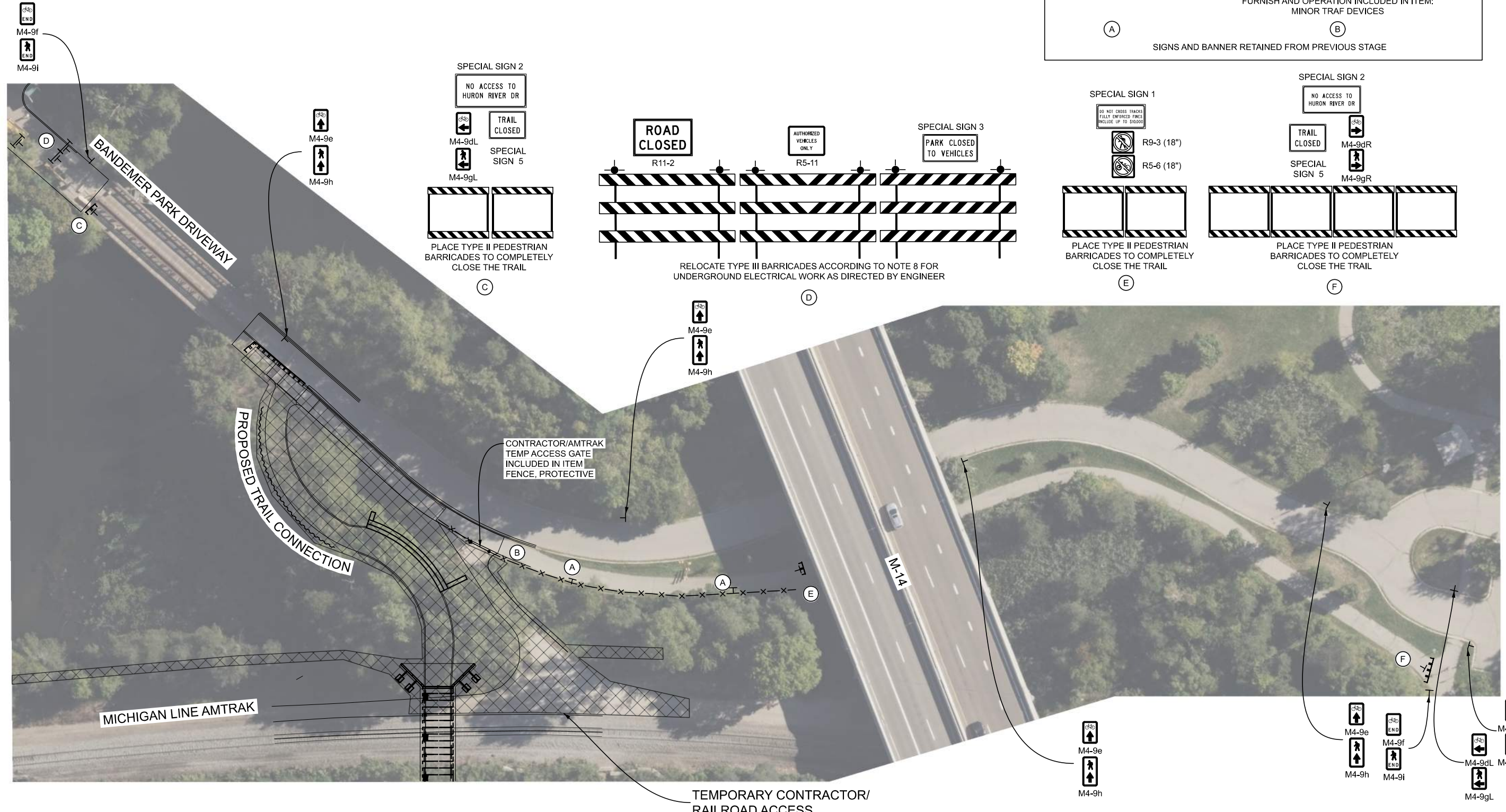
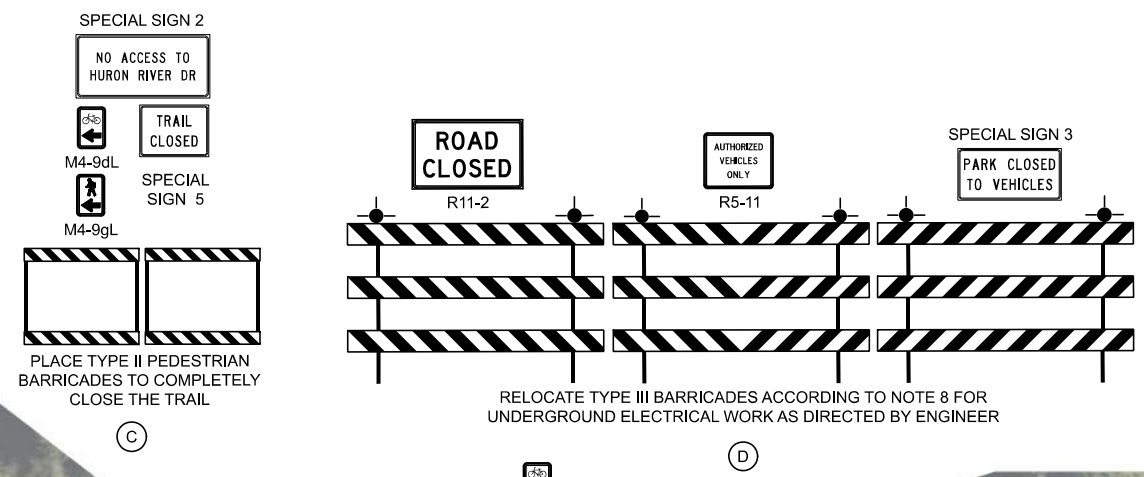
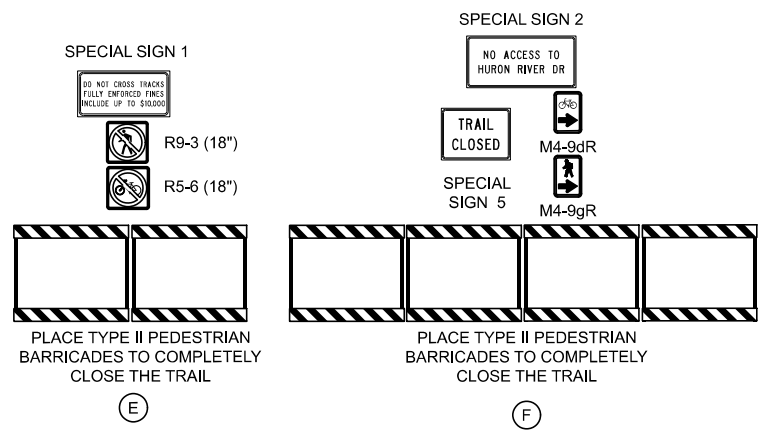
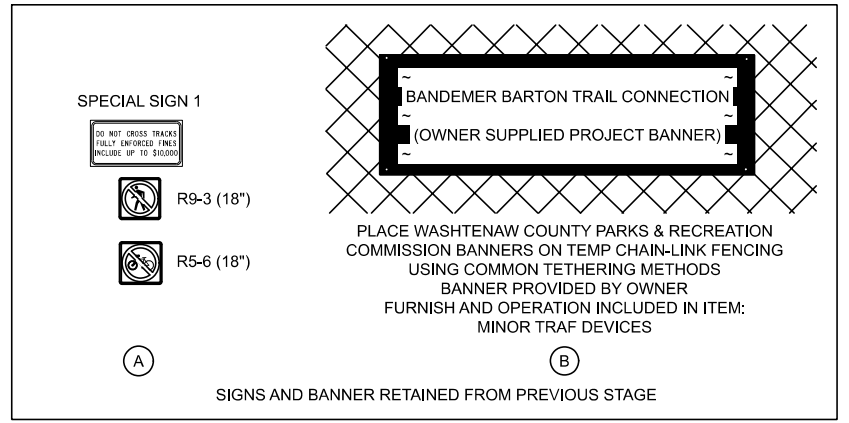


**NOTES:**

1. THE BANDEMER PARK BRIDGE SHALL BE CLOSED TO VEHICLE TRAFFIC DURING PATHWAY CONSTRUCTION IMPACTING EXISTING PAVED TRAIL. SPECIAL CONSIDERATION WILL ONLY BE MADE FOR AUTHORIZED VEHICLES AND CONTRACTOR ACCESS.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF PROPOSED WORK.
4. THE CONTRACTOR SHALL RESTRICT ACCESS INTO THE DESIGNATED WORK AREA WITH 8' CHAIN-LINK FENCING AND LOCKED GATE ACCESS.
5. FINES AND PENALTIES FOR UNAUTHORIZED CROSSING OF RAILROAD TRACKS SHALL BE POSTED IN ACCORDANCE WITH MICHIGAN AND FEDERAL LAW.
6. RETAIN ALL EXISTING ROAD AND TRAIL SIGNS. COVER ANY CONFLICTING ROAD OR TRAIL SIGNS.
7. PLACE W20-1 "ROAD WORK AHEAD" SIGN AT THE NORTH DRIVEWAY ENTRANCE INTO BANDEMER PARK
8. CLOSE PUBLIC PARKING LOT DRIVEWAY OFF BARTON SHORE DRIVE DURING UNDERGROUND ELECTRICAL WORK WITHIN PUBLIC UTILITY EASEMENT ONLY. PLACE SUFFICIENT NUMBER OF TYPE III BARRICADES TO CLOSE THE DRIVEWAY FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT WITH NO GAPS BETWEEN BARRICADES. DURING WORK HOURS, OFFSET BARRICADES TO ALLOW CONSTRUCTION TRAFFIC ACCESS BUT MAINTAIN VISUAL ROAD CLOSURE. PLACE SIGNS R11-2, R5-11, AND SPECIAL SIGN 3 BEHIND BARRICADES ON SEPARATE SIGN SUPPORTS.

**TRAFFIC CONTROL DEVICE LEGEND:**

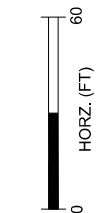
- PLASTIC DRUMS
- X- FENCE, PROTECTIVE (8' CHAIN-LINK)
- ▣ TYPE II PEDESTRIAN BARRICADE/CHANNELIZER
- ⊥ TYPE III BARRICADE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN



SHEET	PROJ NUMBER	ENG	PROJ LEAD	CAD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	DATE	REV	REVISIONS
40 of 80					WASHTENAW	CITY OF ANN ARBOR	AS SHOWN	5/1/2024		

**BANDEMER PARK**  
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

TRAFFIC CONTROL DETAILS



**NOTES:**

1. THE BANDEMER PARK BRIDGE SHALL REMAIN OPEN TO VEHICLE AND PEDESTRIAN TRAFFIC DURING THIS STAGE OF CONSTRUCTION WITH WORK ACTIVITIES TAKING PLACE OUTSIDE OF THE PAVED PATHWAY.
2. MAINTAIN A MINIMUM 5' PAVED WALKING PATHWAY ADJACENT TO THE TEMPORARY CHAIN-LINK FENCE.
3. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF PROPOSED WORK.
4. THE CONTRACTOR SHALL RESTRICT ACCESS INTO THE DESIGNATED WORK AREA WITH 8' CHAIN-LINK FENCE AND LOCKED GATE ACCESS.
5. FINES AND PENALTIES FOR UNAUTHORIZED CROSSING OF RAILROAD TRACKS SHALL BE POSTED IN ACCORDANCE WITH MICHIGAN AND FEDERAL LAW.
6. RETAIN ALL EXISTING ROAD AND TRAIL SIGNS. COVER ANY CONFLICTING ROAD OR TRAILS SIGNS.
7. PLACE "NO ACCESS TO HURON RIVER DR" SIGN AT THE START AND END OF CONSTRUCTION FENCING AND ON TEMPORARY CONTRACTOR/RAILROAD ACCESS AS SHOWN ON THIS SHEET.

**TRAFFIC CONTROL DEVICE LEGEND:**

- PLASTIC DRUMS
- X- FENCE, PROTECTIVE (8' CHAIN-LINK)
- ▤ TYPE II PEDESTRIAN BARRICADE/CHANNELIZER
- ⊥ TYPE III BARRICADE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN



PLACE WASHTENAW COUNTY PARKS & RECREATION COMMISSION BANNERS ON TEMP CHAIN-LINK FENCING USING COMMON TETHERING METHODS  
BANNER PROVIDED BY OWNER  
FURNISH AND OPERATION INCLUDED IN ITEM: MINOR TRAF DEVICES

DO NOT CROSS TRACKS  
FULLY ENFORCED FINES  
INCLUDE UP TO \$10,000  
SPECIAL SIGN 1



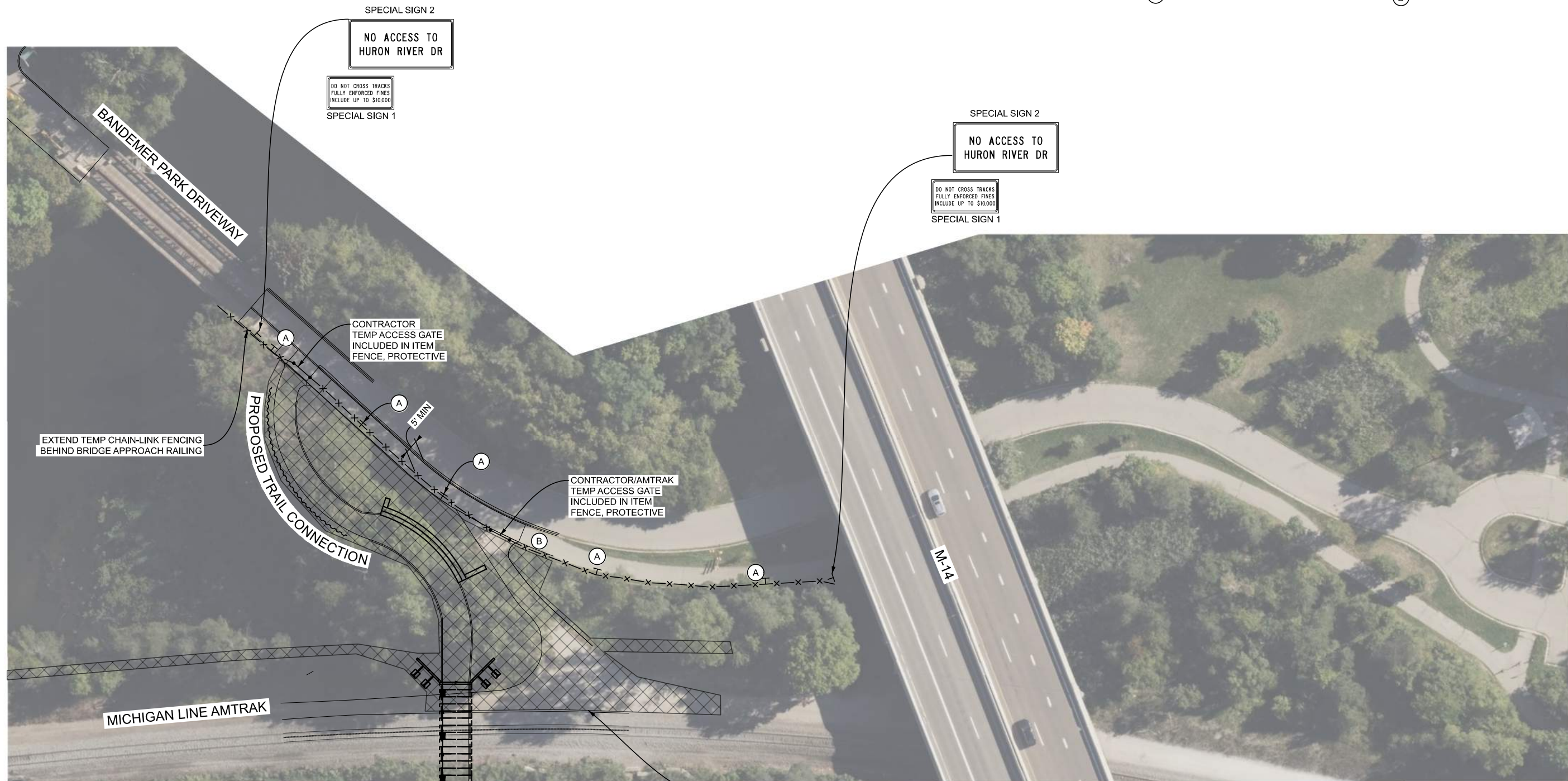
R9-3 (18")

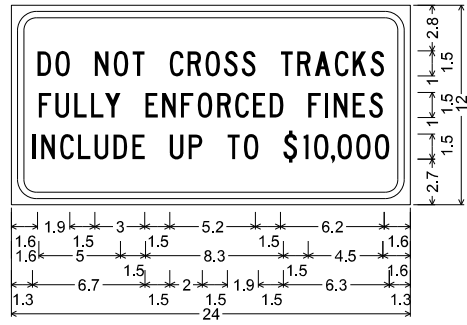


R5-6 (18")

(A)

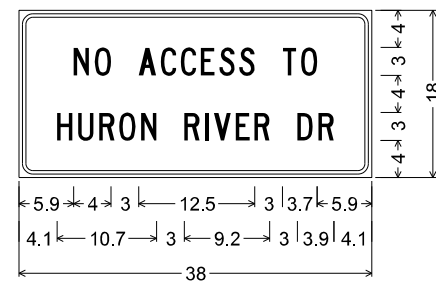
(B)





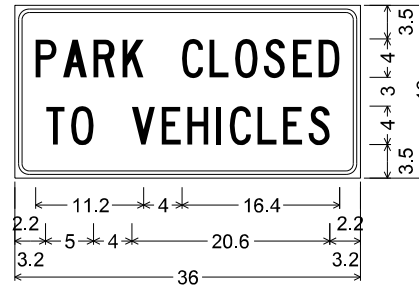
1.5" Radius, 0.4" Border, 0.4" Indent, Black on White;  
 "DO NOT CROSS TRACKS", C;  
 "FULLY ENFORCED FINES", C;  
 "INCLUDE UP TO \$10,000", C;

SPECIAL SIGN 1



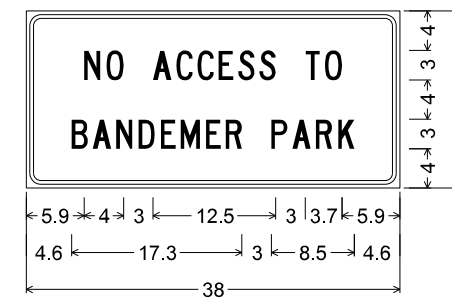
1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;  
 "NO ACCESS TO", C;  
 "HURON RIVER DR", C;

SPECIAL SIGN 2



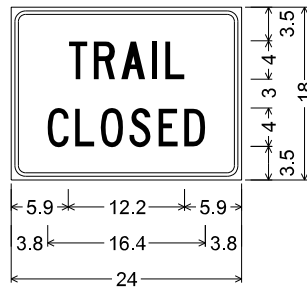
1.5" Radius, 0.4" Border, 0.4" Indent, Black on White;  
 "PARK CLOSED", C;  
 "TO VEHICLES", C;

SPECIAL SIGN 3



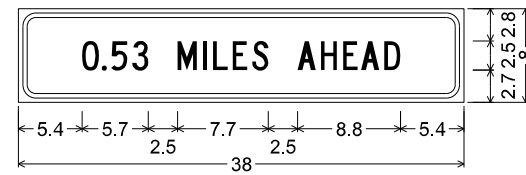
1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;  
 "NO ACCESS TO", C;  
 "BANDEMER PARK", C;

SPECIAL SIGN 4



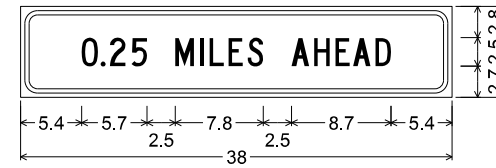
SPECIAL SIGN 06;  
 1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;  
 "TRAIL", C;  
 "CLOSED", C;

SPECIAL SIGN 5



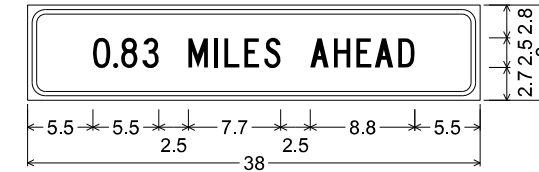
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 "0.53", C; "MILES", C; "AHEAD", C;

SPECIAL SIGN 6



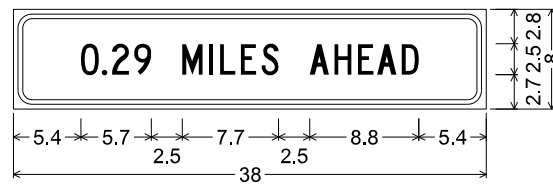
1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;  
 "0.25", C; "MILES", C; "AHEAD", C;

SPECIAL SIGN 7



1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;  
 "0.83", C; "MILES", C; "AHEAD", C;

SPECIAL SIGN 8



1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;  
 "0.29", C; "MILES", C; "AHEAD", C;

SPECIAL SIGN 9

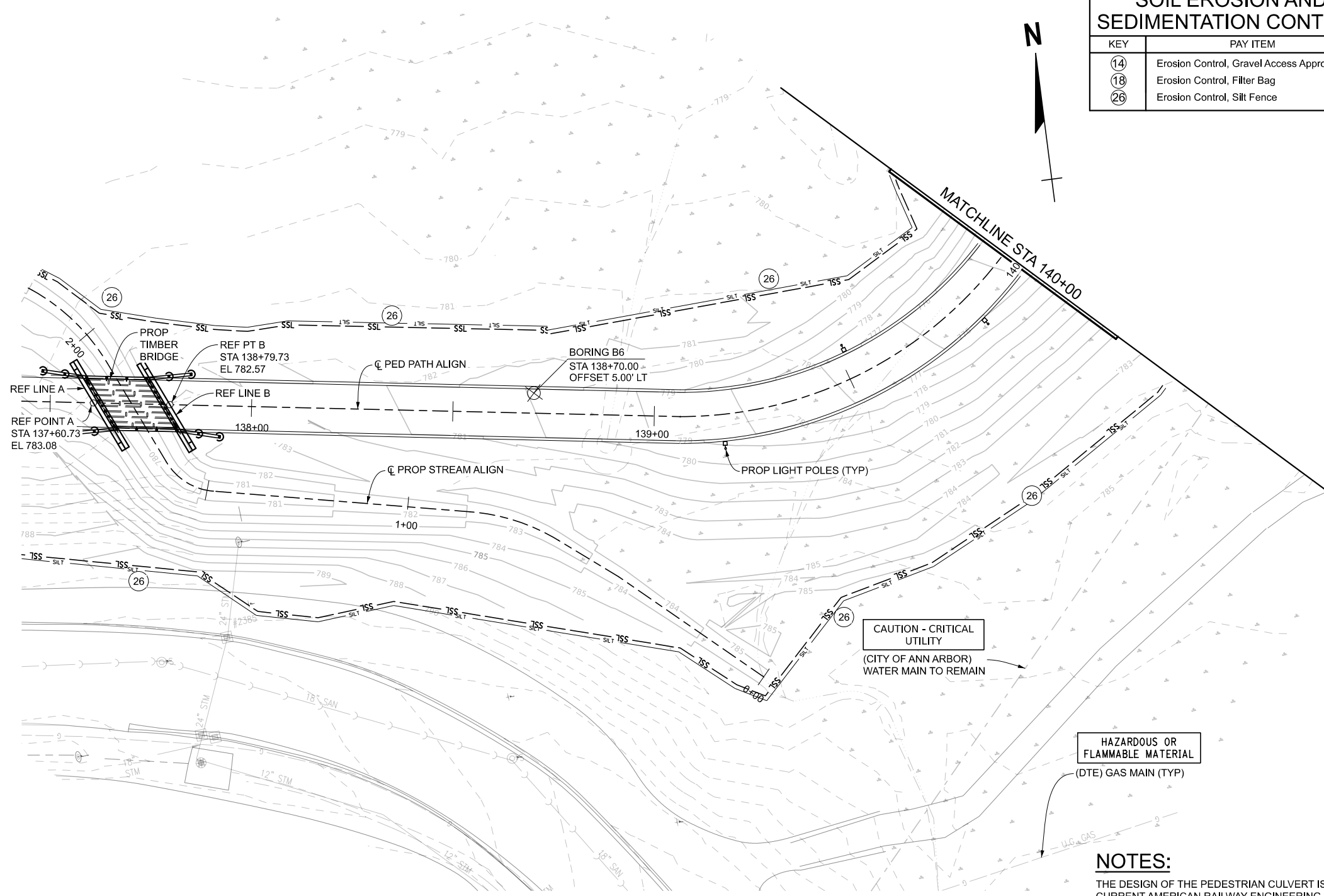
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**SOIL EROSION AND SEDIMENTATION CONTROL**

KEY	PAY ITEM
(14)	Erosion Control, Gravel Access Approach
(18)	Erosion Control, Filter Bag
(26)	Erosion Control, Silt Fence

**MISCELLANEOUS QUANTITIES**

150	Ft	Exploratory Investigation, Vertical
7060	Cyd	Non Haz Contaminated Material Handling and Disposal, LM
5050	Cyd	Backfill, Structure, CIP
5820	Cyd	Excavation, Fdn
1	LSUM	Dewatering System, Excavation
370	Syd	Aggregate Base, 12 inch
245	Syd	Geotextile, Separator, Non-Woven
81	Cyd	Culv Bedding, Box Culv
1	Ea	Elec Grounding System
160	Sft	Joint Waterproofing
20000	Dlr	Railroad Protection, Amtrak
800	Sft	Fence, Protective, Special
1	LSUM	Ltg for Night Work
1	LSUM	Railroad Track Monitoring
1	LSUM	Utility Work, Amtrak
1	LSUM	Utility Work, Lumen
100000	Dlr	Dewatering System for Contaminated Groundwater, Site



**PLAN**  
SHOWING EXISTING AND PROPOSED TOPOGRAPHY

**NOTES:**

THE DESIGN OF THE PEDESTRIAN CULVERT IS BASED ON THE CURRENT AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION SPECIFICATIONS, COOPERS E80 LOADING, AND 50 PERCENT OF THE SPECIFIED IMPACT. FOR ADDITIONAL DESIGN REQUIREMENTS, SEE SUBSECTION 406.03.A OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

WHEN CASTING ITEMS INTO STRUCTURAL PRECAST CONCRETE TO FACILITATE CULVERT CONSTRUCTION (FORMING, FINISHING, ETC.) USE ITEMS THAT ARE GALVANIZED IN ACCORDANCE WITH ASTM B633, SERVICE CONDITION 4 OR EPOXY COATED. INSERTS SHALL BE CAST WITH THE CULVERT.

WHERE UNSUITABLE SOIL IS ENCOUNTERED BENEATH FOUNDATIONS, IT SHALL BE REMOVED AND REPLACED WITH STRUCTURE BACKFILL, CIP COMPACTED TO 100 PERCENT IN THE LOAD BEARING AREA AS DESCRIBED IN THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. AN ESTIMATED AMOUNT IS INCLUDED IN THE QUANTITY FOR "BACKFILL STRUCTURE, CIP" AND EXCAVATION, FDN".

THE CULVERT MAXIMUM FACTORED FOUNDATION PRESSURE IS 4500 PSF. CULVERT AND WINGWALL DESIGNS MUST BE DESIGNED BY THE BOX CULVERT MANUFACTURER TO ACCOMMODATE THIS LIMIT.

THE ENTIRE AREA OF EXCAVATION AROUND THE CULVERT SHALL BE BACKFILLED WITH "BACKFILL, STRUCTURE, CIP".

IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID BOX CULVERT REINFORCEMENT WHEN DRILLING HOLES FOR MOUNTING THE ELECTRICAL CONDUIT, FENCING, AND AESTHETIC TREATMENT SUPPORTS.

JOINT FILLER AND JOINT MATERIALS ARE INCLUDED IN THE RESPECTIVE CONTRACT ITEMS FOR FURNISHING CULVERT MATERIALS.

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL, INCLUDED IN THE RESPECTIVE CONTRACT ITEMS OF THE CULVERT.

\* FIBER OPTIC LINES WILL REMAIN. CONTRACTOR TO TEMPORARILY SUPPORT THE FIBER OPTIC LINES WHILE EXCAVATING AND PLACING CULVERT. ONCE CULVERTS ARE IN PLACE, FIBER OPTIC OWNER WILL PLACE THE LINES INSIDE SPLIT STEEL CONDUIT.

THE RAILROAD WILL PERMIT THE CONTRACTOR TO UTILIZE THE MAINTENANCE OF WAY ON THE NORTH SIDE OF THE TRACKS FOR TRANSPORTING MATERIALS AND EQUIPMENT TO THE SITE WITH ACCESS AT LAKE SHORE DRIVE LOCATED 1/4 MILE TO THE SOUTHEAST. USE OF THE RW MUST BE COORDINATED WITH AMTRAK, REQUIRES FLAGGING, AND MAY HAVE RESTRICTIONS BASED ON AMTRAK OPERATIONS.

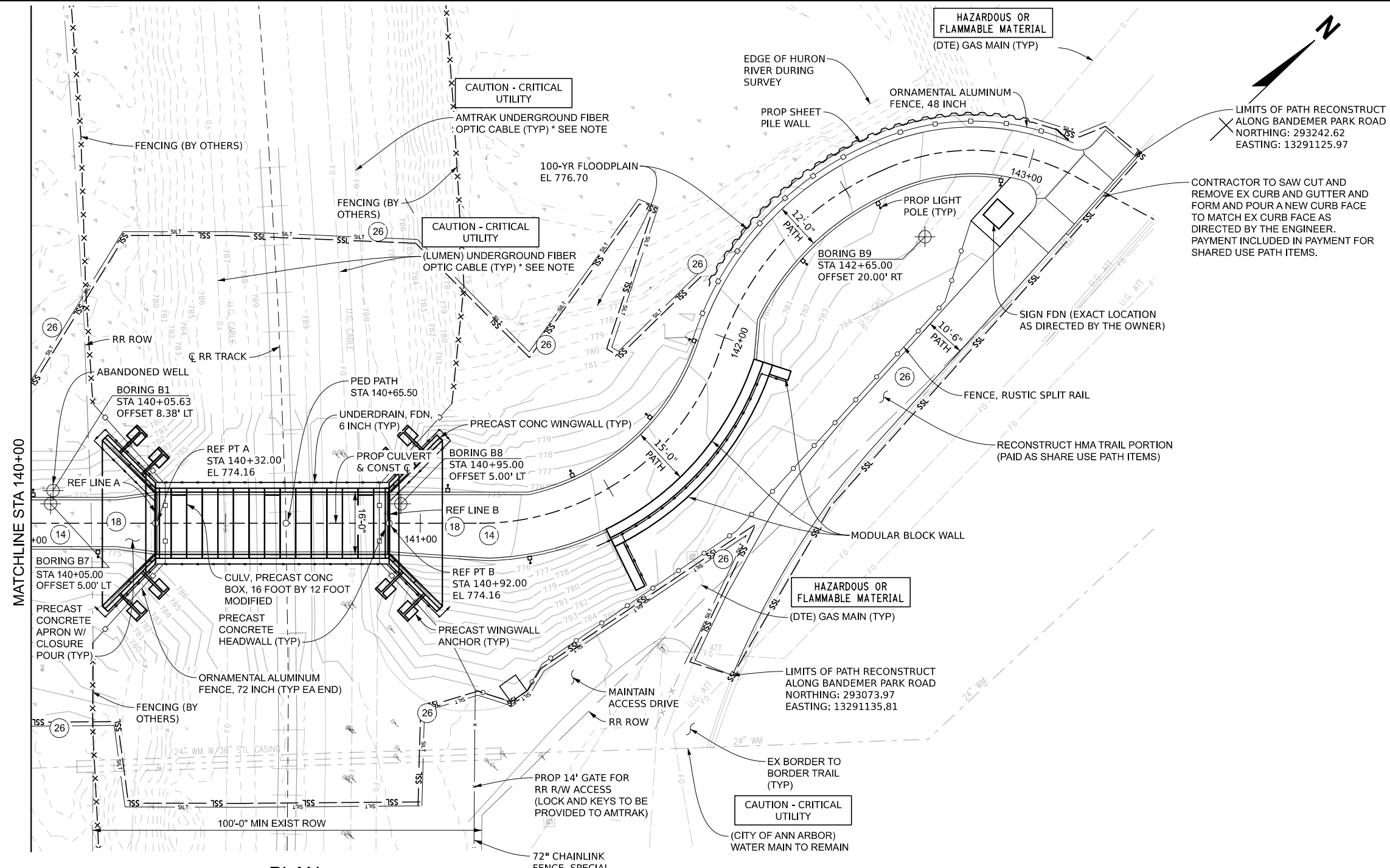
\\minervas\cadd\WCP\1015114.00 WCP\RC - Bandemer Barton Trail Design\4.0 Dwg\4.3 Bridge\xxxxx\_gpstr\_001.dgn

REVISIONS: CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR COUNTY: WASHTENAW CAD: JAH PROJ/MGR: JAH PROJ/ENR: JAH DATE: 4/12/2024

HORIZ. DATUM: NAD83 VERT. DATUM: NAVD83 SCALE: H: 1"=30' V: 1"=30' HORZ. (FT): 0 30 VERT. (FT): 0 30

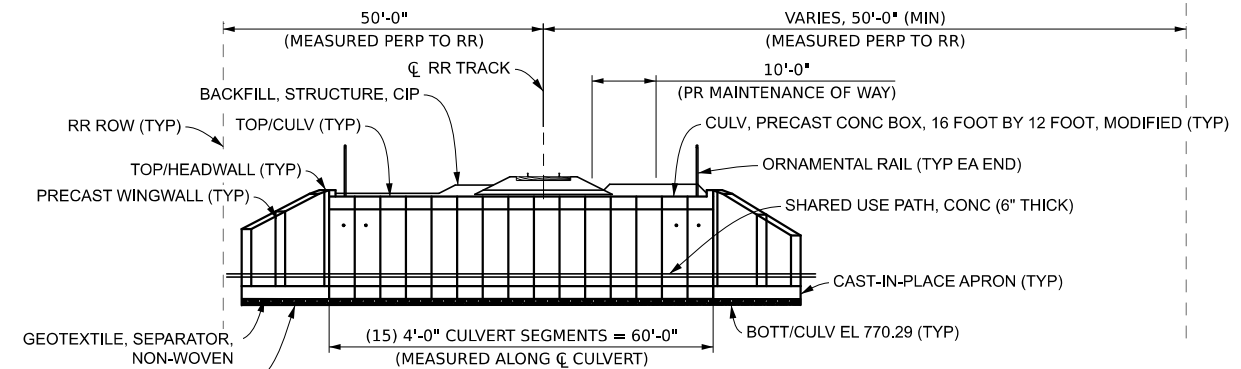
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
GENERAL PLAN OF STRUCTURE





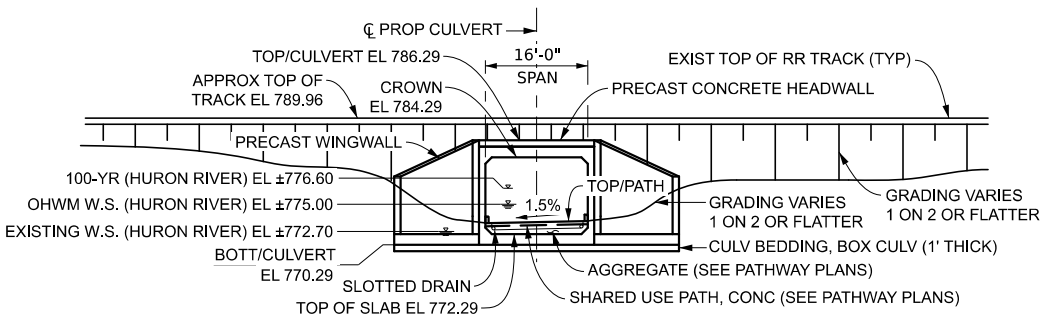
**PLAN**

SHOWING EXISTING AND PROPOSED TOPOGRAPHY



**ELEVATION**

(LOOKING UPSTATION)  
DIMENSIONING IS MEASURED ALONG PROPOSED CULVERT UNLESS OTHERWISE NOTED



**ELEVATION - END VIEW**

(LOOKING UPSTATION)

REVISIONS:

HORIZ DATUM:

SCALE:

CITY/VILLAGE/TOWNSHIP:

CAD:

PROJ/INR:

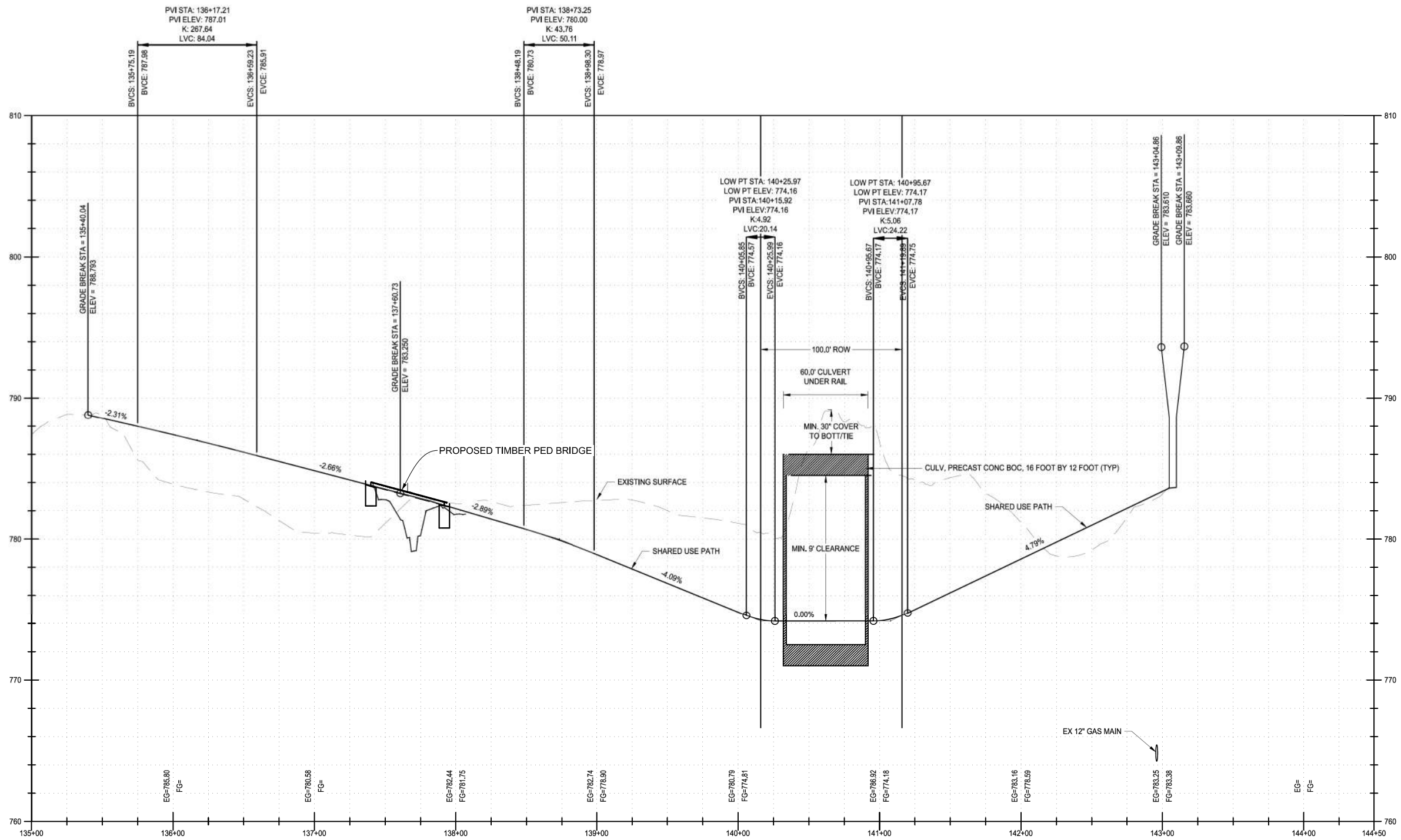
DATE:

SHEET:

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
GENERAL PLAN OF STRUCTURE

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**PROFILE THROUGH PROPOSED CULVERT**

1" = 8' VERTICAL  
1" = 80' HORIZONTAL

REVISIONS:

HORIZ. DATUM: NAVD83  
VERT. DATUM: NAVD83

SCALE: H: 1" = 50'  
V: 1" = 5'

CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH

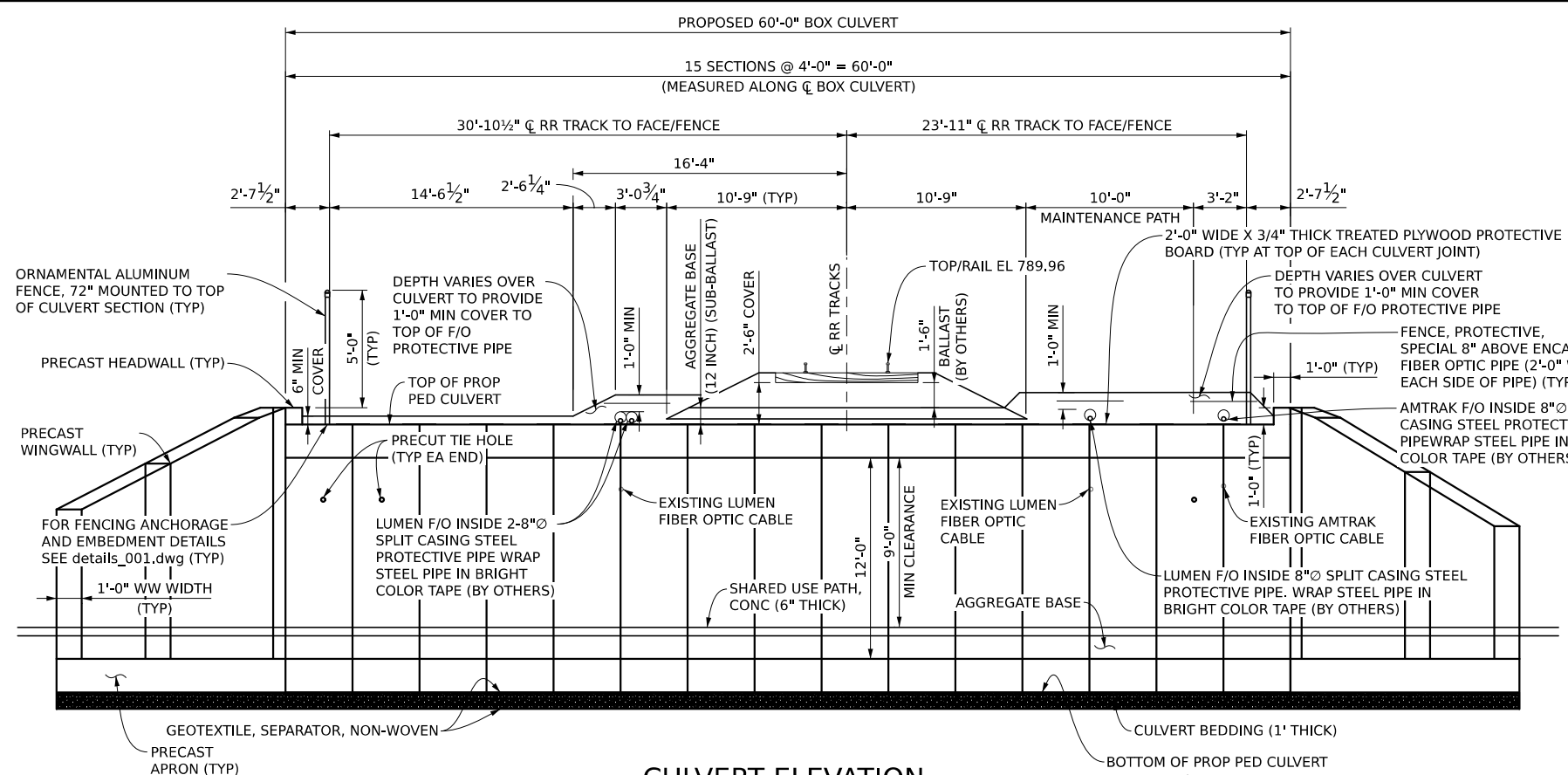
PROJECT NUMBER: JAH  
PROJECT NAME: CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

DATE: 4/12/2024

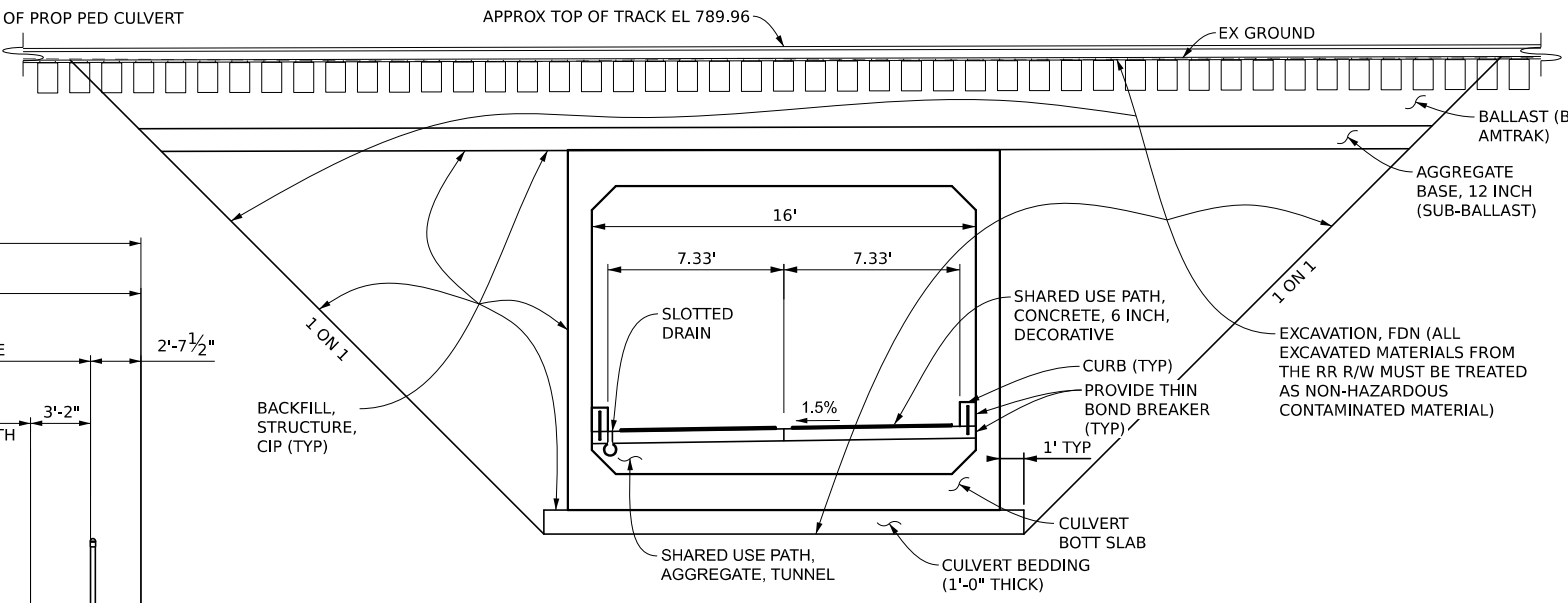
PROJ. LEADER: JAH  
PROJ. ENGINEER: JAH

GENERAL PLAN OF STRUCTURE

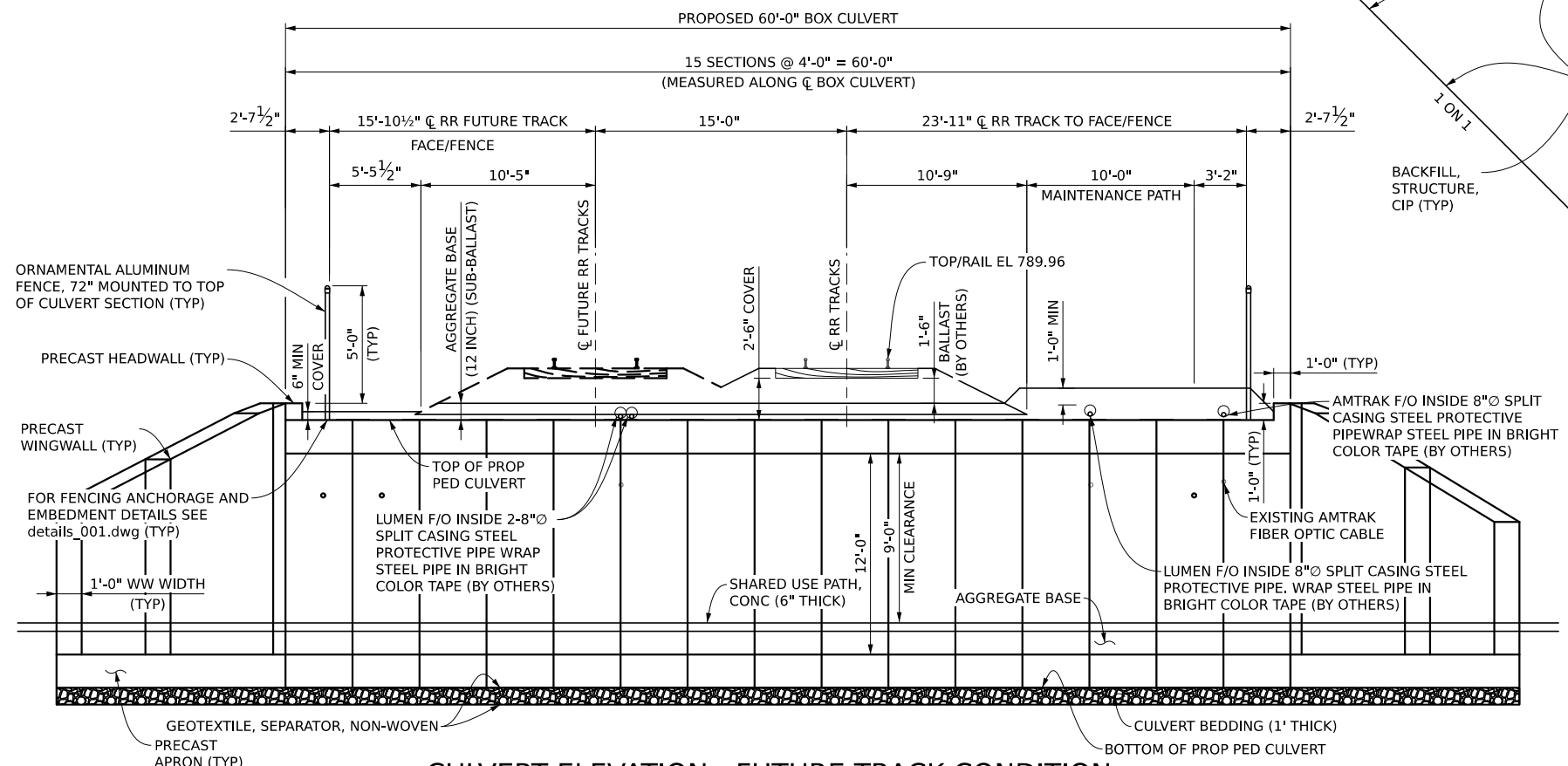
45 of 80



**CULVERT ELEVATION**  
(VIEW PERPENDICULAR TO CL BOX CULVERT)



**SECTION THRU BOX CULVERT**  
(LOOKING UPSTATION)



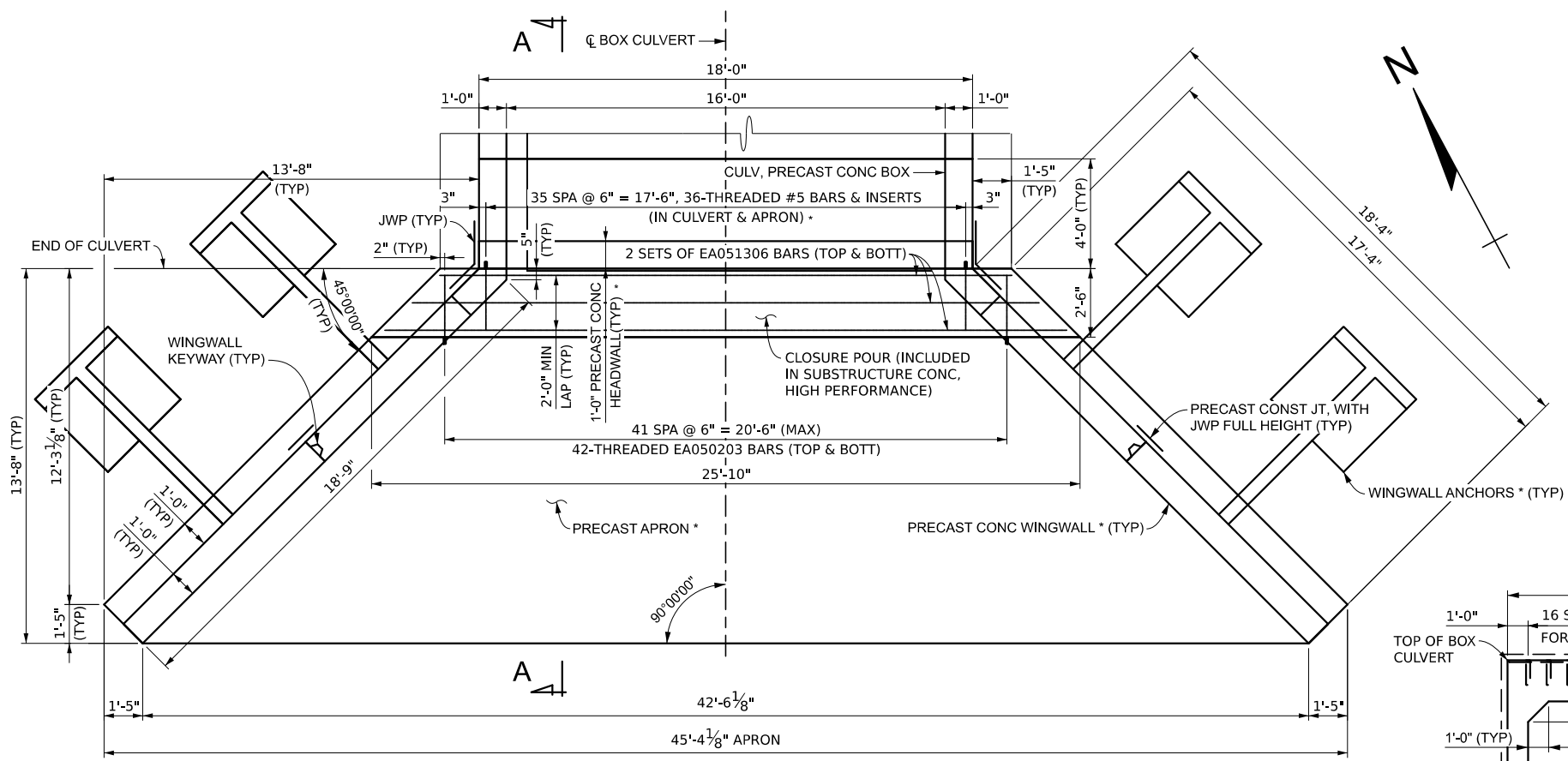
**CULVERT ELEVATION - FUTURE TRACK CONDITION**  
(VIEW PERPENDICULAR TO CL BOX CULVERT)

**NOTES:**  
THE DESIGN OF THE PEDESTRIAN CULVERT IS BASED ON THE CURRENT AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION SPECIFICATIONS, COOPERS E80 LOADING, AND 50 PERCENT OF THE SPECIFIED IMPACT. FOR ADDITIONAL DESIGN REQUIREMENTS, SEE SUBSECTION 406.03.A OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION

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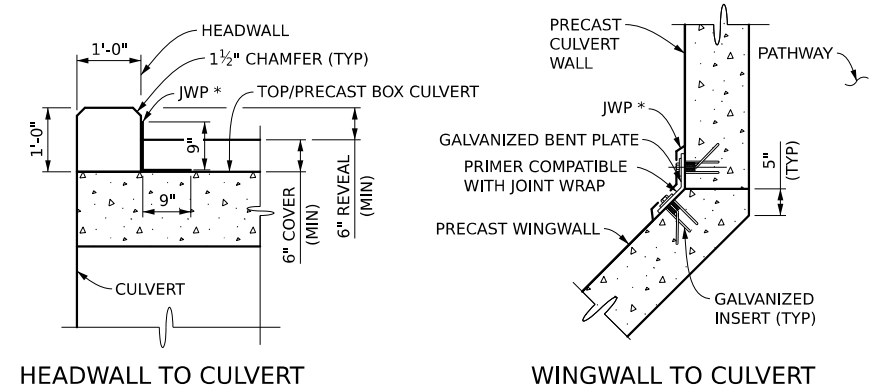
REVISIONS: DATE: 4/12/2024  
SCALE: 1" = 10'  
CITY/VILLAGE/TOWNSHIP: ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH  
PROJECT: JAH  
ENGINEER: JAH  
PROJ NUMBER: JAH  
SHEET: 46 OF 80

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
GENERAL PLAN OF STRUCTURE



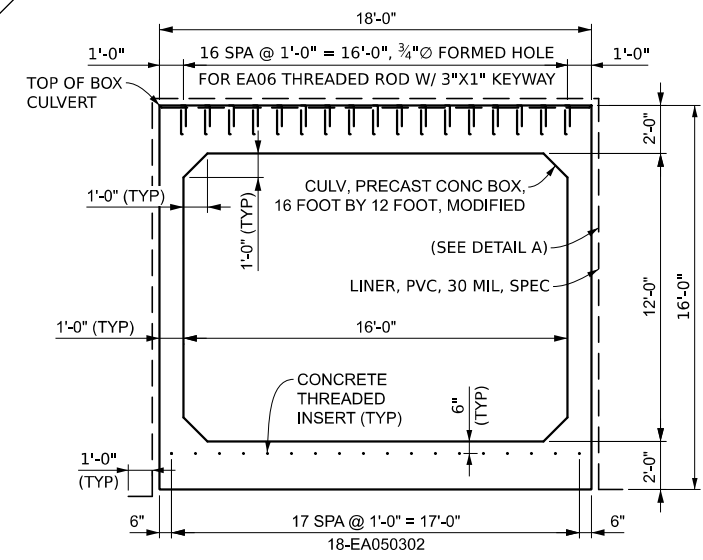
**CULVERT END PLAN**

\* INCLUDED IN "CULV, PRECAST CONC BOX, 16 FOOT BY 12 FOOT, MODIFIED" (TYP)

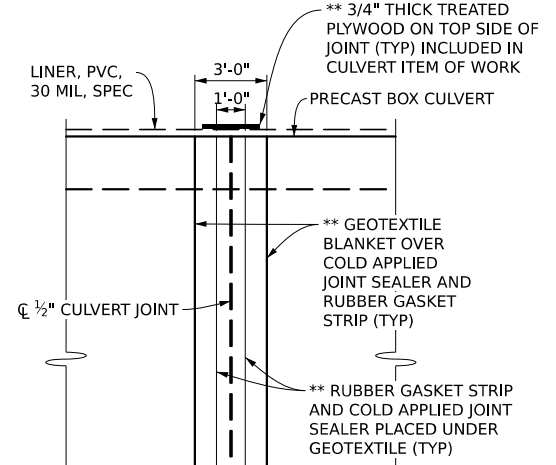


**CONNECTION DETAILS**

\* 18" WIDE JOINT WATERPROOFING TO COVER THE JOINT BETWEEN THE HEADWALL, WINGWALL, AND THE CULVERT (ENTIRE LENGTH)



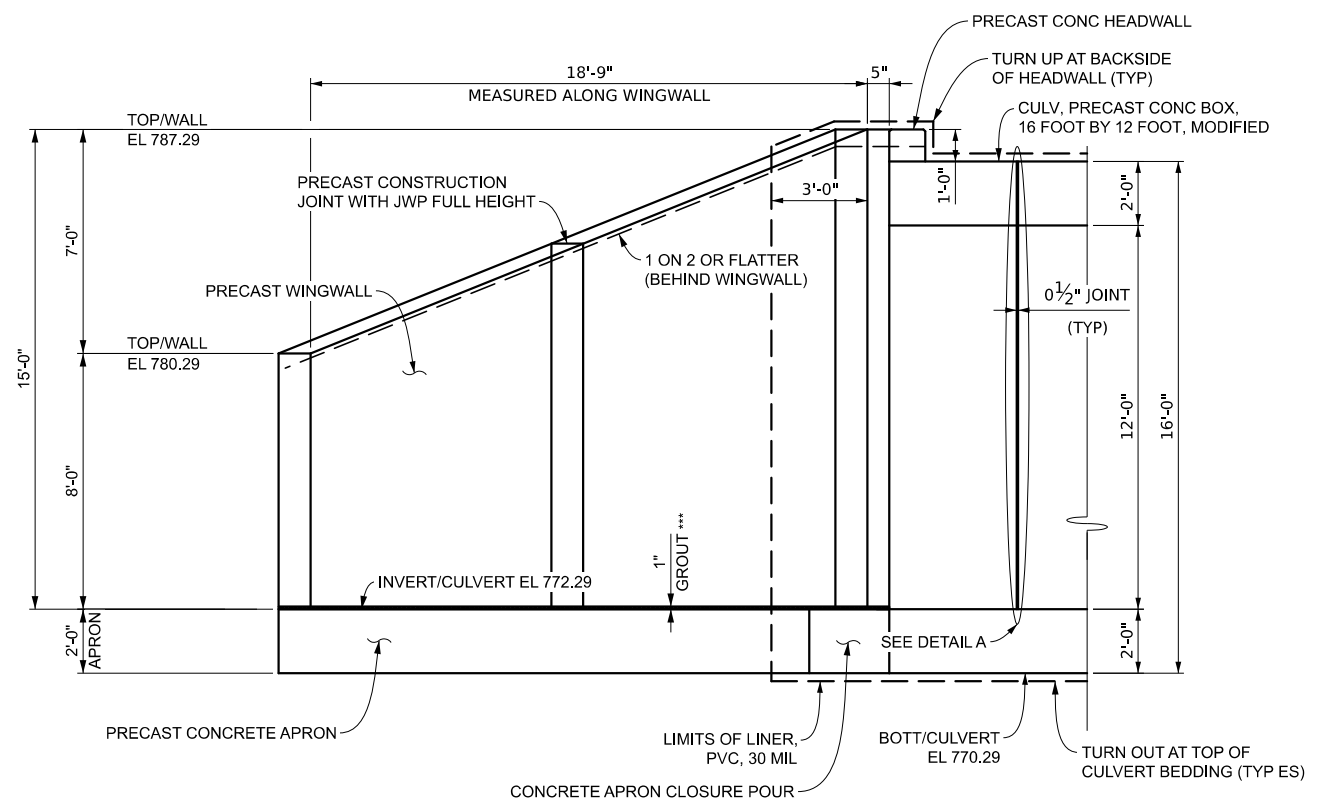
**END CULVERT ELEVATION**



**DETAIL A**

(TYPICAL ELEVATION AT CULVERT JOINT)

\*\* THESE ITEMS WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE PAY ITEM "CULV, PRECAST CONC BOX, 16 FOOT BY 12 FOOT, MODIFIED"

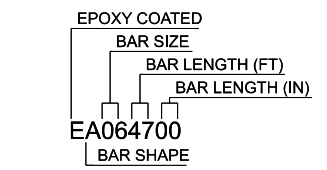


**SECTION A-A**

(TYP ALL QUADRANTS)

\*\*\* WINGWALL GROUT SUPPLIED WITH PRECAST WINGWALLS INCLUDED IN "CULV, PRECAST CONC BOX, 16 FOOT BY 12 FOOT, MODIFIED" (TYP)

CLOSURE	BAR	DIMENSIONS										NO REQ'D	TOTAL WEIGHT
		A	B	C	D	E	F	G	H	J			
	EA050203	2'-3"										168	395
	EA051306	13'-6"										24	338
TOTAL REINFORCEMENT:												733	



**BAR LEGEND**

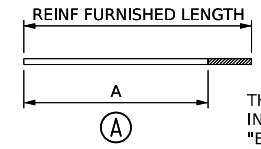
MISCELLANEOUS QUANTITIES		
60	Ft	Culv, Precast Conc Box, 16 foot by 12 foot
733	Lb	Reinforcement, Steel, Epoxy Coated
9	Cyd	Substructure Conc, High Performance
415	Syd	Liner, PVC, 30 mil

**NOTES:**

FOR BEVEL AND MOLDING DETAILS, SEE STANDARD PLAN B-103.

APPLY LOW TEMPERATURE PROTECTION OF CONCRETE ACCORDING TO SECTION 706.03 J. OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. LOW TEMPERATURE PROTECTION OF CONCRETE IS INCLUDED IN RELATED ITEMS OF WORK.

FOR THE PURPOSE OF PLAN DEVELOPMENT, PRECAST CONCRETE BOX CULVERT TOP AND BOTTOM FLANGES HAS BEEN ASSUMED TO BE 12 INCHES THICK, AND THE SIDE WALLS HAVE BEEN ASSUMED TO BE 12 INCHES THICK. IF THE CULVERT THICKNESS MUST VARY FROM THIS ASSUMPTION THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

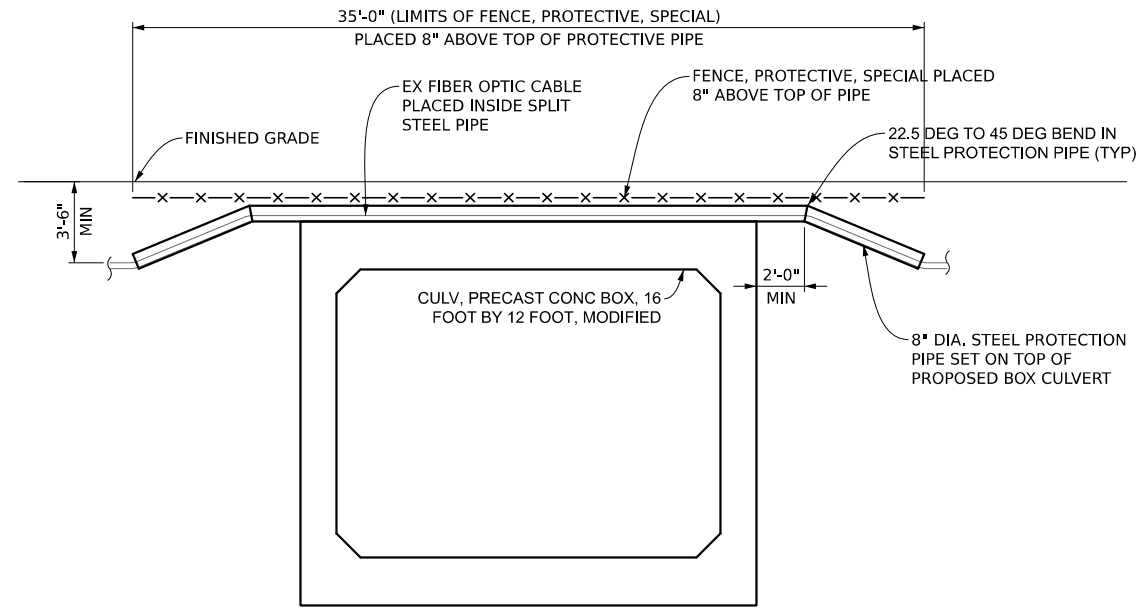


THREADING OF REINFORCEMENT INCLUDED IN THE BID ITEM "ENFORCEMENT STEEL, EPOXY COAT"

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REVISIONS: DATE: 4/12/2024 PROJECT: CITY OF ANN ARBOR, WASHINGTON COUNTY, WA... SHEET: 47 OF 80

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
BOX CULVERT DETAILS



**FIBER OPTIC CABLE OVER CULVERT DETAIL**

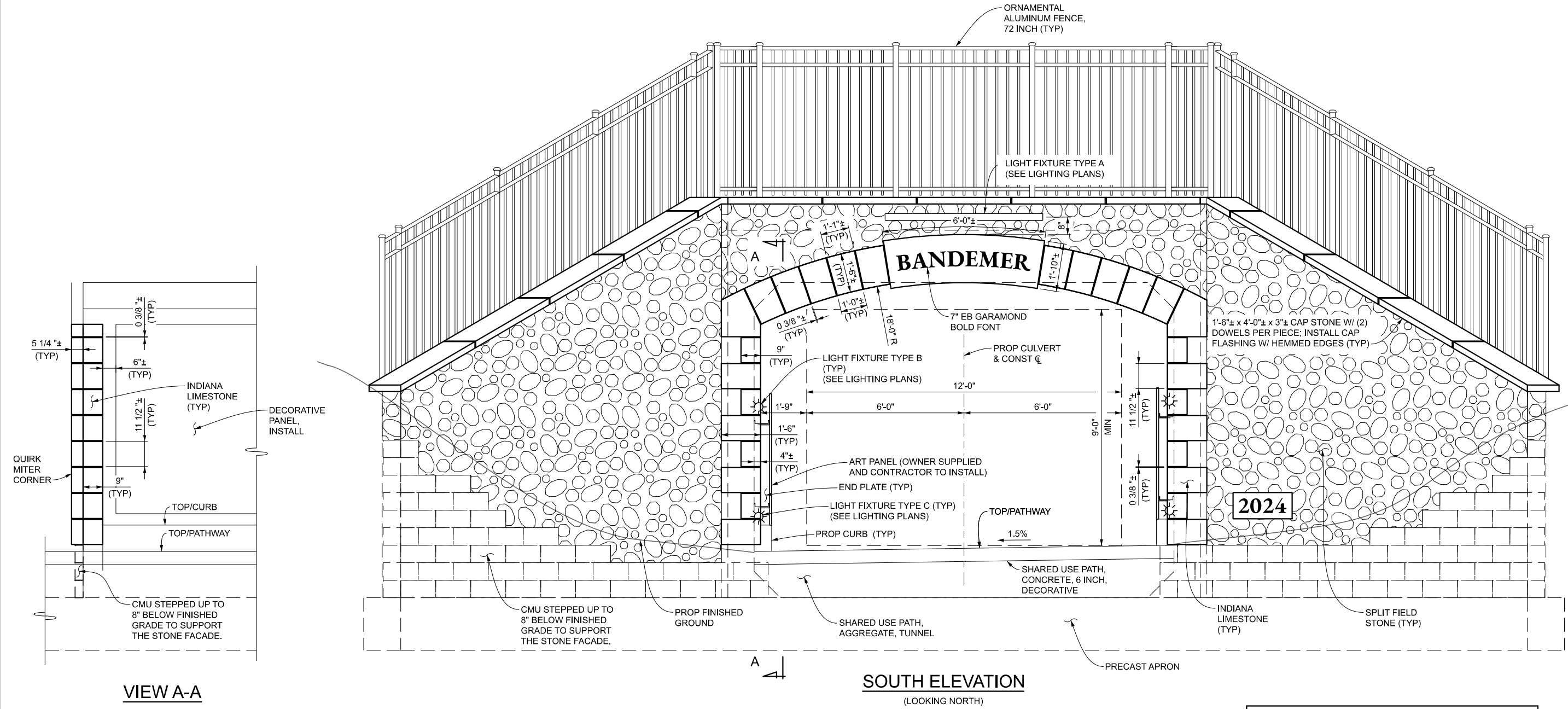
REVISIONS:

DATE: 4/12/2024  
PROJ NUMBER: 015514.00  
PROJ NAME: BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH

SCALE: H: 1" = 6'  
V: 1" = 6'

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

BOX CULVERT DETAILS

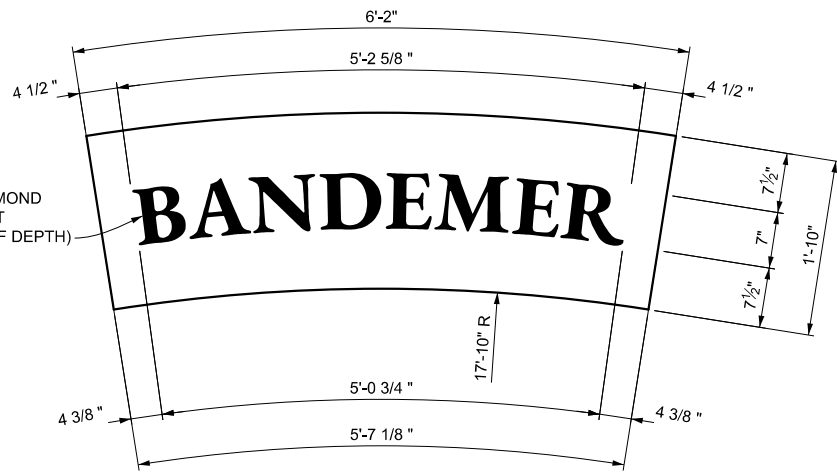


MISCELLANEOUS QUANTITIES		
117	Ft	Limestone Cap
132	Sft	Limestone Block
637	Sft	Split Field Stone
1	Ea	Limestone Sign, "Bandemer"
1	Ea	Limestone Sign, "Barton"
2	Ea	Limestone Sign, "2024"

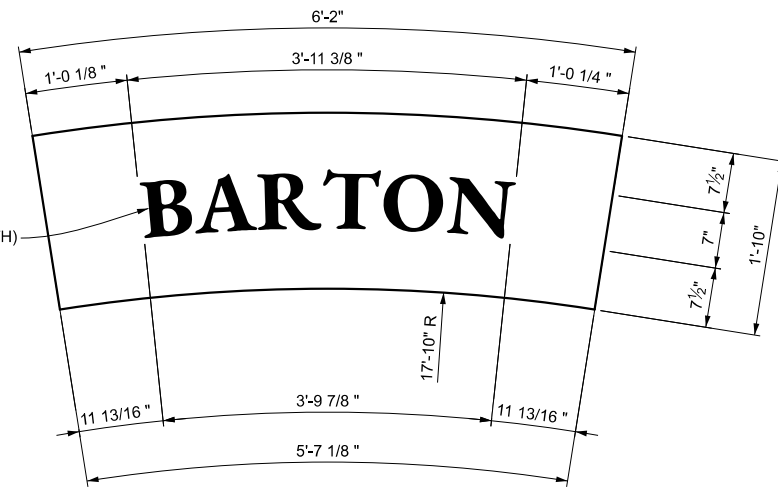
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SHEET: 49 of 80  
 PROJECT: CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 CITY OF ANN ARBOR  
 COUNTY: WASHTENAW  
 CADD: JAH  
 PROJ: JAH  
 DATE: 4/12/2024

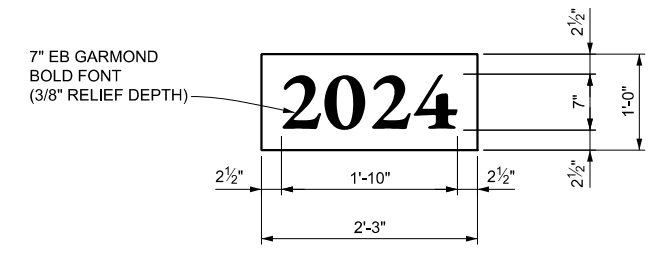
AESTHETIC TREATMENT DETAILS  
 BARTON/BANDEMERE PARK PEDESTRIAN TUNNEL PROJECT  
 CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 SCALE: 1" = 4'  
 REVISIONS:



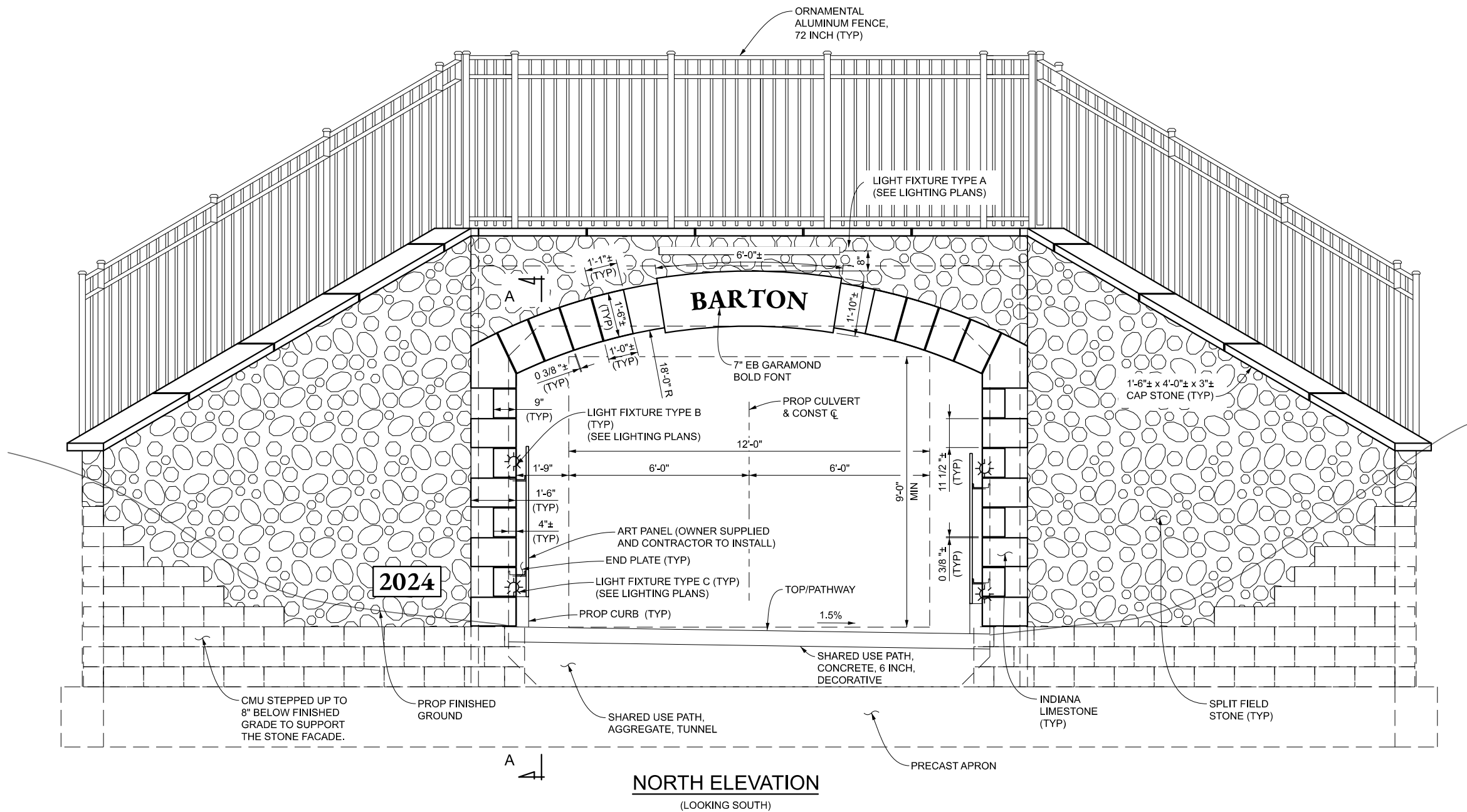
**BANDEMER STONE DETAIL**



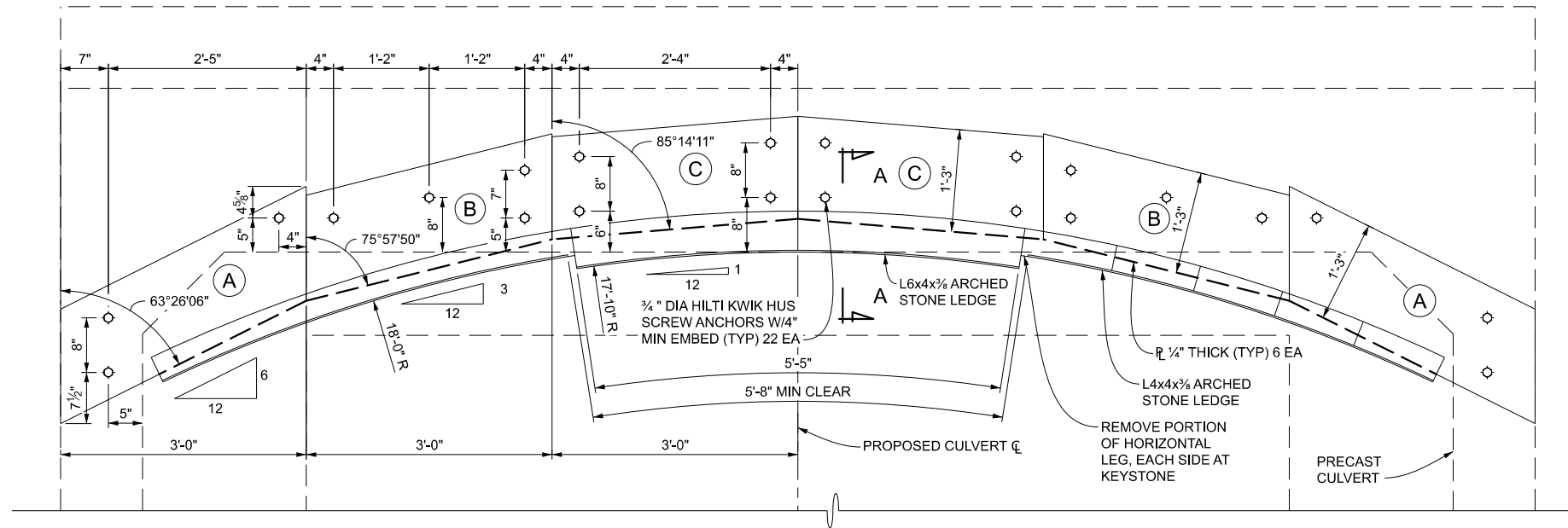
**BARTON STONE DETAIL**



**2024 STONE DETAIL**

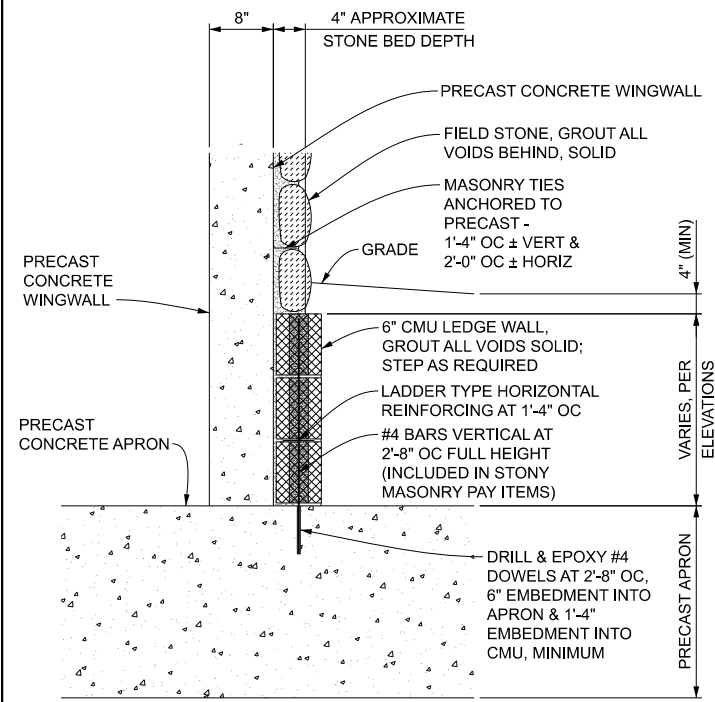


**NORTH ELEVATION**  
(LOOKING SOUTH)

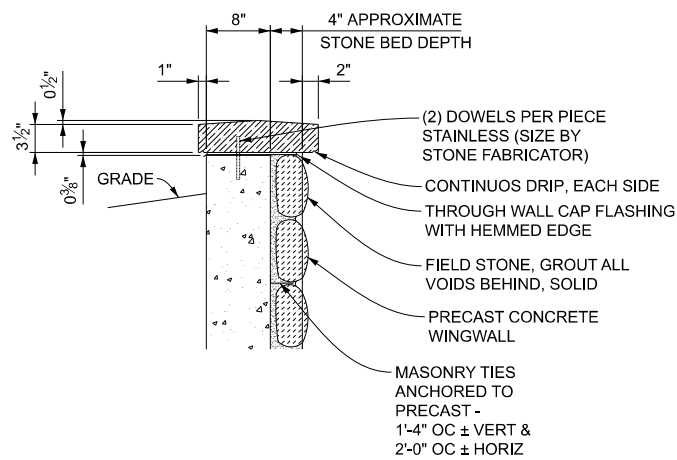


**LINTEL PLATE DETAIL ELEVATION**

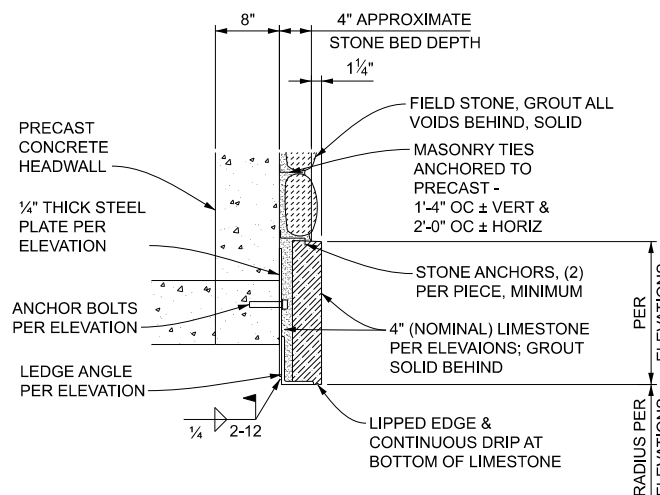
STONE LEDGE, PLATES AND ANCHORS ARE SYMMETRICAL ACROSS CULVERT CENTERLINE



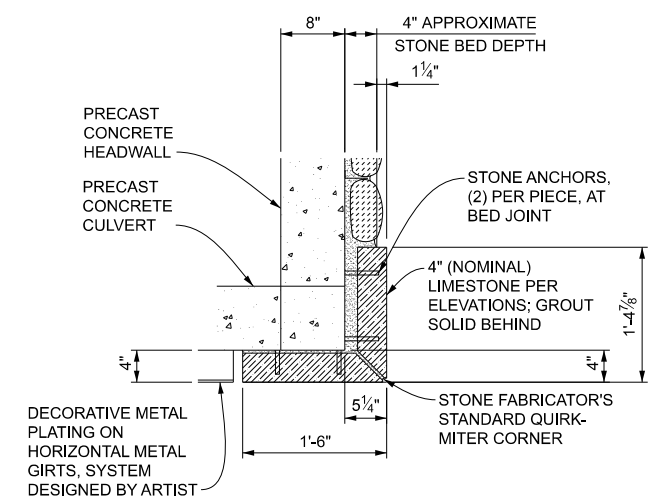
**BASE DETAIL**



**CAP DETAIL**



**SECTION A-A LINTEL DETAIL**



**JAMB DETAIL**

**NOTES:**  
NOTCH BACK OF STONE AS REQUIRED BY STEEL PLATE AND ANCHORS  
ALL STEEL IS TO BE GALVANIZED AND POWDERED COATED BLACK

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REVISIONS

NO. 0

DATE

BY

NO.

NO.

NO.

NO.

NO.

NO.

NO.

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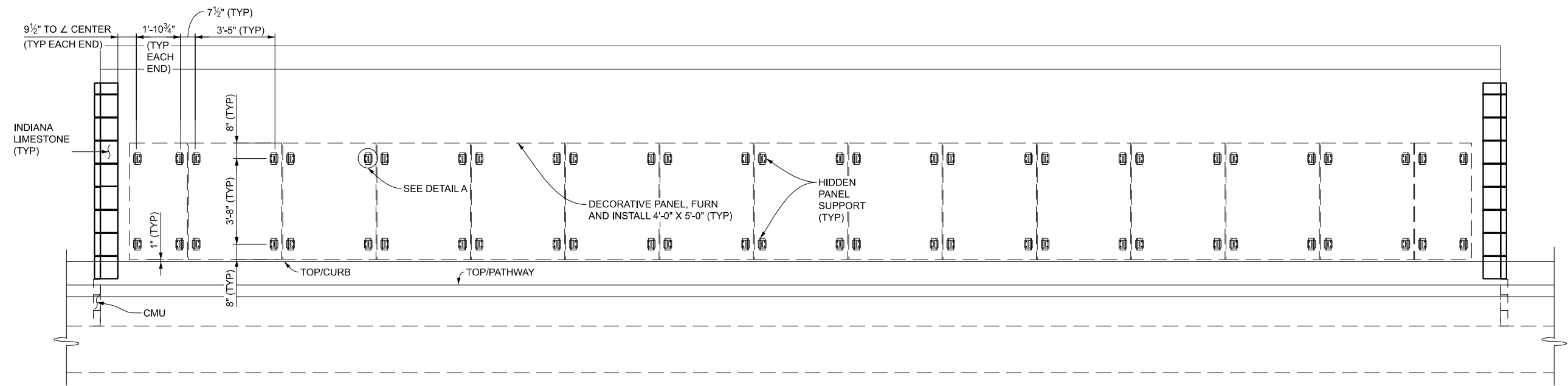
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NO.



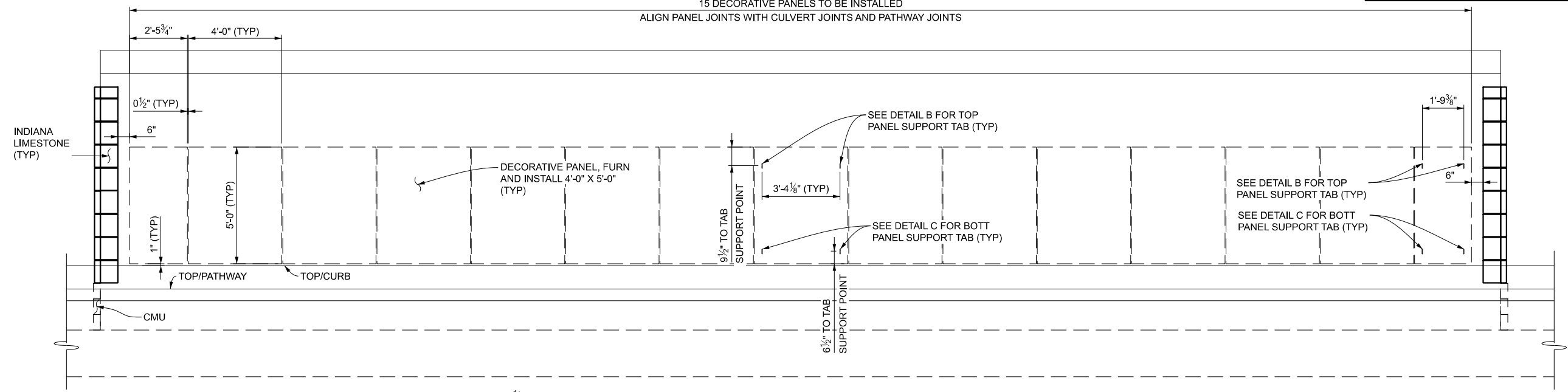


**ELEVATION INSIDE TUNNEL - SHOWING PANEL SUPPORTS**

TYPICAL EACH SIDE OF THE TUNNEL (LIGHTING NOT SHOWN)  
COORDINATE DETAILS SO CULVERT JOINTS ARE LOCATED AT JOINTS BETWEEN ADJACENT PANELS.

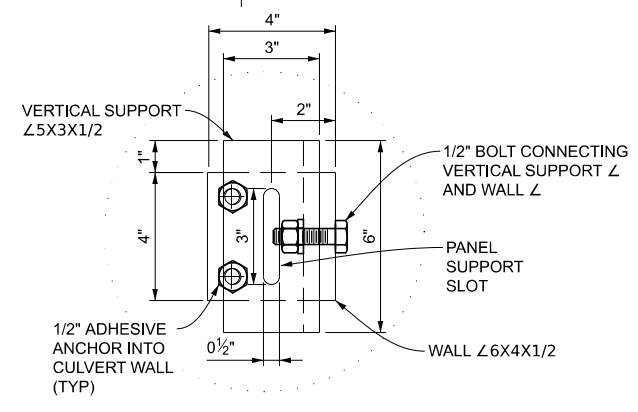
MISCELLANEOUS QUANTITIES		
1	LSUM	Decorative Panel, Install
100000	Dir	Decorative Panel, Furn

15 DECORATIVE PANELS TO BE INSTALLED  
ALIGN PANEL JOINTS WITH CULVERT JOINTS AND PATHWAY JOINTS

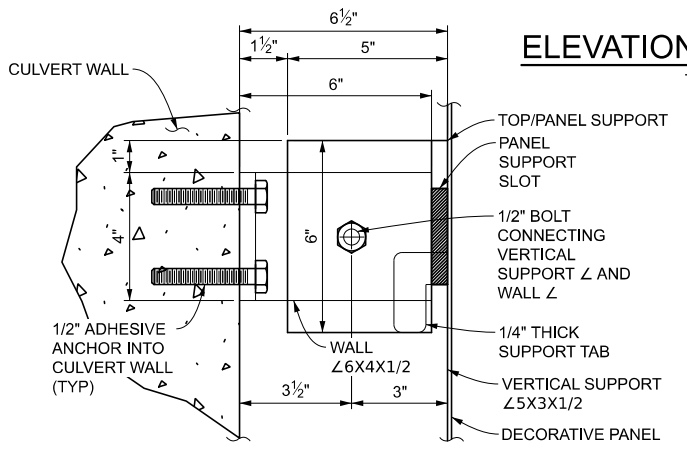


**ELEVATION INSIDE TUNNEL - PANELS INSTALLED**

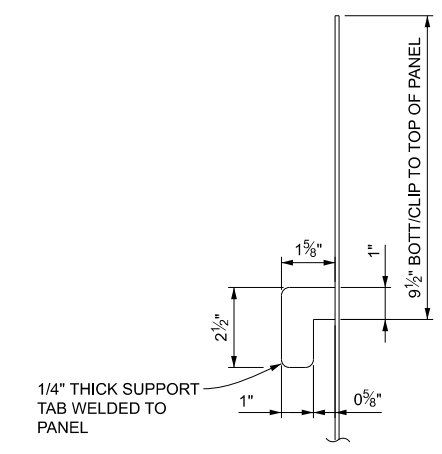
TYPICAL EACH SIDE OF THE TUNNEL (LIGHTING NOT SHOWN)



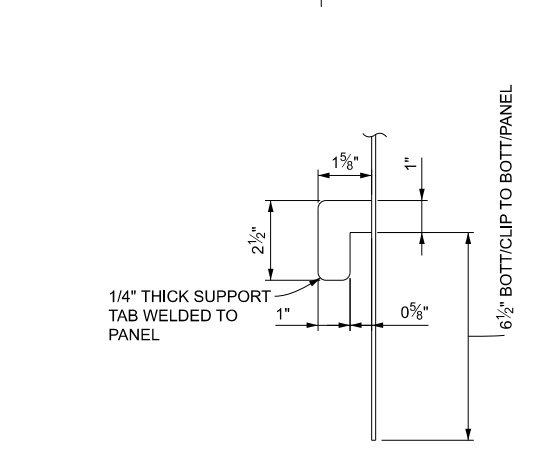
**DETAIL A**



**SECTION THRU WALL**



**DETAIL B**

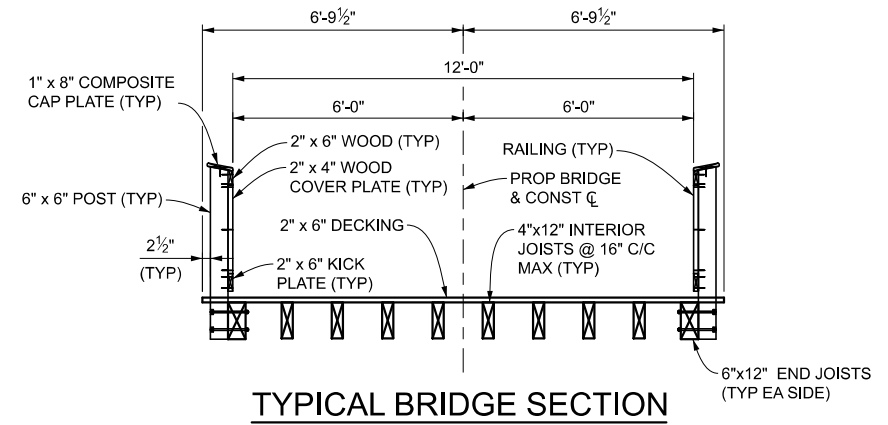
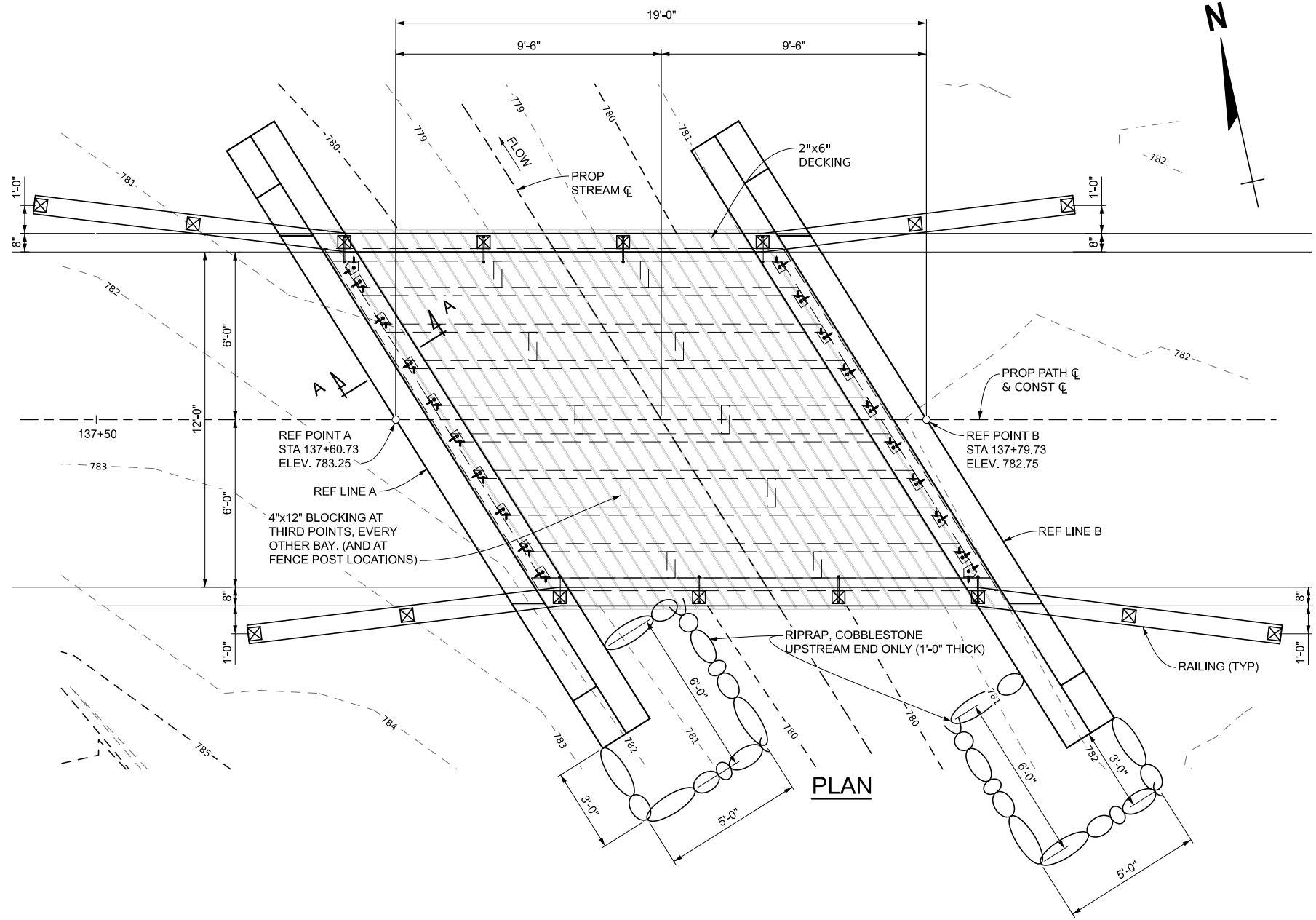


**DETAIL C**

REVISIONS: \_\_\_\_\_  
 HORZ. DATUM: \_\_\_\_\_  
 VERT. DATUM: \_\_\_\_\_  
 SCALE: \_\_\_\_\_  
 CITY/VILLAGE/TOWNSHIP: \_\_\_\_\_  
 COUNTY: \_\_\_\_\_  
 CAD: \_\_\_\_\_  
 PROJ. NO.: \_\_\_\_\_  
 PROJ. NAME: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 SHEET: \_\_\_\_\_

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 AESTHETIC TREATMENT DETAILS

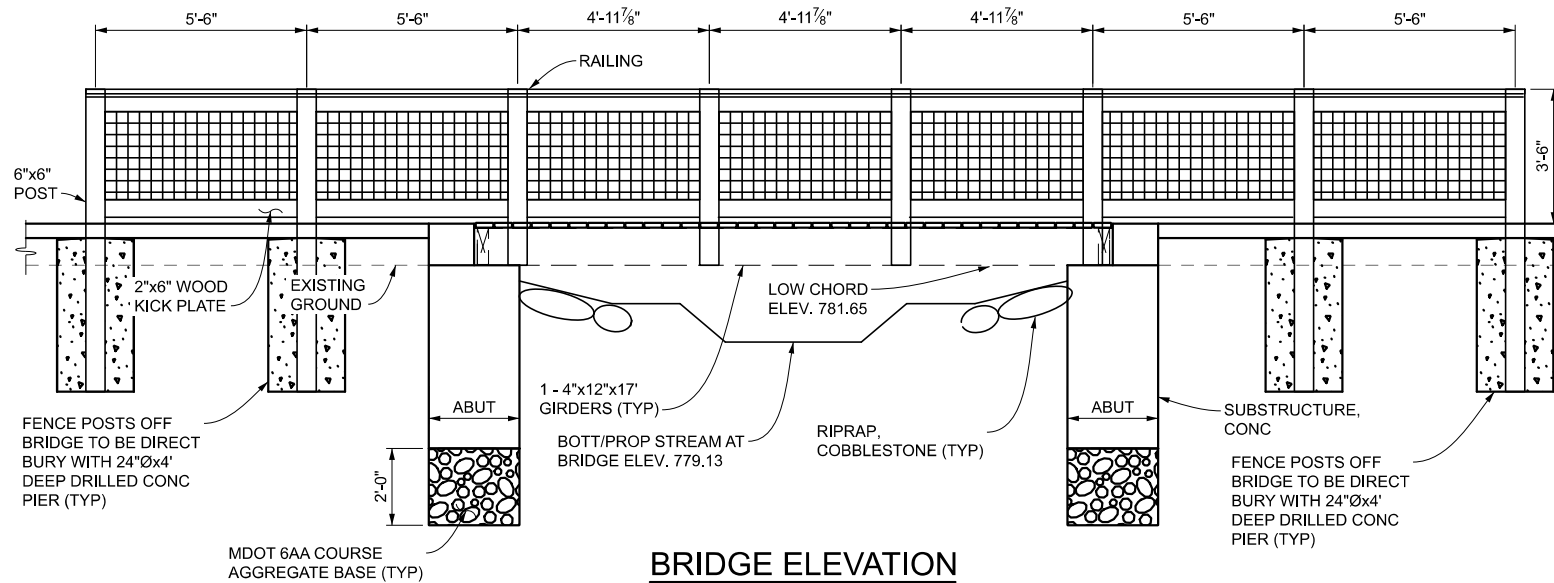
O:\WCP\015514.00 WCP\PC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_details\_006.dgn



REINFORCEMENT SCHEDULE (ABUT A & B)					
BAR MARK	"a"	"b"	"c"	NO.	WT.
EA041602	16'-2"			4	43
EA042002	20'-2"			4	54
ED040510	2'-7"	8"	2'-7"	40	156
EA062411	24'-11"			20	749
ED061102	4'-9"	1'-8"	4'-9"	25	420
ED061202	5'-3"	1'-8"	5'-3"	25	457
				<b>TOTAL:</b>	<b>1879</b>

### MISCELLANEOUS QUANTITIES

8	Cyd	Aggregate, 6A
1879	Lb	Reinforcement, Steel, Epoxy Coated
27	Cyd	Substructure Conc, High Performance
1	LSUM	Timber Bridge
4	Syd	Riprap, Cobblestone



### NOTES:

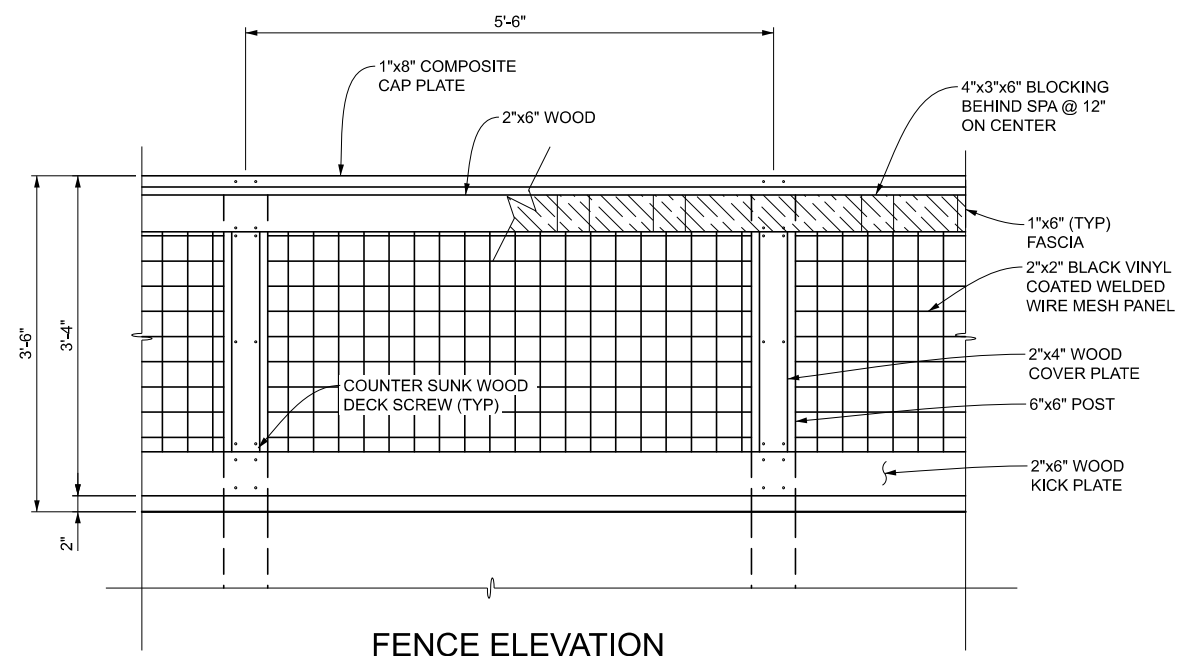
ALL TIMBER (EXCEPT THAT NOTED AS COMPOSITE) SHALL BE SOUTHERN YELLOW PINE #2 OR BETTER AND PRESSURE TREATED TO 0.23 PCF (GROUND CONTACT RATED) WITH MCA.

ALL COMPOSITE MATERIAL SHALL BE TREX, TIMBER TECH OR APPROVED EQUIVALENT. COORDINATE COLOR WITH ENGINEER.

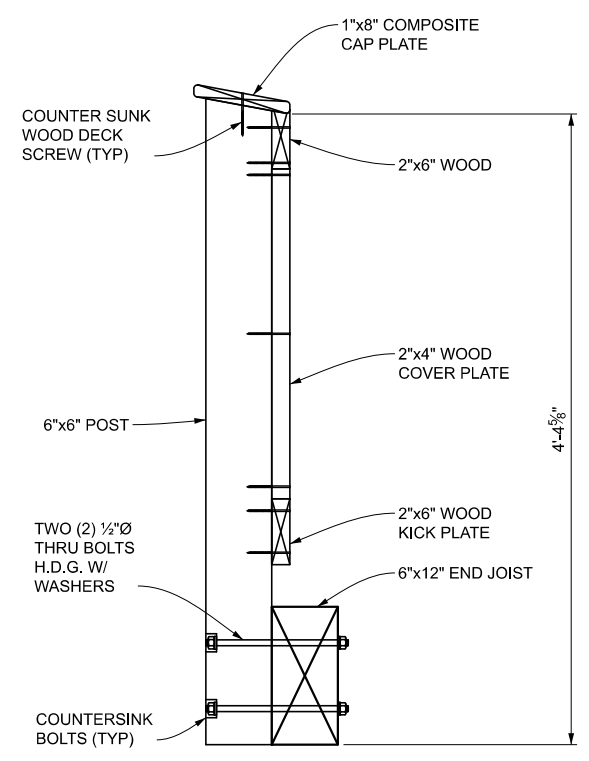
ALL STEEL FASTENERS SHALL BE HOT DIPPED GALVANIZED. COUNTER SINK ALL SCREW CONNECTIONS 1/4".

2"(H) X 2"(V) 16 GAUGE BLACK VINYL COATED WELDED WIRE STEEL MESH PANEL SET IN A WOODEN FRAME. (COVER ALL SHARP ENDS OF MESH PANEL WITH WOODEN FRAMING MEMBERS). CONTRACTOR SHALL PROVIDE SHOP DRAWINGS.

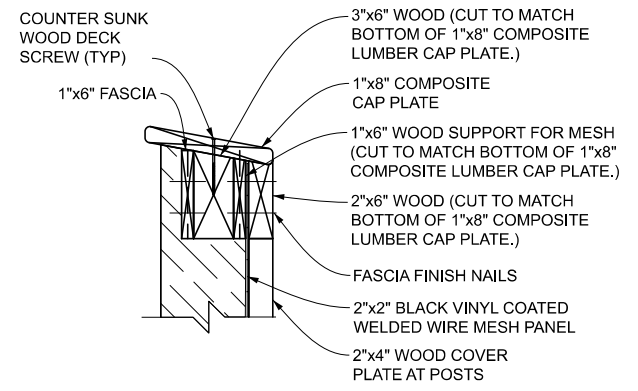
BENT PLATES SHALL BE HOT DIPPED GALVANIZED AFTER BENDING AND DRILLING OF HOLES.



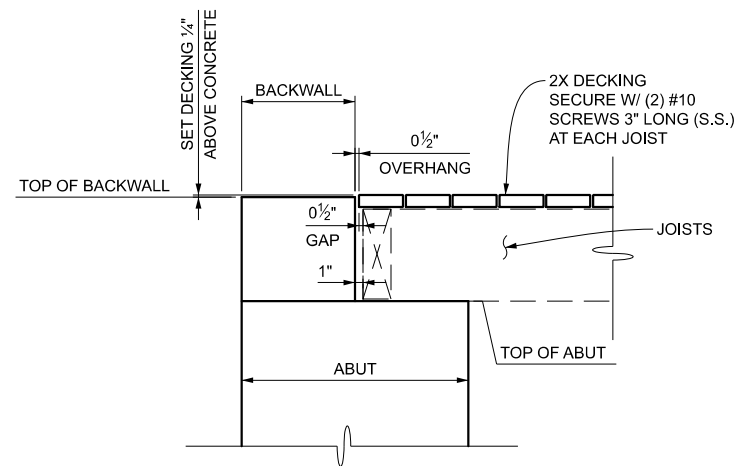
**FENCE ELEVATION**



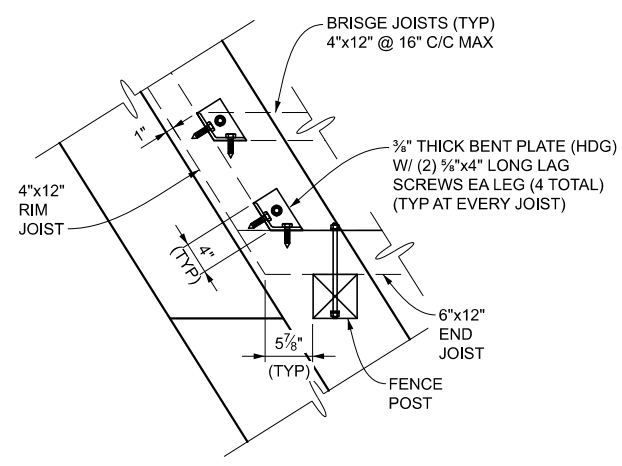
**FENCE SECTION AT POST**



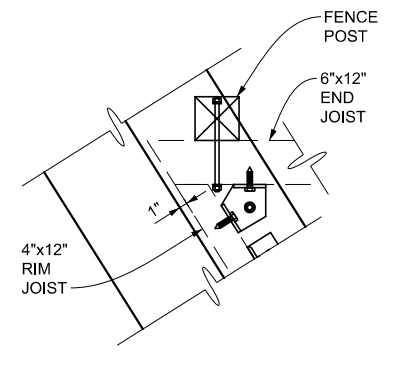
**RAILING CAP DETAIL**



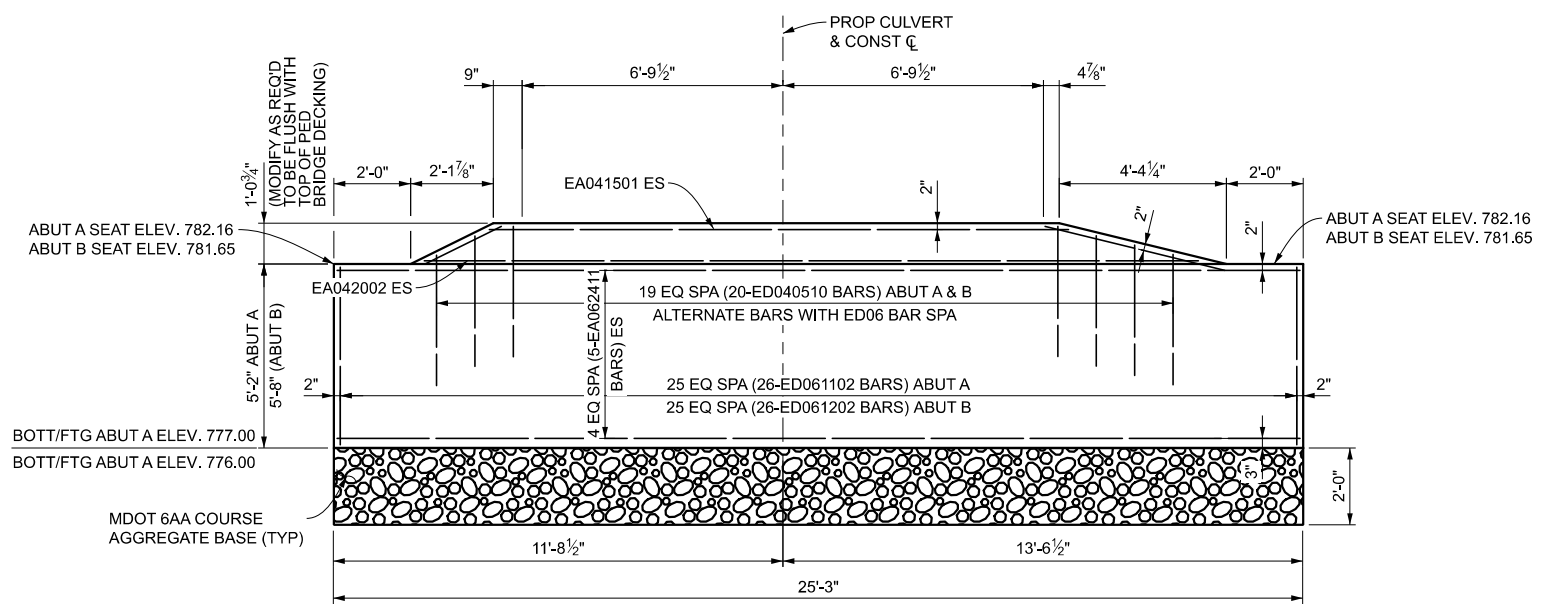
**SECTION A-A**



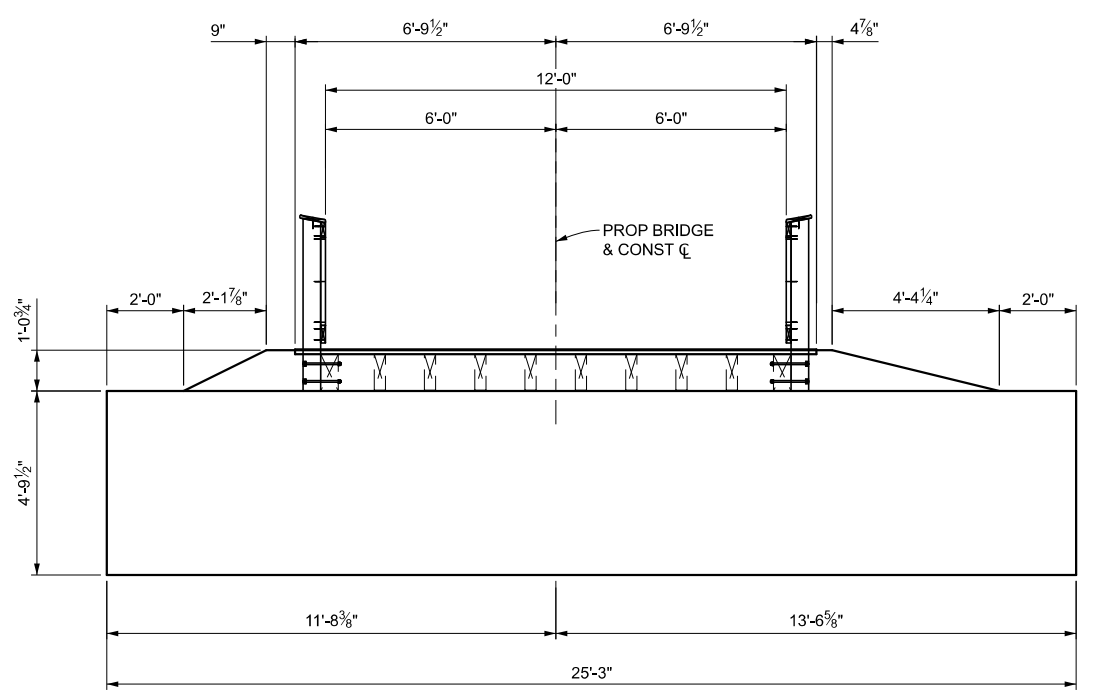
**BASE PLATE AT LAST BAY (OBTUSE ANGLE)**



**BASE PLATE AT LAST BAY (ACUTE ANGLE)**



**ABUTMENT ELEVATION**

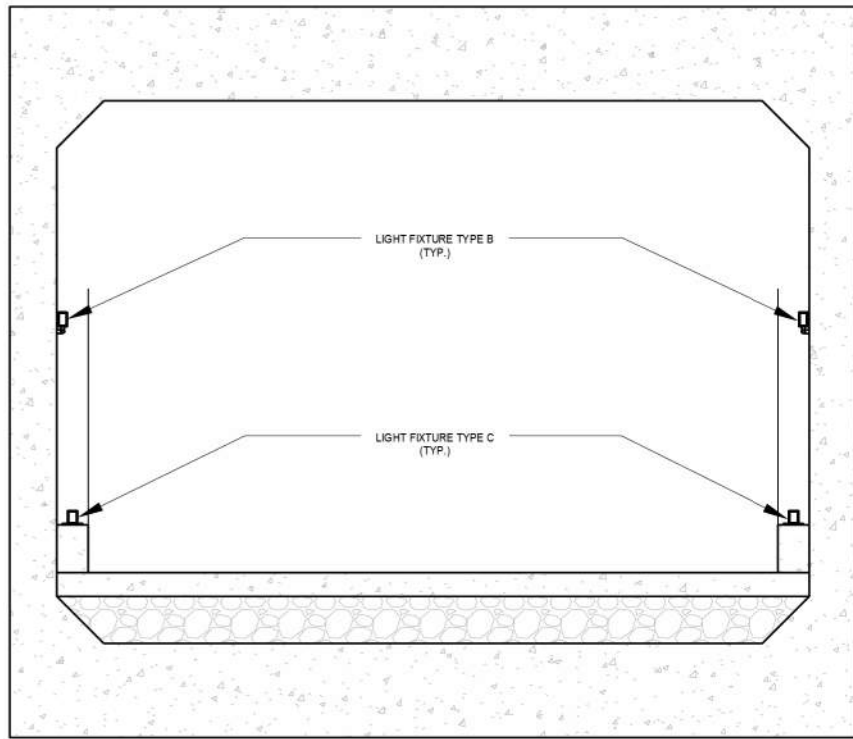


**TYPICAL ABUTMENT SECTION**

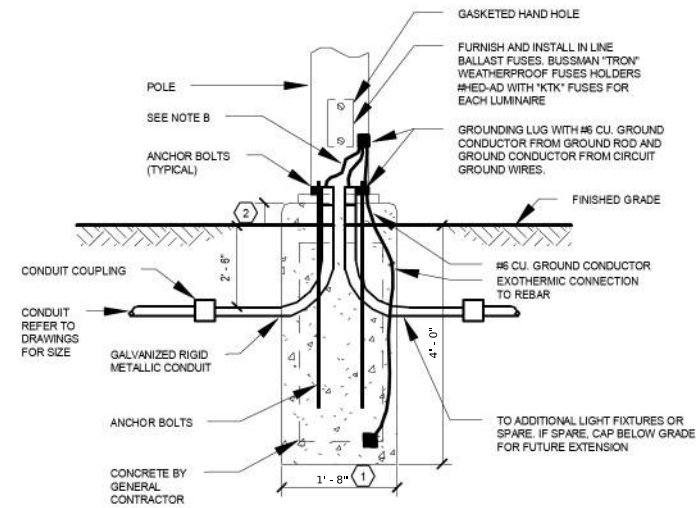
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SHEET NO. PROJECT NO. DATE 4/7/2024 PROJ. NO. PROJ. MGR. JAH CAD. COUNTY WASHTENAW CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR SCALE 1/8"=1'-0" REVISIONS: N/A

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
PEDESTRIAN TIMBER BRIDGE DETAILS



**2 TUNNEL SECTION**  
SCALE: 1/4" = 1'-0"



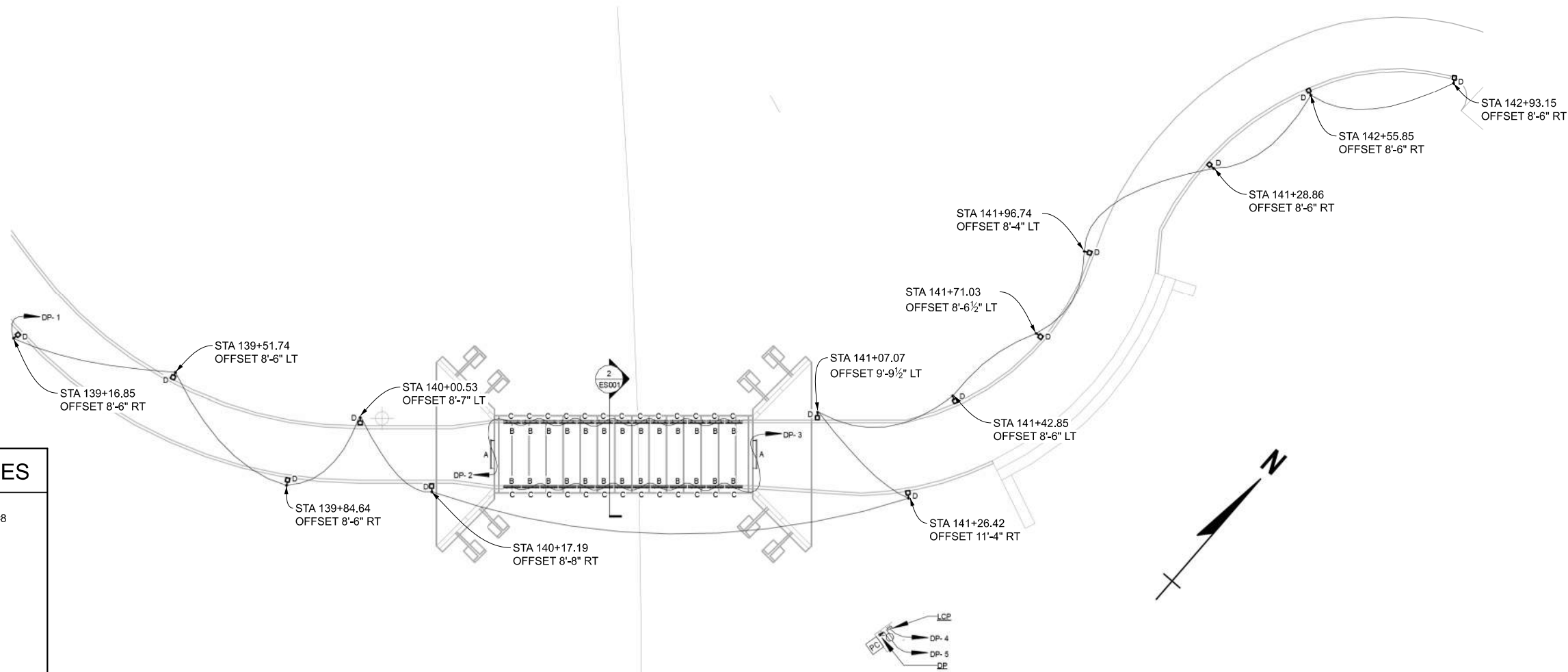
**3 TYPICAL LIGHT POLE BASE - GRASS DETAIL**

**GENERAL NOTES:**

- A. FURNISH POLE BASE TEMPLATE TO GENERAL CONTRACTOR PRIOR TO CONCRETE REBAR.
- B. PROVIDE GROUNDING BUSHINGS PER NEC.

**KEYNOTES: (#)**

- 1. REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR BASE SIZE AND REBAR REQUIREMENTS.
- 2. COORDINATE DIMENSIONS WITH ARCHITECT.

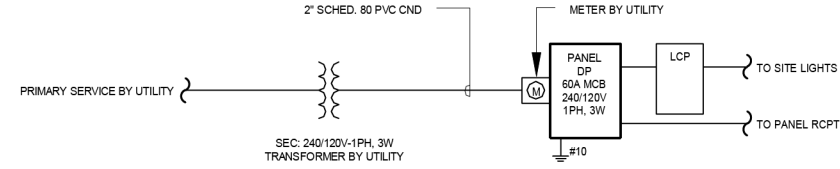


**1 ELECTRICAL SITEPLAN**  
SCALE: 1" = 30'-0"

**MISCELLANEOUS QUANTITIES**

600	Ft	Conduit, Schedule 40, 1 inch
850	Ft	Cable, Equipment Grounding Wire, 1/C#8
2500	Ft	Cable, 600V, 1, 3/C#2
700	Ft	Cable, Grounding Wire, 1/C#12
1350	Ft	Cable, 600V, 1, 2/C#12
1	Ea	Lighting Control Panel
2	Ea	Luminaire, Wall Mount, Type A
28	Ea	Luminaire, Linear, Type B
28	Ea	Luminaire, Linear, Type C
13	Ea	Luminaire, Pole Mount, Type D
13	Ea	Light Pole Foundation
13	Ea	Light Pole, Type D Pole
20000	Dir	Electrical Utility Service

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**4 RISER DIAGRAM**  
SCALE: N.T.S.

PANELBOARD SCHEDULE																					
DP		VOLTS:	240 <th>MAINS RATING:</th> <td>60A <th>A.I.C. RATING:</th> <td>10,000 <th>LOCATION:</th> <td></td> </td></td>	MAINS RATING:	60A <th>A.I.C. RATING:</th> <td>10,000 <th>LOCATION:</th> <td></td> </td>	A.I.C. RATING:	10,000 <th>LOCATION:</th> <td></td>	LOCATION:													
		PHASE:	1 <th>MCB:</th> <td>60A <th>BRKR SPACE:</th> <td>12 <th>SOURCE:</th> <td>UTILITY XFMR </td></td></td>	MCB:	60A <th>BRKR SPACE:</th> <td>12 <th>SOURCE:</th> <td>UTILITY XFMR </td></td>	BRKR SPACE:	12 <th>SOURCE:</th> <td>UTILITY XFMR </td>	SOURCE:	UTILITY XFMR												
		WIRE:	3 <th>MLO:</th> <td></td> <th>MTG./NEMA #:</th> <td>3R <th>FEEDER:</th> <td></td> </td>	MLO:		MTG./NEMA #:	3R <th>FEEDER:</th> <td></td>	FEEDER:													
CKT	DESCRIPTION	LTS	REC	MOTOR	OTHER	KIT	OC	P	CKT	PH	CKT	P	OC	LTS	REC	MOTOR	OTHER	KIT	LOAD DESCRIPTION	CKT	
1	POLE LIGHTS	208						20	1	A	2	1	20							N TUNNEL LIGHTS	2
3	S TUNNEL LIGHTS	739						20	1	B	4	1	20							LCP	4
5	PANEL RCPT		180					20	1	C	6	1	20							SPARE	6
7	SPARE							20	1	A	8	1	20							SPARE	8
9	SPARE							20	1	B	10	1	20							SPARE	10
11	SPARE							20	1	C	12	1	20							SPARE	12

SUBTOTAL CONNECTED KVA					
LTS	REC	MOTOR	OTHER	KIT	TOTAL
PHASE A CONNECTED KVA	0.9	0.0	0.0	0.0	0.9
PHASE B CONNECTED KVA	0.7	0.2	0.0	0.0	0.9
PHASE C CONNECTED KVA	0.0	0.2	0.0	0.0	0.2
25% OF LARGEST MOTOR			0.0		

LOAD SUMMARY & FEEDER CALCULATION						
LTS	REC	MOTOR	OTHER	KIT	SUBTOTAL	TOTAL
1.7	0.4	0.0	0.0	0.0	2.0	25%
1.25	#1	1.0	1.0	1.0		
2.1	0.4	0.0	0.0	0.0	2.5	0.6
						3.1
						7.4
1.25	1.0	1.0	1.0	1.0		1.0
						8.7

RECEPTACLE DEMAND FACTOR:  
#1: 100% FIRST 10 KVA + 50% REMAINING

NEW PANEL "LCP"										
D=DIMMER R=RELAY										
DIMMER/ RELAY	ZONE	DESCRIPTION	PANELBOARD NAME	PANELBOARD CIR #	LOAD	LOAD TYPE	DIMMABLE	ON/OFF SWITCHING	NOTES	RELAY RATING
1	R1	POLE LIGHTS	DP	1	208VA	0-10V		X	TIME OF DAY / PHOTOCELL	20A
2	D1	N TUNNEL LIGHTS	DP	2	739VA	0-10V	X		TIME OF DAY / PHOTOCELL	20A
3	D2	S TUNNEL LIGHTS	DP	3	739VA	0-10V	X		TIME OF DAY / PHOTOCELL	20A
4		SPARE								20A

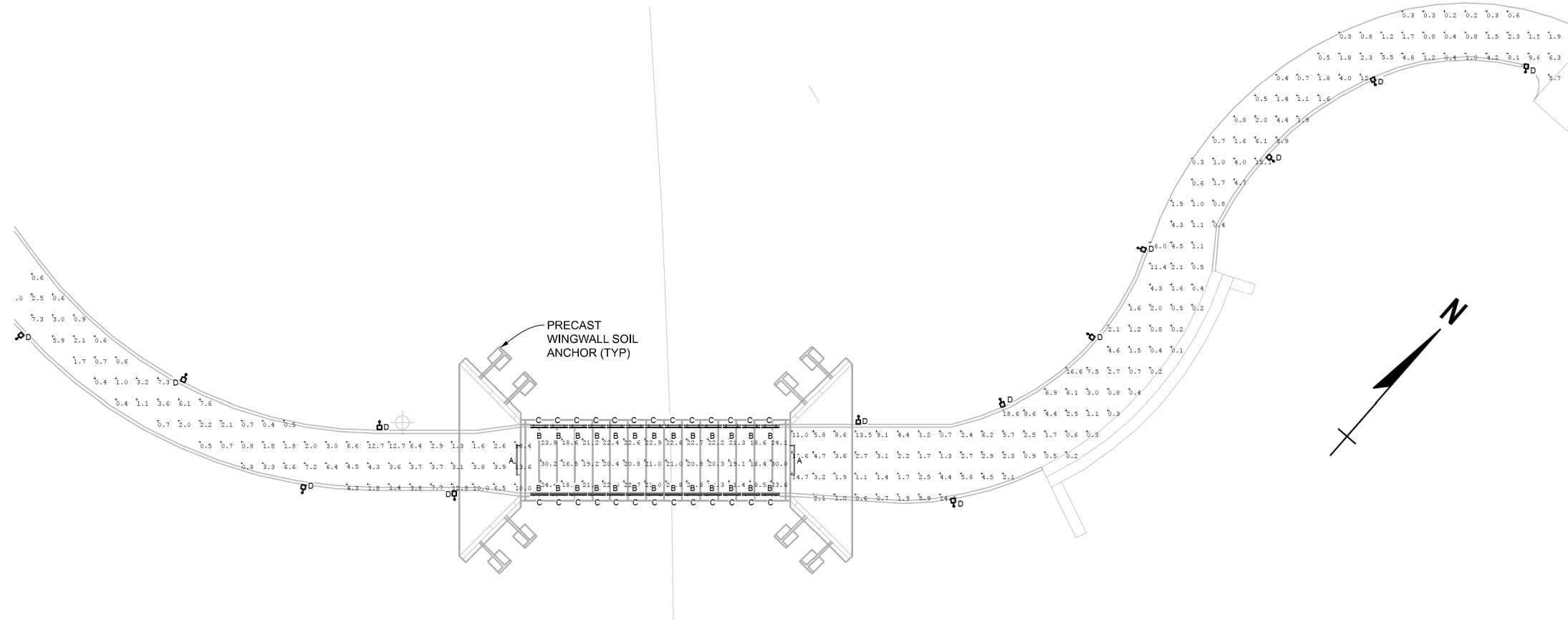
- SEQUENCE OF OPERATION:**
- COORDINATE COMMISSIONING OF SYSTEM PER LIGHTING, LIGHTING CONTROL, AND COMMISSIONING SPECIFICATIONS WITH OWNER'S AGENT AS REQUIRED PER STATE OF MICHIGAN ENERGY CODE.
  - OWNER SHALL BE PROVIDED WITH SOFTWARE AND THE ABILITY TO CONNECT TO THE CONTROL PANEL VIA LAPTOP TO OVERRIDE PROGRAMMING.
  - BRIDGE MOUNTED LIGHT FIXTURES (TYPES A, B, & C):**
    - LIGHTS SHALL BE PROGRAMMED TO TURN ON TO 25% AT 5AM AND TURN OFF AT MIDNIGHT VIA ASTROLOCK.
    - LIGHTS SHALL RAISE TO 100% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS EXCEED 8000FC.
    - LIGHTS SHALL DIM TO 80% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BETWEEN 4000FC AND 8000FC.
    - LIGHTS SHALL DIM TO 60% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BETWEEN 1000FC AND 4000FC.
    - LIGHTS SHALL DIM TO 50% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BETWEEN 20FC AND 1000FC.
    - LIGHTS SHALL DIM TO 25% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BELOW 20FC.
    - LIGHTS SHALL BE ABLE TO BE OVERRIDEN BY OWNER TO DIM UP/DOWN AND TURN ON/OFF.
  - POLE LIGHT FIXTURES:**
    - LIGHTS SHALL BE PROGRAMMED TO TURN ON TO 100% AT 5AM AND TURN OFF AT MIDNIGHT VIA ASTROLOCK.
    - LIGHTS SHALL TURN OFF WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS EXCEED 1000FC.
    - LIGHTS SHALL BE ABLE TO BE OVERRIDEN BY OWNER TO TURN ON/OFF.

LUMINAIRE SCHEDULE								
TYPE	LAMP	MANUFACTURER	MODEL NUMBER	BALLAST/DRIVER	MOUNTING	INPUT WATTAGE	DESCRIPTION	NOTE
A	2400 LUMENS, 4000K, LED	ELLIPTIPAR	(1)S151-S-6-H-02-M-00-0-940-ZX (2)HGA-1-02-00-0 (1)HGE02000	0-10V	WALL MOUNT AT 0'-8" ABOVE SIGN	24W	6' SIGN ILLUMINATING FIXTURE WITH A FORWARD THROW OPTIC AND A BLACK FINISH.	
		INSIGHT LIGHTING	ESX-LO-40K-DL-EXA-12-72-DIM-TBL-ILV					
		SPI LIGHTING	SEW 12145-6FT-L24W-120-277V-4000K-SBC-RUN-DF_FT-AN08					
B	3300 LUMENS, 4000K, LED	LUMENPULSE	LFP-CR-UL-120_277-48-10W-40K-80-CAS-FR-XX-DIM-VRBO-WMI3-BK	0-10V	WALL MOUNT AT 0'-6" BELOW TOP OF PERFORATED PANEL	40W	LINEAR FIXTURE WITH ASYMETRIC CEILING OPTIC AND A BLACK FINISH. VIBRATION RATED FOR BRIDGE AND OVERPASS.	
		ACCLAIM LIGHTING	XTA-211-DTGN					
		COOPER	GRZ-10L-940-ASYMM40-OD-UNV-BLK-ADJ-STD-4F					
C	1500 LUMENS, 4000K, LED	LUMENPULSE	LFP-CR-UL-120_277-48-3.75W-40K-80-WW-FR-XX-DIM-VRBO-FX-BK	0-10V	SURFACE MOUNT CENTERED ON TOP OF CURB	15W	LINEAR FIXTURE WITH WALL WASH OPTIC AND A BLACK FINISH. VIBRATION RATED FOR BRIDGE AND OVERPASS.	
		ACCLAIM LIGHTING	XTC-211-DTGN					
		COOPER	GRZ-05L-940-ASYMM40-OD-UNV-BLK-ADJ-STD-4F					
D	2000 LUMENS, 4000K, LED	BEGA	77-025	0-10V	POLE MOUNTED AT 10'-0" ABOVE SIDEWALK	16W	POLE MOUNTED FIXTURE WITH ASYMETRIC WIDE DISTRIBUTION AND A BLACK FINISH. PROVIDE PHOTOCELL.	
		PERFORMANCE IN LIGHTING	SQ1-T1-16-BK-4K-UNV-0-10V-SPT					
		WE-EF	108-1782					
D POLE		BEGA	10RFNS 1-ROUND				10' ROUND ALUMINUM POLE WITH A BLACK FINISH AND A ROUND BASE COVER.	
		PERFORMANCE IN LIGHTING	714-10-30-22					
		HAPCO	RSA10B4-3-BA					

SHEET DATE: 4/7/2024  
 PROJ NUMBER: 015514.00 WCPRC - Bandemer Barton Trail Design  
 ENG: JAH  
 PROJ LMR: JAH  
 CADD: JAH  
 COUNTY: WASHTENAW  
 CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
 SCALE: VC  
 HORIZ DATUM: NAD83  
 VERT DATUM: NAD83  
 REVISIONS:

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 ELECTRICAL DETAILS

Calculation Summary						
AREA	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
E PATH	Fc	3.31	18.6	0.1	33.10	186.00
TUNNEL WALKWAY	Fc	21.75	30.2	16.4	1.33	1.84
W PATH	Fc	3.89	13.6	0.4	9.73	34.00

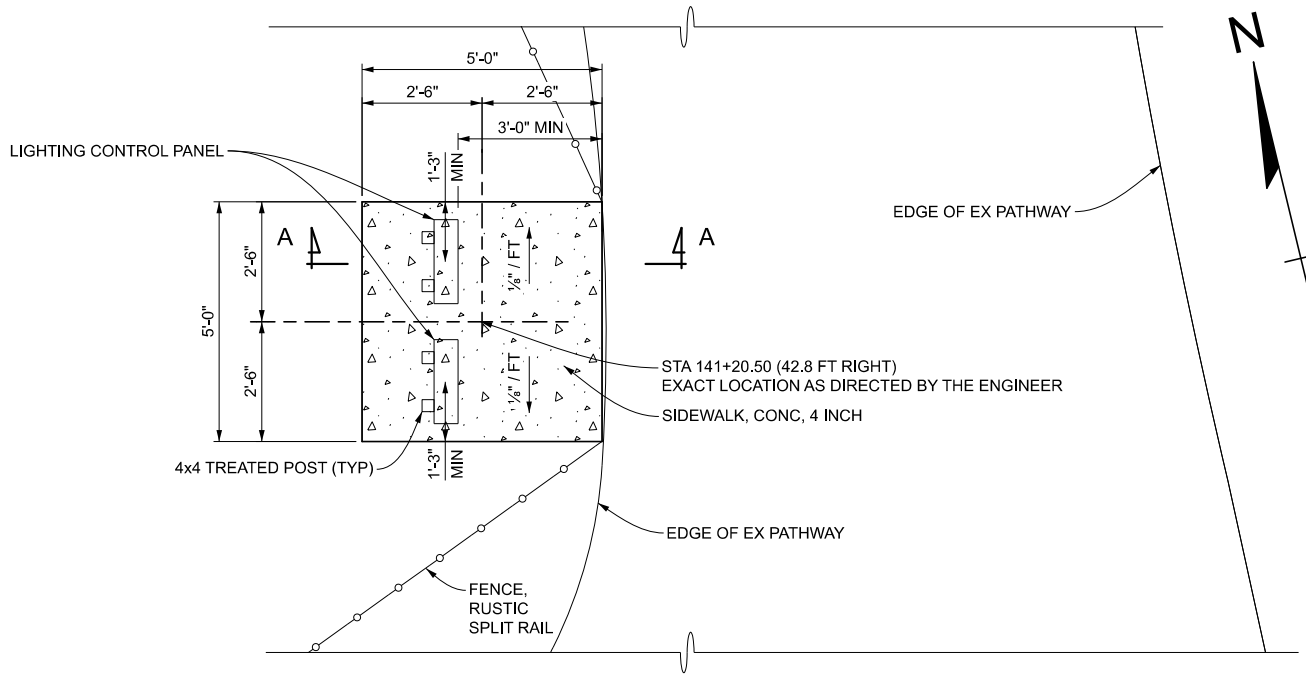


**1** PHOTOMETRIC SITEPLAN  
SCALE : 1" = 30'-0"

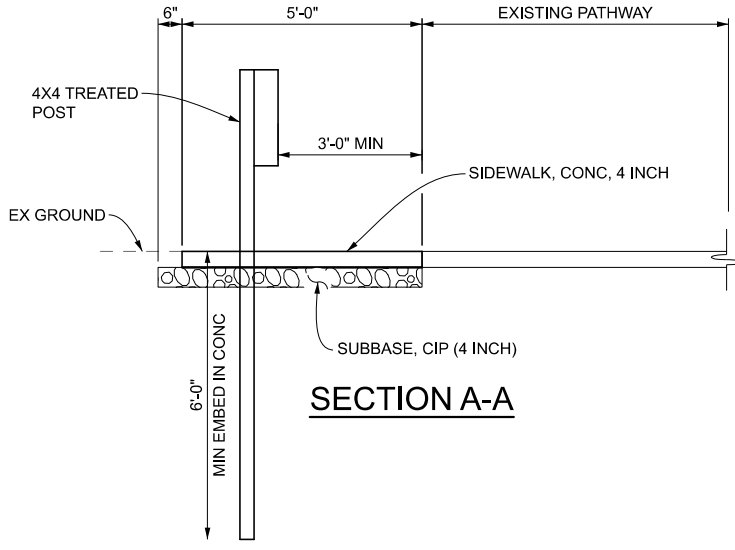
REVISIONS: \_\_\_\_\_  
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH  
PROJECT NUMBER: JAH  
ENGINEER: JAH  
DATE: 4/12/2024

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
ELECTRICAL DETAILS

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**LIGHTING CONTROL PANEL SLAB - PLAN**



**SECTION A-A**

MISCELLANEOUS QUANTITIES		
1	Cyd	Subbase, CIP
25	Sft	Sidewalk, Conc, 4 Inch

REVISIONS:

DATE: 4/12/2024  
PROJ NUMBER: 015514.00  
PROJ NAME: BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR  
COUNTY: WASHTENAW  
CADD: JAH  
PROJECT: JAH  
ENGINEER: JAH

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
ELECTRICAL DETAILS

REVISIONS:

HORIZ. DATUM: NAVD83

SCALE: H: 1"=50' V: NONE

CITY/TOWNSHIP: CITY OF ANN ARBOR

COUNTY: WASHTENAW

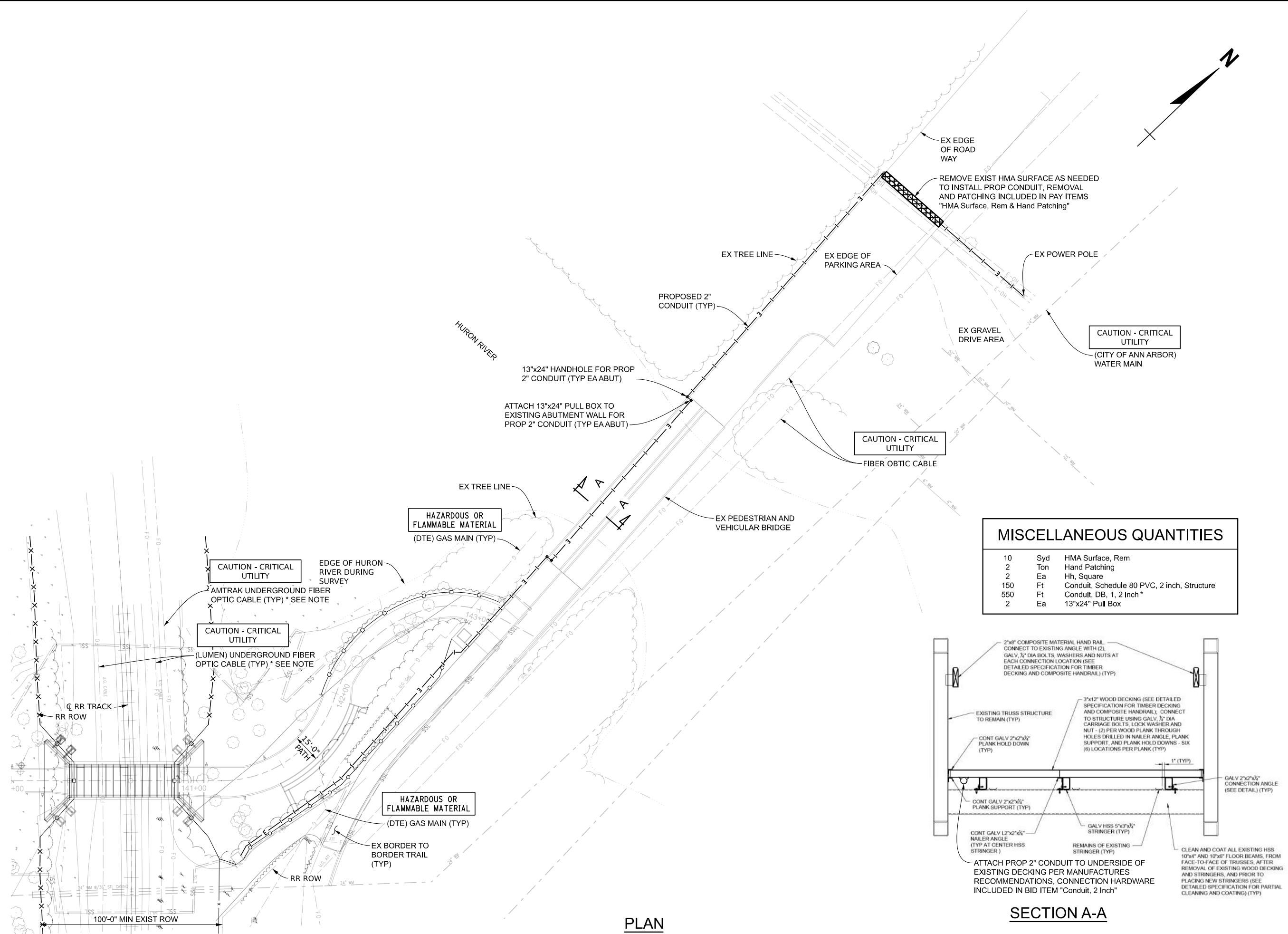
PROJ. NO.: JAH

DATE: 4/12/2024

SHEET

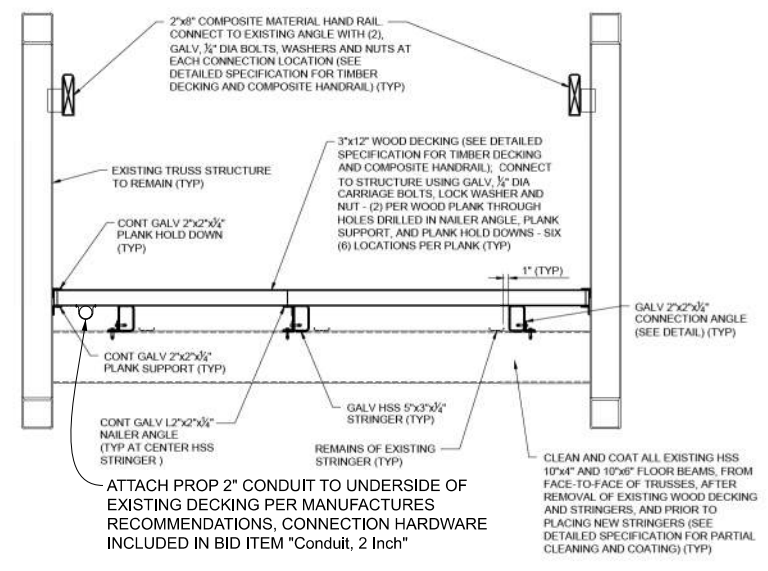
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

ELECTRICAL DETAILS



**MISCELLANEOUS QUANTITIES**

10	Syd	HMA Surface, Rem
2	Ton	Hand Patching
2	Ea	Hh, Square
150	Ft	Conduit, Schedule 80 PVC, 2 inch, Structure
550	Ft	Conduit, DB, 1, 2 inch*
2	Ea	13"x24" Pull Box



**PLAN**  
SHOWING EXISTING AND PROPOSED TOPOGRAPHY

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GENERAL  
 NOTIFY THE CITY OF ANN ARBOR SOIL EROSION CONTROL OFFICE 48 HOURS PRIOR TO BEGINNING WORK ON THE PROJECT. PHONE: 734-794-6265.

- 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.
- ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE PERMIT REQUIREMENTS OF THE CITY OF ANN ARBOR, THE LAWS OF THE STATE OF MICHIGAN, AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- 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.
- 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.
- 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.
- 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.
- 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.
- SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
- PROPER DUST CONTROL SHALL BE MAINTAINED DURING CONSTRUCTION BY USE OF WATER TRUCKS AND/OR OTHER METHODS APPROVED BY THE ENGINEER.
- 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.
- THE CONTRACTOR SHALL NOT GRADE INTO ADJACENT PROPERTIES. SILT AND PROTECTIVE FENCE SHALL BE INSTALLED AND MAINTAINED TO PREVENT GRADING, EROSION AND

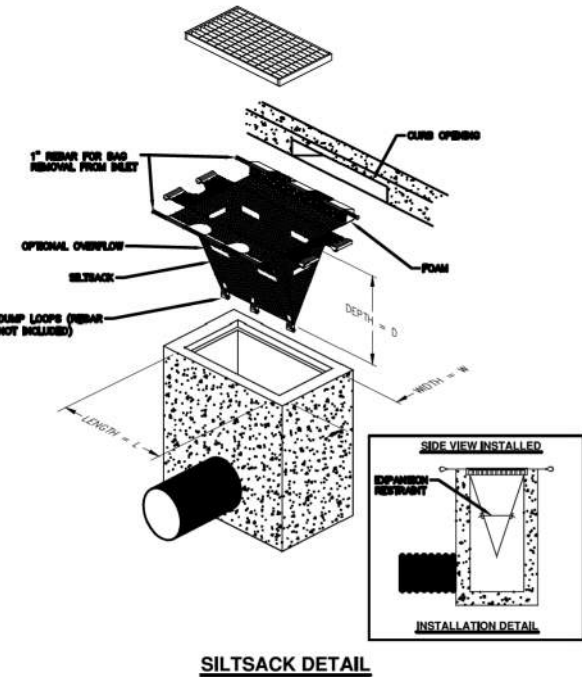
- SEDIMENTATION INTO THE ADJACENT PROPERTIES.
- TREE PROTECTION FENCING MUST REMAIN INTACT UNTIL RESTORATION OF THE SITE IS COMPLETE.
- SEQUENCE OF EROSION CONTROL MEASURES:
- THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER, A SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION CONTROL MEASURES FOR 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:
- 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.
  - STRIP AND STOCKPILE TOPSOIL. STABILIZE STOCKPILE AS REQUIRED.
  - 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.
  - PERFORM MACHINE GRADING OPERATIONS AND CONSTRUCT PAVEMENTS (MAINLINE, SIDEWALKS, DRIVES, ETC.).
  - CONTINUALLY MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED TO ALLOW DRAINAGE AND SEDIMENT REMOVAL. REMOVE ANY ACCUMULATED SEDIMENT IMMEDIATELY.
  - COMPLETE ALL FINE GRADING.
  - TEMPORARY SEED AND INSTALL EROSION CONTROL BLANKET IN ALL DISTURBED AREAS.
  - REFER TO LANDSCAPE PLANTING PLANS FOR PERMANENT SITE STABILIZATION.
  - CLEAN OUT STORM SEWER SYSTEMS.
  - REMEDY ANY NOTED DEFECTS TO THE SATISFACTION OF THE CITY OF ANN ARBOR'S SOIL EROSION AND SEDIMENTATION CONTROL OFFICIAL.
  - 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:
- SEED IN ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS.
  - ANY DISTURBED AREA NOT PAVED, SEEDED, MULCHED, SODDED OR BUILT UPON BY NOVEMBER 15TH OR JUNE 30TH IS TO BE TEMPORARILY STABILIZED PER SPECIFICATIONS.
- THE ESTIMATED COST OF SOIL EROSION AND SEDIMENTATION CONTROL MEASURES, TOPSOIL, SEEDING, AND MULCH = \$50,000.

- BARTON/BANDEMER PARK TUNNEL
- MmF - MIAMI LOAM - 25% TO 35% SLOPES
  - WqA - WASEPI SANDY LOAM - 0% TO 4% SLOPES

**AREA OF PROPOSED DISTURBANCE**  
 BARTON/BANDEMER PARK TUNNEL - 1.47 ac



NOTE: THE SILTSACK WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FIBER THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS:

**REGULAR FLOW SILTSACK**  
 (FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

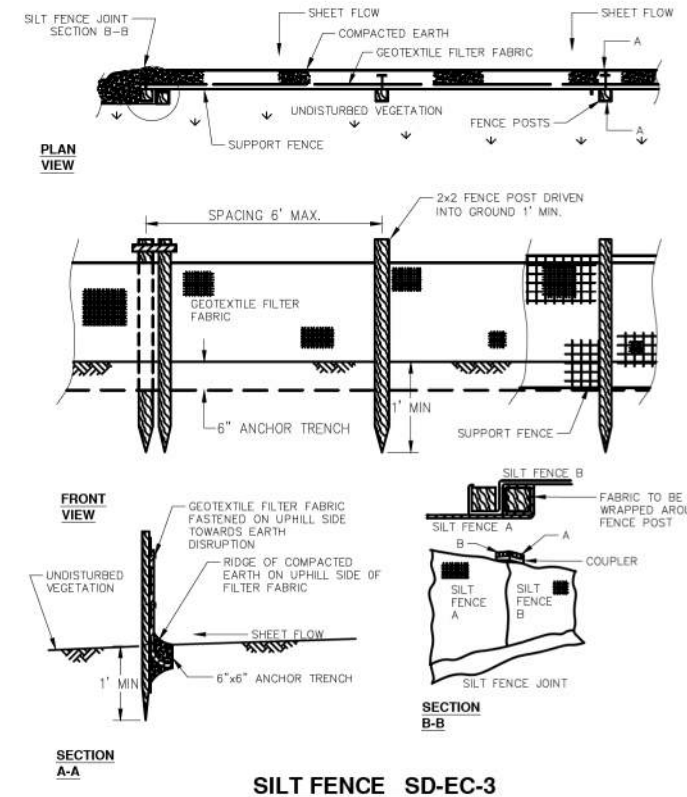
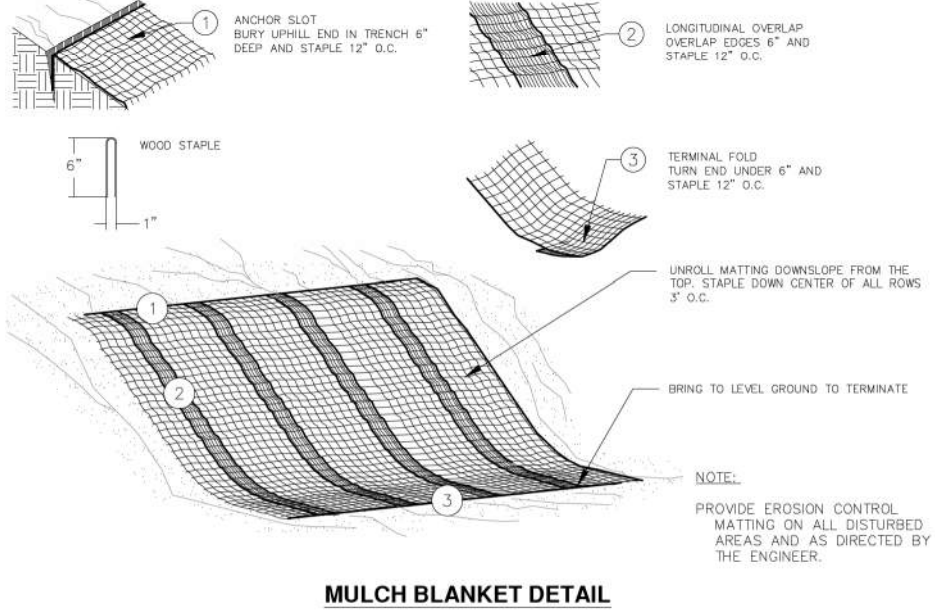
DESIGNER	REQUIRED VALUE	TEST METHOD
GRASS TENSILE STRENGTH	ASTM D-4832	300 LBS
GRASS TENSILE ELONGATION	ASTM D-4832	20%
PUNCTURE	ASTM D-4832	120 LBS
MULLING RESIST	ASTM D-3709	200 FT
TRAPWOOD YEAR	ASTM D-4832	150 LBS
UV RESISTANCE	ASTM D-4328	50%
APPROXIMATE OPENING SIZE	ASTM D-3709	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/AM/30 FT
PERMEABILITY	ASTM D-4491	0.50 SEC -1

**HI-FLOW SILTSACK**  
 (FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

DESIGNER	REQUIRED VALUE	TEST METHOD
GRASS TENSILE STRENGTH	ASTM D-4832	500 LBS
GRASS TENSILE ELONGATION	ASTM D-4832	20%
PUNCTURE	ASTM D-4832	120 LBS
MULLING RESIST	ASTM D-3709	400 FT
TRAPWOOD YEAR	ASTM D-4832	40 LBS
UV RESISTANCE	ASTM D-4328	50%
APPROXIMATE OPENING SIZE	ASTM D-3709	30 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/AM/30 FT
PERMEABILITY	ASTM D-4491	1.5 SEC -1

**OIL-ABSORBANT SILTSACK**  
 (FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

IT IS THE INTENT OF THE PLANS AND SPECIFICATIONS THAT THE CONTRACTOR INSTALL THE SILTSACK AS SHOWN IN THIS DETAIL TO PROVIDE A FULLY FUNCTIONING UNIT. ALL COSTS ASSOCIATED WITH PERMANENT CLEARING AS MANY TIMES AS REQUIRED, DISPOSAL OF SEDIMENT, AND REMOVAL OF THE SILT FENCE WITH NO LINGERER SHOULD BE INCLUDED IN THE FIRM OF SOILS AND WILL NOT BE PAID FOR SEPARATELY.

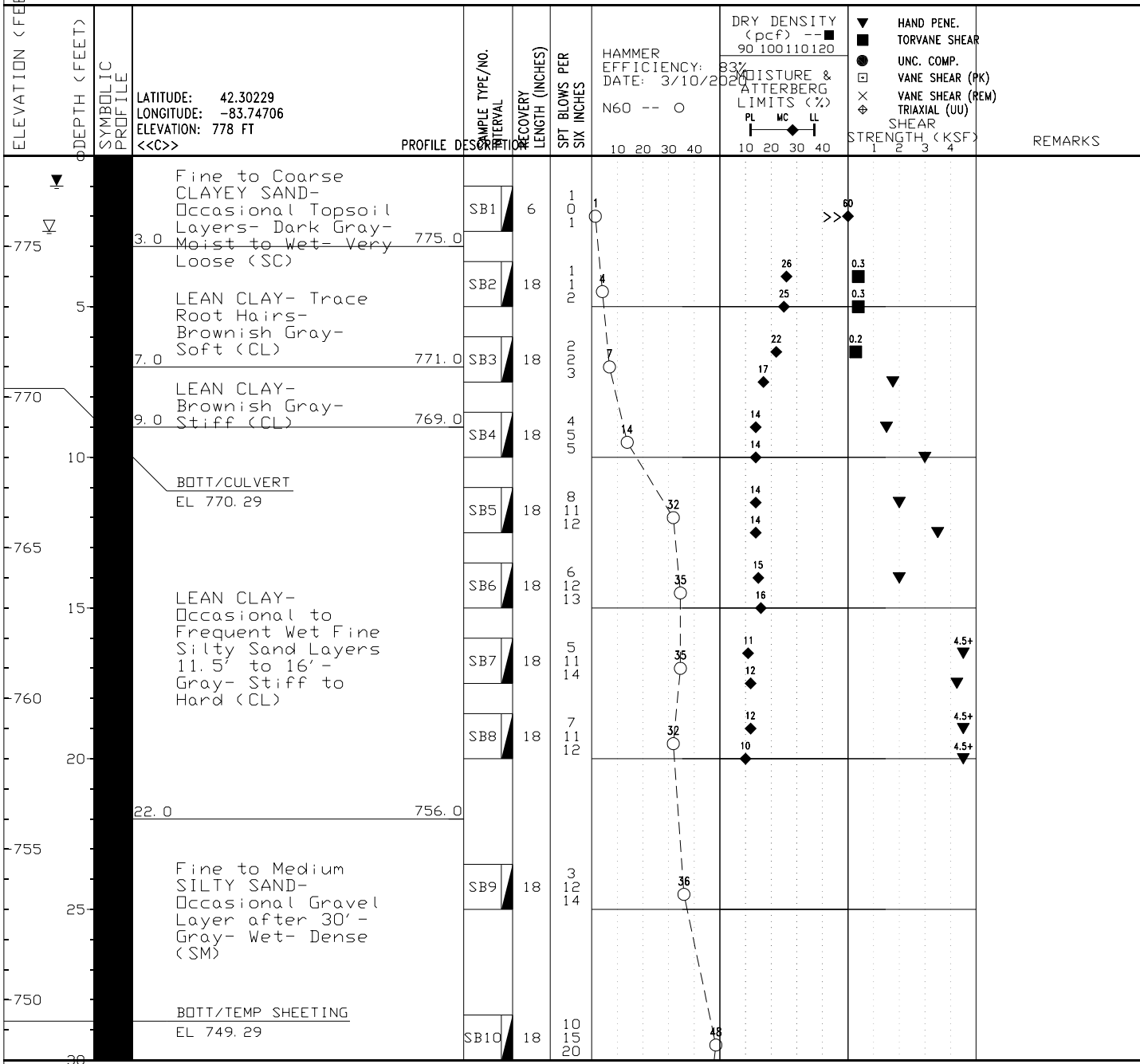


BORING B 1

PAGE 1 OF 2

BORING DEPTH: 50 FEET

PROJECT NAME: Bandemer Barton Trail and Tunnel PROJECT NUMBER: 080118.00  
 CLIENT: Bergmann Associates PROJECT LOCATION: Ann Arbor, Michigan  
 DATE STARTED: 3/21/22 COMPLETED: 3/21/22 BORING METHOD: HSA 0' to 50', Fluid 22' to 50'  
 DRILLER: RM RIG NO. 531 (CME55LCX) LOGGED BY: JKT CHECKED BY: PDF



**GROUNDWATER & BACKFILL INFORMATION**

DEPTH (FEET) V DURING BORING: 2.5 775.5 V AT END OF BORING: 1.0 777.0

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual. 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered. 3. Wet sand was observed at 22 feet below ground surface and trapped groundwater was under pressure. The water level rose approximately 10 to 13 feet in the hollow-stem augers and we lost the integrity of the borehole. We offset 8 feet south, re-drilled to 23.5 feet, and continued sampling with drilling mud in the hollow-stem augers. 4. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

(Continued Next Page)

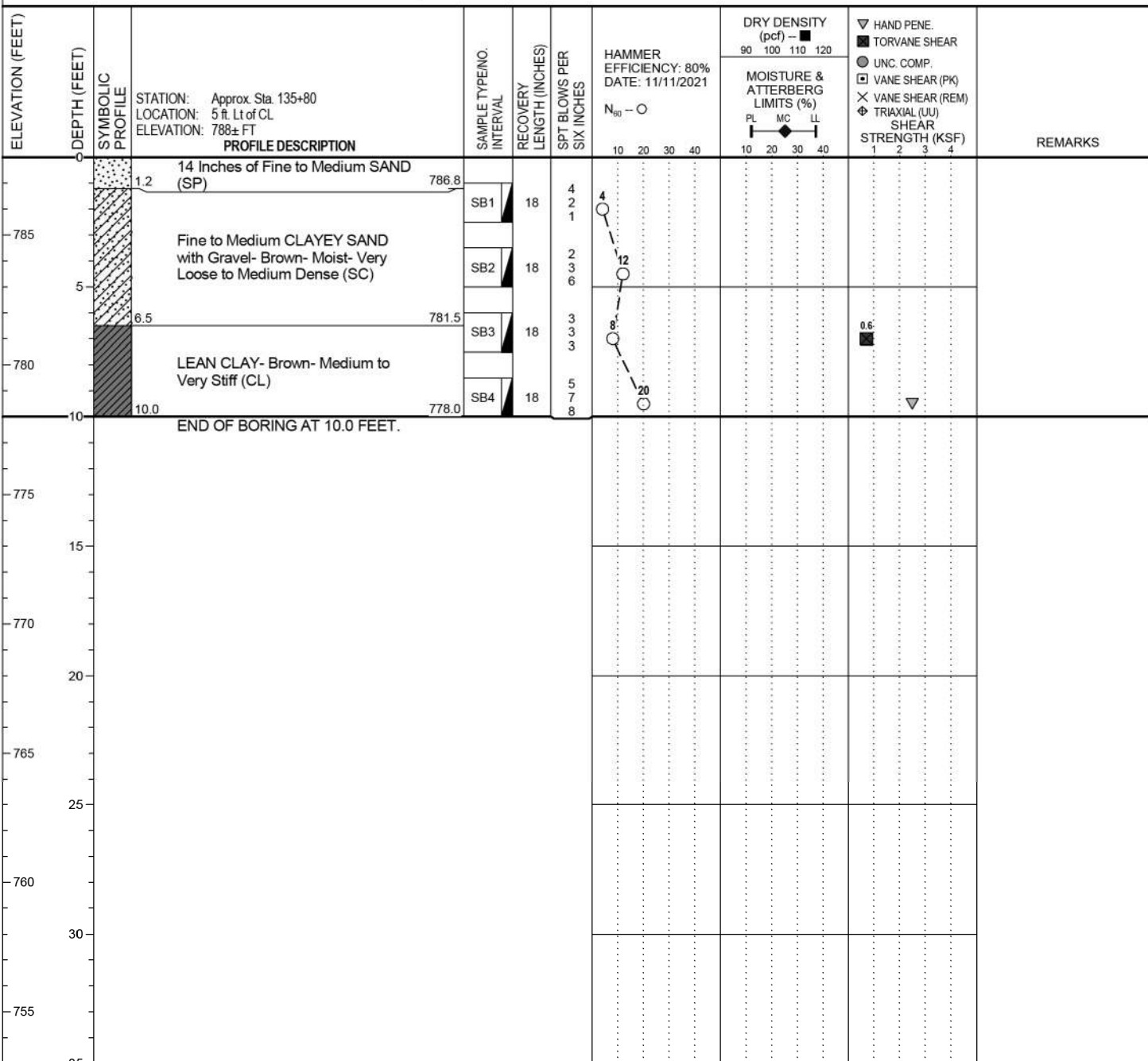


BORING B4

PAGE 1 OF 1

BORING DEPTH: 10 FEET

PROJECT NAME: Barton-Bandemer Tunnel PROJECT NUMBER: 080118.00  
 CLIENT: Colliers Engineering & Design PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan  
 DATE STARTED: 1/19/23 COMPLETED: 1/19/23 BORING METHOD: Solid-stem Augers  
 DRILLER: RM RIG NO.: 531 (CME55LCX) LOGGED BY: TAG CHECKED BY: STR



**GROUNDWATER & BACKFILL INFORMATION**

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Bentonite Chips

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual. 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered. 3. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

Colliers Engineering & Design  
 7050 W. SAGINAW HWY., SUITE 200  
 LANSING, MI 48917  
 P (517) 272-9835 | F (517) 272-9838

REVISIONS: [Table with columns for NO, DATE, DESCRIPTION]

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

SOIL BORING DATA

3/27/24 2:59:36 PM



### BORING B5

PAGE 1 OF 1

BORING DEPTH: 30 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

DATE STARTED: 1/19/23

COMPLETED: 1/19/23

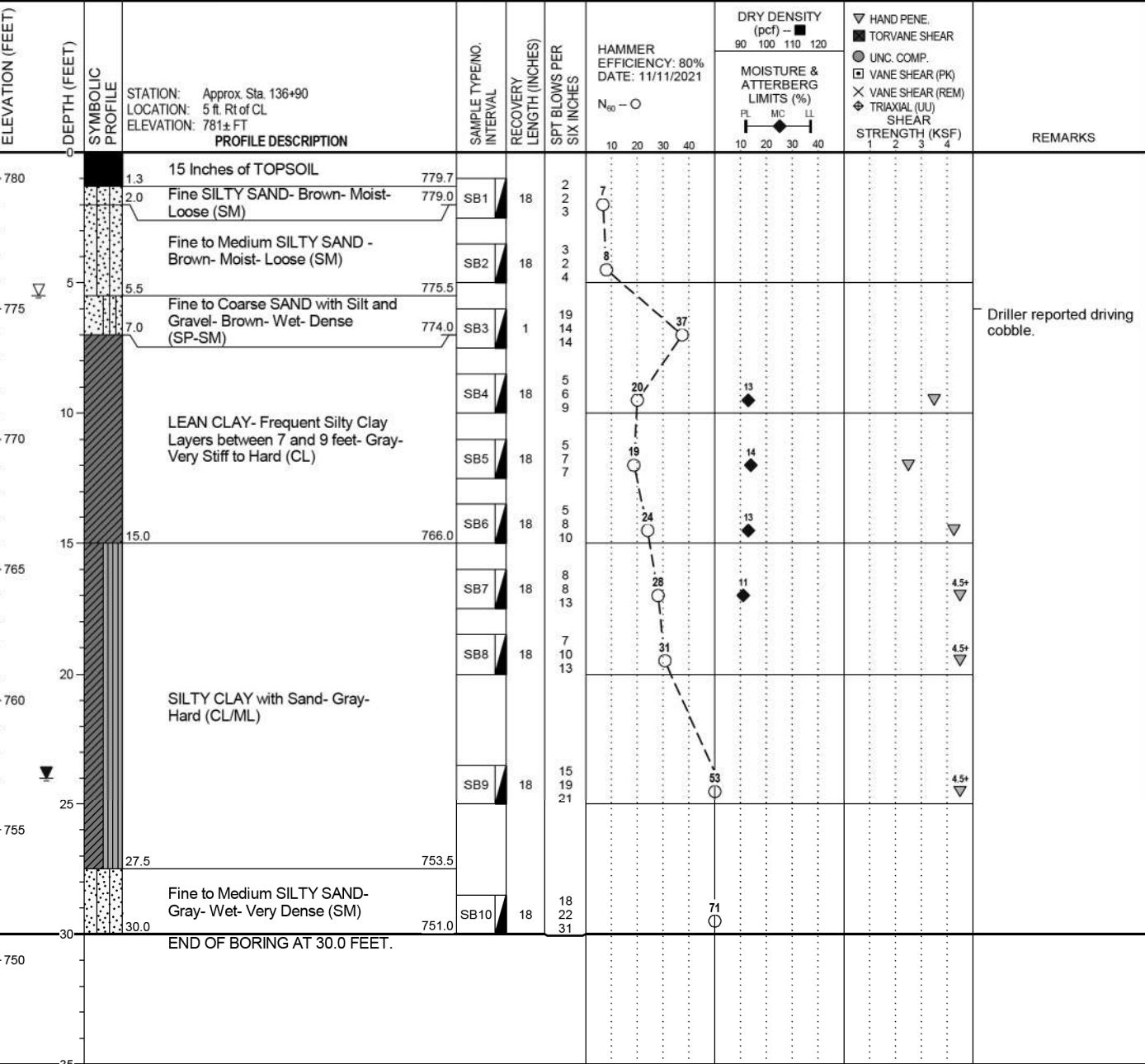
BORING METHOD: Hollow-stem Augers

DRILLER: RM

RIG NO.: 531 (CME55LCX)

LOGGED BY: TAG

CHECKED BY: STR



**GROUNDWATER & BACKFILL INFORMATION**

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	5.5	775.5
▽ AT END OF BORING:	24.0	757.0

**BACKFILL METHOD:** Auger Cuttings 0 to 5 feet, Bentonite Chips and Cement 5 to 30 feet

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.  
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.  
3. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

3/27/24 2:59:43 PM



### BORING B6

PAGE 1 OF 1

BORING DEPTH: 30 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

DATE STARTED: 1/19/23

COMPLETED: 1/19/23

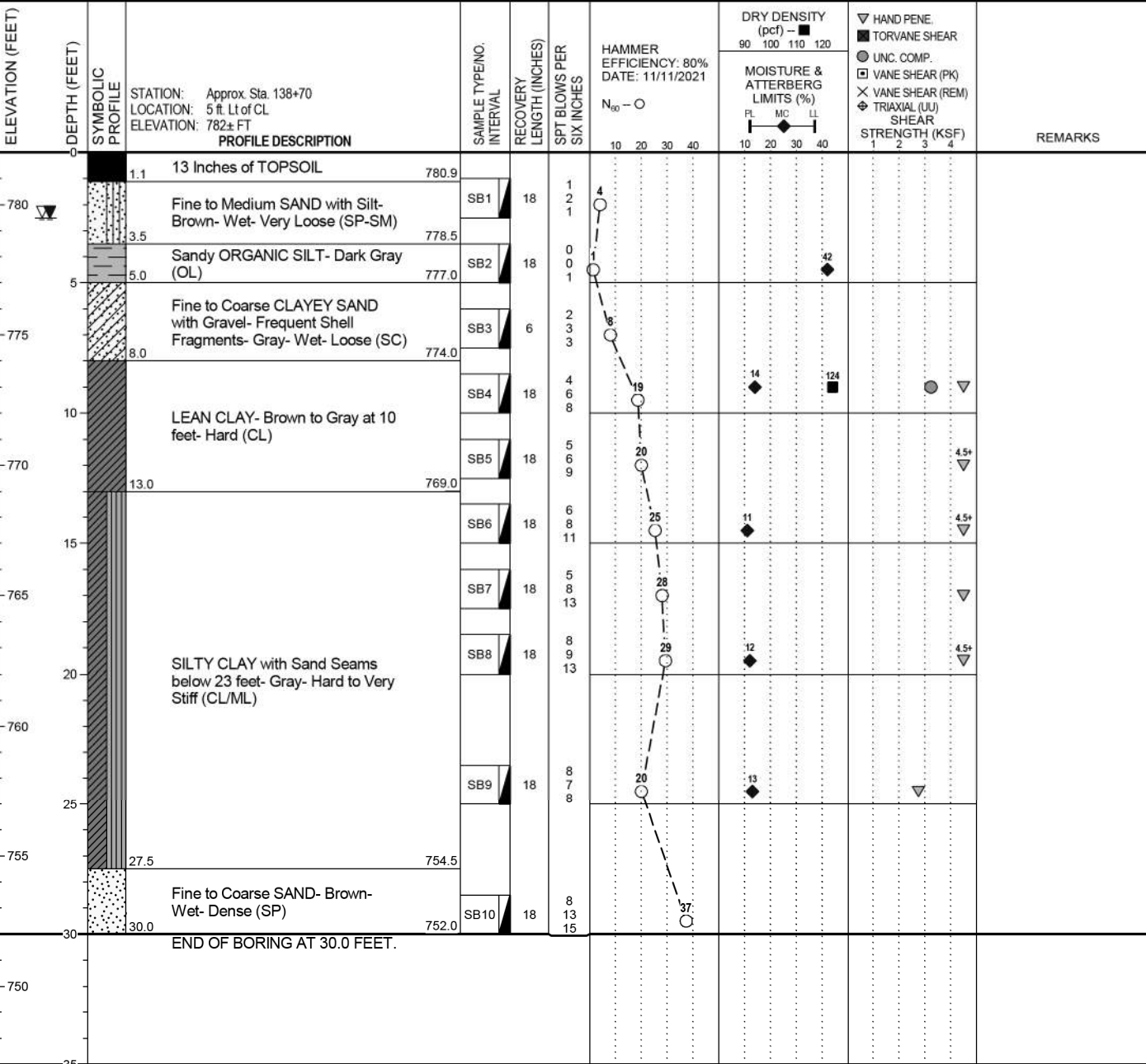
BORING METHOD: Hollow-stem Augers

DRILLER: RM

RIG NO.: 531 (CME55LCX)

LOGGED BY: TAG

CHECKED BY: STR



**GROUNDWATER & BACKFILL INFORMATION**

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	2.5	779.5
▽ AT END OF BORING:	2.5	779.5

**BACKFILL METHOD:** Auger Cuttings 0 to 5 feet, Bentonite Chips and Cement 5 to 30 feet

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.  
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.  
3. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

O:\WPCRC\015514.00 WPCRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_boring\_002.dgn



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CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SOIL BORING DATA

3/28/24 4:04:46 PM



### BORING B7

PAGE 1 OF 2

BORING DEPTH: 50 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

DATE STARTED: 3/21/22

COMPLETED: 3/21/22

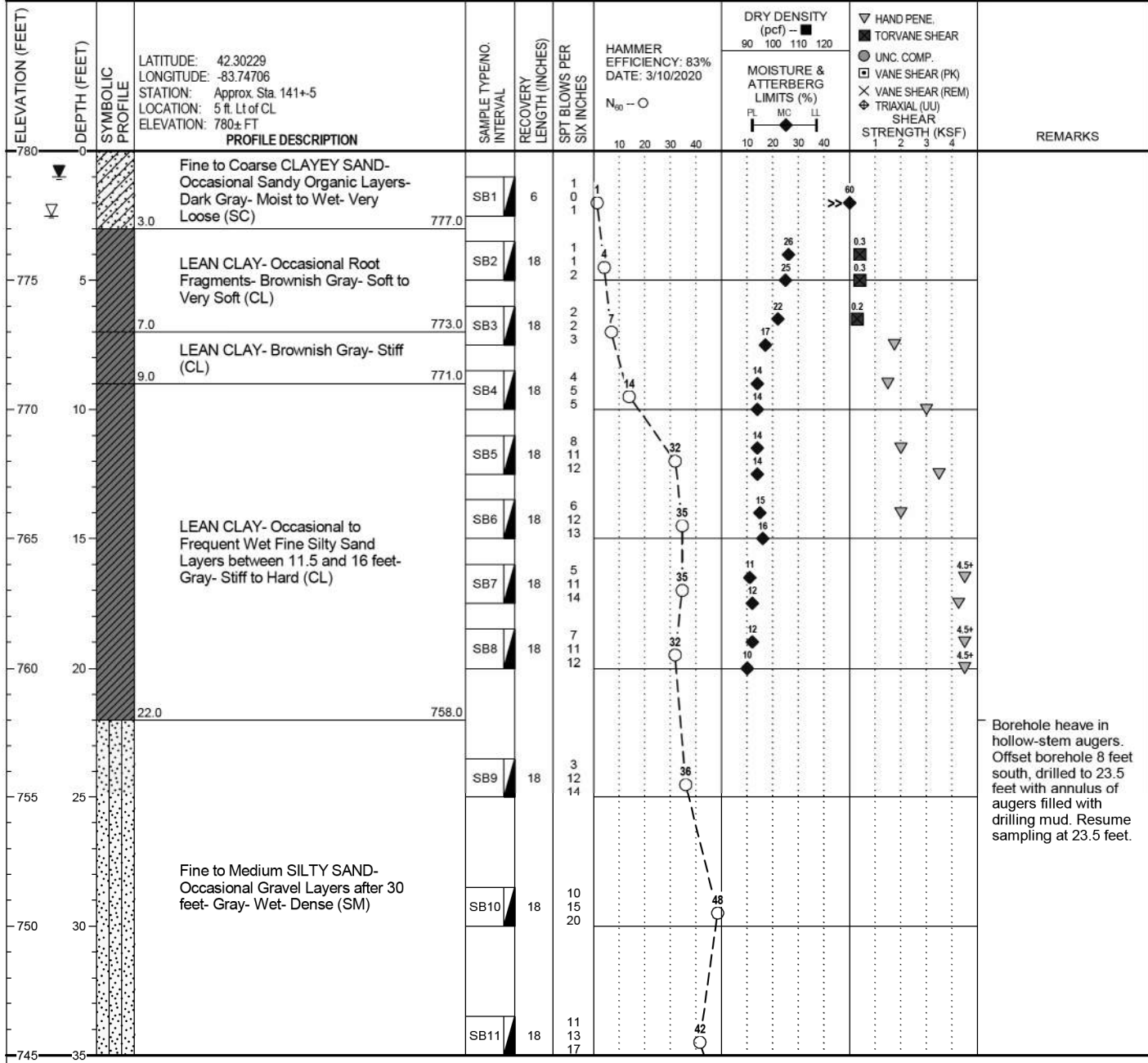
BORING METHOD: HSA 0' to 50', Fluid 22' to 50'

DRILLER: RM

RIG NO.: 531 (CME55LCX)

LOGGED BY: KJT

CHECKED BY: PDF



Borehole heave in hollow-stem augers. Offset borehole 8 feet south, drilled to 23.5 feet with annulus of augers filled with drilling mud. Resume sampling at 23.5 feet.

#### GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	2.5	777.5
▽ AT END OF BORING:	1.0	779.0

BACKFILL METHOD: Note 3

- NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.  
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.  
 3. Borehole backfilled with cement-bentonite grout from 50 feet to 5 feet below the ground surface and auger cuttings above 5 feet to the ground surface.  
 4. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.  
 5. Temporary piezometer installed at offset location.

(Continued Next Page)

3/28/24 4:04:46 PM



### BORING B7

PAGE 2 OF 2

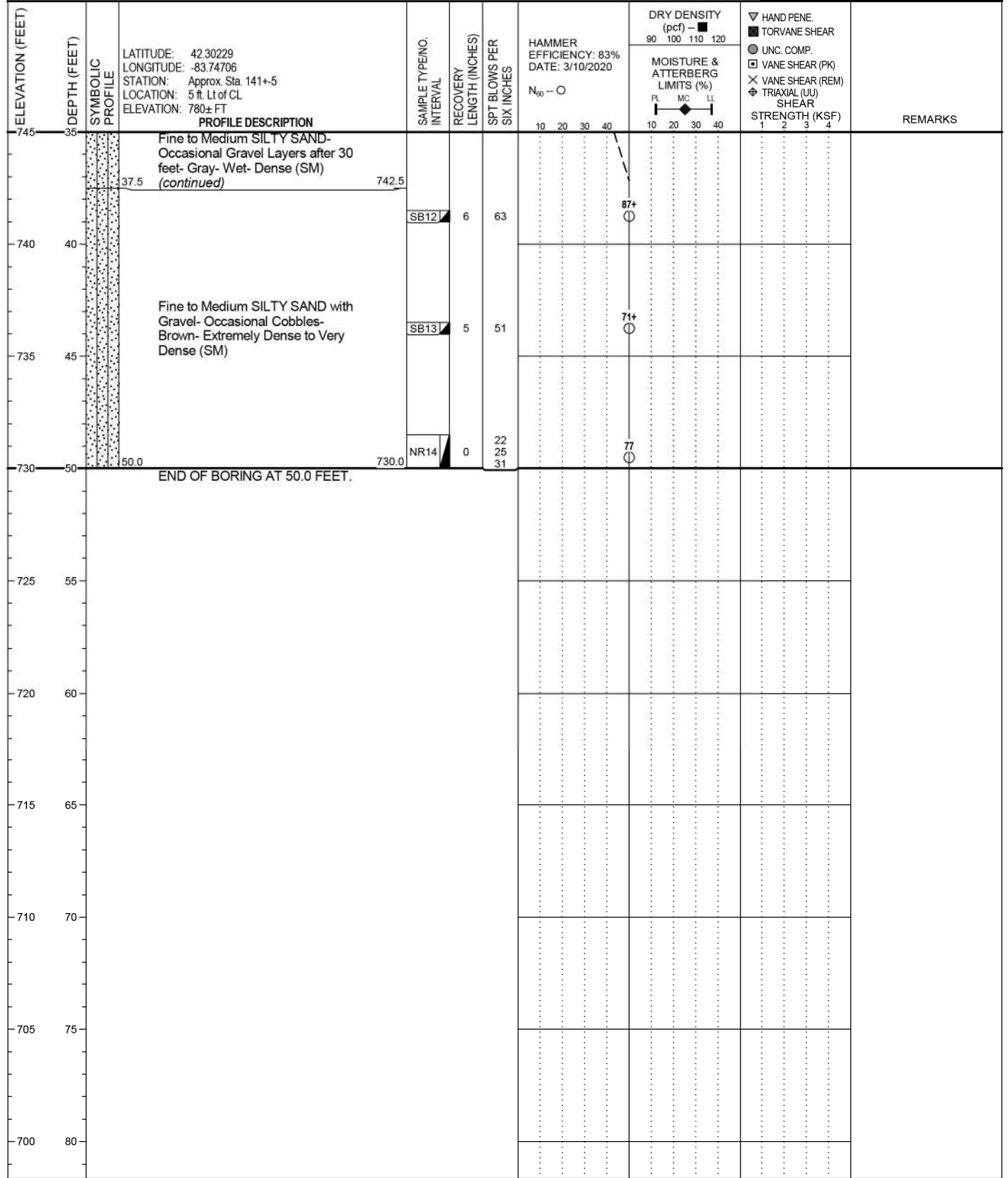
BORING DEPTH: 50 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan



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REVISIONS:

HORIZ. DATUM:

VERT. DATUM:

SCALE:

H. NONE

V. NONE

CITY/VILLAGE/TOWNSHIP:

CITY OF ANN ARBOR

COUNTY:

WASHTENAW

CADD:

JAH

PROJ/MGR:

JAH

DATE:

4/12/2024

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 SOIL BORING DATA

O:\WCP\015514.00 WCP\PC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_boring\_003.dgn

3/27/24 2:59:59 PM



**BORING B8**

PAGE 1 OF 2

BORING DEPTH: 58.7 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

DATE STARTED: 1/19/23

COMPLETED: 1/19/23

BORING METHOD: Hollow-stem Augers

DRILLER: RM

RIG NO.: 531 (CME55LCX)

LOGGED BY: TAG

CHECKED BY: STR

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO.	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 80% DATE: 11/11/2021 N <sub>60</sub> - O	DRY DENSITY (pcf) - [ ] 90 100 110 120	MOISTURE & ATTERBERG LIMITS (%) PL MC LL	HAND PENE. TORVANE SHEAR UNC. COMP. VANE SHEAR (PK) VANE SHEAR (REM) TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
785.0	2.0	[Symbol]	24 Inches of SANDY TOPSOIL	SB1	0	3					
783.0	4.0	[Symbol]	FILL- Fine to Coarse SILTY SAND with Gravel- Occasional Cinder Pieces- Brown- Moist- Very Loose (SM)	SB2	10	2					
780.0	5.0	[Symbol]	FILL- Fine to Coarse SAND with Gravel- Occasional Brick and Cinder Pieces above 7 feet- Occasional Lean Clay Layers at 19 feet- Brown- Moist to Wet- Loose (SP)	SB3	6	2					
775.5	11.5	[Symbol]	Sandy LEAN CLAY with Organics- Black (CL)	SB5	18	2					
774.0	13.0	[Symbol]		SB6	18	6	15			4.5+	
770.0	15.0	[Symbol]	LEAN CLAY with Sand- Gray- Very Stiff to Hard (CL)	SB7	18	6	14				
770.0	18.0	[Symbol]		SB8	18	6	12				4.5+
765.0	23.0	[Symbol]	SILTY CLAY with Sand- Gray- Hard (CL/ML)	SB9	18	6	10				4.5+
758.0	29.0	[Symbol]	Fine to Medium CLAYEY SAND- Dense- Gray- Wet- Very Dense (SC)	SB10	11	12					4.5+
753.5	33.5	[Symbol]		SB11	18	7					

GROUNDWATER & BACKFILL INFORMATION	
DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	8.5 778.5
▽ AT END OF BORING:	Note 3
BACKFILL METHOD:	Note 4

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.  
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.  
 3. Wash water used in hollow-stem augers below a depth of 15 feet, therefore, an accurate groundwater level measurement was not obtained after the completion of drilling activities.  
 4. Borehole backfilled with cement-bentonite grout from 60 feet to 5 feet below the ground surface and auger cuttings above 5 feet to the ground surface.  
 5. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

(Continued Next Page)

3/27/24 3:00:00 PM



**BORING B8**

PAGE 2 OF 2

BORING DEPTH: 58.7 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO.	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 80% DATE: 11/11/2021 N <sub>60</sub> - O	DRY DENSITY (pcf) - [ ] 90 100 110 120	MOISTURE & ATTERBERG LIMITS (%) PL MC LL	HAND PENE. TORVANE SHEAR UNC. COMP. VANE SHEAR (PK) VANE SHEAR (REM) TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
750.0	40.0	[Symbol]	Fine to Coarse SAND with Gravel- Gray- Wet- Dense to Very Dense (SP) (continued)	SB12	18	15					
743.5	43.5	[Symbol]		SB13	18	12					
740.0	47.0	[Symbol]	Fine SAND- Gray- Wet- Very Dense (SP)	SB14	18	10					
735.0	50.0	[Symbol]	LEAN CLAY- Gray- Hard (CL)	SB15	6	35				4.5+	
732.0	55.0	[Symbol]	Fine to Medium CLAYEY SAND- Gray- Wet- Extremely Dense (SC)	SB16	2	60/0.5"					
728.3	58.7	[Symbol]	END OF BORING AT 58.7 FEET.								



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REVISIONS:

NO. DATE

BY: NONE

DATE: NONE

SCALE: NONE

CITY/VILLAGE/TOWNSHIP: ANN ARBOR

COUNTY: WASHTENAW

PROJ. NO.: 080118.00

DATE: 4/12/2024

SHEET: 64 OF 80

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 SOIL BORING DATA



# BORING B9

PAGE 1 OF 2

BORING DEPTH: 52 FEET

PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

DATE STARTED: 1/18/23

COMPLETED: 1/18/23

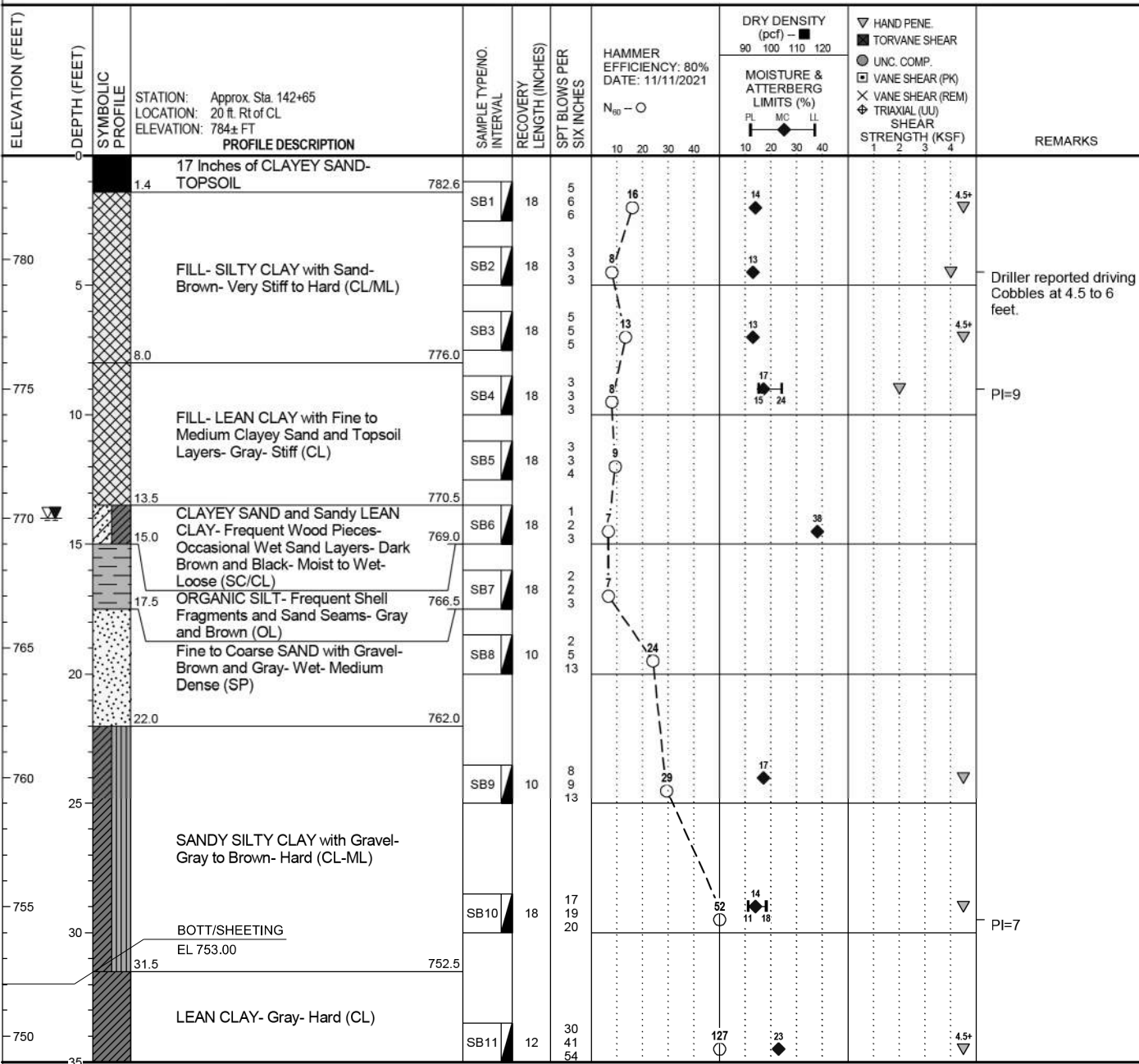
BORING METHOD: Hollow-stem Augers

DRILLER: RM

RIG NO.: 531 (CME55LCX)

LOGGED BY: TAG

CHECKED BY: STR



GROUNDWATER & BACKFILL INFORMATION		
	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	14.0	770.0
▽ AT END OF BORING:	14.0	770.0
BACKFILL METHOD:	Note 3	

- NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.  
 2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.  
 3. The borehole was backfilled by tremie method with cement-bentonite grout to 5 feet below the ground surface and auger cuttings to the ground surface.  
 4. Latitude and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

(Continued Next Page)



# BORING B9

PAGE 2 OF 2

BORING DEPTH: 52 FEET

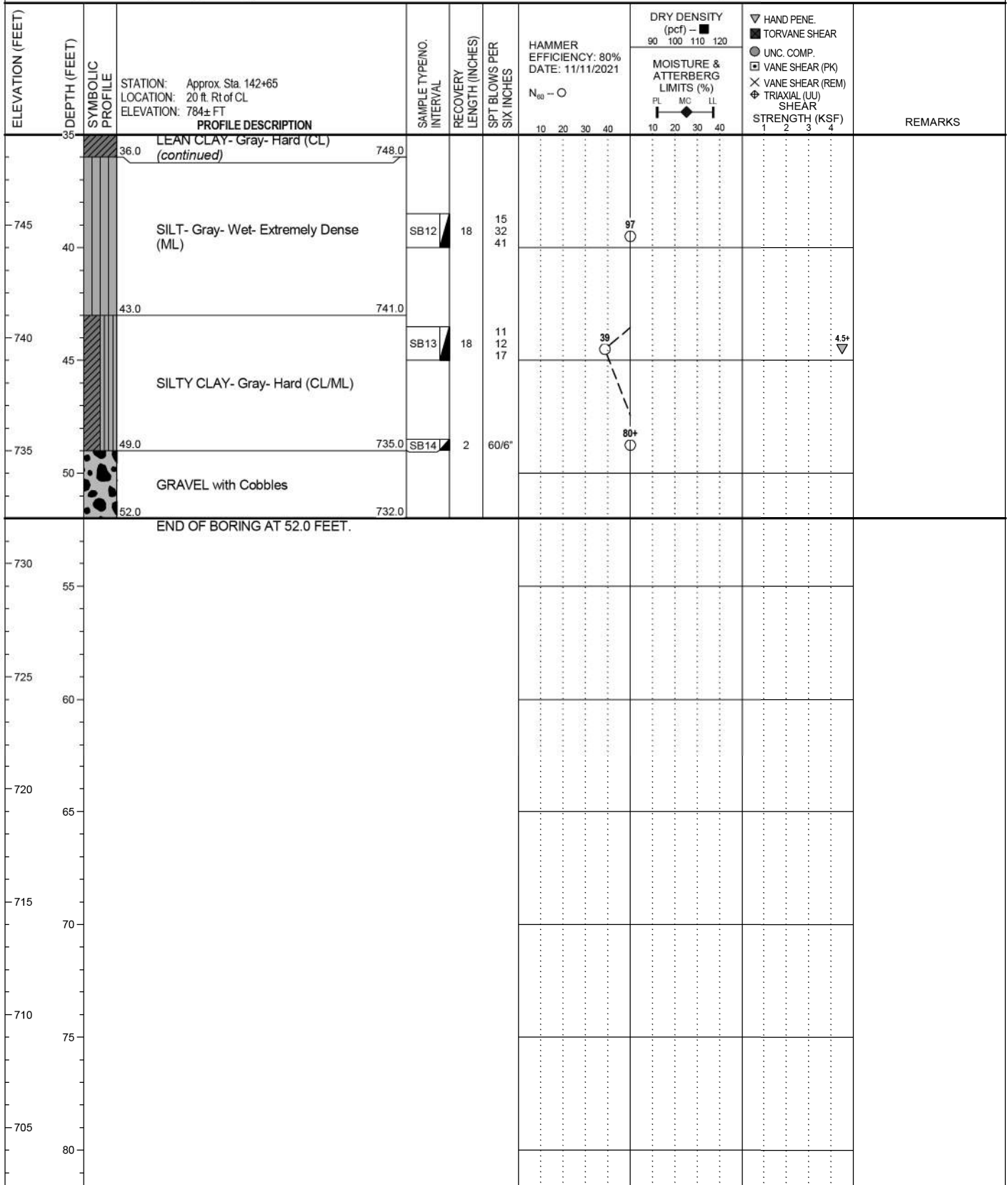
PROJECT NAME: Barton-Bandemer Tunnel

PROJECT NUMBER: 080118.00

CLIENT: Colliers Engineering & Design

PROJECT LOCATION: Ann Arbor, Washtenaw County, Michigan

3/27/24 3:00:10 PM



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REVISIONS:

DATE

DESCRIPTION

BY

SCALE

CITY/TOWNSHIP

COUNTY

STATE

PROJECT

DATE

PROJECT

DATE

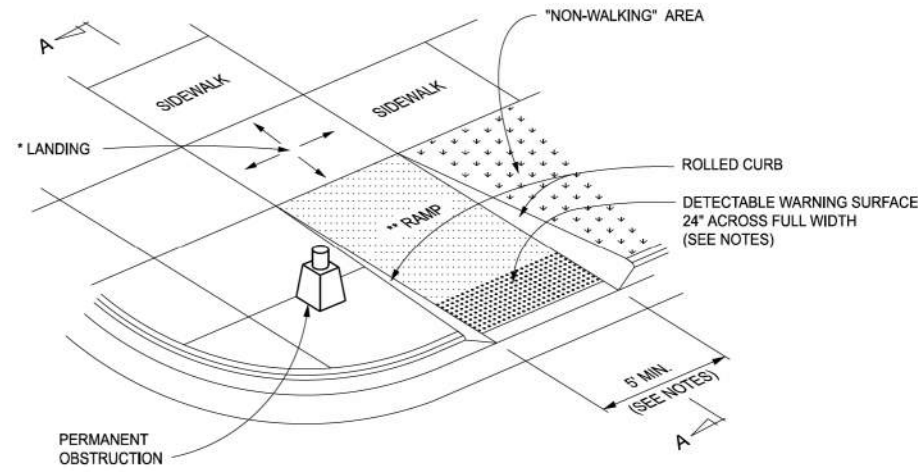
PROJECT

DATE

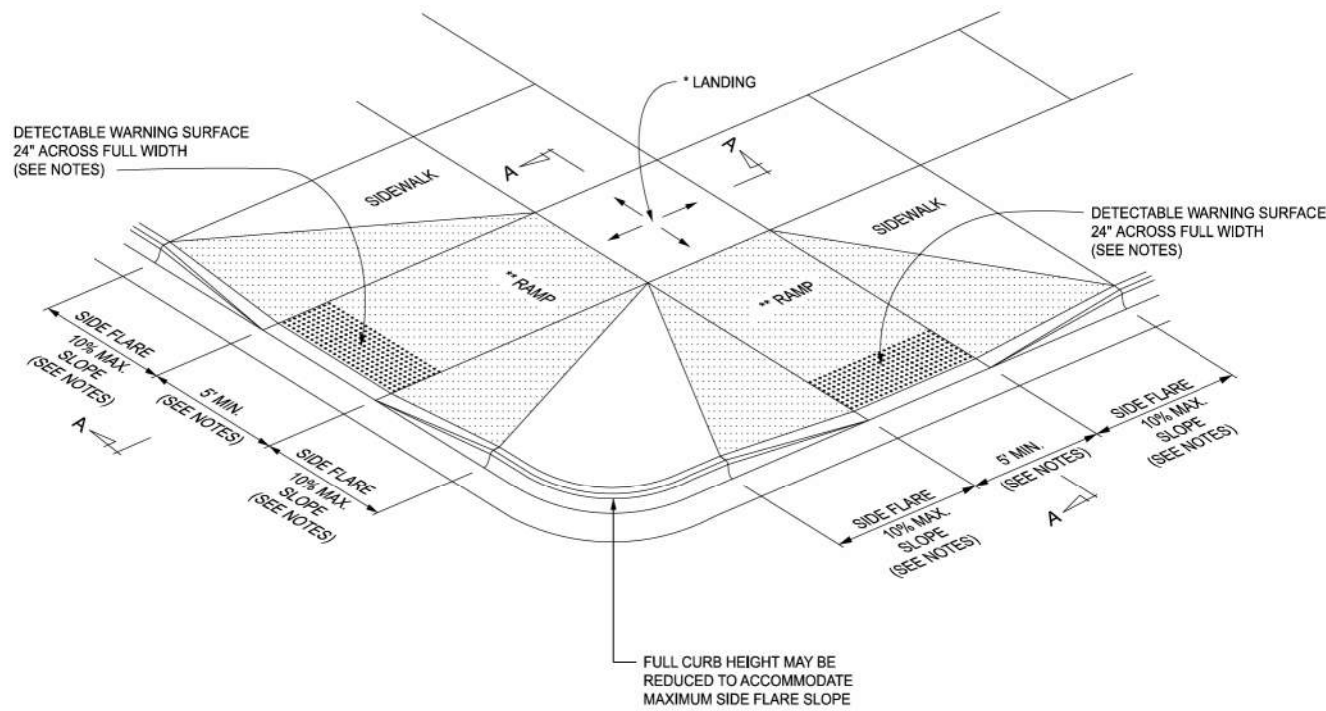
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SOIL BORING DATA

\* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

\*\* MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



**CURB RAMP TYPE R**  
(ROLLED SIDES)



**CURB RAMP TYPE F**  
(FLARED SIDES, TWO RAMPS SHOWN)

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES



APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT

DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

(SPECIAL DETAIL)  
FHWA APPROVAL

11/08/2023  
PLAN DATE

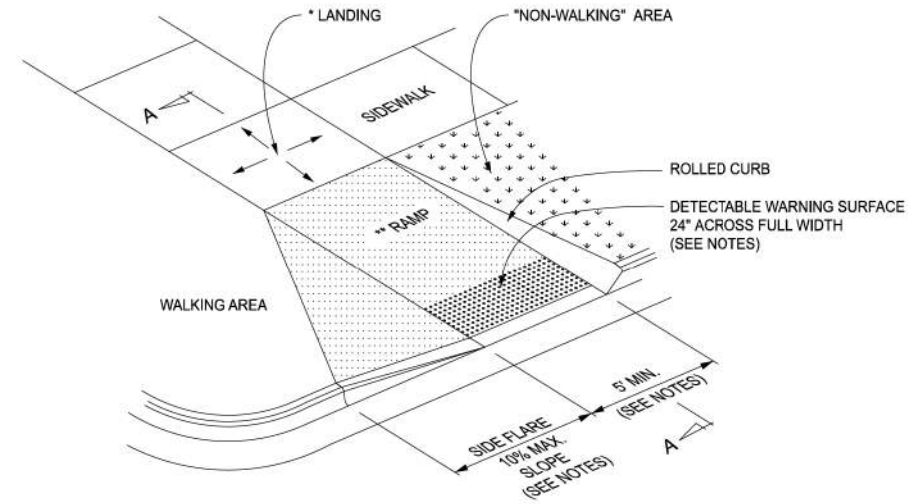
**R-28-K**

SHEET  
1 OF 7

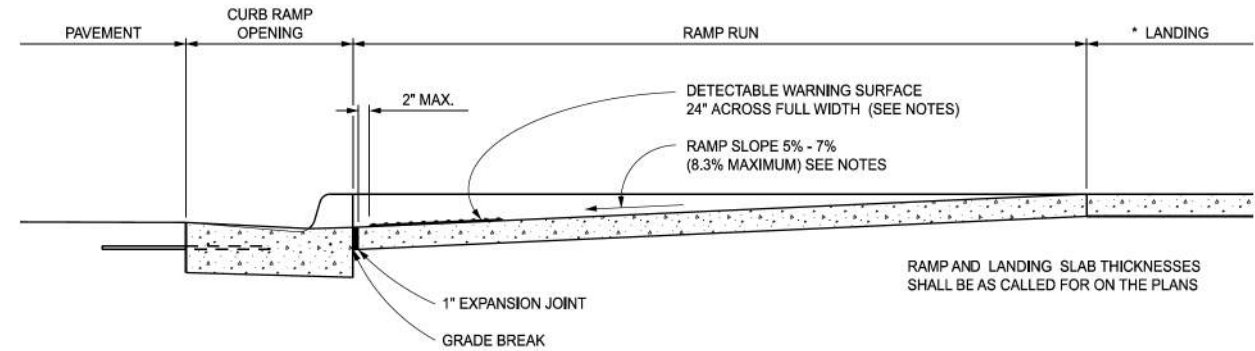
STANDARD PLAN FOR  
CURB RAMP AND  
DETECTABLE WARNING DETAILS

\* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

\*\* MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



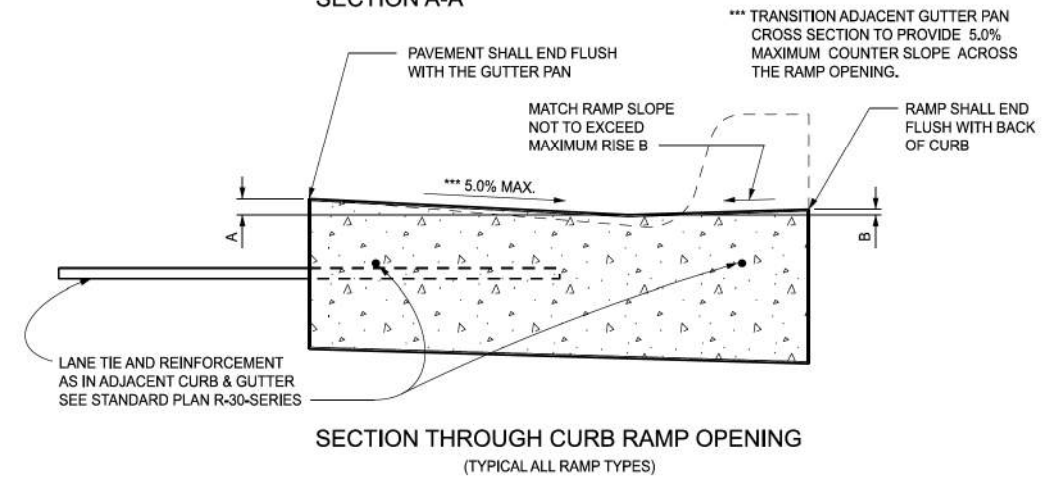
**CURB RAMP TYPE RF**  
(ROLLED / FLARED SIDES)



**SECTION A-A**

CURB TYPE	MAXIMUM RISE (INCHES)	
	A	B
B1	3/4	1
B2	3/4	1
B3	3/4	1
D1	3/4	1
D2	3/4	1
D3	3/4	1
C1	1/2	1/2
C2	1/2	1/2
C3	3/4	1/2
C4	3/4	1/2
C5	1	1/2
C6	1	1/2
F1	1/2	1/2
F2	1/2	1/2
F3	3/4	1/2
F4	3/4	1/2
F5	1	1/2
F6	1	1/2

FOR CURB TYPES SEE  
STANDARD PLAN R-30-SERIES



**SECTION THROUGH CURB RAMP OPENING**  
(TYPICAL ALL RAMP TYPES)



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
CURB RAMP AND  
DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

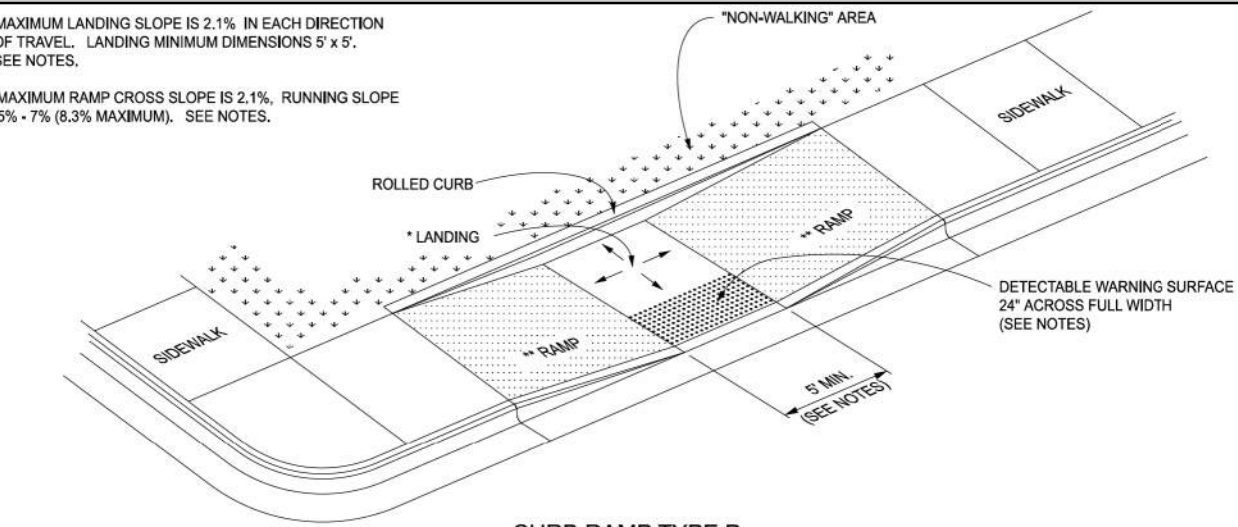
11/08/2023  
PLAN DATE

**R-28-K**

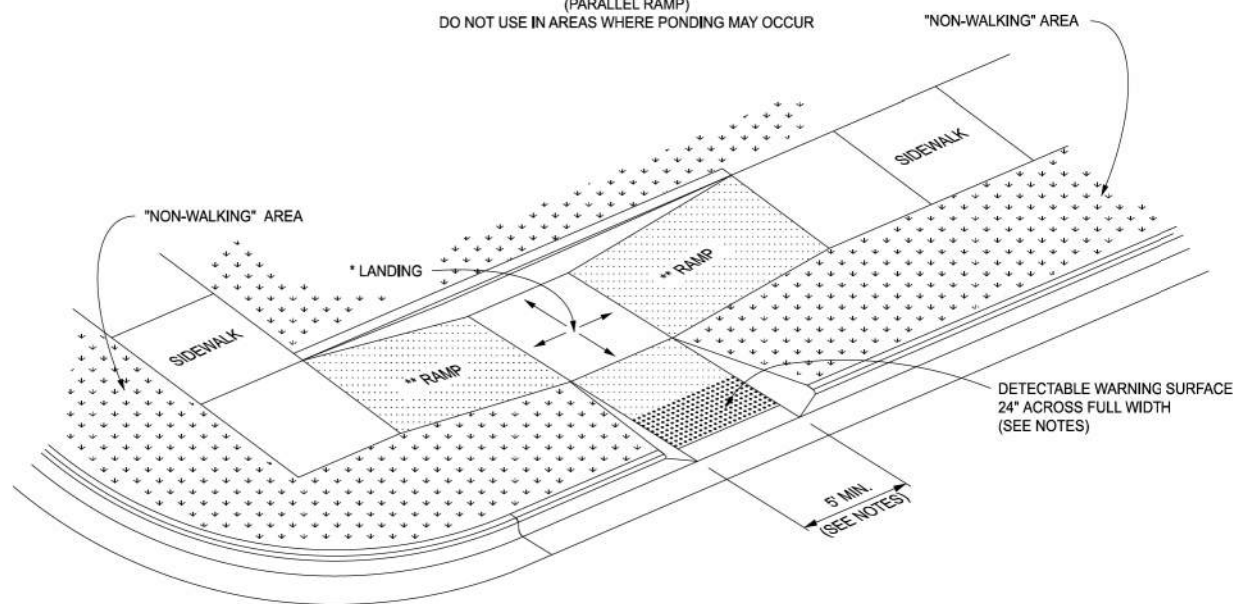
SHEET  
2 OF 7

\* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

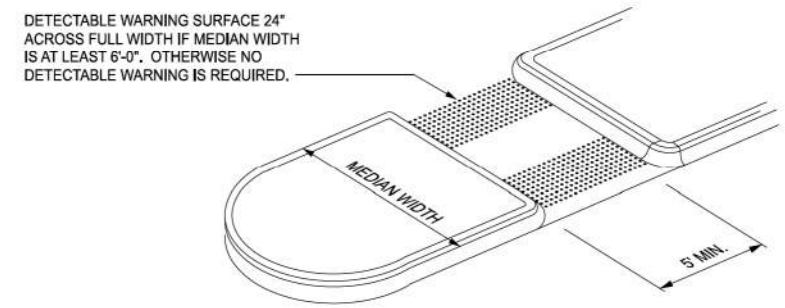
\*\* MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



**CURB RAMP TYPE P**  
(PARALLEL RAMP)  
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR



**CURB RAMP TYPE C**  
(COMBINATION RAMP)

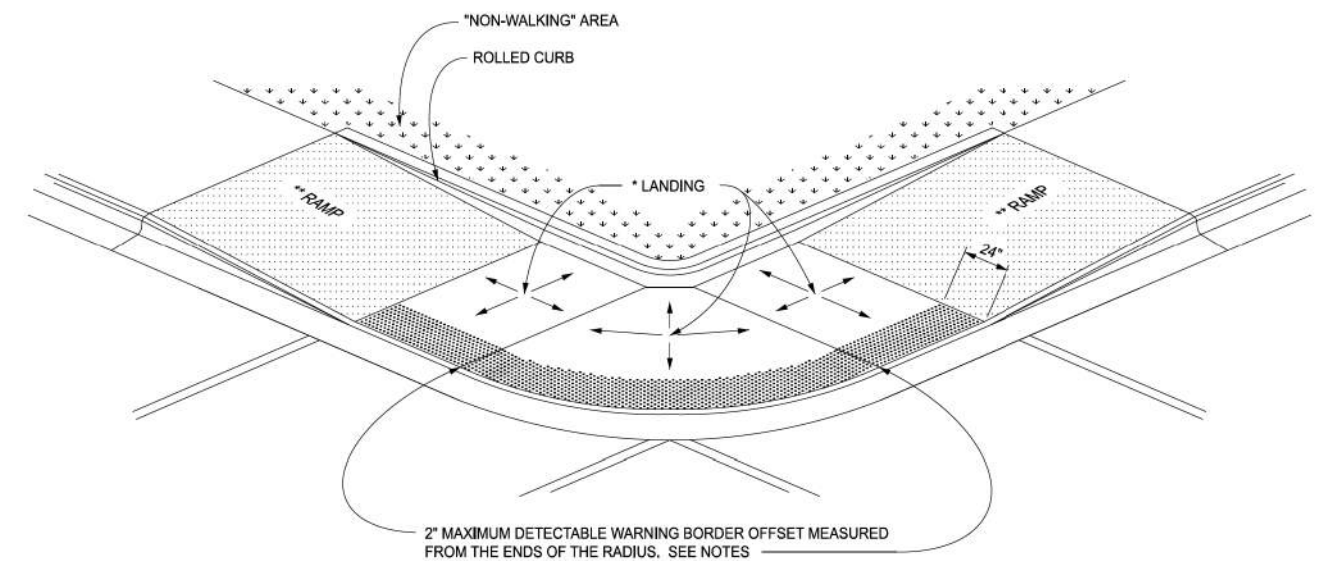


**CURB RAMP TYPE M**  
(MEDIAN ISLAND)

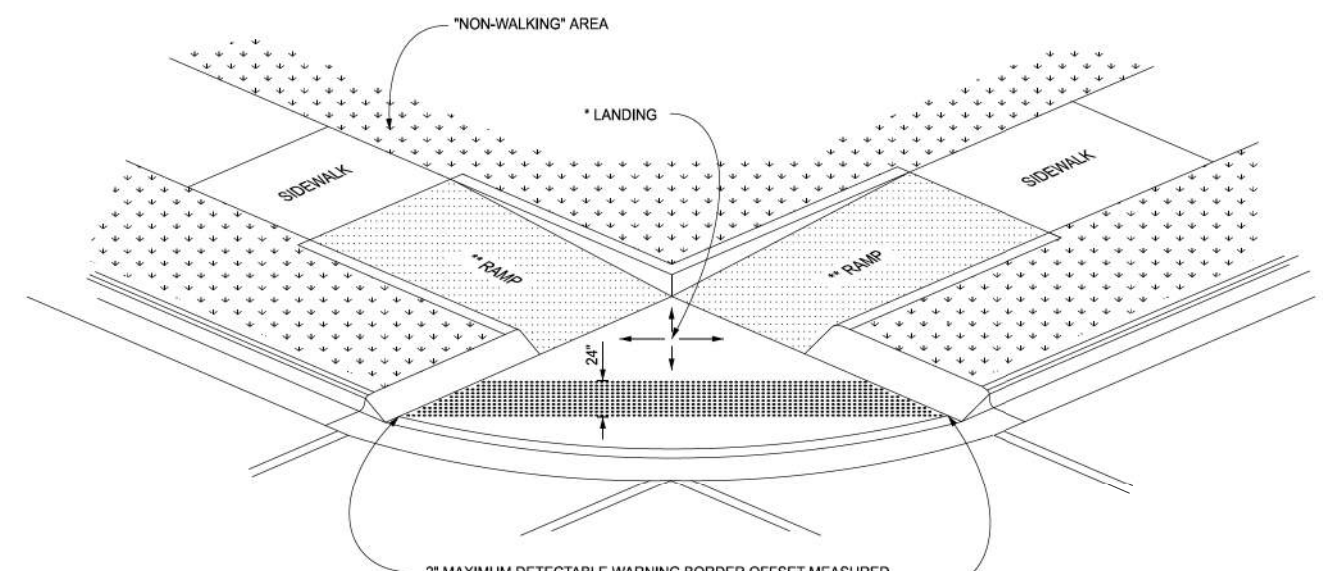
 Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS		
	(SPECIAL DETAIL) FHWA APPROVAL	11/08/2023 PLAN DATE	R-28-K

\* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

\*\* MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



( RADIAL DETECTABLE WARNING SHOWN )



( TANGENT DETECTABLE WARNING SHOWN )

**CURB RAMP TYPE D**  
(DEPRESSED CORNER)

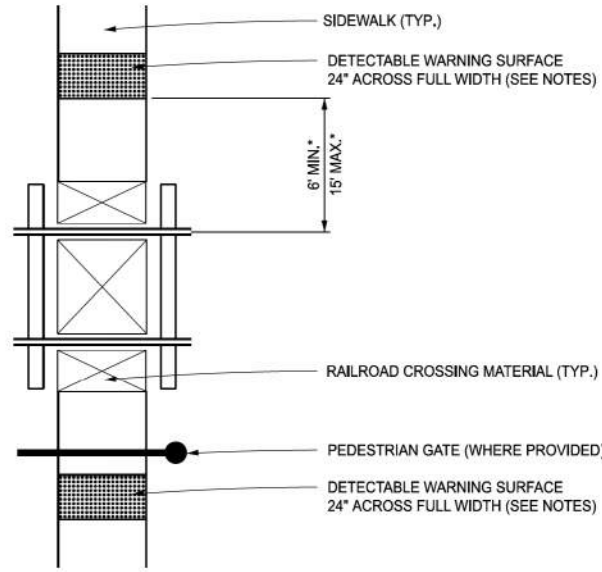
USE ONLY WHEN INDEPENDENT DIRECTIONAL RAMPS CAN NOT BE CONSTRUCTED FOR EACH CROSSING DIRECTION

 Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS		
	(SPECIAL DETAIL) FHWA APPROVAL	11/08/2023 PLAN DATE	R-28-K

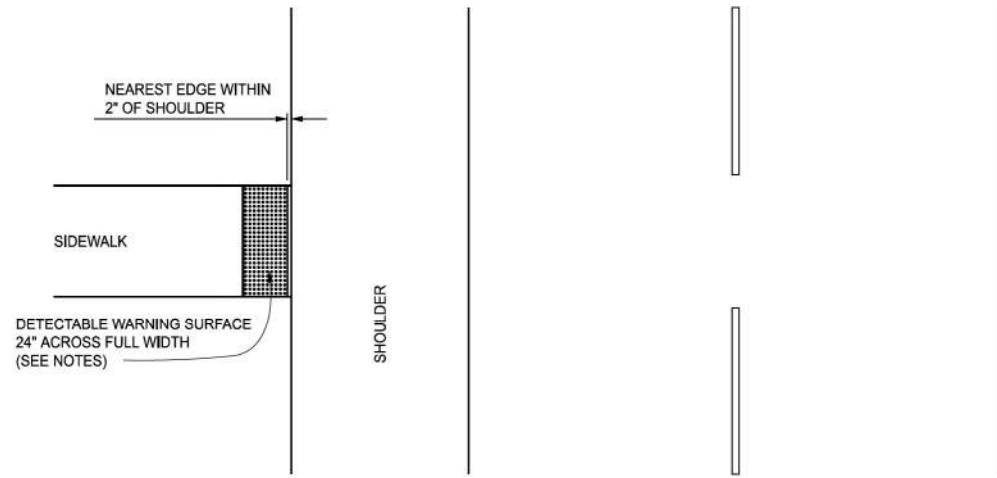
O:\WCP\015514.00 WCP\PC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_spcdet\_002.dgn



\* THE DETECTABLE WARNING SURFACE SHALL BE LOCATED SO THAT THE EDGE NEAREST THE RAIL CROSSING IS 6' MINIMUM AND 15' MAXIMUM FROM THE CENTERLINE OF THE NEAREST RAIL. DO NOT PLACE DETECTABLE WARNING ON RAILROAD CROSSING MATERIAL.

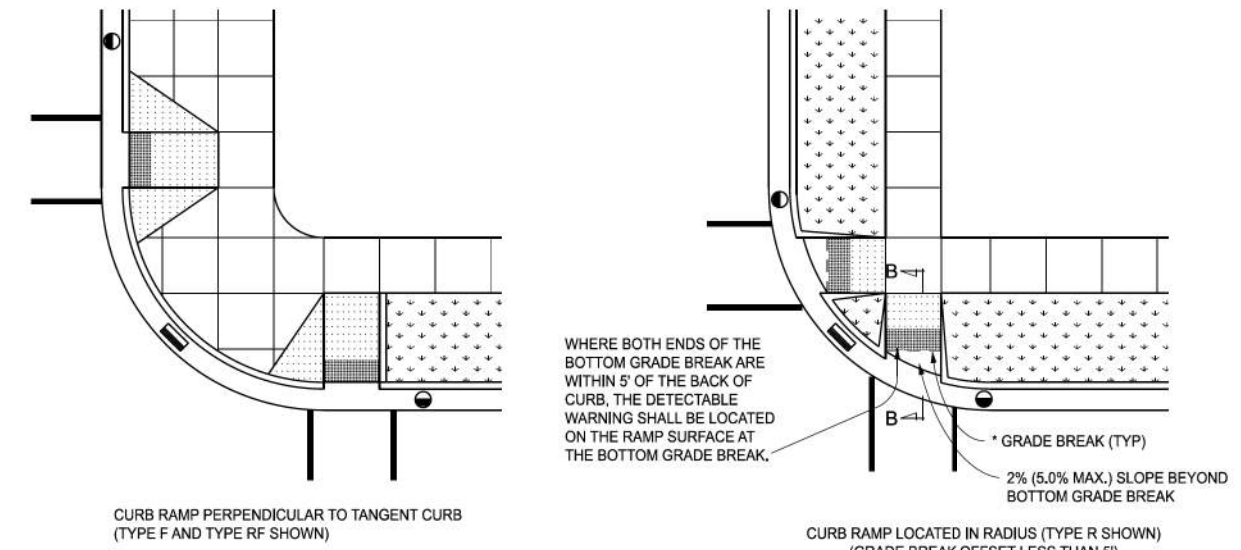
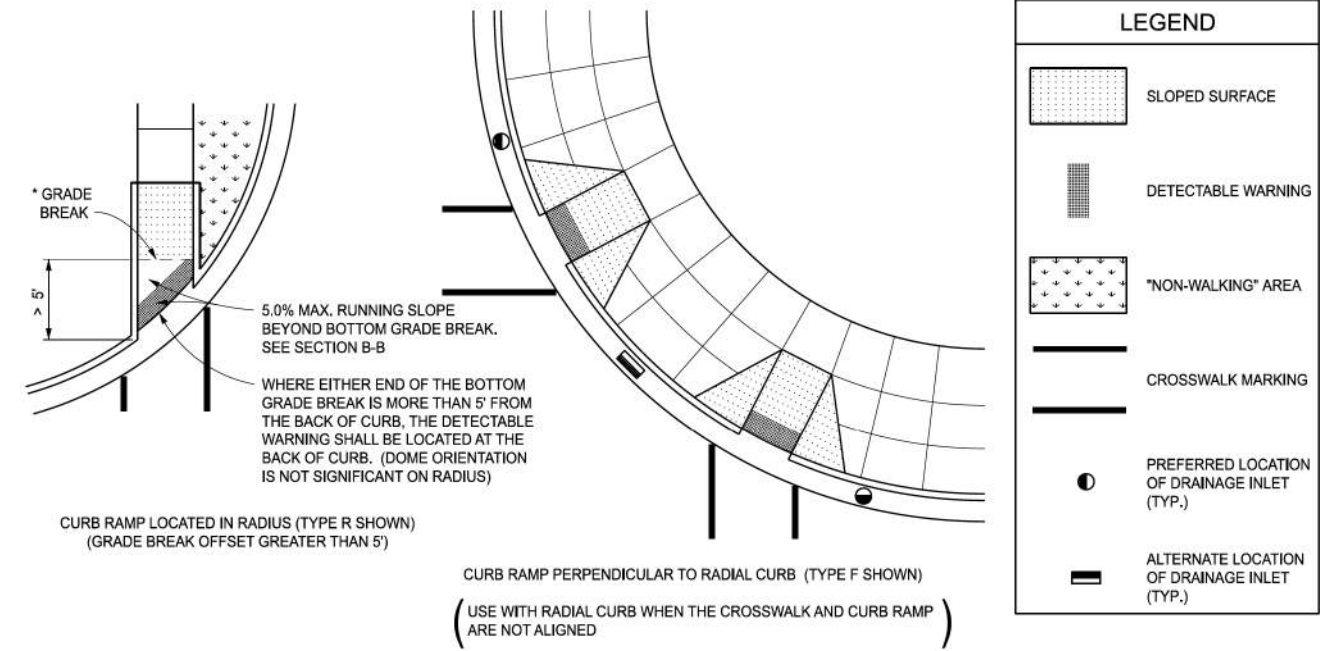


DETECTABLE WARNING AT RAILROAD CROSSING



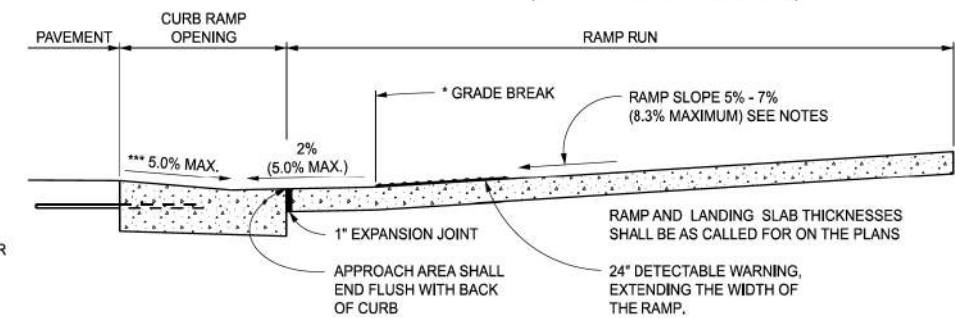
DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY

 Michigan Department of Transportation	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS			
	(SPECIAL DETAIL)	11/08/2023	R-28-K	SHEET 5 OF 7
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	FHWA APPROVAL	PLAN DATE		



\* GRADE BREAKS AT THE TOP AND BOTTOM OF CURB RAMPS SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL.

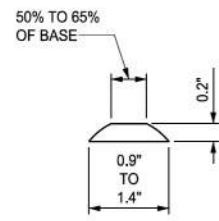
\*\*\* TRANSITION ADJACENT GUTTER PAN CROSS SECTION TO PROVIDE 5.0% MAXIMUM COUNTER SLOPE ACROSS THE RAMP OPENING.  
SEE SHEET 2 FOR CURB RAMP OPENING DETAILS.



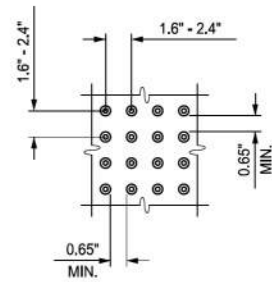
SECTION B-B  
CURB RAMP ORIENTATION

 Michigan Department of Transportation	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS			
	(SPECIAL DETAIL)	11/08/2023	R-28-K	SHEET 6 OF 7
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	FHWA APPROVAL	PLAN DATE		

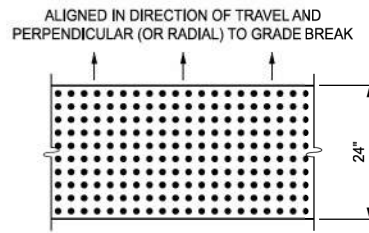
O:\WCP\015514.00 WCP\PC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx\_spcdet\_002.dgn



DOME SECTION



DOME SPACING



DOME ALIGNMENT

DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

CURB RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

WHEN 5' MINIMUM WIDTHS ARE NOT FEASIBLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND LANDINGS TO NOT LESS THAN 4' x 4'.

CURB RAMPS WITH A RUNNING SLOPE  $\leq 5\%$  DO NOT REQUIRE A TOP LANDING. HOWEVER, ANY CONTINUOUS SIDEWALK OR PEDESTRIAN ROUTE CROSSING THROUGH OR INTERSECTING THE CURB RAMP MUST INDEPENDENTLY MAINTAIN A CROSS SLOPE NOT GREATER THAN 2.1% PERPENDICULAR TO ITS OWN DIRECTION(S) OF TRAVEL.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.1%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH NOT INCLUDING LANDINGS OR TRANSITIONS.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN 1/2". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE CURB RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.



STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS			
(SPECIAL DETAIL)	11/08/2023	R-28-K	SHEET 7 OF 7
FHWA APPROVAL	PLAN DATE		

REVISIONS:

VERT DATUM

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CITY OF ANN ARBOR

COUNTY

WASHTENAW

CADD

PROJ/LEADER

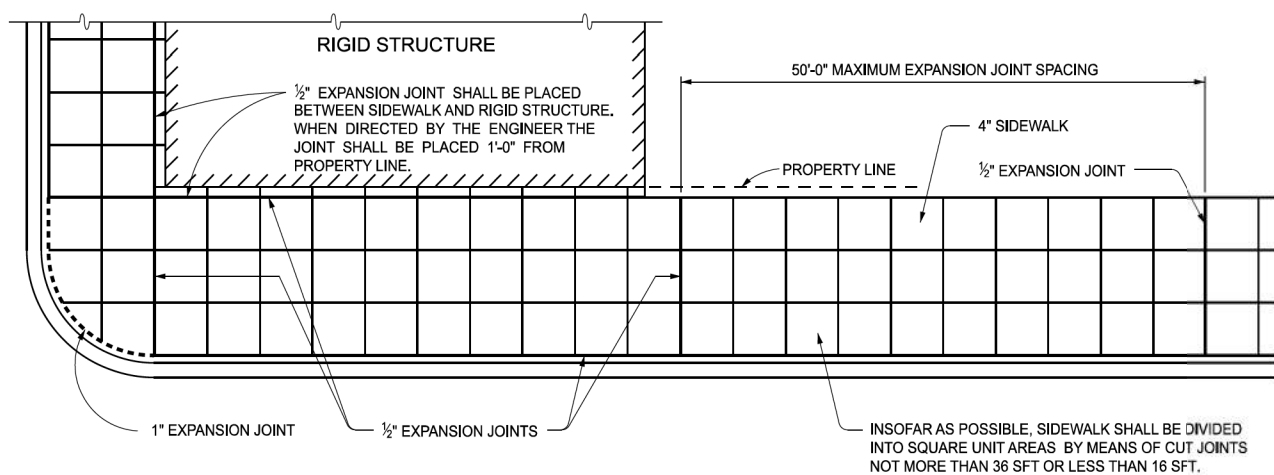
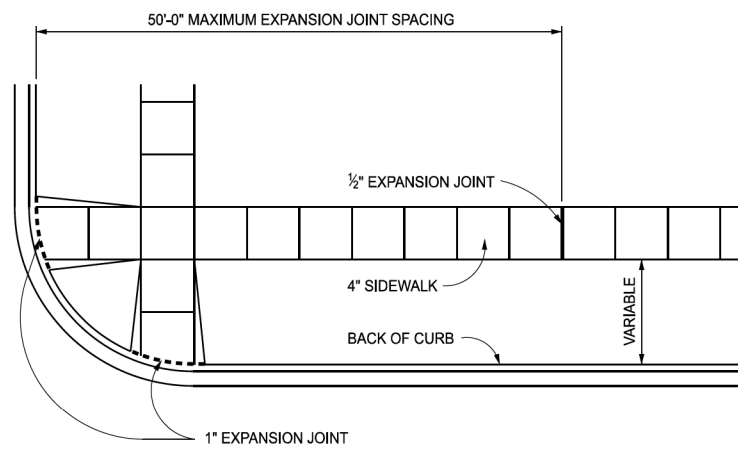
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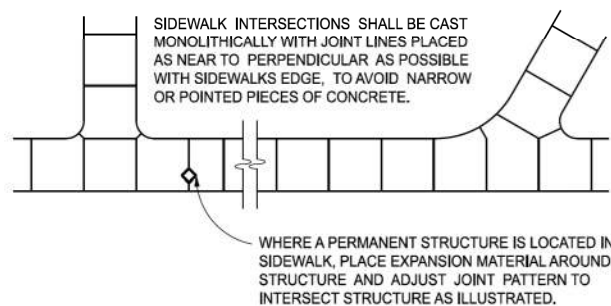
DATE

SHEET

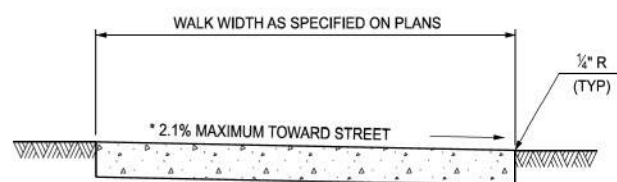
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SPECIAL DETAILS



LOCATION OF JOINTS IN CONCRETE SIDEWALK



TYPICAL SIDEWALK JOINT LAYOUTS



4" CONCRETE SIDEWALK

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

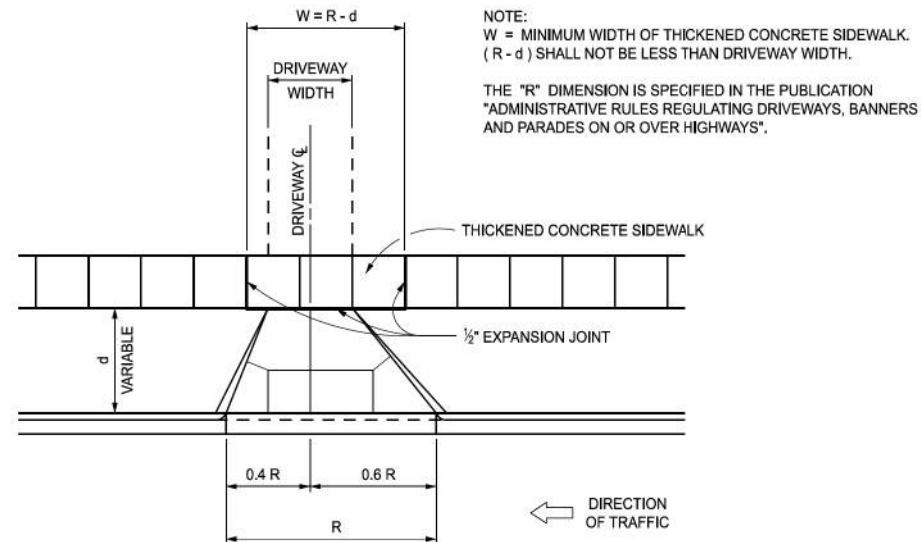
APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



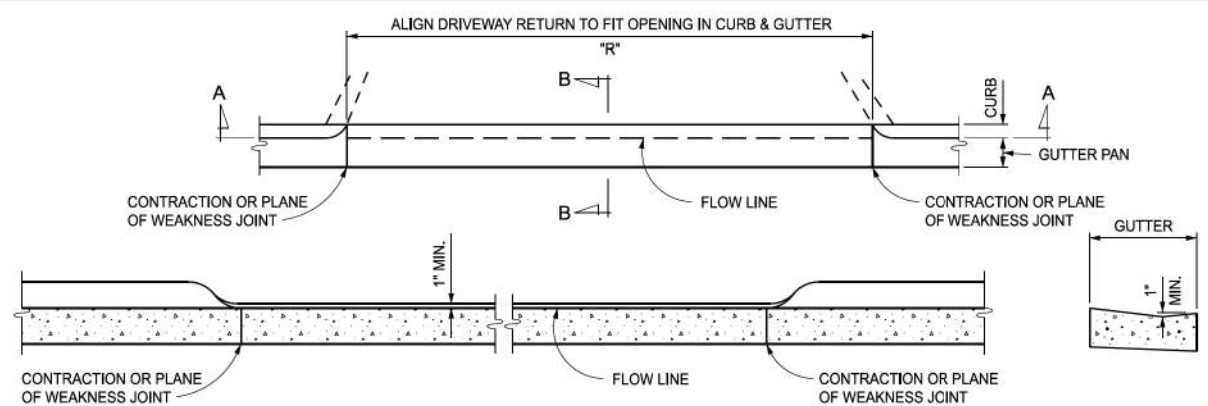
DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
DRIVEWAY OPENINGS & APPROACHES,  
AND CONCRETE SIDEWALK

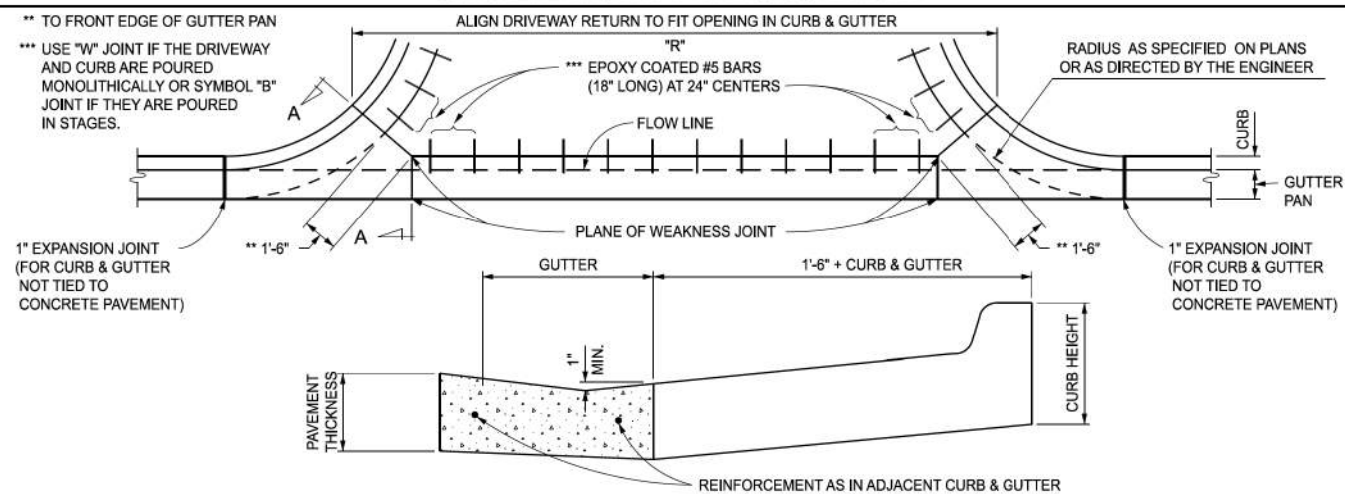
(SPECIAL DETAIL)	11/08/2023	R-29-J	SHEET 1 OF 4
FHWA APPROVAL	PLAN DATE		



CONCRETE DRIVEWAY OPENING LAYOUT



SECTION A - A  
CONCRETE DRIVEWAY OPENING, DETAIL L



SECTION A - A  
CONCRETE DRIVEWAY OPENING, DETAIL M

NOTE:  
FOR ROADWAYS WITH CONCRETE PAVEMENTS,  
LONGITUDINAL LANE TIES WILL BE CONTINUOUS  
THROUGH THE DRIVEWAY OPENING AND THE  
SPACING OF THE #5 BARS IN CONCRETE DRIVEWAYS  
SHALL BE ADJUSTED TO AVOID CONFLICT WITH THE  
LONGITUDINAL LANE TIES.

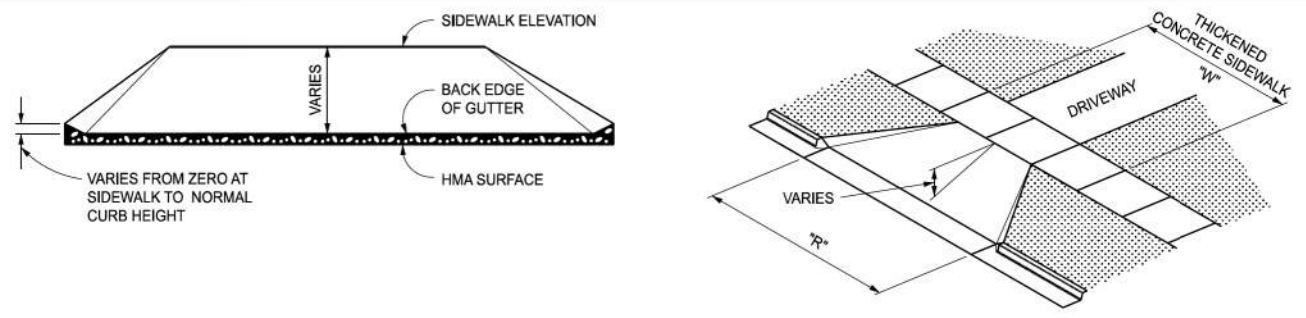


DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

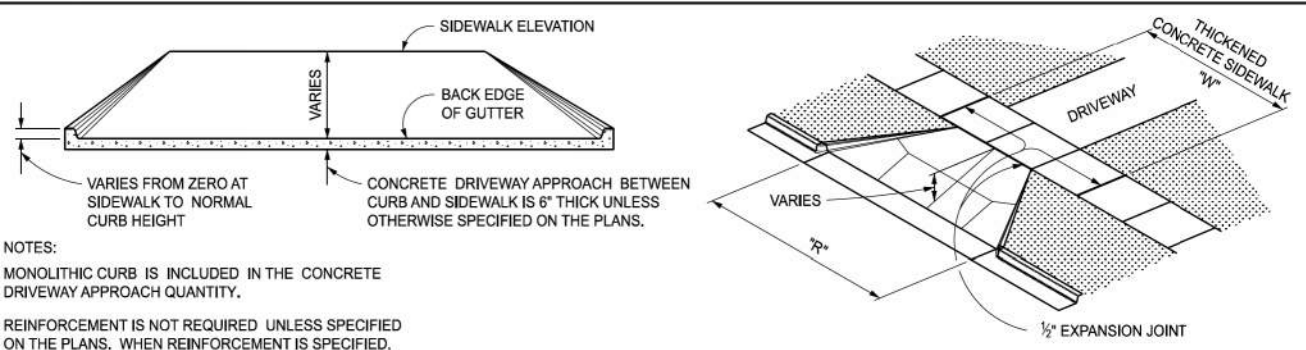
STANDARD PLAN FOR  
DRIVEWAY OPENINGS & APPROACHES,  
AND CONCRETE SIDEWALK

(SPECIAL DETAIL)	11/08/2023	R-29-J	SHEET 2 OF 4
FHWA APPROVAL	PLAN DATE		

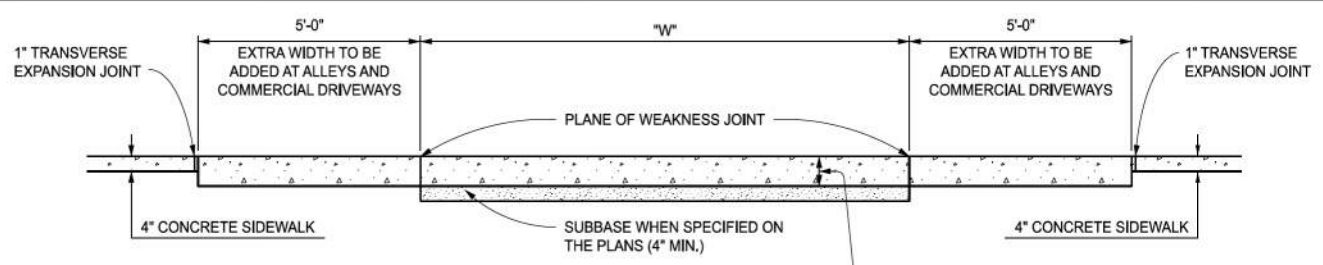
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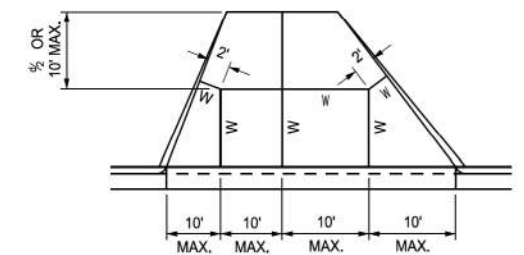
**HMA DRIVEWAY APPROACH**  
(TO BE USED WITH DETAIL L)



**CONCRETE DRIVEWAY APPROACH**  
(TO BE USED WITH DETAIL L OR M)



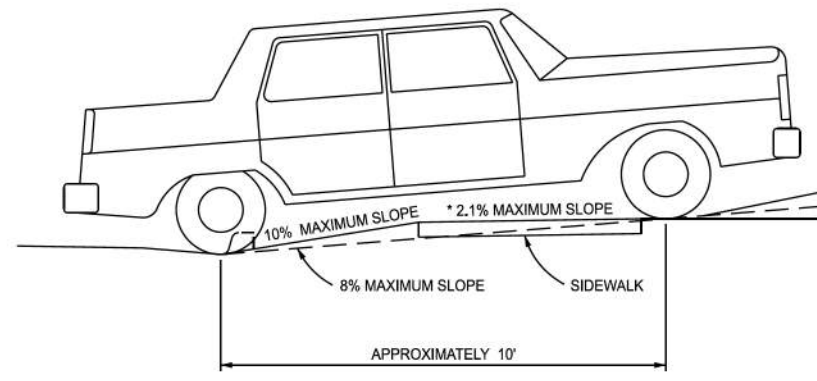
**THICKENED CONCRETE SIDEWALK**



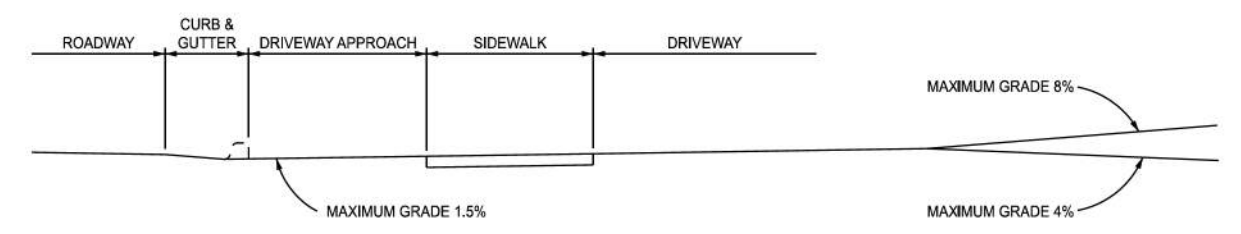
ADJUST DRIVEWAY JOINTS AS NEEDED TO ALIGN WITH ANY COINCIDING TRANSVERSE PAVEMENT JOINTS.  
JOINT LAYOUT IS AS INDICATED OR AS DIRECTED BY THE ENGINEER.  
**INTERMEDIATE DRIVEWAY JOINT DETAILS**

REINFORCEMENT FOR CONCRETE DRIVEWAYS		
CONCRETE DRIVEWAY THICKNESS	WIRE SIZE (6" x 6" MESH)	AVERAGE WEIGHT (LBS/100 SFT)
LESS THAN 8"	W1.4	21
	W2.9	42
8" OR GREATER	USE WIRE FABRIC REINFORCEMENT SPECIFIED ON STANDARD PLAN R-37-SERIES	

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK			
	(SPECIAL DETAIL)	11/08/2023	R-29-J	SHEET 3 OF 4
	FHWA APPROVAL	PLAN DATE		



**LOW VOLUME COMMERCIAL OR RESIDENTIAL DRIVEWAY SLOPES**



**COMMERCIAL DRIVEWAY PROFILE FOR MAJOR TRAFFIC GENERATORS**

**NOTES:**  
FOR DRIVEWAY DESIGN REFER ALSO TO "ADMINISTRATIVE RULES REGULATING DRIVEWAYS, BANNERS, AND PARADES ON OR OVER HIGHWAYS" AND GEOMETRIC DESIGN G-680-SERIES, COMMERCIAL DRIVEWAYS.  
FOR CURB AND GUTTER DETAILS, SEE STANDARD PLAN R-30-SERIES.  
TRANSVERSE SIDEWALK SLOPES ARE 2.1% MAXIMUM. IN ORDER TO MEET SITE CONDITIONS, IF THE TRANSVERSE SLOPE IS REQUIRED TO BE LESS THAN 1.5%, LONGITUDINAL DRAINAGE MUST BE PROVIDED.  
WHEN SETTING GRADES FOR COMMERCIAL DRIVES, THE TYPES OF VEHICLES USING THE DRIVE SHOULD BE CONSIDERED.

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK			
	(SPECIAL DETAIL)	11/08/2023	R-29-J	SHEET 4 OF 4
	FHWA APPROVAL	PLAN DATE		

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REVISIONS: CITY/VILLAGES/TOWNSHIP: WASHINGTON COUNTY: WASHTENAW CITY OF ANN ARBOR

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SPECIAL DETAILS

REVISIONS:

HORIZ. DATUM: NAD83

SCALE: V:

CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR

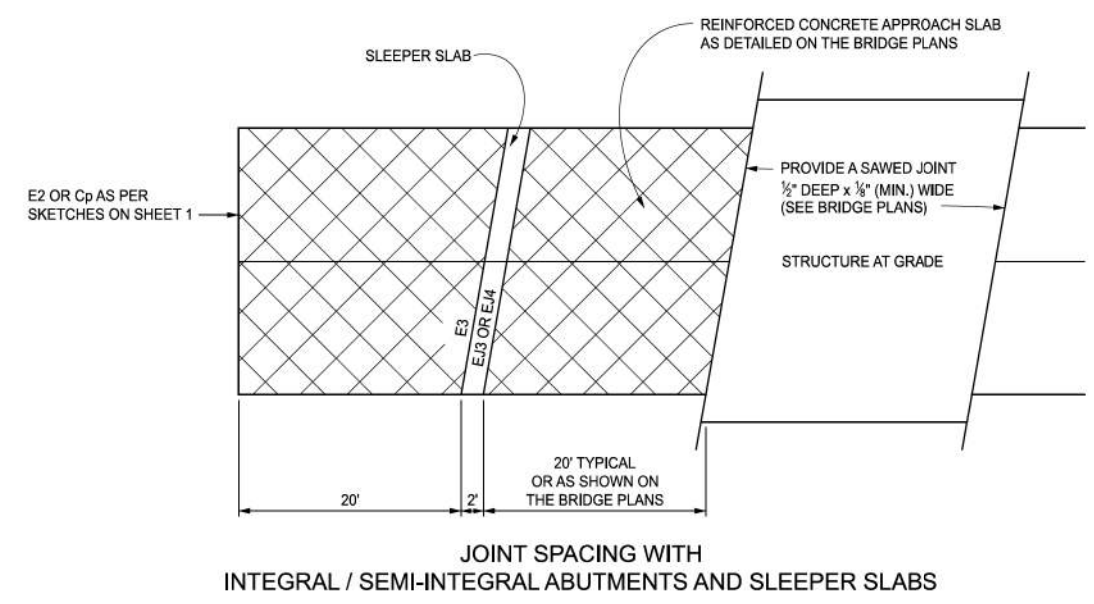
COUNTY: WASHTENAW

PROJ. NUMBER: JAH

DATE: 4/7/2024

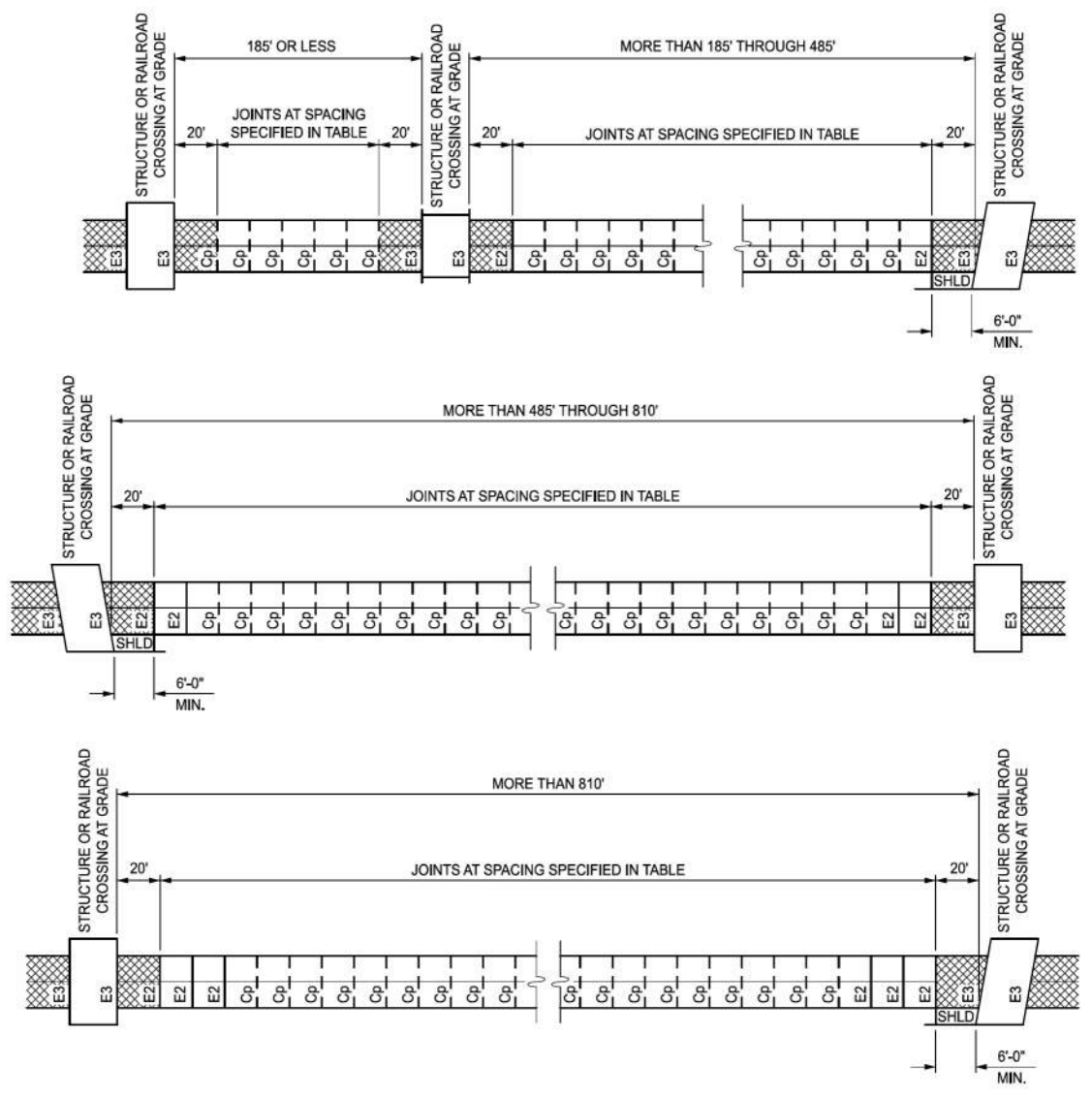
SHEET

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SPECIAL DETAILS



JOINT SPACING WITH INTEGRAL / SEMI-INTEGRAL ABUTMENTS AND SLEEPER SLABS

NOTES:  
UNLESS OTHERWISE SPECIFIED ON THE PLANS OR DIRECTED BY THE ENGINEER, TRANSVERSE JOINTS SHALL BE PLACED AS SPECIFIED ON THIS STANDARD PLAN AND ON STANDARD PLAN R-42-SERIES.  
MAXIMUM JOINT SPACING SHALL NOT EXCEED THE DISTANCE SPECIFIED. WHEN A JOINT SPACING ADJUSTMENT IS REQUIRED, IT SHALL BE MADE BETWEEN CONTRACTION JOINTS WITH THE ADJUSTED SPACE BEING NOT LESS THAN 6'-6".  
EXPANSION JOINTS SHALL ONLY BE PLACED AT STRUCTURES, INTERSECTIONS AND SPECIFIED LOCATIONS.  
JOINTS ABUTTING RAILROAD TRACKS SHALL BE AS SPECIFIED ON STANDARD PLAN R-121-SERIES.



PLAN VIEW SHOWING TRANSVERSE JOINT LOCATIONS

JOINT LEGEND  
ACCORDING TO STANDARD PLAN R-39-SERIES

- (E2) 1" TRANSVERSE EXPANSION JOINT WITH LOAD TRANSFER ASSEMBLY
- (E3) 1" TRANSVERSE EXPANSION JOINT WITHOUT LOAD TRANSFER ASSEMBLY
- (Cp) TRANSVERSE CONTRACTION JOINT
- REINFORCED CONCRETE PAVEMENT ADJACENT TO BRIDGE REFERENCE LINE OR SLEEPER SLAB

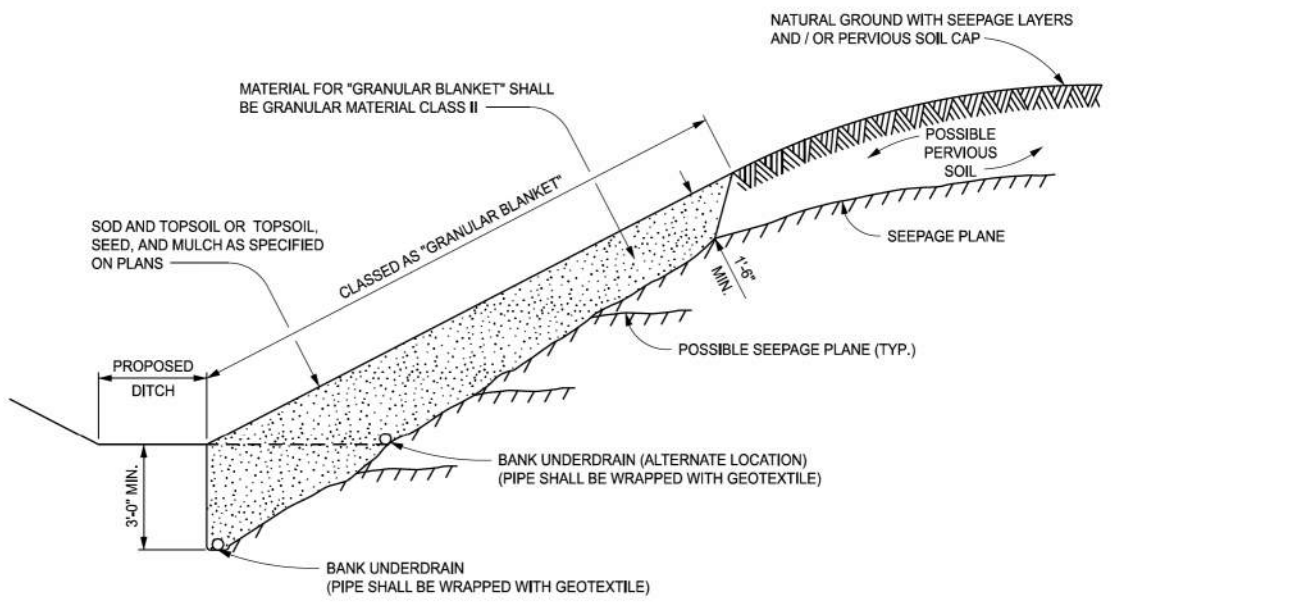
JOINED PLAIN CONCRETE PAVEMENT	
PAVEMENT THICKNESS	JOINT SPACING
6 1/2" TO 8 3/4"	12'
9" TO 11 3/4"	14'
12" OR MORE	16'

NOTE:  
SEE SHEET 2 FOR DETAIL OF JOINT SPACING WITH INTEGRAL / SEMI-INTEGRAL ABUTMENTS AND SLEEPER SLAB.

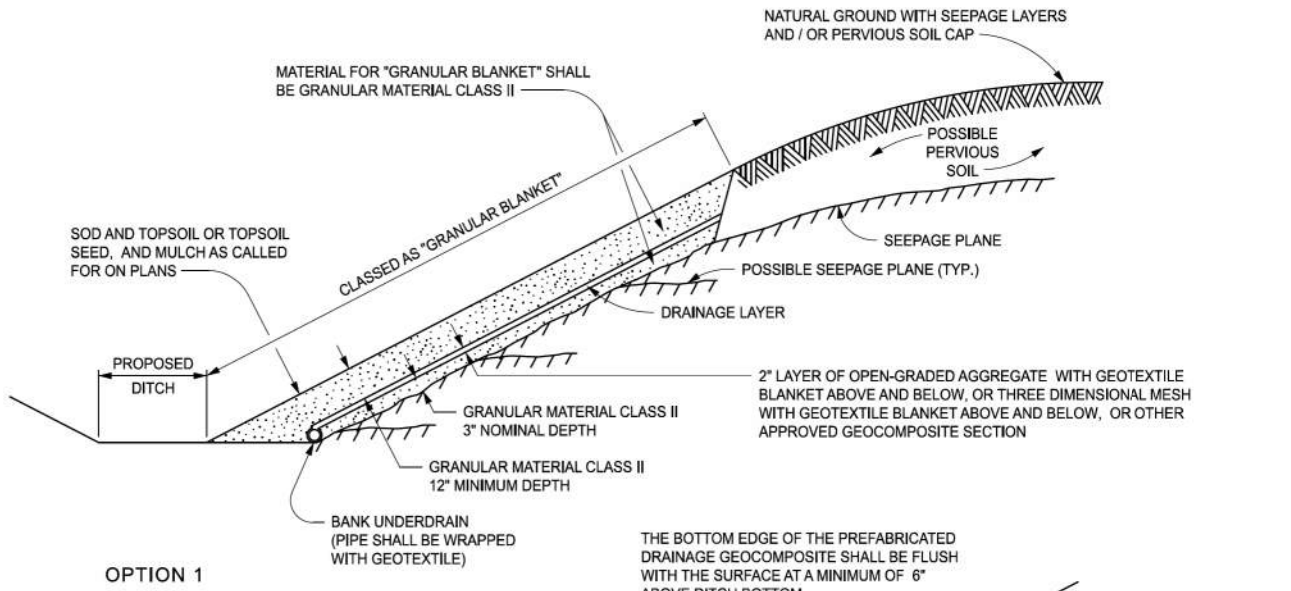
APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES	<p>Michigan Department of Transportation</p>	STANDARD PLAN FOR LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT			
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2022 PLAN DATE	R-43-J

APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES	<p>Michigan Department of Transportation</p>	STANDARD PLAN FOR LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT			
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2022 PLAN DATE	R-43-J

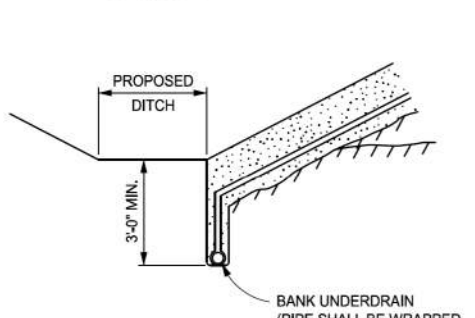
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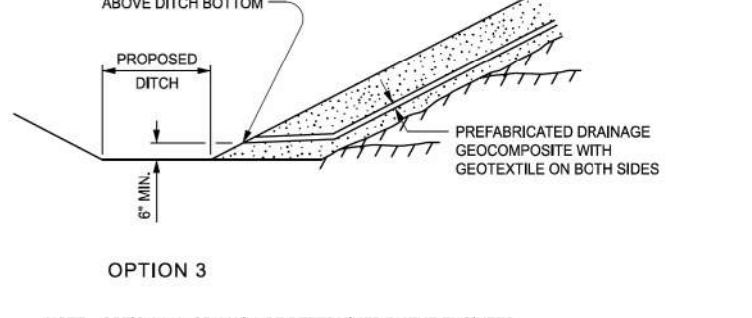
**GRANULAR BLANKET TYPE 1**



**OPTION 1**



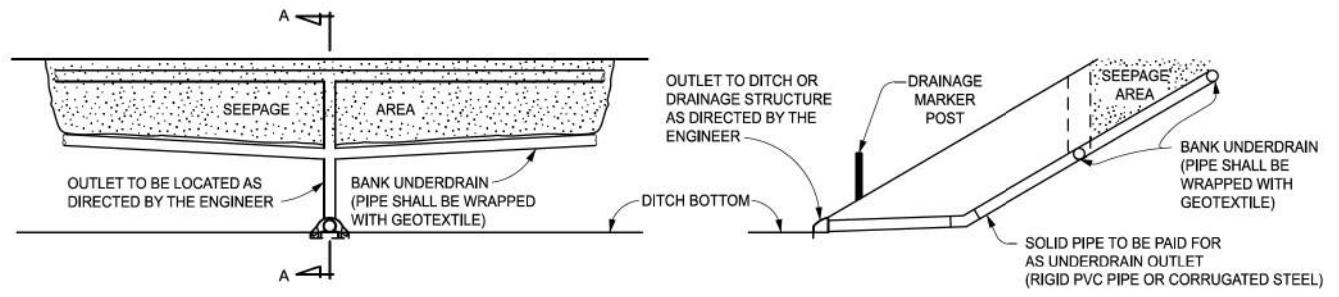
**OPTION 2**



**OPTION 3**

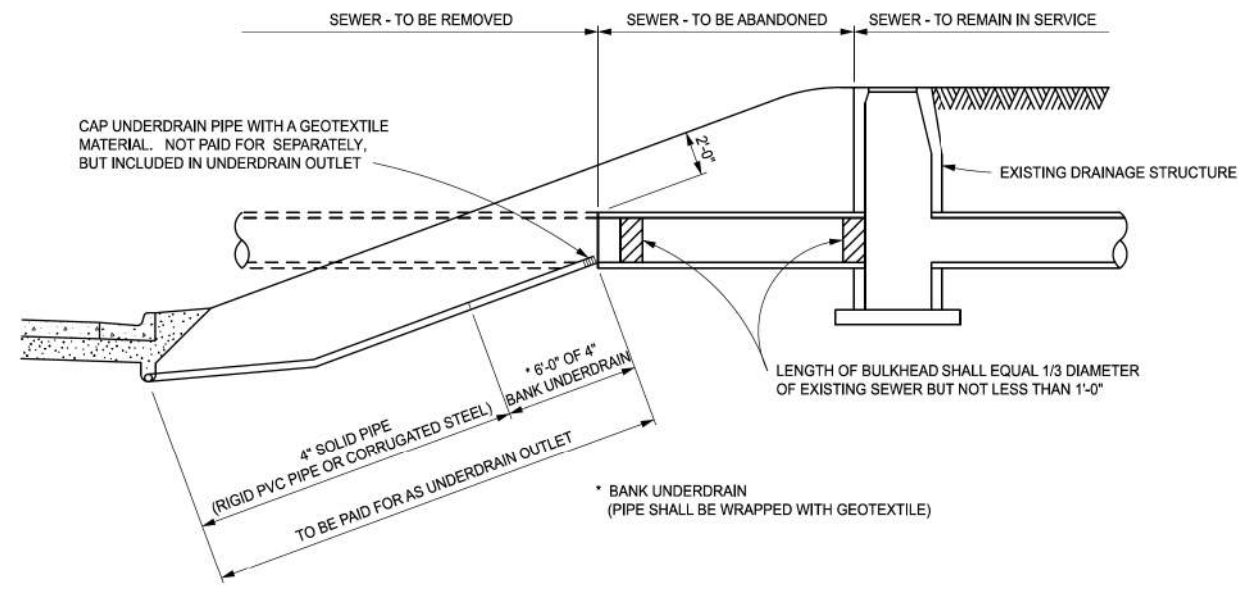
NOTE: OPTION 1, 2, OR 3 WILL BE DETERMINED BY THE ENGINEER BASED ON THE PROJECT CONDITIONS.

**GRANULAR BLANKET TYPE 2**



**SECTION A - A**

**BANK UNDERDRAIN OUTLET**



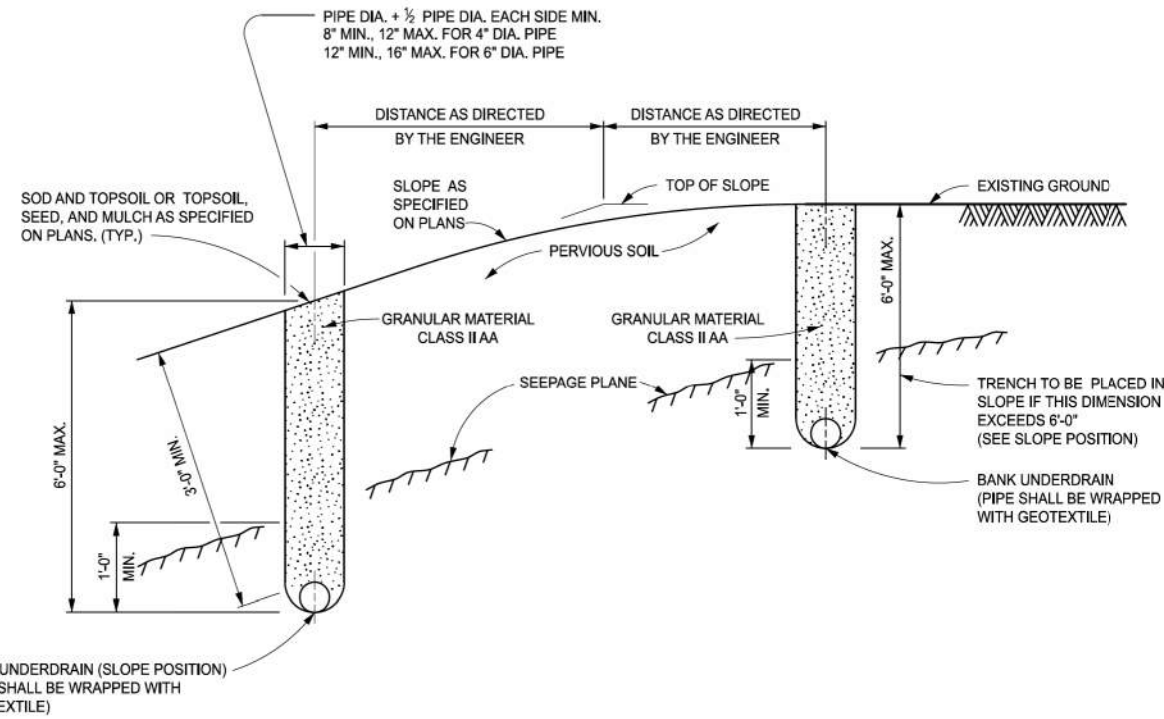
**WEEPER UNDERDRAIN AND BULKHEADING SEVERED SEWER**

APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES		STANDARD PLAN FOR <b>GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</b>			
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	06/28/2021 PLAN DATE	<b>R-80-F</b>

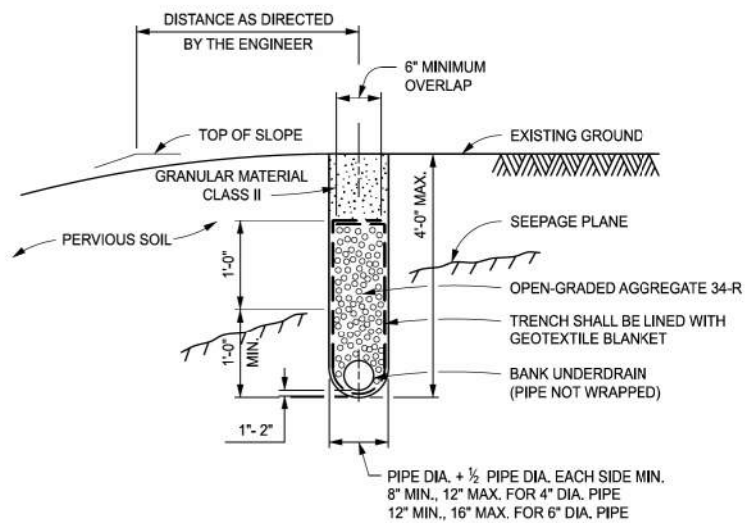
APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES		STANDARD PLAN FOR <b>GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</b>			
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	06/28/2021 PLAN DATE	<b>R-80-F</b>

REVISIONS: \_\_\_\_\_  
HORIZ. DATUM: NAVD83  
VERT. DATUM: NAVD83  
SCALE: \_\_\_\_\_  
CITY/VILLAGES/TOWNSHIP: \_\_\_\_\_  
COUNTY: WASHTENAW  
CITY OF ANN ARBOR  
PROJECT: CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SPECIAL DETAILS

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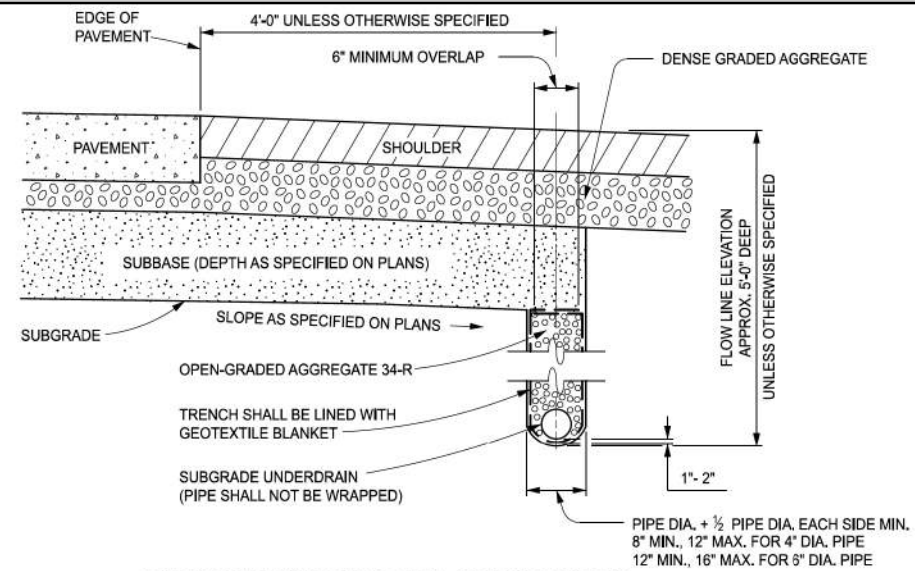


**BANK UNDERDRAINS**

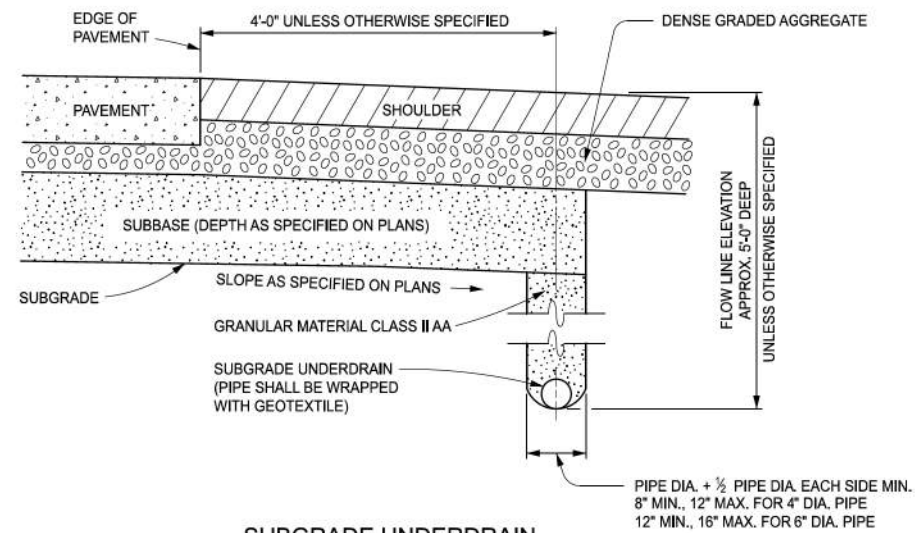


**BANK UNDERDRAIN, OPEN-GRADED**

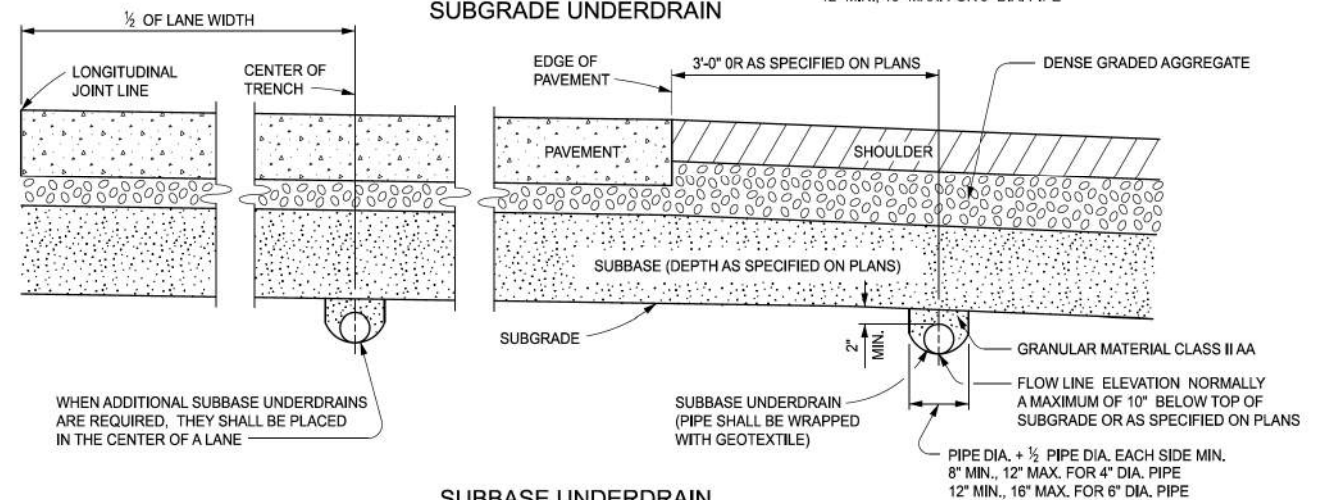
 Michigan Department of Transportation	STANDARD PLAN FOR			
	<b>GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</b>			
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	06/28/2021 PLAN DATE	<b>R-80-F</b>	SHEET 3 OF 8



**SUBGRADE UNDERDRAIN - OPEN-GRADED**



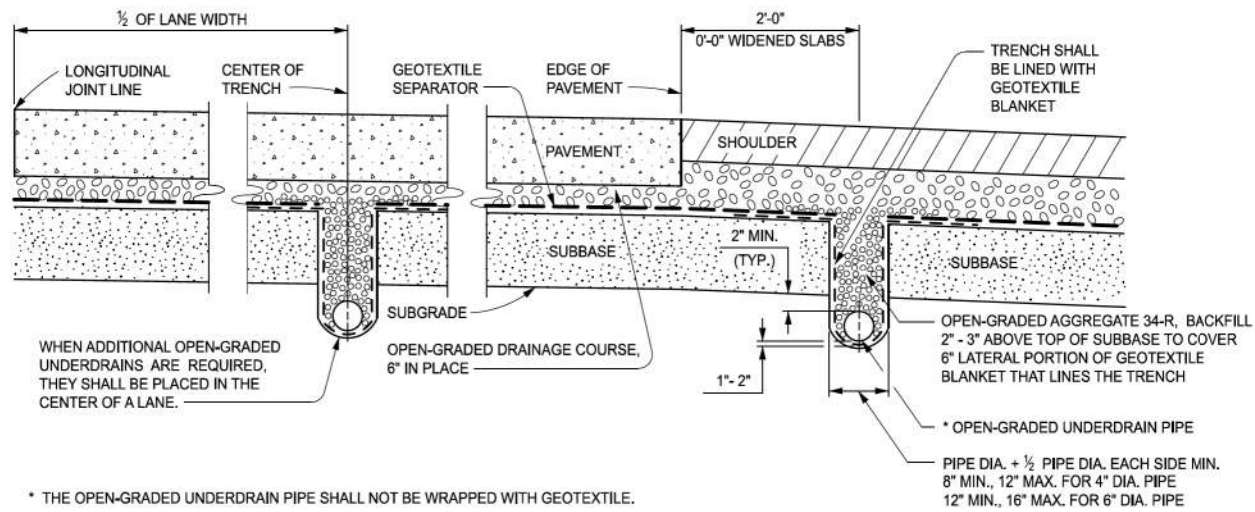
**SUBGRADE UNDERDRAIN**



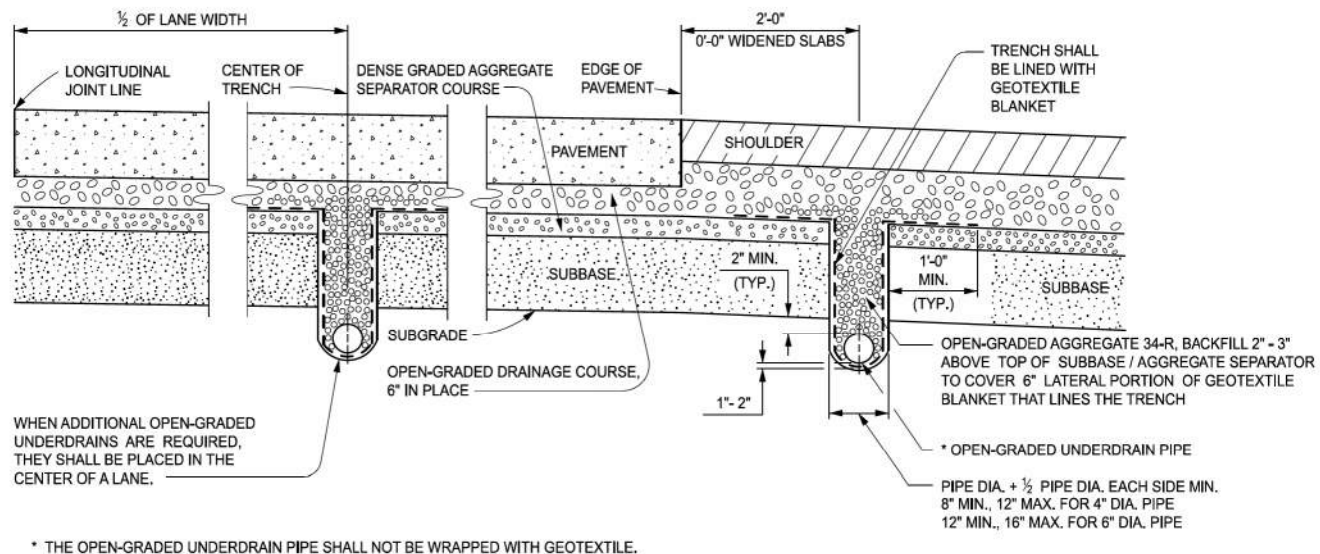
**SUBBASE UNDERDRAIN**

 Michigan Department of Transportation	STANDARD PLAN FOR			
	<b>GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</b>			
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	06/28/2021 PLAN DATE	<b>R-80-F</b>	SHEET 4 OF 8

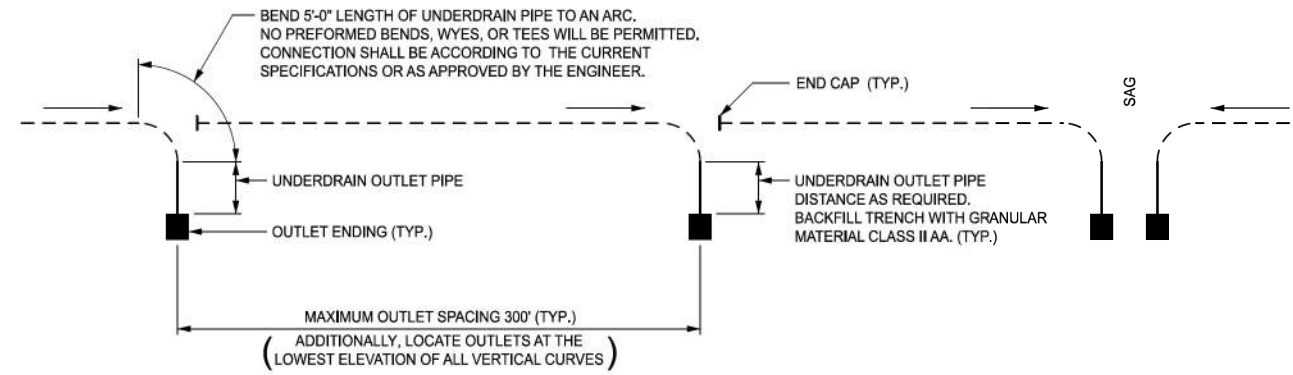
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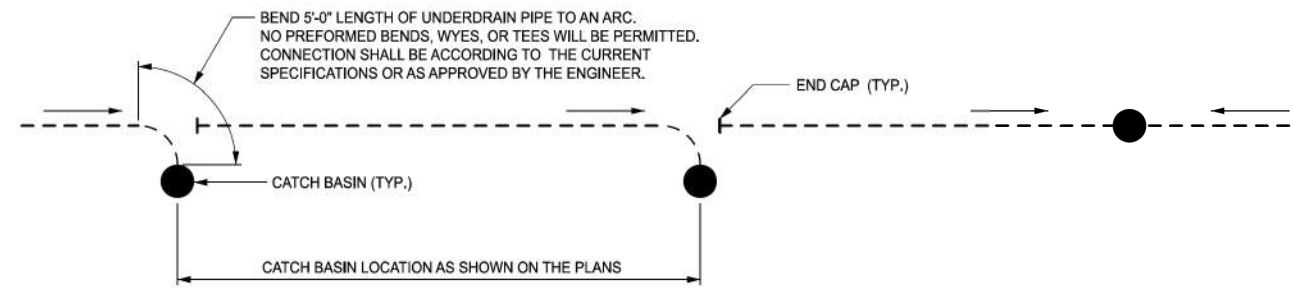
OPEN-GRADED UNDERDRAIN PIPE WITH GEOTEXTILE SEPARATOR



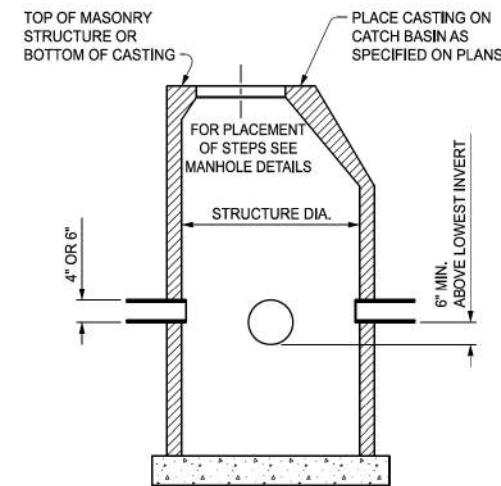
OPEN-GRADED UNDERDRAIN PIPE WITH DENSE GRADED AGGREGATE SEPARATOR COURSE



PLAN SHOWING OUTLETS FOR UNDERDRAINS



PLAN SHOWING UNDERDRAINS TAPPED INTO CATCH BASINS



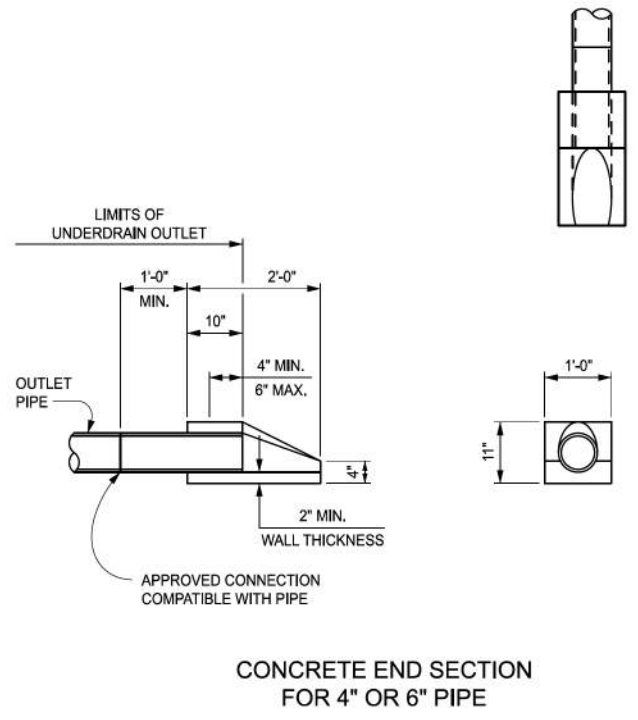
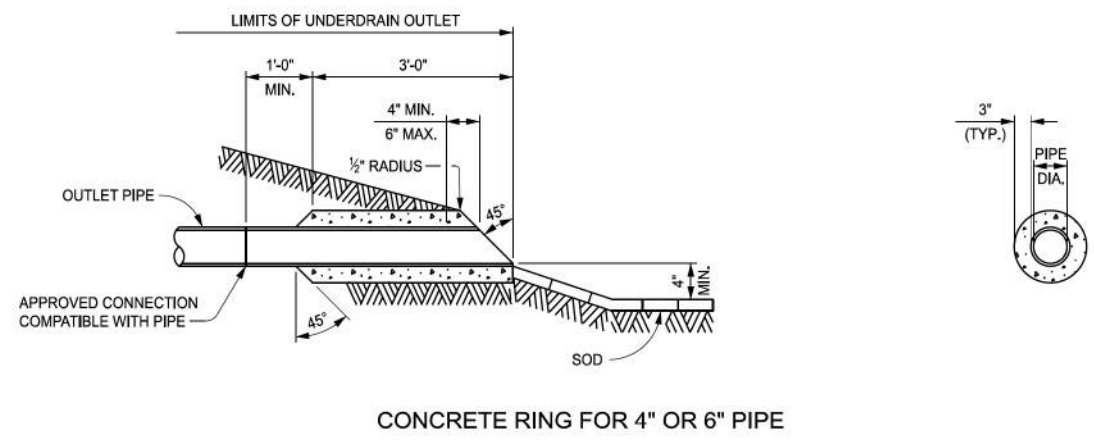
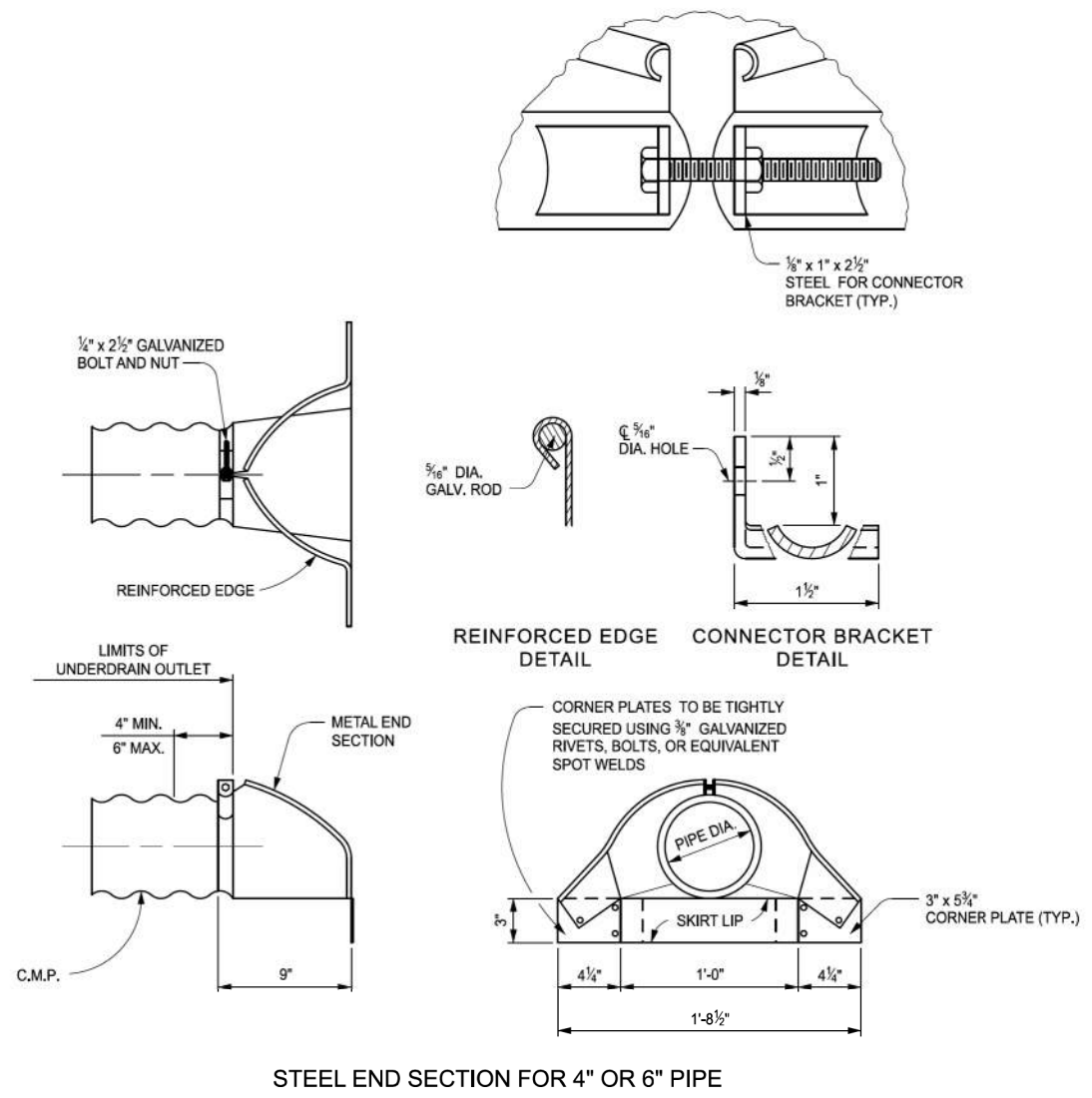
PROFILE VIEW

<p>Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS			
	(SPECIAL DETAIL)	06/28/2021	R-80-F	SHEET 5 OF 8
	FHWA APPROVAL	PLAN DATE		

<p>Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS			
	(SPECIAL DETAIL)	06/28/2021	R-80-F	SHEET 6 OF 8
	FHWA APPROVAL	PLAN DATE		



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NOTES:

POSITIVE DRAINAGE SHALL BE PROVIDED FOR UNDERDRAINS AND UNDERDRAIN OUTLETS.

UNDERDRAIN PIPE SIZES SHALL BE AS SPECIFIED ON THE PLANS.

CONNECTIONS BETWEEN UNDERDRAIN PIPE AND UNDERDRAIN OUTLET PIPE SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND AS APPROVED BY THE ENGINEER.

CONNECTIONS, IF REQUIRED WITHIN THE OUTLET PIPE, SHALL BE ACCORDING TO APPLICABLE ASTM SPECIFICATIONS REFERENCED IN THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. THEY SHALL BE WATER TIGHT, AND OF THE SAME MATERIAL AS THE OUTLET PIPE.

OUTLET CONNECTIONS TO DRAINAGE STRUCTURES SHALL BE ACCORDING TO STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR DRAINAGE STRUCTURES.

UNDERDRAIN OUTLET PIPE SHALL BE RIGID PVC OR CORRUGATED METAL ONLY.

THE CONCRETE RING OR CONCRETE END SECTION SHALL BE CAST AROUND THE SAME TYPE OF PIPE AS THAT USED FOR UNDERDRAIN OUTLET PIPE.

STEEL END SECTIONS SHALL BE ATTACHED TO THE ENDS OF CORRUGATED METAL PIPE AS SPECIFIED ON THIS STANDARD PLAN, BY STANDARD METAL BANDS, OR BY OTHER CONNECTING DEVICES AS APPROVED BY THE ENGINEER.

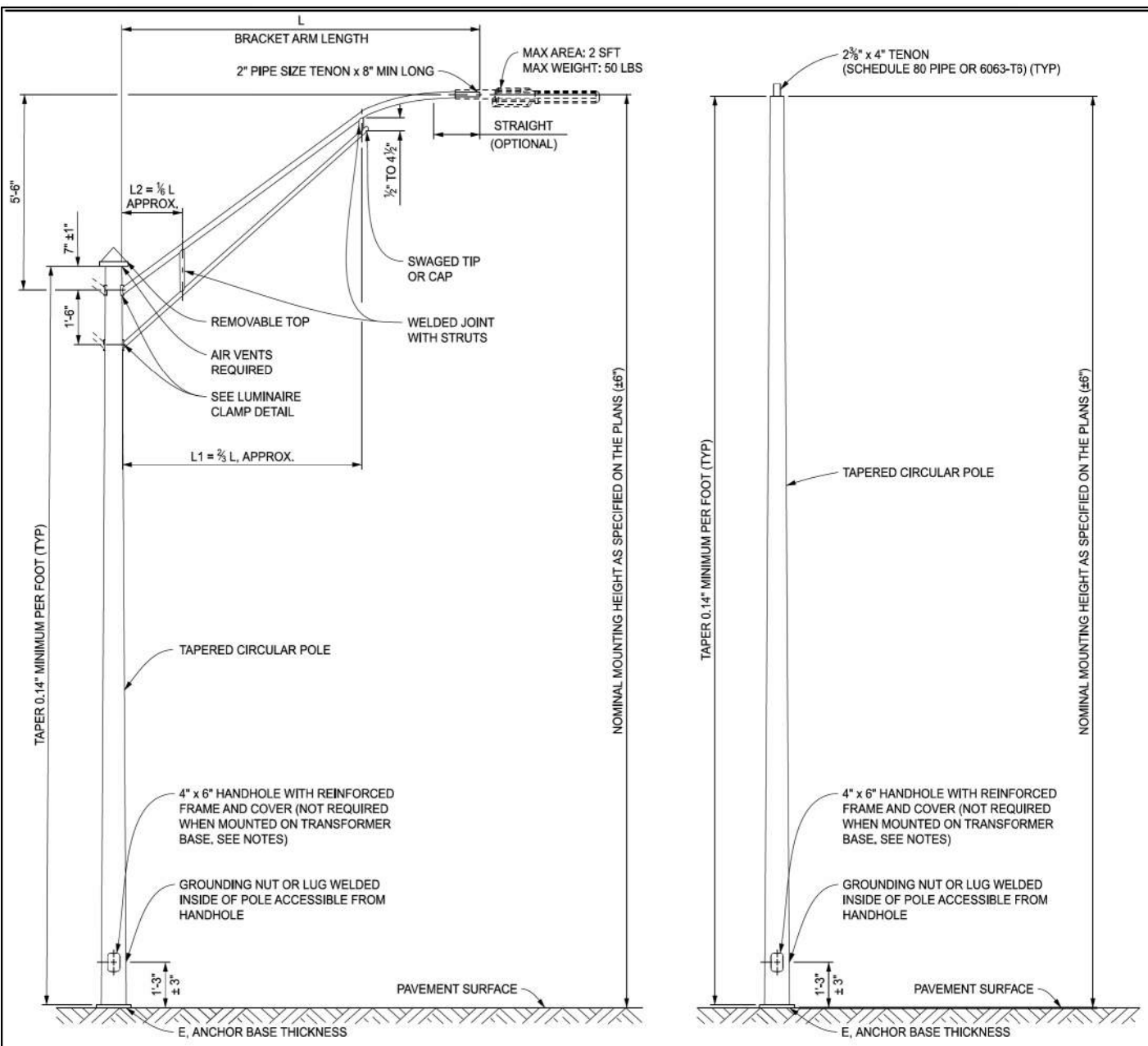
STEEL END SECTIONS ARE NOT ALLOWED ON PVC OUTLET PIPE. CONCRETE END SECTIONS ARE REQUIRED.

HELICALLY CORRUGATED PIPE (EXCEPT PERFORATED PIPE) SHALL HAVE THE ENDS OF THE PIPE REROLLED TO FORM ANNULAR CORRUGATIONS FOR CONNECTING THE END SECTION.

GRANULAR MATERIAL PRODUCED FROM CRUSHED PORTLAND CEMENT CONCRETE IS NOT PERMITTED FOR ANY BACKFILL MATERIAL.

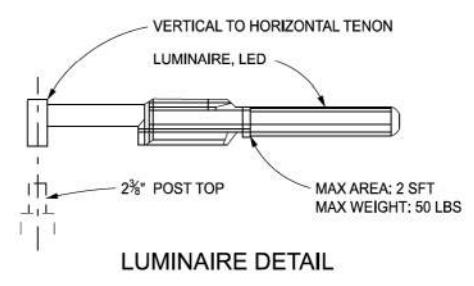
 Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR			SHEET
	GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS			
(SPECIAL DETAIL)	06/28/2021	R-80-F	PLAN DATE	
FHWA APPROVAL				

 Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR			SHEET
	GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS			
(SPECIAL DETAIL)	06/28/2021	R-80-F	PLAN DATE	
FHWA APPROVAL				

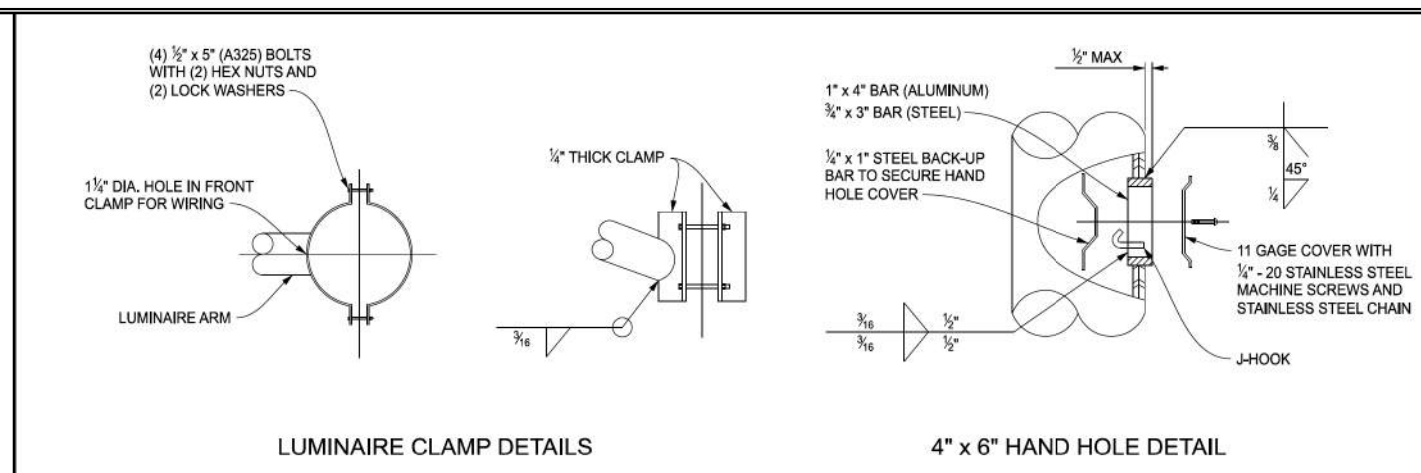


**LIGHT STANDARD DETAIL (WITH ARM)**

**LIGHT STANDARD DETAIL (WITH TENON)**



**LUMINAIRE DETAIL**



**LUMINAIRE CLAMP DETAILS**

**4" x 6" HAND HOLE DETAIL**

**NOTES:**

ALL MATERIALS AND WORKMANSHIP MUST BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

EACH BRACKET ARM MUST BE SUPPLIED WITH ITS OWN POLE CONNECTION WITH STAINLESS STEEL HARDWARE. HARDWARE MUST INCLUDE LOCK WASHERS, MEETING ANSI B18.21.1.

BOLT CIRCLE DIMENSION MUST BE EXACT. ANCHOR BOLTS MUST BE SET BY A TEMPLATE AND CENTERED ON THE FOUNDATION.

IF FOUNDATION IS WITHIN 30 FEET OF HANDHOLE, CONDUIT MAY BE RUN DIRECTLY TO HANDHOLE.

HANDHOLE TO FACE AWAY FROM TRAFFIC, EXCEPT IT MUST FACE ROADWAY WHEN MOUNTED ON BRIDGE OR MEDIAN WALL. USE STAINLESS STEEL HEX HEAD MACHINE SCREWS. THE HANDHOLES MUST BE PLACED SO THEY DO NOT INTERSECT THE LONGITUDINAL SEAM WELD ON THE POLE.

NUT COVERS ARE NOT ALLOWED.

WHEN A FRANGIBLE TRANSFORMER BASE IS CALLED FOR ON THE PLANS, NO LEVELING NUT IS TO BE USED. FRANGIBLE TRANSFORMER BASES SHALL BE MOUNTED FLUSH WITH TOP OF FOUNDATION.

LIGHT STANDARDS MOUNTED ON FRANGIBLE TRANSFORMER BASES MUST HAVE THE SAME DIMENSIONS AS OTHER BASE TYPES, EXCEPT SHAFT LENGTH.

THE FOUNDATION LENGTHS PROVIDED ARE BASED ON TWO SOIL TYPES: LOOSE COHESIONLESS SOILS WITH A MINIMUM BLOW COUNT OF 5 BLOWS/FT, AND MEDIUM STIFF COHESIVE SOILS WITH A MINIMUM UNDRAINED SHEAR STRENGTH OF 750 PSF. THE CONTRACTOR SHALL VERIFY THE SOIL STRENGTH DURING DRILLING FOR THE SHAFT FOUNDATIONS. SHOULD VERY LOOSE COHESIONLESS SOILS OR SOFT TO VERY SOFT COHESIVE SOILS WITH UNDRAINED SHEAR STRENGTH LESS THAN 750 PSF BE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

THIS STRUCTURE IS DESIGNED FOR THE SPECIFIED LUMINAIRE ONLY. DEVIATIONS FROM THIS STANDARD REQUIRE ADDITIONAL ANALYSIS.

THIS STRUCTURE IS DESIGNED FOR A HEIGHT ABOVE GROUND EQUAL TO THE STRUCTURE'S MOUNTING HEIGHT. STRUCTURES PLACED AT A HIGHER ELEVATION REQUIRE A UNIQUE DESIGN.

FOUNDATIONS SHALL NOT BE BURIED AND SHALL BE REMOVED IF NO LONGER IN USE.

THE DESIGN OF THIS STRUCTURE IS BASED ON THE CATEGORY 1 FATIGUE REQUIREMENTS FOUND IN AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 1ST EDITION, WITH INTERIM REVISIONS THROUGH 2022.

SHAFT LENGTHS MOUNTED ON TRANSFORMER BASES MUST BE ALTERED TO COMPENSATE FOR THE HEIGHT OF THE TRANSFORMER BASE. THE BOLT CIRCLE ON TOP OF THE TRANSFORMER BASE MUST BE THE SAME AS THE BOLT CIRCLE OF THE LIGHT STANDARD ANCHOR BASE.

THE ENTIRE BOTTOM OF THE FRANGIBLE TRANSFORMER BASE MUST BE SEATED ON THE FOUNDATION. THE DIAMETER OF THE FOUNDATION MAY BE ALTERED TO MEET THIS REQUIREMENT.

ALL HARDWARE COMPONENTS (INCLUDING FLAT AND LOCK WASHERS) MUST BE INSTALLED AS SHOWN IN THE DETAILS ON THIS SHEET.

FRANGIBLE TRANSFORMER BASES SHALL MATCH DARK BRONZE LUMINAIRE ASSEMBLY COLOR.

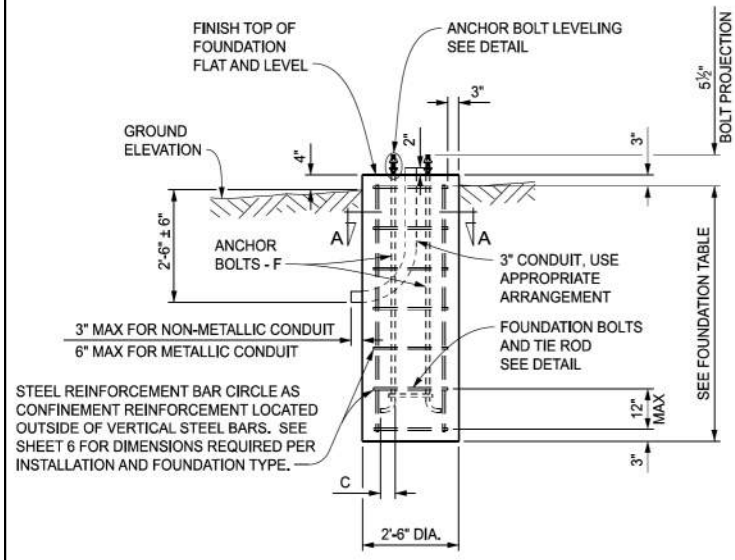
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APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES		STANDARD PLAN FOR LIGHT STANDARD DETAILS			
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2024 PLAN DATE	R-130-A

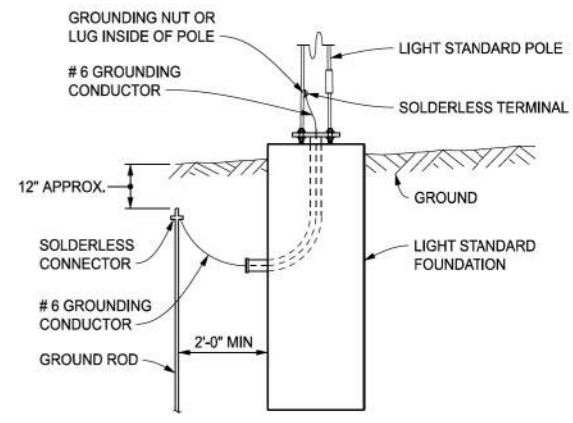
APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES		STANDARD PLAN FOR LIGHT STANDARD DETAILS			
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2024 PLAN DATE	R-130-A

	7050 W. SAGINAW HWY., SUITE 200 LANSING, MI 48917 P (517) 272-9835   F (517) 272-9838	
	CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT SPECIAL DETAILS	
SHEET	4/7/2024	77 of 80

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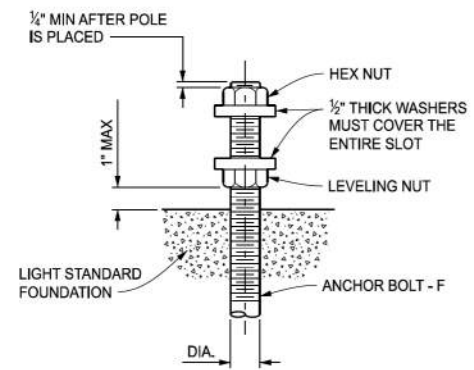


**LIGHT STANDARD FOUNDATION DETAIL**



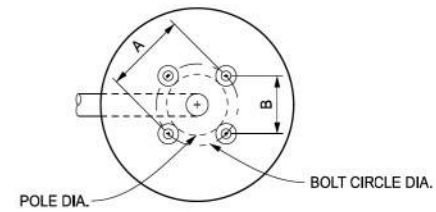
**LIGHT STANDARD GROUNDING DETAIL**

NOTE:  
IF CONDUIT EXTENDS TO HAND HOLE, DRIVE GROUND ROD IN OR NEAR HANDHOLE.

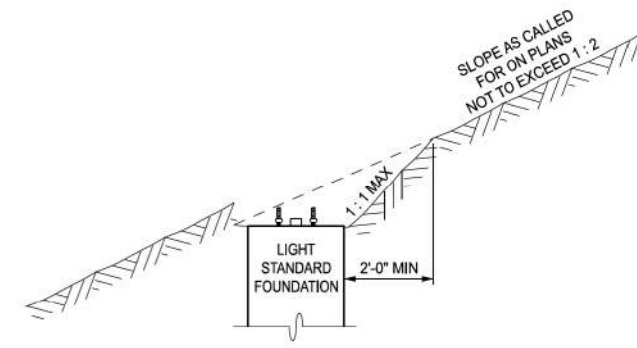


**ANCHOR BOLT LEVELING DETAIL**

THIS DETAIL DOES NOT APPLY WHEN USING FRANGIBLE TRANSFORMER BASE. SEE FRANGIBLE TRANSFORMER BASE DETAIL ON SHEET 4.



**TOP OF FOUNDATION DETAIL**

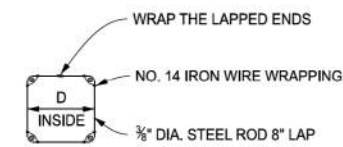


**SLOPE DETAIL AT FOUNDATION**

ON FILL OR CUT SLOPE

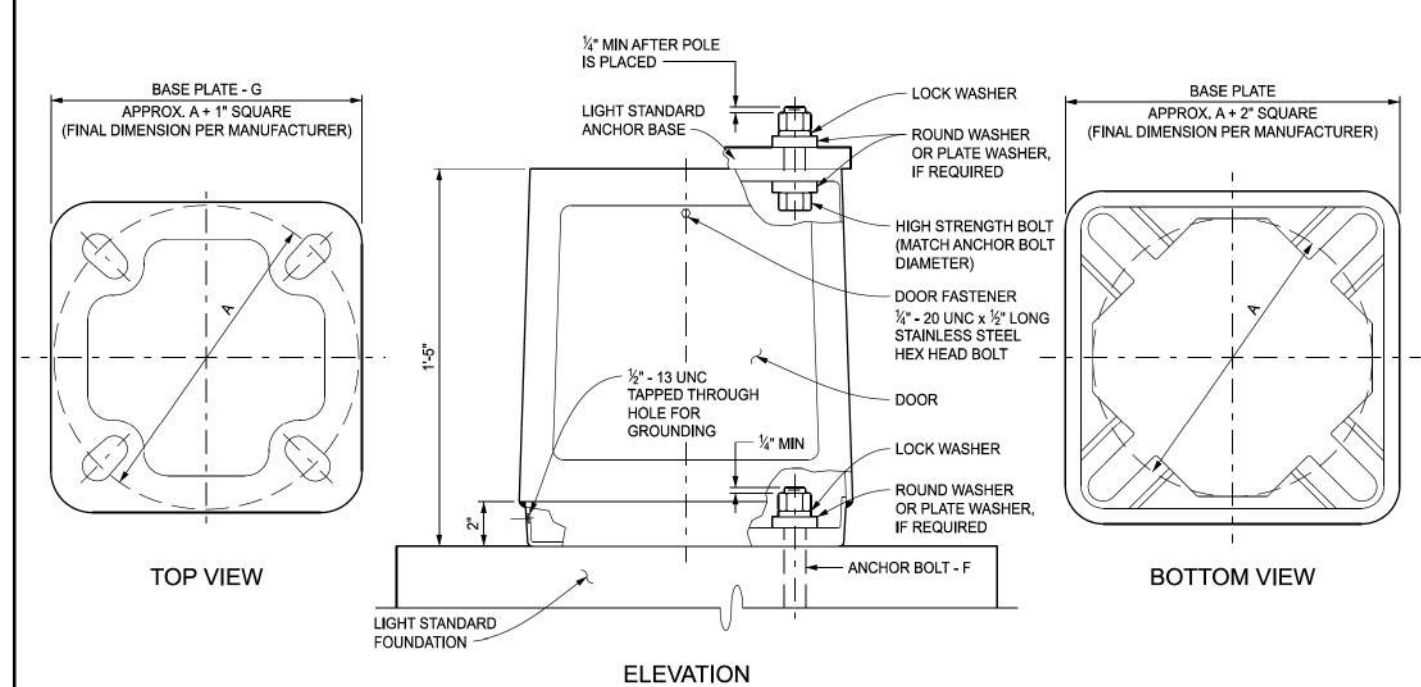
NOTE:  
DO NOT COVER HANDHOLES. PLACE PERPENDICULAR TO SLOPE AT SAME ELEVATION AS FOUNDATION.

DO NOT PLACE SOIL ABOVE TOP OF FOUNDATION.

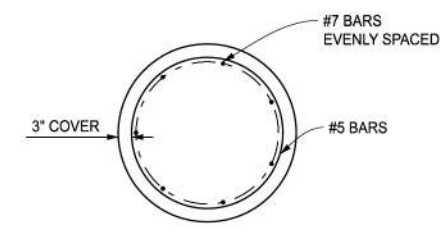


**ANCHOR BOLTS AND TIE ROD**

<p>Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR LIGHT STANDARD DETAILS			SHEET 3 OF 6
	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2024 PLAN DATE	R-130-A	

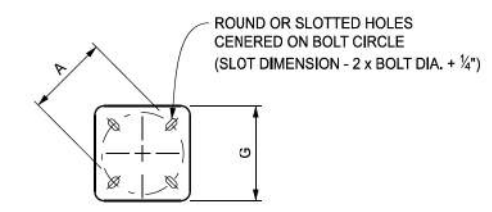


**FRANGIBLE TRANSFORMER BASE FOR POLES WITH BOLT CIRCLE DIAMETER - A**

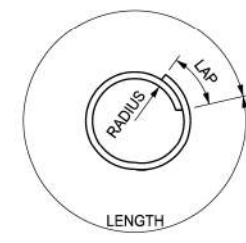


**SECTION A-A**

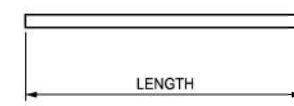
ANCHOR RODS NOT SHOWN FOR CLARITY



**ANCHOR BASE DETAIL**



**CONFINEMENT REINFORCEMENT**



**VERTICAL REINFORCEMENT**

**REINFORCEMENT DETAILS**

<p>Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR LIGHT STANDARD DETAILS			SHEET 4 OF 6
	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2024 PLAN DATE	R-130-A	

REVISIONS:	VERT. DATUM:	SCALE:	CITY/VIL/LAGE/TOWNSHIP:	COUNTY:	PROJ. NO.:	DATE:
	NAVD83		ANN ARBOR	WASHTENAW	JAH	4/12/2024

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
SPECIAL DETAILS

**BASE AND POLE DATA TABLE**

LIGHT STANDARD FOR	A	B	C	D	E	STEEL POLES GAGE (MIN)	** F	ALUM. POLES GAGE (MIN)	POLE DIAMETER AT BASE	G
20 FT NOMINAL MOUNTING HEIGHT (WITHOUT TRANSFORMER BASE)	11"	7 3/4"			2"		1" Ø x 3'-4"	0.188"		12.2"
20 FT NOMINAL MOUNTING HEIGHT (WITH TRANSFORMER BASE)	* 11"	7 3/4"			2"		1" Ø x 3'-4"	0.188"		12.2"
30 FT MOUNTING HEIGHT WITH 4 OR 6 FT SINGLE OR DOUBLE BRACKET ARM	1'-3" (A) 1'-0" (S)	10 5/8" (A) 8 1/2" (S)	5 5/8"	11 7/8" (A) 9 3/4" (S)	2"	7	1 1/4" Ø x 3'-4"	0.188"	9" ± 1/2"	15.38" (A) *** 13.26" (S)
30 FT MOUNTING HEIGHT WITH 8, 10 OR 12 FT SINGLE OR DOUBLE BRACKET ARM	1'-3" (A) 1'-0" (S)	10 5/8" (A) 8 1/2" (S)	5 5/8"	11 7/8" (A) 9 3/4" (S)	2"	7	1 1/4" Ø x 5'-0"	0.188"	9" ± 1/2"	15.38" (A) *** 13.26" (S)
30 FT MOUNTING HEIGHT WITH 15 FT SINGLE OR DOUBLE BRACKET ARM	1'-3" (A) 1'-0" (S)	10 5/8" (A) 8 1/2" (S)	6 3/4"	1'-0 1/8" (A) 10" (S)	2"	7	1 1/2" Ø x 5'-0"	0.25"	9" ± 1/2"	15.73" (A) *** 13.61" (S)
30 FT MOUNTING HEIGHT WITH 17 FT SINGLE OR DOUBLE BRACKET ARM	1'-3" (A) 1'-0" (S)	10 5/8" (A) 8 1/2" (S)	6 3/4"	1'-0 1/8" (A) 10" (S)	2"	7	1 1/2" Ø x 5'-0"	0.25"	9" ± 1/2"	15.73" (A) *** 13.61" (S)
40 FT MOUNTING HEIGHT WITH 4, 6, 8, 10, 12, 15 OR 17 FT SINGLE OR DOUBLE BRACKET ARM	1'-4" (A) 1'-3" (S)	11 3/8" (A) 10 5/8" (S)	7 7/8"	1'-1 1/8" (A) 1'-0 3/4" (S)	2"	7	1 3/4" Ø x 5'-0"	0.313"	10" ± 1/2"	16.79" (A) *** 16.09" (S)
45 FT MOUNTING HEIGHT WITH 4, 6, 8, 10, 12, 15 OR 17 FT SINGLE OR DOUBLE BRACKET ARM	1'-5" (A) 1'-6" (S)	1'-0" (A) 1'-0 3/4" (S)	7 7/8"	1'-1 3/4" (A) 1'-2 1/2" (S)	2" (A) 2 3/8" (S)	7	1 3/4" Ø x 5'-0"	0.375"	11" ± 1/2" (A) 10" ± 1/2" (S)	17.5" (A) *** 18.21" (S)

\* THE 11" BOLT CIRCLE SHALL APPLY FOR BOTH THE POLE TO TRANSFORMER BASE AND FOR THE TRANSFORMER BASE TO FOUNDATION.  
 \*\* LENGTH GIVEN IS LENGTH PRIOR TO BENDING.  
 \*\*\* FINAL BASEPLATE WIDTHS FOR ALUMINUM STRUCTURES ARE PER MANUFACTURER  
 (A) = DIMENSION CORRESPONDS TO ALUMINUM  
 (S) = DIMENSION CORRESPONDS TO STEEL

**FOUNDATION DATA TABLE**


GROUND SLOPE	SINGLE ARM MAXIMUM LUMINAIRE STRUCTURE SIZE	30 FT MOUNTING HEIGHT, 6 FT ARM	30 FT MOUNTING HEIGHT, 17 FT ARM	45 FT MOUNTING HEIGHT, 17 FT ARM
	L (FT)	L (FT)	L (FT)	L (FT)
HORIZONTAL		8.5	9	10
	SLOPED	16.5	17.5	18.5

GROUND SLOPE	DOUBLE ARM MAXIMUM LUMINAIRE STRUCTURE SIZE	30 FT MOUNTING HEIGHT, 6 FT ARM	30 FT MOUNTING HEIGHT, 17 FT ARM	45 FT MOUNTING HEIGHT, 17 FT ARM
	L (FT)	L (FT)	L (FT)	L (FT)
HORIZONTAL		9	10	11

L = EMBEDDED LENGTH OF THE SHAFT FOUNDATION  
 \* SLOPED GROUND SLOPE CASE NOT TO BE USED FOR DOUBLE ARM LUMINAIRE STRUCTURE.

**BRACKET ARM TABLE**

STEEL	BRACKET LENGTH, L	6'-0"	12'-0"	15'-0"	17'-0"
	TOP MEMBER O.D.	2" DIA.	2 1/2" DIA.	2 1/2" DIA.	3 1/4" DIA.
BOTTOM MEMBER O.D.	1 1/2" DIA.	1 1/2" DIA.	2" DIA.	2" DIA.	
ALUMINUM	TOP MEMBER O.D.	2" DIA.	3" DIA.	3" DIA.	3" DIA.
	BOTTOM MEMBER O.D.	1 1/2" DIA.	2" DIA.	2 1/4" DIA.	2 1/4" DIA.

 Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR LIGHT STANDARD DETAILS			SHEET 5 OF 6
	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2024 PLAN DATE	R-130-A	

**REINFORCEMENT DATA TABLE**

MAXIMUM LUMINAIRE STRUCTURE SIZE	FOUNDATION DIAMETER (IN)	VERTICAL REINFORCEMENT				CONFINEMENT REINFORCEMENT			
		BAR SIZE	NUMBER OF BARS	BAR LENGTH		BAR RADIUS	BAR SIZE	BAR SPACING	BAR LENGTH
				HORIZONTAL	SLOPED				
30 FT MOUNTING HEIGHT, 6 FT ARM	30	7	12	8'-0" (SINGLE ARM) 8'-6" (DOUBLE ARM)	16'-0"	12"	5	12" (MAX)	6'-4"
30 FT MOUNTING HEIGHT, 17 FT ARM				8'-6" (SINGLE ARM) 9'-6" (DOUBLE ARM)	17'-0"				
45 FT MOUNTING HEIGHT, 17 FT ARM				9'-6" (SINGLE ARM) 10'-6" (DOUBLE ARM)	18'-0"				

PROVIDE A 2'-8" LAP FOR #5 BAR CIRCLES.

**MATERIALS TABLE (ANCHOR BASE)**


MATERIAL	SPECIFICATION	DIMENSIONS	QUANTITY (PER FOUNDATION)
ANCHOR BOLTS	MDOT 908.14	DETERMINED BY LIGHT STANDARD CHART	4
ANCHOR NUTS	MDOT 908.14	DETERMINED BY ANCHOR BOLT DIAMETER	8
FLAT WASHERS **** (1 1/4" DIA. ANCHOR BOLT)	MDOT 908.14	2 3/4" O.D. x 1 5/16" I.D. x 1/2" THICK	8 (IF REQUIRED ****)
FLAT WASHERS **** (1 1/2" DIA. ANCHOR BOLT)	MDOT 908.14	2 3/4" O.D. x 1 5/16" I.D. x 1/2" THICK	8 (IF REQUIRED ****)
FLAT WASHERS **** (1 3/4" DIA. ANCHOR BOLT)	MDOT 908.14	4" O.D. x 1 5/8" I.D. x 1/2" THICK	8 (IF REQUIRED ****)
PLATE WASHERS **** (1 1/4" DIA. ANCHOR BOLT)	ASTM A1018	1 5/16" I.D. x 1/2" THICK	8 (IF REQUIRED ****)
PLATE WASHERS **** (1 1/2" DIA. ANCHOR BOLT)	ASTM A1018	1 5/16" I.D. x 1/2" THICK	8 (IF REQUIRED ****)
PLATE WASHERS **** (1 3/4" DIA. ANCHOR BOLT)	ASTM A1018	1 7/8" I.D. x 1/2" THICK	8 (IF REQUIRED ****)

**MATERIALS TABLE (FRANGIBLE BASE)**

MATERIAL	SPECIFICATION	DIMENSIONS	QUANTITY (PER FOUNDATION)
ANCHOR BOLTS	MDOT 908.14	DETERMINED BY LIGHT STANDARD CHART	4
ANCHOR NUTS	MDOT 908.14	DETERMINED BY ANCHOR BOLT DIAMETER	4
FLAT WASHERS **** (1 1/4" DIA. ANCHOR BOLT)	MDOT 908.14	2 3/4" O.D. x 1 5/16" I.D. x 1/2" THICK	12 OR 14 (****)
FLAT WASHERS **** (1 1/2" DIA. ANCHOR BOLT)	MDOT 908.14	2 3/4" O.D. x 1 5/16" I.D. x 1/2" THICK	12 OR 14 (****)
FLAT WASHERS **** (1 3/4" DIA. ANCHOR BOLT)	MDOT 908.14	4" O.D. x 1 5/8" I.D. x 1/2" THICK	12 OR 14 (****)
LOCK WASHERS	ANSI B18.21.1	1/2" THICK	8
HIGH STRENGTH BOLTS	MDOT 906.07	LENGTH DETERMINED BY THE CONTRACTOR DIAMETER TO BE SAME AS ANCHOR BOLT	4
CONNECTING NUTS	MDOT 906.07	DETERMINED BY HIGH STRENGTH BOLT DIAMETER	4
PLATE WASHERS **** (1 1/4" DIA. ANCHOR BOLT)	ASTM A1018	1 5/16" I.D. x 1/2" THICK	8 (IF REQUIRED)
PLATE WASHERS **** (1 1/2" DIA. ANCHOR BOLT)	ASTM A1018	1 5/16" I.D. x 1/2" THICK	8 (IF REQUIRED)
PLATE WASHERS **** (1 3/4" DIA. ANCHOR BOLT)	ASTM A1018	1 7/8" I.D. x 1/2" THICK	8 (IF REQUIRED)
FRANGIBLE TRANSFORMER BASE	SELECT FROM THE MDOT QUALIFIED PRODUCTS LIST	ACCESS DOOR OPENING: 8 1/2" x 9" x 11"	1

\*\*\*\* IF LIGHT STANDARDS BASE PLATE HAS SLOTTED HOLES, PLATE WASHERS ARE REQUIRED IN LIEU OF CIRCULAR WASHERS AND MUST COVER ENTIRE SLOT.

ALL ANCHOR BOLTS, NUTS, WASHERS AND PLATE WASHERS MUST BE HOT DIP GALVANIZED ACCORDING TO AASHTO M232.

 Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR LIGHT STANDARD DETAILS			SHEET 6 OF 6
	(SPECIAL DETAIL) FHWA APPROVAL	01/04/2024 PLAN DATE	R-130-A	



7050 W. SAGINAW HWY., SUITE 200  
 LANSING, MI 48917  
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REVISIONS:

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC  
 BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT  
 SPECIAL DETAILS

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ANCHOR BOLT ASSEMBLY DIMENSIONS

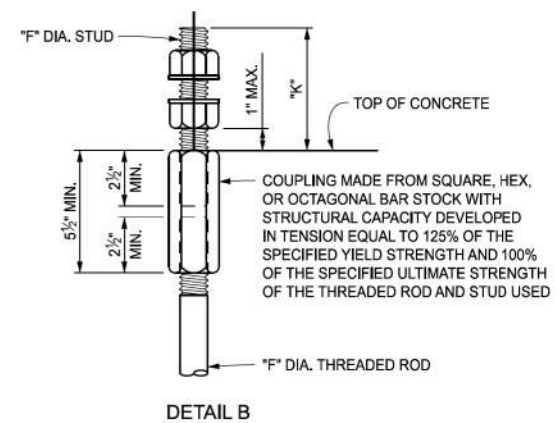
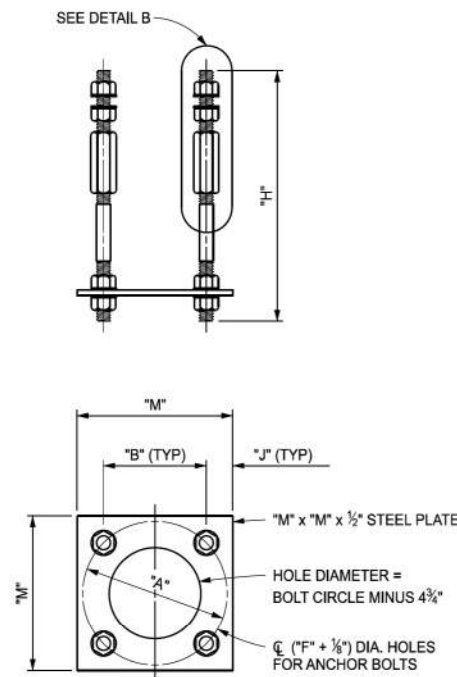
LIGHT STANDARD MOUNTING HEIGHT	BOLT CIRCLE "A"	"B"	ANCHOR BOLT DIAMETER "F"	"H"	"J"	STUD PROJECTION "K"	STUD LENGTH "L"	"M"
30' *	1'-3" (A)	10 <sup>5</sup> / <sub>8</sub> " (A)	1 <sup>1</sup> / <sub>2</sub> "	1'-9 <sup>3</sup> / <sub>4</sub> "	2 <sup>3</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>2</sub> "	7 <sup>1</sup> / <sub>4</sub> "	1'-3 <sup>3</sup> / <sub>8</sub> " (A)
	1'-0" (S)	8 <sup>1</sup> / <sub>2</sub> " (S)						1'-1 <sup>1</sup> / <sub>4</sub> " (S)
30' **	1'-3" (A)	10 <sup>5</sup> / <sub>8</sub> " (A)	1 <sup>1</sup> / <sub>2</sub> "	1'-10 <sup>1</sup> / <sub>2</sub> "	2 <sup>3</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>2</sub> "	8"	1'-3 <sup>3</sup> / <sub>8</sub> " (A)
	1'-0" (S)	8 <sup>1</sup> / <sub>2</sub> " (S)						1'-1 <sup>1</sup> / <sub>4</sub> " (S)
40' **	1'-4" (A)	11 <sup>3</sup> / <sub>8</sub> " (A)	1 <sup>3</sup> / <sub>4</sub> "	1'-10 <sup>1</sup> / <sub>2</sub> "	2 <sup>3</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>2</sub> "	8"	1'-5 <sup>1</sup> / <sub>8</sub> " (A)
	1'-3" (S)	10 <sup>5</sup> / <sub>8</sub> " (S)						1'-4 <sup>3</sup> / <sub>8</sub> " (S)
45' **	1'-5" (A)	1'-0" (A)	1 <sup>3</sup> / <sub>4</sub> "	1'-10 <sup>1</sup> / <sub>2</sub> "	2 <sup>3</sup> / <sub>8</sub> "	5 <sup>1</sup> / <sub>2</sub> "	8"	1'-5 <sup>3</sup> / <sub>4</sub> " (A)
	1'-6" (S)	1'-0 <sup>1</sup> / <sub>2</sub> " (S)						1'-6 <sup>1</sup> / <sub>2</sub> " (S)

\* UP TO 15' SINGLE OR DOUBLE BRACKET ARM

\*\* UP TO 17' SINGLE OR DOUBLE BRACKET ARM

ANCHOR BOLTS (4 REQUIRED):  
"F" DIA. x 1'-2" THREADED ROD AND "F" DIA. x "L" STUD WITH 4 NUTS, 4 WASHERS, AND ONE COUPLING.

(A) = DIMENSION CORRESPONDS TO ALUMINUM  
(S) = DIMENSION CORRESPONDS TO STEEL



LIGHT STANDARD ANCHOR BOLT ASSEMBLY

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

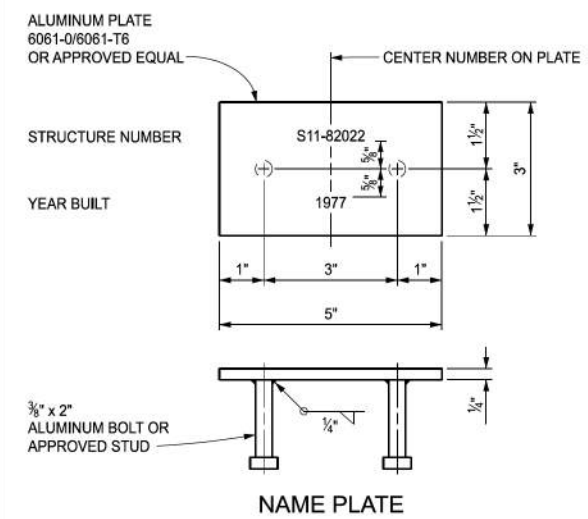
APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



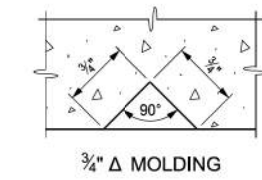
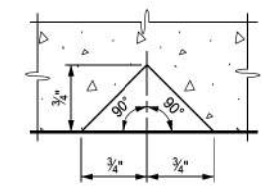
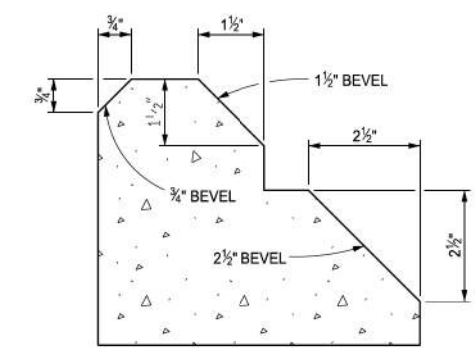
DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
MOLDING, BEVEL, LIGHT STD. ANCHOR BOLT ASSEMBLY  
AND NAME PLATE DETAILS

(SPECIAL DETAIL)	12/08/2023	B-103-F	SHEET 1 OF 2
FHWA APPROVAL	PLAN DATE		



NOTES:  
DIE STAMP - 1/4" MINIMUM  
LETTERS AND NUMBERS SHALL BE 1/4" MINIMUM OR 3/8" MAXIMUM HEIGHT.  
DATE SHALL BE YEAR THAT SUPERSTRUCTURE WAS COMPLETED.



NOTES:  
DETAILS SHOWN ARE ACCORDING TO THE AASHTO SPECIFICATIONS.  
LIGHT STANDARD ANCHOR BOLT ASSEMBLY STEEL PLATE SHALL BE ASTM A36.  
ALL STEEL SHALL BE HOT-DIP GALVANIZED ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.  
ANCHOR BOLTS, WASHERS, COUPLINGS AND NUTS FOR LIGHT STANDARDS SHALL BE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.  
THE COUPLING SHALL BE RETAPPED AFTER GALVANIZING IN THE SAME MANNER AS SPECIFIED FOR NUTS.  
ALUMINUM PLATE SHALL MEET THE REQUIREMENTS OF ASTM B209.  
ALUMINUM BOLT SHALL MEET THE REQUIREMENTS OF ASTM F468.  
INTERNAL DAMPENER FOR LIGHT STANDARDS SHALL BE INCLUDED AS RECOMMENDED BY THE MANUFACTURER.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
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(SPECIAL DETAIL)	12/08/2023	B-103-F	SHEET 2 OF 2
FHWA APPROVAL	PLAN DATE		

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