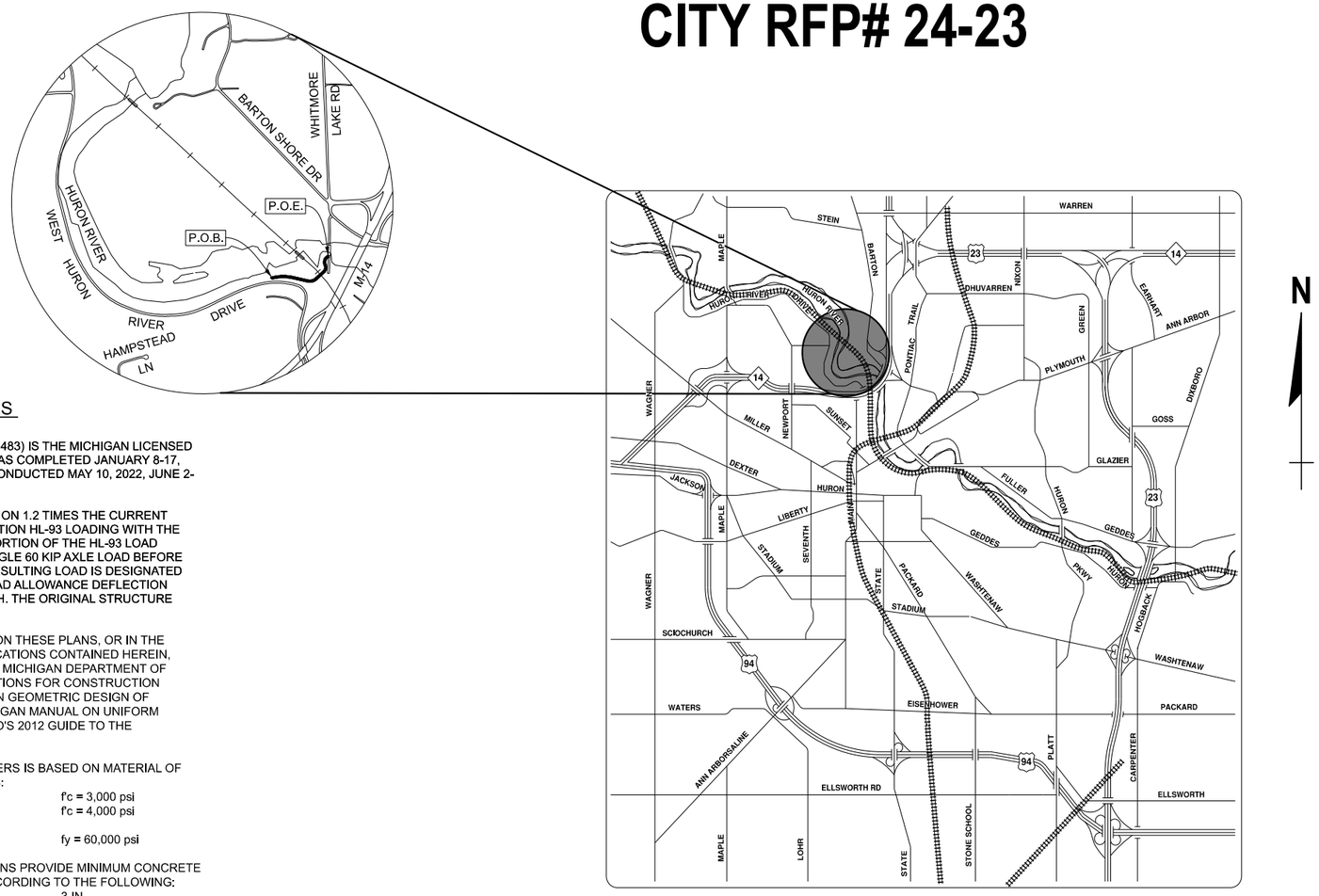
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT
CITY OF ANN ARBOR PARKS AND RECREATION SERVICES &
WASHTENAW COUNTY PARKS AND RECREATION COMMISSION

CITY RFP# 24-23



LOCATION MAP
N.T.S.

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GENERAL NOTES

ANDREW W. SCHRIPSEMA (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, 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	fy = 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 ½" 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	EGLE JOINT PERMIT	
BY CONTRACTOR	CITY OF ANN ARBOR SESC PERMIT	
BY CONTRACTOR	AMTRAK PERMIT TO ENTER (PTE)	

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

Colliers Engineering & Design
7050 W. SAGINAW HWY, SUITE 200
LANSING, MI 48917
P (517) 272-9835
F (517) 272-9836

PREPARED UNDER THE SUPERVISION OF:

STATE OF MICHIGAN · JEREMY A. HEDDEN · ENGINEER · No. 50409 · LICENSED PROFESSIONAL ENGINEER

50409
Registration No.

JEREMY A. HEDDEN, P.E.

APRIL 12, 2024
Date

OHM
34000 PLYMOUTH ROAD
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P (734) 522-6711
F (734) 522-6427

PREPARED UNDER THE SUPERVISION OF:

STATE OF MICHIGAN · CHRISTOPHER JAY ELENBAAS · ENGINEER · No. 6201056730 · LICENSED PROFESSIONAL ENGINEER

6201056730
Registration No.

CHRISTOPHER J. ELENBAAS, P.E.

APRIL 12, 2024
Date

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.	SHEET NO.
1022-18-0011	1 OF 80

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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 it's accuracy and the location of the existing utilities.

Name Of Owner	Type of Utility
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.

Title	Plan No.
ROAD	
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 *
BRIDGE	
MOLDING, BEVEL, LIGHT STANDARD ANCHOR BOLT ASSEMBLY AND NAME PLATE DETAILS	B-103-F *
PAVEMENT MARKINGS	
LONGITUDINAL LINE TYPES & PLACEMENT	PAVE-905-E
INTERSECTION, STOP BAR & CROSSWALK MARKINGS	PAVE-945-D
SIGNING	
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.

SHEET INDEX

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

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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.

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 form 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. Reparations 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.

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.

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PROJECT INFORMATION

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. Use of the pedestrian bridge(s) over the Huron River is not permitted.

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 willb e 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.

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

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PROJECT INFORMATION

WATER & SEWER UTILITY SYMBOLS

EXISTING

- ST — STORM MANHOLE
- SQUARE CATCH BASIN
- ROUND CATCH BASIN
- CULVERT
- CULVERT W/O END SECTION
- CULVERT W/END SECTION
- S — SANITARY MANHOLE
- CO — CLEAN OUT
- GW — GATE VALVE & WELL
- GATE VALVE & BOX
- W — WATER STOP BOX
- FIRE HYDRANT
- MP — METER PIT
- WATER METER
- SH — SPRINKLER HEAD
- IRRIGATION VALVE

PROPOSED

- STORM MANHOLE
- INLET/CATCH BASIN
- CULVERT END SECTION
- SANITARY MANHOLE
- GV&W — GATE VALVE & WELL
- GV&B — GATE VALVE & BOX
- TSV&W — TAPPING SLEEVE VALVE & WELL
- TSV&B — TAPPING SLEEVE VALVE & BOX
- FIRE HYDRANT

REAL ESTATE SYMBOLS

- CONTIGUOUS PROPERTY SYMBOL
- XXXX — PARCEL NUMBER BOX
- XXXX — NO ROW IMPACTS

MISCELLANEOUS UTILITY SYMBOLS

EXISTING

- GUY WIRE
- GP — GUY POLE
- U — UTILITY POLE
- U — UTILITY POLE W/LIGHT
- LIGHT/DECOR LAMP POLE
- FLOOD LIGHT
- GAS VALVE
- G — GAS VENT
- G — GAS METER
- G — GAS RISER
- TRAFFIC SIGNAL
- P — PEDESTRIAN RISER
- T — TRANSFORMER PAD
- U — PRIVATE UTILITY MANHOLE
- RAILROAD CROSSING
- E — ELECTRIC METER
- PB — PHONE BOOTH
- TS — TRAFFIC SIGNAL CONTROLLER
- HAND HOLE
- E — ELECTRIC RISER
- T — TELEPHONE RISER
- C — CABLE TV RISER
- W — MONITORING WELL
- UNDERGROUND MARKER

MISCELLANEOUS SYMBOLS

EXISTING

- RIPRAP
- SIGN
- FLOW DIRECTION
- STUMP
- WETLAND
- CONIFEROUS TREE — CL 1 1" TO 5", CL 2 6" TO 17", CL 3 18" TO 35", CL 4 36" AND UP
- DECIDUOUS TREE — CL 1 1" TO 5", CL 2 6" TO 17", CL 3 18" TO 35", CL 4 36" AND UP
- CONIFEROUS SHRUB
- DECIDUOUS SHRUB
- SB# — SOIL BORING
- SECTION CORNER
- MON — MONUMENT
- IRON ROD/PIPE
- PK — PK NAIL
- BM# — BENCHMARK
- TP# — TRAVERSE POINT
- MAIL/NEWSPAPER BOX
- FP — 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
- XX XX XXX — STRUCTURE NUMBER WM SAN STM
- ADA SIDEWALK RAMP
- GRAVEL

UTILITY PATTERN

EXISTING

- ELEC — ELECTRICAL *
- 6" (COMPANY) GAS — GAS\OIL
- (COMPANY) CABLE/TEL — CABLE/TELEPHONE *
- FIBER OPTIC — FIBER OPTIC *
- 12" WM — WATER
- 12" SAN — SANITARY
- 12" STM — STORM

PROPOSED

- 12" — STORM/SANITARY/WATER
- 12" — PRIMARY UTILITY WILL HAVE A CONTINUOUS LINESTYLE, WITH THE SECONDARY UTILITY MATCHING ITS RESPECTIVE EXISTING UTILITY LINESTYLE

*OH = OVERHEAD , UG = UNDERGROUND

ROW PATTERN

EXISTING

- ROW — ROW
- SECTION
- PROPERTY/PARCEL

PROPOSED

- ROW — 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
- S-[XXXXXX] — SALVAGE
- B-[XXXXXX] — BULKHEAD
- A-[XXXXXX] — ABANDON
- R-[XXXXXX] — REMOVE
- ADJ-[XXXXXX] — ADJUST
- REL-[XXXXXX] — RELOCATE
- REC-[XXXXXX] — RECONSTRUCT
- R B/O-[XXXXXX] — REMOVE BY OTHERS
- ADJ B/O-[XXXXXX] — ADJUST BY OTHERS
- REL B/O-[XXXXXX] — RELOCATE BY OTHERS

IF NECESSARY FOR CLARITY

- (S) — SALVAGE
- (B) — BULKHEAD
- (A) — ABANDON
- (C) — CLEARING
- (R) — REMOVE
- (REL) — RELOCATE
- (REC) — RECONSTRUCT
- (REL B/O) — RELOCATE BY OTHERS
- (ADJ B/O) — ADJUST BY OTHERS

SPECIAL LEGEND

- Riprap, Cobblestone
- Infiltration Trench, Det A

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REVISIONS:

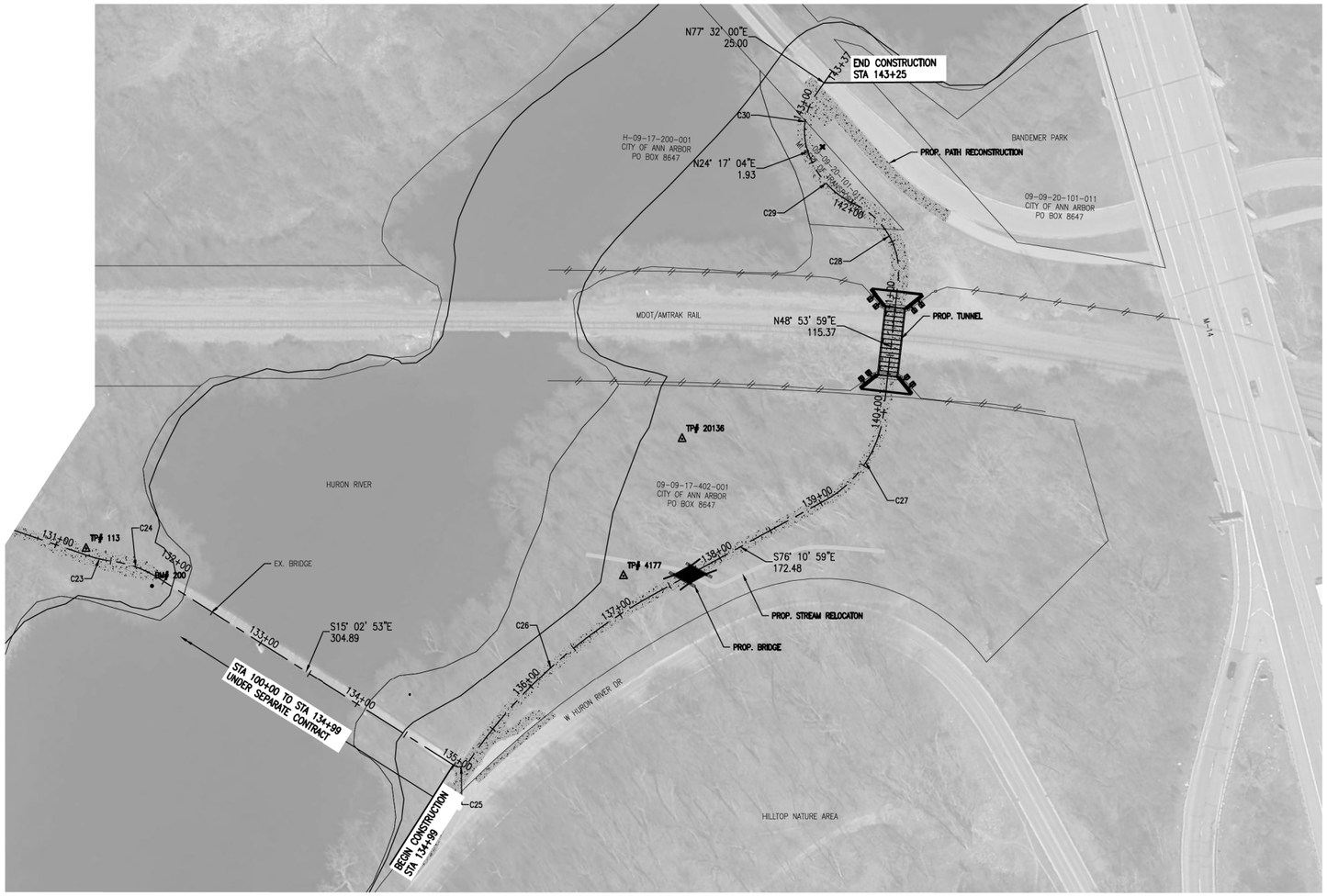
DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORIZ DATUM	VERT DATUM
6/28/2022	1022-18-6011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H:	N/A	NAD83	NAVD88
							V:	N/A		

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

LEGEND SHEET

SHEET 5 of 80

DRAWING PATH: P:\1000_1999\1022\180010_Bandemer-Barton_Trail\Drawings\Civil\Misc\180010LEG.dwg Apr 12, 2024 - 9:20am



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	13290390.92
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.

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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORIZ DATUM
8/29/2022	1022-14-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=40'	V: N/A	NAD83

HORIZ DATUM NAD83 VERT DATUM VAVD88

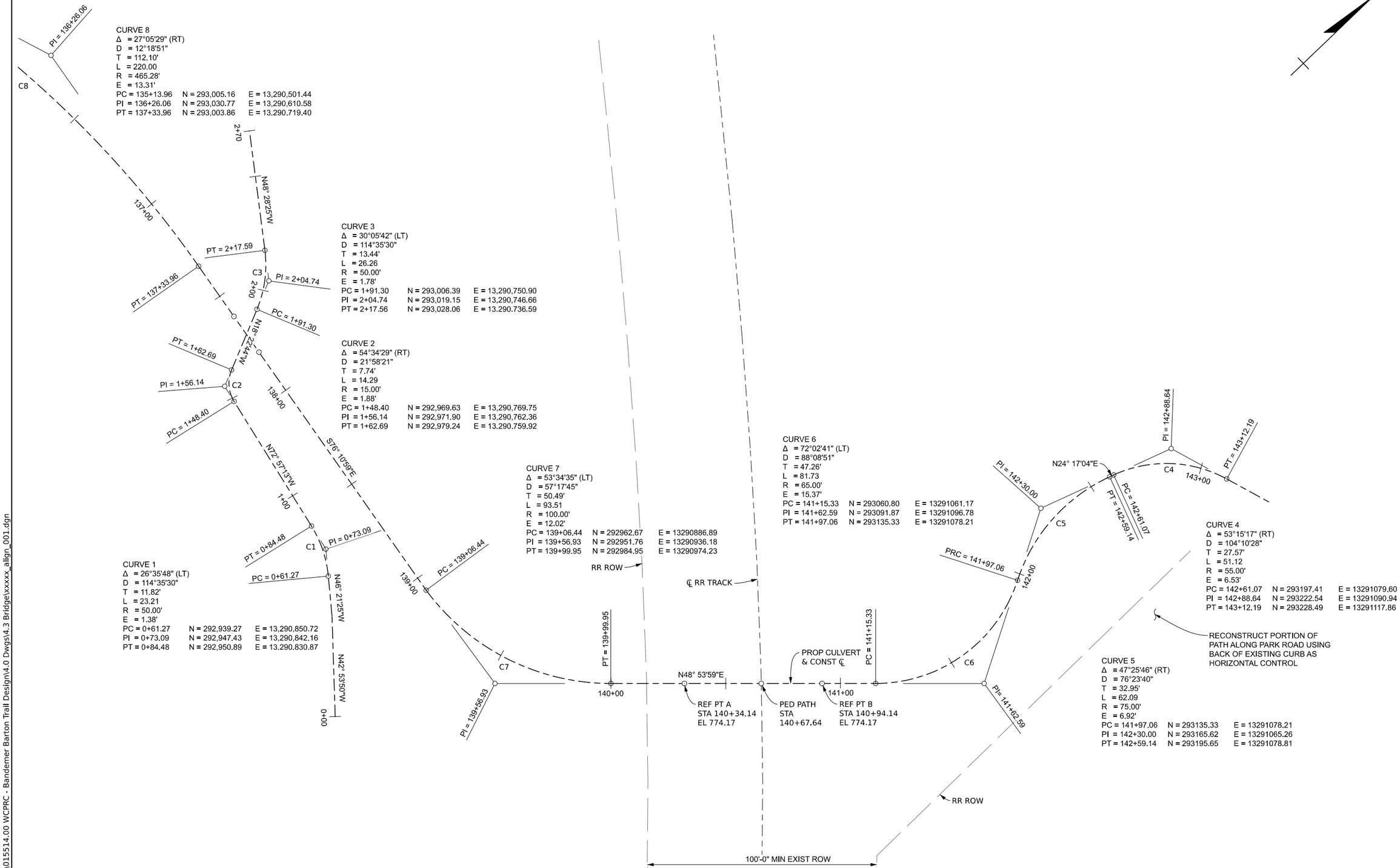
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON NATURE AREA BORDER TO BORDER TRAIL

ALIGNMENT PLAN

SHEET 6 of 80

Know what's below. Call before you dig.

DRAWING PATH: P:\1000_1999\1022\18010_Bandemer-Barton_Trail\Drawings\Civil\MSsc\180010ALN.dwg Apr 12, 2024 - 10:07am



PLAN

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

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" = 40' V: 1" = 40'
HORZ DATUM	NAD83
VERT DATUM	NAVD88

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

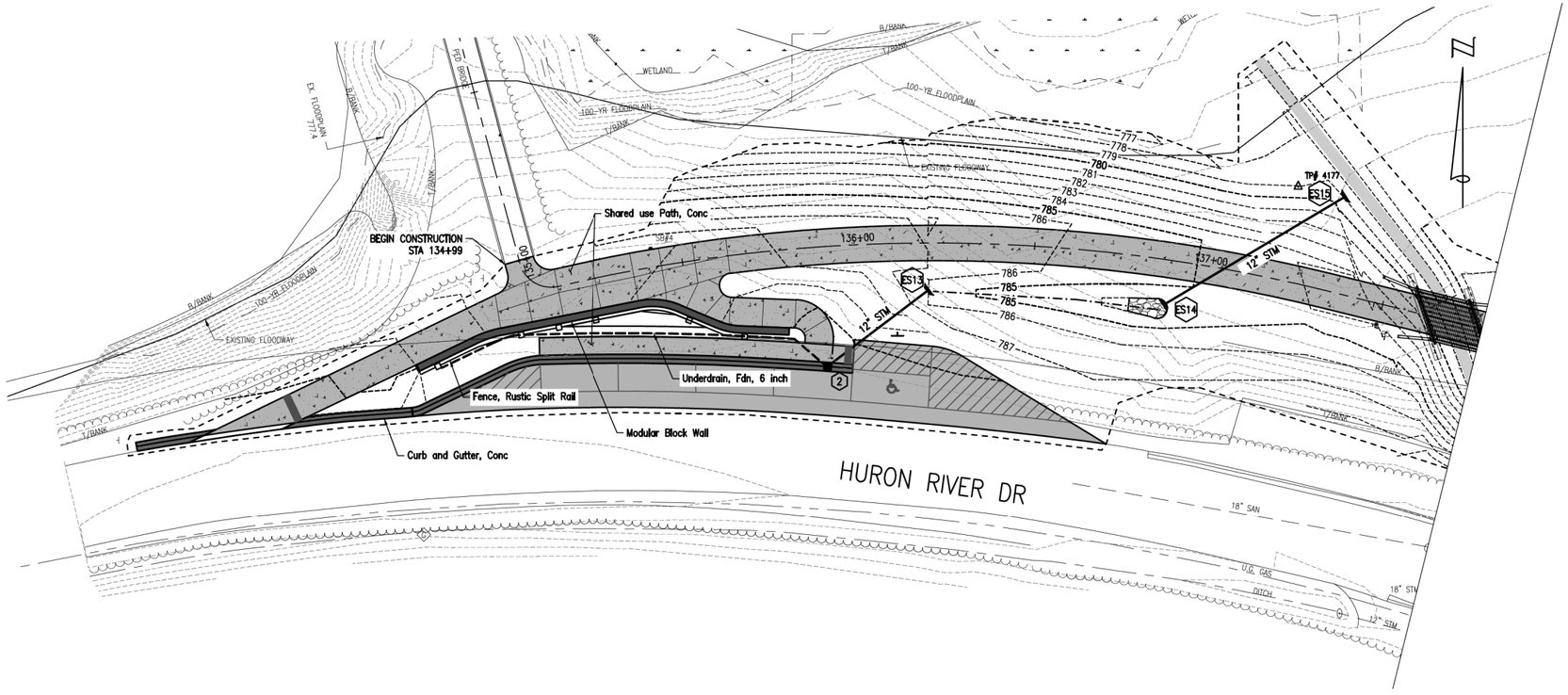
ALIGNMENT PLAN

SHEET 7 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_align_001.dgn

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

Know what's **below.** **Call** before you dig.

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Livonia, MI 48150
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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORIZ DATUM	VERT DATUM
6/28/2022	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=10'	V: N/A	NAD83	NAVD88

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

Subset 2_RFP 24-xx

SHEET 8 of 80

DRAWING PATH: P:\1000_1999\1022\18\0010_Bandemer-Barton_Trail\Drawings\Civil\Grading\180010GRD.dwg Apr 12, 2024 - 8:43am

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

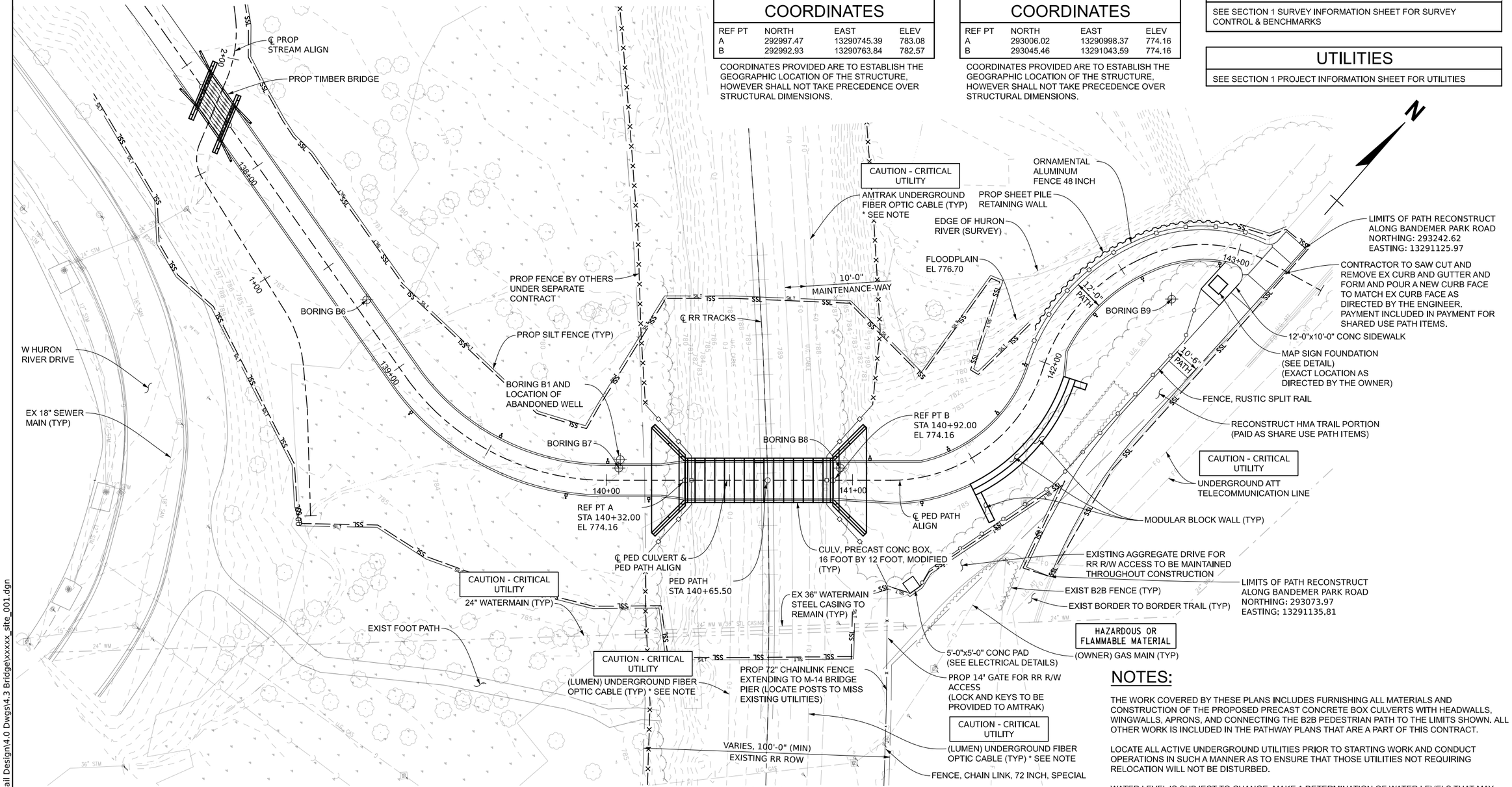
COORDINATES PROVIDED ARE TO ESTABLISH THE GEOGRAPHIC LOCATION OF THE STRUCTURE, HOWEVER SHALL NOT TAKE PRECEDENCE OVER STRUCTURAL DIMENSIONS.

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 — SILT FENCE

SSL — SSL — 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 ½ MILE TO THE SOUTHEAST. USE OF THE R/W MUST BE COORDINATED WITH AMTRAK, REQUIRES FLAGGING, AND MAY HAVE RESTRICTIONS BASED ON AMTRAK OPERATIONS.

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
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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" = 40' V: NONE
HORIZ DATUM NAD83
VERT DATUM NAVD88

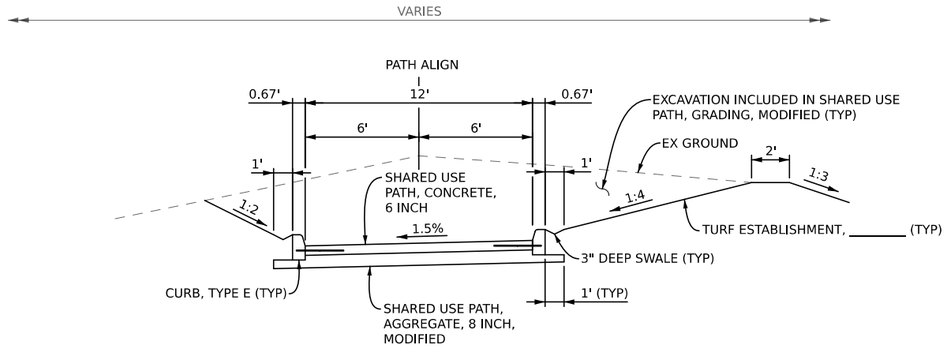
HORIZ. (FT) 0 40
VERT. (FT) 0 NONE

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

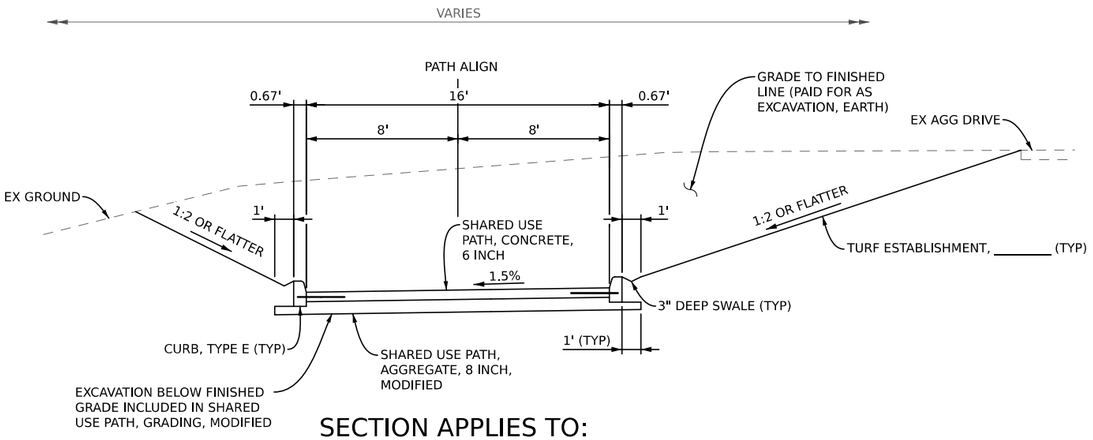
GENERAL PLAN OF SITE

SHEET 9 of 80

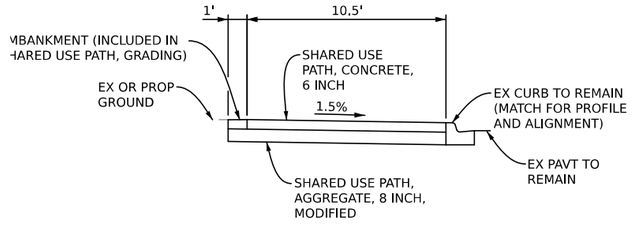
O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_site_001.dgn



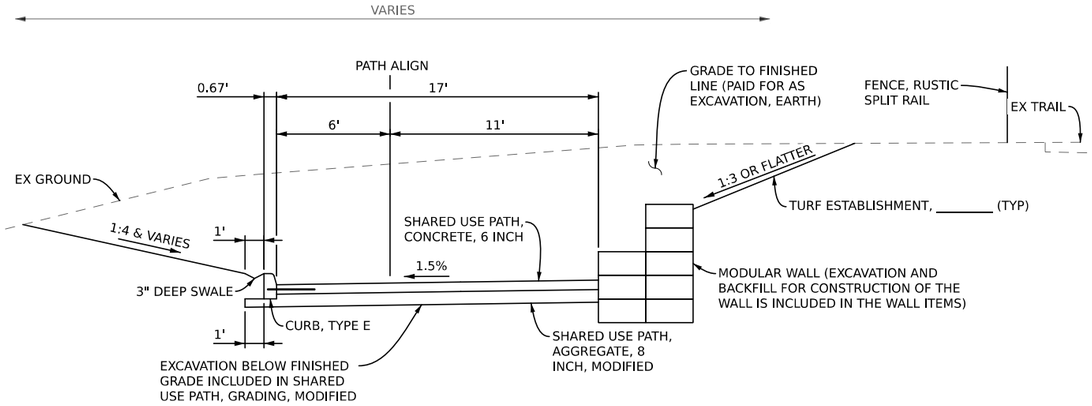
SECTION APPLIES TO:
STA 137+79 TO STA 140+18.33
12' PATH CUT



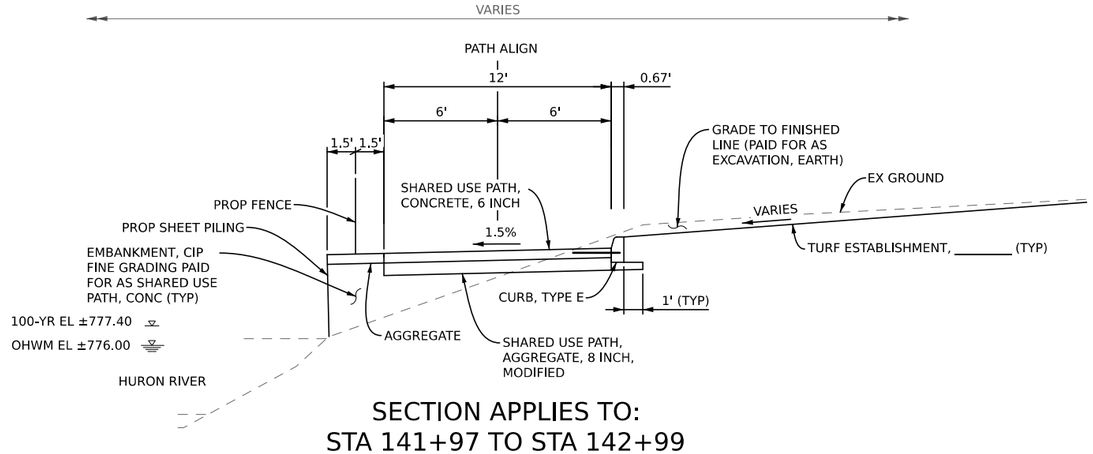
SECTION APPLIES TO:
STA 141+5.66 TO STA 141+45
16' PATH CUT



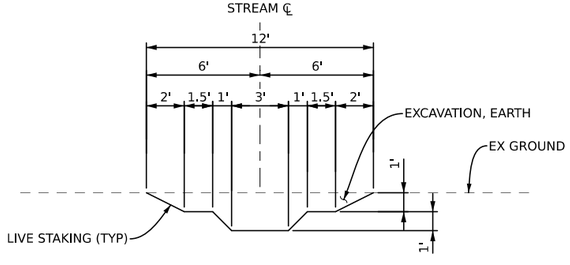
SECTION APPLIES TO:
RECONSTRUCTED B2B TRAIL
ALONG BANDEMER PARK ROAD



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



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



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

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REVISIONS

DATE 4/12/2024
PRO. NUMBER
ENG JAH
PROJ. MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE H: AS SHOWN V: AS SHOWN
HORIZ. DATUM NAD83
VERT. DATUM NAVD88

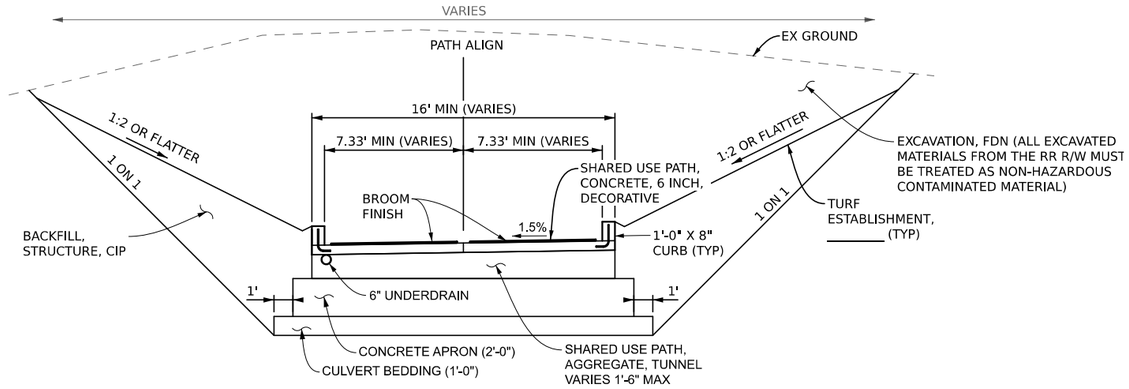
HORIZ. (FT) 0 4
VERT. (FT) 0 4

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

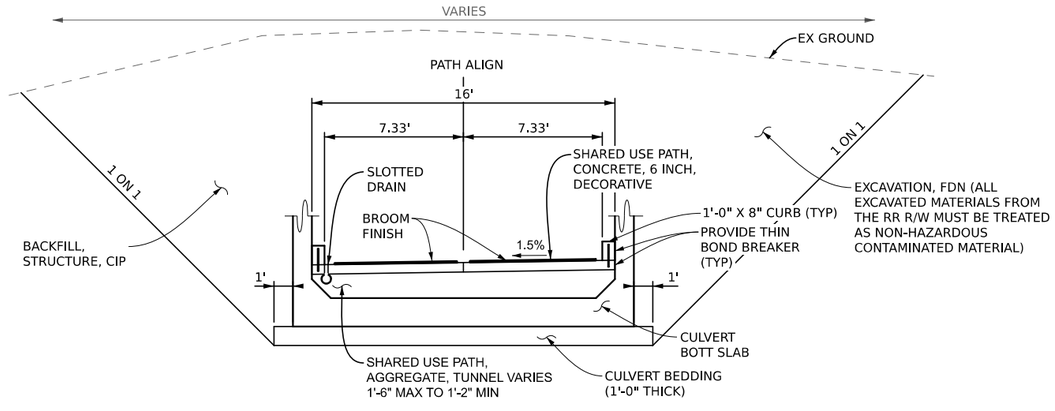
SECTIONS

SHEET 10 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_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

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LANSING, MI 48917
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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: AS SHOWN V:AS SHOWN
HORIZ DATUM NAD83
VERT DATUM NAVD88

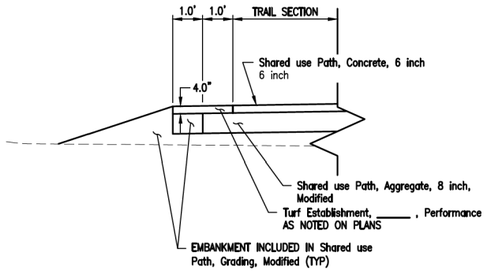
HORIZ. (FT) 0 4
VERT. (FT) 0 4

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

SECTIONS

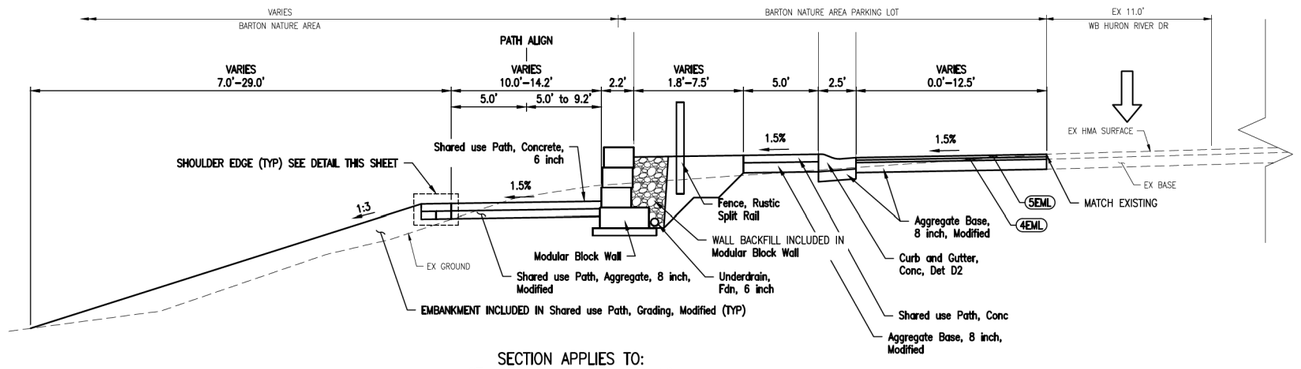
SHEET 11 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_sections_002.dgn

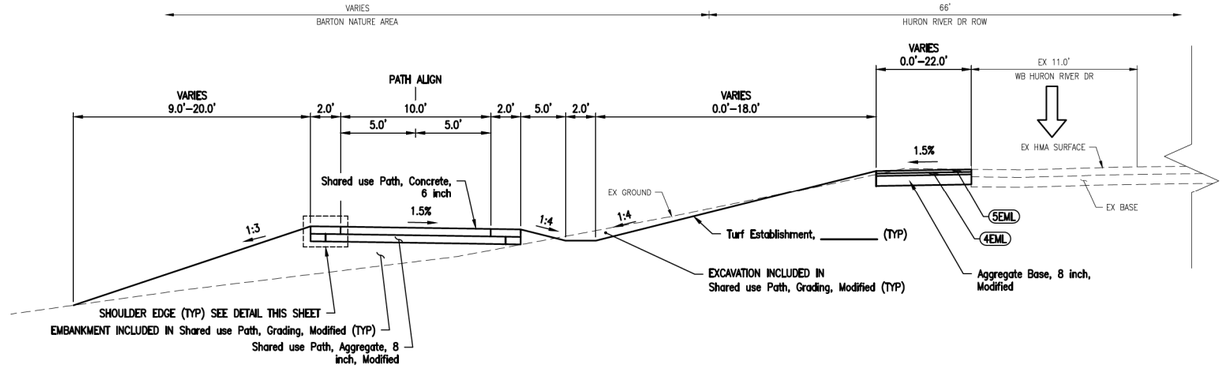


SHOULDER EDGE DETAIL

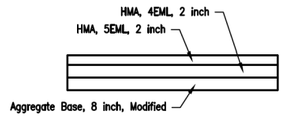
APPLIES TO STA 135+26 TO 137+66
(NOT TO SCALE)



SECTION APPLIES TO:
STA 135+00 TO STA 136+19

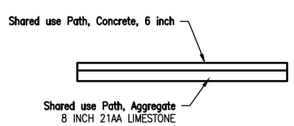


SECTION APPLIES TO:
STA 136+19 TO STA 137+79



HMA PARKING LOT DETAIL

NOT TO SCALE



CONCRETE SHARED USE PATH

NOT TO SCALE

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Livonia, MI 48150
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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORZ DATUM	VERT DATUM
6/28/2022	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=40'	V: 1"=4'	NAD83	NAVD88

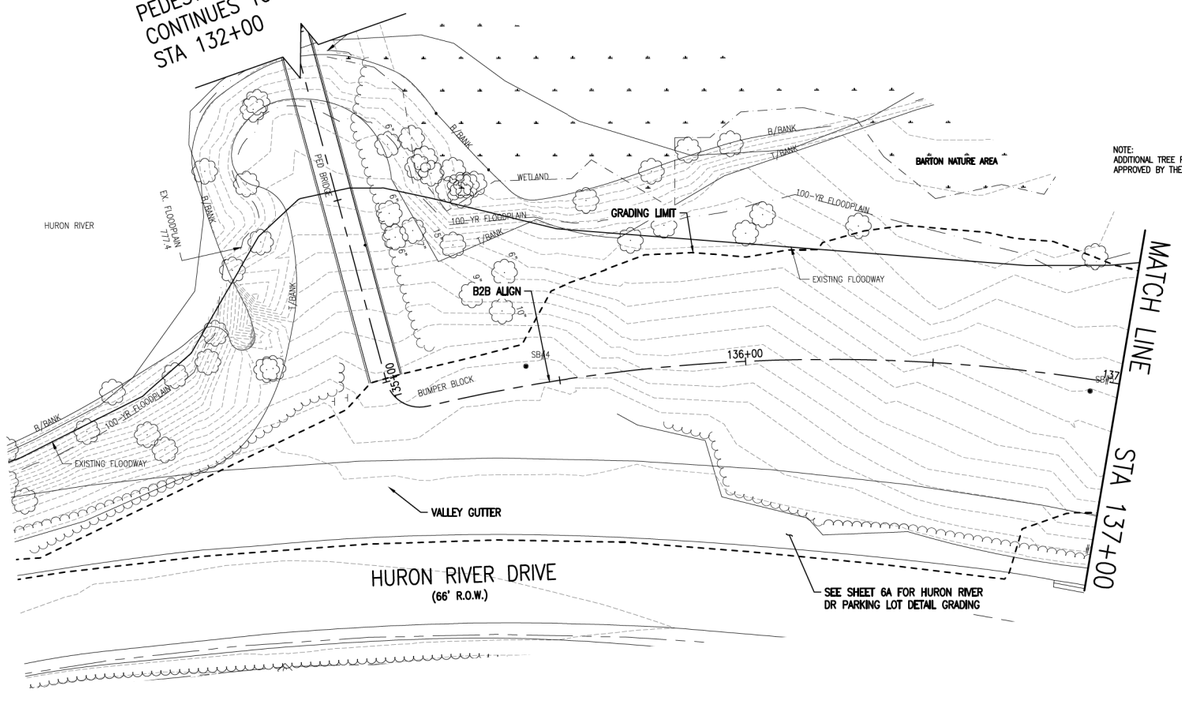
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

TYPICAL SECTIONS

SHEET 12 of 80

SOIL BORING #4
N 293018.00
E 13290528.00 ELEV 787.86

REMOVAL PLAN

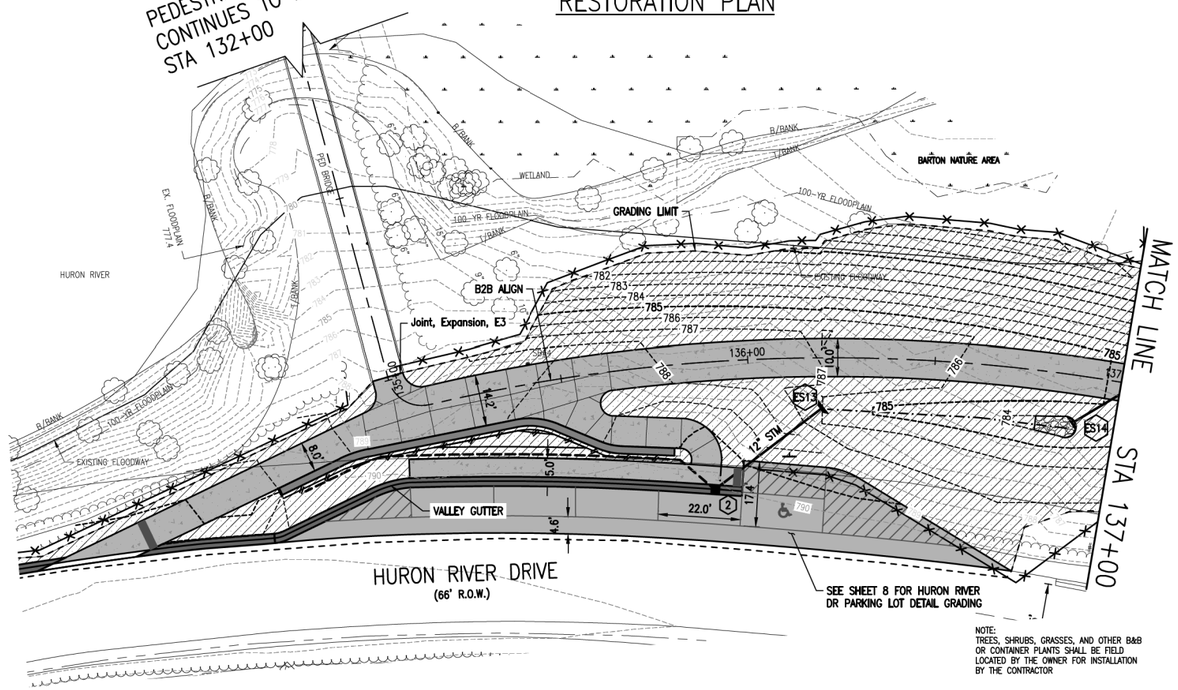


NOTE:
ADDITIONAL TREE REMOVALS SHALL BE APPROVED BY THE OWNER

LEGEND

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

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.

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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORIZ DATUM	VERT DATUM
12/21/2023	1022-180011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20'	V:	NAD83	NAVD88

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

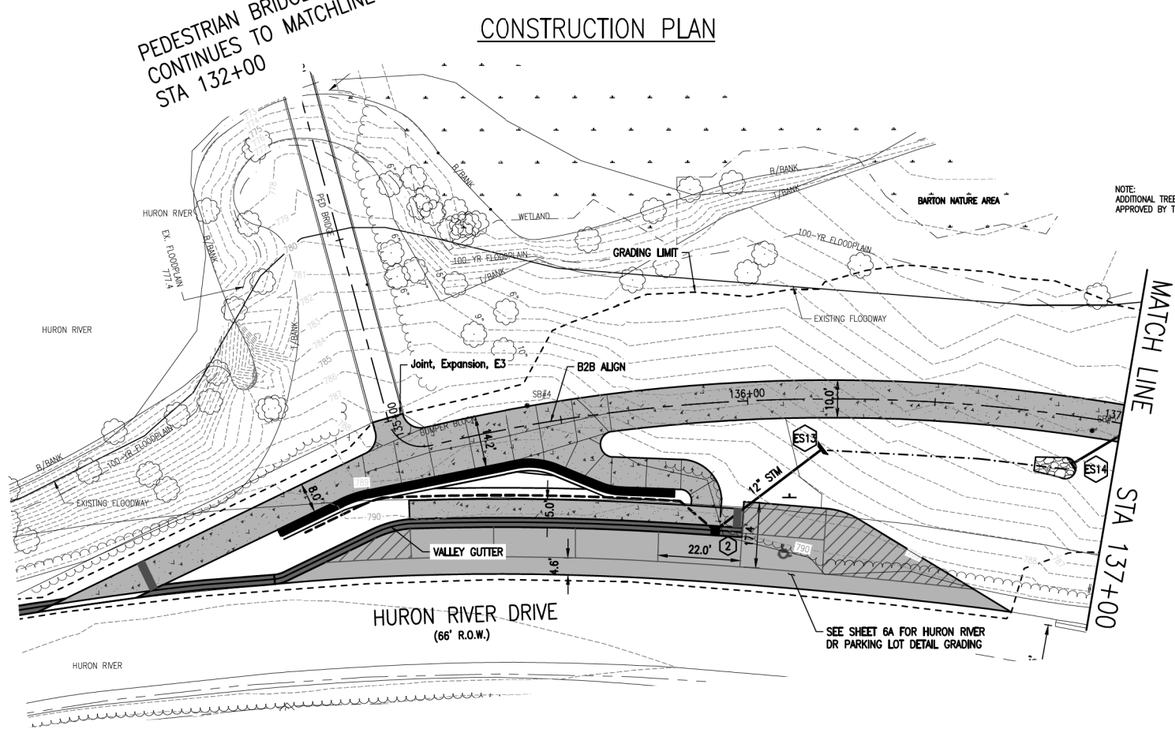
GRADING AND RESTORATION PLAN
STA ###### TO STA ######

SHEET 13 of 80

DRAWING PATH: P:\1000_1999\1022180010_Bandemer-Barton_Trail\Drawings\Civil\Plans_Const\180010GRD_RES_03.dwg Apr 12, 2024 - 9:47am

SOIL BORING #4
N 293018.00
E 13290528.00 ELEV 787.86

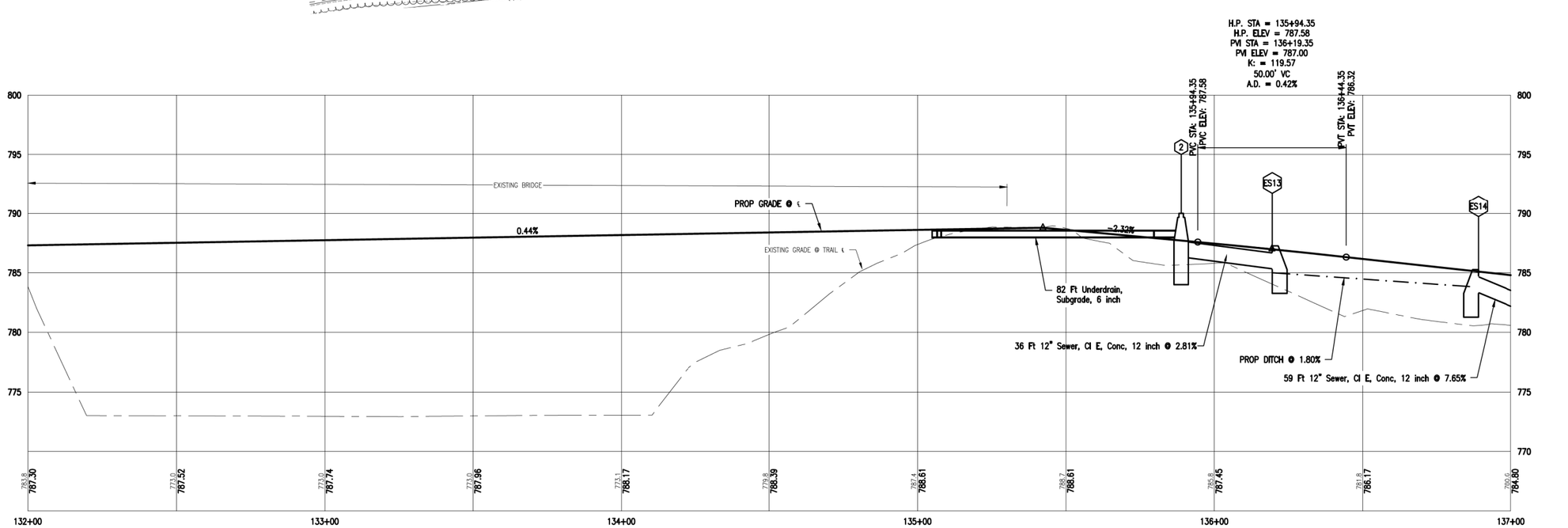
CONSTRUCTION PLAN



NOTE:
ADDITIONAL TREE REMOVALS SHALL BE APPROVED BY THE OWNER

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
365	Syd	Aggregate Base, 8 inch, Modified
3	Ea	Culv End Sect, Conc, 12 inch
95	Ft	Sewer, Cl E, 12 inch, Tr Det B
1	Ea	Dr Structure Cover, Type C
1	Ea	Dr Structure, 24 inch dia
114	Ft	Underdrain, Fdn, 6 inch
33	Ton	HMA, 4EML
33	Ton	HMA, 5EML
9	Ft	Joint, Expansion, E3
207	Ft	Curb and Gutter, Conc, Det D2
13	Ft	Detectable Warning Surface
345	Ft	Shared use Path, Grading, Modified
426	Syd	Shared use Path, Aggregate, 8 inch, Modified
411	Syd	Shared Use Path, Concrete, 6 inch
113	Ft	Fence, Rustic Split Rail
60	Ft	Post, Steel, 3 lb
2	Sft	Sign, Type IIIB
278	Ft	Pavt Mrkg, Polyurea, 4 inch, Yellow
270	Ft	Pavt Mrkg, Polyurea, 12 inch, Cross Hatching, Yellow
1	Ea	Pavt Mrkg, Preformed Thermopl, Accessible Sym
75	Ft	Pavt Mrkg, Waterborne, for Rest Areas, Parks, and Lots, 4 inch, Blue
17	Syd	Riprap, Cobblestone



(2) STA 135+88.77, 34.0' R
Dr Structure, 48 inch dia
6" INV NW 788.00
12" INV NE 786.50

ES13 STA 136+19.47, 13.6' R
Culv End Section, Conc, 12 inch
12" INV SW 785.50

ES14 STA 136+88.95, 12.4' R
Culv End Section, Conc, 12 inch
12" INV NE 783.50

811 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:

DATE	PROJ.NUMBER	ENG	PROJ.MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
12/21/2023	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20' V: 1"=4'	NAD83	NAVD88

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

CONSTRUCTION PLAN

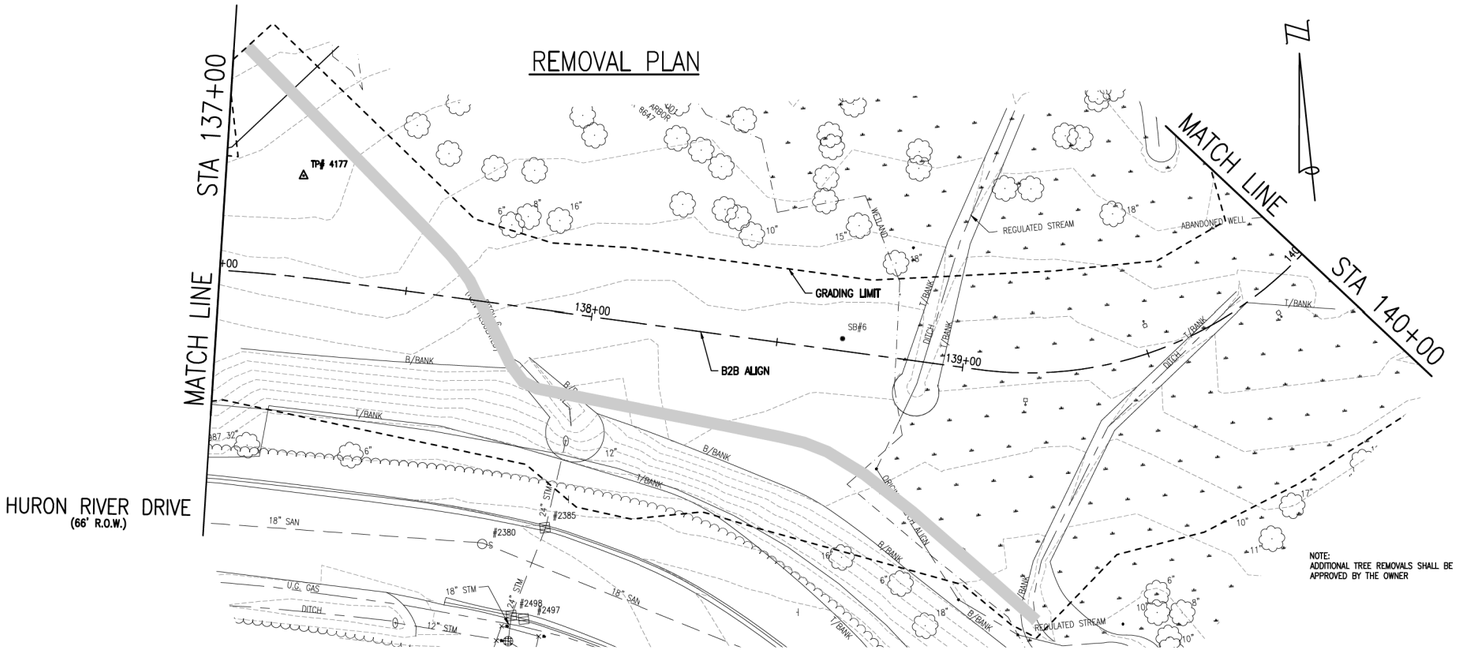
STA ###### TO STA 136+00

SHEET 14 of 80

DRAWING PATH: P:\1000_1999\1022\18\0010_Bandemer-Barton_Trail\Drawings\Civil\Plans_Const\18001OCON3.dwg Apr 12, 2024 - 9:49am

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

REMOVAL PLAN



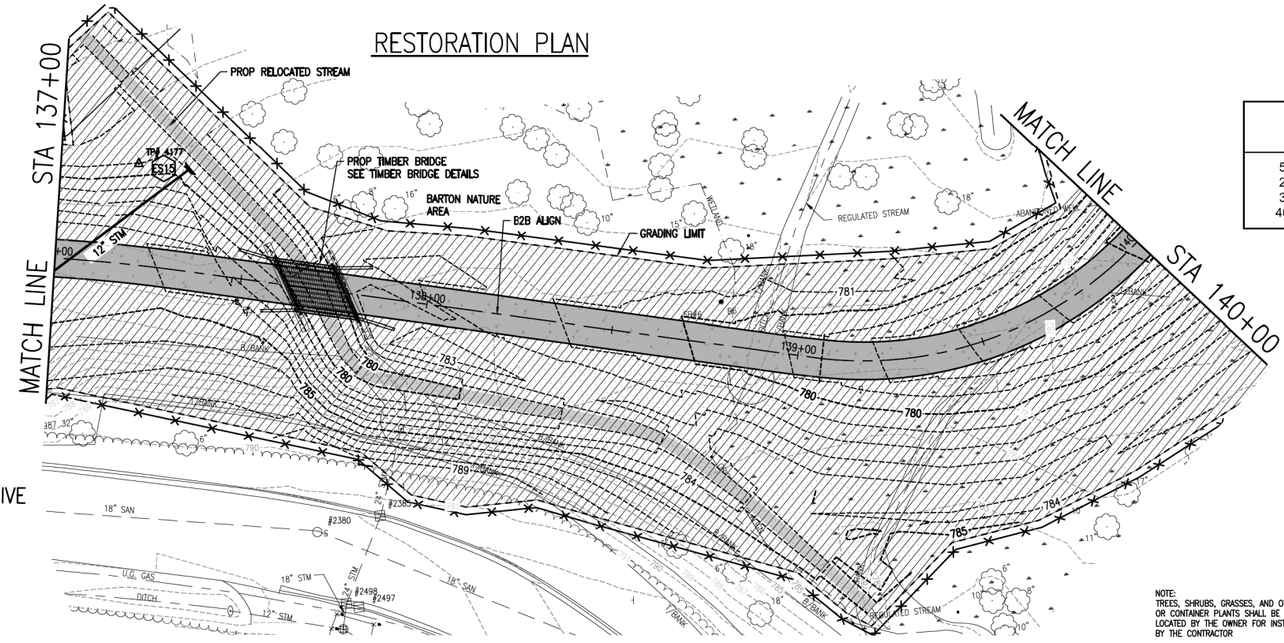
MISCELLANEOUS QUANTITIES

1100	Cyd	Excavation, Earth

LEGEND

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

RESTORATION PLAN



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

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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
12/21/2023	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20' V:	NAD83	NAVD88

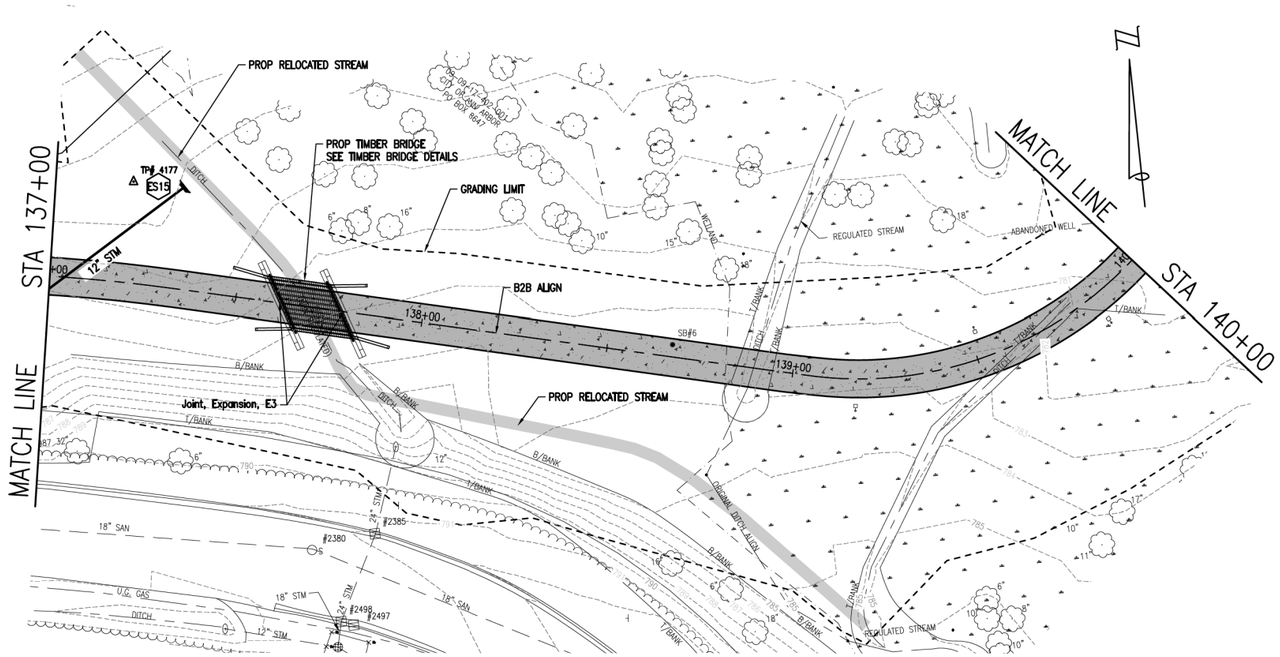
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

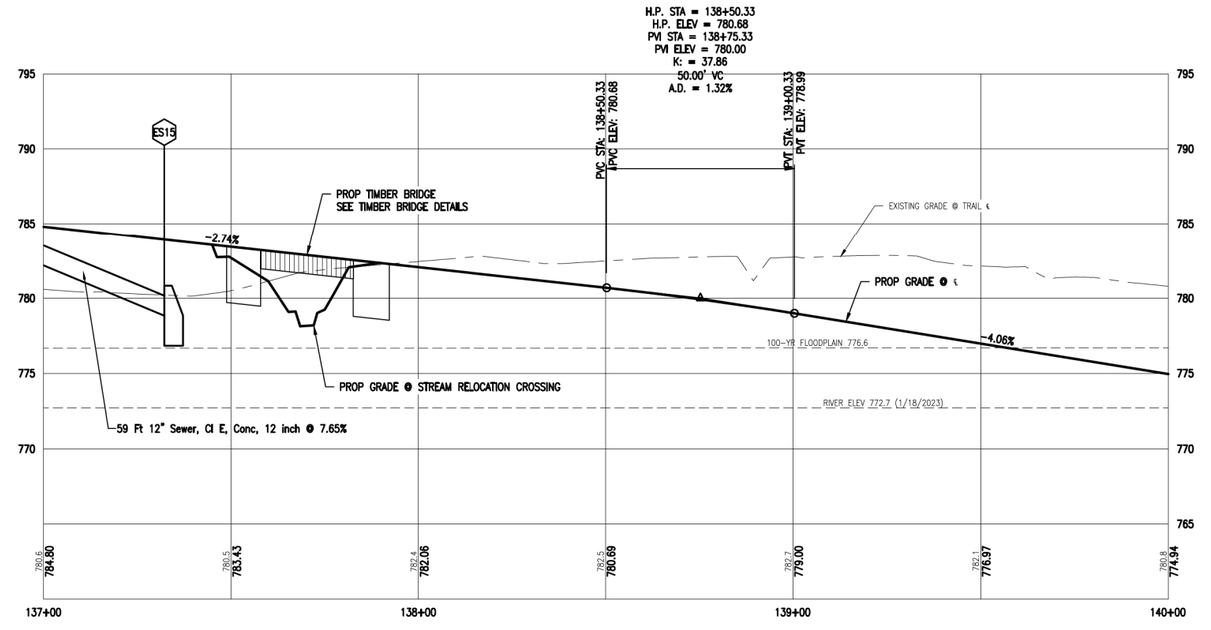
GRADING AND RESTORATION PLAN
STA 137+00 TO STA 140+00

SHEET 15 of 80

DRAWING PATH: P:\1000_1999\1022180010_Bandemer-Barton_Trail\Drawings\Civil\Plans_Const\180010GRD_RES_03.dwg Apr 12, 2024 - 9:51am

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





ES15 STA 137+32.16, -26.8' L
Culv 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

Know what's **below.**
Call before you dig.

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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORZ DATUM	VERT DATUM
12/21/2023	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20'	V: 1"=4'	NAD83	NAVD88

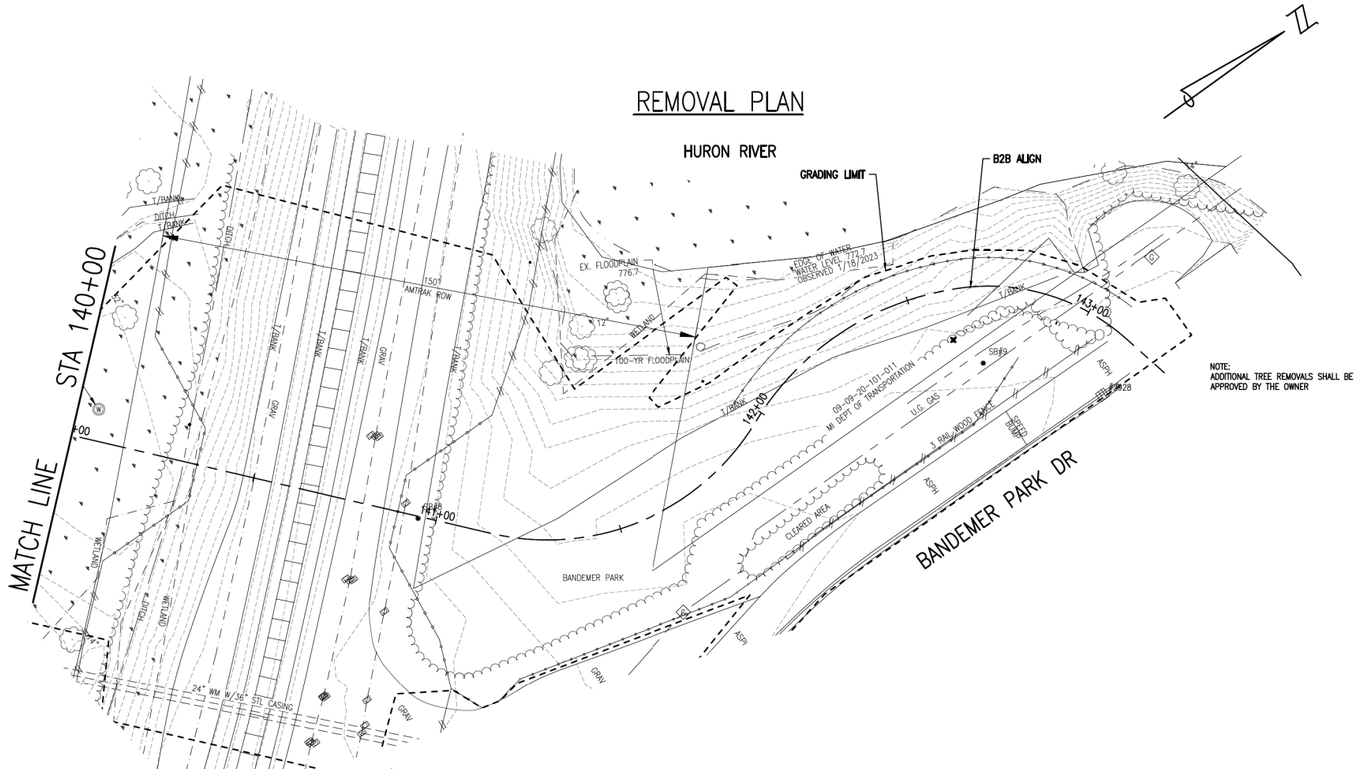
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

CONSTRUCTION PLAN
STA 137+00 TO STA 140+00

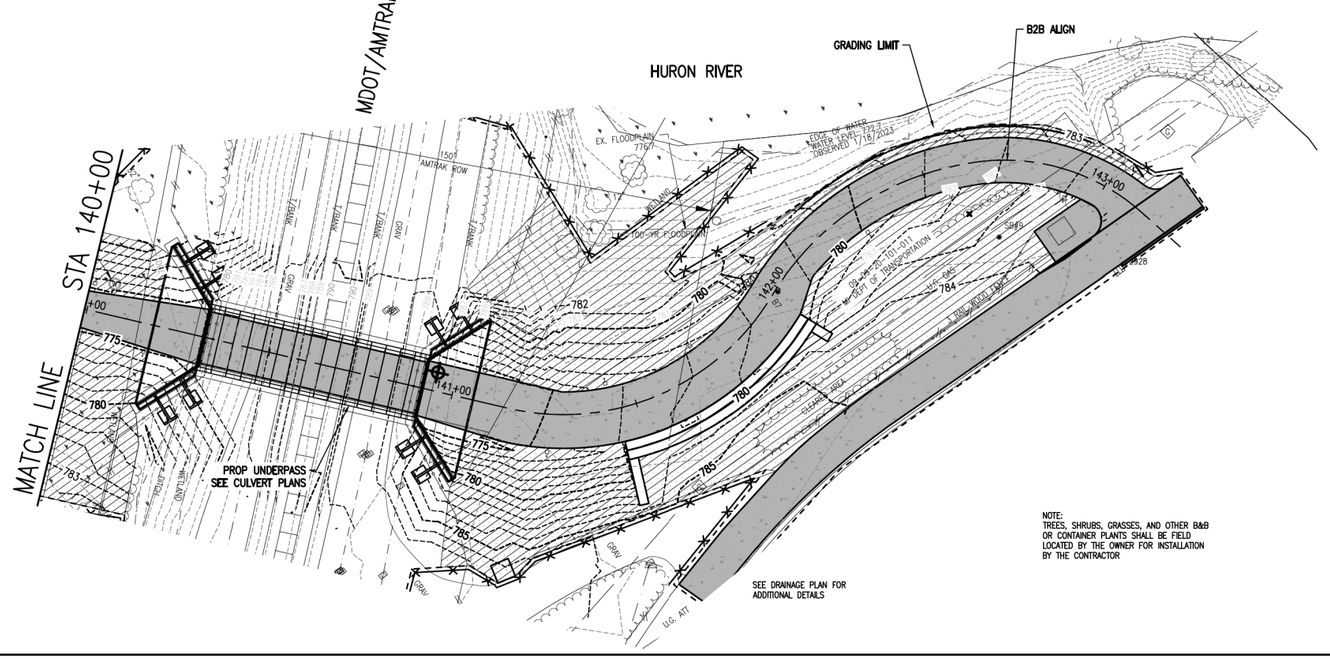
SHEET 16 of 80

SOIL BORING #8		
N 293047.00		
E 1329046.00	ELEV 787.46	
SOIL BORING #9		
N 293194.00		
E 1329101.00	ELEV 783.64	

REMOVAL PLAN



RESTORATION PLAN



MISCELLANEOUS QUANTITIES

101	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

Know what's **below.** **Call** before you dig.

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REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CAD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
12/1/2023	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20' V:	NAD83	NAVD88

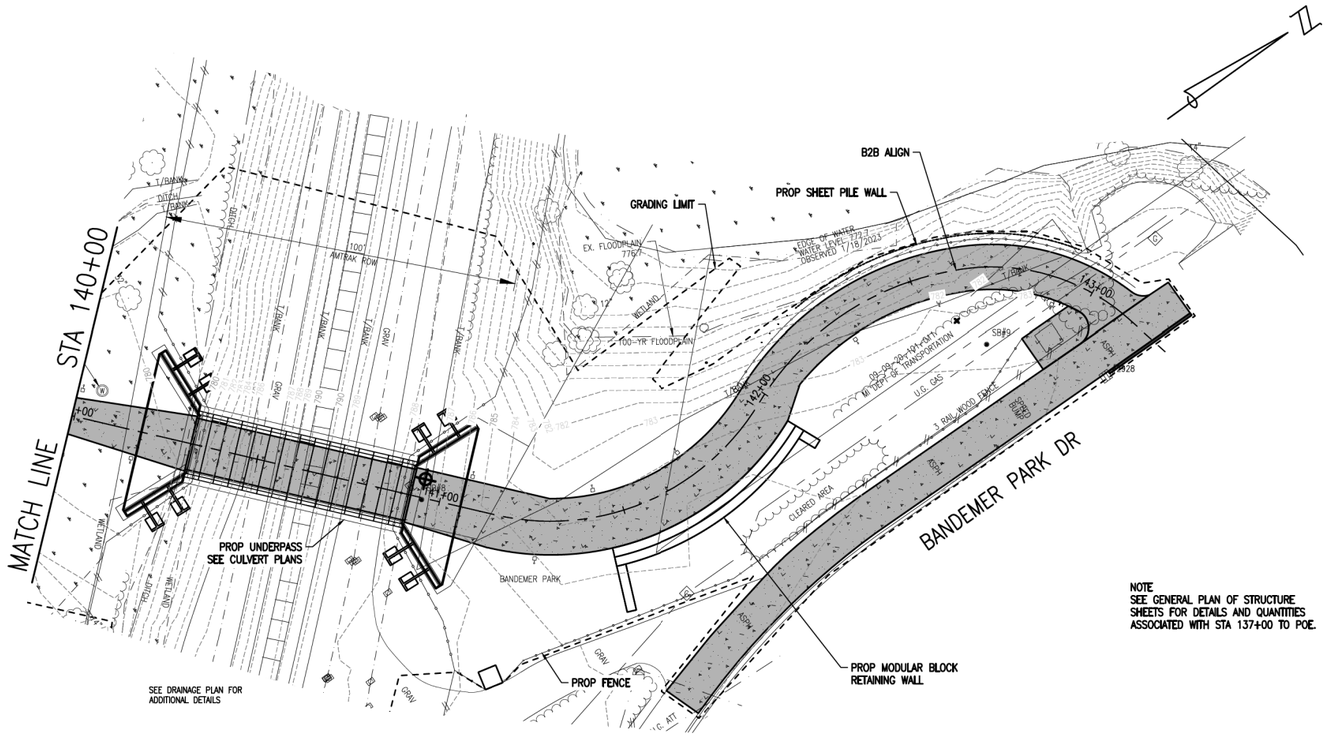
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

GRADING AND RESTORATION PLAN
STA 140+00 TO POE

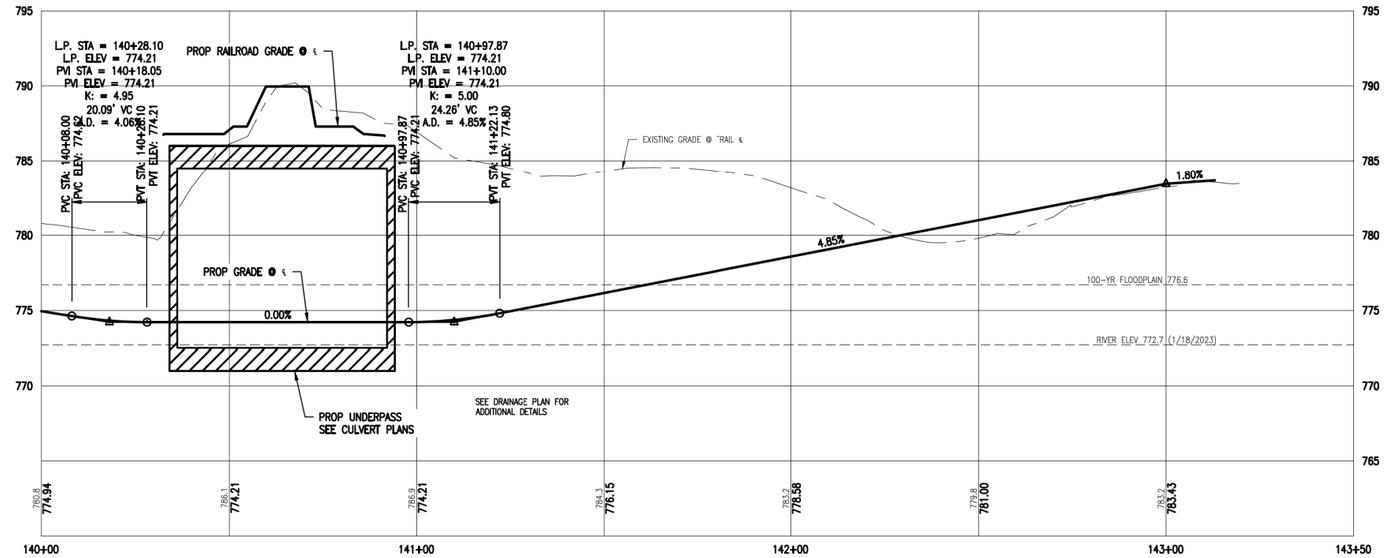
SHEET 17 of 80

DRAWING PATH: P:\1000_1999\1022\180010_Bandemer-Barton_Trail\Drawings\Civil\Plans_Const\180010GRD_RES_03.dwg Apr 12, 2024 - 9:55am

SOIL BORING #8	
N 293047.00	
E 1329046.00	ELEV 787.46
SOIL BORING #9	
N 293194.00	
E 1329101.00	ELEV 783.64



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



MISCELLANEOUS QUANTITIES

305	Ft	Curb, Conc, Det E1
394	Ft	Shared use Path, Grading, Modified
698	Syd	Shared use Path, Aggregate, 8 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

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Livonia, MI 48150
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REVISIONS:

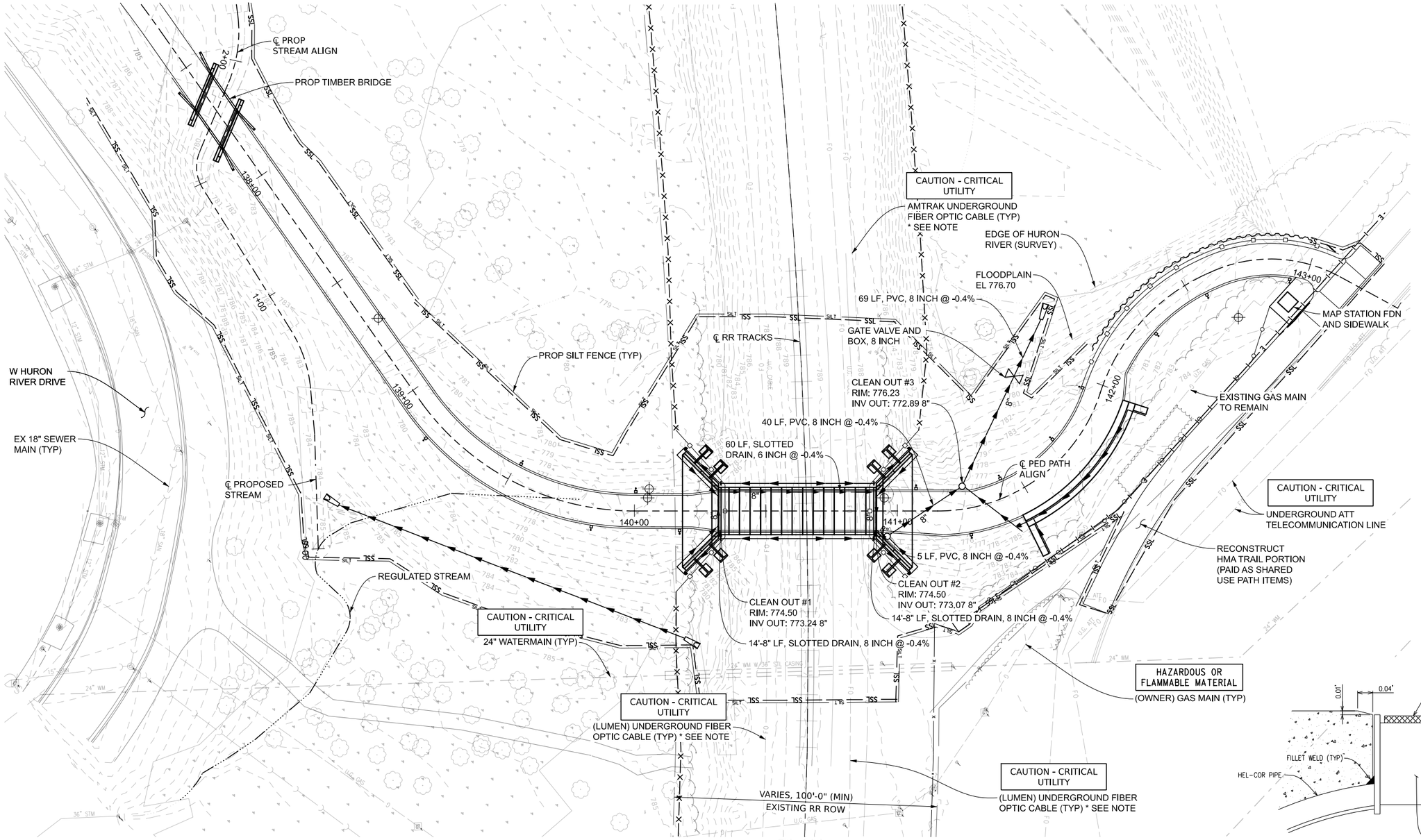
DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORZ DATUM	VERT DATUM
12/21/2023	1022-19-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20' V: 1"=4'	NAD83	NAVD88

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

CONSTRUCTION PLAN
STA 140+00 TO POE

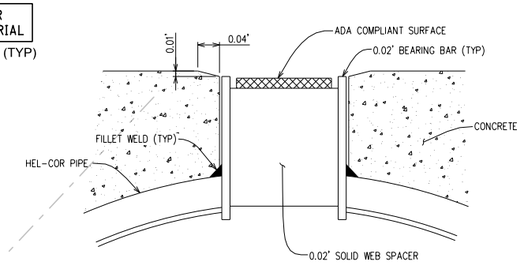
SHEET 18 of 80

DRAWING PATH: P:\1000_1999\1022180010_Bandemer-Barton_TrailDrawings\Civil\Plans_Const\180010CON3.dwg Apr 12, 2024 - 9:56am



PLAN

EXISTING TOPOGRAPHY SHOWN



6" SLOTTED DRAIN DETAIL

MISCELLANEOUS QUANTITIES

42	Ft	Slotted Drain, Galv, 6 inch
187	Ft	Sewer, PVC, 6 inch, Tr Det B
3	Ea	Clean Out
210	Ft	Underdrain, Fdn, 6 inch
1	Ea	Gate Valve and Box, 6 inch

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE 4/12/2024
PROJ NUMBER
ENG JAH
PROJ MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE VC: NONE HC: 1" = 40' HORIZ (FT) 40 0 VERT. (FT) NONE 0
HORIZ DATUM NAD83 VERT DATUM NAVD88

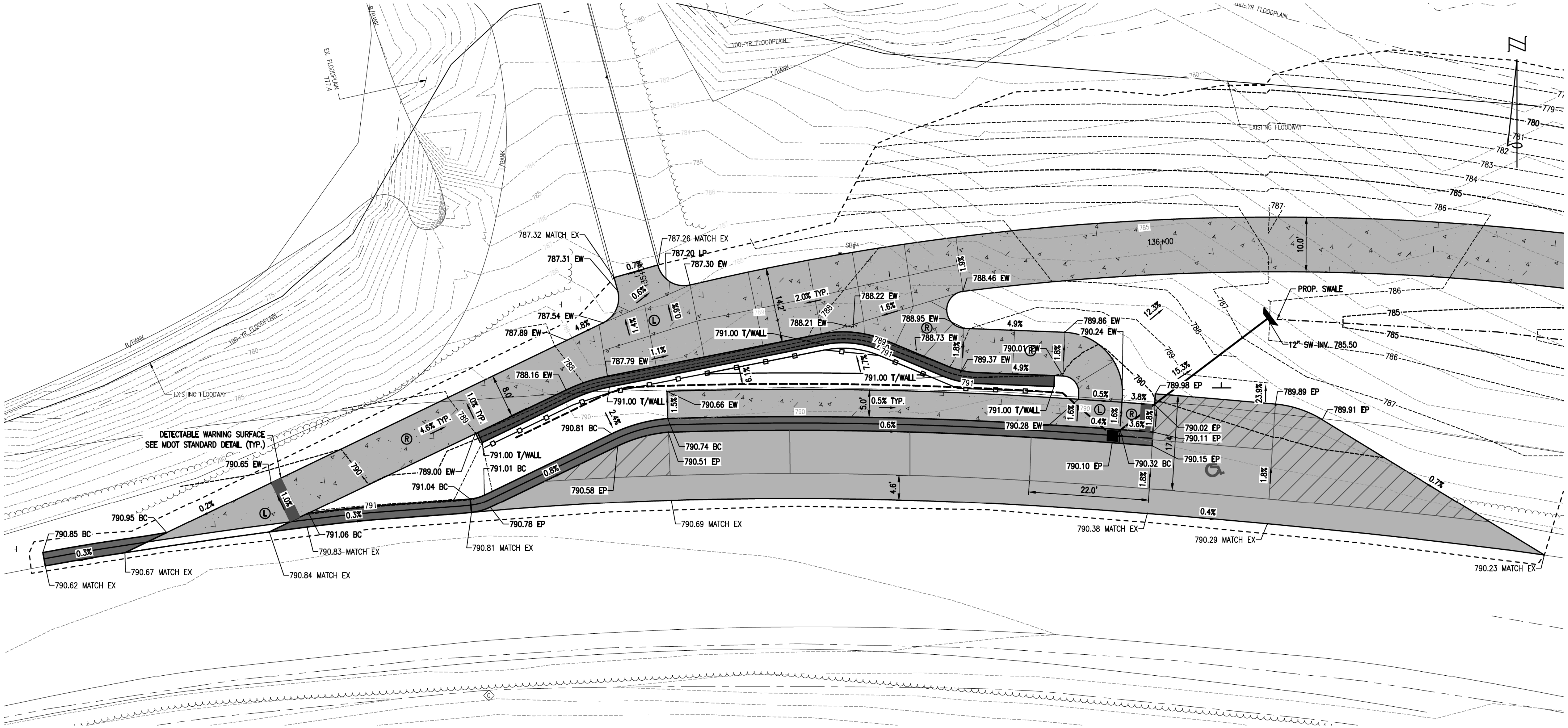
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

DRAINAGE PLAN

SHEET 19 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_drain_001.dgn

HURON RIVER DR PARKING LOT



② STA 135+88.77, 34.0' R
Dr Structure, 48 inch dia
T/CAST 790.00, COVER K
6" INV NW 788.00
12" INV NE 786.50

ES13 STA 136+19.47, 13.6' R
Culv End Section, Conc, 12 inch
12" INV SW 785.50

ES14 STA 136+88.95, 12.4' R
Culv End Section, Conc, 12 inch
12" INV NE 783.50

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

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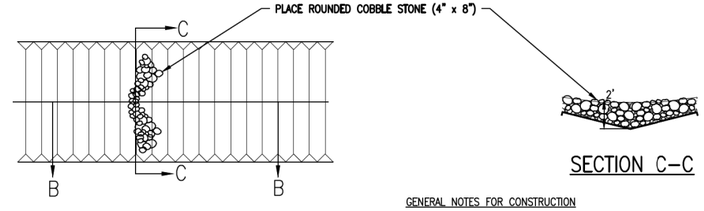
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

DETAILED GRADING PLAN

DRAWING PATH: P:\11000_1999\10221\80010_Bandemer-Barton_Trail\Drawings\Civil\Grading\180010GRD.dwg Apr 12, 2024 - 9:43am

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

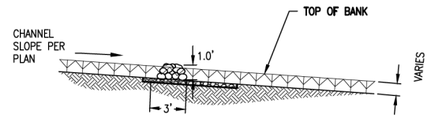
STORM STRUCTURE SCHEDULE			
STRUCTURE NAME	STRUCTURE DETAILS	STATION	OFFSET
2 Dr Structure, 48 inch dia	RIM = 790.00 COVER = TYPE K 2' SUMP BOT = 784.50 6" NW INV = 788.00 12" NE INV = 786.50	135+88.77	33.99' R



CHECK DAM, COBBLESTONE

SECTION C-C

NOT TO SCALE



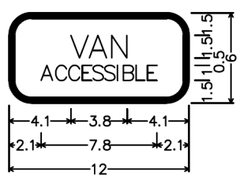
SECTION B-B

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.

R7-8 (12" X 18")
1.5 SFT TYPE IIIB SIGN
1- 3# POST (15 FT)

R7-8
1.5" Radius, 0.4" Border, 0.4" Indent, Green on White;
"RESERVED", C 2K 50% spacing;
"PARKING", C 2K 66% spacing;
Rounded Rectangle 0.5" Radius Blue;
"ONLY", C 2K;



R7-8p (12" X 6")
0.5 SFT TYPE IIIB SIGN

R7-8p_12x6
1.5" Radius, 0.4" Border, White on Blue;
"VAN", D 2K specified length;
"ACCESSIBLE", D 2K specified length;

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

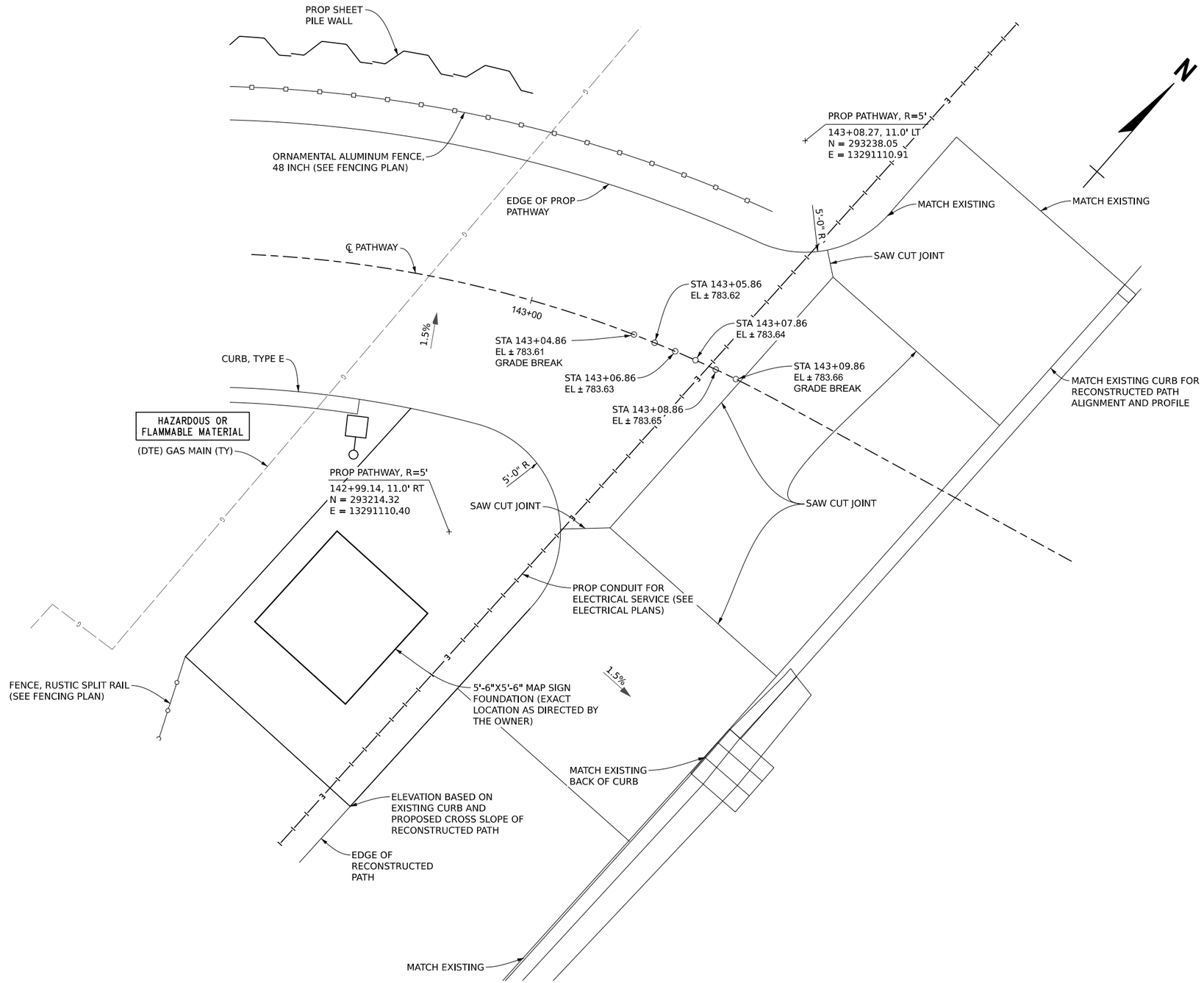
REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
6/28/2022	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=5' V:	NAD83	NAVD88

CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON NATURE AREA BORDER TO BORDER TRAIL

MISCELLANEOUS DETAILS

SHEET 21 of 80



Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: 1" = 5' V: 1" = 5'	NAD83	NAVD88

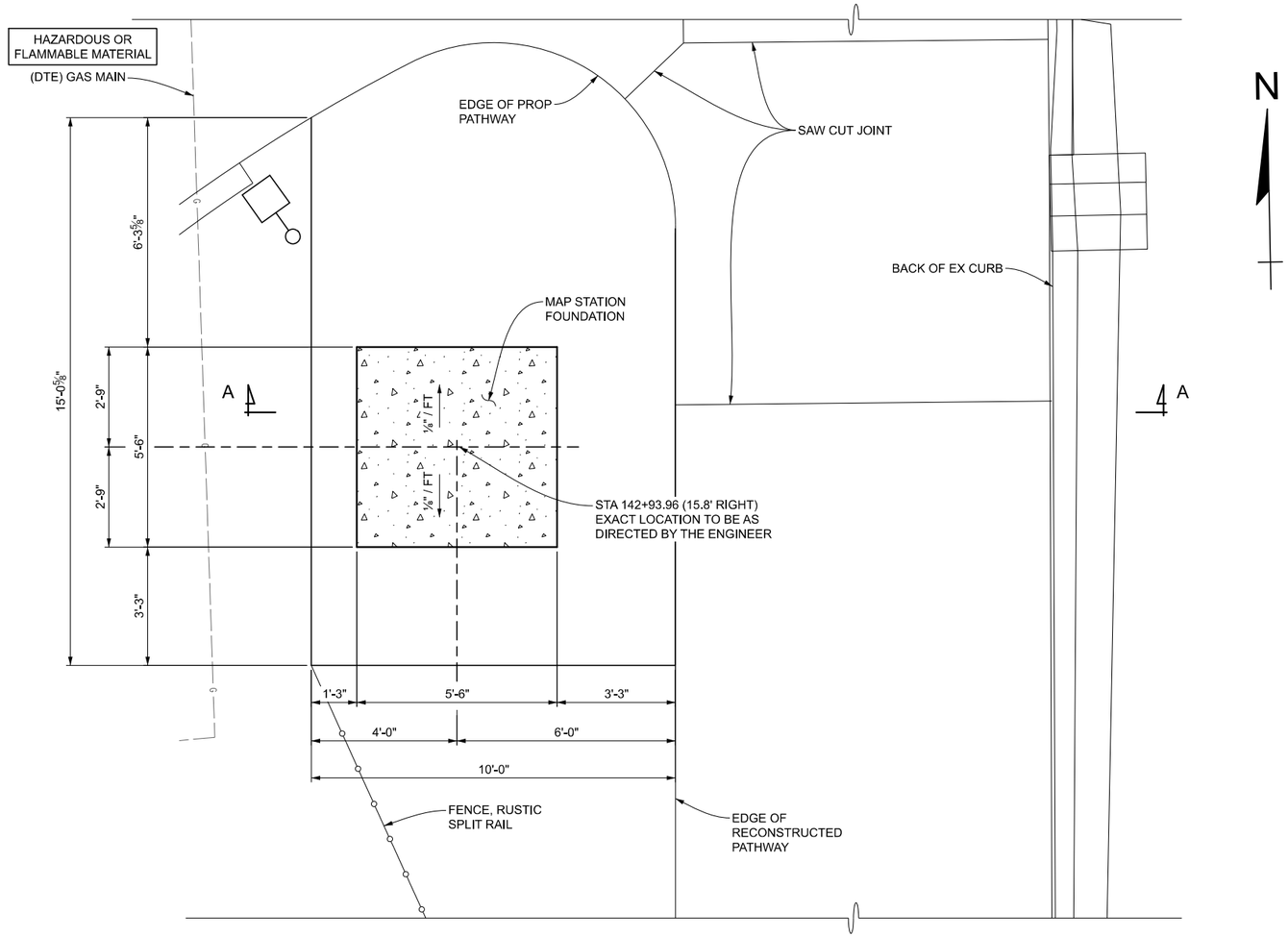
HORIZ. (FT) 0 5 VERT. (FT) 0 5

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

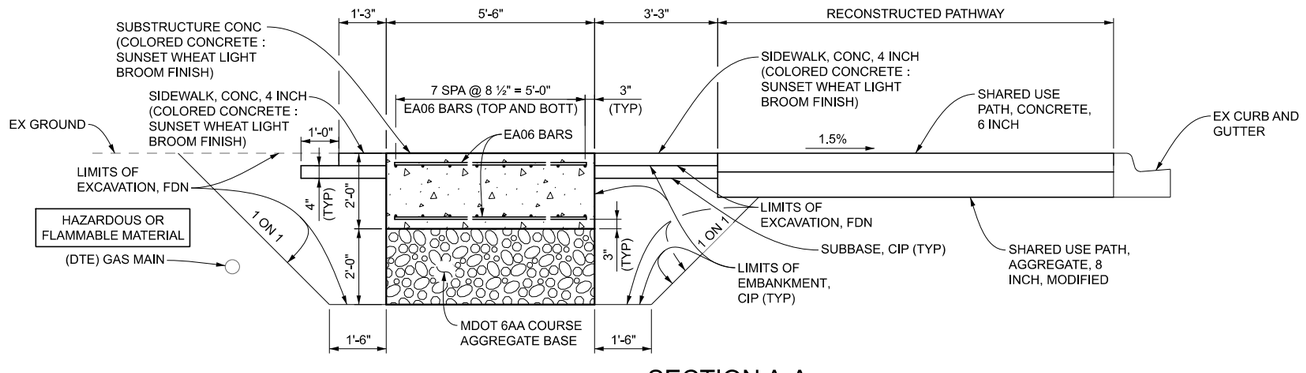
PATH DETAILS

SHEET 22 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_path_002.dgn



MAP STATION FOUNDATION PLAN



SECTION A-A

MISCELLANEOUS QUANTITIES

15	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

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7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

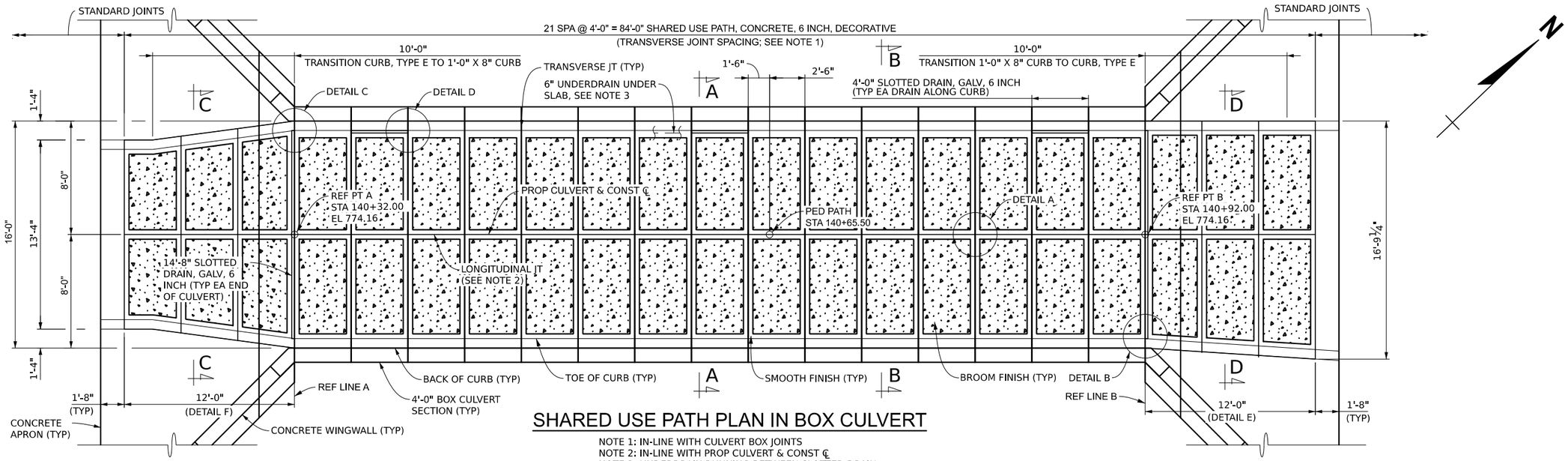
REVISIONS

DATE 4/12/2024
PRO. NUMBER
ENG JAH
PROJ MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE H: 1" = 4' V: 1" = 4'
HORIZ DATUM NAD83
VERT DATUM NAVD88

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

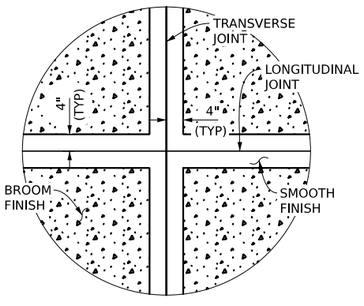
PATH DETAILS

SHEET 23 of 80

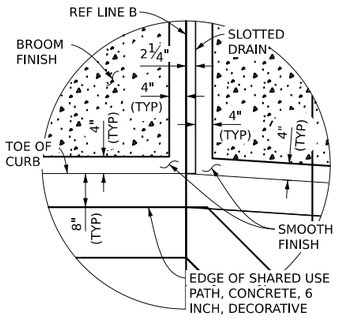


SHARED USE PATH PLAN IN BOX CULVERT

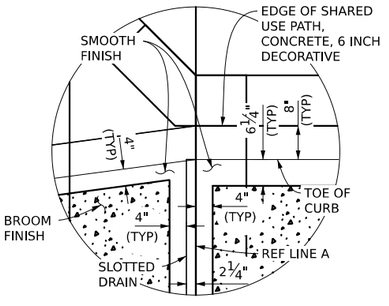
NOTE 1: IN-LINE WITH CULVERT BOX JOINTS
NOTE 2: IN-LINE WITH PROP CULVERT & CONST ℄
NOTE 3: UNDERDRAIN RUNNING BETWEEN SLOTTED DRAIN INCLUDED IN PAY ITEM "Sewer, PVC, 6 inch, Tr Det B", SEE drain_001.dgn FOR PAY LIMITS AND QUANTITY.



DETAIL A



DETAIL B



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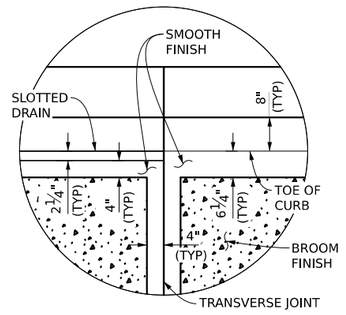

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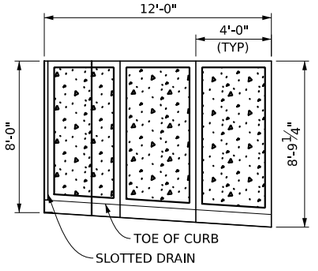
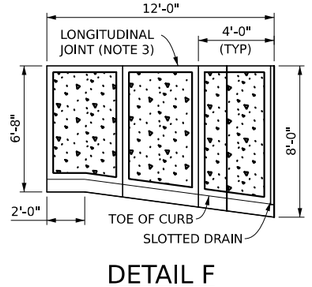
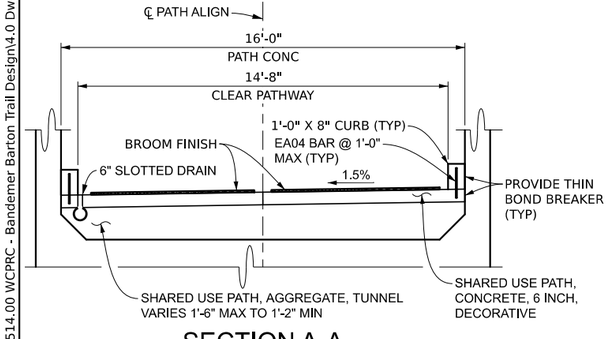


DETAIL E



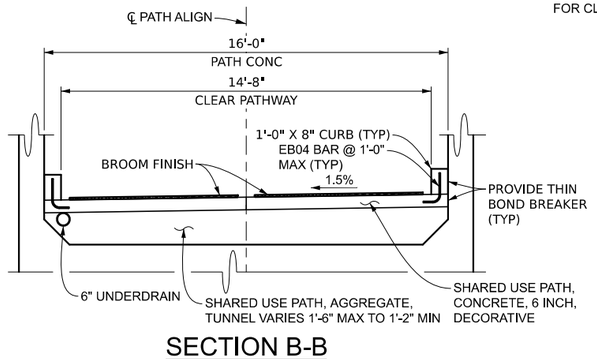
DETAIL F

NOTE 3: DIMENSIONS SYMMETRICAL ABOUT LONGITUDINAL JOINT



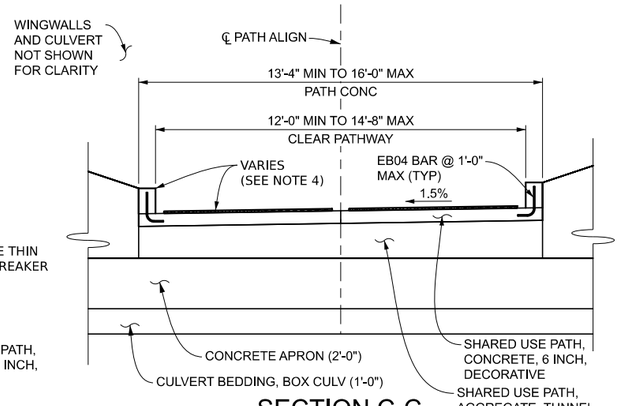
SECTION A-A

TYPICAL PATH SECTION INSIDE CULVERT WITH SLOTTED DRAIN



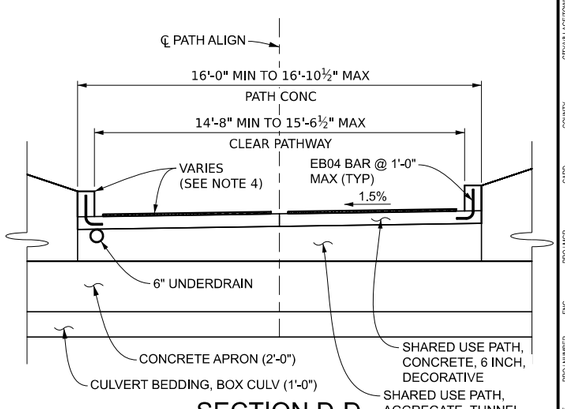
SECTION B-B

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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LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

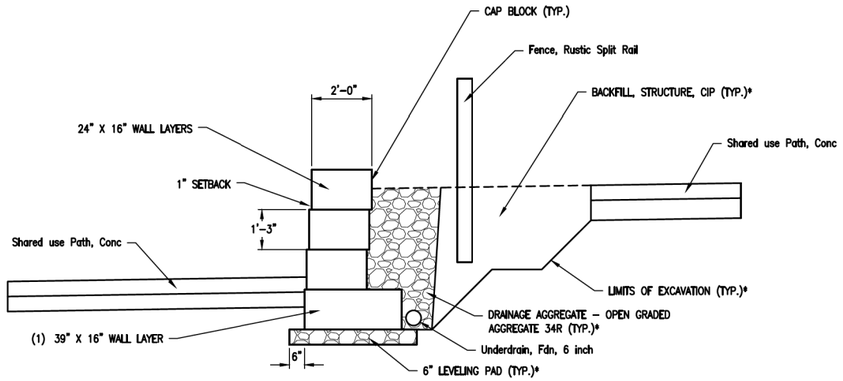
HORIZ DATUM	NAD83
VERT DATUM	NAVD88
SCALE	V: 1" = 30' H: 1" = 30'
CITY/VILLAGE/TOWNSHIP	CITY OF ANN ARBOR
COUNTY	WASHTENAW
CADD	JAH
PROJ MGR	JAH
ENG	JAH
PROJ NUMBER	
DATE	4/12/2024

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

PATH DETAILS

SHEET 24 of 80

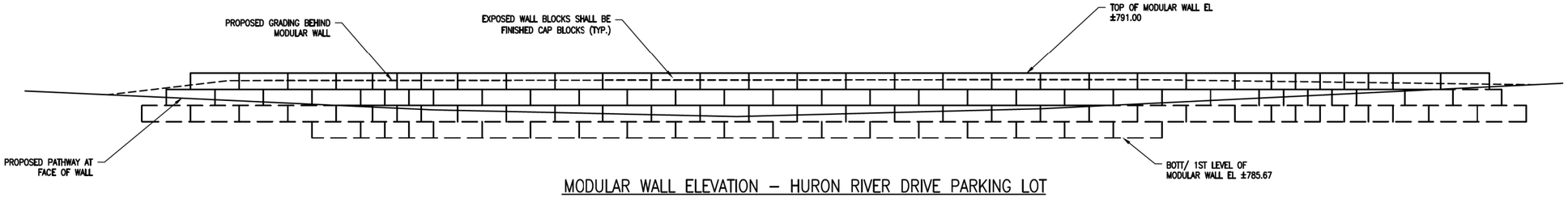
O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_path_001.dgn



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

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

REVISIONS:

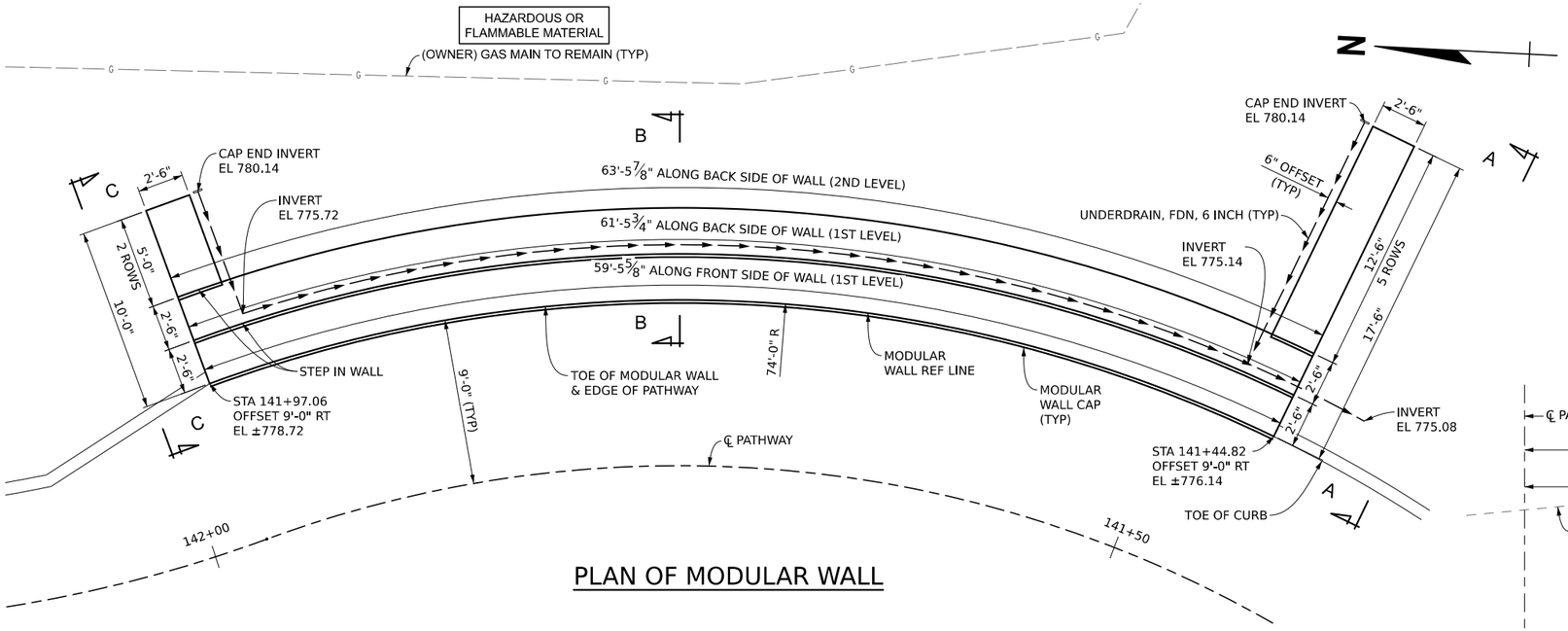
DATE: 6/28/2022 | PROJ NUMBER: 1022-18-0011 | ENG: MB | PROJ MGR: CE | CADD: JK | COUNTY: WASHTENAW | CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR | SCALE: H: 1"=40' V: 1"=4' | HORZ DATUM: NAD83 | VERT DATUM: NAVD88

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

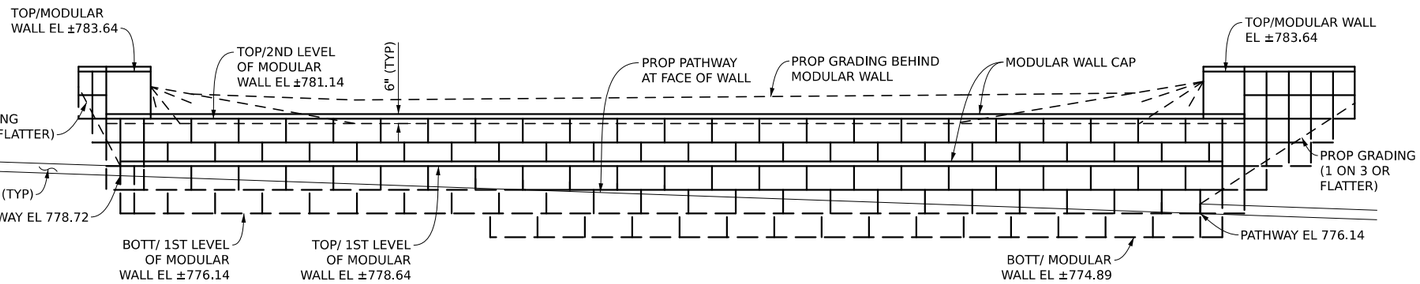
MODULAR WALL DETAILS - HURON RIVER DRIVE PARKING LOT

SHEET: 25 of 80

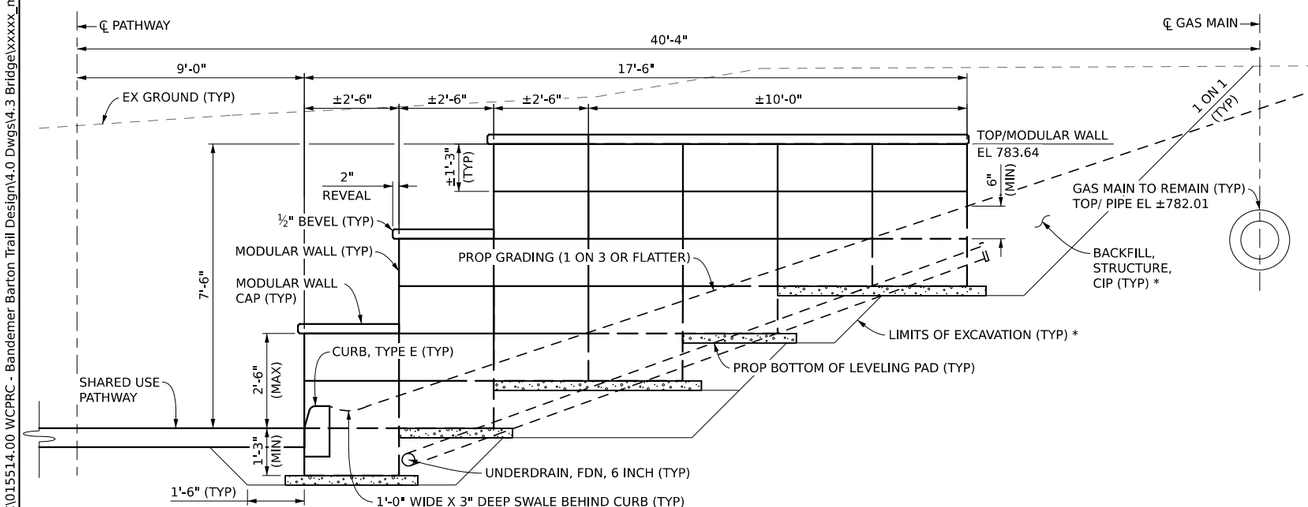
DRAWING PATH: P:\1000_1999\1022180010_Bandemer-Barton_Trail\Drawings\Civil\Typicals\180010TYP.dwg Apr 12, 2024 - 9:21am



PLAN OF MODULAR WALL



MODULAR WALL ELEVATION



SECTION A-A MODULAR WALL END

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

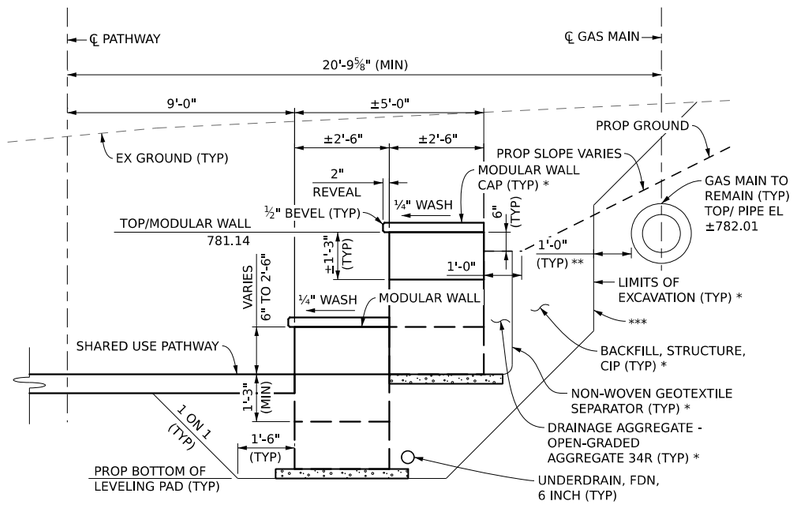
TEXTURING NOTES:

BLOCK TEXTURE TO MATCH 'NORTHSHORE GRANITE' AS SUPLIED 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 CAP JOINT. PROVIDE JOINTS IN THE WALL CAP AT 8'-0" MAXIMUM SPACING.

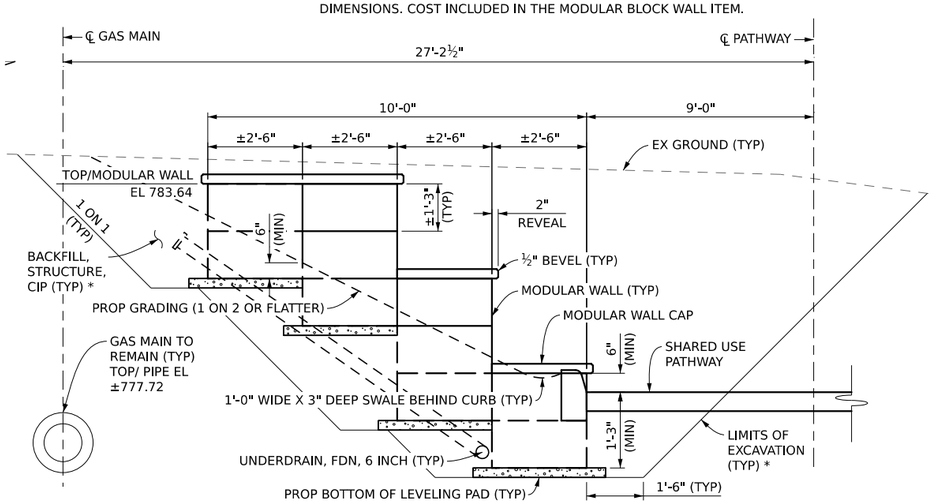
MISCELLANEOUS QUANTITIES

143	Ft	Modular Block Wall, Cap
493	Sft	Modular Block Wall



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 ACCOMODATE WALL DIMENSIONS. COST INCLUDED IN THE MODULAR BLOCK WALL ITEM.



SECTION C-C MODULAR WALL END

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

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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: AS SHOWN V: AS SHOWN
HORIZ DATUM NAD83
VERT DATUM NAVD88

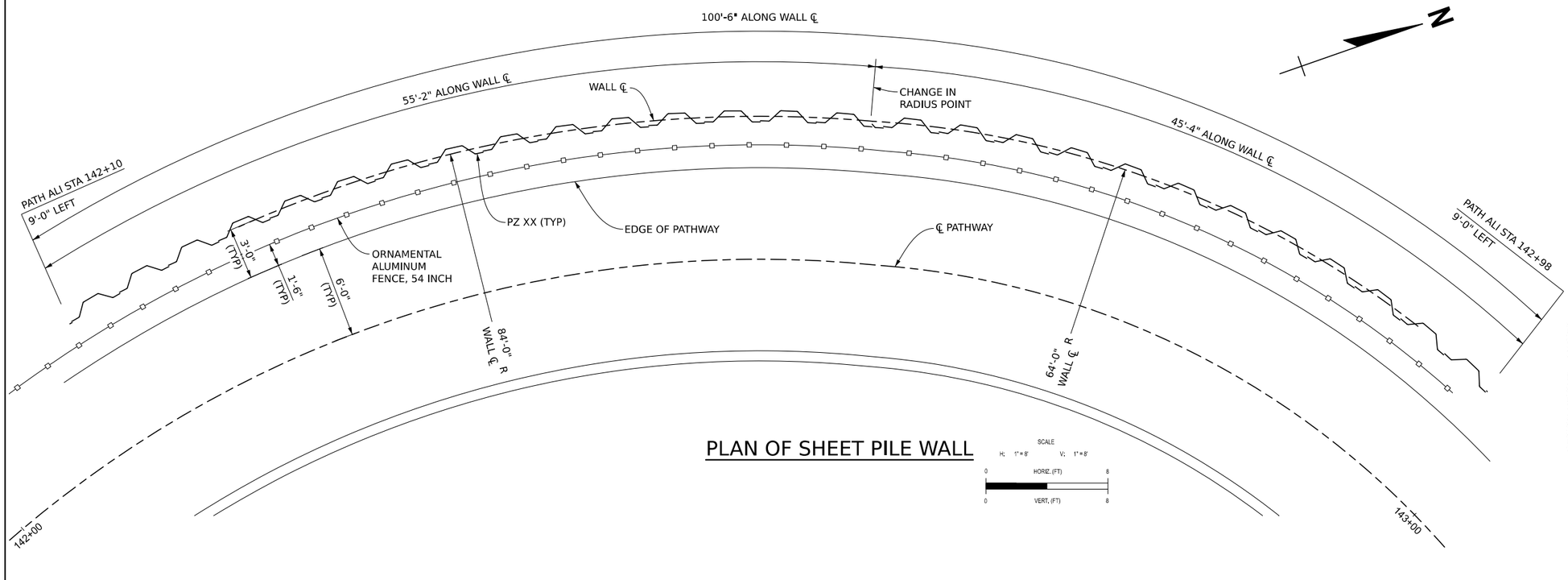
HORIZ. (FT) NONE 0
VERT. (FT) NONE 0

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

MODULAR WALL DETAILS

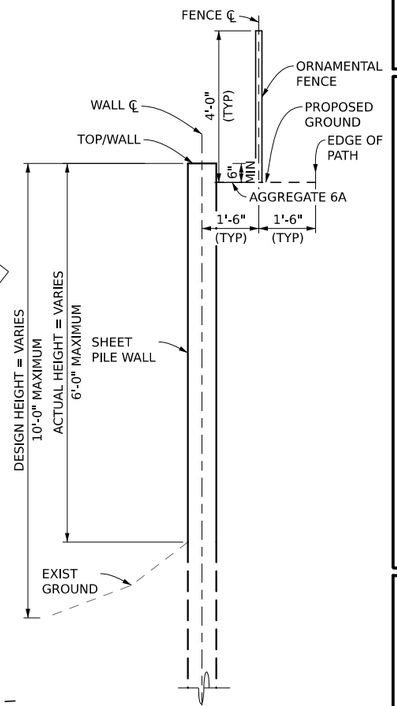
SHEET 26 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_modwall_001.dgn



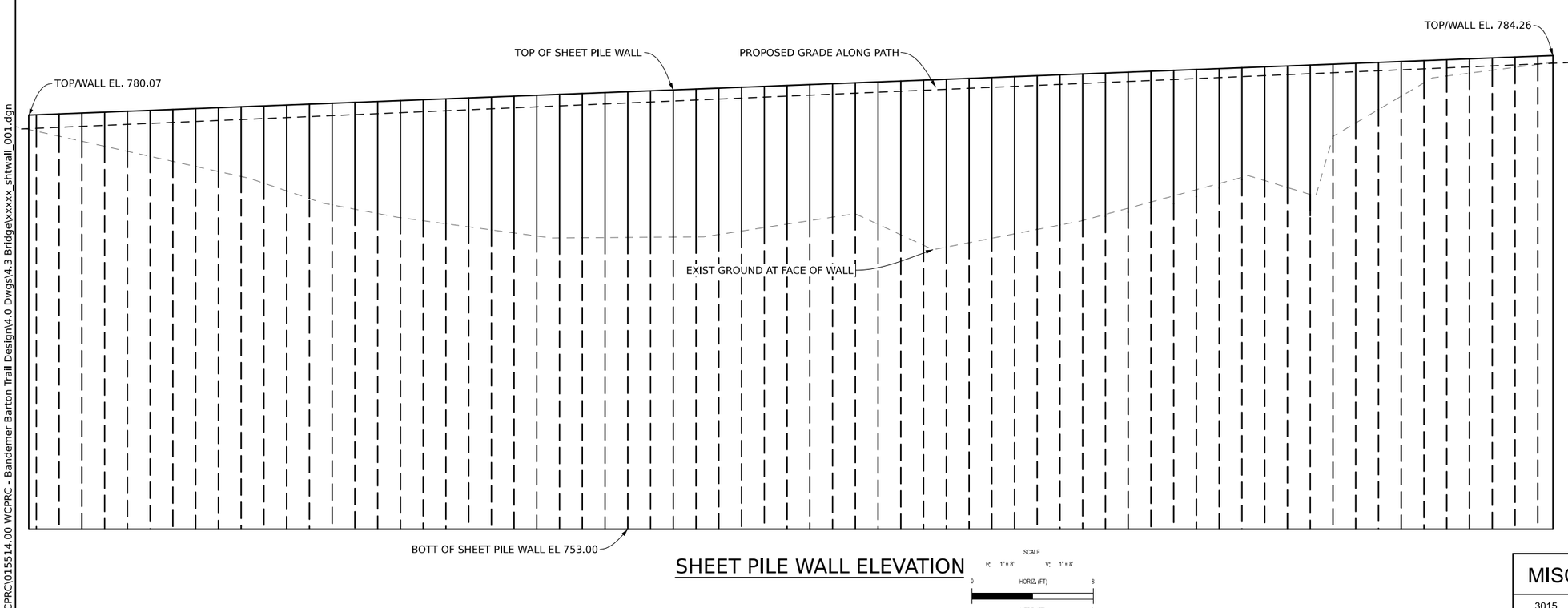
PLAN OF SHEET PILE WALL

SCALE
H: 1" = 8' V: 1" = 8'
0 HORIZ. (FT) 8
0 VERT. (FT) 8



SECTION A-A THRU SHEET PILE WALL

SCALE
H: 1" = 2' V: 1" = 2'
0 HORIZ. (FT) 2
0 VERT. (FT) 2



SHEET PILE WALL ELEVATION

SCALE
H: 1" = 8' V: 1" = 8'
0 HORIZ. (FT) 8
0 VERT. (FT) 8

MISCELLANEOUS QUANTITIES

3015	Sft	Steel Sheet Piling, Permanent

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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: AS SHOWN V: AS SHOWN
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

NONE
HORIZ. (FT) 0
NONE
VERT. (FT) 0

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

SHEET PILE WALL DETAILS

SHEET 27 of 80

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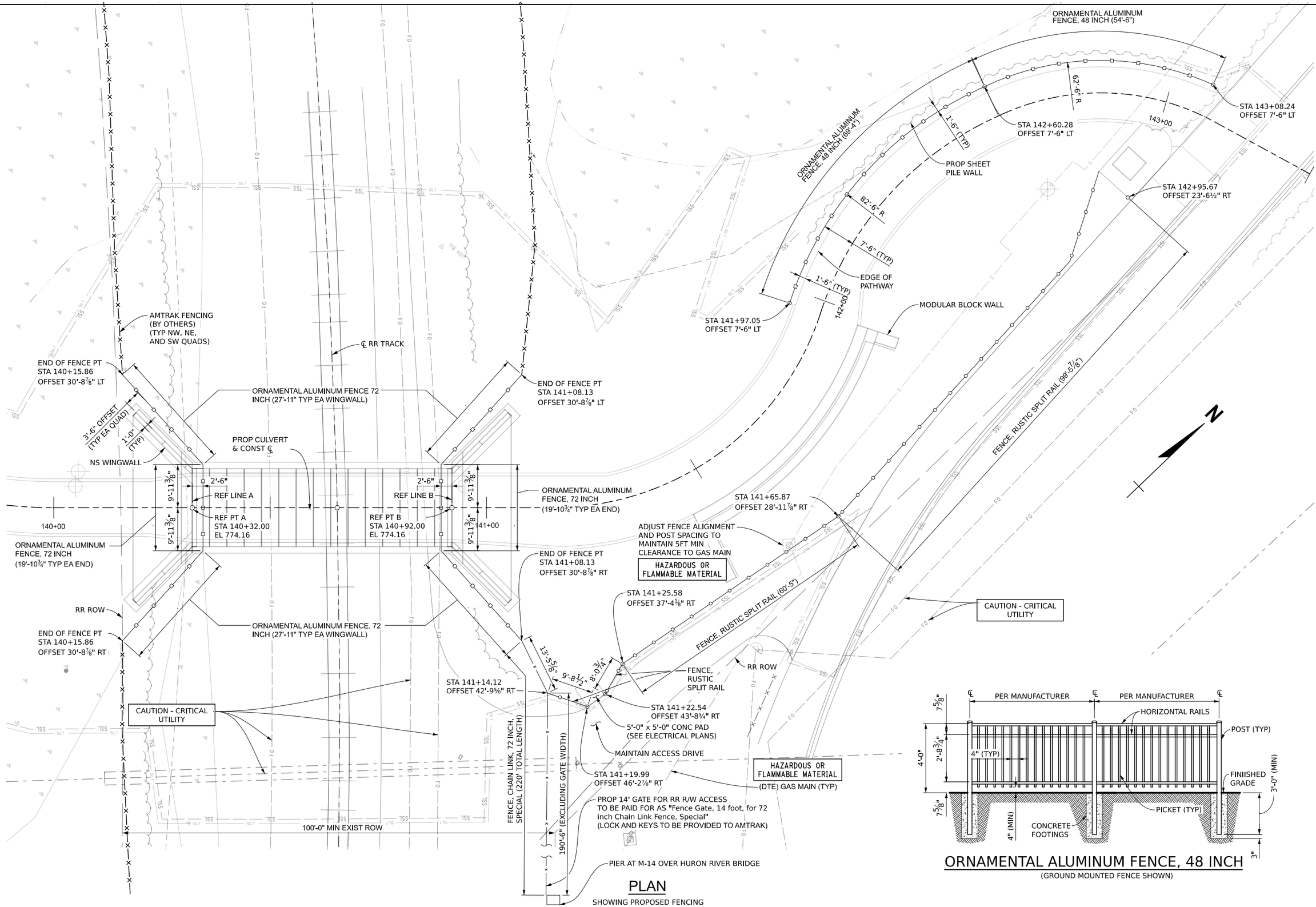

PLAN

SHOWING PROPOSED FENCING

ORNAMENTAL ALUMINUM FENCE, 48 INCH

(GROUND MOUNTED FENCE SHOWN)

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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" = 30' V: 1" = 30'
HORIZ DATUM NAD83
VERT DATUM NAVD88

HORIZ. (FT) 0 30
VERT. (FT) 0 30

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

FENCING PLAN

SHEET 28 of 80

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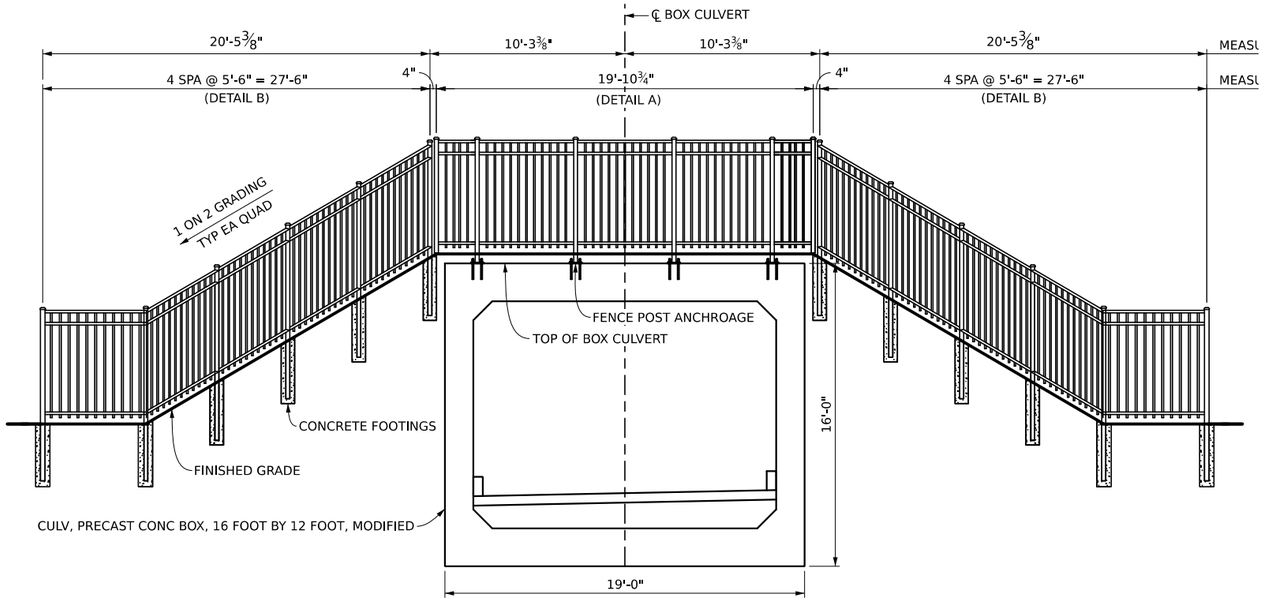
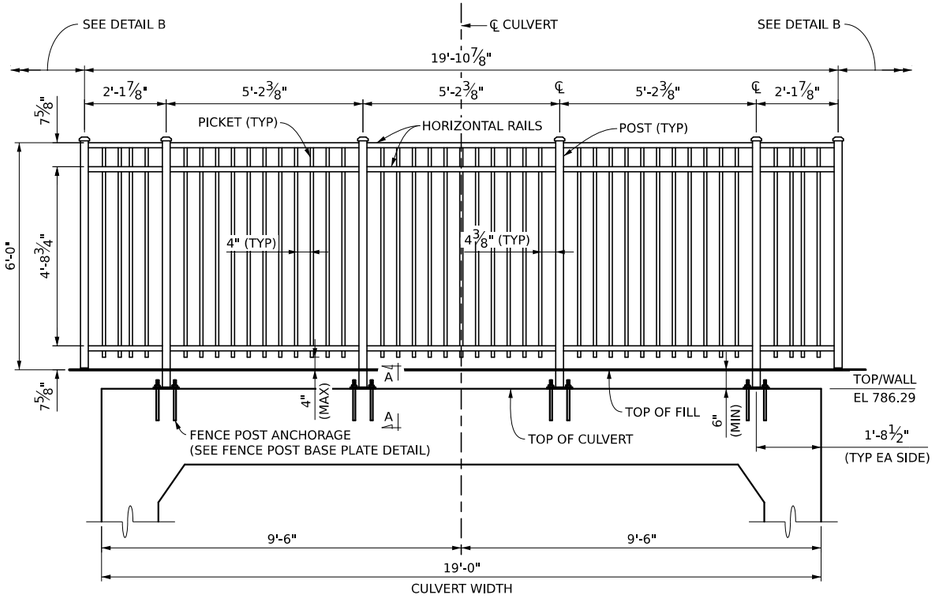


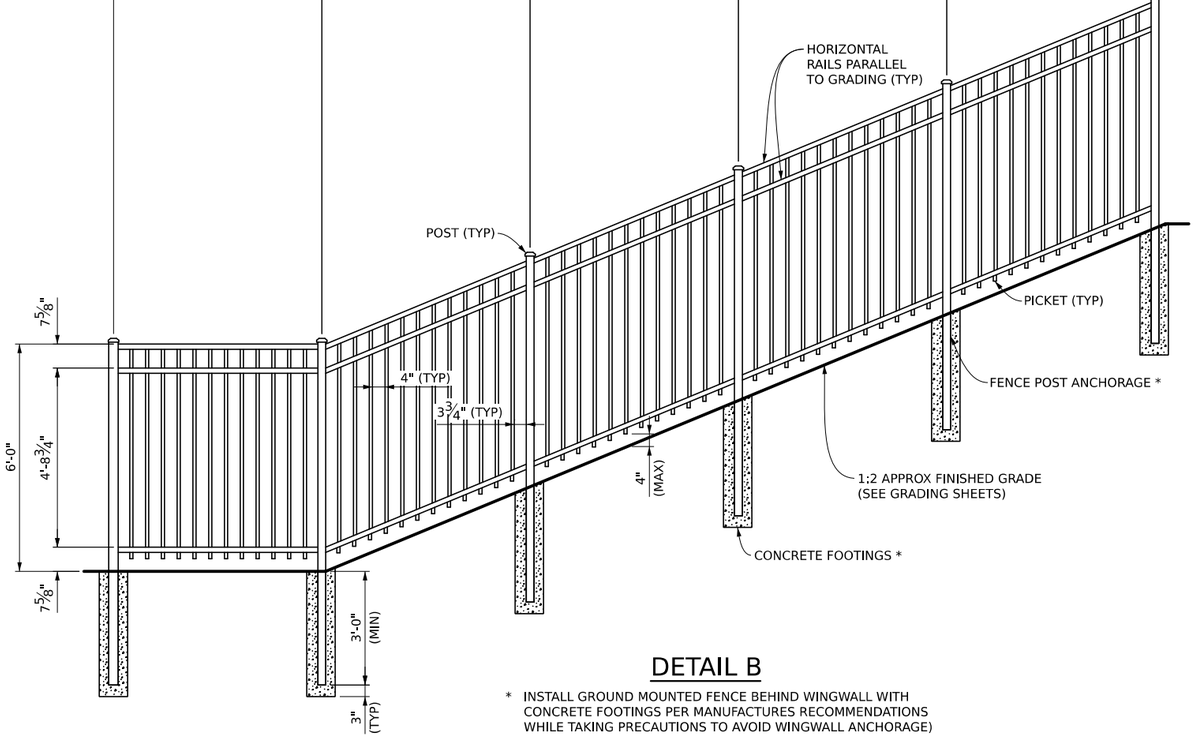
ORNAMENTAL ALUMINUM FENCE, 72 INCH

(TYPICAL EA END OF CULVERT)



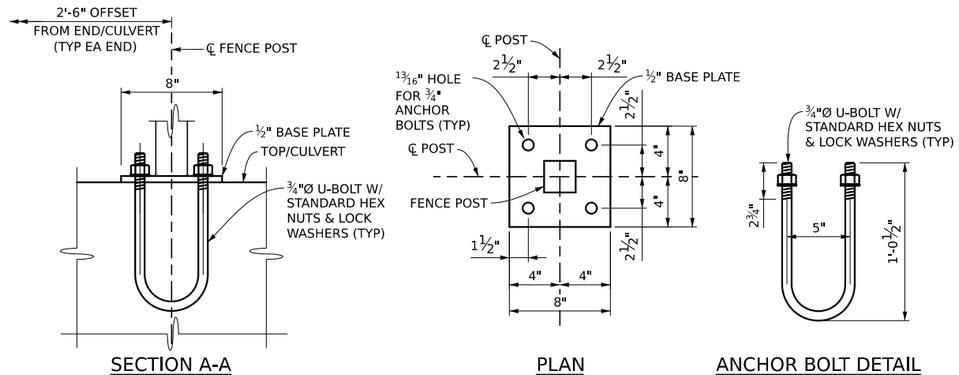
DETAIL A

(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.

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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" = 30' V: 1" = 30'
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

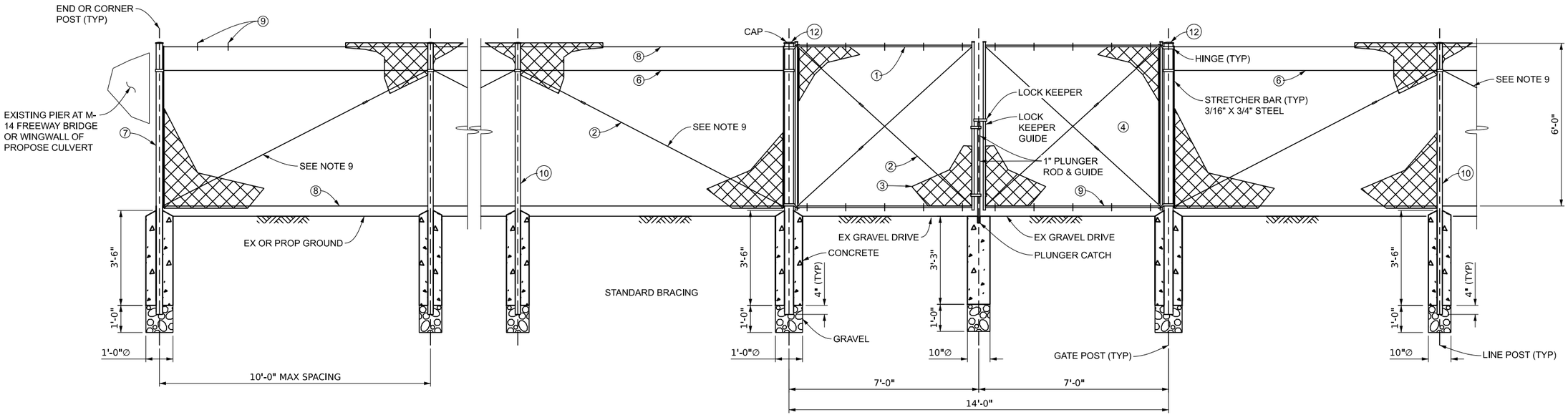
HORIZ. (FT) 0 30 VERT. (FT) 0 30

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

FENCE DETAILS

SHEET 29 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_fence_002.dgn



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

FROM NEW CULVERT WINGWALL TO M-14 FREEWAY BRIDGE PIER

MISCELLANEOUS QUANTITIES		
291	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 #/LF.
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 #/LF.
11. SINGLE-GATE POSTS - 3" O.D. PIPE AT 5.79 #/LF.
12. DOUBLE-GATE POSTS - 4" O.D. PIPE AT 9.1 #/LF.

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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REVISIONS

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PRO. NUMBER
ENG JAH
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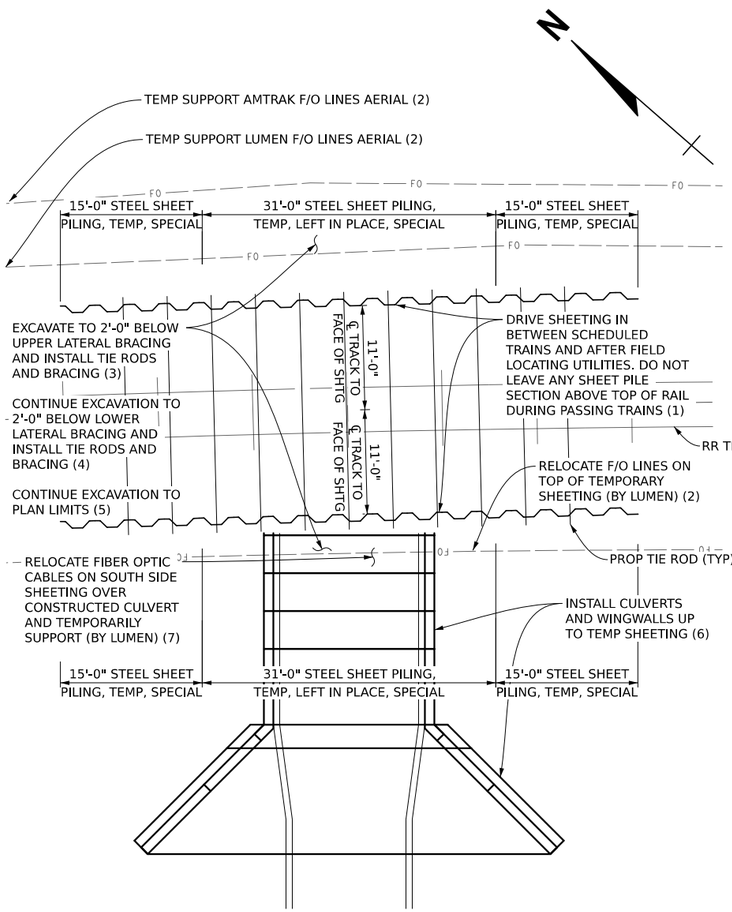
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
H: NONE
SCALE V: NONE
HORIZ DATUM NAD83
VERT DATUM NAVD88
HORIZ. (FT) 0 NONE
VERT. (FT) 0 NONE

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

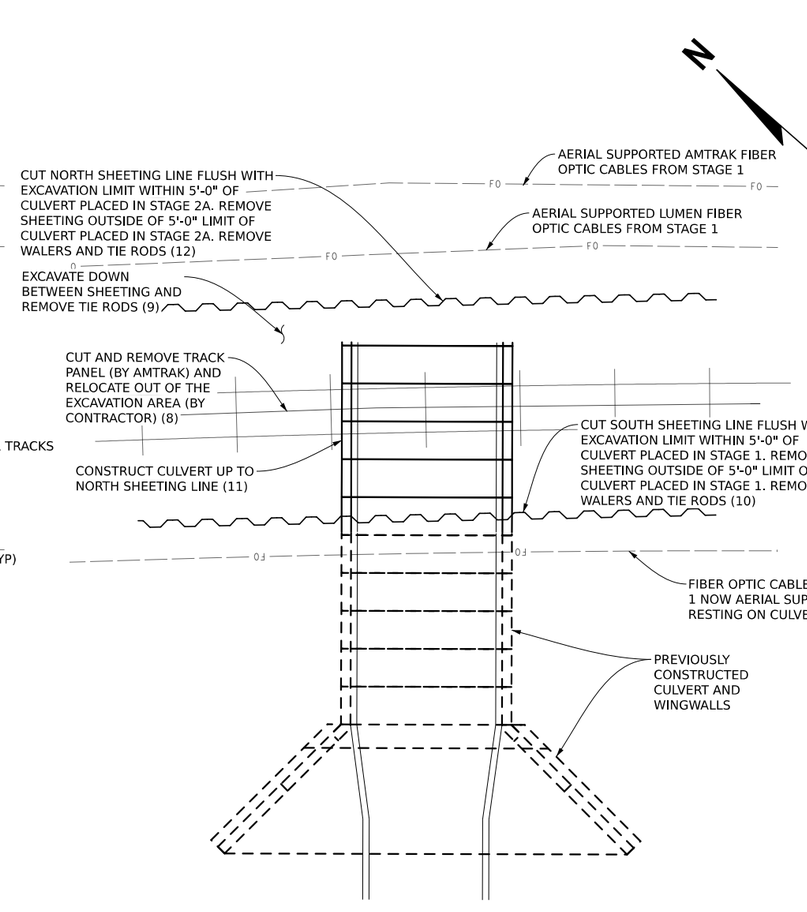
FENCE DETAILS

SHEET 30 of 80



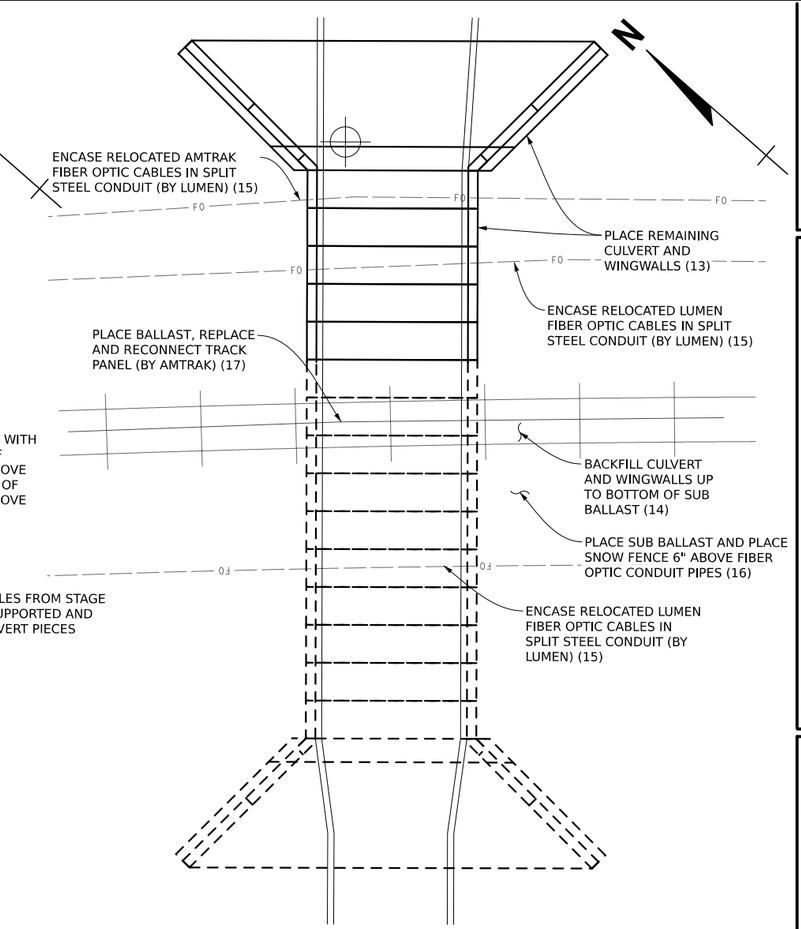
STAGE 1 - PLAN (ALTERNATIVE A)

WORK PERFORMED BETWEEN TRAINS PRIOR TO TRAIN OUTAGE



STAGE 2A (TRACK OUTAGE) - PLAN (ALTERNATIVE A)

WORKED PERFORMED DURING TRAIN OUTAGE



STAGE 2B (TRACK OUTAGE) - PLAN (ALTERNATIVE A)

WORK PERFORMED DURING TRAIN OUTAGE

MISCELLANEOUS QUANTITIES

1450	Sft	Steel Sheet Piling, Temp, Left in Place, Special
500	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.

Colliers Engineering & Design
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LANSING, MI 48917
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REVISIONS

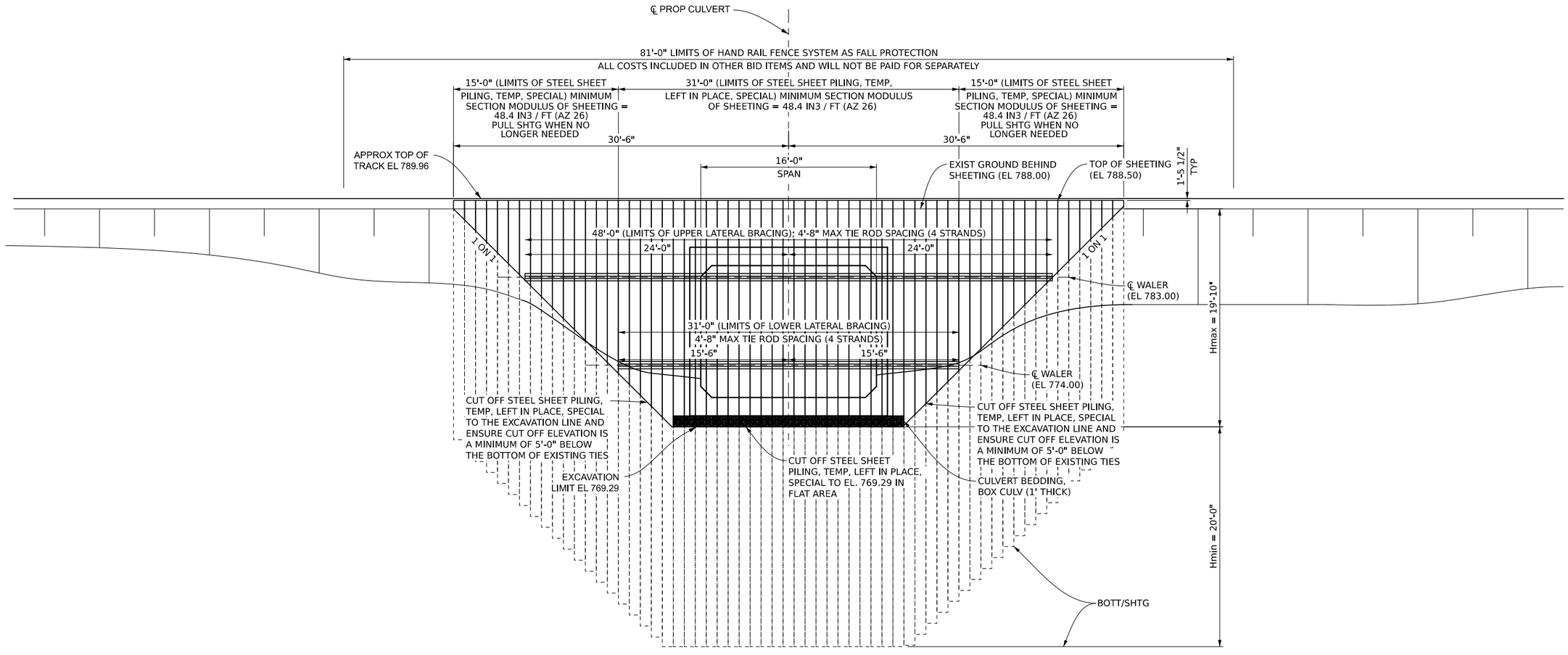
DATE 4/12/2024
PROJ NUMBER
ENG JAH
PROJ MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE H: 1" = 8' V: NONE
HORIZ DATUM NAD83
VERT DATUM NAVD88

HORIZ. (FT) 0 8 16
VERT. (FT) 0 NONE

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

SHEET 31 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_constg_001.dgn



STEEL SHEETING - ELEVATION (ALTERNATIVE A)

TYPICAL NORTH SIDE AND SOUTH SIDE SHEETING LINES

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE	PRO.NUMBER	ENG	PROJ.MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: 1" = 10' V: 1" = 1'	NAD83	NAVD88

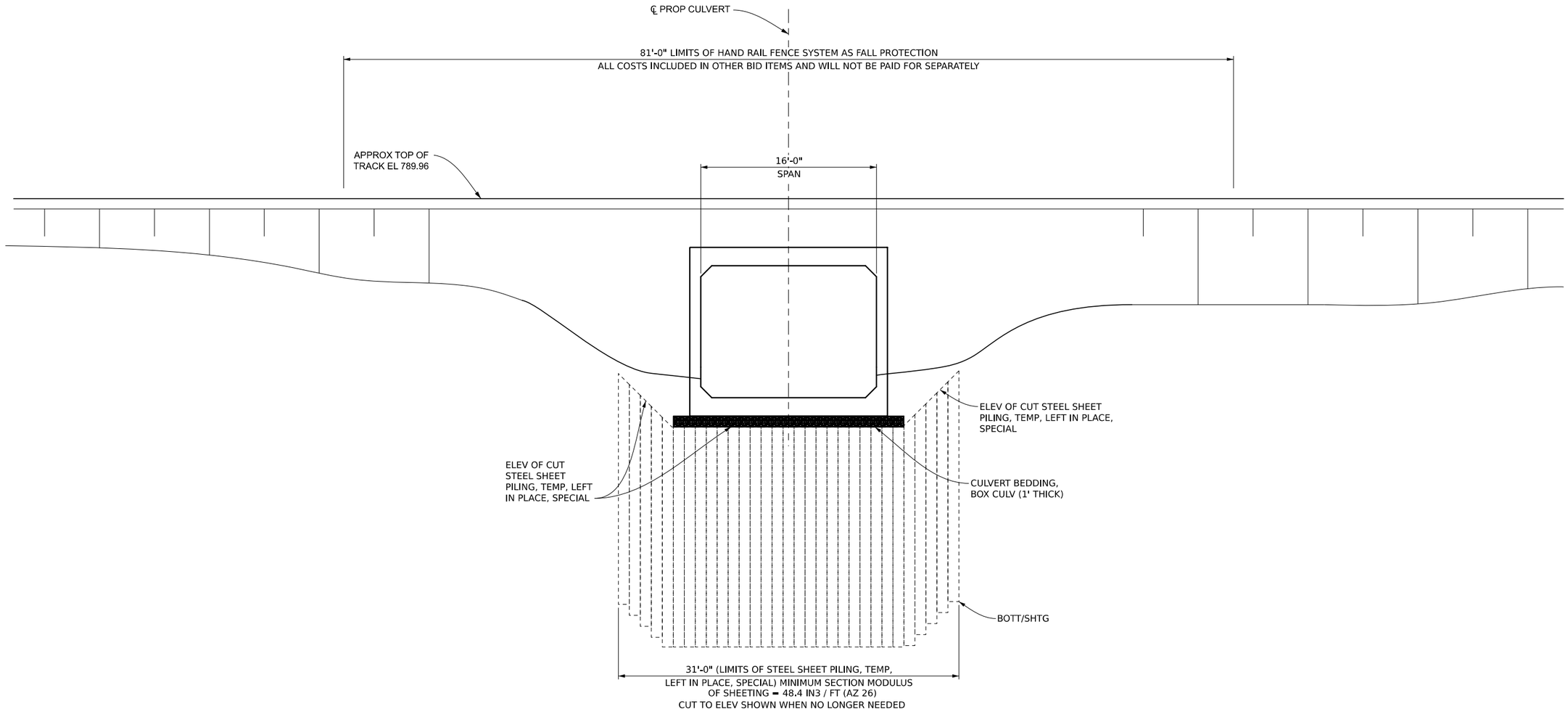
HORIZ. (FT) 0 10
VERT. (FT) 0 10

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

CONSTRUCTION STAGING DETAILS

SHEET 32 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_constg_002.dgn



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

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

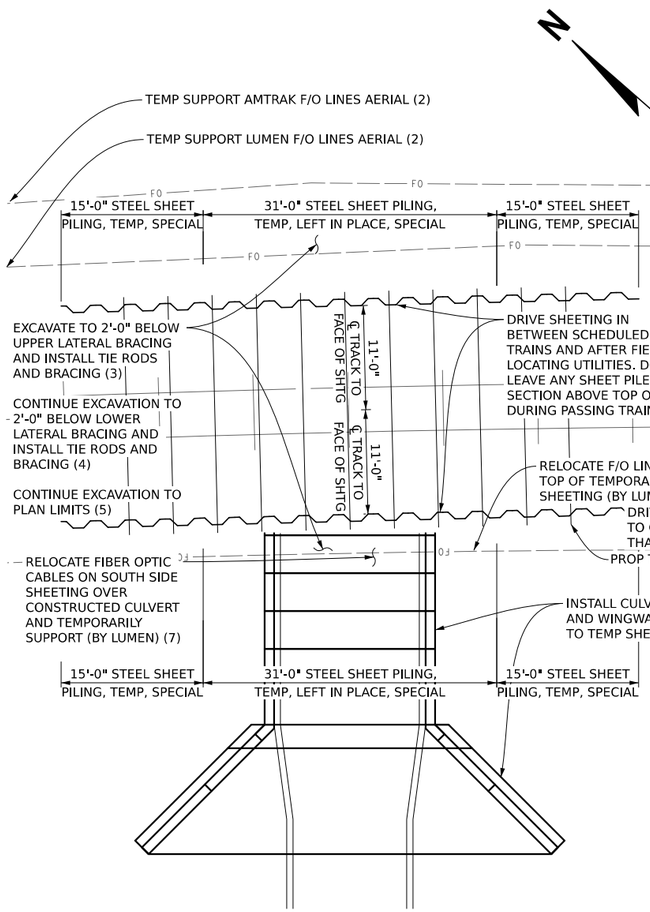
DATE 4/12/2024
PROJ NUMBER
ENG JAH
PROJ MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE H: 1" = 50' V: 1" = 10'
HORZ DATUM NAD83
VERT DATUM NAVD88

HORIZ.(FT) 0 10
VERT.(FT) 0 10

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

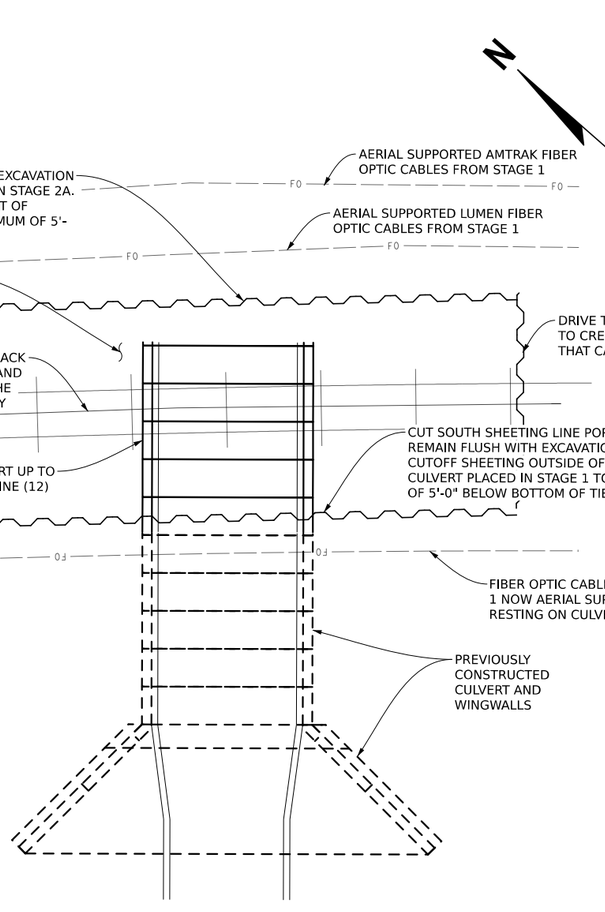
SHEET 33 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_constg_003.dgn



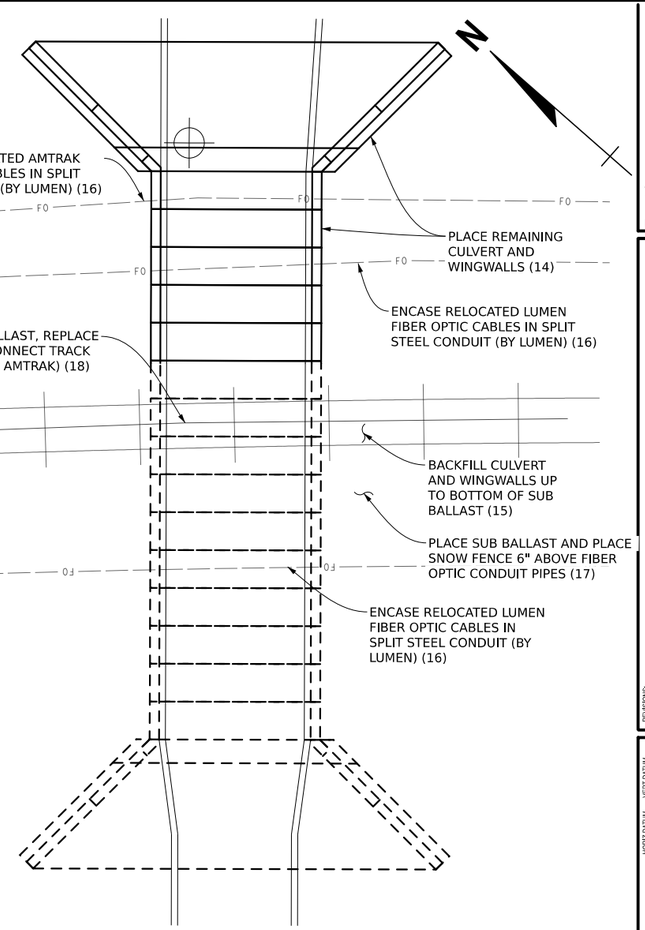
STAGE 1 - PLAN (ALTERNATIVE B)

WORK PERFORMED BETWEEN TRAINS PRIOR TO TRAIN OUTAGE



STAGE 2A (TRACK OUTAGE) - PLAN (ALTERNATIVE B)

WORKED 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.

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

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" = 8' V: NONE
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

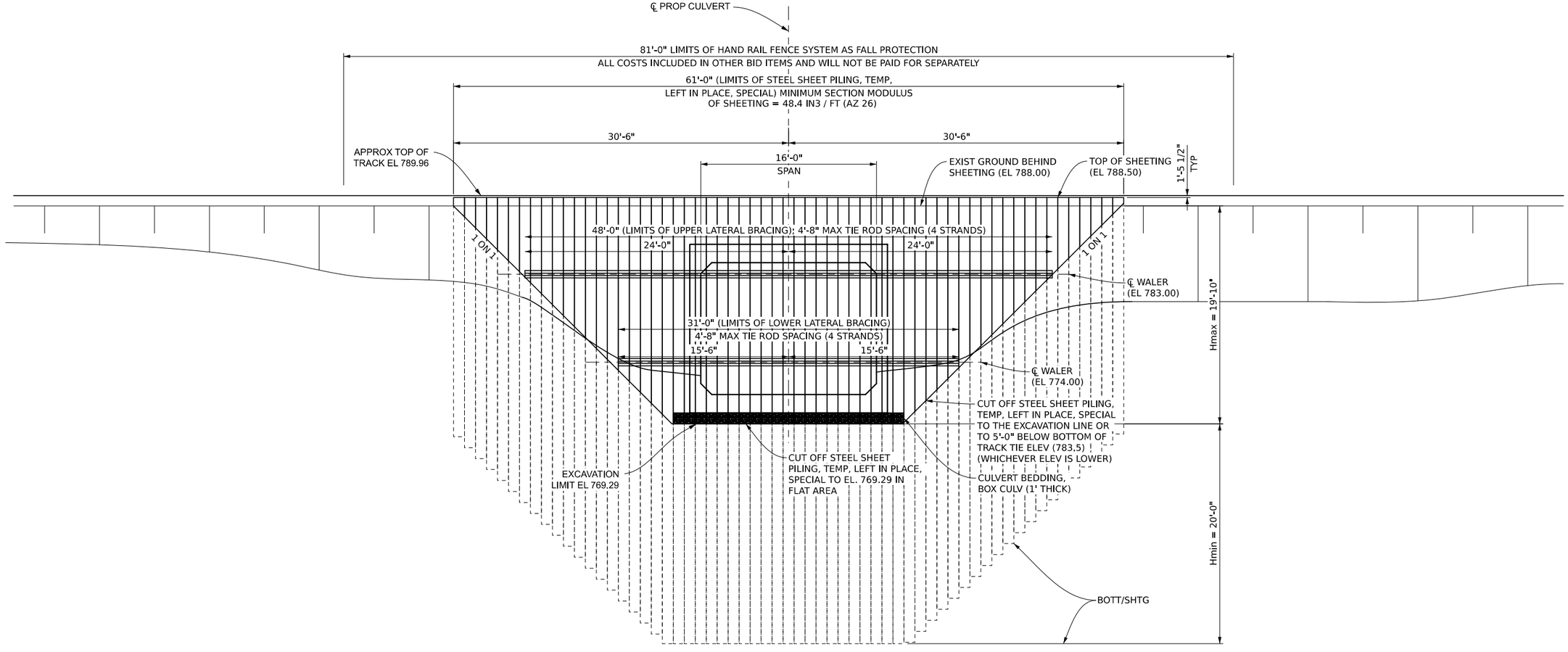
HORIZ. (FT) 0 8 — VERT. (FT) 0 NONE

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

CONSTRUCTION STAGING DETAILS

SHEET 34 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_constg_004.dgn



STEEL SHEETING - ELEVATION (ALTERNATIVE B)

TYPICAL NORTH SIDE AND SOUTH SIDE SHEETING LINES

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

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'
HORIZ DATUM NAD83
VERT DATUM NAVD88

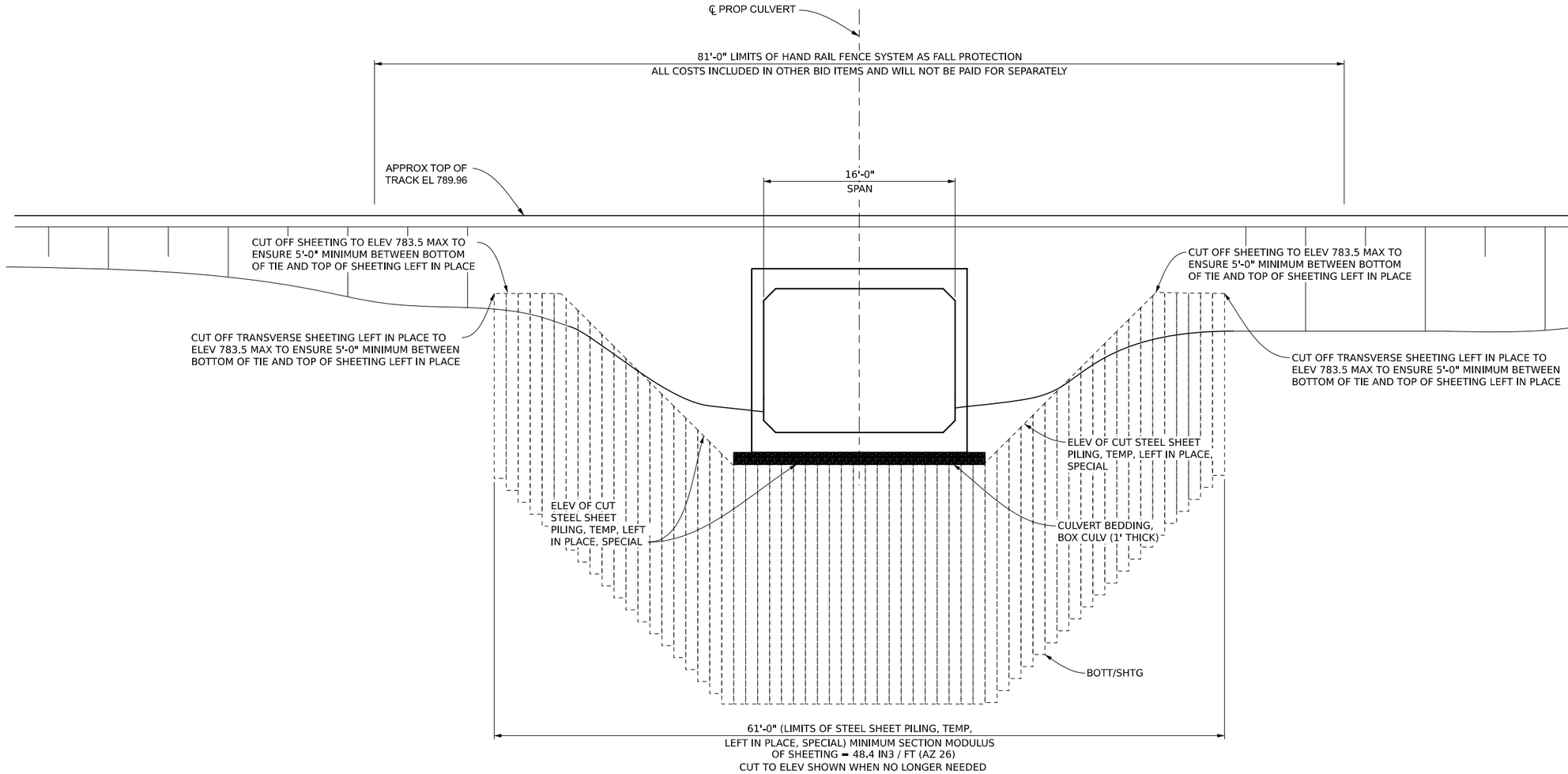
HORIZ. (FT) 0 10
VERT. (FT) 0 10

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

CONSTRUCTION STAGING DETAILS

SHEET 35 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_constg_005.dgn



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

Colliers Engineering & Design
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REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: 1" = 10' V: 1" = 10'	NAD83 VERT DATUM NAVD88

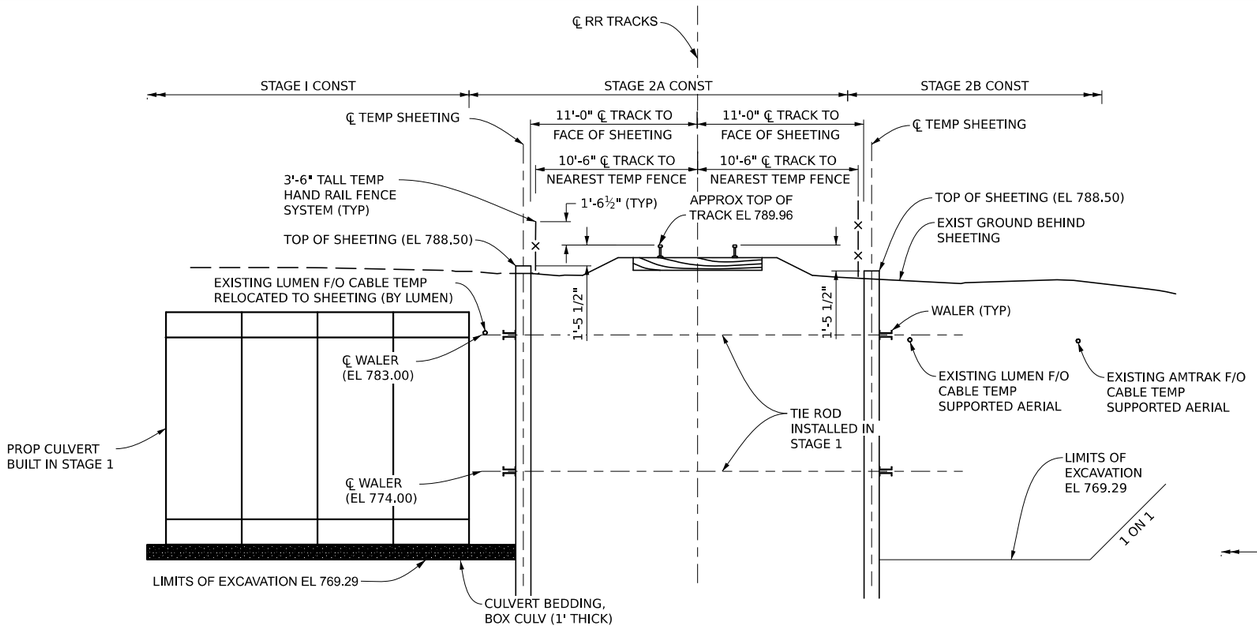
HORIZ. (FT) 0 10
VERT. (FT) 0 10

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

CONSTRUCTION STAGING DETAILS

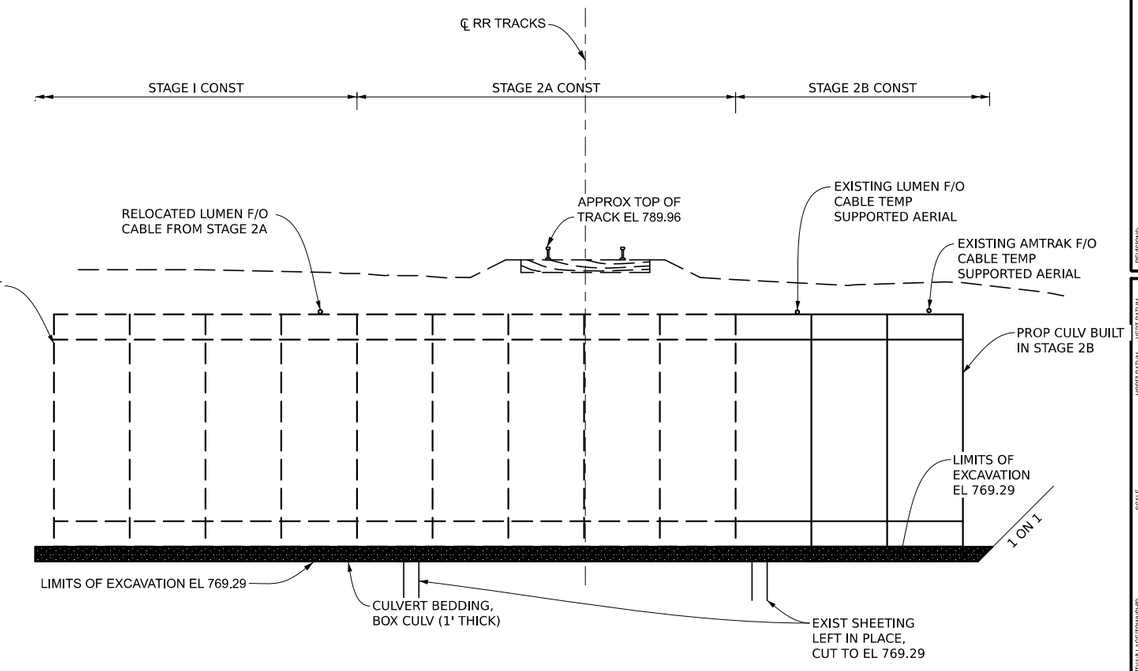
SHEET 36 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_constg_006.dgn



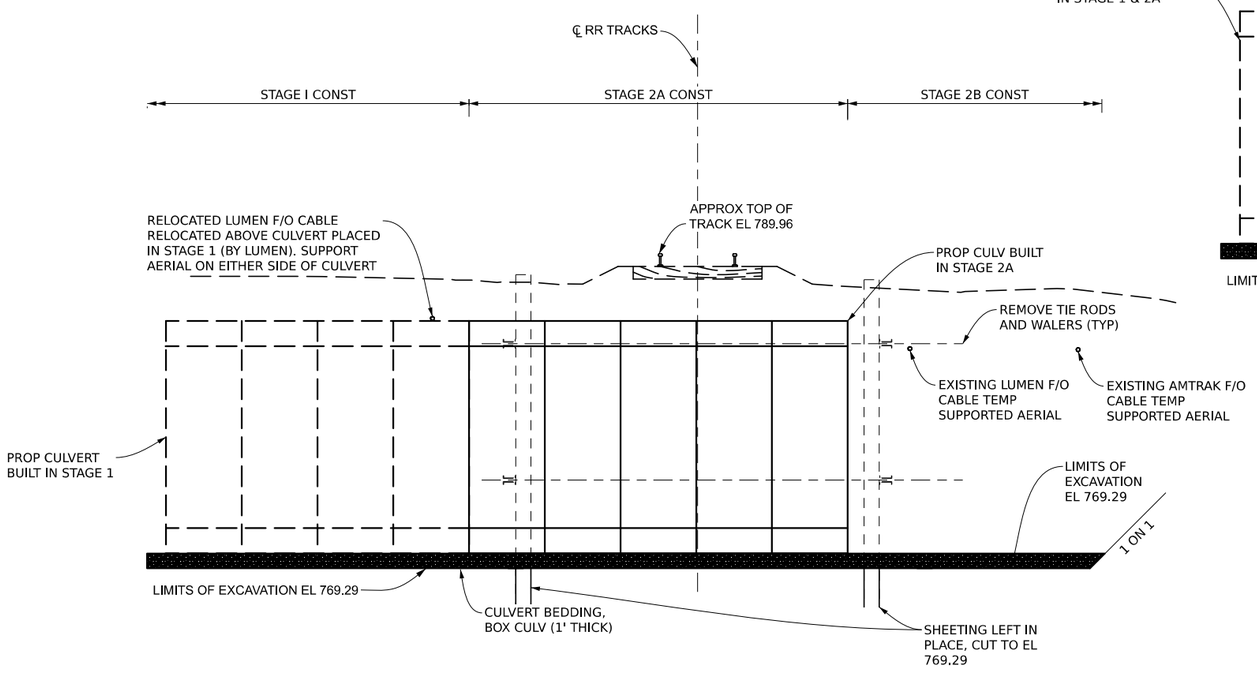
SECTION THRU RR TRACKS - STAGE 1

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

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LANSING, MI 48917
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REVISIONS

DATE	4/12/2024
PRO NUMBER	015514.00
ENG	JAH
PROJ MGR	JAH
CADD	JAH
COUNTY	WASHTENAW
CITY/VILLAGE/TOWNSHIP	CITY OF ANN ARBOR
SCALE	V: 1" = 10' H: 1" = 10'
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

HORIZ. (FT) 0 10
VERT. (FT) 0 10

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

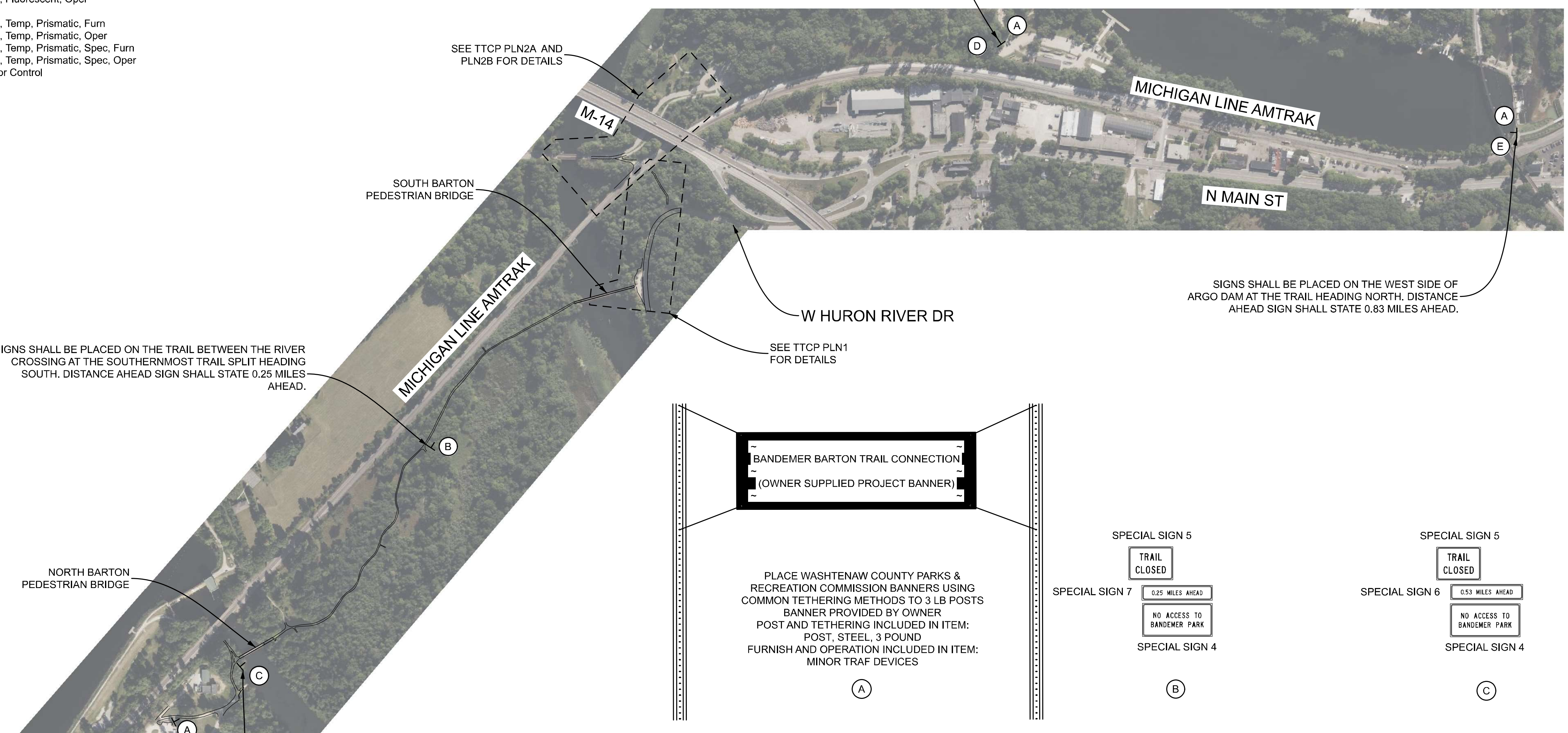
CONSTRUCTION STAGING DETAILS

SHEET 37 of 80

O:\WCPRC\015514.00 WCPRC - 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

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.

NORTH BARTON PEDESTRIAN BRIDGE

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

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

(A)

SPECIAL SIGN 5: TRAIL CLOSED
SPECIAL SIGN 7: 0.25 MILES AHEAD
SPECIAL SIGN 4: NO ACCESS TO BANDEMER PARK

(B)

SPECIAL SIGN 5: TRAIL CLOSED
SPECIAL SIGN 6: 0.53 MILES AHEAD
SPECIAL SIGN 4: NO ACCESS TO BANDEMER PARK

(C)

SPECIAL SIGN 5: TRAIL CLOSED
SPECIAL SIGN 9: 0.29 MILES AHEAD
SPECIAL SIGN 2: NO ACCESS TO HURON RIVER DR

(D)

SPECIAL SIGN 5: TRAIL CLOSED
SPECIAL SIGN 8: 0.83 MILES AHEAD
SPECIAL SIGN 2: NO ACCESS TO HURON RIVER DR

(E)

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.

Colliers Engineering & Design
7050 W. SAGINAW HWY, SUITE 200
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HORZ. (FT) 0 600

REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
04/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: 600 V: N/A	NAD83	NAVD88

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

TRAFFIC CONTROL DETAILS

SHEET

SPECIAL SIGN 5: TRAIL CLOSED

PLACE TYPE II PEDESTRIAN BARRICADES TO COMPLETELY CLOSE THE TRAIL

(A)

SPECIAL SIGN 4: NO ACCESS TO BANDEMER PARK

R5-6 (18") | R9-3 (18")

(B)

BANDEMER BARTON TRAIL CONNECTION

(OWNER SUPPLIED PROJECT BANNER)

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

(C)

DEPARTING SIGNING DETAIL

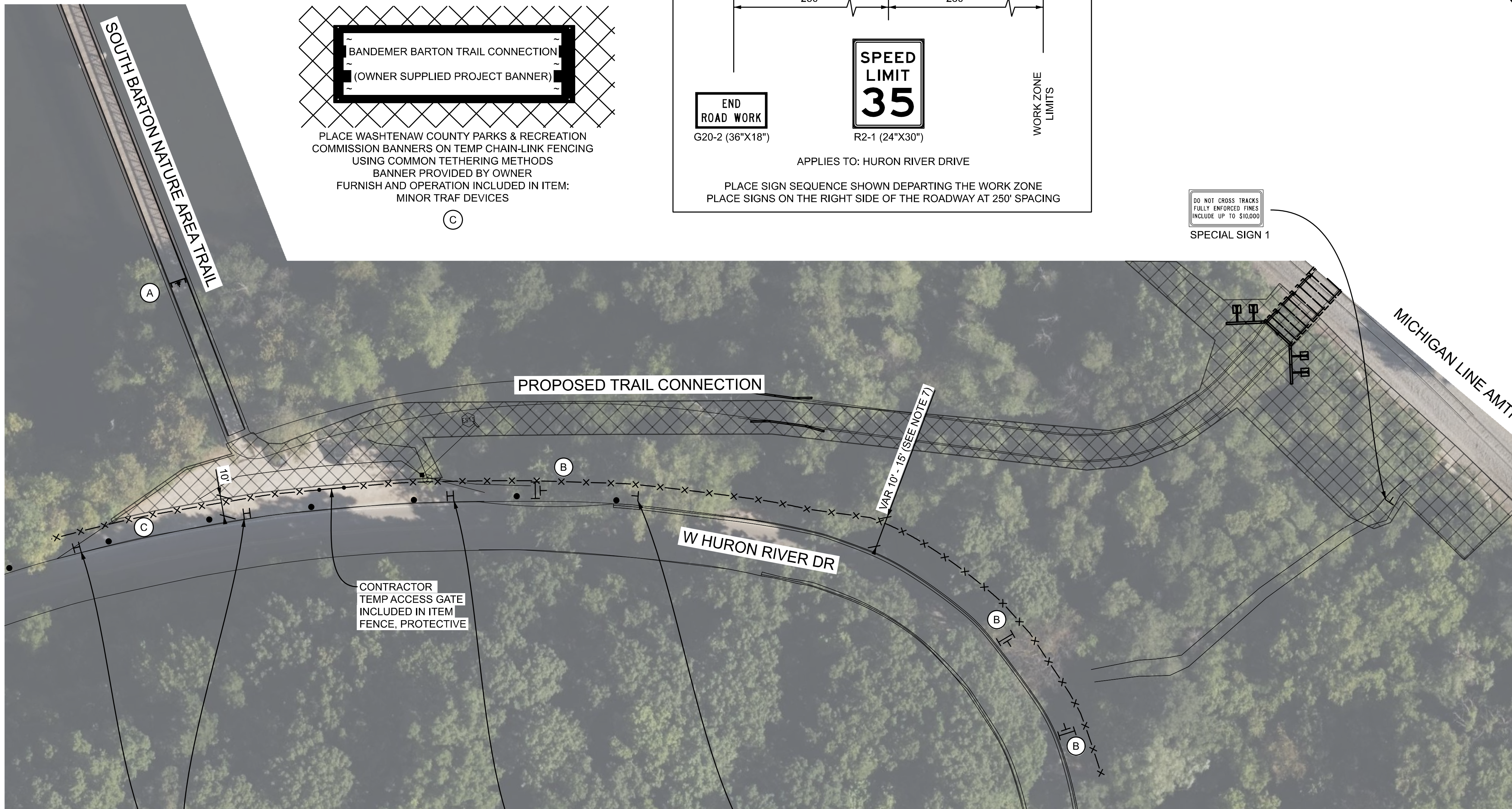
FARTHEST FROM WORK ZONE — 250' — 250' — CLOSEST TO WORK ZONE

END ROAD WORK	SPEED LIMIT 35	WORK ZONE LIMITS
G20-2 (36"X18")	R2-1 (24"X30")	

APPLIES TO: HURON RIVER DRIVE

PLACE SIGN SEQUENCE SHOWN DEPARTING THE WORK ZONE
PLACE SIGNS ON THE RIGHT SIDE OF THE ROADWAY AT 250' SPACING

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



R8-3 (18") | R8-3 (18") | R8-3 (18") | R8-3 (18")

RIGHT SHOULDER CLOSED — W21-5aR (36")

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.

TRAFFIC CONTROL DEVICE LEGEND:

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

ADVANCED SIGNING DETAIL

FARTHEST FROM WORK ZONE — 250' — 250' — 250' — 250' — CLOSEST TO WORK ZONE

ROAD WORK AHEAD	TRUCKS ENTERING & EXITING ROADWAY	INJURE / KILL A WORKER $ 7500 + 15 YEARS	WORK ZONE BEGINS	WORK ZONE LIMITS
W20-1 (36")	W20-16 (36")	R5-18b	R5-18c	

APPLIES TO: HURON RIVER DRIVE

PLACE SIGN SEQUENCE SHOWN PRIOR TO WORK ZONE
PLACE SIGNS ON THE RIGHT SIDE SIDE OF THE ROADWAY AT 250' SPACING

Colliers Engineering & Design
7050 W. SAGINAW HWY, SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: 60 V: N/A	NAD83	NAVD88

0 — 60 HORZ. (FT)

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

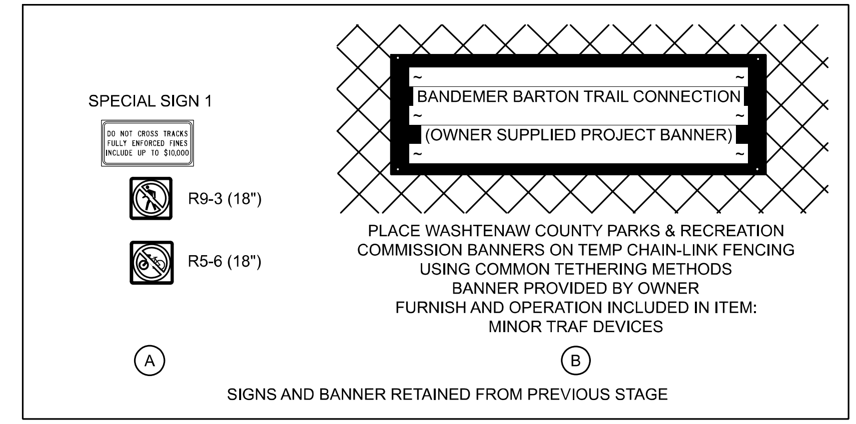
TRAFFIC CONTROL DETAILS

NOTES:

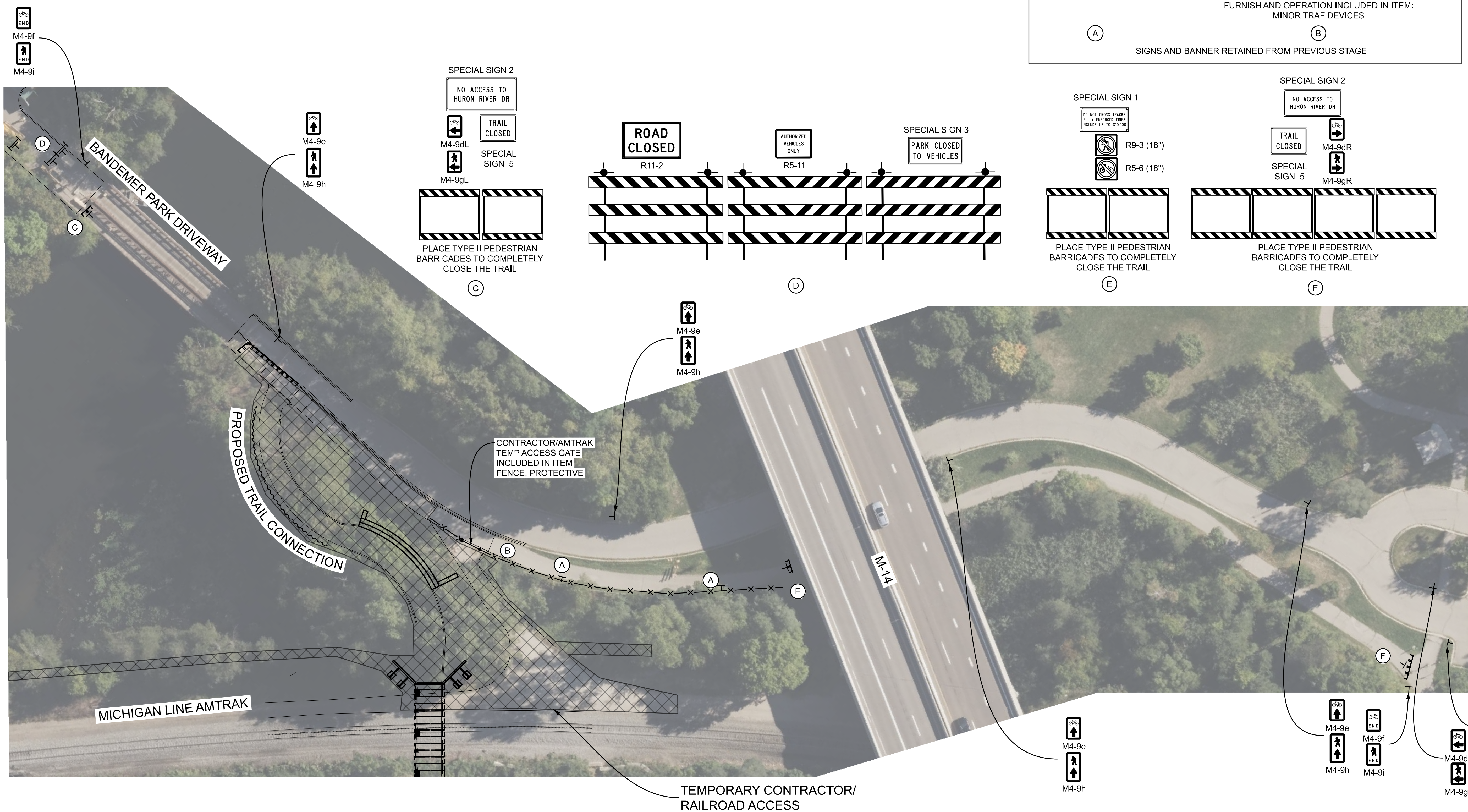
1. THE BANDEMER PARK BRIDGE SHALL BE CLOSED TO VEHICLE TRAFFIC DURING PATHWAY CONSTRUCTION IMPACTING EXISTING PAVED TRAIL. SPECIAL CONSIDERATION WILL ONLY BE MADE FOR AUTHORIZED VEHICLES AND CONTRACTOR ACCESS.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS PRIOR TO FABRICATION 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

TRAFFIC CONTROL DEVICE LEGEND:

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



SPECIAL SIGN 1
DO NOT CROSS TRACKS FULLY ENFORCED FINES INCLUDE UP TO $10,000
R9-3 (18")
R5-6 (18")
A
BANDEMER BARTON TRAIL CONNECTION
(OWNER SUPPLIED PROJECT BANNER)
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
B
SIGNS AND BANNER RETAINED FROM PREVIOUS STAGE



M4-9f
M4-9i
SPECIAL SIGN 2
NO ACCESS TO HURON RIVER DR
M4-9dL
M4-9gL
TRAIL CLOSED
SPECIAL SIGN 5
PLACE TYPE II PEDESTRIAN BARRICADES TO COMPLETELY CLOSE THE TRAIL
C
ROAD CLOSED
R11-2
AUTHORIZED VEHICLES ONLY
R5-11
SPECIAL SIGN 3
PARK CLOSED TO VEHICLES
D
SPECIAL SIGN 1
DO NOT CROSS TRACKS FULLY ENFORCED FINES INCLUDE UP TO $10,000
R9-3 (18")
R5-6 (18")
PLACE TYPE II PEDESTRIAN BARRICADES TO COMPLETELY CLOSE THE TRAIL
E
SPECIAL SIGN 2
NO ACCESS TO HURON RIVER DR
TRAIL CLOSED
SPECIAL SIGN 5
M4-9dR
M4-9gR
PLACE TYPE II PEDESTRIAN BARRICADES TO COMPLETELY CLOSE THE TRAIL
F
M4-9e
M4-9h
BANDEMER PARK DRIVEWAY
PROPOSED TRAIL CONNECTION
CONTRACTOR/AMTRAK TEMP ACCESS GATE INCLUDED IN ITEM FENCE, PROTECTIVE
M-14
MICHIGAN LINE AMTRAK
TEMPORARY CONTRACTOR/ RAILROAD ACCESS
BANDEMER PARK
M4-9dR
M4-9dL
M4-9gR
M4-9gL
HORZ. (FT)
0
60

MICHIGAN LINE AMTRAK

Colliers Engineering & Design
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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

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

R9-3 (18")

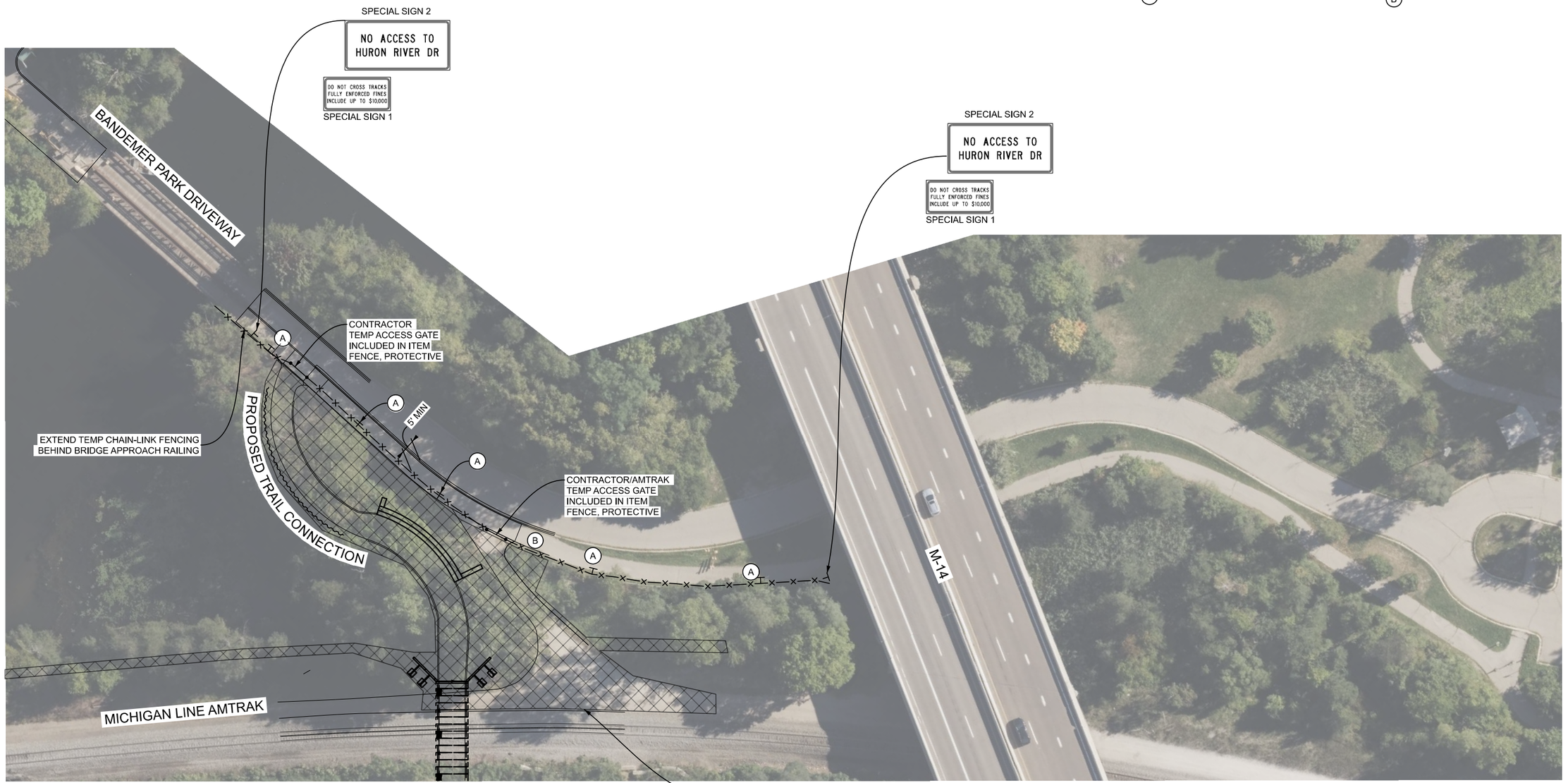
R5-6 (18")

(A)

BANDEMER BARTON TRAIL CONNECTION
(OWNER SUPPLIED PROJECT BANNER)

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

(B)



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REVISIONS:

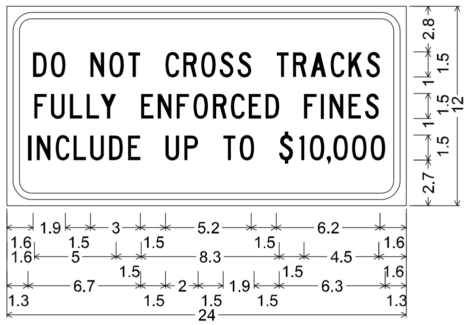
HORZ. (FT) 0 60

HORZ DATUM	NAD83
VERT DATUM	NAVD88
SCALE	N/A
H/BI	
CITY/VILLAGE/TOWNSHIP	CITY OF ANN ARBOR
COUNTY	WASHTENAW
CADD	JAH
PROJ MGR	JAH
ENG	JAH
PROJ NUMBER	
DATE	4/22/2024
SHEET	

BANDEMER PARK

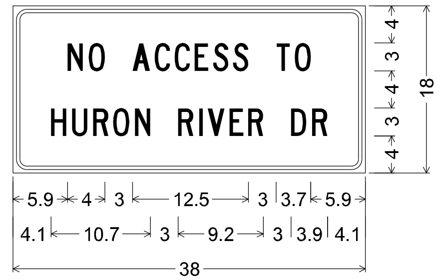
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

TRAFFIC CONTROL DETAILS



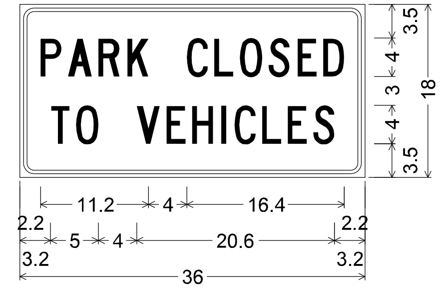
1.5" Radius, 0.4" Border, 0.4" Indent, Black on White;
"DO NOT CROSS TRACKS", C;
"FULLY ENFORCED FINES", C;
"INCLUDE UP TO $10,000", C;

SPECIAL SIGN 1



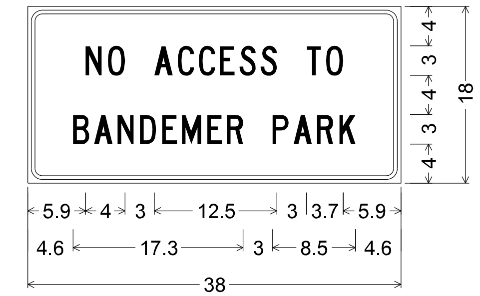
1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;
"NO ACCESS TO", C;
"HURON RIVER DR", C;

SPECIAL SIGN 2



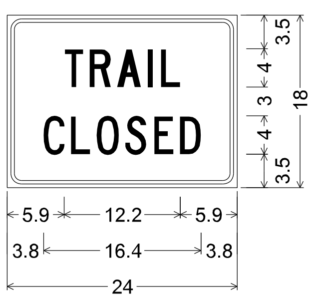
1.5" Radius, 0.4" Border, 0.4" Indent, Black on White;
"PARK CLOSED", C;
"TO VEHICLES", C;

SPECIAL SIGN 3



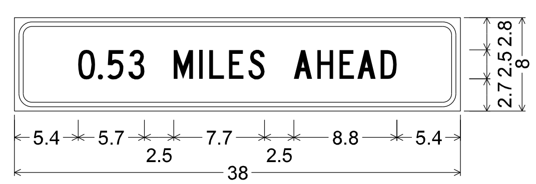
1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;
"NO ACCESS TO", C;
"BANDEMER PARK", C;

SPECIAL SIGN 4



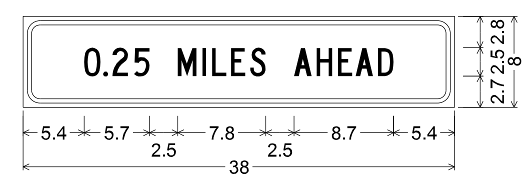
SPECIAL SIGN 06;
1.5" Radius, 0.4" Border, 0.4" Indent, Black on Orange;
"TRAIL", C;
"CLOSED", C;

SPECIAL SIGN 5



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

SPECIAL SIGN 6



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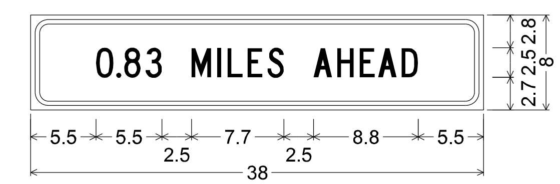
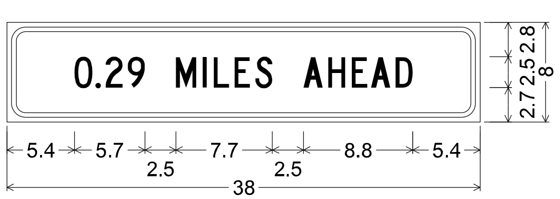
"0.25", C; "MILES", C; "AHEAD", C;

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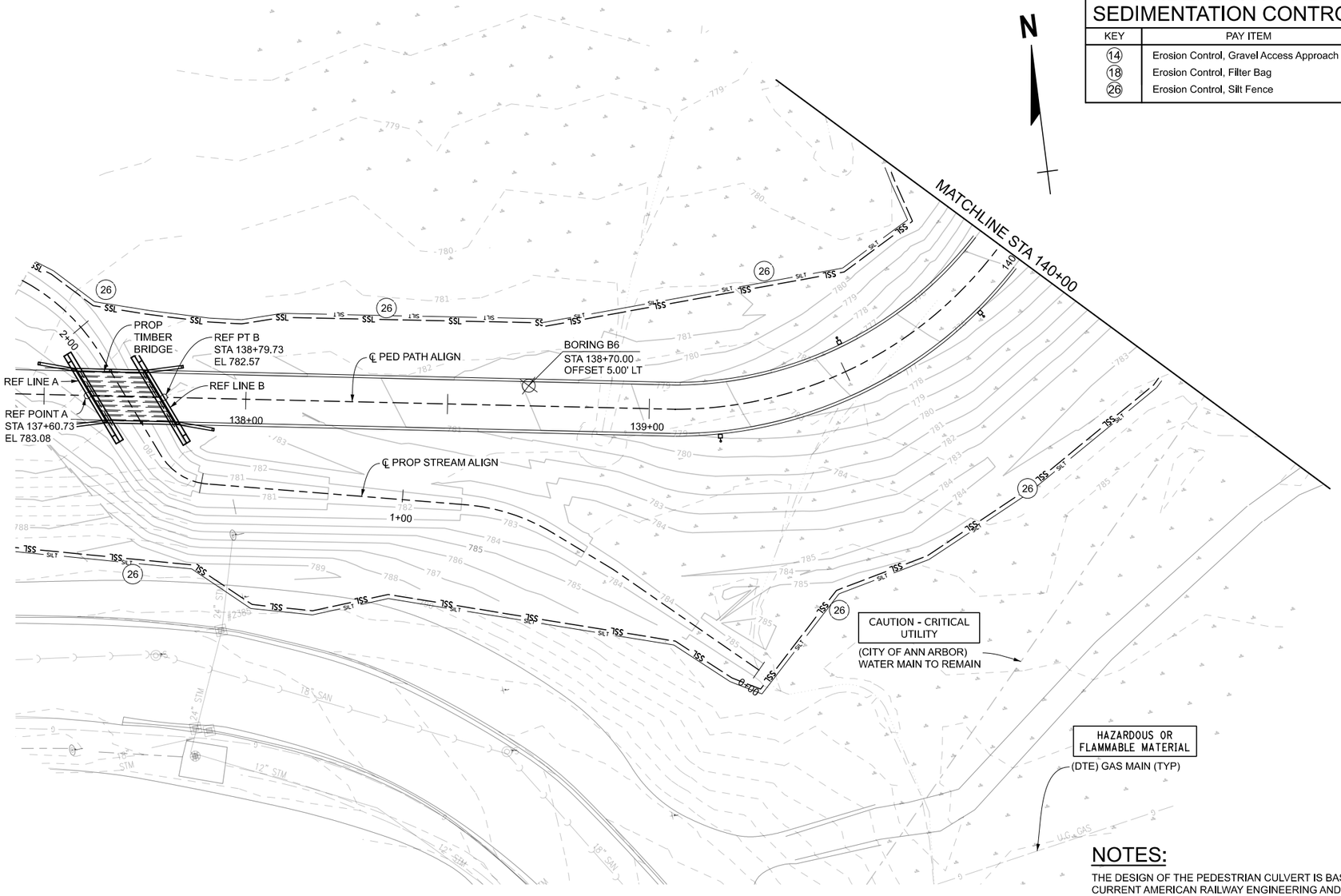
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

TRAFFIC CONTROL DETAILS



PLAN

SHOWING EXISTING AND PROPOSED TOPOGRAPHY

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
5800	Cyd	Non Haz Contaminated Material Handling and Disposal, LM
5050	Cyd	Backfill, Structure, CIP
5800	Cyd	Excavation, Fdn
1	LSUM	Dewatering System, Excavation
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

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 ACCOMODATE 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 ½ MILE TO THE SOUTHEAST. USE OF THE R/W MUST BE COORDINATED WITH AMTRAK, REQUIRES FLAGGING, AND MAY HAVE RESTRICTIONS BASED ON AMTRAK OPERATIONS.

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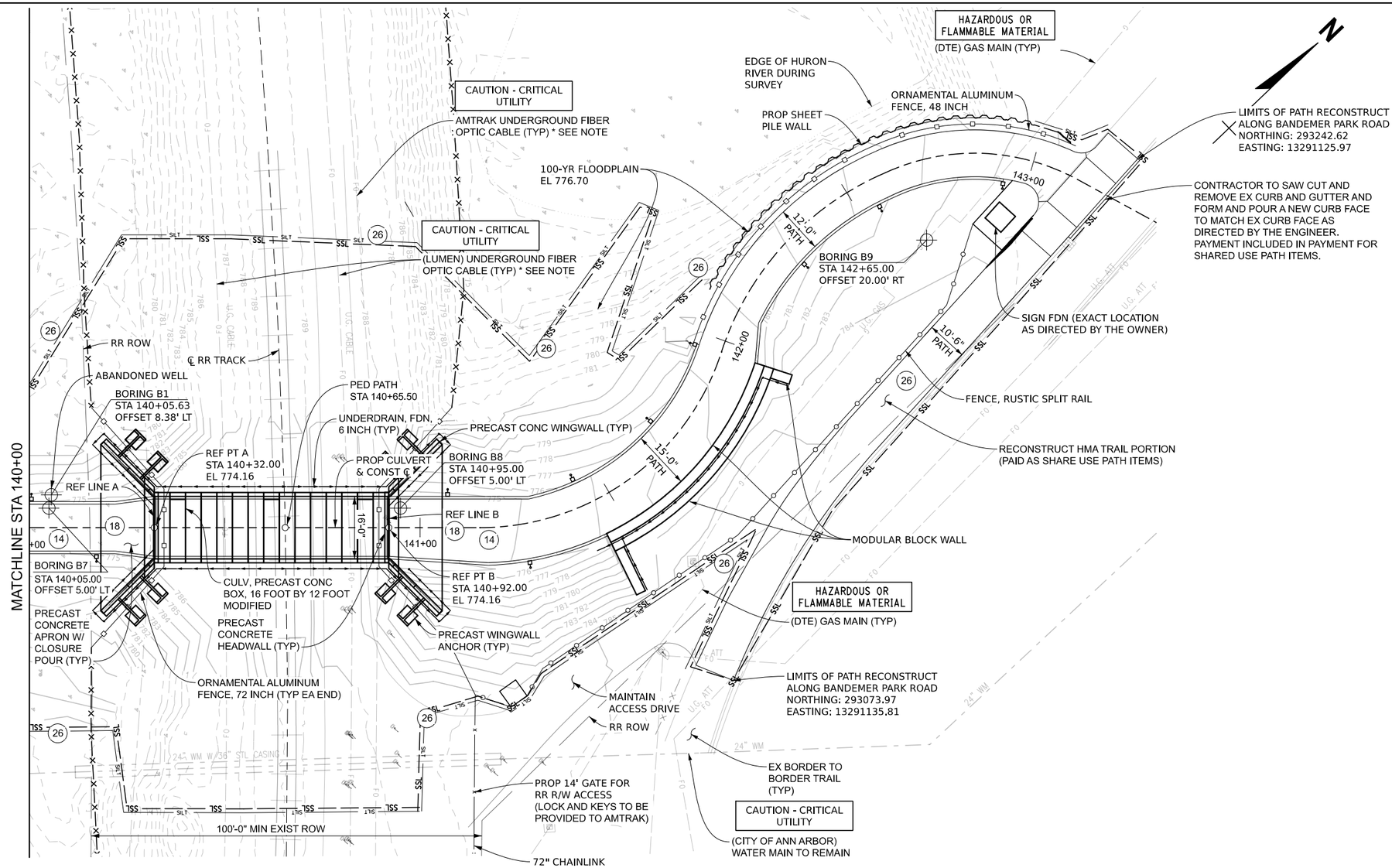
REVISIONS

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" = 30' V: 1" = 30'
HORIZ. (FT) 0 30
VERT. (FT) 0 30
HORIZ DATUM NAD83
VERT DATUM NAVD88

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

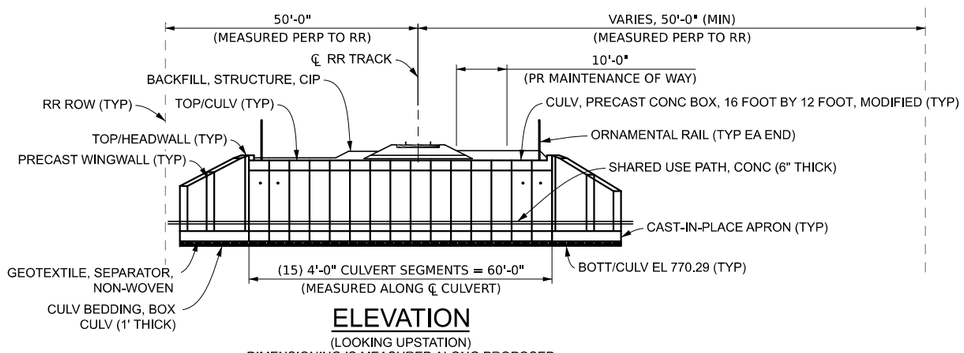
SHEET 43 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_gpstr_001.dgn



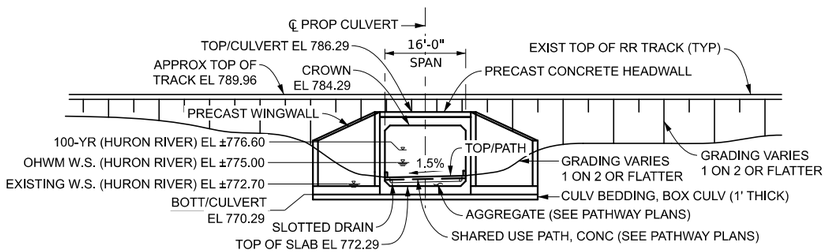
PLAN

SHOWING EXISTING AND PROPOSED TOPOGRAPHY



ELEVATION

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



ELEVATION - END VIEW

(LOOKING UPSTATION)

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REVISIONS

HORZ DATUM: NAD83 | VERT DATUM: NAVD88
SCALE: H: 1" = 30' | V: 1" = 30'
HORIZ. (FT): 0, 30 | VERT. (FT): 0, 30
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR
COUNTY: WASHTENAW
CADD: JAH
PROJ MGR:
ENG: JAH
PROJ NUMBER:
DATE: 4/12/2024

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

SHEET 44 of 80

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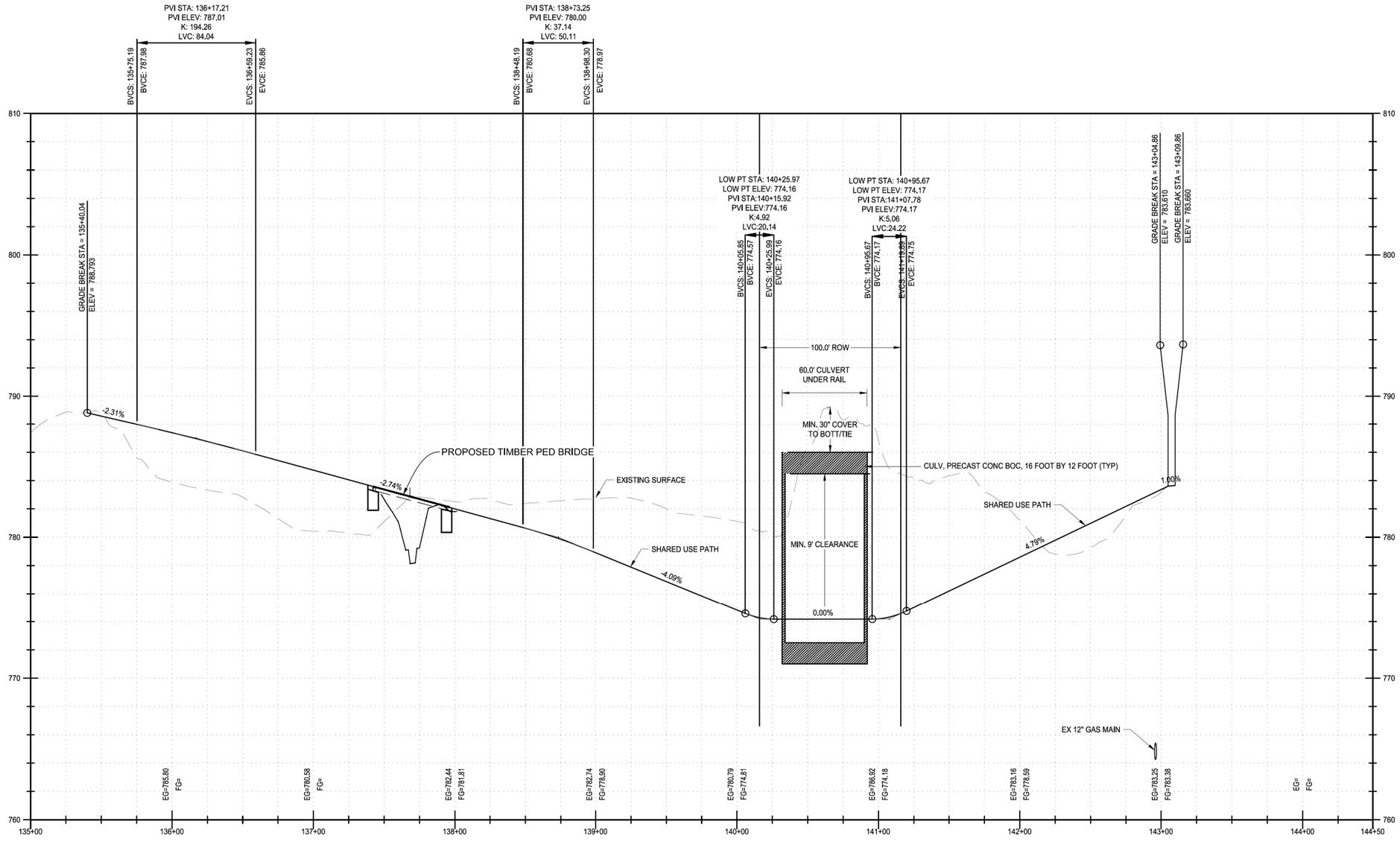

PROFILE THROUGH PROPOSED CULVERT

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

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REVISIONS

DATE: 4/12/2024
PRO.NUMBER:
ENG: JAH
PROJ.MGR: JAH
CADD: JAH
COUNTY: WASHTENAW
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR
SCALE: H: 1"=50' V: 1"=5'
HORIZ.DATUM: NAD83
VERT.DATUM: NAVD88

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

GENERAL PLAN OF STRUCTURE

SHEET: 45 of 80

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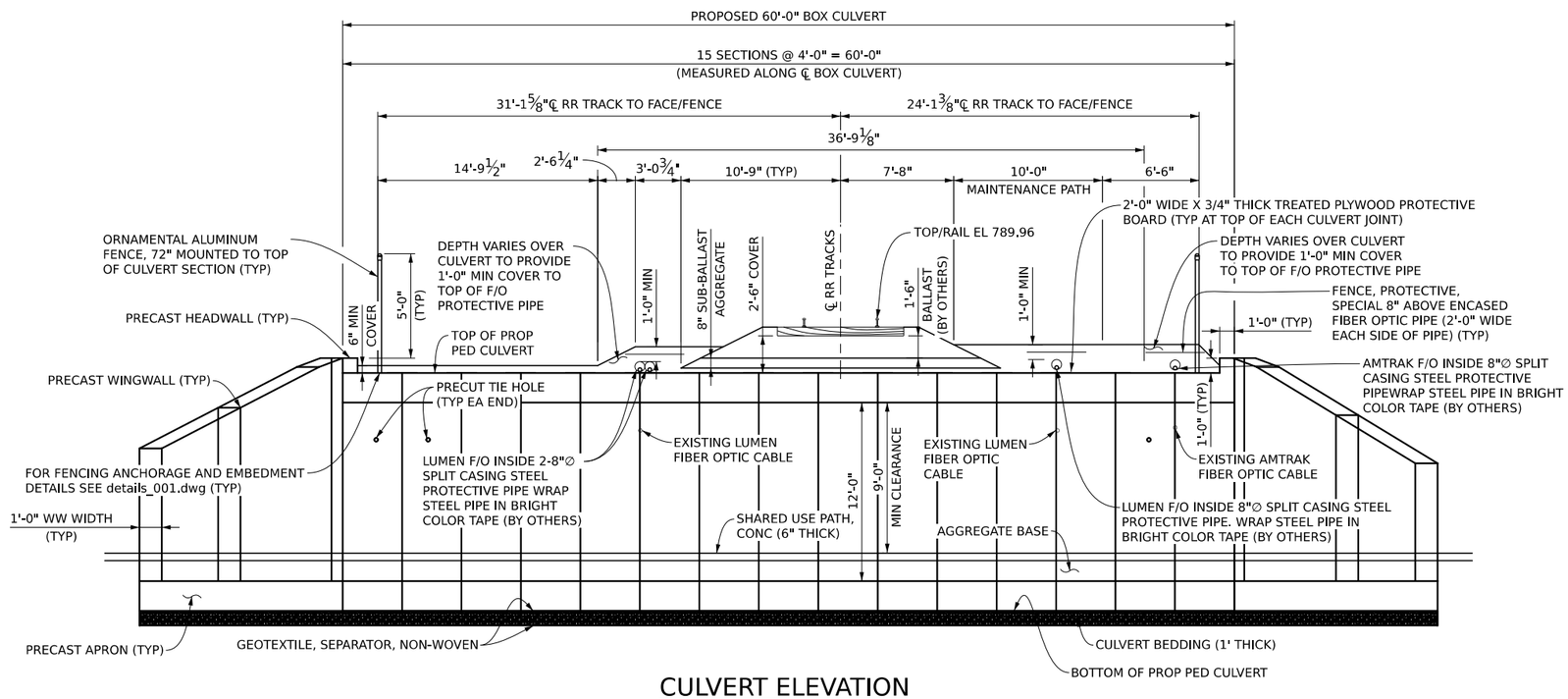

CULVERT ELEVATION

(VIEW PERPENDICULAR TO ℄ BOX CULVERT)

NOTES:

THE DESIGN OF THE PEDESTRIAN CULVERT IS BASED ON THE CURRENT AMERICAN RAILWAY ENGINEERING AND MAINTENACNCE-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 | PRO.NUMBER | ENG JAH | PROJ.MGR JAH | CADD JAH | COUNTY WASHTENAW | CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR | SCALE H: 1" = 50' V: 1" = 0' | HORIZ DATUM NAD83 | VERT DATUM NAVD88

HORIZ. (FT) 0 10
VERT. (FT) 0 10

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

SHEET 46 of 80

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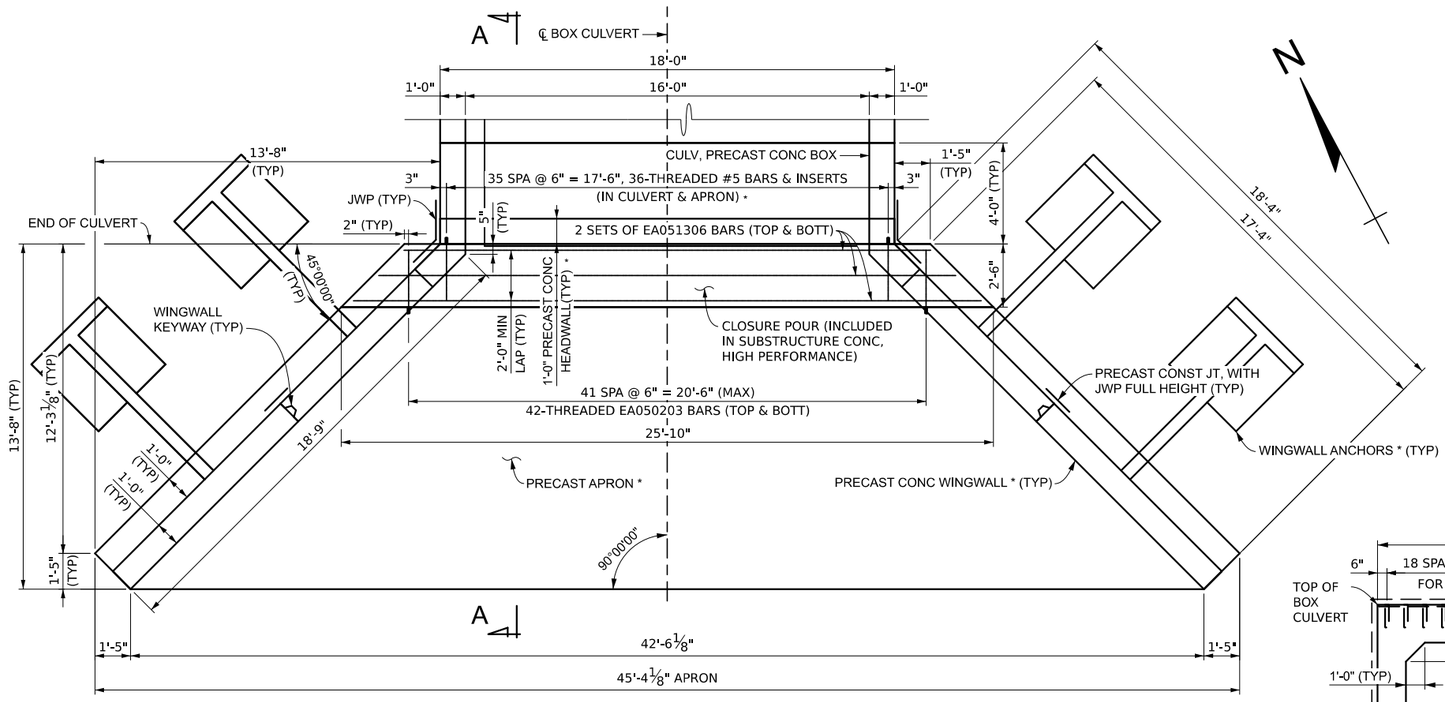
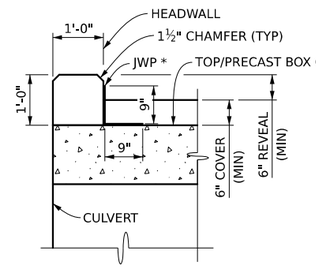
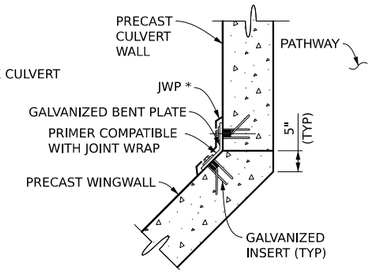


CULVERT END PLAN

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



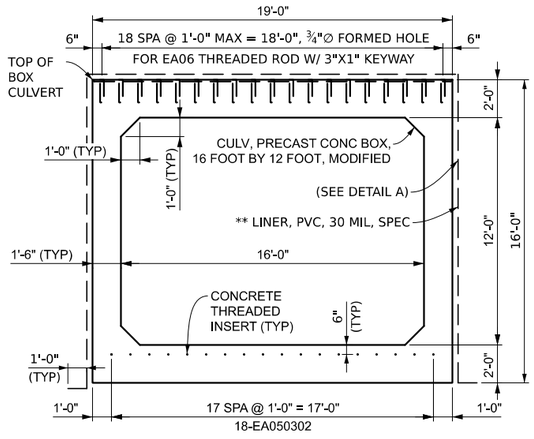
HEADWALL TO CULVERT



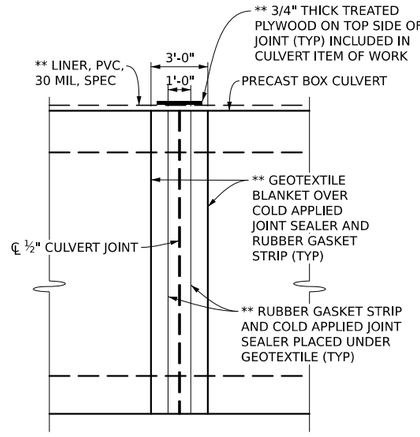
WINGWALL TO CULVERT

CONNECTION DETAILS

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



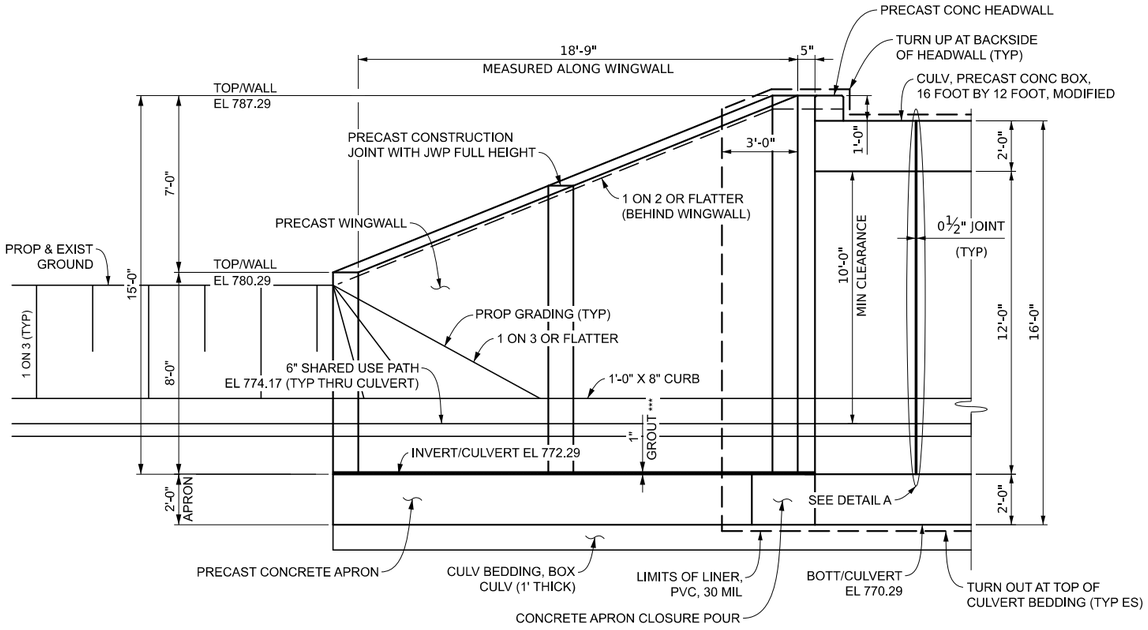
END CULVERT ELEVATION



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"

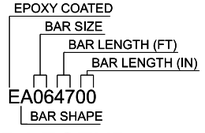


SECTION A-A

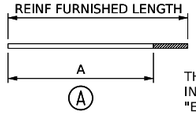
(TYP ALL QUADRANTS)

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

CLOSURE BAR	DIMENSIONS									NO	TOTAL
	A	B	C	D	E	F	G	H	J	REQ'D	WEIGHT
EA050203	2'-3"									188	395
EA051306	13'-6"									24	317
									TOTAL REINFORCEMENT:		712



BAR LEGEND



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

MISCELLANEOUS QUANTITIES

60	Ft	Culv, Precast Conc Box, 16 foot by 12 foot
712	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.

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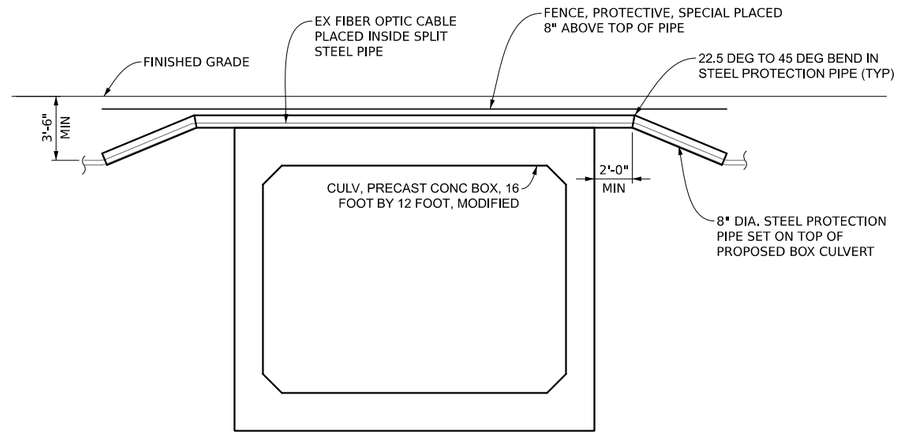
REVISIONS

DATE 4/12/2024 | PROJ NUMBER | ENG JAH | PROJ MGR JAH | CADD JAH | COUNTY WASHTENAW | CITY/TWP/VILLAGE/TOWNSHIP CITY OF ANN ARBOR | SCALE Ht: NONE V: NONE HORIZ (FT) 0 NONE VERT. (FT) 0 NONE | HORIZ DATUM NAD83 | VERT DATUM NAVD88

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

SHEET 47 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_details_001.dgn



FIBER OPTIC CABLE OVER CULVERT DETAIL

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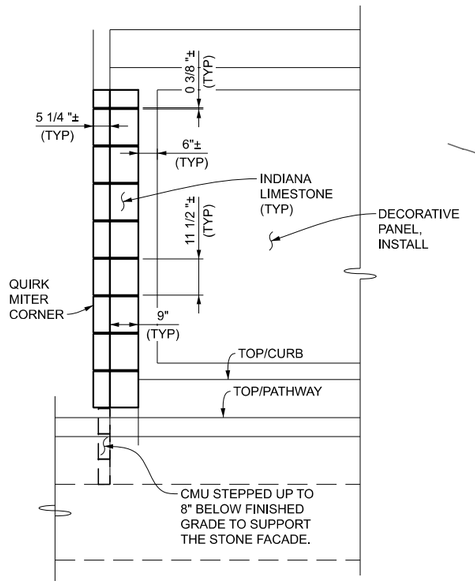
REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE		HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: 1" = 6'	V: 1" = 6'	NAD83	NAVD88

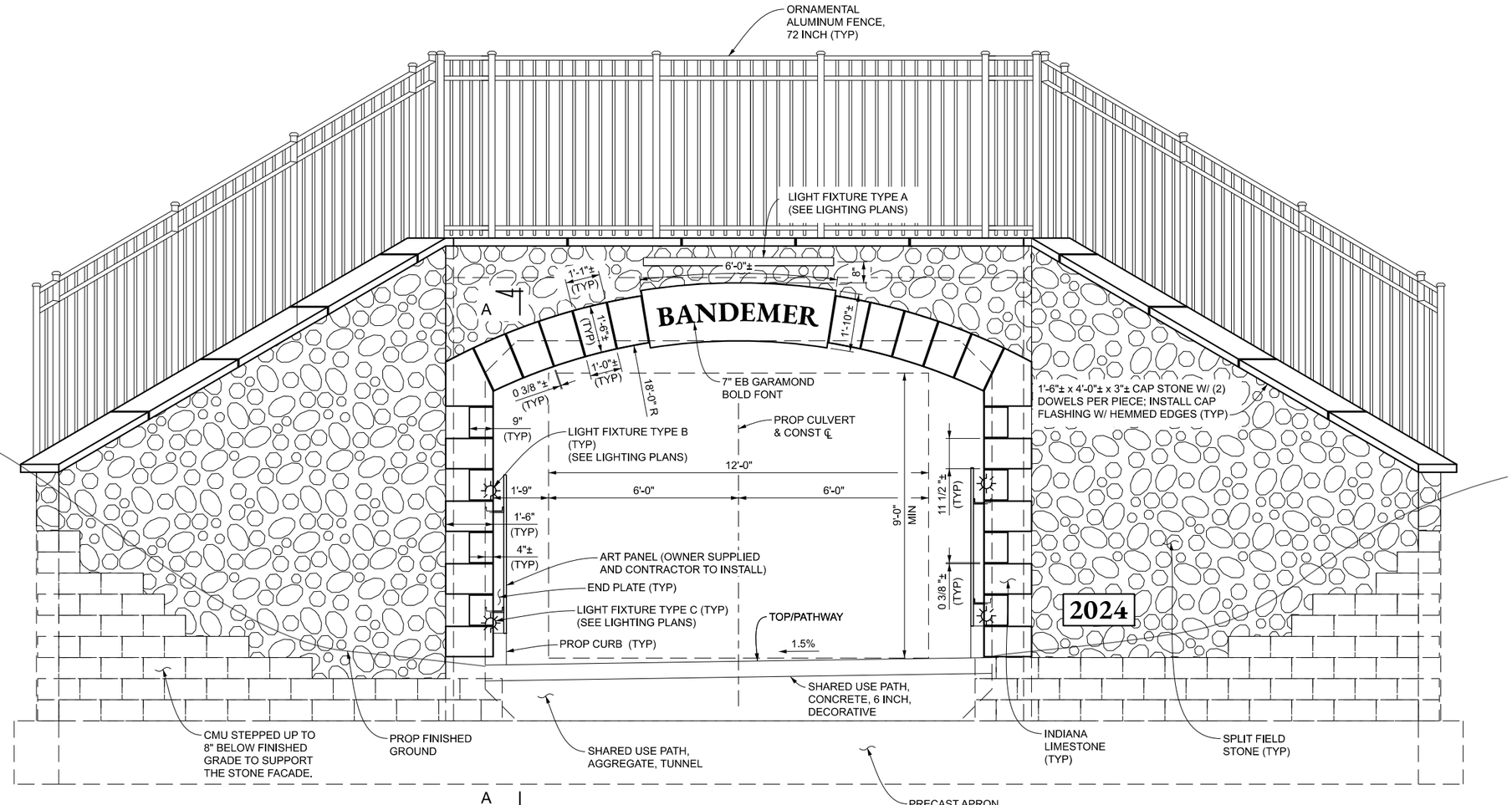
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

BOX CULVERT DETAILS

SHEET 48 of 80



VIEW A-A



A

SOUTH ELEVATION

(LOOKING NORTH)

MISCELLANEOUS QUANTITIES

100	Ft	Limestone Cap
210	Sft	Limestone Block
520	Sft	Split Field Stone
1	Ea	Limestone Sign, "Bandemer"
1	Ea	Limestone Sign, "Barton"
2	Ea	Limestone Sign, "2024"

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LANSING, MI 48917
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REVISIONS

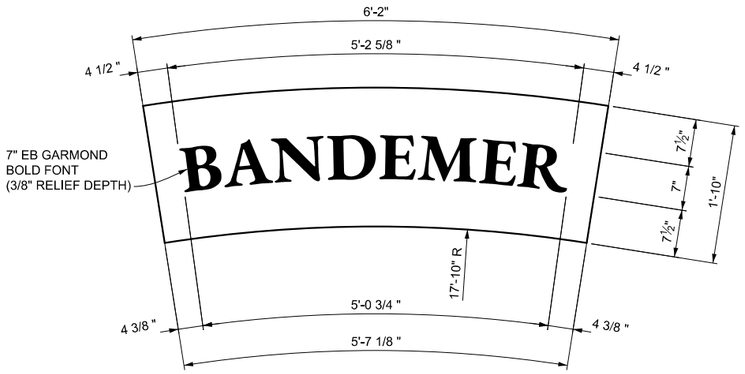
DATE 4/12/2024
PRO.NUMBER
ENG JAH
PROJ.MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE H: 1"=4' V: 1"=4'
HORIZ.DATUM NAD83
VERT.DATUM NAVD88

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

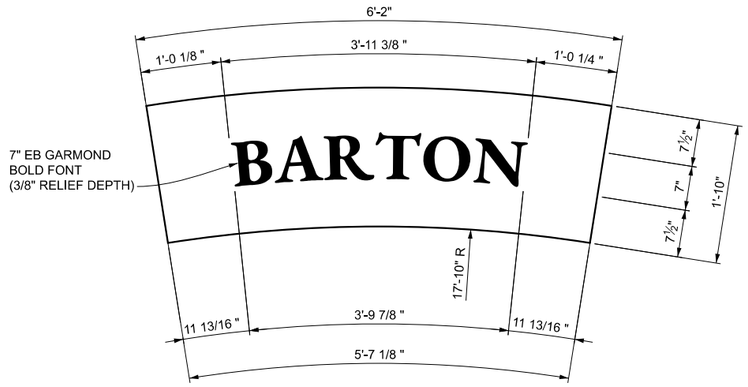
AESTHETIC TREATMENT DETAILS

SHEET 49 of 80

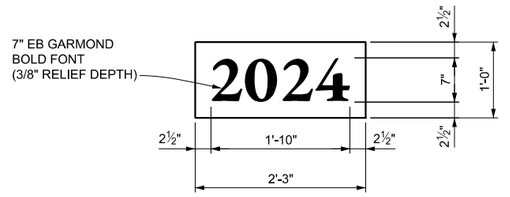
O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_details_004.dgn



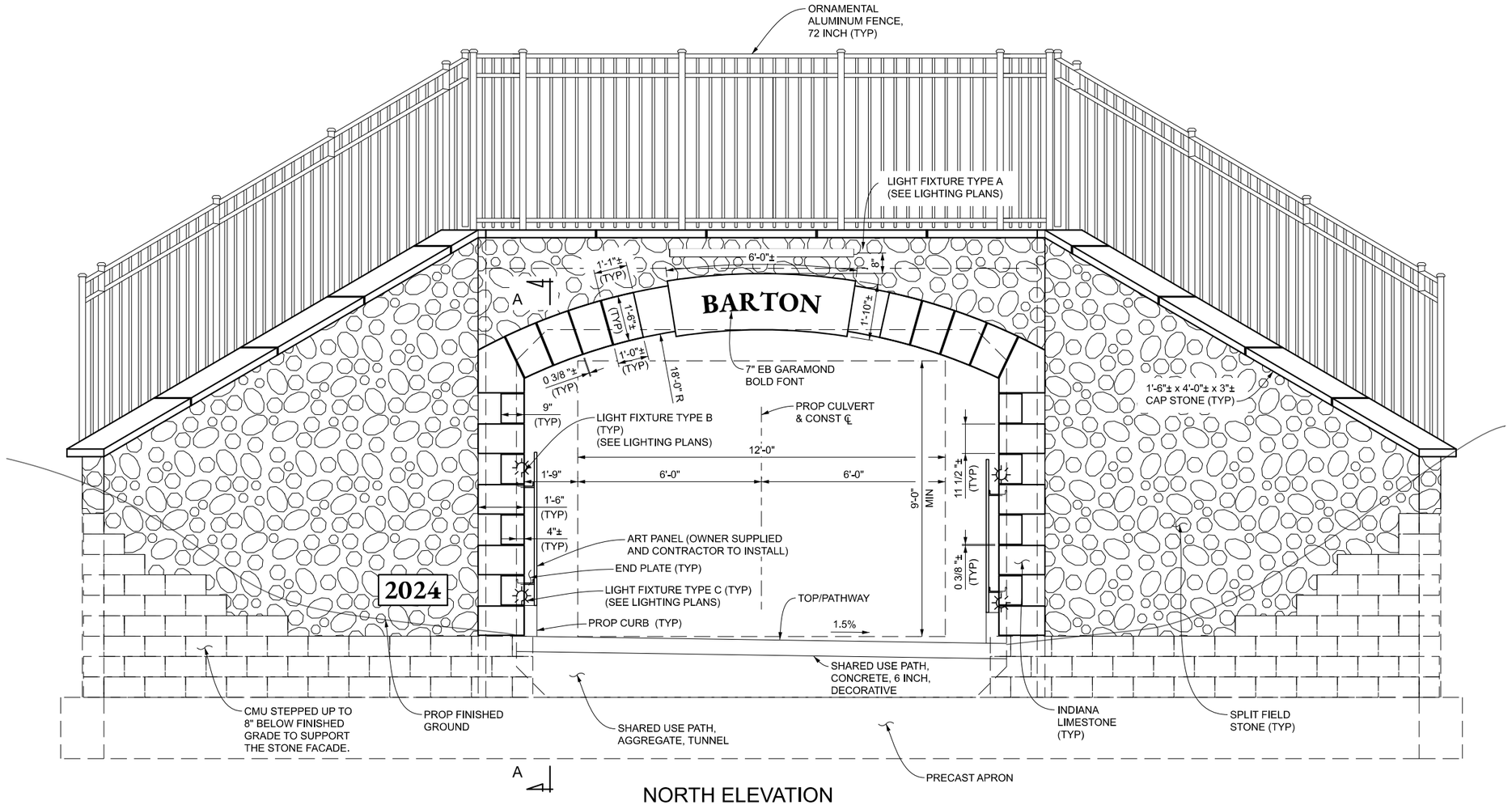
BANDEMER STONE DETAIL



BARTON STONE DETAIL



2024 STONE DETAIL



NORTH ELEVATION

(LOOKING SOUTH)

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ENG JAH
PROJ MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
HK 1"=4'-0"
SCALE V: 1"=4'-0"
HORIZ DATUM NAD83
VERT DATUM NAVD88

HORIZ. (FT) 0 4
VERT. (FT) 0 4

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

AESTHETIC TREATMENT DETAILS

SHEET 50 of 80

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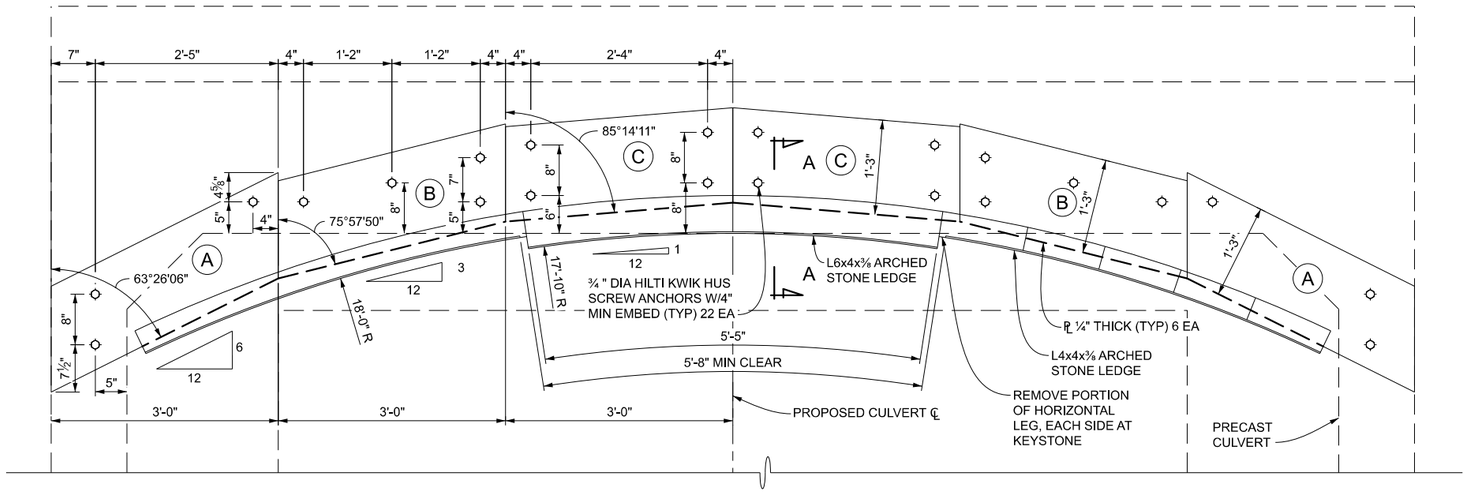
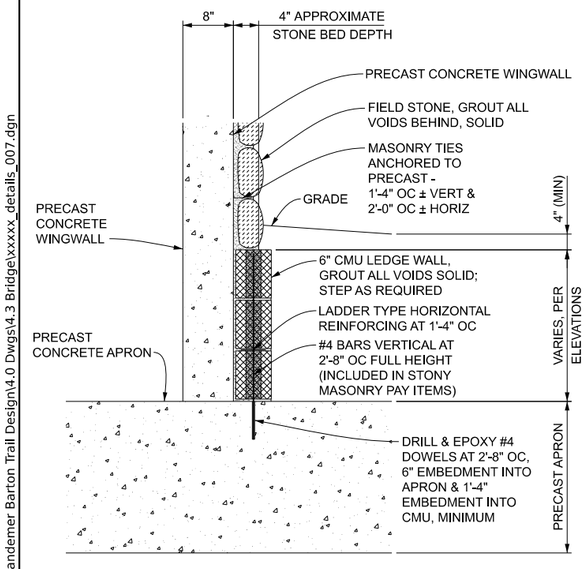
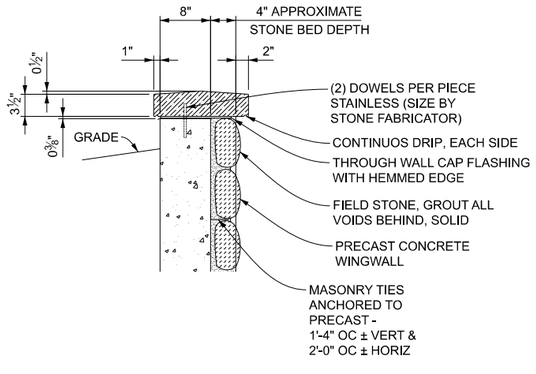


LINTEL PLATE DETAIL ELEVATION

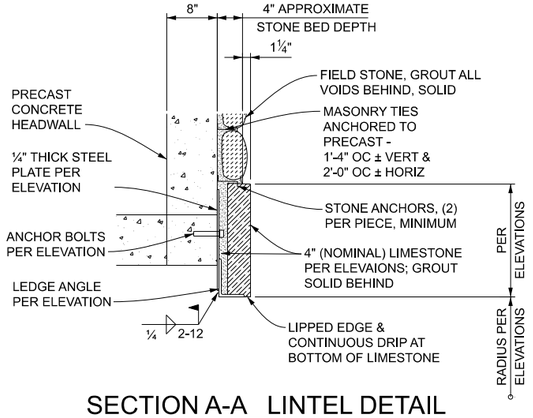
STONE LEDGE, PLATES AND ANCHORS ARE
SYMETRICAL ACROSS CULVERT CENTERLINE



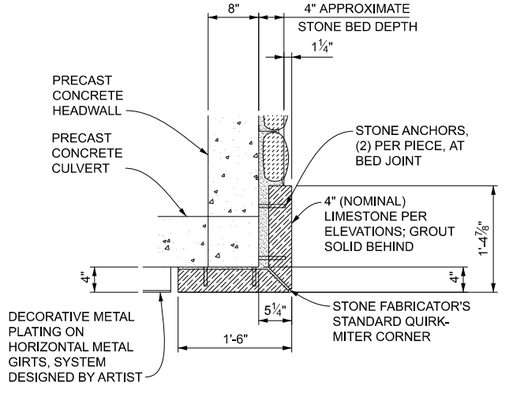
BASE DETAIL



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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PRO. NUMBER
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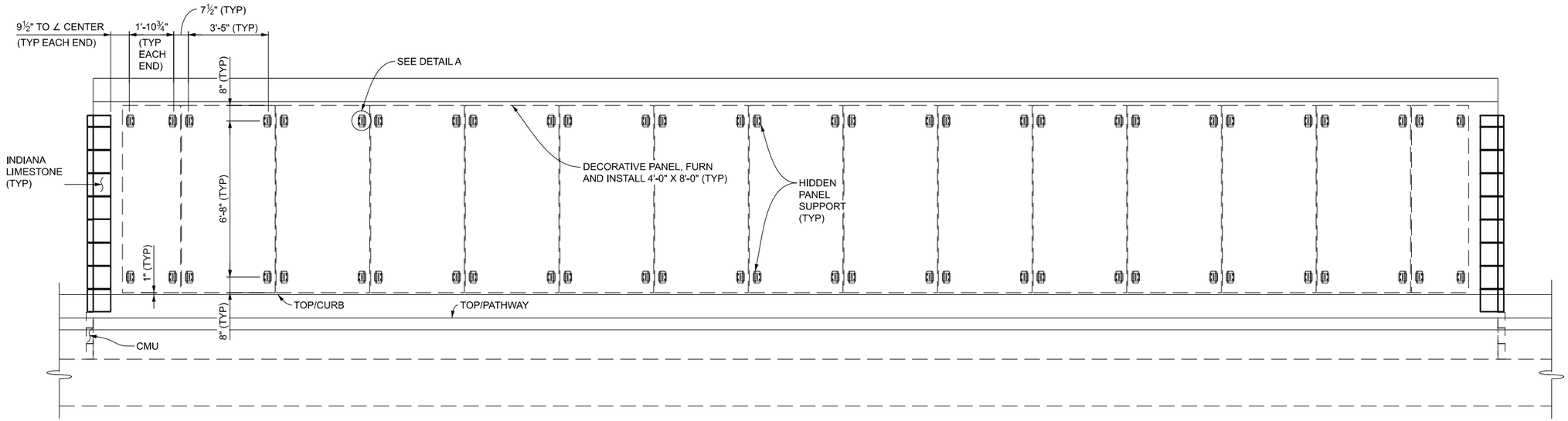
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE H: 1" = 4' V: 1" = 4'
HORIZ DATUM NAD83
VERT DATUM NAVD88
HORIZ. (FT) 0 4
VERT. (FT) 0 4

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

AESTHETIC TREATMENT DETAILS

SHEET 51 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_details_007.dgn

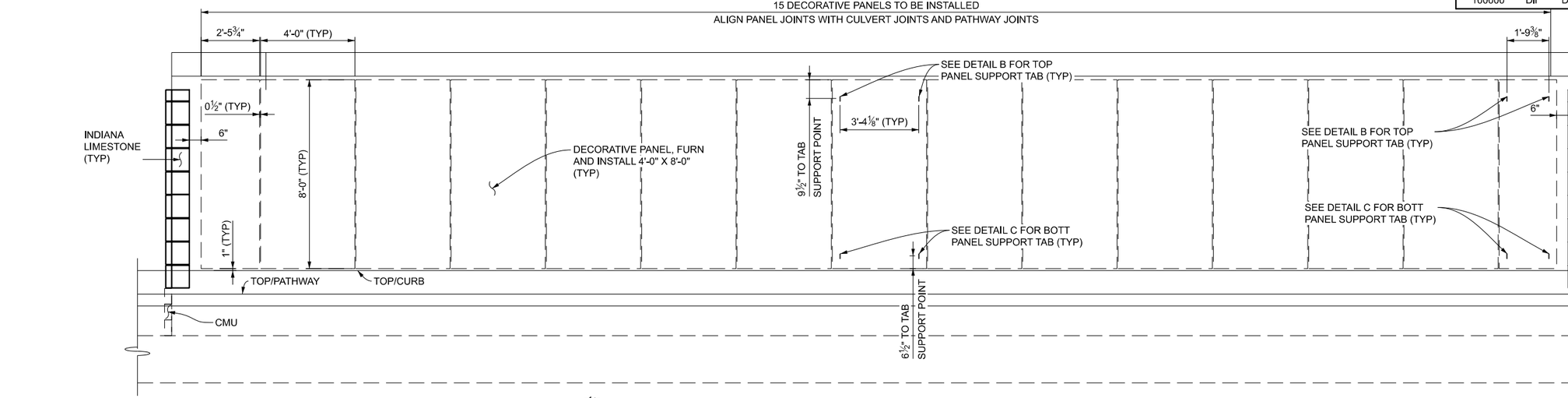


ELEVATION INSIDE TUNNEL - SHOWING PANEL SUPPORTS

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

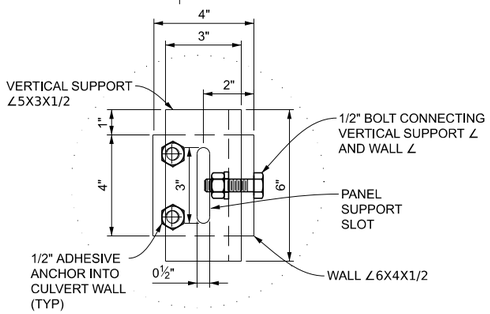
MISCELLANEOUS QUANTITIES

1	LSUM	Decorative Panel, Install
100000	Dlr	Decorative Panel, Furn

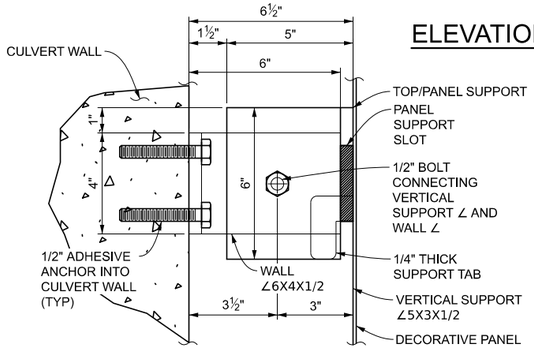


ELEVATION INSIDE TUNNEL - PANELS INSTALLED

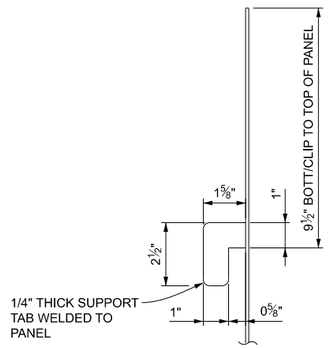
TYPICAL EACH SIDE OF THE TUNNEL (LIGHTING NOT SHOWN)



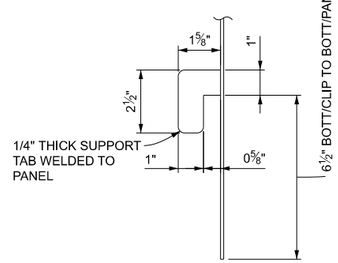
DETAIL A



SECTION THRU WALL



DETAIL B



DETAIL C

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REVISIONS

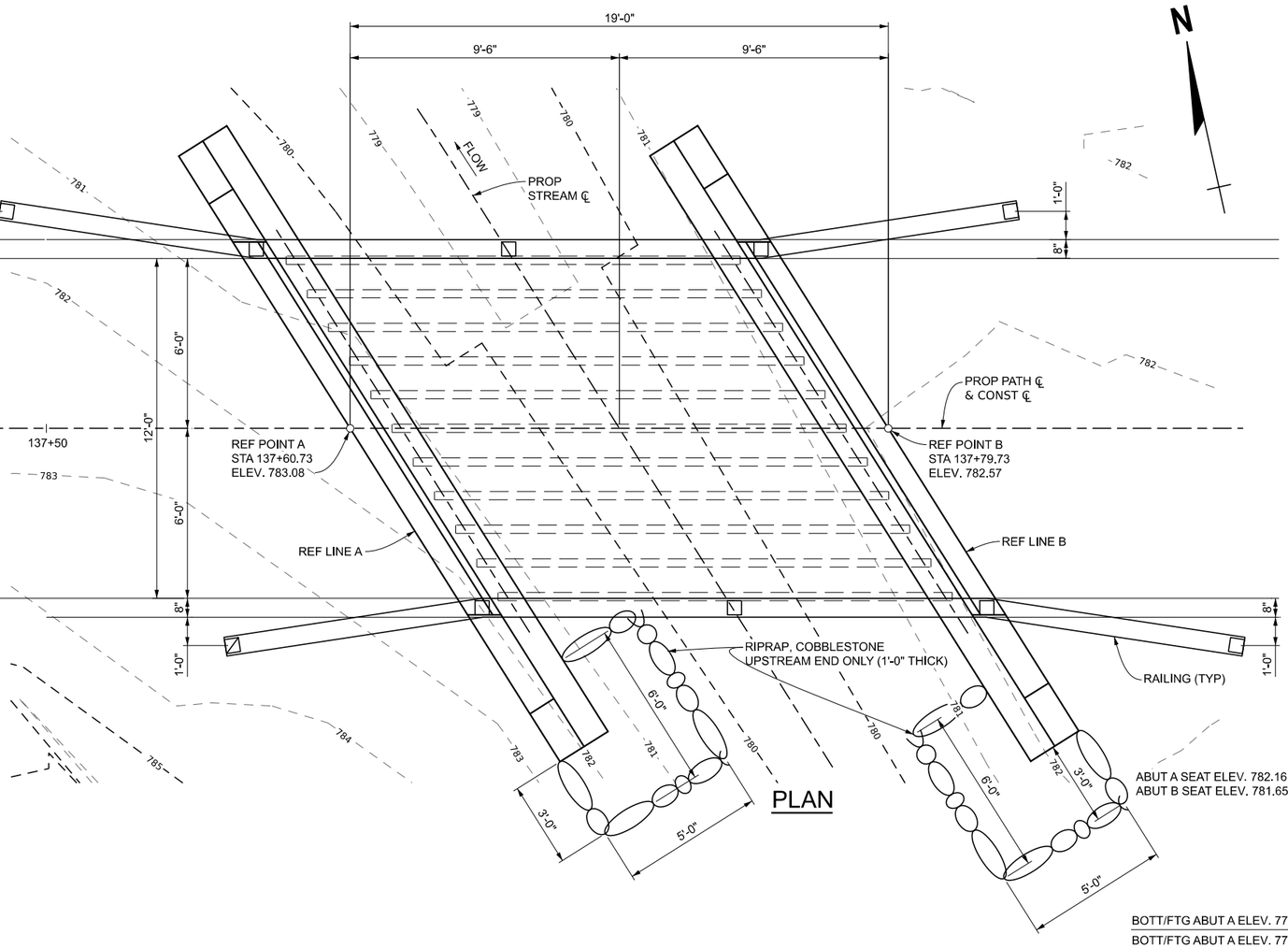
DATE	4/12/2024
PROJ NUMBER	
ENG	JAH
PROJ MGR	JAH
CADD	JAH
COUNTY	WASHTENAW
CITY/VILLAGE/TOWNSHIP	CITY OF ANN ARBOR
SCALE	V: 1" = 4' H: 1" = 4'
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

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

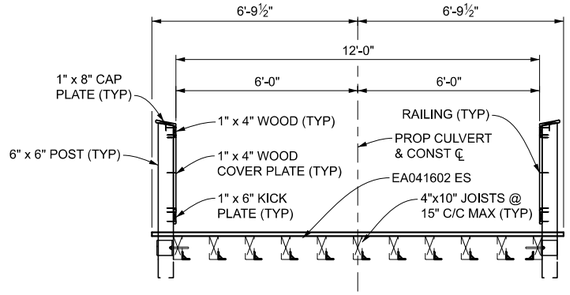
AESTHETIC TREATMENT DETAILS

SHEET 52 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_details_006.dgn

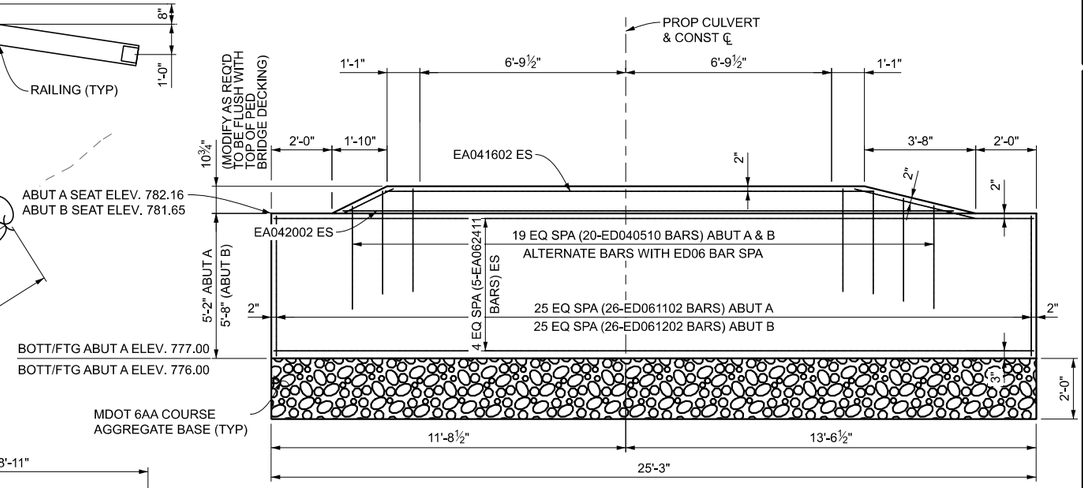


PLAN



TYPICAL BRIDGE SECTION

BRIDGE ELEVATION



ABUTMENT ELEVATION

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
			TOTAL:		1879

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

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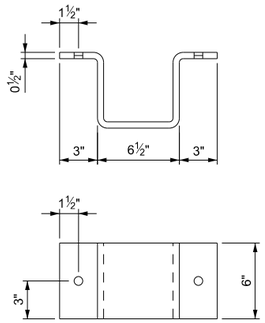
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
SCALE
H:
V:
HORZ DATUM NAD83
VERT DATUM NAVD88

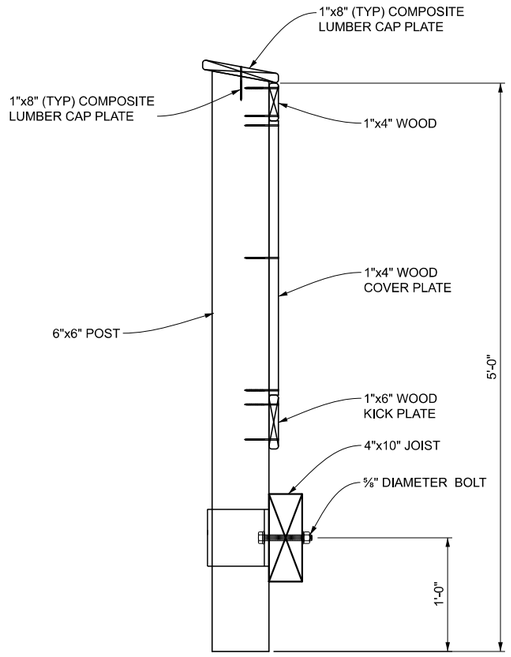
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT
PEDESTRIAN TIMBER BRIDGE DETAILS

SHEET 53 of 80

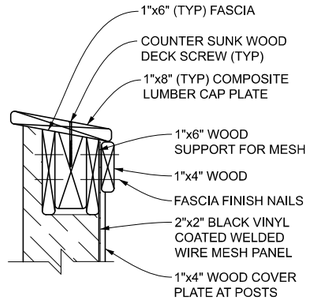
O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_details_008.dgn



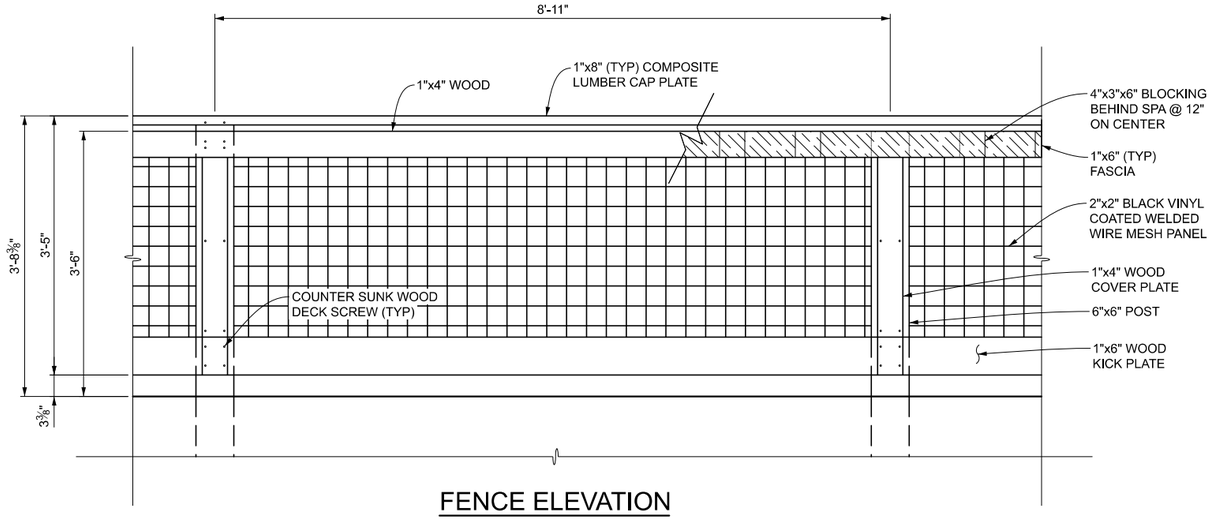
BENT PLATE DETAILS



FENCE SECTION AT POST



RAILING CAP DETAIL



FENCE ELEVATION

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4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR		V:	NAD83	NAVD88

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

PEDESTRIAN TIMBER BRIDGE DETAILS

SHEET 54 of 80

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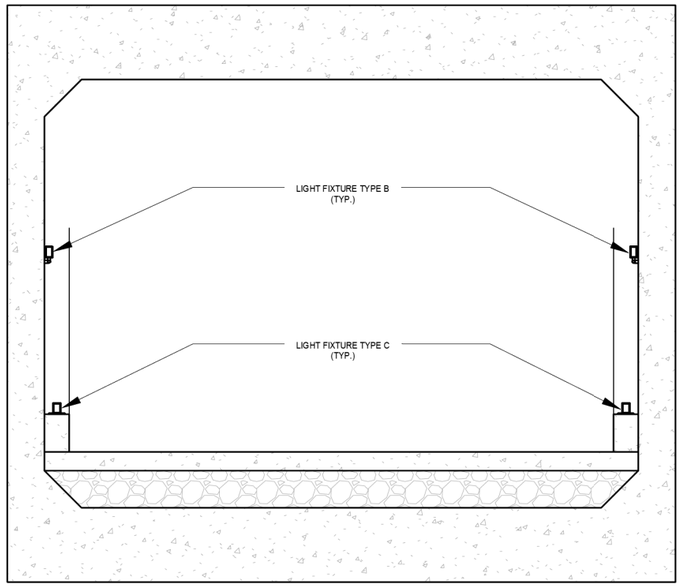
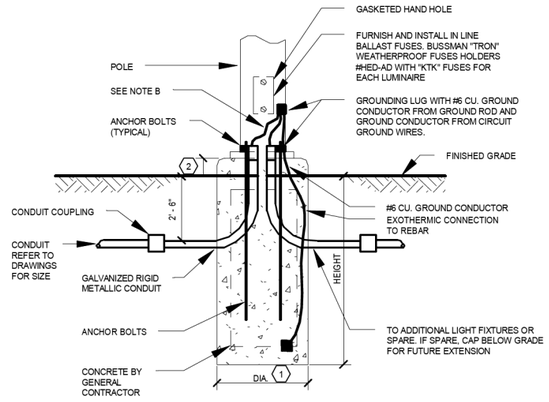


2 TUNNEL SECTION

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.

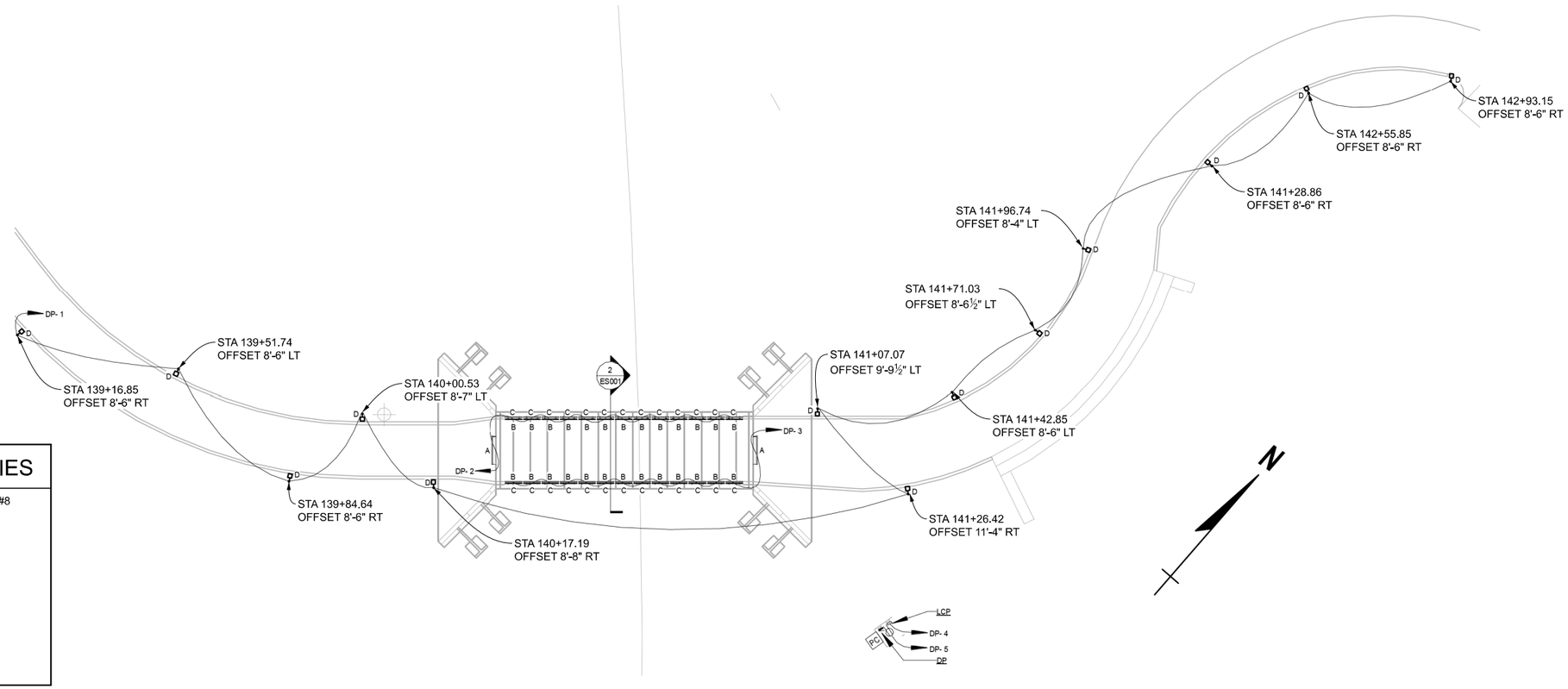
B. PROVIDE GROUNDING BUSHINGS PER NEC.

KEYNOTES: ⟨#⟩

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

MISCELLANEOUS QUANTITIES

600	Ft	Cable, Equipment Grounding Wire, 1/C#8
600	Ft	Conduit, Schedule 80, 1-1/4"
600	Ft	Cable, 600V, 1, 3/C#2
1350	Ft	Conduit, PVC, 3/4"
1350	Ft	Cable, 600V, 1, 3/C#12
1350	Ft	Cable, Grounding Wire, 1/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	Dlr	Electrical Utility Service



1 ELECTRICAL SITEPLAN

SCALE : 1" = 30'-0"

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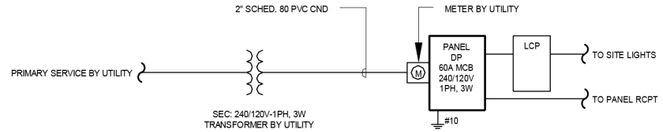
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	V: H:	NAD83	NAVD88

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

ELECTRICAL DETAILS

SHEET 55 of 80



4 RISER DIAGRAM

SCALE : N.T.S.

PANELBOARD SCHEDULE

DP

VOLTS:	240	MAINS RATING:		A.I.C. RATING:	10,000	LOCATION:														
PHASE:	1	MCB:	60A	BRKR SPACE:	12	SOURCE:	UTILITY XFMR													
WIRE:	3	MLO:		MTG./NEMA #:	3R	FEEDER:														

	LOAD	LOAD VOLT-AMPERES											LOAD VOLT-AMPERES							
CKT	DESCRIPTION	LTS	REC	MOTOR	OTHER	KIT	OCPD	P	CKT	PH	CKT	P	OCPD	LTS	REC	MOTOR	OTHER	KIT	DESCRIPTION	CKT
1	POLE LIGHTS	208					20	1	1	A	2	1	20	739					N TUNNEL LIGHTS	2
3	S TUNNEL LIGHTS	739					20	1	3	B	4	1	20		180				LCP	4
5	PANEL RCPT		180				20	1	5	C	6	1	20						SPARE	6
7	SPARE						20	1	7	A	8	1	20						SPARE	8
9	SPARE						20	1	9	B	10	1	20						SPARE	10
11	SPARE						20	1	11	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	0.0	0.9
PHASE B CONNECTED KVA	0.7	0.2	0.0	0.0	0.0	0.9
PHASE C CONNECTED KVA	0.0	0.2	0.0	0.0	0.0	0.2
25% OF LARGEST MOTOR			0.0			

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

LOAD SUMMARY & FEEDER CALCULATION

LTS	REC	MOTOR	OTHER	KIT	SUBTOT	SPARE	TOTAL	
1.7	0.4	0.0	0.0	0.0	2.0	25%		CONNECTED KVA
1.25	#1	1.0	1.0					DEMAND FACTOR
2.1	0.4	0.0	0.0	0.0	2.5	0.6	3.1	DEMAND KVA
							7.4	DEMAND AMPS
1.25	1.0	1.0	1.0	1.0		1.0		CONTINUOUS/NONCONT FACTOR
							8.7	MIN. OVERCURRENT DEVICE AMPS

NEW PANEL "LCP"

D=DIMMER
R=RELAY

DIMMER/ RELAY #	DIMMER/ RELAY ZONE	DESCRIPTION	PANELBOARD NAME	PANELBOARD CIR #	LOAD	LOAD TYPE	DIMMABLE	ON/OFF SWITCHING	NOTES LIGHTING CONTROL STATION	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:

1. COORDINATE COMMISSIONING OF SYSTEM PER LIGHTING, LIGHTING CONTROL, AND COMMISSIONING SPECIFICATIONS WITH OWNER'S AGENT AS REQUIRED PER STATE OF MICHIGAN ENERGY CODE.
2. OWNER SHALL BE PROVIDED WITH SOFTWARE AND THE ABILITY TO CONNECT TO THE CONTROL PANEL VIA LAPTOP TO OVERRIDE PROGRAMMING.
3. **BRIDGE MOUNTED LIGHT FIXTURES (TYPES A, B, & C):**
   - A. LIGHTS SHALL BE PROGRAMMED TO TURN ON TO 25% AT 5AM AND TURN OFF AT MIDNIGHT VIA ASTROCLOCK.
   - B. LIGHTS SHALL RAISE TO 100% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS EXCEED 8000FC.
   - C. LIGHTS SHALL DIM TO 80% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BETWEEN 4000FC AND 8000FC.
   - D. LIGHTS SHALL DIM TO 65% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BETWEEN 1000FC AND 4000FC.
   - E. LIGHTS SHALL DIM TO 50% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BETWEEN 20FC AND 1000FC.
   - F. LIGHTS SHALL DIM TO 25% WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS ARE BELOW 20FC.
   - G. LIGHTS SHALL BE ABLE TO BE OVERRIDEN BY OWNER TO DIM UP/DOWN AND TURN ON/OFF.
4. **POLE LIGHT FIXTURES:**
   - A. LIGHTS SHALL BE PROGRAMMED TO TURN ON TO 100% AT 5AM AND TURN OFF AT MIDNIGHT VIA ASTROCLOCK.
   - B. LIGHTS SHALL TURN OFF WHEN LIGHT LEVELS SENSED VIA POLE MOUNTED PHOTOCELLS EXCEED 1000FC.
   - C. 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	E5X-LO-40K-DL-EXA-12-72-DIM-TBL-ILV					
		SPI LIGHTING	SEW12145-6FT-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-ASYMx40-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-ASYMx40-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	10RFNS1-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					

Colliers Engineering & Design
7050 W. SAGINAW HWY, SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

HORIZ DATUM: NAD83 | VERT DATUM: NAVD88
SCALE: V: | H:
CITY/VILLAGE/TOWNSHIP: CITY OF ANN ARBOR
COUNTY: WASHTENAW
CADD: JAH
PROJ MGR: JAH
ENG: JAH
PROJ NUMBER
DATE: 4/12/2024

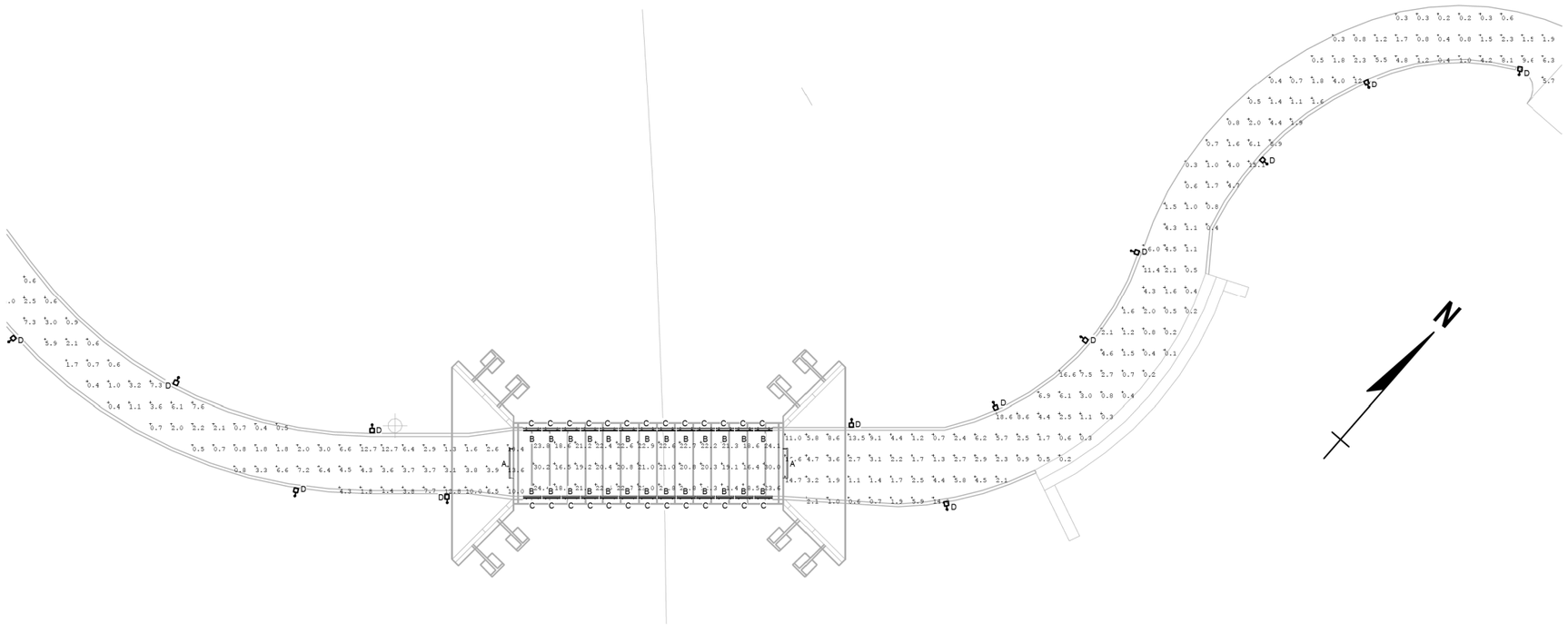
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

ELECTRICAL DETAILS

SHEET 56 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_elec_002.dgn

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"

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LANSING, MI 48917
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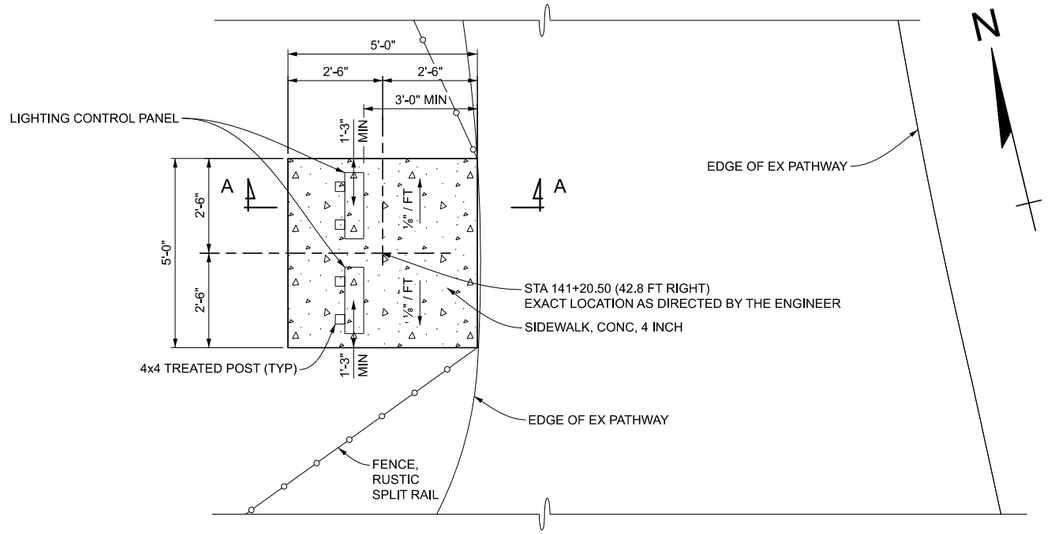
REVISIONS

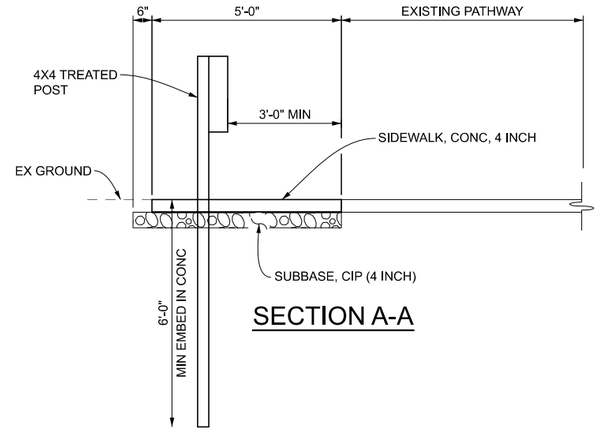
DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	V:	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR			NAD83	NAVD88

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

ELECTRICAL DETAILS



LIGHTING CONTROL PANEL SLAB - PLAN



SECTION A-A

MISCELLANEOUS QUANTITIES

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

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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"=4' V: 1"=4'
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

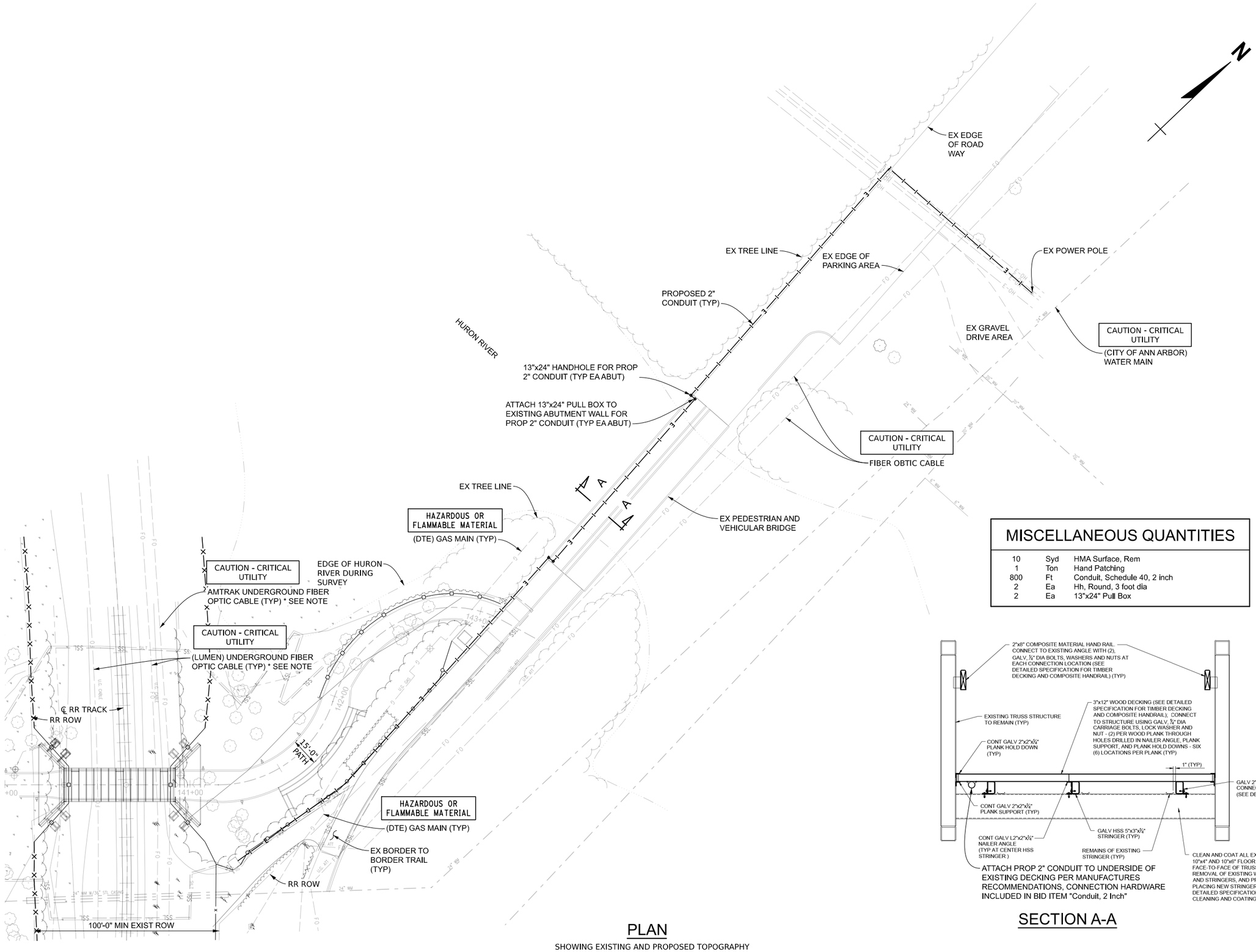
HORIZ. (FT) 0 4
VERT. (FT) 0 4

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

ELECTRICAL DETAILS

SHEET 58 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_elec_004.dgn

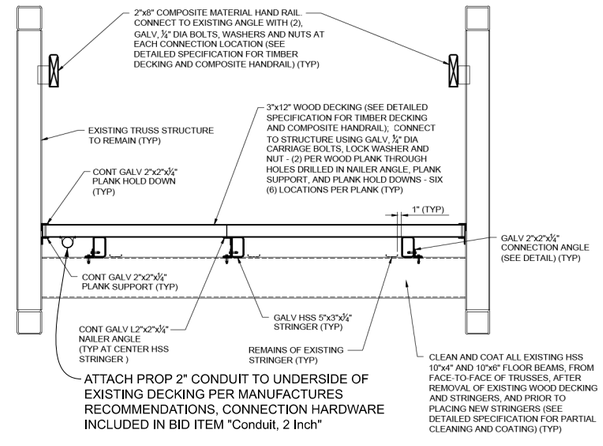


PLAN

SHOWING EXISTING AND PROPOSED TOPOGRAPHY

MISCELLANEOUS QUANTITIES

10	Syd	HMA Surface, Rem
1	Ton	Hand Patching
800	Ft	Conduit, Schedule 40, 2 inch
2	Ea	Hh, Round, 3 foot dia
2	Ea	13"x24" Pull Box



SECTION A-A

Colliers Engineering & Design
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LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

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"=50' V: NONE
HORIZ DATUM	NAD83
VERT DATUM	NAVD88

HORIZ. (FT) 50 0
VERT. (FT) NONE 0

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

ELECTRICAL DETAILS

SHEET 59 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_elec_005.dgn

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

1. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER AT ALL TIMES DURING CONSTRUCTION. ANY MODIFICATIONS OR ADDITIONS TO THE SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE AS DIRECTED AND APPROVED BY THE ENGINEER.

2. ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE PERMIT REQUIREMENTS OF THE CITY OF ANN ARBOR, THE LAWS OF THE STATE OF MICHIGAN, AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

3. DAILY, OR AFTER ANY STORM EVENT, INSPECTIONS OF EROSION CONTROL MEASURES SHALL BE MADE BY THE CONTRACTOR. PERIODIC INSPECTIONS MAY BE MADE BY THE ENGINEER TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY CORRECTIONS SHALL BE MADE WITHOUT DELAY, AND WITHOUT ADDITIONAL COST TO THE CITY OF ANN ARBOR.

4. EROSION AND SEDIMENTATION FROM WORK ON THE SITE SHALL BE CONTAINED ON THE SITE AND NOT BE ALLOWED TO COLLECT ON ANY OFF-SITE AREAS, ROADWAYS OR WATERWAYS.

5. ALL MUD/SOIL TRACKED ONTO ROADWAYS FROM THE SITE DUE TO CONSTRUCTION, SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR. IF SO ORDERED, THE CONTRACTOR SHALL PROVIDE AND OPERATE A VACUUM-TYPE STREET SWEEPER, AT NO ADDITIONAL COST TO THE CITY OF ANN ARBOR.

6. RESTORATION OF ALL DISTURBED AREAS, INCLUDING PLACEMENT OF TOPSOIL, SEED, FERTILIZER AND MULCH AND/OR SOD SHALL BE PERFORMED WITHIN FIVE (5) DAYS OF THE COMPLETION OF FINAL GRADE.

7. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE SOIL EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION IN CRITICAL AREAS AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING OPERATIONS.

8. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.

9. PROPER DUST CONTROL SHALL BE MAINTAINED DURING CONSTRUCTION BY USE OF WATER TRUCKS AND/OR OTHER METHODS APPROVED BY THE ENGINEER.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND REMOVAL OF SOME MEASURES UPON AUTHORIZED COMPLETION OF THE PROJECT. FINAL COMPLETION OF PROJECT WILL NOT BE AUTHORIZED UNTIL ALL SITE WORK AND UTILITY CONSTRUCTION IS COMPLETE AND ALL SOILS ARE STABILIZED.

11. THE CONTRACTOR SHALL NOT GRADE INTO ADJACENT PROPERTIES. SILT AND PROTECTIVE FENCE SHALL BE INSTALLED AND MAINTAINED TO PREVENT GRADING, EROSION AND SEDIMENTATION INTO THE ADJACENT PROPERTIES.

12. TREE PROTECTION FENCING MUST REMAIN INTACT UNTIL RESTORATION OF THE SITE IS COMPLETE.

SEQUENCE OF EROSION CONTROL MEASURES:

1. THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER, A SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION CONTROL MEASURES FOR REVIEW, COMMENT AND APPROVAL. THIS SCHEDULE IS TO INCLUDE INSPECTION AND REPAIR OF ALL TEMPORARY EROSION CONTROL MEASURES DAILY AND WITHIN 24 HOURS OF A STORM EVENT.

SAMPLE SOIL EROSION AND SEDIMENTATION CONTROL INSTALLATION MINIMUM REQUIREMENTS:

1.1. INSTALL SILT FENCE, TREE PROTECTION FENCING, MUD MATS, INLET FILTERS ON EXISTING DRAINAGE FEATURES, AND ALL OTHER TEMPORARY SOIL EROSION CONTROLS, PRIOR TO ANY CLEARING OR EARTH MOVING OPERATION.

1.2. STRIP AND STOCKPILE TOPSOIL. STABILIZE STOCKPILE AS REQUIRED.

1.3. INSTALL WATER MAINS, STORM AND SANITARY SEWERS AND OTHER ENCLOSED DRAINAGE FEATURES. NEW INLET FILTERS SHALL BE INSTALLED IMMEDIATELY FOLLOWING INSTALLATION OF NEW DRAINAGE INLETS.

1.4. PERFORM MACHINE GRADING OPERATIONS AND CONSTRUCT PAVEMENTS (MAINLINE, SIDEWALKS, DRIVES, ETC.).

1.5. CONTINUALLY MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED TO ALLOW DRAINAGE AND SEDIMENT REMOVAL. REMOVE ANY ACCUMULATED SEDIMENT IMMEDIATELY.

1.6. COMPLETE ALL FINE GRADING.

1.7. TEMPORARY SEED AND INSTALL EROSION CONTROL BLANKET N ALL DISTURBED AREAS.

1.8. REFER TO LANDSCAPE PLANTING PLANS FOR PERMANENT SITE STABILIZATION.

1.9. CLEAN OUT STORM SEWER SYSTEMS.

1.10. REMEDY ANY NOTED DEFECTS TO THE SATISFACTION OF THE CITY OF ANN ARBOR'S SOIL EROSION AND SEDIMENTATION CONTROL OFFICIAL.

1.11. ALL TEMP. SOIL EROSION CONTROL MEASURES MUST BE REMOVED, WITH ENGINEERS APPROVAL, PRIOR TO FINAL INSPECTION

NOTE: THIS SEQUENCE IS FOR INFORMATION ONLY. IT IS INTENDED TO SHOW THE SEQUENCE OF CONSTRUCTION WITH RESPECT TO THE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING THEIR OWN DETAILED CONSTRUCTION SEQUENCE AND SCHEDULE TO THE ENGINEER FOR REVIEW, COMMENT, AND APPROVAL.

TEMPORARY SEEDING:

1. SEED IN ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS.

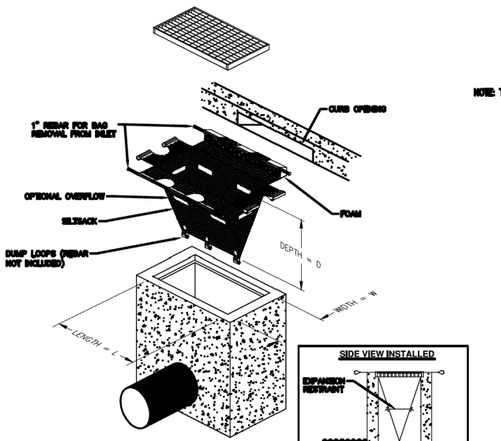
2. ANY DISTURBED AREA NOT PAVED, SEEDED, MULCHED, SODDED OR BUILT UPON BY NOVEMBER 15TH OR JUNE 30TH IS TO BE TEMPORARILY STABILIZED PER SPECIFICATIONS.

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
- WaA – WASEPI SANDY LOAM – 0% TO 4% SLOPES

AREA OF PROPOSED DISTURBANCE

BARTON/BANDEMER PARK TUNNEL – 1.47 ac



SILTSACK DETAIL

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

REGULAR FLOW SILTSACK

(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	REQUIRED VALUE	TEST METHOD
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	30%
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	600 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	90%
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC-1

HI-FLOW SILTSACK

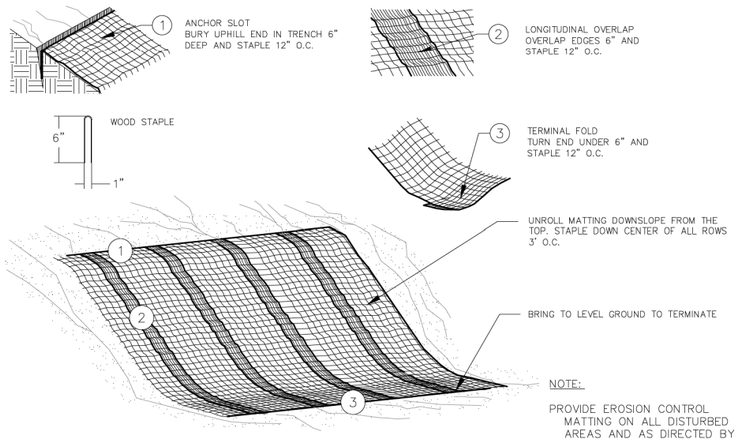
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	REQUIRED VALUE	TEST METHOD
GRAB TENSILE STRENGTH	ASTM D-4632	200 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	30%
PUNCTURE	ASTM D-4833	125 LBS
MULLEN BURST	ASTM D-3786	400 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90%
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC-1

OIL-ABSORBANT SILTSACK

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

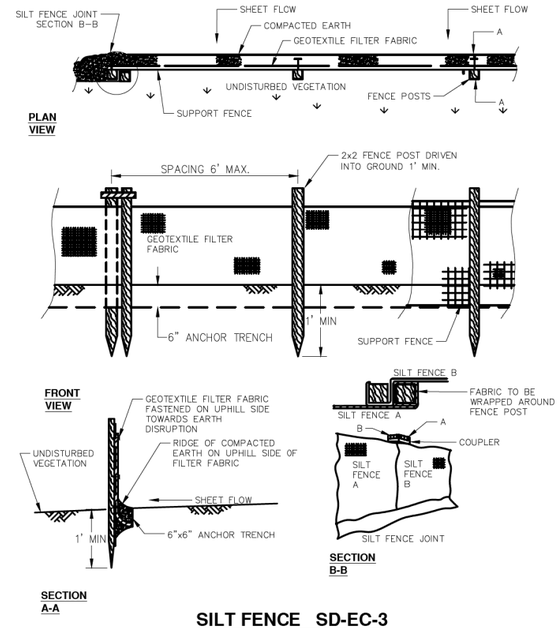
IT IS THE INTENT OF THE PLANS AND SPECIFICATIONS THAT THE CONTRACTOR INSTALL THE REBAR AS SHOWN IN THIS DETAIL TO PROVIDE A FULLY FUNCTIONING UNIT. ALL COSTS ASSOCIATED WITH PURCHASING, CLEANING AS MANY TIMES AS REQUIRED, DISPOSAL OF SEDIMENT, AND REMOVING THE INLET FILTER WHEN NO LONGER NEEDED IS INCLUDED IN THE ITEM OF WORK AND WILL NOT BE PAID FOR SEPARATELY.



NOTE:

PROVIDE EROSION CONTROL MATTING ON ALL DISTURBED AREAS AND AS DIRECTED BY THE ENGINEER.

MULCH BLANKET DETAIL



SILT FENCE SD-EC-3

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

REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORZ DATUM	VERT DATUM
6/28/2022	1022-18-0011	MB	CE	JK	WASHTENAW	CITY OF ANN ARBOR	H: 1"=20' V: N/A	NAD83	NAVD88

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

EROSION CONTROL DETAILS

SHEET 60 of 80

DRAWING PATH: P:\1000_1999\1022180010_Bandemer-Barton_Trail\Drawings\Civil\Plans_Const\180010SECS_DET.dwg Apr 12, 2024 - 9:56am

BORING B 1

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: KJT | CHECKED BY: DF

LATITUDE: 42.30229
LONGITUDE: -83.74706
ELEVATION: 778 FT
<<C>>

HAMMER EFFICIENCY: 83%
DATE: 3/10/2020
N_{60} -- O

DRY DENSITY (pcf) --■ 90 100 110 120
MOISTURE & ATTERBERG LIMITS (%) PL MC LL 10 20 30 40
SHEAR STRENGTH (KSF) 1 2 3 4
▼ HAND PENE. ■ TORVANE SHEAR ● UNC. COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⌖ TRIAXIAL (UU)

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	REMARKS
775	0	Fine to Coarse CLAYEY SAND- Occasional Topsoil Layers- Dark Gray- Moist to Wet- Very Loose (SC)	SB1	6	1 0 1	
	3.0		SB2	18	1 1 2	
	5	LEAN CLAY- Trace Root Hairs- Brownish Gray- Soft (CL)	SB3	18	2 2 3	
	7.0	771.0	SB4	18	4 5 5	
770	9.0	LEAN CLAY- Brownish Gray- Stiff (CL) 769.0				
	10	BOTT/CULVERT EL 770.29	SB5	18	8 11 12	
765	15	LEAN CLAY- Occasional to Frequent Wet Fine Silty Sand Layers 11.5' to 16'- Gray- Stiff to Hard (CL)	SB6	18	6 12 13	
			SB7	18	5 11 14	
760	20		SB8	18	7 11 12	
	22.0	756.0				
755	25	Fine to Medium SILTY SAND- Occasional Gravel Layer after 30'- Gray- Wet- Dense (SM)	SB9	18	3 12 14	
750		BOTT/TEMP SHEETING EL 749.29	SB10	18	10 15 20	
	30					

GROUNDWATER & BACKFILL INFORMATION

DEPTH (FEET) ELEV (FT)
▽ DURING BORING: 2.5 775.5
▼ 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. West 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 interity 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 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 2:59:32 PM

SME

BORING B4

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

STATION: Approx. Sta. 135+80
LOCATION: 5 ft. Lt of CL
ELEVATION: 788± FT

HAMMER EFFICIENCY: 80%
DATE: 11/11/2021
N_{60} -- O

DRY DENSITY (pcf) --■ 90 100 110 120
MOISTURE & ATTERBERG LIMITS (%) PL MC LL 10 20 30 40
SHEAR STRENGTH (KSF) 1 2 3 4
▽ HAND PENE. ■ TORVANE SHEAR ● UNC. COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⌖ TRIAXIAL (UU)

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	REMARKS
785	0	14 Inches of Fine to Medium SAND (SP) 786.8	SB1	18	4 2 1	
	1.2		SB2	18	2 3 6	
	5	Fine to Medium CLAYEY SAND with Gravel- Brown- Moist- Very Loose to Medium Dense (SC)	SB3	18	3 3 3	
	6.5	781.5	SB4	18	5 7 8	
780	10.0	LEAN CLAY- Brown- Medium to Very Stiff (CL) 778.0				
	10	END OF BORING AT 10.0 FEET.				
775	15					
770	20					
765	25					
760	30					
755	35					

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) 272-9836

REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	HI:	SCALE	V:	HORIZ DATUM	VERT DATUM
4/12/2024	080118.00	JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	NONE		NONE	NAD83	NAVD88

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

SOIL BORING DATA

SHEET 61 of 80

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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

STATION: Approx. Sta. 136+90
LOCATION: 5 ft. Rt of CL
ELEVATION: 781± FT

ELEV (FT)	DEPTH (FT)	PROFILE DESCRIPTION	SAMPLE TYPE/NO.	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	REMARKS
780	0	15 Inches of TOPSOIL				
	1.3	779.7				
	2.0	Fine SILTY SAND- Brown- Moist- Loose (SM)	SB1	18	2 2 3	
	779.0					
		Fine to Medium SILTY SAND - Brown- Moist- Loose (SM)	SB2	18	3 2 4	
775	5.5	775.5				
		Fine to Coarse SAND with Silt and Gravel- Brown- Wet- Dense (SP-SM)	SB3	1	19 14 14	Driller reported driving cobble.
	7.0	774.0				
		LEAN CLAY- Frequent Silty Clay Layers between 7 and 9 feet- Gray- Very Stiff to Hard (CL)	SB4	18	5 6 9	
770	10		SB5	18	5 7 7	
			SB6	18	5 8 10	
	15.0	766.0				
765	15	SILTY CLAY with Sand- Gray- Hard (CL/ML)	SB7	18	8 8 13	
			SB8	18	7 10 13	
760	20					
			SB9	18	15 19 21	
755	25					
	27.5	753.5				
		Fine to Medium SILTY SAND- Gray- Wet- Very Dense (SM)	SB10	18	18 22 31	
	30.0	751.0				
750	30	END OF BORING AT 30.0 FEET.				
	35					

HAMMER EFFICIENCY: 80%
DATE: 11/11/2021
N_{60} – ○

DRY DENSITY (pcf) – ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)
SHEAR STRENGTH (KSF) (1 2 3 4)
▽ HAND PENE. ▩ TORVANE SHEAR ● UNC. COMP. ⊡ VANE SHEAR (PK) ✕ VANE SHEAR (REM) ⌖ TRIAXIAL (UU)

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.

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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

STATION: Approx. Sta. 138+70
LOCATION: 5 ft. Lt of CL
ELEVATION: 782± FT

ELEV (FT)	DEPTH (FT)	PROFILE DESCRIPTION	SAMPLE TYPE/NO.	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	REMARKS
780	0	13 Inches of TOPSOIL				
	1.1	780.9				
		Fine to Medium SAND with Silt- Brown- Wet- Very Loose (SP-SM)	SB1	18	1 2 1	
	3.5	778.5				
		Sandy ORGANIC SILT- Dark Gray (OL)	SB2	18	0 0 1	
775	5.0	777.0				
		Fine to Coarse CLAYEY SAND with Gravel- Frequent Shell Fragments- Gray- Wet- Loose (SC)	SB3	6	2 3 3	
	8.0	774.0				
		LEAN CLAY- Brown to Gray at 10 feet- Hard (CL)	SB4	18	4 6 8	
770	10		SB5	18	5 6 9	
	13.0	769.0				
			SB6	18	6 8 11	
765	15	SILTY CLAY with Sand Seams below 23 feet- Gray- Hard to Very Stiff (CL/ML)	SB7	18	5 8 13	
			SB8	18	8 9 13	
760	20					
			SB9	18	8 7 8	
755	25					
	27.5	754.5				
		Fine to Coarse SAND- Brown- Wet- Dense (SP)	SB10	18	8 13 15	
	30.0	752.0				
750	30	END OF BORING AT 30.0 FEET.				
	35					

HAMMER EFFICIENCY: 80%
DATE: 11/11/2021
N_{60} – ○

DRY DENSITY (pcf) – ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)
SHEAR STRENGTH (KSF) (1 2 3 4)
▽ HAND PENE. ▩ TORVANE SHEAR ● UNC. COMP. ⊡ VANE SHEAR (PK) ✕ VANE SHEAR (REM) ⌖ TRIAXIAL (UU)

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.

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REVISIONS

DATE	PRO. NUMBER	ENG	PROJ. MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: NONE V: NONE	NAD83	NAVD88

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

SOIL BORING DATA

SHEET

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3/28/24 4:04:46 PM

SME

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

LATITUDE: 42.30229
LONGITUDE: -83.74706
STATION: Approx. Sta. 141+-5
LOCATION: 5 ft. Lt of CL
ELEVATION: 780± FT

HAMMER EFFICIENCY: 83%
DATE: 3/10/2020
N_{60} -- O

DRY DENSITY (pcf) -- ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) (PL MC LL)
SHEAR STRENGTH (KSF) (1 2 3 4)
▽ HAND PENE. ■ TORVANE SHEAR ● UNC. COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU)

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	REMARKS
780	0	Fine to Coarse CLAYEY SAND- Occasional Sandy Organic Layers- Dark Gray- Moist to Wet- Very Loose (SC)	SB1	6	1 0 1	
	3.0	777.0				
		LEAN CLAY- Occasional Root Fragments- Brownish Gray- Soft to Very Soft (CL)	SB2	18	1 1 2	
775	5		SB3	18	2 2 3	
	7.0	773.0				
		LEAN CLAY- Brownish Gray- Stiff (CL)	SB4	18	4 5 5	
	9.0	771.0				
770	10		SB5	18	8 11 12	
			SB6	18	6 12 13	
765	15	LEAN CLAY- Occasional to Frequent Wet Fine Silty Sand Layers between 11.5 and 16 feet- Gray- Stiff to Hard (CL)	SB7	18	5 11 14	
			SB8	18	7 11 12	
760	20					
	22.0	758.0				
			SB9	18	3 12 14	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.
755	25	Fine to Medium SILTY SAND- Occasional Gravel Layers after 30 feet- Gray- Wet- Dense (SM)				
			SB10	18	10 15 20	
750	30					
			SB11	18	11 13 17	
745	35					

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)

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SME

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

LATITUDE: 42.30229
LONGITUDE: -83.74706
STATION: Approx. Sta. 141+-5
LOCATION: 5 ft. Lt of CL
ELEVATION: 780± FT

HAMMER EFFICIENCY: 83%
DATE: 3/10/2020
N_{60} -- O

DRY DENSITY (pcf) -- ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) (PL MC LL)
SHEAR STRENGTH (KSF) (1 2 3 4)
▽ HAND PENE. ■ TORVANE SHEAR ● UNC. COMP. ⊡ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU)

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	REMARKS
745	35	Fine to Medium SILTY SAND- Occasional Gravel Layers after 30 feet- Gray- Wet- Dense (SM) *(continued)*				
	37.5	742.5				
			SB12	6	63	
740	40	Fine to Medium SILTY SAND with Gravel- Occasional Cobbles- Brown- Extremely Dense to Very Dense (SM)				
			SB13	5	51	
735	45					
	50.0	730.0	NR14	0	22 25 31	
730	50	END OF BORING AT 50.0 FEET.				
725	55					
720	60					
715	65					
710	70					
705	75					
700	80					

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REVISIONS

DATE 4/12/2024 | PRO.NUMBER | ENG JAH | PROJ.MGR JAH | CADD JAH | COUNTY WASHTENAW | CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR | SCALE H: NONE V: NONE | HORIZ DATUM NAD83 | VERT DATUM NAVD88

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

SOIL BORING DATA

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SME

BORING B8

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	STATION: Approx. Sta. 140+95 ELEVATION: 787± FT PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 80% DATE: 11/11/2021 N_{60} -- ○	DRY DENSITY (pcf) -- ■ 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		24 Inches of SANDY TOPSOIL 2.0 785.0	SB1	0	3 2 1	4			
			FILL- Fine to Coarse SILTY SAND with Gravel- Occasional Cinder Pieces- Brown- Moist- Very Loose (SM) 4.0 783.0	SB2	10	2 2 2	5			
780	5		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 2 2	5			
				SB4	10	2 2 2	5			
775	10		11.5 775.5	SB5	18	1 2 2	5			
			Sandy LEAN CLAY with Organics- Black (CL) 13.0 774.0	SB6	18	6 6 8	19	15 121	4.5+	
770	15		LEAN CLAY with Sand- Gray- Very Stiff to Hard (CL)	SB7	18	6 7 8	20	14		
				SB8	18	6 7 8	20	12	4.5+	
765	20		23.0 764.0	SB9	18	6 7 11	24	10	4.5+	
			SILTY CLAY with Sand- Gray- Hard (CL/ML)							
760	25		29.0 758.0	SB10	11	12 19 19	51		4.5+	
			Fine to Medium CLAYEY SAND- Dense- Gray- Wet- Very Dense (SC) 33.5 753.5							
755	30			SB11	18	7 14 14	37			
	35									

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)

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SME

BORING B8

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	STATION: Approx. Sta. 140+95 ELEVATION: 787± FT PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 80% DATE: 11/11/2021 N_{60} -- ○	DRY DENSITY (pcf) -- ■ 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	35		Fine to Coarse SAND with Gravel- Gray- Wet- Dense to Very Dense (SP) *(continued)*	SB12	18	15 18 23	55			
745	40		43.5 743.5	SB13	18	12 21 24	60			
			Fine SAND- Gray- Wet- Very Dense (SP) 47.0 740.0	SB14	18	10 15 26	55	16	4.5+	
740	45		LEAN CLAY- Gray- Hard (CL)							
735	50			SB15	6	35 60/0.5"	60+		4.5+	
730	55		55.0 732.0 Fine to Medium CLAYEY SAND- Gray- Wet- Extremely Dense (SC) 58.7 728.3	SB16	2	60/2"	80+			
725	60		END OF BORING AT 58.7 FEET.							
720	65									
715	70									
710	75									
	80									

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REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H: NONE V: NONE	NAD83	NAVD88

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

SOIL BORING DATA

SHEET 64 of 80

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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

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 80% DATE: 11/11/2021 N_{60} – ○ (10 20 30 40)	DRY DENSITY (pcf) – ■ (90 100 110 120); MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	HAND PENE. ▽; TORVANE SHEAR ■; UNC. COMP. ●; VANE SHEAR (PK) ⊡; VANE SHEAR (REM) ×; TRIAXIAL (UU) ⊕; SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
	0		STATION: Approx. Sta. 142+65 LOCATION: 20 ft. Rt of CL ELEVATION: 784± FT							
			17 Inches of CLAYEY SAND-TOPSOIL							
	1.4									
780				SB1	18	5 6 6	16	14	4.5+	
	5		FILL- SILTY CLAY with Sand- Brown- Very Stiff to Hard (CL/ML)	SB2	18	3 3 3	8	13		Driller reported driving Cobbles at 4.5 to 6 feet.
				SB3	18	5 5 5	13	13	4.5+	
	8.0									
775			FILL- LEAN CLAY with Fine to Medium Clayey Sand and Topsoil Layers- Gray- Stiff (CL)	SB4	18	3 3 3	8	17 15 24		PI=9
	10			SB5	18	3 3 4	9			
	13.5									
770 ▼			CLAYEY SAND and Sandy LEAN CLAY- Frequent Wood Pieces- Occasional Wet Sand Layers- Dark Brown and Black- Moist to Wet- Loose (SC/CL)	SB6	18	1 2 3	7	38		
	15									
	15.0			SB7	18	2 2 3	7			
	17.5		ORGANIC SILT- Frequent Shell Fragments and Sand Seams- Gray and Brown (OL)							
765			Fine to Coarse SAND with Gravel- Brown and Gray- Wet- Medium Dense (SP)	SB8	10	2 5 13	24			
	20									
	22.0									
760			SANDY SILTY CLAY with Gravel- Gray to Brown- Hard (CL-ML)	SB9	10	8 9 13	29	17		
	25									
755				SB10	18	17 19 20	52	14 11 18		PI=7
	30		BOTT/SHEETING EL 753.00							
	31.5									
			LEAN CLAY- Gray- Hard (CL)	SB11	12	30 41 54	127	23	4.5+	
750	35									

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 and longitude obtained with a Geode GNS2 Submeter GPS unit. Estimated ground surface elevation is based on available project drawings.

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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

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES	HAMMER EFFICIENCY: 80% DATE: 11/11/2021 N_{60} – ○ (10 20 30 40)	DRY DENSITY (pcf) – ■ (90 100 110 120); MOISTURE & ATTERBERG LIMITS (%) PL MC LL (10 20 30 40)	HAND PENE. ▽; TORVANE SHEAR ■; UNC. COMP. ●; VANE SHEAR (PK) ⊡; VANE SHEAR (REM) ×; TRIAXIAL (UU) ⊕; SHEAR STRENGTH (KSF) (1 2 3 4)	REMARKS
	35		STATION: Approx. Sta. 142+65 LOCATION: 20 ft. Rt of CL ELEVATION: 784± FT							
			LEAN CLAY- Gray- Hard (CL) *(continued)*							
	36.0									
745			SILT- Gray- Wet- Extremely Dense (ML)	SB12	18	15 32 41		97		
	40									
	43.0									
740			SILTY CLAY- Gray- Hard (CL/ML)	SB13	18	11 12 17		39	4.5+	
	45									
	49.0			SB14	2	60/6"		80+		
735			GRAVEL with Cobbles							
	50									
	52.0									
			END OF BORING AT 52.0 FEET.							
730	55									
725	60									
720	65									
715	70									
710	75									
705	80									

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REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	H:	SCALE	HORIZ DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	NONE	V: NONE	NAD83

VERT DATUM NAVD88

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

SOIL BORING DATA

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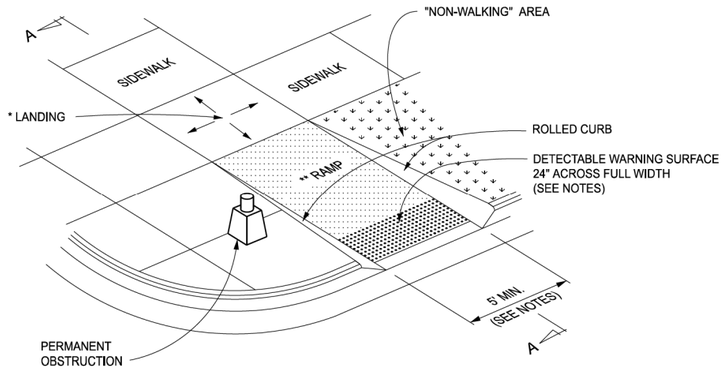
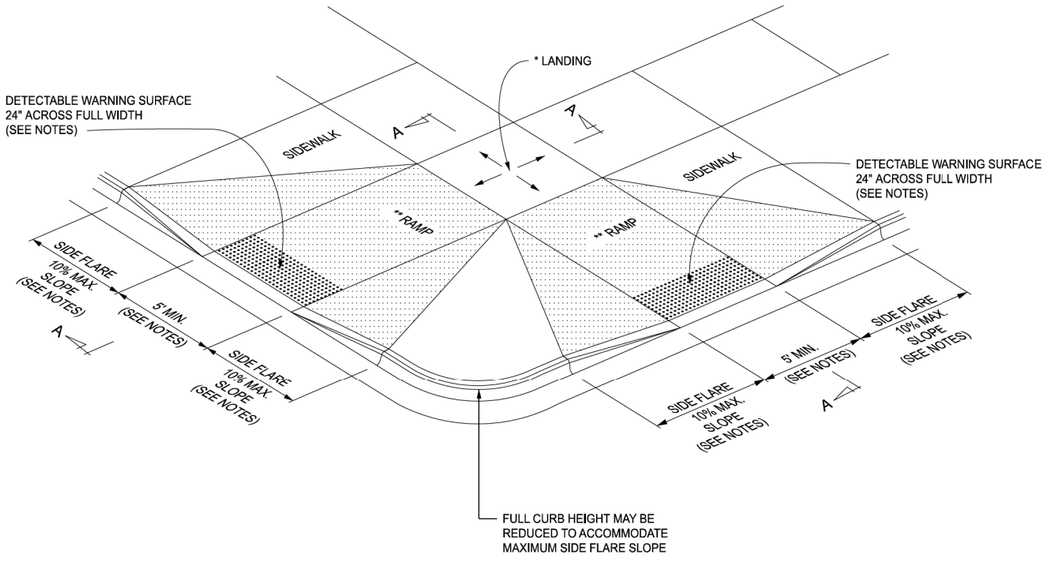
* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** 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

MDOT Michigan Department of Transportation

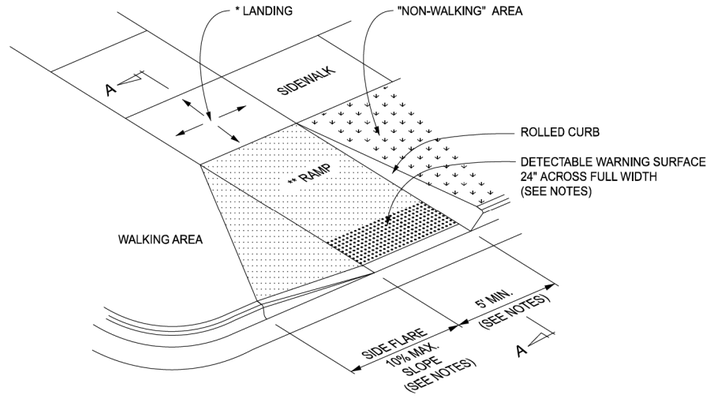
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
CURB RAMP AND
DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)	11/08/2023	R-28-K	SHEET
FHWA APPROVAL	PLAN DATE		1 OF 7

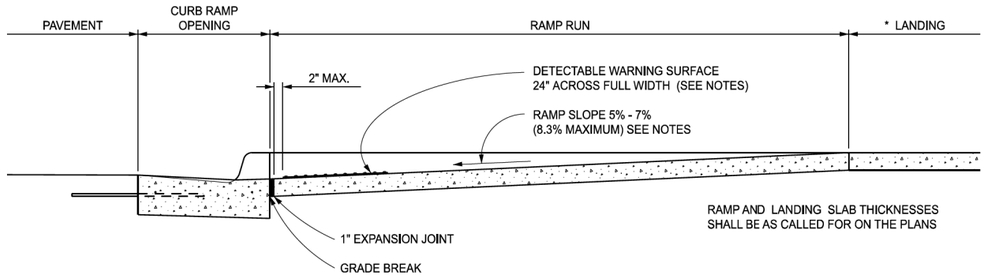
* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

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



CURB RAMP TYPE RF

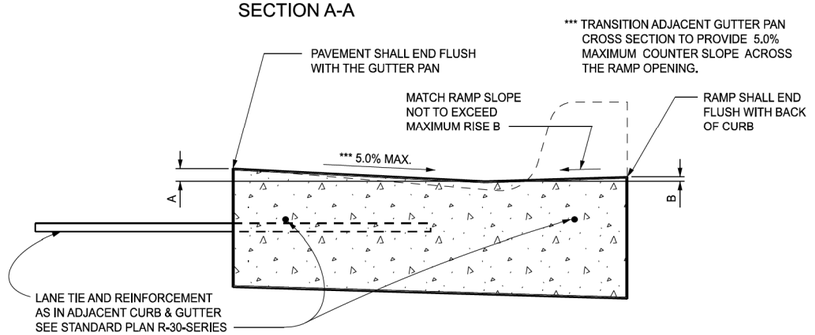
(ROLLED / FLARED SIDES)



SECTION A-A

CURB TYPE	MAXIMUM RISE (INCHES)	
	A	B
B1	¾	1
B2	¾	1
B3	¾	1
D1	¾	1
D2	¾	1
D3	¾	1
C1	½	½
C2	½	½
C3	¾	½
C4	¾	½
C5	1	½
C6	1	½
F1	½	½
F2	½	½
F3	¾	½
F4	¾	½
F5	1	½
F6	1	½

FOR CURB TYPES SEE
STANDARD PLAN R-30-SERIES



SECTION THROUGH CURB RAMP OPENING

(TYPICAL ALL RAMP TYPES)

MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
CURB RAMP AND
DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)	11/08/2023	R-28-K	SHEET
FHWA APPROVAL	PLAN DATE		2 OF 7

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	H:	V:	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR				NAD83	NAVD88

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

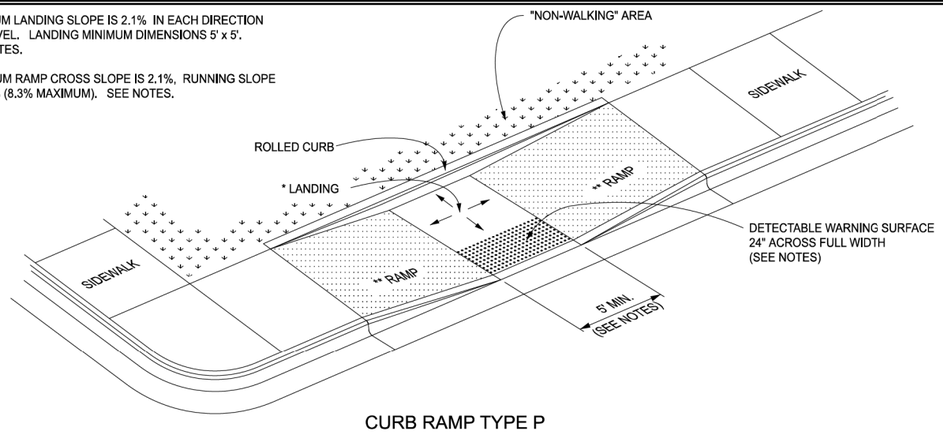
SPECIAL DETAILS

SHEET 66 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_001.dgn

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

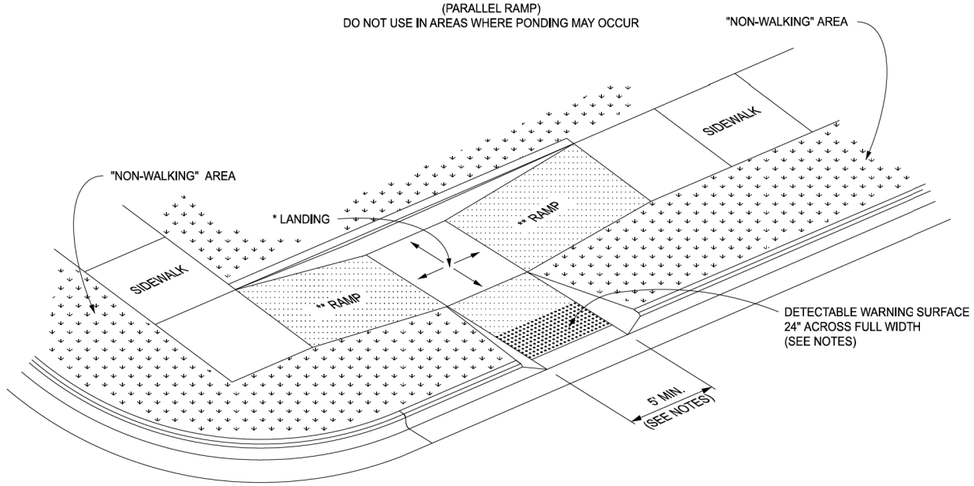
** MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



CURB RAMP TYPE P

(PARALLEL RAMP)

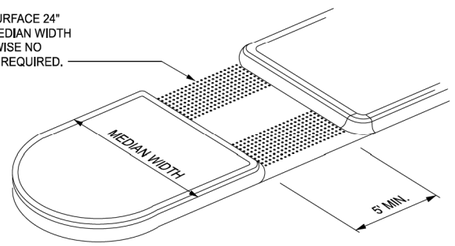
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR



CURB RAMP TYPE C

(COMBINATION RAMP)

DETECTABLE WARNING SURFACE 24" ACROSS FULL WIDTH IF MEDIAN WIDTH IS AT LEAST 6'-0". OTHERWISE NO DETECTABLE WARNING IS REQUIRED.



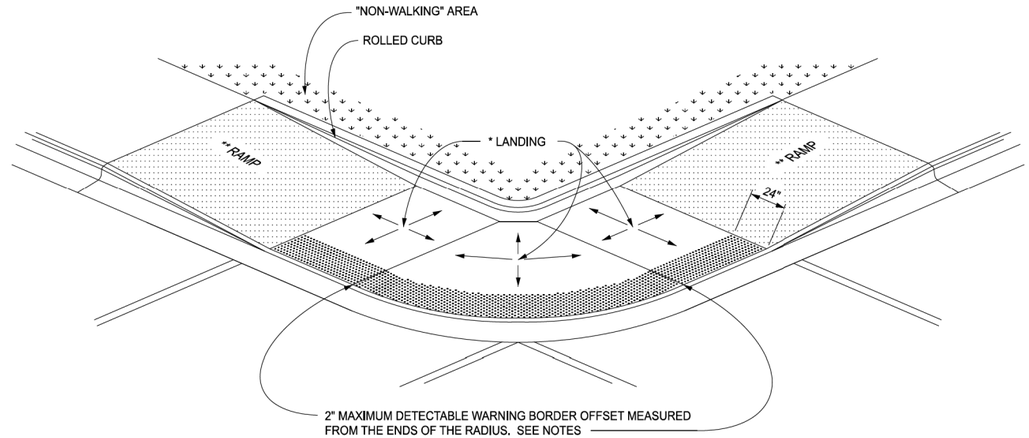
CURB RAMP TYPE M

(MEDIAN ISLAND)

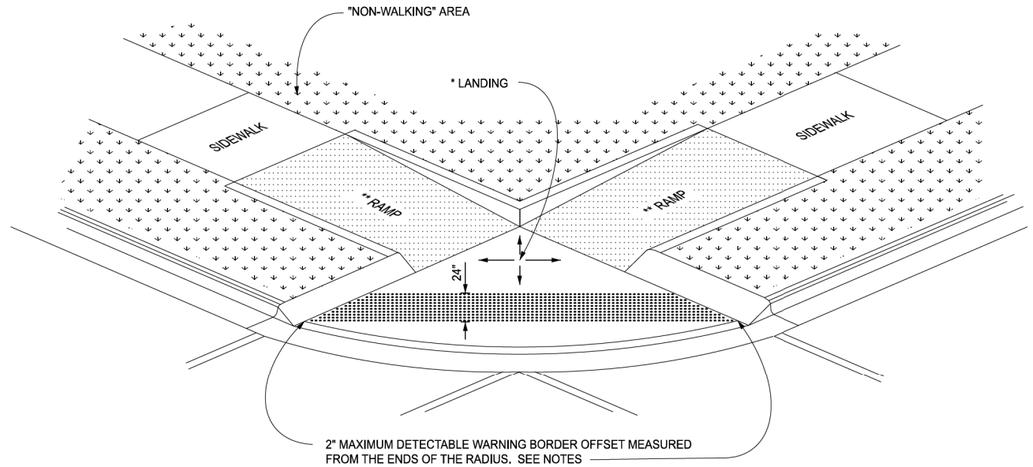
MDOT Michigan Department of Transportation	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS			
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	11/08/2023 PLAN DATE	R-28-K	SHEET 3 OF 7

* 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.



(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

MDOT Michigan Department of Transportation	STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS			
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	11/08/2023 PLAN DATE	R-28-K	SHEET 4 OF 7

Colliers Engineering & Design
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REVISIONS

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4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR		V:	NAD83	NAVD88

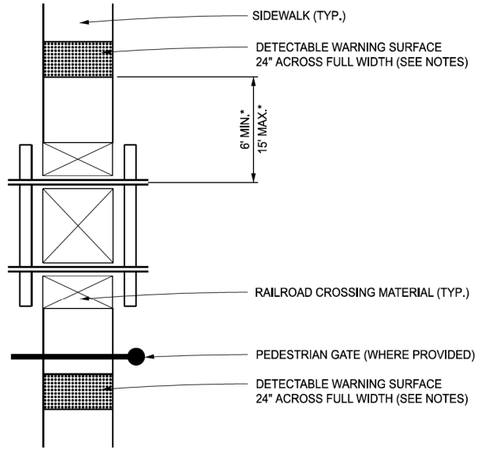
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

SPECIAL DETAILS

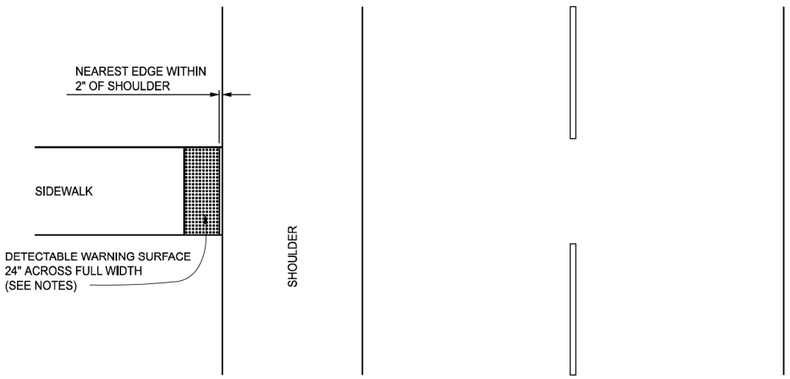
SHEET 67 of 80

O:\WCPRC\015514.00 WCPRC - 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.

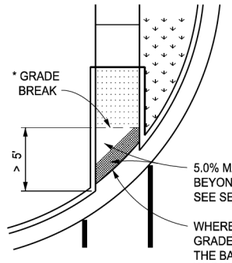


DETECTABLE WARNING AT RAILROAD CROSSING

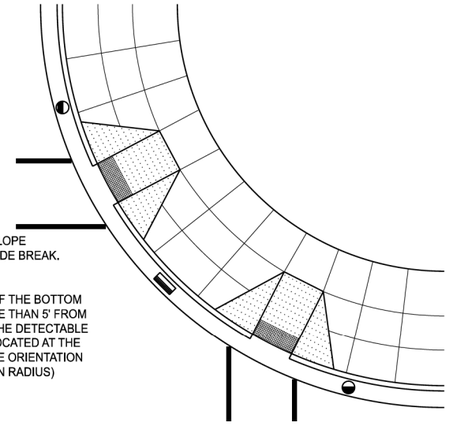


DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY

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



CURB RAMP LOCATED IN RADIUS (TYPE R SHOWN)
(GRADE BREAK OFFSET GREATER THAN 5')

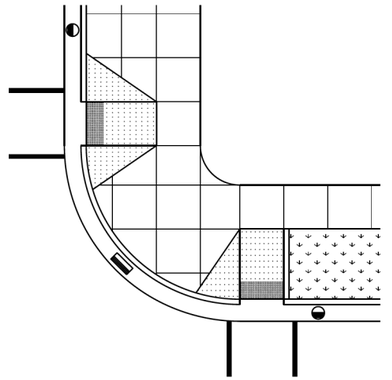


CURB RAMP PERPENDICULAR TO RADIAL CURB (TYPE F SHOWN)

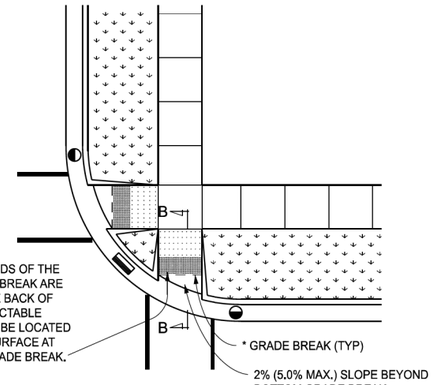
(USE WITH RADIAL CURB WHEN THE CROSSWALK AND CURB RAMP ARE NOT ALIGNED)

LEGEND

- SLOPED SURFACE
- DETECTABLE WARNING
- "NON-WALKING" AREA
- CROSSWALK MARKING
- PREFERRED LOCATION OF DRAINAGE INLET (TYP.)
- ALTERNATE LOCATION OF DRAINAGE INLET (TYP.)



CURB RAMP PERPENDICULAR TO TANGENT CURB
(TYPE F AND TYPE RF SHOWN)

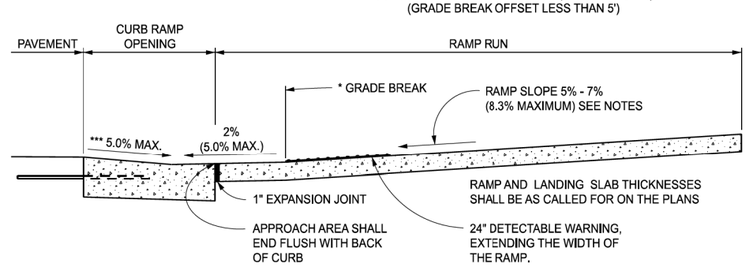


CURB RAMP LOCATED IN RADIUS (TYPE R SHOWN)
(GRADE BREAK OFFSET LESS THAN 5')

* 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

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

Colliers Engineering & Design
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REVISIONS

DATE 4/12/2024 | PROJ NUMBER | ENG JAH | PROJ MGR JAH | CADD JAH | COUNTY WASHTENAW | CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR | SCALE | VC | HC | HORIZ DATUM NAD83 | VERT DATUM NAVD88 | SHEET

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

SPECIAL DETAILS

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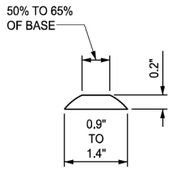
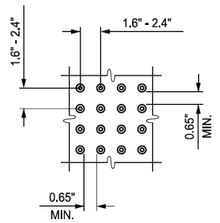
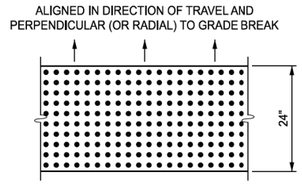


DOME SECTION



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 ≤ 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 ½". 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.

MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
CURB RAMP AND
DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)	11/08/2023	R-28-K	SHEET
FHWA APPROVAL	PLAN DATE		7 OF 7

Colliers Engineering & Design
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REVISIONS

DATE 4/12/2024
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H:
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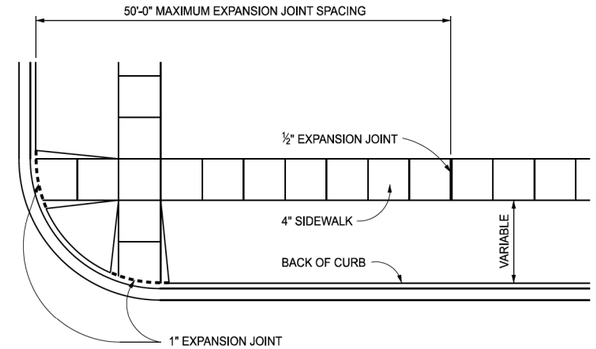
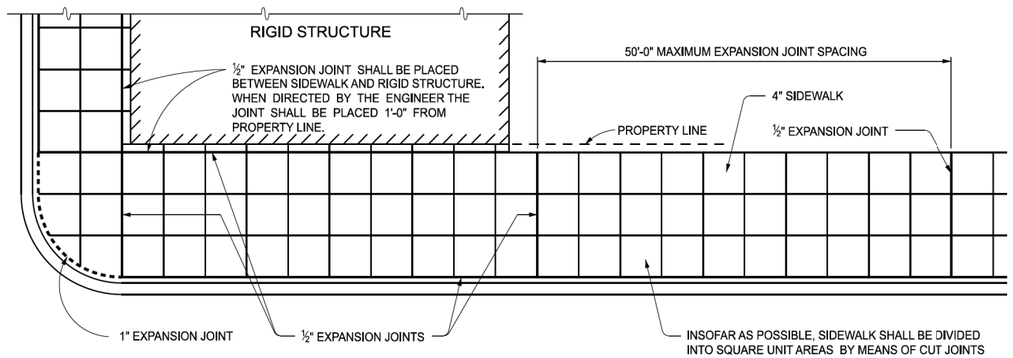
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

SPECIAL DETAILS

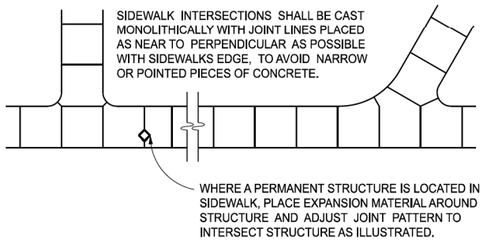
SHEET 69 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn

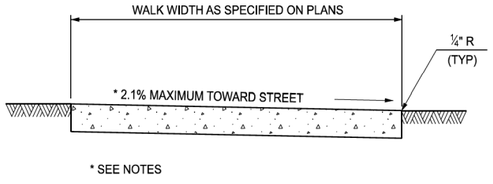




LOCATION OF JOINTS IN CONCRETE SIDEWALK



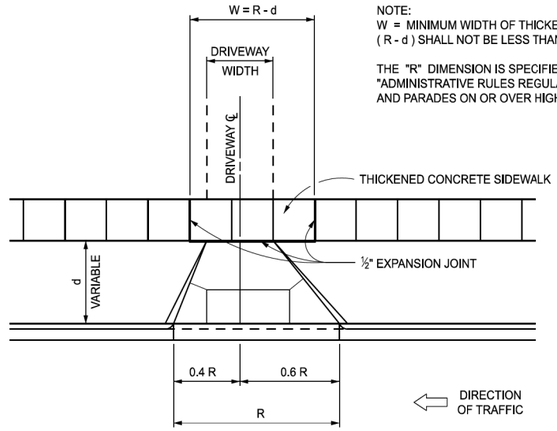
TYPICAL SIDEWALK JOINT LAYOUTS



* SEE NOTES

4" CONCRETE SIDEWALK

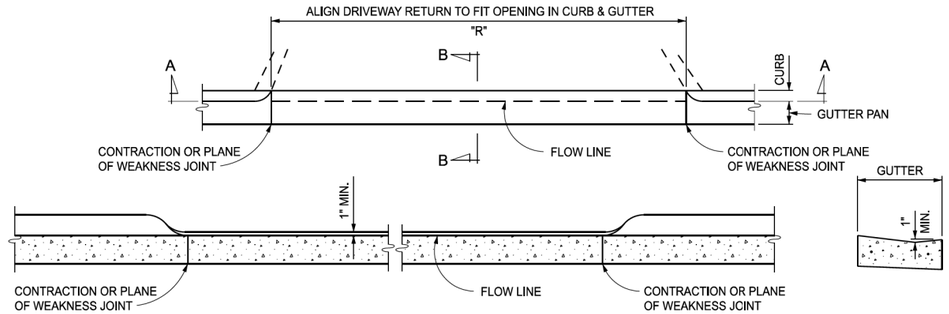
APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT	MDOT Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK	
		(SPECIAL DETAIL) FHWA APPROVAL | 11/08/2023 PLAN DATE | R-29-J	SHEET 1 OF 4



NOTE:
W = MINIMUM WIDTH OF THICKENED CONCRETE SIDEWALK.
(R - d) SHALL NOT BE LESS THAN DRIVEWAY WIDTH.

THE "R" DIMENSION IS SPECIFIED IN THE PUBLICATION "ADMINISTRATIVE RULES REGULATING DRIVEWAYS, BANNERS AND PARADES ON OR OVER HIGHWAYS".

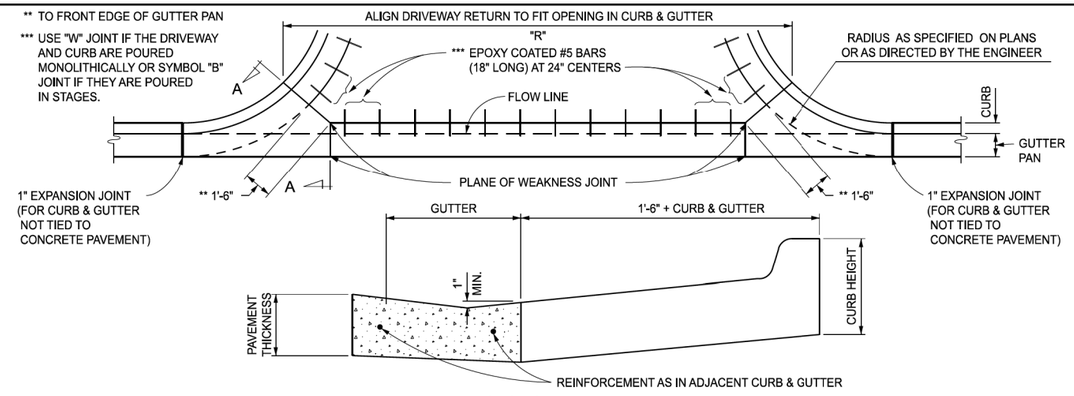
CONCRETE DRIVEWAY OPENING LAYOUT



SECTION A - A

SECTION B - B

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.

MDOT Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK		
	(SPECIAL DETAIL) FHWA APPROVAL | 11/08/2023 PLAN DATE | R-29-J	SHEET 2 OF 4

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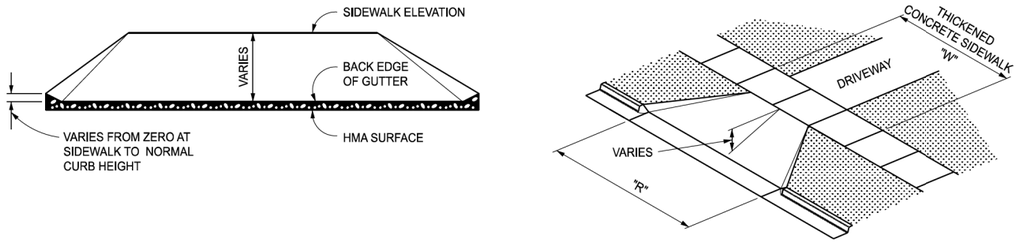
REVISIONS

HORIZ DATUM NAD83 | VERT DATUM NAVD88
SCALE VC
H:
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
COUNTY WASHTENAW
CADD JAH
PROJ MGR JAH
ENG JAH
PROJ NUMBER
DATE 4/12/2024

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

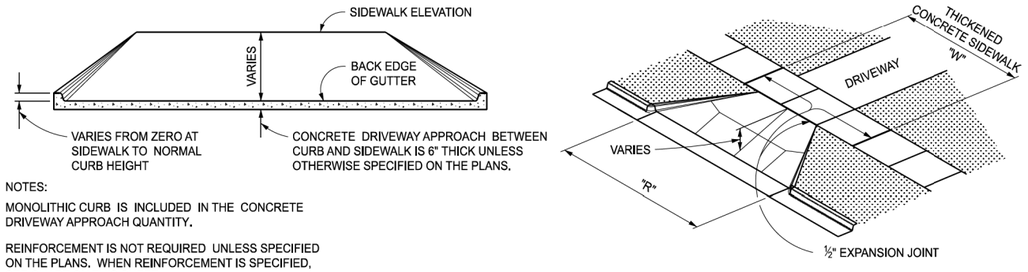
SHEET 70 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn



HMA DRIVEWAY APPROACH

(TO BE USED WITH DETAIL L)



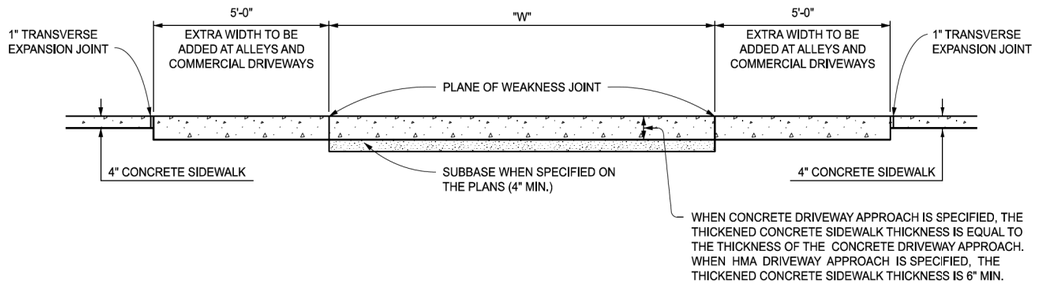
NOTES:

MONOLITHIC CURB IS INCLUDED IN THE CONCRETE DRIVEWAY APPROACH QUANTITY.

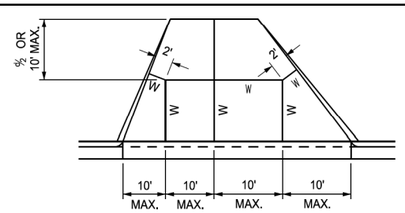
REINFORCEMENT IS NOT REQUIRED UNLESS SPECIFIED ON THE PLANS. WHEN REINFORCEMENT IS SPECIFIED, SEE CHART ON THIS SHEET.

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

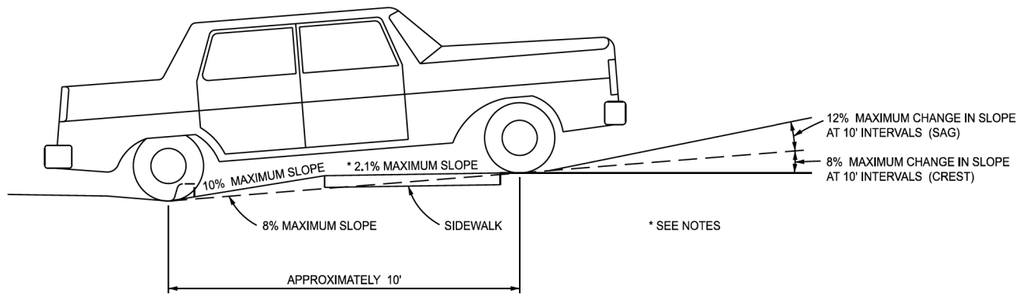
REINFORCEMENT FOR CONCRETE DRIVEWAYS		
CONCRETE DRIVEWAY THICKNESS	WIRE SIZE (6" x 6" MESH)	AVERAGE WEIGHT (LBS/100 SFT)
LESS THAN 8"	W1.4	21
	W2.9	42
8" OR GREATER	USE WIRE FABRIC REINFORCEMENT SPECIFIED ON STANDARD PLAN R-37-SERIES	

MDOT Michigan Department of Transportation

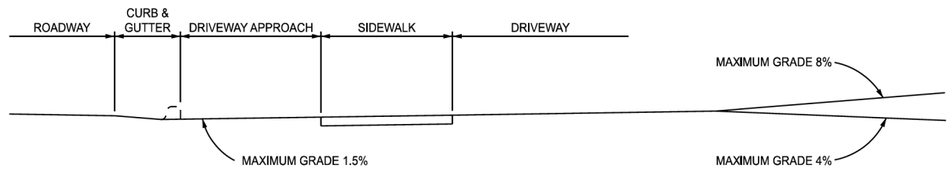
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

(SPECIAL DETAIL) FHWA APPROVAL	11/08/2023 PLAN DATE	R-29-J	SHEET 3 OF 4



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.

MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

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

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

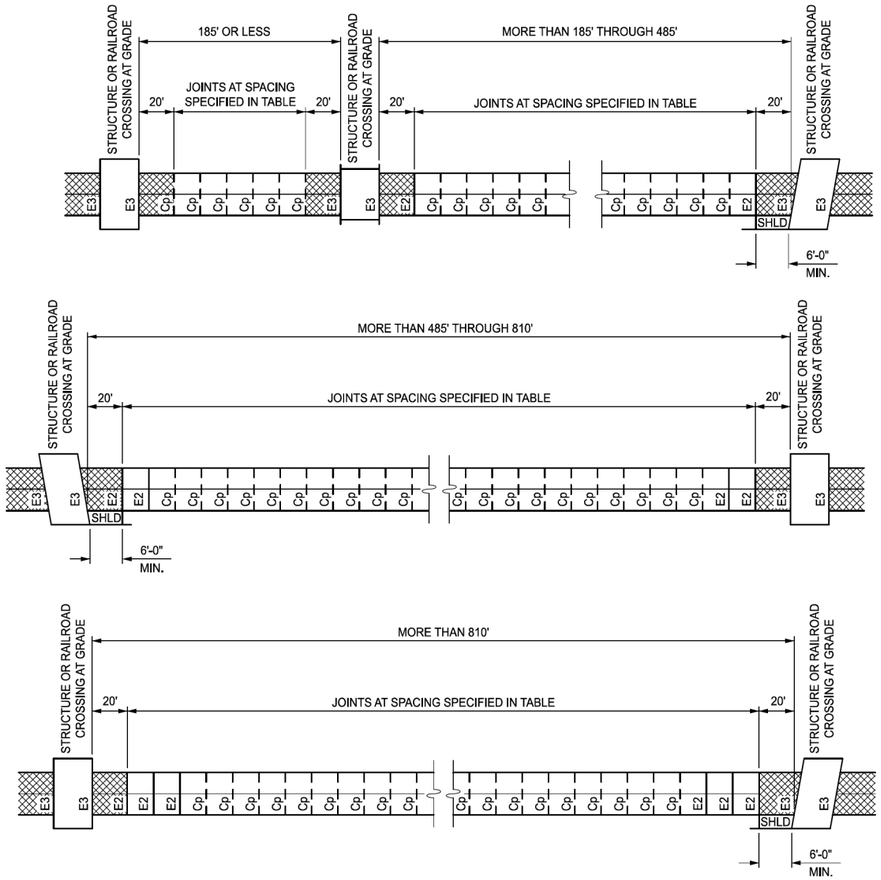
REVISIONS

DATE 4/12/2024 | PRO NUMBER | ENG JAH | PROJ MGR JAH | DESIGNED | CADD JAH | CHECKED | COUNTY WASHTENAW | CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR | SCALE | H: | V: | HORZ DATUM NAD83 | VERT DATUM NAVD88

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

SHEET 71 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_spcdet_002.dgn



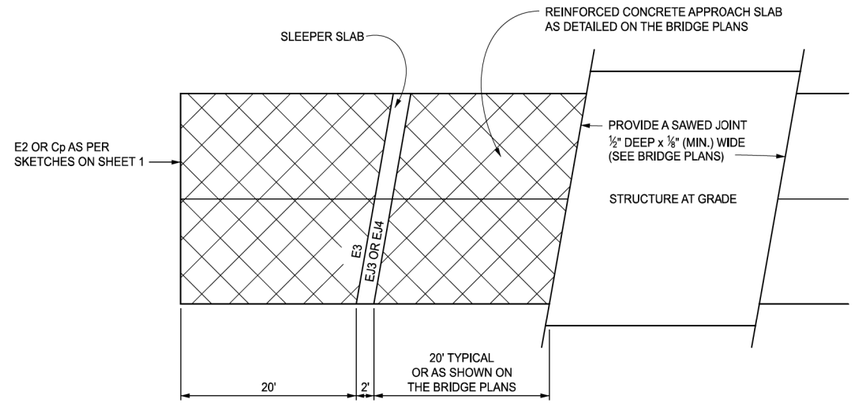
PLAN VIEW SHOWING TRANSVERSE JOINT LOCATIONS

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

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

JOINTED PLAIN CONCRETE PAVEMENT	
PAVEMENT THICKNESS	JOINT SPACING
6½" TO 8¾"	12'
9" TO 11¾"	14'
12" OR MORE	16'



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.

APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT

(SPECIAL DETAIL) FHWA APPROVAL	01/04/2022 PLAN DATE	R-43-J	SHEET 1 OF 2

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT

(SPECIAL DETAIL) FHWA APPROVAL	01/04/2022 PLAN DATE	R-43-J	SHEET 2 OF 2

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REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORZ DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR		NAD83

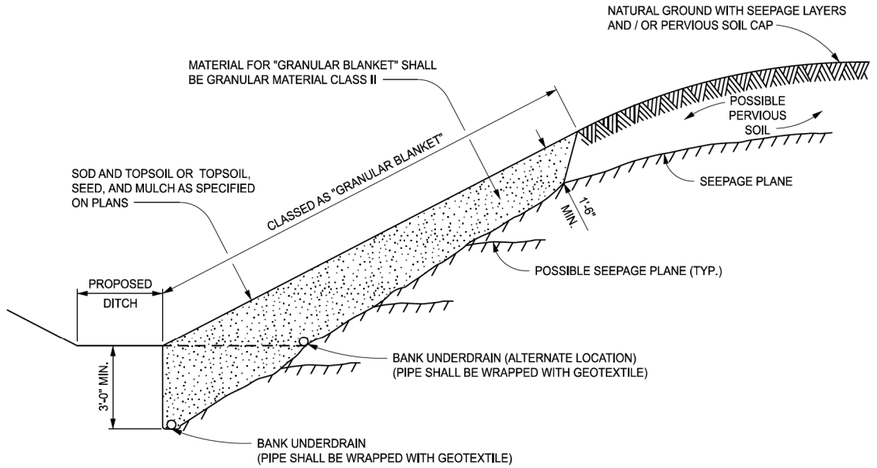
VERT DATUM NAVD88

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

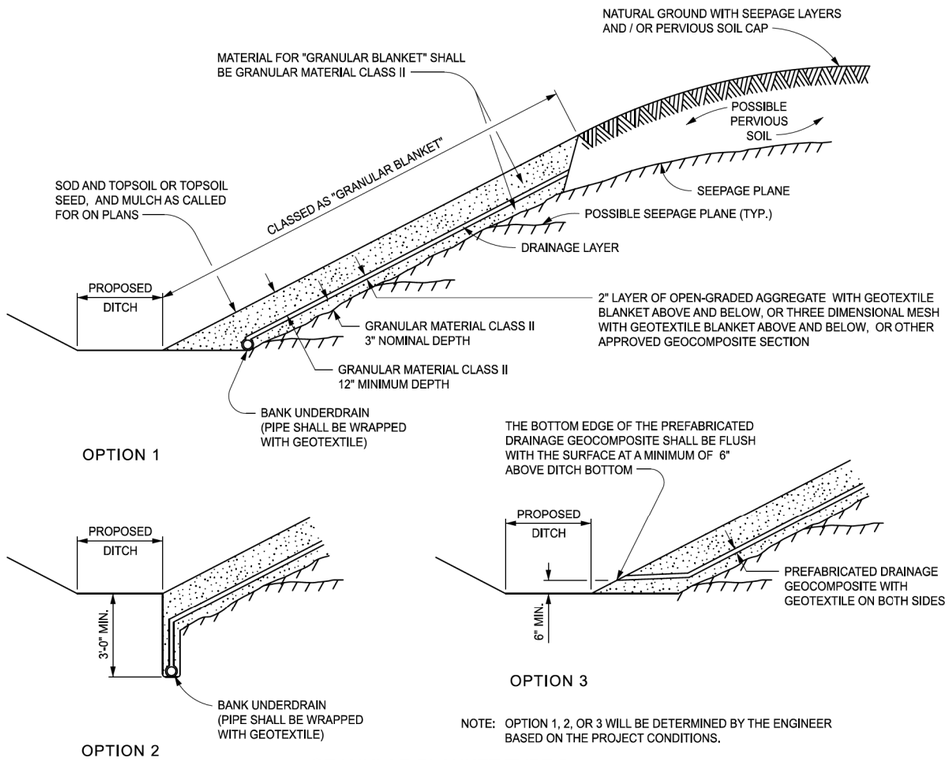
SPECIAL DETAILS

SHEET 72 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn

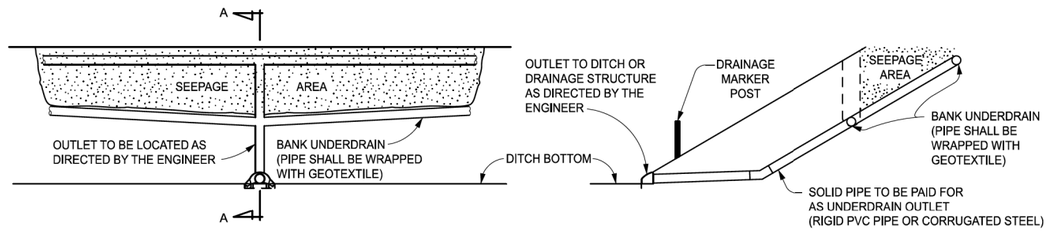


GRANULAR BLANKET TYPE 1



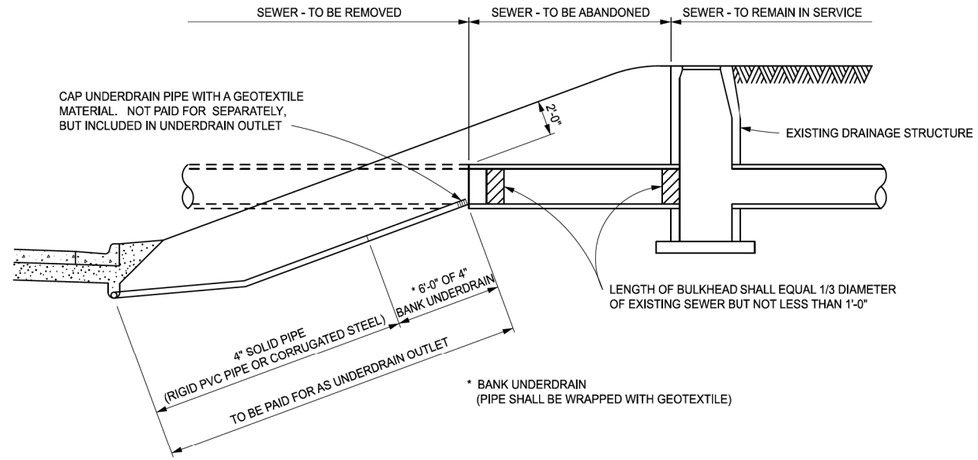
NOTE: OPTION 1, 2, OR 3 WILL BE DETERMINED BY THE ENGINEER BASED ON THE PROJECT CONDITIONS.

GRANULAR BLANKET TYPE 2



SECTION A - A

BANK UNDERDRAIN OUTLET



WEEPER UNDERDRAIN AND BULKHEADING SEVERED SEWER

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS
FOR UNDERDRAINS, AND SEWER BULKHEADS

(SPECIAL DETAIL)	06/28/2021	R-80-F	SHEET 1 OF 8
FHWA APPROVAL	PLAN DATE		

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS
FOR UNDERDRAINS, AND SEWER BULKHEADS

(SPECIAL DETAIL)	06/28/2021	R-80-F	SHEET 2 OF 8
FHWA APPROVAL	PLAN DATE		

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REVISIONS

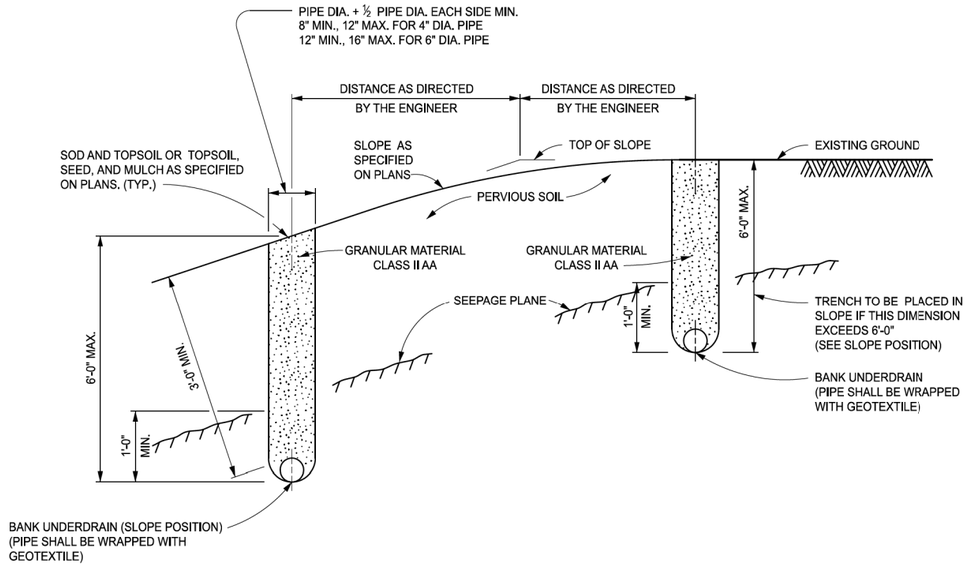
DATE	PRO.NUMBER	ENG	PROJ.MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ.DATUM	VERT.DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	N.T.S.	NAD83	NAVD88

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

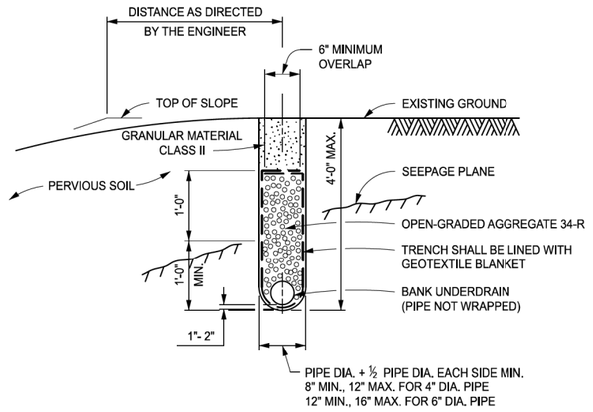
SPECIAL DETAILS

SHEET 73 of 80

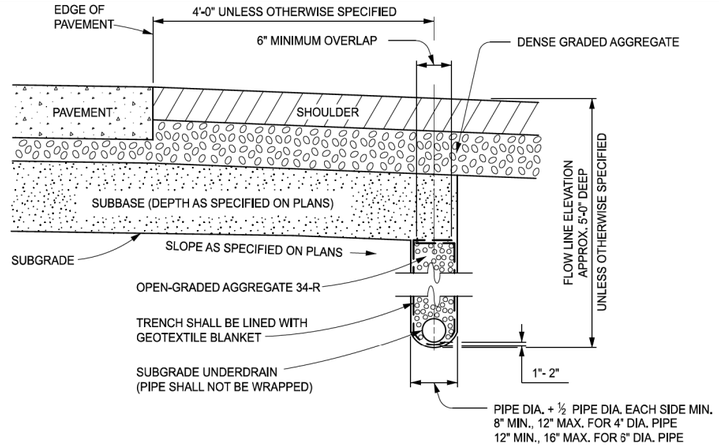
O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn



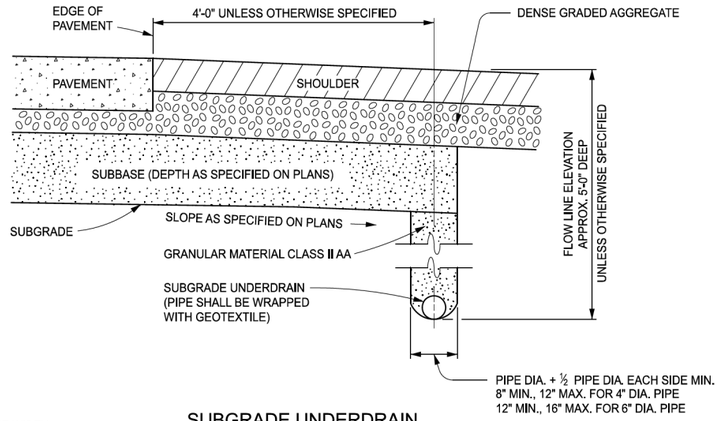
BANK UNDERDRAINS



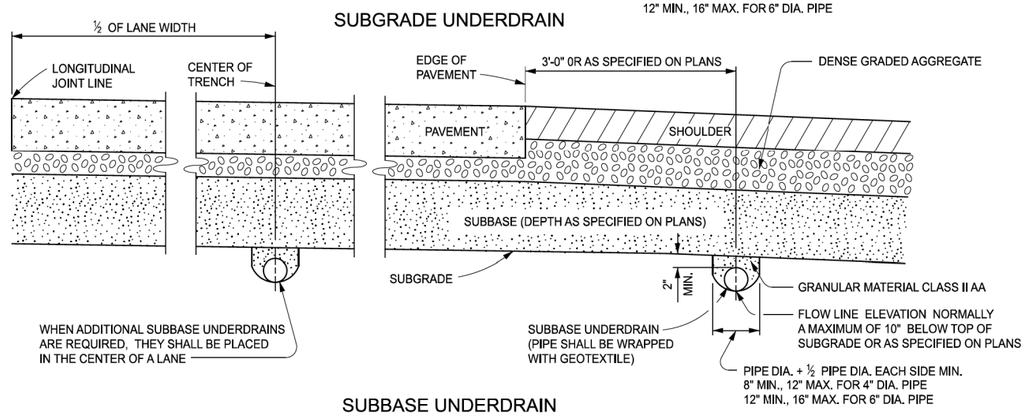
BANK UNDERDRAIN, OPEN-GRADED



SUBGRADE UNDERDRAIN - OPEN-GRADED



SUBGRADE UNDERDRAIN



SUBBASE UNDERDRAIN

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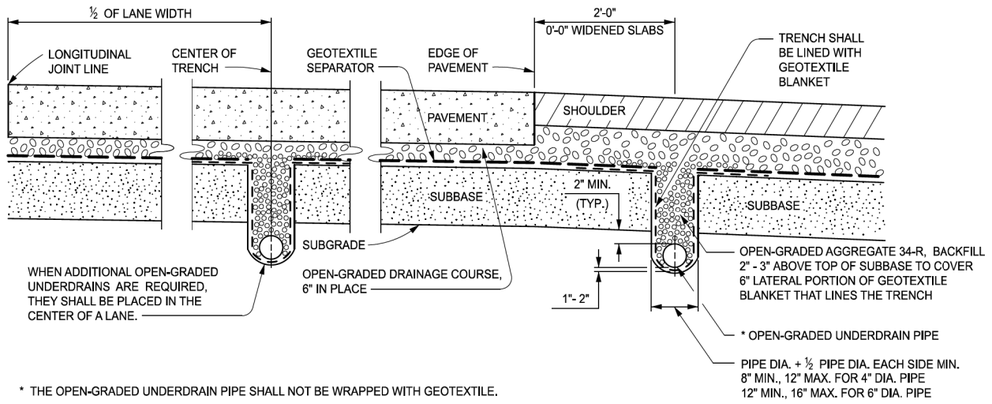
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

SPECIAL DETAILS

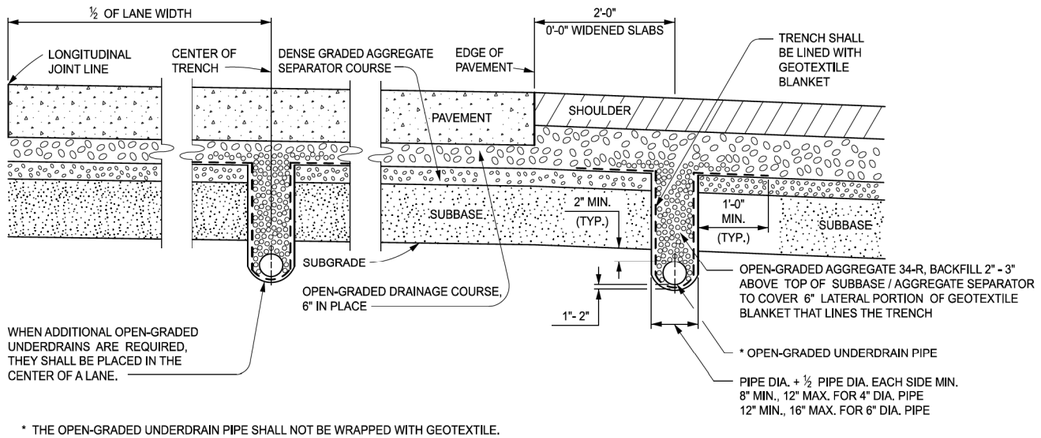
SHEET 74 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn



* THE OPEN-GRADED UNDERDRAIN PIPE SHALL NOT BE WRAPPED WITH GEOTEXTILE.

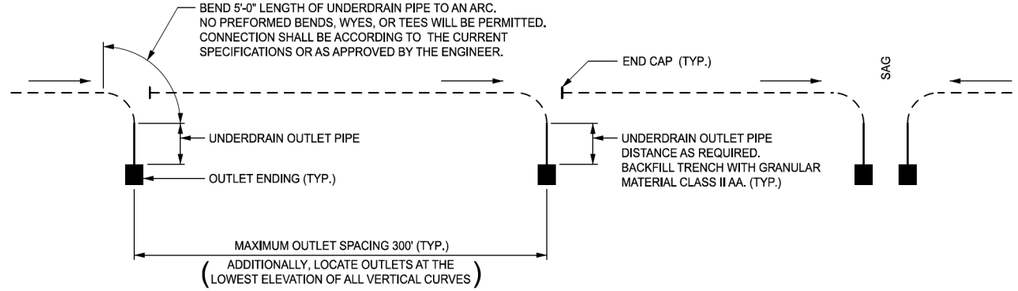
OPEN-GRADED UNDERDRAIN PIPE
WITH GEOTEXTILE SEPARATOR



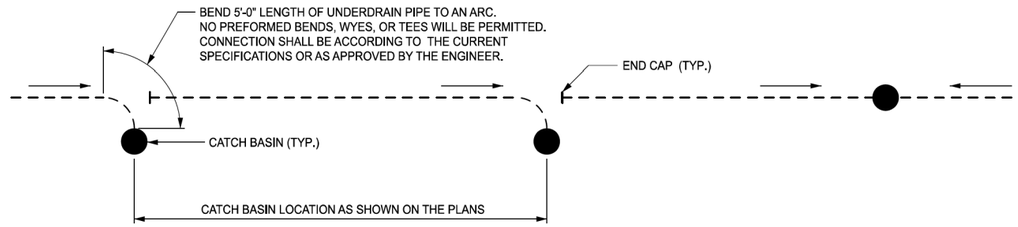
* THE OPEN-GRADED UNDERDRAIN PIPE SHALL NOT BE WRAPPED WITH GEOTEXTILE.

OPEN-GRADED UNDERDRAIN PIPE
WITH DENSE GRADED AGGREGATE SEPARATOR COURSE

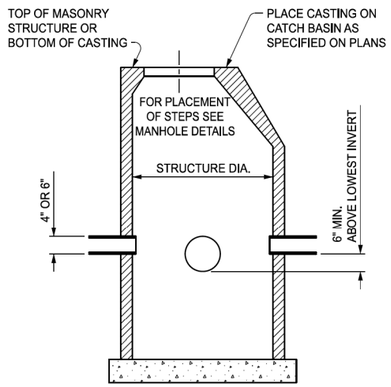
MDOT Michigan Department of Transportation	STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS			
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	(SPECIAL DETAIL) FHWA APPROVAL	06/28/2021 PLAN DATE	R-80-F	SHEET 5 OF 8



PLAN SHOWING OUTLETS FOR UNDERDRAINS



PLAN SHOWING UNDERDRAINS TAPPED INTO CATCH BASINS



PROFILE VIEW

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

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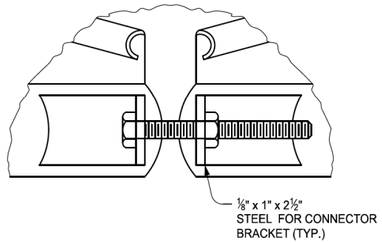
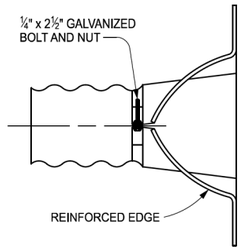
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT
SPECIAL DETAILS

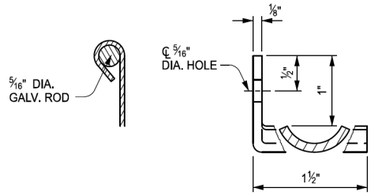
SHEET 75 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn

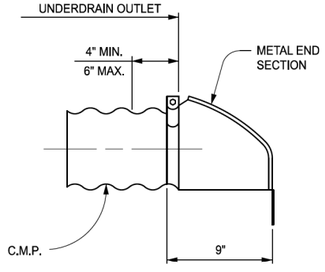


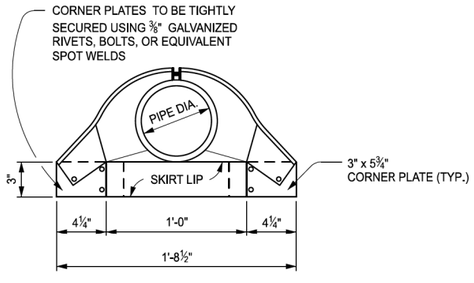


REINFORCED EDGE DETAIL

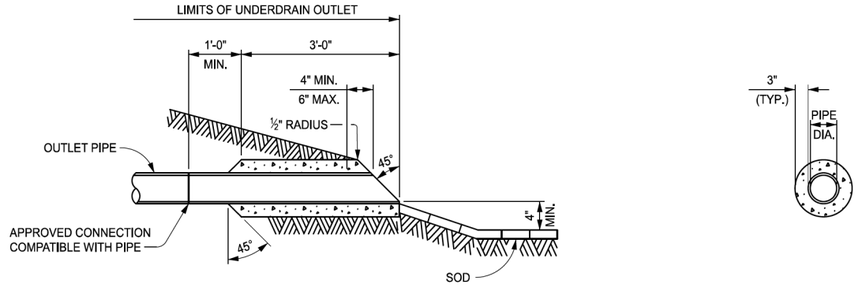


CONNECTOR BRACKET DETAIL

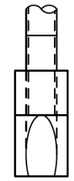


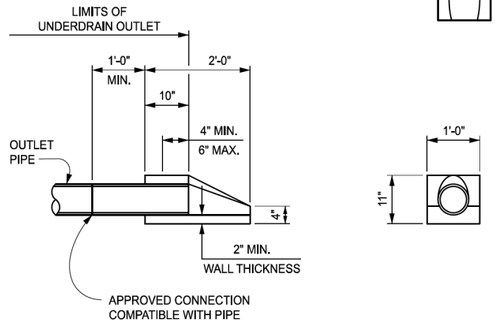


STEEL END SECTION FOR 4" OR 6" PIPE



CONCRETE RING FOR 4" OR 6" PIPE





CONCRETE END SECTION
FOR 4" OR 6" PIPE

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.

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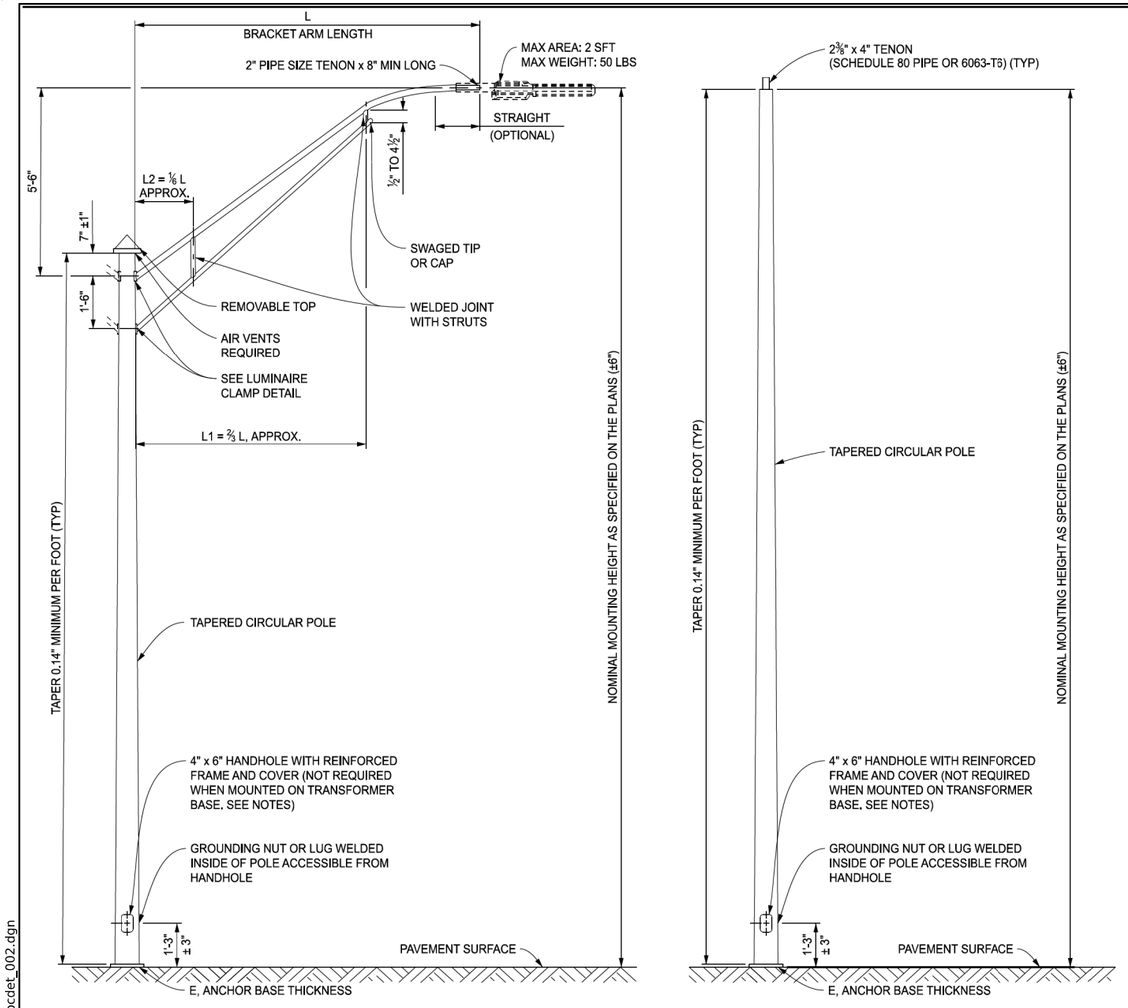
CITY OF ANN ARBOR PRS & WASHTENAW COUNTY PRC
BARTON/BANDEMER PARK PEDESTRIAN TUNNEL PROJECT

SPECIAL DETAILS

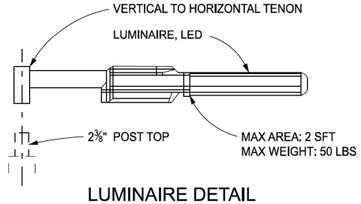
SHEET 76 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxx_spcdet_002.dgn



LIGHT STANDARD DETAIL
(WITH ARM)

LIGHT STANDARD DETAIL
(WITH TENON)



LUMINAIRE DETAIL

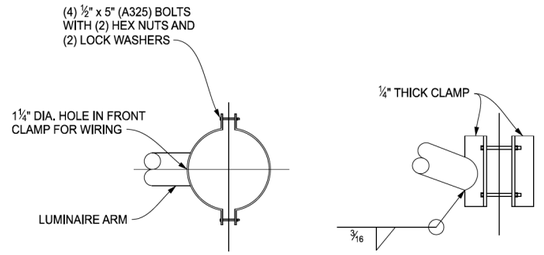
APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

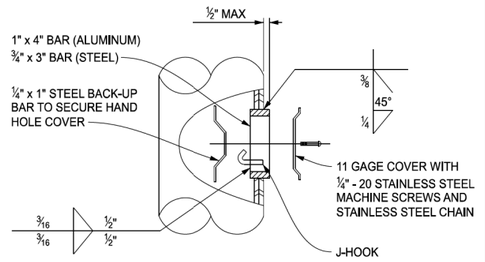
MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
LIGHT STANDARD DETAILS

(SPECIAL DETAIL)	01/04/2024	R-130-A	SHEET
FHWA APPROVAL	PLAN DATE		1 OF 6



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. HARWARE 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 I 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.

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
LIGHT STANDARD DETAILS

(SPECIAL DETAIL)	01/04/2024	R-130-A	SHEET
FHWA APPROVAL	PLAN DATE		2 OF 6

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE 4/12/2024
PRO. NUMBER
ENG JAH
PROJ MGR JAH
CADD JAH
COUNTY WASHTENAW
CITY/VILLAGE/TOWNSHIP CITY OF ANN ARBOR
H:
SCALE
V:
HORIZ DATUM NAD83
VERT DATUM NAVD88

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

SHEET 77 of 80

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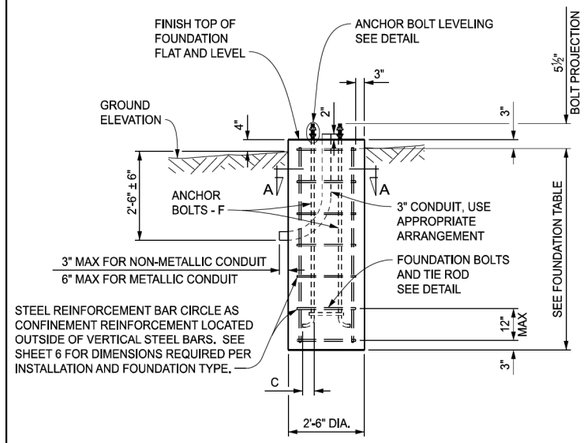
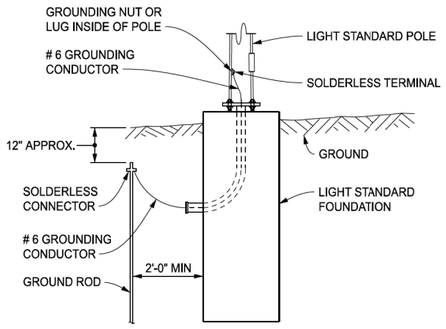
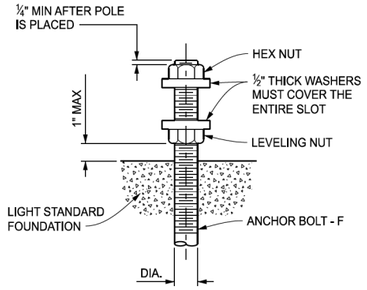


LIGHT STANDARD FOUNDATION DETAIL



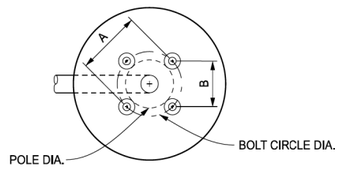
LIGHT STANDARD GROUNDING DETAIL

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

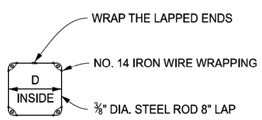


ANCHOR BOLT LEVELING DETAIL

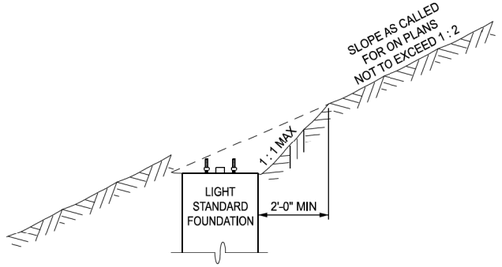
THIS DETAIL DOES NOT APPLY WHEN USING FRANGIBLE TRANSFORMER BASE. SEE FRANGIBLE TRANSFORMER BASE DETAIL ON SHEET 4.



TOP OF FOUNDATION DETAIL



ANCHOR BOLTS AND TIE ROD



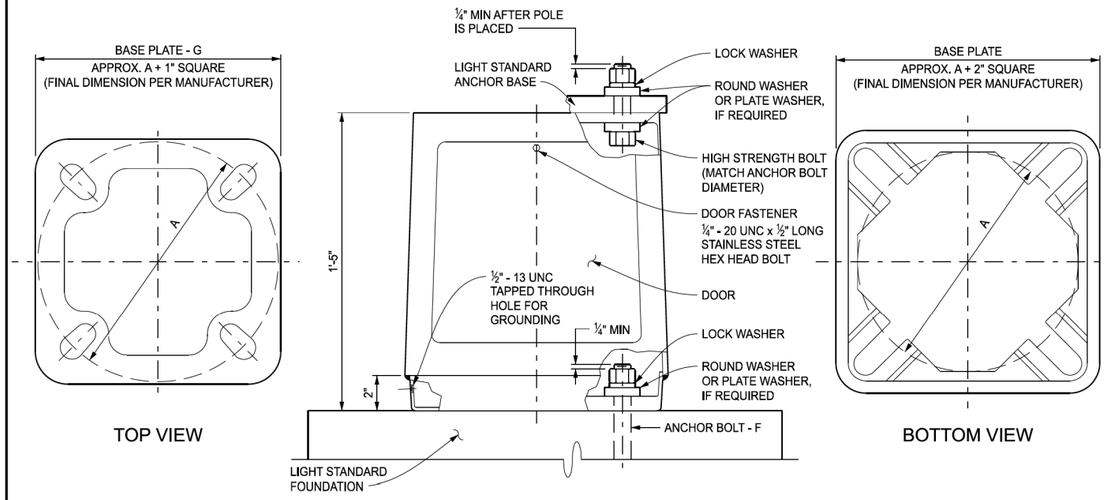
SLOPE DETAIL AT FOUNDATION

ON FILL OR CUT SLOPE

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

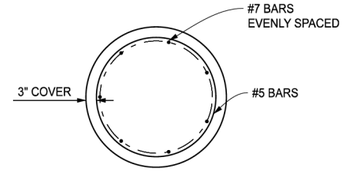
DO NOT PLACE SOIL ABOVE TOP OF FOUNDATION.

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



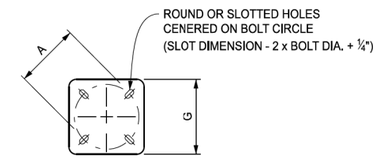
ELEVATION

FRANGIBLE TRANSFORMER BASE FOR POLES WITH BOLT CIRCLE DIAMETER - A

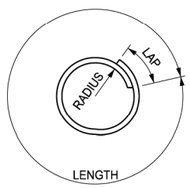


SECTION A-A

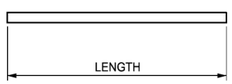
ANCHOR RODS NOT SHOWN FOR CLARITY



ANCHOR BASE DETAIL



CONFINEMENT REINFORCEMENT



VERTICAL REINFORCEMENT

REINFORCEMENT DETAILS

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

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
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REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	H:	V:	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR				NAD83	NAVD88

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

SPECIAL DETAILS

SHEET 78 of 80

O:\WCPRC\015514.00 WCPRC - Bandemer Barton Trail Design\4.0 Dwgs\4.3 Bridge\xxxxx_spcdet_002.dgn

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"	7¾"			2"		1" Ø x 3'-4"	0.188"		12.2"
20 FT NOMINAL MOUNTING HEIGHT (WITH TRANSFORMER BASE)	* 11"	7¾"			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)	10⅝" (A) 8½" (S)	5⅝"	11⅞" (A) 9¾" (S)	2"	7	1¼" Ø x 3'-4"	0.188"	9" ±½"	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)	10⅝" (A) 8½" (S)	5⅝"	11⅞" (A) 9¾" (S)	2"	7	1¼" Ø x 5'-0"	0.188"	9" ±½"	15.38" (A) *** 13.26" (S)
30 FT MOUNTING HEIGHT WITH 15 FT SINGLE OR DOUBLE BRACKET ARM	1'-3" (A) 1'-0" (S)	10⅝" (A) 8½" (S)	6¾"	1'-0⅛" (A) 10" (S)	2"	7	1½" Ø x 5'-0"	0.25"	9" ±½"	15.73" (A) *** 13.61" (S)
30 FT MOUNTING HEIGHT WITH 17 FT SINGLE OR DOUBLE BRACKET ARM	1'-3" (A) 1'-0" (S)	10⅝" (A) 8½" (S)	6¾"	1'-0⅛" (A) 10" (S)	2"	7	1½" Ø x 5'-0"	0.25"	9" ±½"	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)	11⅜" (A) 10⅝" (S)	7⅞"	1'-1⅛" (A) 1'-0⅜" (S)	2"	7	1¾" Ø x 5'-0"	0.313"	10" ±½"	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'-0¾" (S)	7⅞"	1'-1¾" (A) 1'-2½" (S)	2" (A) 2⅜" (S)	7	1¾" Ø x 5'-0"	0.375"	11" ±½" (A) 10" ±½" (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

	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)
GROUND SLOPE	HORIZONTAL	8.5	9	10
	SLOPED	16.5	17.5	18.5

	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)
GROUND SLOPE *	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

	BRACKET LENGTH, L	6'-0"	12'-0"	15'-0"	17'-0"
STEEL	TOP MEMBER O.D.	2" DIA.	2½" DIA.	2½" DIA.	3¼" DIA.
	BOTTOM MEMBER O.D.	1½" DIA.	1½" DIA.	2" DIA.	2" DIA.
ALUMINUM	TOP MEMBER O.D.	2" DIA.	3" DIA.	3" DIA.	3" DIA.
	BOTTOM MEMBER O.D.	1½" DIA.	2" DIA.	2¼" DIA.	2¼" DIA.

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
LIGHT STANDARD DETAILS

(SPECIAL DETAIL)	01/04/2024	R-130-A	SHEET
FHWA APPROVAL	PLAN DATE		5 OF 6

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 **** (1¼" DIA. ANCHOR BOLT)	MDOT 908.14	2¾" O.D. x 1⁵⁄₁₆" I.D. x ½" THICK	8 (IF REQUIRED ****)
FLAT WASHERS **** (1½" DIA. ANCHOR BOLT)	MDOT 908.14	2¾" O.D. x 1⁵⁄₁₆" I.D. x ½" THICK	8 (IF REQUIRED ****)
FLAT WASHERS **** (1¾" DIA. ANCHOR BOLT)	MDOT 908.14	4" O.D. x 1⅞" I.D. x ½" THICK	8 (IF REQUIRED ****)
PLATE WASHERS **** (1¼" DIA. ANCHOR BOLT)	ASTM A1018	1⁵⁄₁₆" I.D. x ½" THICK	8 (IF REQUIRED ****)
PLATE WASHERS **** (1½" DIA. ANCHOR BOLT)	ASTM A1018	1⁵⁄₁₆" I.D. x ½" THICK	8 (IF REQUIRED ****)
PLATE WASHERS **** (1¾" DIA. ANCHOR BOLT)	ASTM A1018	1⅞" I.D. x ½" 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 **** (1¼" DIA. ANCHOR BOLT)	MDOT 908.14	2¾" O.D. x 1⁵⁄₁₆" I.D. x ½" THICK	12 OR 14 (****)
FLAT WASHERS **** (1½" DIA. ANCHOR BOLT)	MDOT 908.14	2¾" O.D. x 1⁵⁄₁₆" I.D. x ½" THICK	12 OR 14 (****)
FLAT WASHERS **** (1¾" DIA. ANCHOR BOLT)	MDOT 908.14	4" O.D. x 1⅞" I.D. x ½" THICK	12 OR 14 (****)
LOCK WASHERS	ANSI B18.21.1	¼" 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 **** (1¼" DIA. ANCHOR BOLT)	ASTM A1018	1⁵⁄₁₆" I.D. x ½" THICK	8 (IF REQUIRED)
PLATE WASHERS **** (1½" DIA. ANCHOR BOLT)	ASTM A1018	1⁵⁄₁₆" I.D. x ½" THICK	8 (IF REQUIRED)
PLATE WASHERS **** (1¾" DIA. ANCHOR BOLT)	ASTM A1018	1⅞" I.D. x ½" THICK	8 (IF REQUIRED)
FRANGIBLE TRANSFORMER BASE	SELECT FROM THE MDOT QUALIFIED PRODUCTS LIST	ACCESS DOOR OPENING: 8½" 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.

MDOT Michigan Department of Transportation
DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
LIGHT STANDARD DETAILS

(SPECIAL DETAIL)	01/04/2024	R-130-A	SHEET
FHWA APPROVAL	PLAN DATE		6 OF 6

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	H:	NAD83	NAVD88

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

SPECIAL DETAILS

SHEET 79 of 80

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ANCHOR BOLT ASSEMBLY DIMENSIONS

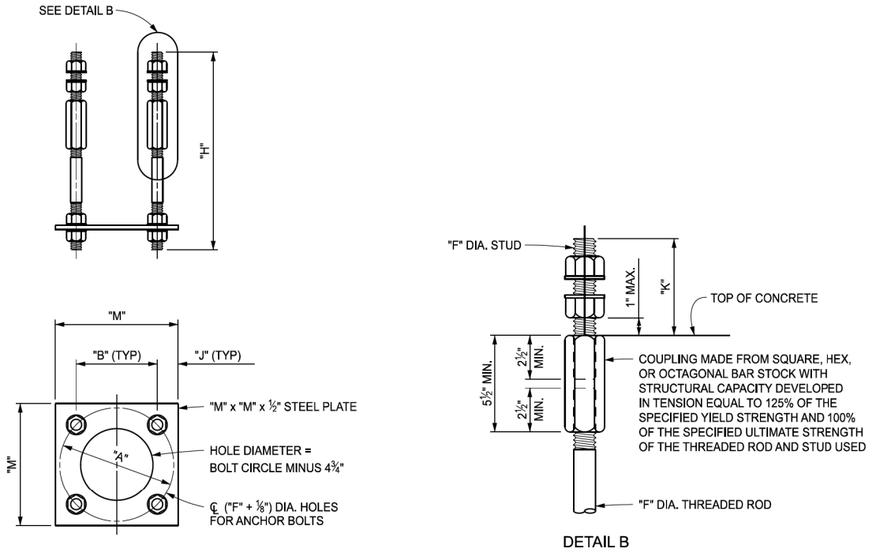
LIGHT STANDARD MOUNTING HEIGHT	BOLT CIRCLE "A"	"B"	ANCHOR BOLT DIAMETER "F"	"H"	"J"	STUD PROJECTION "K"	STUD LENGTH "L"	"M"
30' *	1'-3" (A)	10⅝" (A)	1½"	1'-9¾"	2⅜"	5½"	7¼"	1'-3⅜" (A)
	1'-0" (S)	8½" (S)						1'-1¼" (S)
30' **	1'-3" (A)	10⅝" (A)	1½"	1'-10½"	2⅜"	5½"	8"	1'-3⅜" (A)
	1'-0" (S)	8½" (S)						1'-1¼" (S)
40' **	1'-4" (A)	11⅜" (A)	1¾"	1'-10½"	2⅞"	5½"	8"	1'-5⅛" (A)
	1'-3" (S)	10⅝" (S)						1'-4⅜" (S)
45' **	1'-5" (A)	1'-0" (A)	1¾"	1'-10½"	2⅞"	5½"	8"	1'-5¾" (A)
	1'-6" (S)	1'-0¾" (S)						1'-6½" (S)

* UP TO 15' SINGLE OR DOUBLE BRACKET ARM

** UP TO 17' SINGLE OR DOUBLE BRACKET ARM

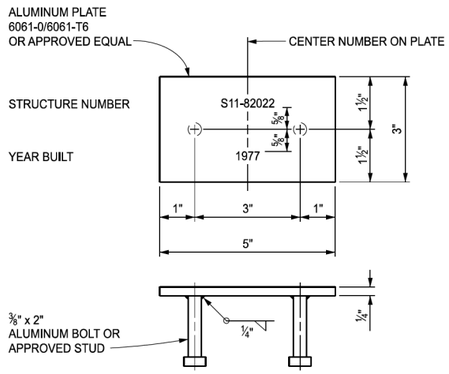
ANCHOR BOLTS (4 REQUIRED):
"F" DIA. x 1'-2" THREADED ROD AND "F" DIA. x "L" STUD WITH 4 NUTS, 4 WASHERS, AND ONE COUPLING.

(A) = DIMENSION CORRESPONDS TO ALUMINUM
(S) = DIMENSION CORRESPONDS TO STEEL



DETAIL B

LIGHT STANDARD ANCHOR BOLT ASSEMBLY



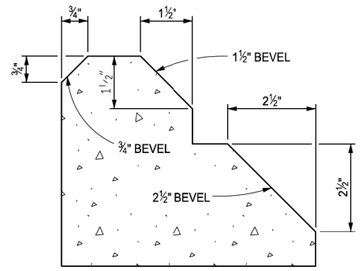
NAME PLATE

NOTES:

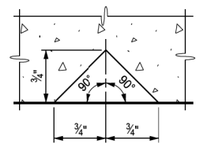
DIE STAMP - ¼" MINIMUM

LETTERS AND NUMBERS SHALL BE ¼" MINIMUM OR ⅜" MAXIMUM HEIGHT.

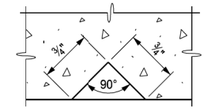
DATE SHALL BE YEAR THAT SUPERSTRUCTURE WAS COMPLETED.



BEVEL DETAILS



DOUBLE ¾" Δ MOLDING



¾" Δ MOLDING

MOLDING DETAILS

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.

APPROVED BY: _____
DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

MDOT Michigan Department of Transportation

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
FHWA APPROVAL	PLAN DATE		1 OF 2

MDOT Michigan Department of Transportation

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
FHWA APPROVAL	PLAN DATE		2 OF 2

Colliers Engineering & Design
7050 W. SAGINAW HWY. SUITE 200
LANSING, MI 48917
P (517) 272-9835 | F (517) 272-9836

REVISIONS

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
4/12/2024		JAH	JAH	JAH	WASHTENAW	CITY OF ANN ARBOR	N:	NAD83	NAVD88

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

SPECIAL DETAILS

SHEET 80 of 80

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