



# Antrim County Road Commission

DIETER AMOS, Kewadin  
KEVIN GIAR, Bellaire  
GODFREY "PETE" HOOGERHYDE, Elmira  
ALLEN MUSALL, Manager

June 30, 2026

## REQUEST TOTAL PROJECT BID FOR M88

Sealed bids will be received until 1:00 PM, Monday, July 13, 2026, at which time they will be publicly opened and read. Bids shall be received at the office of the Antrim County Road Commission, PO Box 308, 319 E. Lincoln St, Mancelona, Michigan 49659-0308. Bids will be tabulated and a recommendation will be made to the Board of County Road Commissioners at their next regular meeting.

The Antrim County Road Commission (ACRC) requests bids for the following:

**M88 Culverts Replacement:** In Central Lake Township, just West of Ellsworth road. Project description: Replace existing culverts, replacing existing guardrail, HMA paving over new culverts, and restoration.

Attached is a schedule of items sheet for contractor's information only. Contractor shall verify all item quantities. Bid will be a lump sum amount. **Traffic Control and Detour will be set by others do to recent storm so that can be disregarded in bidding.**

HMA approach shall be for paving patches after culvert installation. Paving shall match existing thickness. HMA 4EL shall be used.

All pay items shall be in accordance with 2020 MDOT Standard Specifications for Construction and as modified herein.

All work shall be completed by August 31, 2026 unless otherwise agreed to by the contractor and road commission.

The successful bidder shall enter into a subcontract with the road commission for MDOT work (0426)

Label bid "**M88 CULVERTS**" plainly on the outside of a sealed envelope.

The Antrim County Road Commission reserves the right to accept or reject any or all bids, to waive any irregularity or defect in a bid, or to accept that bid which in the opinion of the Road Commission is in the best interest of the county.

Allen Musall  
Manger



**Schedule of Items**

Report v1

**Proposal ID:** 05031-221459

**Project(s):** 221459A

**Letting Number:**

**Call Number:**

**Contractor:** \_\_\_\_\_

**Section Information**

Section ID	Section Description	Section Total	Alt. Set ID	Alt. Member ID
1	Road Fed / State			

**Item Prices**

Proposal Line Number	Item ID - Description	Approximate Quantity and Units	Unit Price	Bid Amount
0005	2030002 - Culv, Rem, 24 inch to 48 inch	4.000 Ea		
0010	2040015 - Culv, Other than Pipe, Rem	2.000 Ea		
0015	2040035 - Guardrail, Rem	1,350.000 Ft		
0020	2050010 - Embankment, CIP	45.000 Cyd		
0025	2050016 - Excavation, Earth	675.000 Cyd		
0030	2080018 - Erosion Control, Gravel Filter Berm	30.000 Ft		
0035	2080026 - Erosion Control, Maintenance, Sediment Rem	10.000 Cyd		
0040	2080036 - Erosion Control, Silt Fence	250.000 Ft		
0045	3010002 - Subbase, CIP	400.000 Cyd		
0050	3020001 - Aggregate Base	348.000 Ton		
0055	3070121 - Shld, CI II	23.000 Ton		
0060	4011109 - Dr Marker Post	4.000 Ea		
0065	4017001 - _Culv, CSP Arch, CI A, 47 inch by 71 inch, Polymer Coated	146.000 Ft		



**Schedule of Items**

Report v1

**Item Prices**

Proposal Line Number	Item ID - Description	Approximate Quantity and Units	Unit Price	Bid Amount
0070	4017050 - _Culv End Sect, CSP, Arch Pipe, 47 inch by 71 inch	4.000 Ea		
0075	4021260 - Trench Undercut and Backfill	78.000 Cyd		
0080	5010005 - HMA Surface, Rem	484.000 Syd		
0085	5010061 - HMA Approach	109.000 Ton		
0090	7047050 - _Bypass Pumping	2.000 Ea		
0095	7047050 - _Construction Dam	2.000 Ea		
0100	8070044 - Guardrail Approach Terminal, Type 2M	4.000 Ea		
0105	8070080 - Guardrail Reflector	66.000 Ea		
0110	8072121 - Guardrail, Long Span, Det MGS-1	3.000 Ea		
0115	8072122 - Guardrail, Long Span, Det MGS-2	1.000 Ea		
0120	8072180 - Guardrail, Type MGS-8, 108 inch Post	1,288.000 Ft		
0125	8100133 - Delineator Reflector, Green	4.000 Ea		
0130	8100361 - Post, Rigid, Delineator	4.000 Ea		
0135	8107001 - _Enhanced Delineation, Bidirectional, Guardrail, Post Mtd	1,601.000 Ft		
0140	8110233 - Pavt Mrkg, Waterborne, 6 inch, White	250.000 Ft		
0145	8110234 - Pavt Mrkg, Waterborne, 6 inch, Yellow	250.000 Ft		



**Schedule of Items**

Report v1

**Item Prices**

Proposal Line Number	Item ID - Description	Approximate Quantity and Units	Unit Price	Bid Amount
0150	8110253 - Pavt Mrkg, Waterborne, 2nd Application, 6 inch, White	250.000 Ft		
0155	8110254 - Pavt Mrkg, Waterborne, 2nd Application, 6 inch, Yellow	250.000 Ft		
0160	8120012 - Barricade, Type III, High Intensity, Double Sided, Lighted, Furn	10.000 Ea		
0165	8120013 - Barricade, Type III, High Intensity, Double Sided, Lighted, Oper	10.000 Ea		
0170	8120140 - Lighted Arrow, Type C, Furn	2.000 Ea		
0175	8120141 - Lighted Arrow, Type C, Oper	2.000 Ea		
0180	8120170 - Minor Traf Devices	1.000 LSUM		
0185	8120252 - Plastic Drum, Fluorescent, Furn	50.000 Ea		
0190	8120310 - Sign Cover	40.000 Ea		
0195	8120332 - Sign, Portable, Changeable Message, NTCIP-Compliant, Furn	3.000 Ea		
0200	8120333 - Sign, Portable, Changeable Message, NTCIP-Compliant, Oper	3.000 Ea		
0205	8120350 - Sign, Type B, Temp, Prismatic, Furn	1,100.000 Sft		
0210	8120351 - Sign, Type B, Temp, Prismatic, Oper	1,100.000 Sft		
0215	8120352 - Sign, Type B, Temp, Prismatic, Spec, Furn	165.000 Sft		
0220	8120353 - Sign, Type B, Temp, Prismatic, Spec, Oper	165.000 Sft		



**Schedule of Items**

Report v1

**Item Prices**

Proposal Line Number	Item ID - Description	Approximate Quantity and Units	Unit Price	Bid Amount
0225	8120370 - Traf Regulator Control	1.000 LSUM		
0230	8122188 - Rumble Strip, Temp, Portable, Furn	24.000 Ea		
0235	8122189 - Rumble Strip, Temp, Portable, Oper	24.000 Ea		
0240	8137011 - _Riprap, Spec, CI II	196.000 Syd		
0245	8160021 - Fertilizer, Chemical Nutrient, CI B	31.000 Lb		
0250	8160028 - Mulch Blanket, High Velocity	1,250.000 Syd		
0255	8160037 - Seeding, Mixture TDS	56.000 Lb		
0260	8160077 - Topsoil Surface, Salv, 4 inch	1,250.000 Syd		

**Section 1 Total:**

**Total Bid:**





## NOTICE OF AUTHORIZATION

**Permit Number: WRP048407 v.1**  
**Site Name: 05 M-88: Over Coulter Creek**

**Date Issued: March 27, 2026**  
**Expiration Date: March 27, 2031**

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division, P.O. Box 30458, Lansing, Michigan 48909-7958, under provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; specifically:

- Part 31, Floodplain Regulatory Authority of the Water Resources Protection.
- Part 301, Inland Lakes and Streams.
- Part 303, Wetlands Protection.

### Authorized Activity:

Remove the existing west culvert that is 54-foot long by 2.5-foot round circular metal pipe and replace with a 70-foot long by 5.9-foot wide elliptical culvert. Remove the existing east culvert that is 65-foot long by 2.5-foot round circular metal pipe and replace with a 76-foot long by 5.9-foot wide elliptical culvert. Impacts for stream realignment will consist of 53 feet of existing stream channel to be abandoned and filled in using 59.2 cubic yards. A total of 61 feet of excavation will be needed for new channels and will result in 116.6 cubic yards of cut. A total of 44.0 cubic yards of riprap will be placed to provide stream channel protection from scour at both the inlet and outlet. It will also line the stream banks and the energy dissipation pools created at both culvert outlets. Wetland impacts are the result of stream channel realignments, riprap cells creation for scour protection and energy dissipation pools, and lastly later drainage ditch realignments. 0.071 acres of emergent wetland will be impacted.

**Waterbody:** Coulter Creek

**To be conducted at property located in:** Antrim County, Central Lake Township  
Town 31N, Range 08W, Section 15

Permittee:  
Michigan Department of Transportation  
Douglas Bates  
1088 M-32  
Gaylord, Michigan 49735

Luke Golden  
Transportation Review Unit  
Water Resources Division  
989-370-1569

*This notice must be displayed at the site of work.  
Laminating this notice or utilizing sheet protectors is recommended.*  
Please refer to the above permit number with any questions or concerns.

**EGLE**  
**WRP048407 v1.0**  
**Approved**  
**Issued On:03/27/2026**  
**Expires On:03/27/2031**



**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY  
WATER RESOURCES DIVISION  
PERMIT**

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**Issued To:**

**Michigan Department of Transportation  
Douglas Bates  
1088 M-32  
Gaylord, Michigan 49735**

**Permit No: WRP048407 v.1  
Submission No.: HQK-RD0S-9YEYG  
Site Name: 05 M-88: Over Coulter Creek  
Issued: March 27, 2026  
Revised:  
Expires: March 27, 2031**

**This permit is being issued by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division, under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); specifically:**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> <b>Part 301, Inland Lakes and Streams</b>                         | <input type="checkbox"/> <b>Part 323, Shorelands Protection and Management</b> |
| <input checked="" type="checkbox"/> <b>Part 303, Wetlands Protection</b>                              | <input type="checkbox"/> <b>Part 325, Great Lakes Submerged Lands</b>          |
| <input type="checkbox"/> <b>Part 315, Dam Safety</b>  | <input type="checkbox"/> <b>Part 353, Sand Dunes Protection and Management</b> |
| <input type="checkbox"/> <b>Part 31, Water Resources Protection (Floodplain Regulatory Authority)</b> |  |

**EGLE certifies that the activities authorized under this permit are in compliance with the State Coastal Zone Management Program and certifies without conditions under the Federal Clean Water Act, Section 401 that the discharge from the activities authorized under this permit will comply with Michigan's water quality requirements in Part 31, Water Resources Protection, of the NREPA and associated administrative rules, where applicable.**

**Permission is hereby granted, based on permittee assurance of adherence to State of Michigan requirements and permit conditions, to:**

**Authorized Activity:**

**Remove the existing west culvert that is 54-foot long by 2.5-foot round circular metal pipe and replace with a 70-foot long by 5.9-foot wide elliptical culvert. Remove the existing east culvert that is 65-foot long by 2.5-foot round circular metal pipe and replace with a 76-foot long by 5.9-foot wide elliptical culvert.**

**Impacts for stream realignment will consist of 53 feet of existing stream channel to be abandoned and filled in using 59.2 cubic yards. A total of 61 feet of excavation will be needed for new channels and will result in 116.6 cubic yards of cut. A total of 44.0 cubic yards of riprap will be placed to**

provide stream channel protection from scour at both the inlet and outlet. It will also line the stream banks and the energy dissipation pools created at both culvert outlets. Wetland impacts are the result of stream channel realignments, riprap cells creation for scour protection and energy dissipation pools, and lastly later drainage ditch realignments. 0.071 acres of emergent wetland will be impacted.

Waterbody Affected: Coulter Creek

Property Location: Antrim County, Central Lake Township, Town 31N, Range 08W, Section 15

**Authority granted by this permit is subject to the following limitations:**

- A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
- B. The permittee, in exercising the authority granted by this permit, shall not cause unlawful pollution as defined by Part 31 of the NREPA.
- C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
- D. All work shall be completed in accordance with the approved plans and specifications submitted with the application and/or plans and specifications attached to this permit.
- E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved.
- F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with 2013 PA 174 (Act 174) and comply with each of the requirements of Act 174.
- G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits, or complying with other state statutes.
- H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
- I. Permittee shall notify EGLE within one (1) week after the completion of the activity authorized by this permit by completing and forwarding the attached preaddressed postcard to the office addressed thereon.
- J. This permit shall not be assigned or transferred without the written approval of EGLE.
- K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific state act, federal act, and/or rule under which this permit is granted.
- L. All dredged or excavated materials shall be disposed of in an upland site (outside of floodplains, unless exempt under Part 31 of the NREPA, and wetlands).
- M. In issuing this permit, EGLE has relied on the information and data that the permittee has provided in connection with the submitted application for permit. If, subsequent to the issuance of a permit, such information and data prove to be false, incomplete, or inaccurate, EGLE may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
- N. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representative of the permittee, undertaken in connection with this permit. The permittee's obligation to indemnify

the State of Michigan applies only if the state: (1) provides the permittee or its designated representative written notice of the claim or cause of action within 30 days after it is received by the state, and (2) consents to the permittee's participation in the proceeding on the claim or cause of action. It does not apply to contested case proceedings under the Administrative Procedures Act, 1969 PA 306, as amended, challenging the permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.

- O. Noncompliance with these terms and conditions and/or the initiation of other regulated activities not specifically authorized shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, EGLE may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.
- P. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity from EGLE. Such revision request shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by EGLE prior to being implemented.
- Q. This permit may be transferred to another person upon written approval of EGLE. The permittee must submit a written request to EGLE to transfer the permit to the new owner. The new owner must also submit a written request to EGLE to accept transfer. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties that includes all the above information may be provided to EGLE. EGLE will review the request and, if approved, will provide written notification to the new owner.
- R. Prior to initiating permitted construction, the permittee is required to provide a copy of the permit to the contractor(s) for review. The property owner, contractor(s), and any agent involved in exercising the permit are held responsible to ensure that the project is constructed in accordance with all drawings and specifications. The contractor is required to provide a copy of the permit to all subcontractors doing work authorized by the permit.
- S. Construction must be undertaken and completed during the dry period of the wetland. If the area does not dry out, construction shall be done on equipment mats to prevent compaction of the soil.
- T. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or the need to acquire applicable permits from the County Enforcing Agent (CEA).
- U. Authority granted by this permit does not waive permit requirements under the authority of Part 305, Natural Rivers, of the NREPA. A Natural Rivers Zoning Permit may be required for construction, land alteration, streambank stabilization, or vegetation removal along or near a natural river.
- V. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.
- W. Unless specifically stated in this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the water body are not authorized and shall not be constructed unless authorized by a separate permit or permit revision granted in accordance with the applicable law.
- X. For projects with potential impacts to fish spawning or migration, no work shall occur within fish spawning or migration timelines (i.e., windows) unless otherwise approved in writing by the Michigan Department of Natural Resources, Fisheries Division.

Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:

1. All work shall be completed in accordance with plans attached; kept on file at the EGEL's Water Resources Division, Transportation Review Unit.
2. Authority granted by this permit does not waive compliance requirements under Part 91, Soil Erosion and Sedimentation Control, of the NREPA. Any discharge of sediment into waters of the state and/or off the road right-of-way is a violation of this permit, Part 91, and Part 31, Water Resources Protection, of the NREPA. A violation of these parts subjects the permittee to potential fines and penalties.
3. This permit does not authorize or sanction work that has been completed in violation of applicable federal, state, or local statutes.
4. The permittee is responsible for acquiring all necessary easements or rights-of-way before commencing any work authorized by this permit. All construction operations relating to or part of this project shall be confined to the existing right-of-way limits or other acquired easements.
5. Temporary soil erosion and sedimentation control measures shall be installed before or upon commencement of the earth change and shall be maintained daily. Temporary soil erosion and sedimentation control measures shall be maintained until permanent soil erosion and sedimentation control measures are in place and the area is stabilized. Permanent soil erosion and sedimentation control measures for all slopes, channels, ditches, or any disturbed area shall be installed within five (5) calendar days after final grading or the final earth change has been completed.
6. All raw areas in uplands resulting from the permitted construction activity shall be effectively stabilized with sod and/or seed and mulch (or other technology specified by this permit or project plans) in a sufficient quantity and manner to prevent erosion and any potential siltation to surface waters or wetlands. Temporary stabilization measures shall be installed before or upon commencement of the permitted activity and shall be maintained until permanent measures are in place. Permanent measures shall be in place within five (5) days of achieving final grade.
7. All raw earth within 100 feet of a lake, stream, or wetland that is not brought to final stabilization by the end of the active growing season shall be temporarily stabilized with mulch blankets in accordance with the following dates: September 20 for the Upper Peninsula, October 1 for the Lower Peninsula north of US-10, and October 10 for the Lower Peninsula south of US-10.
8. This permit placard shall be kept posted at the work site, in a prominent location at all times for the duration of the project, or until permit expiration.
9. This permit is being issued for the maximum time allowed and no extensions of this permit will be granted. Initiation of the construction work authorized by this permit indicates the permittee's acceptance of this condition. The permit, when signed by the EGEL, will be for a five (5) year period beginning at the date of issuance. If the project is not completed by the expiration date, a new permit must be sought.
10. All dredge/excavated spoils including organic and inorganic soils, vegetation, and other material removed shall be placed on upland (non-wetland, non-floodplain or non-bottomland), prepared for stabilization, revegetated and reseeded with native Michigan

- species appropriate to the site, and mulched in such a manner so as to prevent and ensure against erosion of any material into any waterbody, wetland, or floodplain.
11. During removal or repair of the existing structure, every precaution shall be taken to prevent debris from entering any watercourse. Any debris reaching the watercourse during the removal and/or reconstruction of the structure shall be immediately retrieved from the water. All material shall be disposed of in an acceptable manner consistent with local, state, and federal regulations.
  12. Prior to the removal of the existing structures, cofferdams of steel sheet piling, gravel bags, clean stone, coarse aggregate, concrete or other acceptable barriers shall be installed to isolate all construction activity from the water. The barriers shall be maintained in good working order throughout the duration of the project. Upon project completion, the accumulated materials shall be removed and disposed of at an upland site.
  13. All cofferdam and temporary steel sheet pile shall then be removed in its entirety, unless specifically shown to be left in plan on the accepted plans. Cofferdam and sheet pile that is left in place shall be cut off at the elevation shown on the plans and shall be a minimum of one (1) foot below the stream bottom.
  14. The existing structure shall be kept open to pass the stream flow during removal of the existing road fill.
  15. The placement of the new culvert and the initial placement of fill in the stream shall be done immediately after removal of the existing culvert. The placement shall be conducted in such a manner that all flow is immediately passed through the new culverts, allowing the major placement of fill to be done in the dry or in still water where erosion and sedimentation will be minimized. The fill material used in this initial placement shall be washed gravel, coarse aggregate, or rock and shall be placed at both ends of the culvert to a level above normal water level before backfill material is placed.
  16. The culvert shall be installed to align with the center line of the existing stream at both the inlet and outlet ends and must be **recessed into the stream bed** to provide a natural channel substrate throughout the structure, as shown on the approved plans.
  17. Road fill side slopes shall not be steeper than 1-on-2 (one [1] vertical to two [2] horizontal) except where headwalls of reinforced concrete, mortar masonry, dry masonry, or other acceptable methods are used.
  18. Areas to be protected by riprap shall be cleared of brush and debris. All grades shall be shaped and compacted to the required cross section. Geotextile liner shall be placed on the prepared grades. The riprap installation shall not damage the geotextile liner.
  19. Any fill shall consist of clean inert material.
  20. Any alterations to the existing road grade elevations other than that shown on the plans will require prior approval from the Water Resources Division (WRD).
  21. Road fill side slopes terminating in the stream and any raw streambanks resulting from the construction shall be stabilized with temporary measures in accordance with appropriate Best Management Practices based on site conditions, and if necessary, may be riprapped extending above the ordinary high-water mark, before or upon commencement of the permitted activity. Temporary stabilization measures shall be maintained until permanent measures are in place.

22. All other road fill slopes, ditches, and other raw areas draining directly to the stream may be protected with riprap, sod and/or seed and mulch as may be necessary to provide effective erosion protection. The placement of riprap shall be limited to the minimum necessary to ensure proper stabilization of the side slopes and fill in the immediate vicinity of the structure.
23. All riprap shall be properly sized and graded based on wave action and velocity and shall consist of clean natural field stone or rock (free of paint, soil or other fines, asphalt, soluble chemicals, or organic material). Broken concrete, free of protruding metal, free of contaminants and other foreign material may be used **if permitted by the contract documents**.
24. The placement of riprap shall be limited to the minimum necessary to ensure proper stabilization of the side slopes and fill in the immediate vicinity of the structure. Rock riprap shall be placed such that it does not narrow the stream or interfere with stream flows into and out of the structure.
25. If the project, or any portion of the project, is stopped and lies incomplete for any length of time other than that encountered in a normal work week, every precaution shall be taken to protect the incomplete work from erosion, including the placement of temporary gravel bag riprap, temporary seed and mulch, or other acceptable temporary protection.
26. No work shall be done in the stream during periods of above-normal flows except as necessary to prevent erosion.
27. **No work or dredging within the water authorized by this permit is allowed from October 1 to April 30 due to critical spawning, migration, and/or recreational use periods.**
28. **To avoid disturbance of Northern long-eared bat, which is federally listed as a threatened species, or Indiana bat, which is federally listed as an endangered species, any tree larger than 3 inches in diameter shall not be cut between April 1 and September 30 of any year.**
29. **Prior to the start of construction, all adjacent non-work wetland areas shall be protected by properly trenched sedimentation barrier to prevent sediment from entering the wetland. Orange construction fencing shall be installed as needed to prohibit construction personnel and equipment from entering or performing work in these areas. Fence shall be maintained daily throughout the construction process. Upon project completion, the accumulated materials shall be removed and disposed of at an upland site, the sedimentation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.**
30. Stormwater shall not directly outlet to the stream.

31. Issuance of this permit is contingent upon the effect determinations to federally listed threatened and endangered species, as can be found within the United States Fish and Wildlife Service (USFWS) "All Species Michigan Determination Key" verification letter provided with the permit application. The permittee is responsible for adhering to all of the agreed-upon conservation measures listed within the verification letter and discussed during consultation with USFWS.

Issued By: *Luke F Golden*  
Luke Golden  
Transportation Review Unit  
Water Resources Division  
989-370-1569

THIS PERMIT MUST BE SIGNED BY THE PERMITTEE TO BE VALID.

I hereby assure that I have read, am familiar with, and agree to adhere to the terms and conditions of this permit.

\_\_\_\_\_  
Permittee Signature

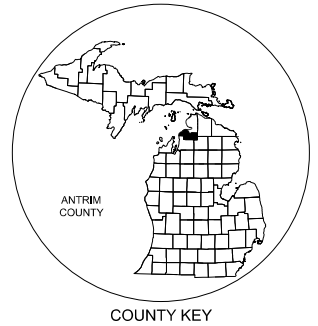
\_\_\_\_\_  
Date

cc: Central LakeTownship Clerk  
Antrim County Clerk  
Antrim County Drain Commissioner

PERFORM ALL WORK COVERED BY THESE PLANS IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION.  
 PHYSICAL ROAD NUMBER (PR#) & MILEPOST (MP) DATA ARE FROM MICHIGAN GEOGRAPHIC FRAMEWORK VERSION # 24.

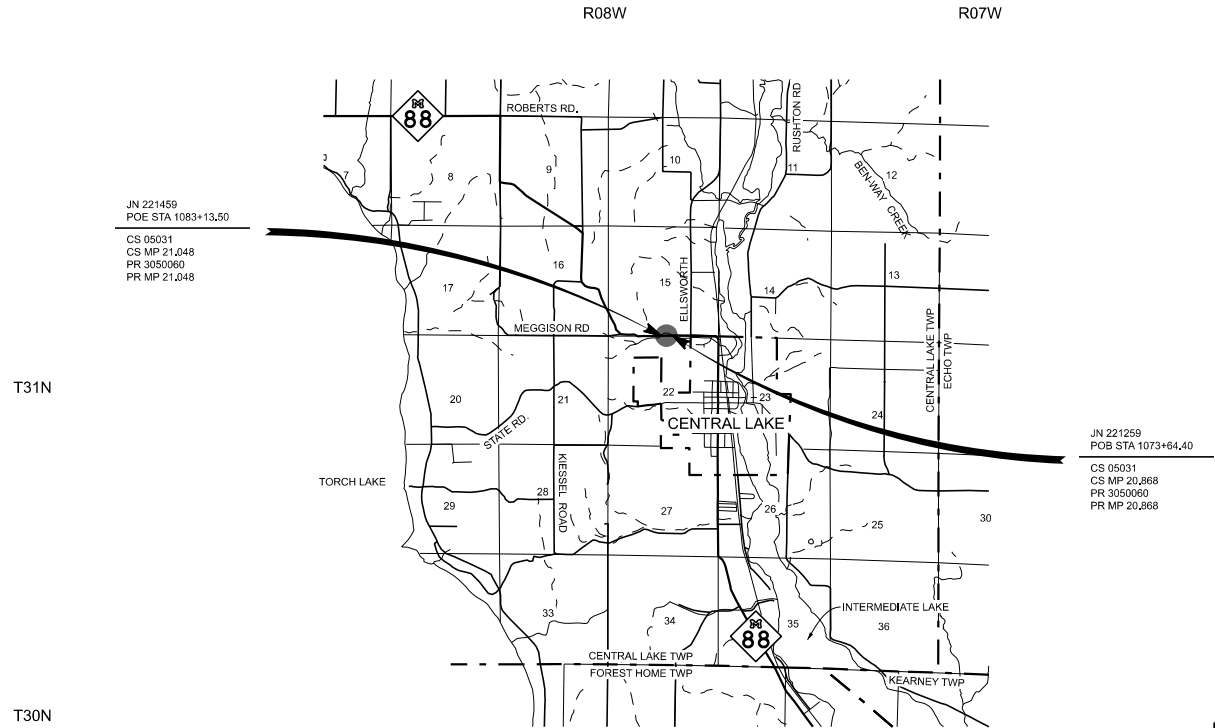
# MICHIGAN DEPARTMENT OF TRANSPORTATION

ROUTE: M-88  
 CENTRAL LAKE TOWNSHIP  
 ANTRIM COUNTY



TRAFFIC DATA				SPEED DATA			
ROAD	YEAR	ADT	DHV	COMM	DESIGN	POSTED	LIMITS
M-88	2023	3390		4.4%	55	55	POB TO POE

SECTION	CONTROL SEC	JOB NO.	FED AID PROJ.
1	05031	221459A	YES



JN 221459  
 POE STA 1083+13.50  
 CS 05031  
 CS MP 21,048  
 PR 3050060  
 PR MP 21,048

JN 221259  
 POB STA 1073+64.40  
 CS 05031  
 CS MP 20,868  
 PR 3050060  
 PR MP 20,868



**MICHIGAN DEPARTMENT OF TRANSPORTATION**  
 BRADLEY C. WIEFERICH, P.E., DIRECTOR

MILES: 0.180  
 CONTRACT FOR:  
 CULVERT RECONSTRUCTION, GUARDRAIL RECONSTRUCTION

FINAL ROW PLAN REVISIONS			SUBMITTAL DATE:		
NO.	DATE	AUTH.	NO.	DATE	AUTH.



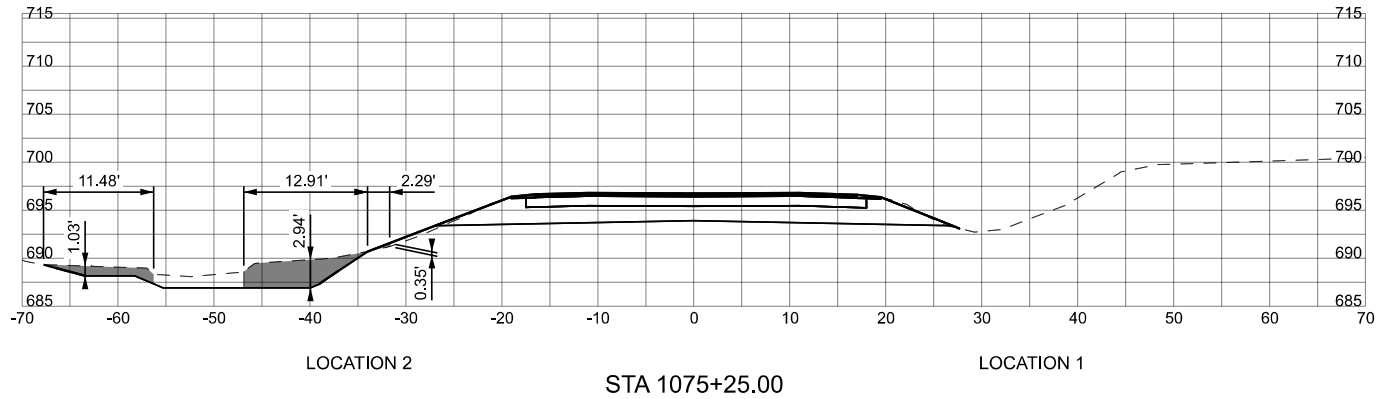
DATE: 02/05/26	CS: 05031
DESIGN UNIT: MONROE	JN: 221459
TSC: GAYLORD	

TITLE	DRAWING SHEET
	M-88 SECT 1
	TITLE 001

**EGLE**  
**WRP048407 v1.0**  
 Approved  
 Issued On: 03/27/2026  
 Expires On: 03/27/2031

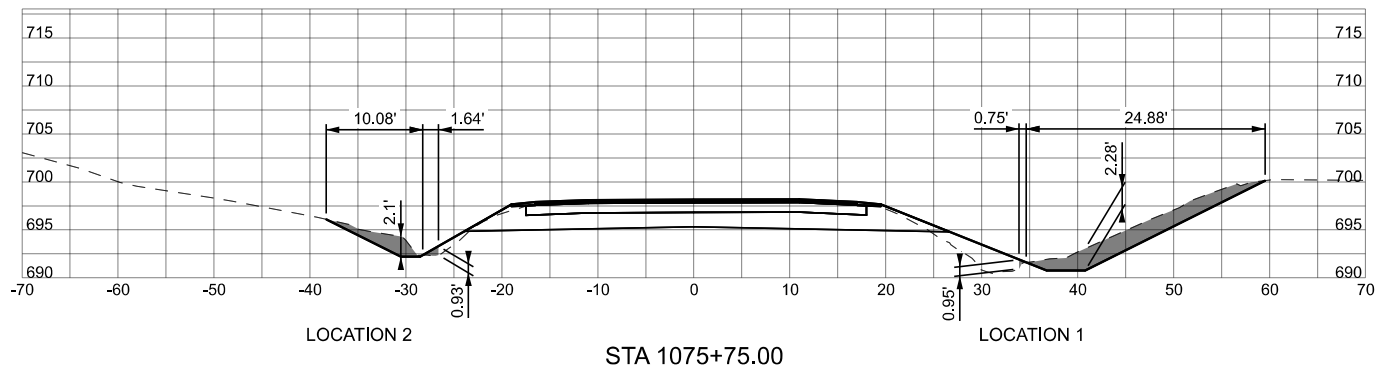
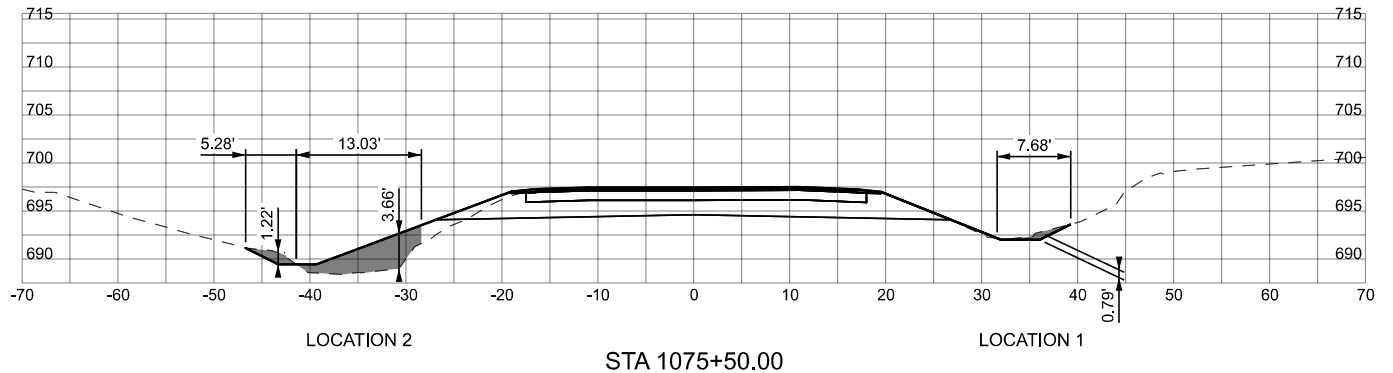
LOCATION 1 CALCULATIONS

STATION	CROSS SECTION EXCAVATION AREA OVER WETLAND	EXCAVATION VOLUME
	Sft	Cft
1075+31.5	0.00	22.39
1075+50.0	2.42	502.13
1075+75.0	37.75	436.10
1075+95.0	5.86	30.18
1076+05.3	0.00	
	TOTAL	990.79 Cft
	TOTAL	36.7 Cyd

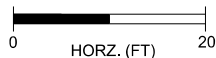


LOCATION 1 CALCULATIONS

STATION	CROSS SECTION FILL AREA OVER WETLAND	FILL VOLUME
	Sft	Cft
1075+31.5	0.00	0.00
1075+50.0	0.00	3.00
1075+75.0	0.24	3.00
1075+95.0	0.00	0.00
1076+05.3	0.00	
	TOTAL	6.00 Cft
	TOTAL	0.2 Cyd



FILE: 221459\_DEGLE Permit.dgn



DATE: 02/11/26  
 DESIGN UNIT: MONROE  
 TSC: GAYLORD

CS: 05031  
 JN: 221459

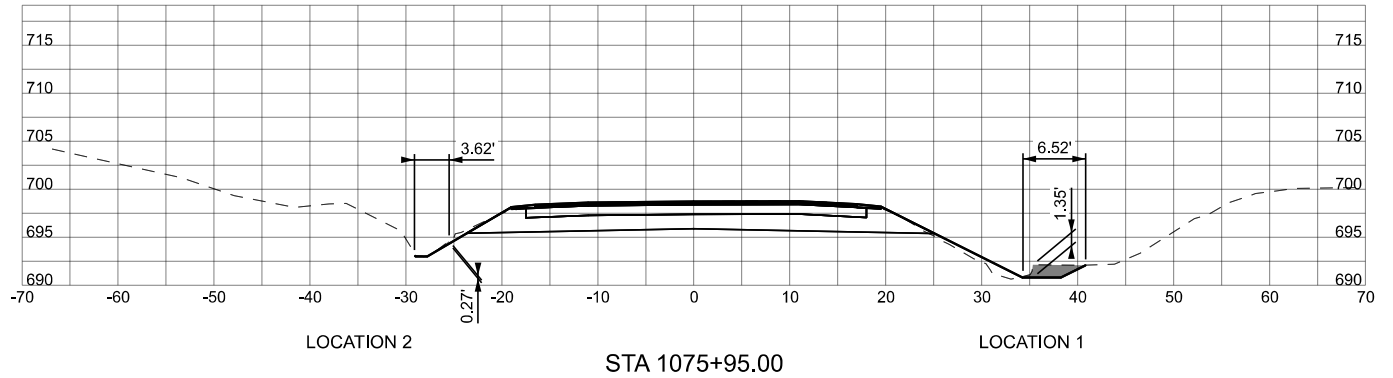
WETLAND LOCATIONS 1 & 2  
 CROSS SECTION VIEW

DRAWING SHEET  
 M-88 XSECT  
 1001 LE

WRP048407 v1.0  
 Approved  
 Issued On: 03/27/2026  
 Expires On: 03/27/2031

LOCATION 2 CALCULATIONS

STATION	CROSS SECTION EXCAVATION AREA OVER WETLAND	EXCAVATION VOLUME
	Sft	Cft
1075+17.5	0.00	136.76
1075+25.0	36.47	500.13
1075+50.0	3.54	165.25
1075+75.0	9.68	99.30
1075+95.0	0.25	
	TOTAL	901.44 Cft
	TOTAL	33.4 Cyd

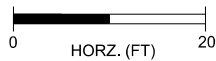


LOCATION 2 CALCULATIONS

STATION	CROSS SECTION FILL AREA OVER WETLAND	FILL VOLUME
	Sft	Cft
1075+17.5	0.00	1.58
1075+25.0	0.42	358.13
1075+50.0	28.23	363.00
1075+75.0	0.81	8.10
1075+95.0	0.00	
	TOTAL	730.81 Cft
	TOTAL	27.1 Cyd



FILE: 221459\_DEGLE Permit.dgn



DATE: 02/11/26  
 DESIGN UNIT: MONROE  
 TSC: GAYLORD

CS: 05031  
 JN: 221459

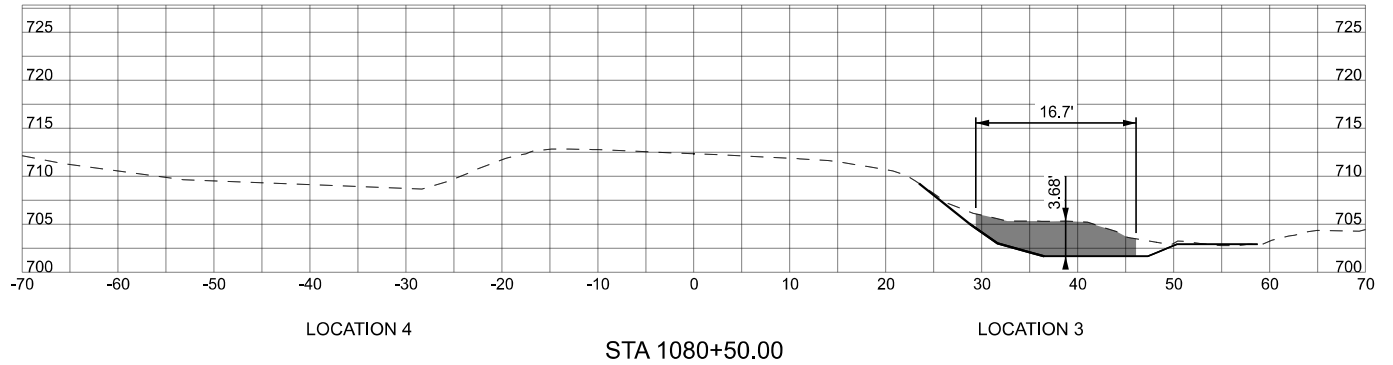
WETLAND LOCATIONS 1 & 2  
 CROSS SECTION VIEW

DRAWING	SHEET
M-88 XSECT 1002 LE	SECT 1

WRP048407 v1.0  
 Approved  
 Issued On: 03/27/2026  
 Expires On: 03/27/2031

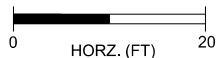
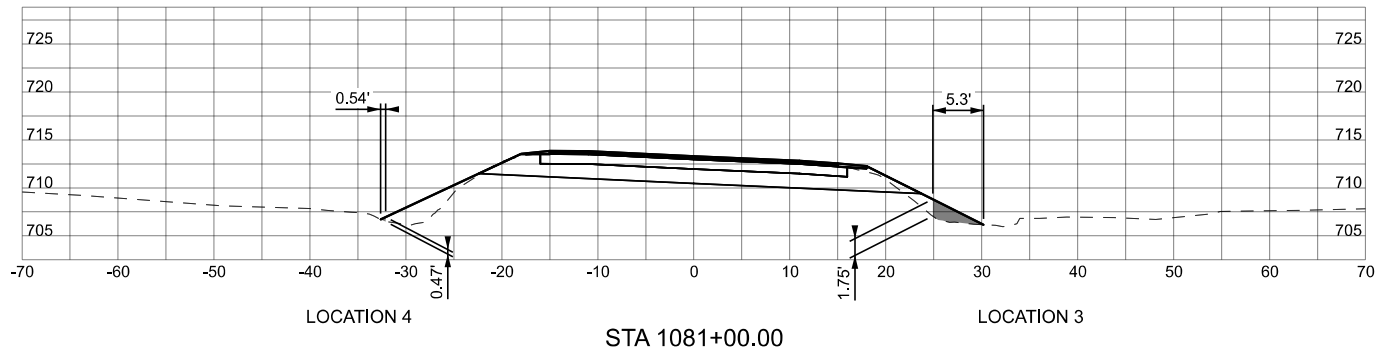
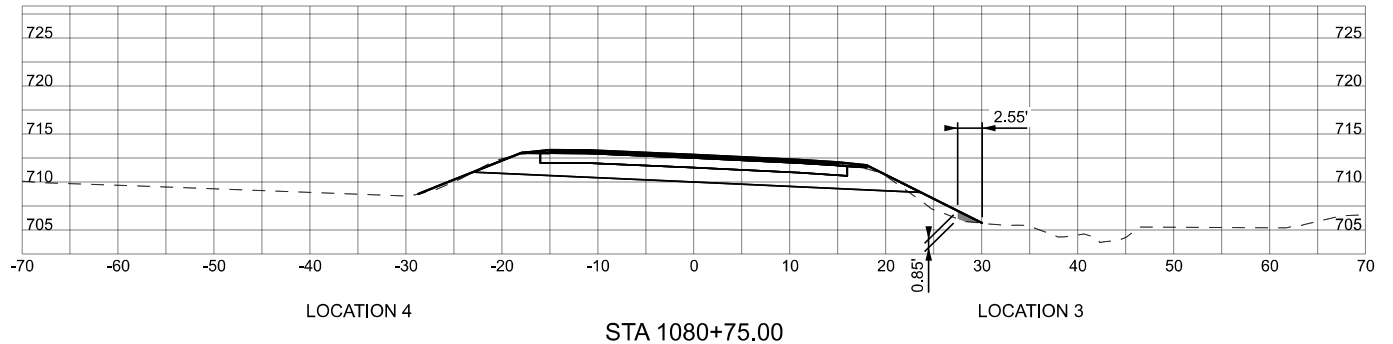
LOCATION 3 CALCULATIONS

STATION	CROSS SECTION EXCAVATION AREA OVER WETLAND	EXCAVATION VOLUME
	Sft	Cft
1080+35.2	0.00	365.12
1080+50.0	49.34	616.75
1080+75.0	0.00	0.00
1081+00.0	0.00	0.00
1081+13.0	0.00	0.00
	TOTAL	981.87 Cft
	TOTAL	36.4 Cyd



LOCATION 3 CALCULATIONS

STATION	CROSS SECTION FILL AREA OVER WETLAND	FILL VOLUME
	Sft	Cft
1080+35.2	0.00	0.00
1080+50.0	0.00	16.00
1080+75.0	1.28	86.88
1081+00.0	5.67	36.86
1081+13.0	0.00	0.00
	TOTAL	139.74 Cft
	TOTAL	5.2 Cyd



DATE: 02/11/26  
 DESIGN UNIT: MONROE  
 TSC: GAYLORD

CS: 05031  
 JN: 221459

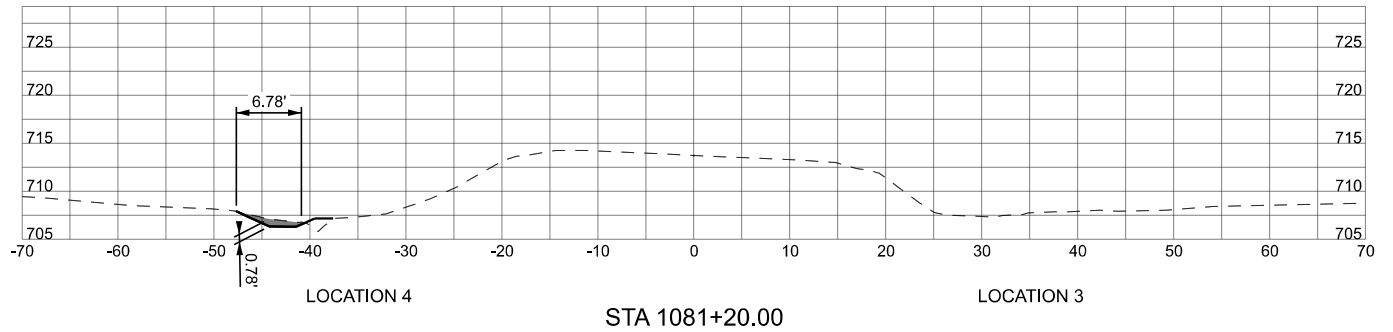
WETLAND LOCATIONS 3 & 4  
 CROSS SECTION VIEW

DRAWING SHEET  
 M-88 SECT 1  
 XSECT  
 1003 LE

WRP048407 v1.0  
 Approved  
 Issued On: 03/27/2026  
 Expires On: 03/27/2031

LOCATION 4 CALCULATIONS

STATION	CROSS SECTION EXCAVATION AREA OVER WETLAND	EXCAVATION VOLUME
	Sft	Cft
1080+89.2	0.00	0.00
1081+00.0	0.00	32.60
1081+20.0	3.26	18.58
1081+31.4	0.00	
	TOTAL	51.18 Cft
	TOTAL	1.9 Cyd

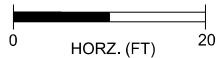


LOCATION 4 CALCULATIONS

STATION	CROSS SECTION FILL AREA OVER WETLAND	FILL VOLUME
	Sft	Cft
1080+89.2	0.00	0.70
1081+00.0	0.13	1.30
1081+20.0	0.00	0.00
1081+31.4	0.00	
	TOTAL	2.00 Cft
	TOTAL	0.1 Cyd



FILE: 221459\_DEGLE Permit.dgn



DATE: 02/11/26  
 DESIGN UNIT: MONROE  
 TSC: GAYLORD

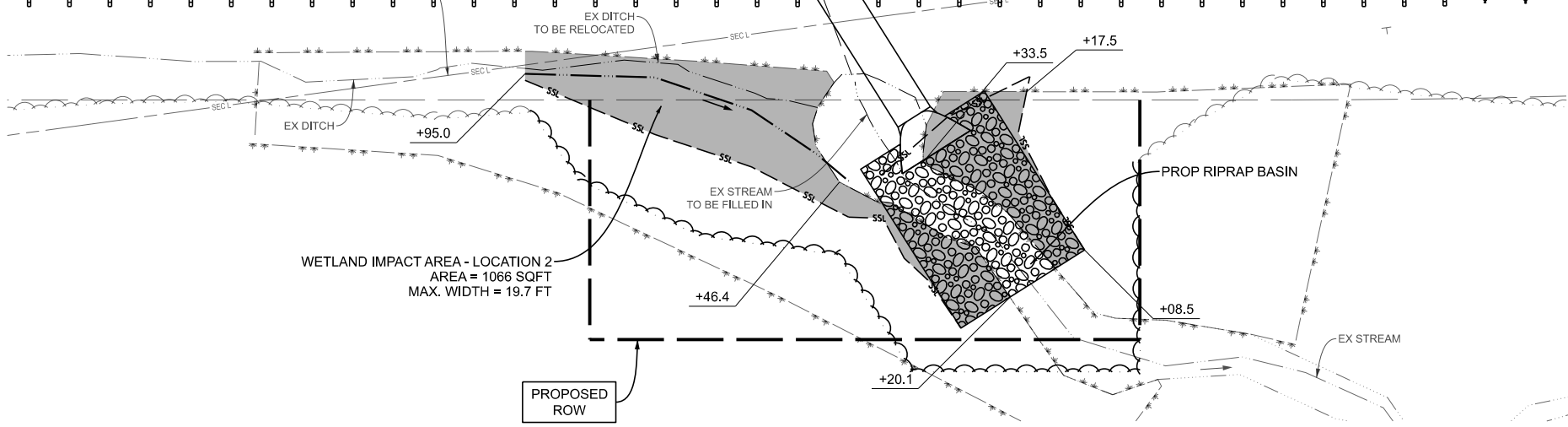
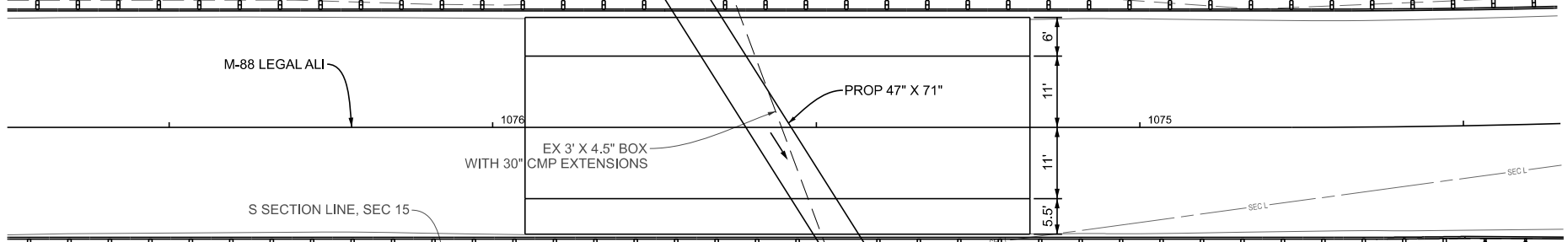
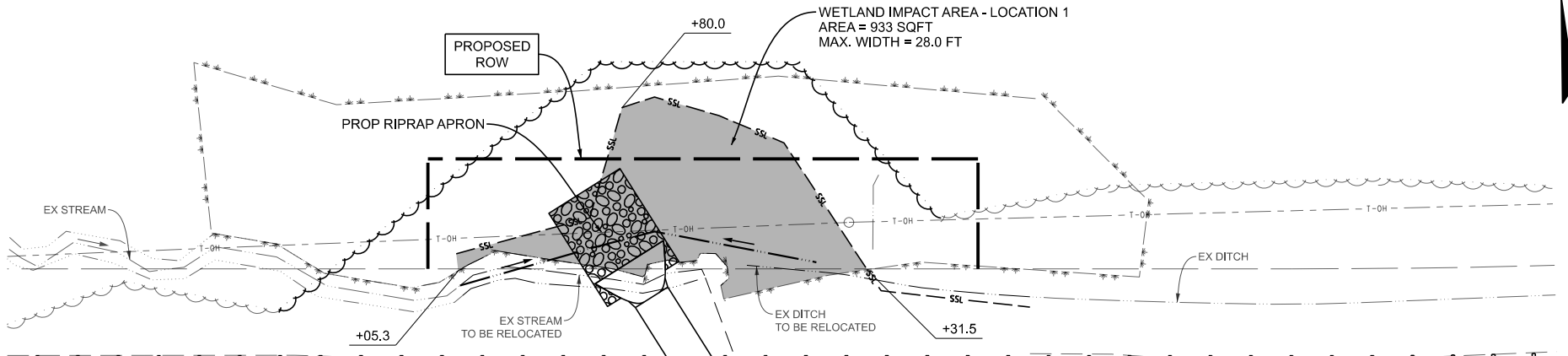
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WETLAND LOCATIONS 3 & 4  
 CROSS SECTION VIEW

DRAWING	SHEET
M-88 XSECT 1004LE	SECT 1

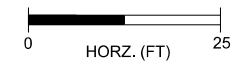
WRP048407 v1.0  
 Approved  
 Issued On: 03/27/2026  
 Expires On: 03/27/2031

SECTION 15  
T31N, R8W  
CENTRAL LAKE TWP



SECTION 22  
T31N, R8W  
CENTRAL LAKE TWP

**MDOT**  
Michigan Department of Transportation  
FILE: 221459\_DEGLE Permit.dgn



DATE: 02/09/26  
DESIGN UNIT: MONROE  
TSC: GAYLORD

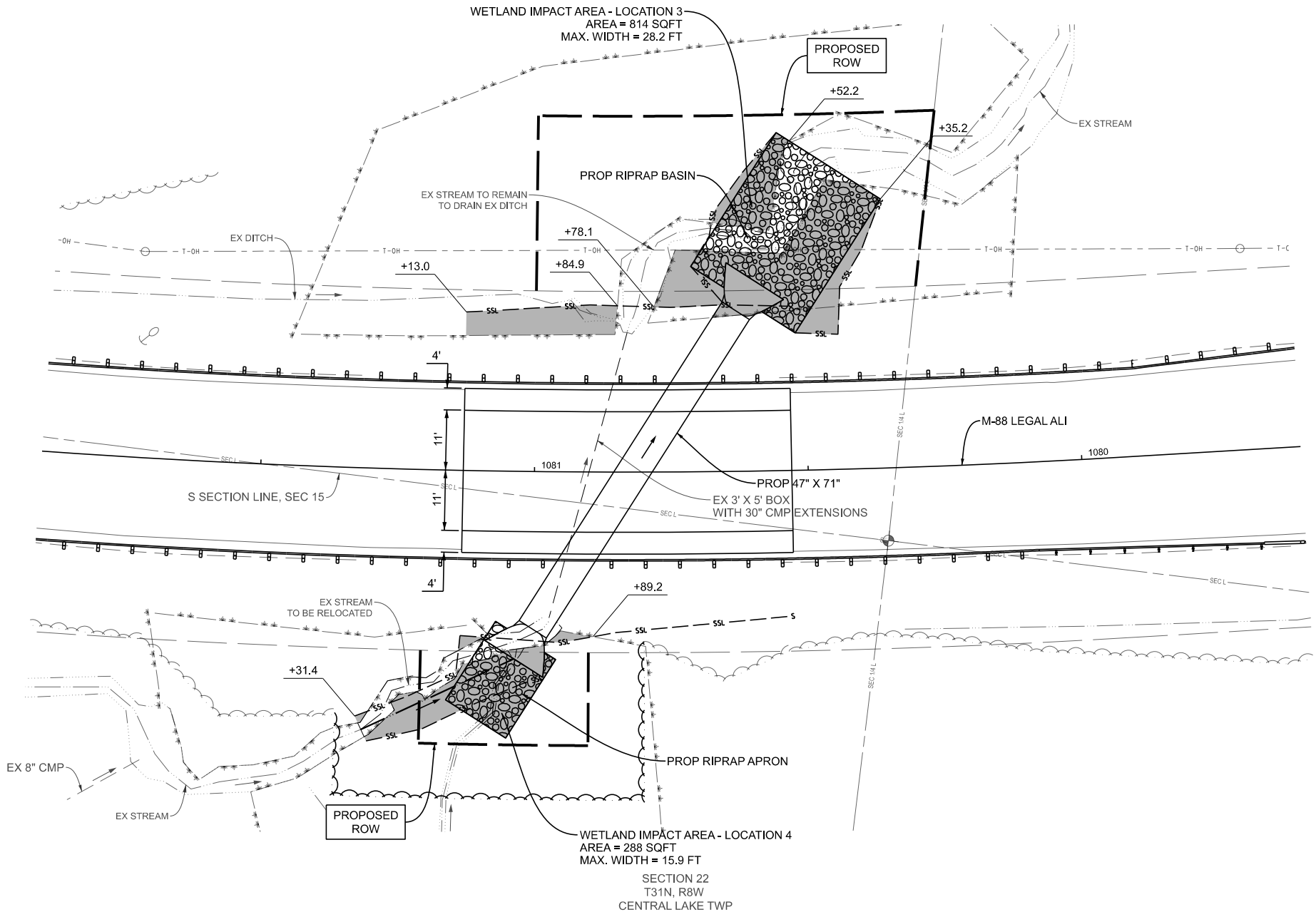
CS: 05031  
JN: 221459

CULVERT NO. 1  
WETLAND LOCATIONS 1 & 2  
PLAN VIEW

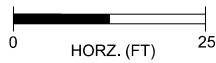
DRAWING SHEET  
M-88 PLAN 1001 LE  
SECT 1

WRP048407 v1.0  
Approved  
Issued On: 03/27/2026  
Expires On: 03/27/2031

SECTION 15  
T31N, R8W  
CENTRAL LAKE TWP



SECTION 22  
T31N, R8W  
CENTRAL LAKE TWP



DATE: 02/09/26  
DESIGN UNIT: MONROE  
TSC: GAYLORD

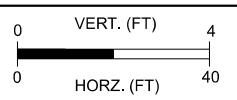
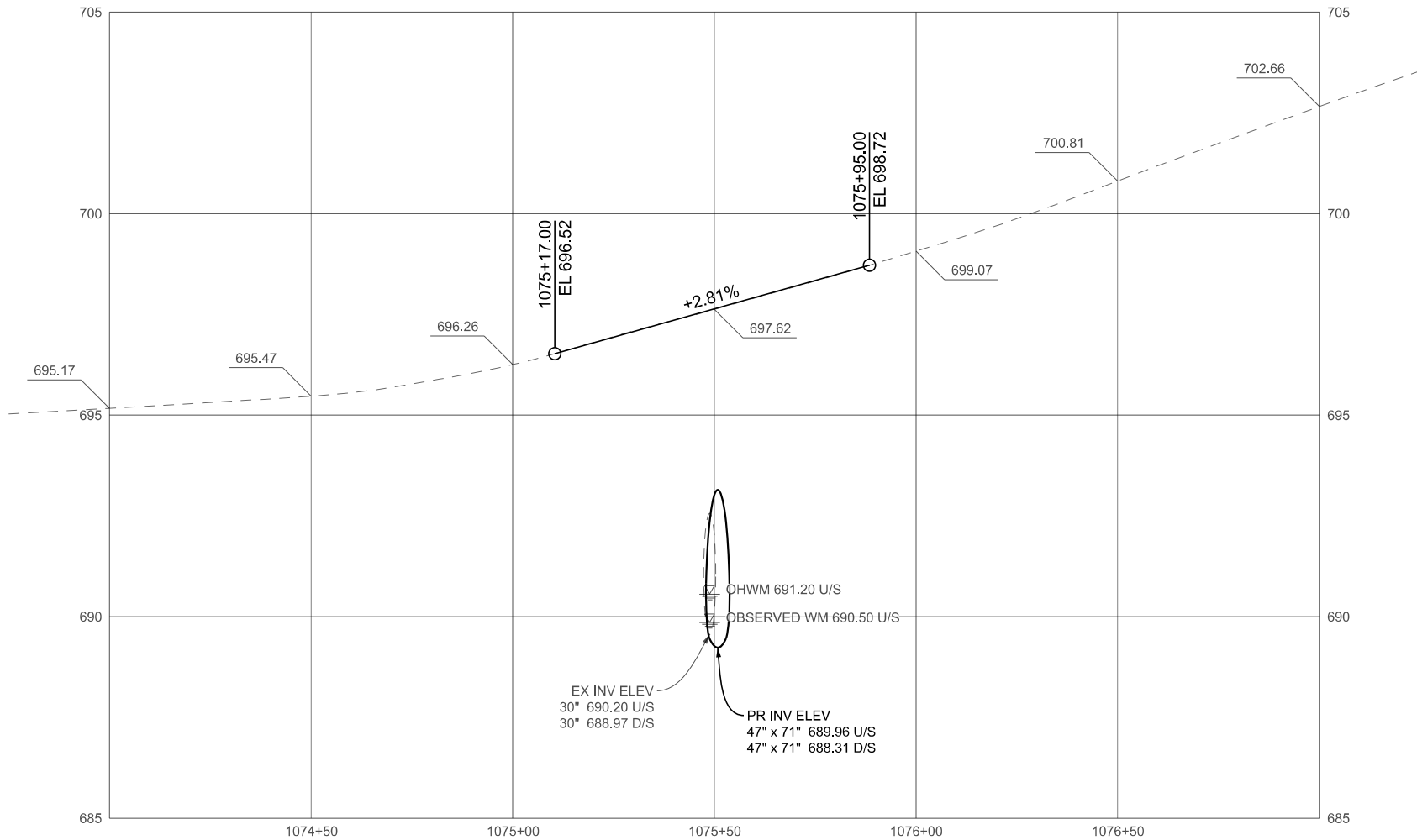
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JN: 221459

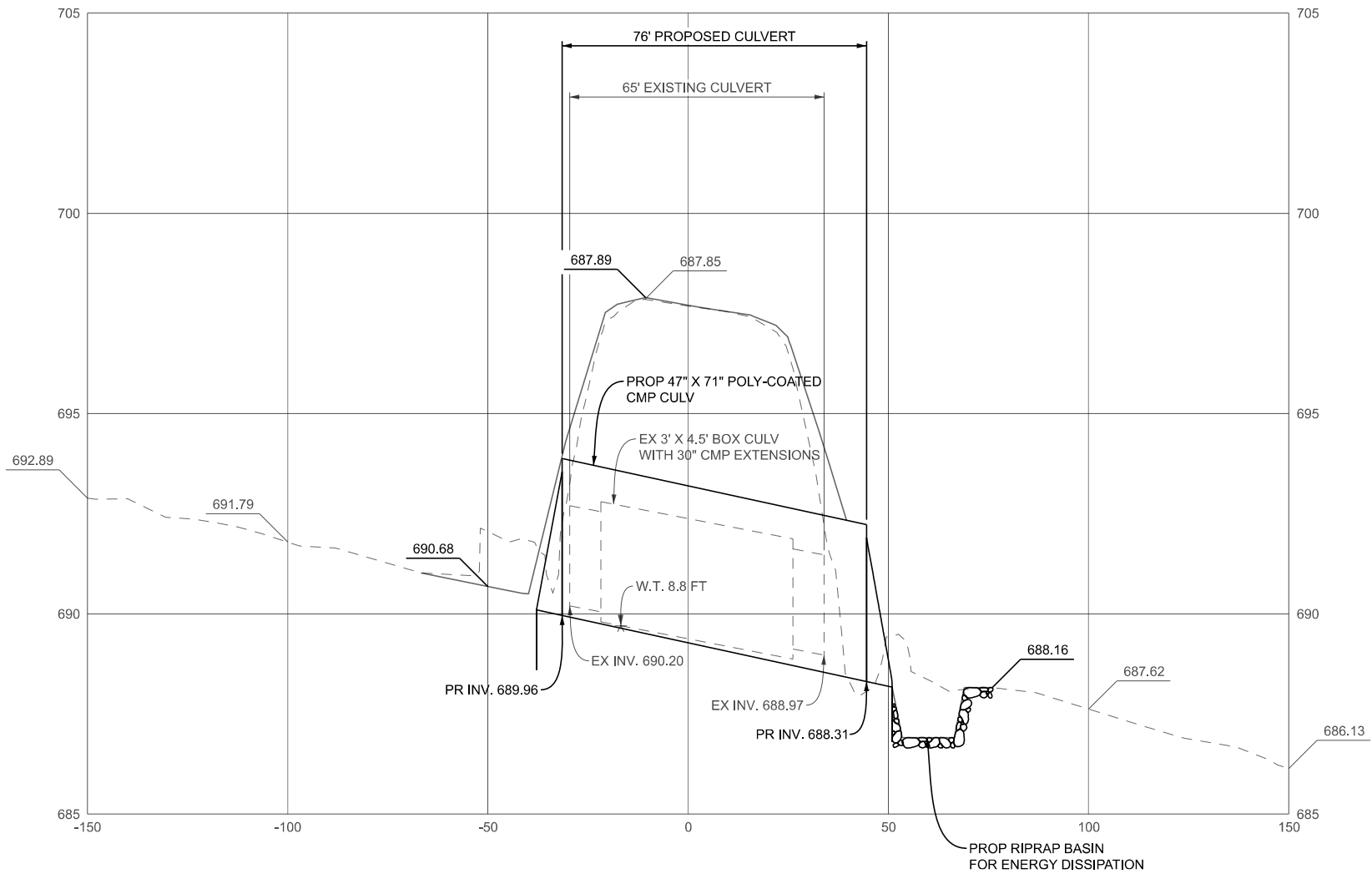
CULVERT NO. 2  
WETLAND LOCATIONS 3 & 4  
PLAN VIEW

DRAWING SHEET  
M-88 PLAN 1002 LE

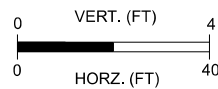
FILE: 221459\_DEGLE Permit.dgn

WRP048407 v1.0  
Approved  
Issued On: 03/27/2026  
Expires On: 03/27/2031





FILE: 221459\_DEGLE Permit.dgn



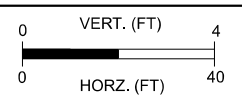
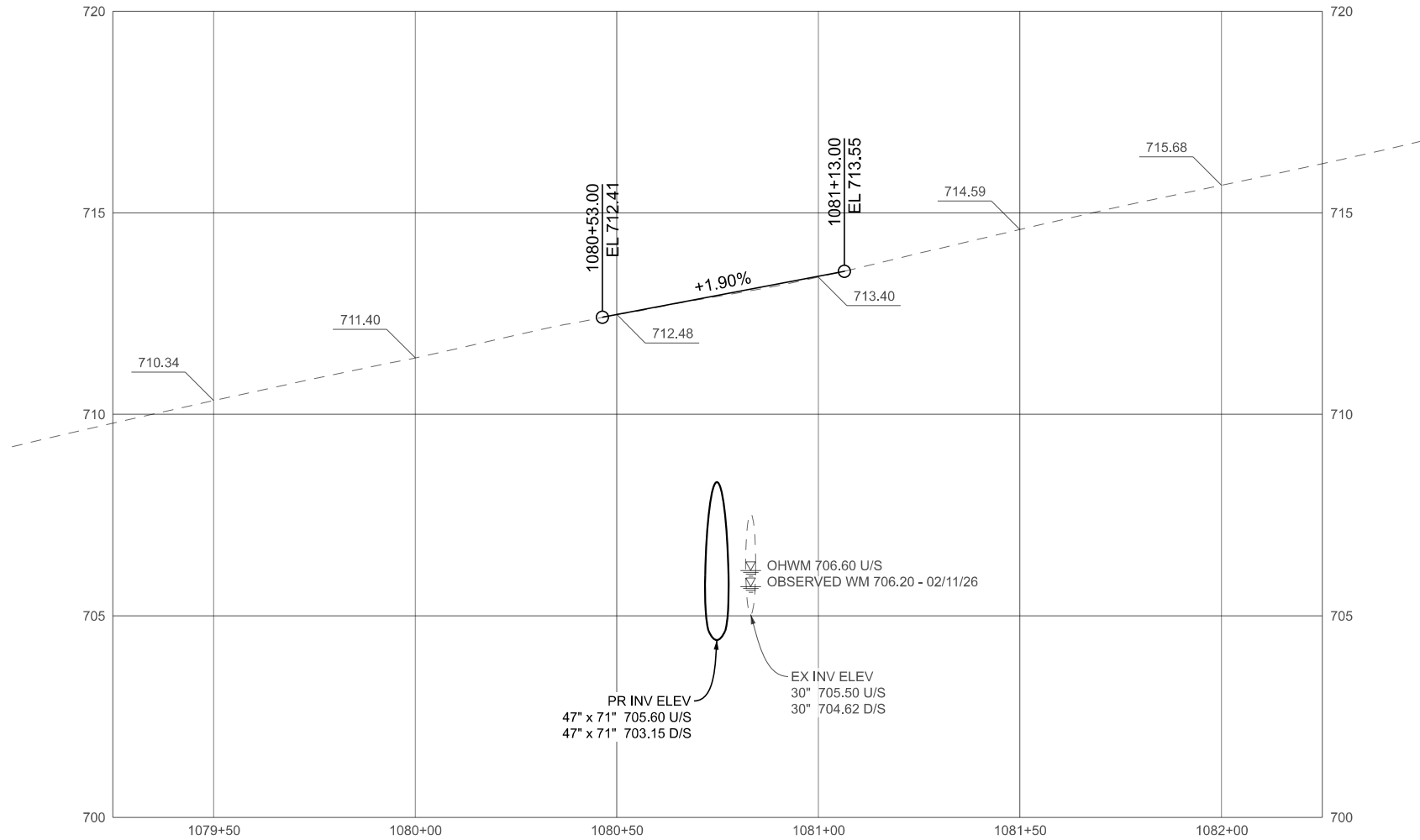
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 DESIGN UNIT: MONROE  
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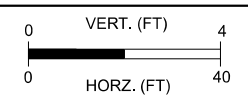
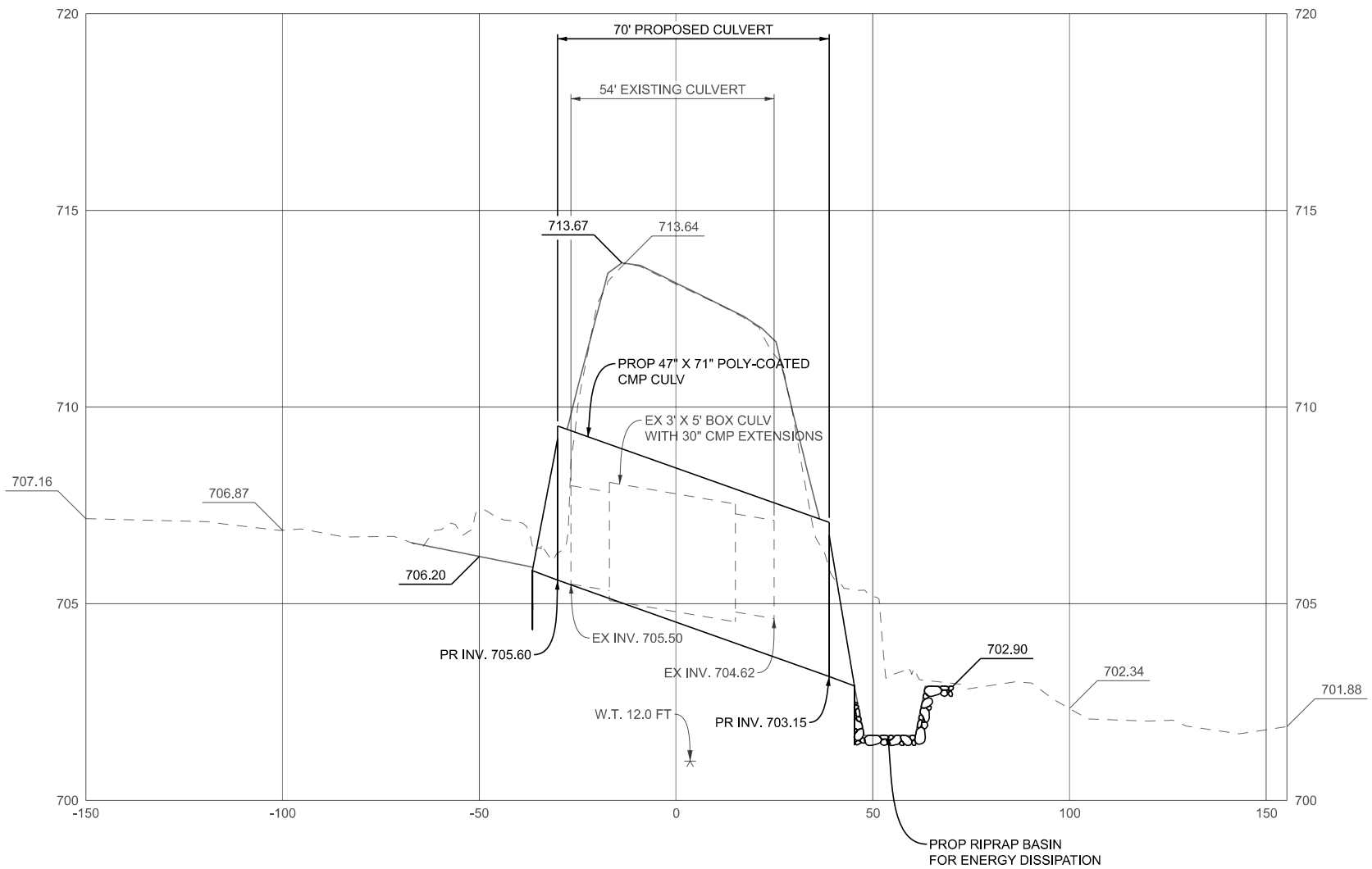
CS: 05031  
 JN: 221459

CULVERT NO. 1  
 CULVERT AND STREAM PROFILE

DRAWING	SHEET
M-88 STREAM	SECT 1
<b>FILE</b>	

WRP048407 v1.0  
 Approved  
 Issued On: 03/27/2026  
 Expires On: 03/27/2031

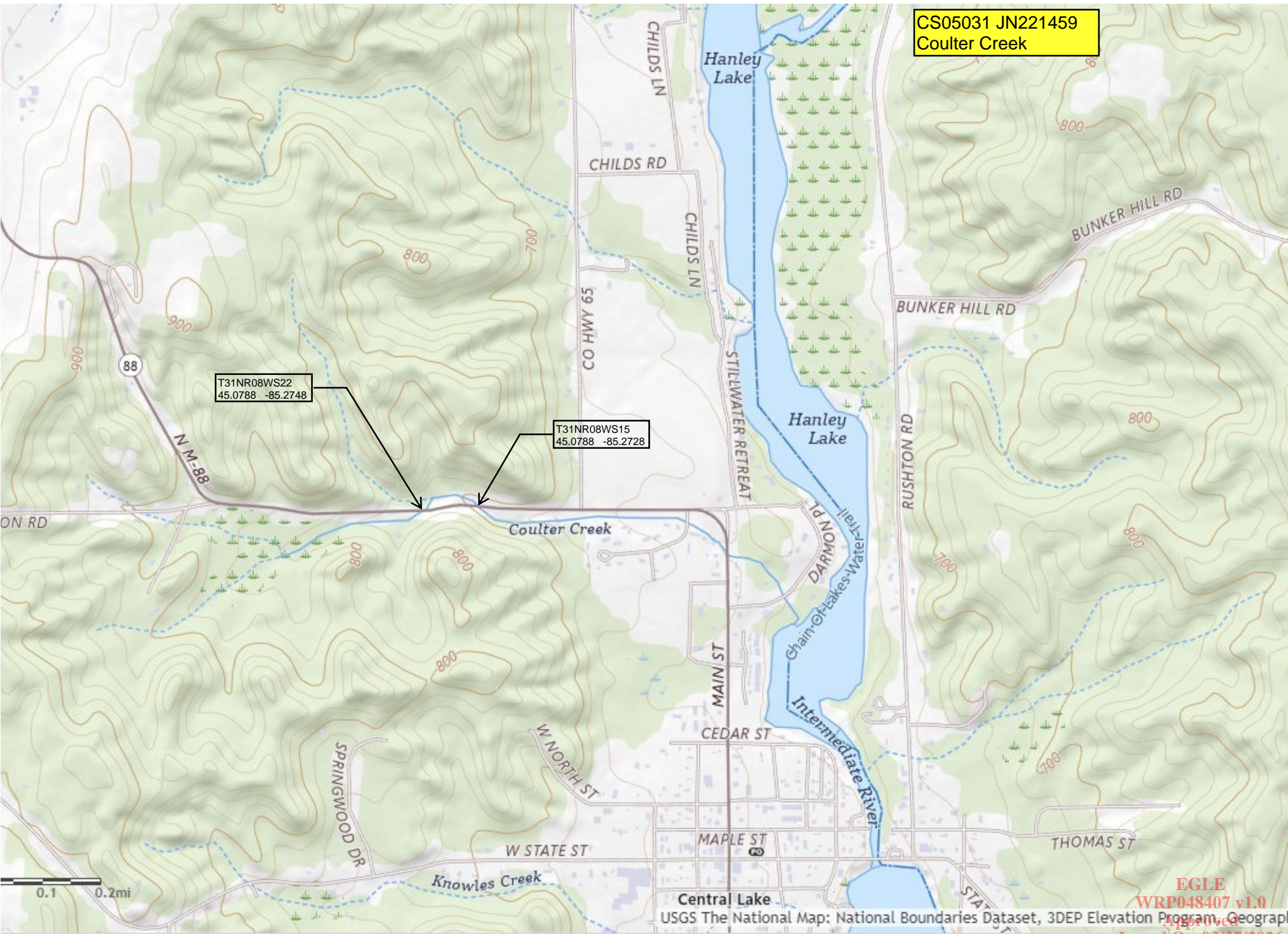




CS05031 JN221459  
Coulter Creek

T31NR08WS22  
45.0788 -85.2748

T31NR08WS15  
45.0788 -85.2728





Michigan Department of Environment, Great Lakes, and  
Energy Water Resources Division

**NOTICE OF COMPLETION**

I hereby give notice to the Michigan Department of Environment, Great Lakes, and Energy that the project, which was permitted under applicable statute provisions, has been completed.

PERMIT NUMBER	COUNTY
PROJECT COMPLETION DATE	AREA CODE AND TELEPHONE NUMBER
PERMITTEE'S SIGNATURE	

Noncompliance with reporting requirements may result in monetary penalty. Completion of this form is required under the authority of the applicable parts of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Once complete please via email to staff or my mail to:  
EGLE WRD  
Transportation Review Unit  
P.O. Box 30458  
Lansing, Michigan 48909-7958

MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
**MAINTAINING TRAFFIC**

GLD:AWK

1 of 6

APPR:GLD:MRR:6:3:2026

**a. Description.** This special provision consists of requirements and restrictions to maintain traffic for job number 221459 on M-88 in Central Lake Township, Antrim County.

**b. General.** Maintain traffic throughout the project in accordance with the standard specifications, typicals, and supplemental specifications in the contract and as described on the plans for this project.

**c. Construction Influence Area (CIA).** The CIA includes the right-of-way of the following roadways, within the approximate limits described below:

1. On M-88 from approximately 2 miles in advance of the point of beginning (POB) and the point of ending (POE) or as far as advanced signing is required.

2. In addition, the CIA includes the right-of-way of any designated detour route or alternate route, intersecting roads and ramps adjacent to the work zone for a distance of approximately 1/4 mile in advance of the work zone or as far as the construction or detour signing extends. The roads include but are not limited to US-31, Atwood Rd, and Ellsworth Rd.

**d. Traffic Restrictions.** Maintain traffic in accordance with the Maintaining Traffic Typicals contained herein, except as noted below. Changes or adjustments to the Maintaining Traffic Typicals may be necessary to fit field conditions, subject to approval of the Engineer or as determined by the Engineer.

1. Utilize the following Maintaining Traffic Typicals:

- A. 100-GEN-KEY
- B. 101-GEN-SPACING-CHARTS
- C. 102-GEN-NOTES
- D. 103-GEN-SIGNS
- E. 104-GEN-AB
- F. 107-GEN-SPEED
- G. 110-TR-NFW-2L
- H. 122-NFW-SHL-(R)

- I. WZD-100-A
- J. WZD-125-E

2. Do not work, deliver material, detour traffic, or close lanes during the holiday periods as defined in Table 1:

**Table 1: 2026 Holiday Periods**

Holiday	Start Date and Time	End Date and Time
Independence Day	6:00 am, Thursday, July 2 <sup>nd</sup>	6:00 am, Tuesday, July 7 <sup>th</sup>
Labor Day	6:00 am, Thursday, September 3 <sup>rd</sup>	6:00 am, Tuesday, September 8 <sup>th</sup>

- 3. Close M-88 and detour traffic via US-31, Atwood Road, and Ellsworth Road.
- 4. No traffic regulator control will be allowed from Friday at noon to Monday at 6:00 am. Daytime work and traffic regulator control will only be allowed from sunrise to sunset as defined by the [National Oceanic and Atmospheric Administration](#) (NOAA).
- 5. Ensure traffic is not maintained on a shoulder overnight.
- 6. Maintain access to all side roads at all times.
- 7. Maintain access to all driveways as directed by the Engineer unless prior agreements are made with the respective property owners.
- 8. When a lane is closed, place channelizing devices at cross streets and major drives to form a radius that clearly defines the approaches to the through and turning traffic.
- 9. Complete all work for the project by September 30<sup>th</sup>, 2026.

**e. Traffic General.**

- 1. For any lane open to traffic, provide a minimum lane width of 11 feet, unless otherwise approved by the Engineer.
- 2. Do not close lanes or utilize traffic regulation sequences where work can be accomplished with a shoulder closure. Do not occupy any part of the active traffic lane with personnel or equipment when utilizing a shoulder closure. Place lane closures and traffic regulation operations only in areas as shown on the plans unless otherwise directed by the Engineer.
- 3. Prior to shifting traffic onto shoulders or opening any lanes/shoulders remove, by sweeping all accumulated debris that has collected within the shoulder and/or within the closed lane/shoulder.
- 4. A speed reduction will be used. Set the work zone speed limit on M-88 at 10 miles per hour less than the posted speed limit when utilizing traffic regulator control.

5. Develop and submit to the Engineer an Internal Traffic Control Plan (ITCP) per subsection 104.11.B of the Standard Specifications for Construction. The requirements listed herein are the requirements for a Type A ITCP. Submit the Type A ITCP at the preconstruction meeting. The Engineer will have 7 calendar days to review the ITCP for approval or provide comments for revisions required to obtain approval. Include in the ITCP, at a minimum, the proposed ingress/egress locations for construction equipment and vehicles, traffic control devices that will be utilized to warn the motoring public of ingress/egress locations, and measures that will be taken to ensure compliance with the ITCP. Ensure that the ITCP minimizes conflicts between construction vehicles and motorists and maintains overall safety and mobility within the work zone. No work may begin prior to approval of the ITCP. Additional time required to obtain an approved ITCP will not be cause for delay or impact claims. All costs associated with obtaining an approved ITCP, providing and executing all parts of the approved ITCP including required traffic control devices, or resolving an incomplete or unacceptable ITCP will be borne by the Contractor.

6. Protect the work area at the end of each day. Close all open access points on the project to traffic with Type III barricades or other devices approved by the Engineer.

7. The Engineer will be responsible for notifying emergency services, transit agencies, law enforcement and schools prior to any lane closures, detours or major traffic shifts. In addition, the Contractor will be responsible for working with and complying with any coordination that is necessary with the Department and emergency services, transit agencies, law enforcement and schools. All costs associated with these coordination efforts will be considered included in the pay item "Minor Traf Devices".

8. Obtain all necessary permits from local governments within areas of local jurisdiction, including noise/dust ordinance waivers when required, prior to placing construction signing on local roads.

A. The Department will reimburse permit costs in accordance with subsection 107.02.A of the Standard Specification for Construction. Adhere to all requirements made by local maintaining agencies regarding placement of traffic control devices prior to closing lanes on roadways not under MDOT jurisdiction.

9. Remove all temporary traffic control devices from MDOT right-of-way during any shut down periods unless needed for directly maintaining or channelizing traffic. No additional payment will be made for removal and/or redeployment of these devices except for in the case of an approved extension of time.

10. Cover or remove construction signing that refers to work zone speed when work at a location is planned to be inactive for a period greater than 2 days, unless otherwise specified on the plans or as directed by the Engineer.

11. Once work is initiated that includes any lane restrictions, that work must be continued daily until completed. A lack of work activity for more than 3 days will require the removal of lane closures at no expense to the Department.

**f. Traffic Regulator Control.**

1. Maintain two-way traffic at all times on M-88 using traffic regulator control. A traffic regulator sequence is allowed to cover a maximum closure length of ½ mile. Place the arrow

panel, signs and channelizing taper for the traffic regulator operation at locations approved by the Engineer for adequate visibility by oncoming traffic.

2. Do not utilize more than one traffic regulator operation at one time on M-88.

3. Crossroads must remain open to traffic at all times. Use intermediate traffic regulators at each intersection approach and commercial driveways within the closure limits, as directed by the Engineer. Use traffic regulator control as directed by the Engineer for cross street traffic while paving through intersections.

**g. Detours.**

1. Cover all detour signs installed prior to closing a road. Do not uncover detour signing until just before the closure is in effect. Immediately remove or cover all detour signing upon opening the road to traffic.

**h. Earthwork and Excavation.**

1. Use protective fencing to protect open excavations within the work zone during non-working hours.

**i. Traffic Control Devices.** Ensure all traffic control devices are in accordance with the *MMUTCD* and must meet the "acceptable" criteria as defined in the *ATSSA* publication entitled "*Quality Guidelines for Temporary Traffic Control Devices and Features*" at the time of initial deployment and after each major stage change.

1. During non-working periods, place applicable advance signs and channelizing devices at specific locations, as directed by the Engineer, at no additional cost to the Department.

2. Notify the Engineer 24 hours in advance of when traffic control devices are being delivered to the project site, to allow for initial inspection of devices to take place.

3. Remove from the project site all traffic control devices (including detour signing) no longer needed for a particular operation and equipment for construction within 14 calendar days of reopening the shoulder/lane/roadway.

4. Channelizing Devices.

A. Ensure all devices have sufficient ballast to prevent moving or tipping. If moving or tipping occurs, place additional ballast, as directed by the Engineer, at no additional cost to the Department. No more than two ballasts are allowed on each channelizing device.

B. Do not use caution tape on this project.

C. Delineate the edge line using 42" channelizing devices spaced at 100 ft.

5. Temporary Signs.

A. Additional W20-1 (ROAD WORK AHEAD) signs are included in the quantities to be placed on all intersecting or adjacent roads where construction activities may be

encountered. The additional sign quantities listed below are for information only, actual quantities will be as directed by the Engineer:

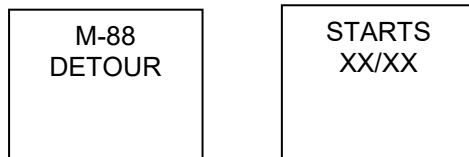
B. Fabricate, install, and remove temporary sign overlays on existing signs with the pay item for Sign, Type B, Temp, Prismatic, Furn. Attach the overlay in accordance with subsection 812.03.D.2 of the Standard Specifications for Construction.

6. Portable Changeable Message Signs (PCMS's). Use PCMS's to warn traffic of upcoming and changing traffic control during the life of the project. Messaging and PCMS placement will be as directed by the Engineer.

A. Install PCMS's and make them operational a minimum of 7 calendar days prior to the start of work, unless otherwise directed by the Engineer. Messages displayed on the PCMS's must conform to MDOT's policy on PCMS's. Messages will be as directed by the Engineer.

B. Do not leave PCMS's with a blank screen within the clear zone of any roadway at any time. Remove the PCMS or display flashing dots in each corner of the screen when there is no message to display. Update the PCMS messages at the end of each work period to reflect current traffic lane restrictions.

C. Display the following messages for two weeks prior to starting work:



D. Display the following messages during the detour:



E. Display the following messages during the detour:



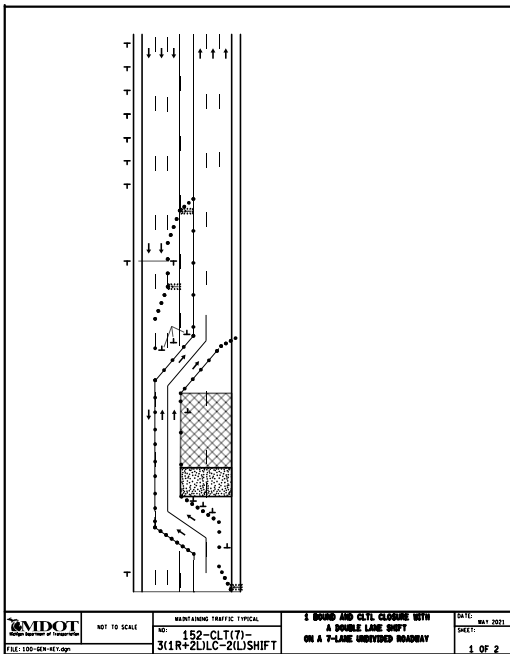
**j. Measurement and Payment.** Payment will be in accordance with the standard specifications unless otherwise specified. No additional payment will be made for the following activities:

1. Transporting traffic control items from site to site.
2. Providing sufficient vehicles and staff to make changes as-needed on site during work.
3. Providing sufficient vehicles and staff to remove closures from the roadway.
4. Providing additional traffic control devices required to expedite the construction for the convenience of the Contractor.

# TYPICAL NUMBER KEY

## CODES

AB = ARROW BOARD AW = ADVANCE WARNING C = CLOSURE CLT = CENTER LEFT TURN LANE CROSS = CROSSOVER CruSha = CRUSH AND SHAPE EM = EARLY MERGE EnR = ENTRANCE RAMP ExR = EXIT RAMP FW = FREEWAY GEN = GENERAL INFORMATION GORE = FREEWAY GORE AREA IN = INSIDE INT = INTERSECTION L = LANE (L) = LEFT LC = LANE CLOSURE LD = LONG DURATION	LO = LANE OPEN O = OUTSIDE (LANE CLOSURE) OUT = OUTSIDE OF SHOULDER MID = MIDDLE OF INTERSECTION OR ROAD NFW = NON-FREEWAY PARK = PARKING LANE PCMS = PORTABLE CHANGEABLE MESSAGE SIGN (R) = RIGHT ROLL = ROLLING ROADBLOCK RUM = RUMBLE STRIP SD = SHORT DURATION SHL = SHOULDER CLOSURE SIGN = SIGN SP = SPECIAL SPEED = SPEED STA = STOPPED TRAFFIC ADVISORY TR = TRAFFIC REGULATOR TS = TEMPORARY SIGNAL ZIP = ZIPPER MERGE
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- 100 - GENERAL NOTES
- 110 - TRAFFIC REGULATORS
- 120 - NON-FREEWAY
- 130 - CENTER LEFT TURN (CLT) LANES
- 140 - PARKING LANES
- 150 - CLT 7 LANE SECTIONS
- 160 - SIGNAL WORK
- 200 - FREEWAY CLOSURES
- 210 - FREEWAY LANE SHIFTS
- 220 - FREEWAY ENTRANCE RAMPS
- 230 - FREEWAY EXIT RAMPS
- 300 - ADVANCE WARNINGS
- 310 - CROSSOVER CLOSURE
- 320 - CRUSH AND SHAPE
- 340 - MERGE SYSTEMS
- 350 - GORE LOCATIONS
- 360 - ROLLING ROADBLOCK
- 4000 - MAINTENANCE
- 5000 - SURVEY

EXAMPLE TYPICAL

CODE: 152-CTL(7)-3(1R+2L)LC-2(L)SHIFT

152 - TYPICAL NUMBER

CTL(7) = CENTER LEFT TURN LANE, 7 LANES TOTAL.

3(1R+2L)LC = 3 LANES CLOSED, (1 RIGHT LANE AND 2 LEFT LANES).

2(L)SHIFT = 2 LANES SHIFTED TO THE LEFT.

NOT TO SCALE

	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	TYPICAL NUMBERING KEY	DATE: DECEMBER 2021
		NO: 100-GEN-KEY		SHEET: 1 OF 2

FILE: 100-GEN-KEY.dgn

1 OF 1

**DISTANCE BETWEEN TRAFFIC SIGNS, "D"**

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
D (FEET)	250	300	350	400	450	500	550	600	650	700	750

**GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE, "B"**

"B" LENGTHS	SPEED*, MPH (PRIOR TO WORK AREA)											
	20	25	30	35	40	45	50	55	60	65	70	75
B (FEET)	33	50	83	132	181	230	279	329	411	476	542	625

\* POSTED SPEED, OFF-PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED.

**MINIMUM MERGING TAPER LENGTH, "L" (FEET)**

OFFSET (FEET)	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
1	11	15	21	27	45	50	55	60	65	70	75
2	21	30	41	54	90	100	110	120	130	140	150
3	32	45	62	80	135	150	165	180	195	210	225
4	42	60	82	107	180	200	220	240	260	280	300
5	53	75	103	134	225	250	275	300	325	350	375
6	63	90	123	160	270	300	330	360	390	420	450
7	73	105	143	187	315	350	385	420	455	490	525
8	84	120	164	214	360	400	440	480	520	560	600
9	94	135	184	240	405	450	495	540	585	630	675
10	105	150	205	267	450	500	550	600	650	700	750
11	115	165	225	294	495	550	605	660	715	770	825
12	125	180	245	320	540	600	660	720	780	840	900
13	136	195	266	347	585	650	715	780	845	910	975
14	146	210	286	374	630	700	770	840	910	980	1050
15	157	225	307	400	675	750	825	900	975	1050	1125

NOT TO SCALE

	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	<b>"B", "D" AND "L" TABLES</b> <b>CHANNELIZING DEVICE SPACING,</b> <b>SIGN BORDER KEY, AND ROLL-AHEAD SPACING</b>	DATE: MAY 2021
		NO: 101-GEN-SPACING-CHARTS		SHEET: 1 OF 3

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

"L" =  $\frac{W \times S^2}{60}$  WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = W X S WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER  
 S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA  
 W = WIDTH OF OFFSET

TYPES OF TAPERS

**UPSTREAM TAPERS**

- MERGING TAPER
- SHIFTING TAPER
- SHOULDER TAPER
- 2 TO 1 LANE ROAD TAPER

TAPER LENGTH

- L - MINIMUM
- 1/2 L - MINIMUM
- 1/3 L - MINIMUM
- 100' - MAXIMUM

**DOWNSTREAM TAPERS**  
 (USE IS RECOMMENDED)

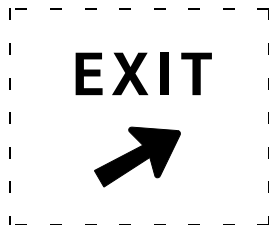
100' (PER LANE)

**MAXIMUM SPACING FOR CHANNELIZING DEVICES**

WORK ZONE SPEED LIMIT	DRUM AND 42" DEVICE SPACING (FT)		NIGHTTIME 42" DEVICE SPACING (FT)	
	TAPER	TANGENT	TAPER	TANGENT
< 45 MPH	1 x SPEED LIMIT	2 x SPEED LIMIT	25 FEET	50 FEET
≥ 45 MPH	50 FEET	100 FEET	25 FEET	50 FEET

**SIGN OUTLINE KEY**

DASHED OUTLINES INDICATE A SIGN THAT EXISTS ON SITE, AND NEEDS TO BE COVERED.



SOLID OUTLINES INDICATE A SIGN THAT IS TO BE PLACED ON THE PROJECT



NOT TO SCALE

	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	<b>"B", "D" AND "L" TABLES</b> <b>CHANNELIZING DEVICE SPACING</b> <b>SIGN BORDER KEY AND ROLL-AHEAD SPACING</b>	DATE: MAY 2021
		NO: 101-GEN-SPACING-CHARTS		SHEET: 2 OF 3

GUIDELINES FOR ROLL-AHEAD DISTANCES FOR TMA VEHICLES – TEST LEVEL 2

WEIGHT OF TMA VEHICLE	PREVAILING SPEED (POSTED SPEED PRIOR TO WORK ZONE)	ROLL-AHEAD DISTANCE* (DISTANCE FROM FRONT OF TMA VEHICLE TO WORK AREA)
5.5 TONS (STATIONARY)	40 MPH OR LESS	25 FT

\* ROLL-AHEAD DISTANCES ARE CALCULATED USING A 4,410 POUND IMPACT VEHICLE WEIGHT.

GUIDELINES FOR ROLL-AHEAD DISTANCES FOR TMA VEHICLES – TEST LEVEL 3

WEIGHT OF TMA VEHICLE	PREVAILING SPEED (POSTED SPEED PRIOR TO WORK ZONE)	ROLL-AHEAD DISTANCE* (DISTANCE FROM FRONT OF TMA VEHICLE TO WORK AREA)
5 TONS (MOBILE)	45 MPH	100 FT
	50-55 MPH	150 FT
	60-75 MPH	175 FT
12 TONS (STATIONARY)	45 MPH	25 FT
	50-55 MPH	25 FT
	60-75 MPH	50 FT

\* ROLL-AHEAD DISTANCES ARE CALCULATED USING A 10,000 POUND IMPACT VEHICLE WEIGHT.



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 101-GEN-SPACING-CHARTS

"B", "D" AND "L" TABLES  
CHANNELIZING DEVICE SPACING  
SIGN BORDER KEY AND ROLL AHEAD SPACING

DATE: MAY 2021

SHEET:

3 OF 3

**THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL**

**GENERAL NOTES**

- G1: SEE GEN-SPACING-CHARTS FOR COMMON VALUES INCLUDING:  
 D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES  
 L = MINIMUM LENGTH OF TAPER  
 B = LENGTH OF LONGITUDINAL BUFFER  
 ROLL AHEAD DISTANCE
- G2: DISTANCE BETWEEN SIGNS, "D", THE VALUES FOR WHICH ARE SHOWN IN TYPICAL GEN-KEY ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- G3: ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING MUST MEET NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP 350) TEST LEVEL 3, OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) TL-3 AS WELL AS THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
- G4: DO NOT STORE EQUIPMENT, MATERIALS OR PERFORM WORK IN ESTABLISHED BUFFER AREAS.
- G5: ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR TRAFFIC PATTERNS FOR WORK LESS THAN THREE DAYS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.

**SIGN NOTES**

- S1: ALL NON-APPLICABLE SIGNING WITHIN THE CIA MUST BE MODIFIED TO FIT CONDITIONS, COVERED, OR REMOVED. FOR GUIDANCE SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, SECTIONS 6.01.09 AND 6.01.10.
- S2: R5-18b SIGNS ARE ONLY REQUIRED ON FREEWAY PROJECTS WITH A DURATION OF 15 DAYS OR LONGER OR NON-FREEWAY PROJECTS WITH A DURATION OF 90 DAYS OR LONGER. TO APPLY THIS TYPICAL WITHOUT R5-18b SIGNS, REMOVE THE SIGNS AND CONSOLIDATE THE SEQUENCE AS APPROPRIATE.
- S3: R5-18c IS ONLY REQUIRED IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. OMIT THIS SIGN IN SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE.
- S4: ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W20-5 SIGNS.
- S5: PLACE ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE WORK ZONE SPEED AFTER EACH MAJOR CROSSROAD THAT INTERSECTS THE WORK ZONE, OR AFTER EACH ENTRANCE RAMP THAT COMES ONTO THE FREEWAY WHERE THE REDUCED SPEED IS IN EFFECT. PLACE ADDITIONAL SPEED LIMIT SIGNS AT INTERVALS ALONG THE ROADWAY SUCH THAT NO SPEED LIMIT SIGNS ARE MORE THAN 2 MILES APART. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, PLACE ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED BEYOND THE LIMITS OF THE WORK AREA AS INDICATED. IF PERMANENT SIGNS DISPLAYING THE CORRECT SPEED LIMIT ARE POSTED, OMIT ALL W3-5b AND R2-1 SIGNS AND REDUCE SPACING ACCORDINGLY.
- S6: FABRICATE SPECIAL SIGNS IN ACCORDANCE WITH CURRENT SIGNING DESIGN STANDARDS.
- S7: PLACE ADDITIONAL R8-3 SIGNS AT A MAXIMUM 500' SPACING THROUGHOUT THE WORK ZONE.
- S8: WHEN SPEED LIMIT SIGNS CANNOT BE PLACED SIDE BY SIDE AS SHOWN, PLACE THEM "D" DISTANCE APART.
- S9: STOP SIGNS NOT REQUIRED IF SIGNALS ARE ON 4-WAY FLASHING RED. STOP AHEAD SIGNS ARE NOT REQUIRED IF THERE IS ADEQUATE VISIBILITY OF THE STOP SIGN OR IF SIGNALS ARE BEING USED TO CONTROL TRAFFIC.
- S10: PLACE REDUCED SPEED ZONE AHEAD SIGN (W3-5b) HERE WHEN USING A SPEED REDUCTION IN THIS DIRECTION.
- S11: THE NUMBER OF W1-6 SHIFT SIGNS TO PLACE FOR A SHIFT IS AS FOLLOWS:  
 SHIFTS 4FT OR LESS, PLACE ONE W1-6(R)(L)  
 SHIFTS 5FT TO 12FT, PLACE TWO W1-6(R)(L)  
 SHIFTS MORE THAN 12FT, PLACE THREE OR MORE W1-6(R)(L) SIGNS DEPENDING UPON LENGTH OF SHIFT AND AS PER THE ENGINEER.
- S12: PLACE R2-1 SIGNS AS DETAILED IN NOTE S5 WHEN THERE IS A SPEED REDUCTION IN THIS DIRECTION

**TRAFFIC REGULATOR NOTES**

- TR1: TRAFFIC REGULATORS MUST FOLLOW ALL THE REQUIREMENTS IN THE STANDARD SPECIFICATIONS, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS, THE CURRENT VERSIONS OF THE TRAFFIC REGULATOR'S INSTRUCTION MANUAL AND THE VIDEO "HOW TO SAFELY REGULATE TRAFFIC IN MICHIGAN". THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS IS DETERMINED BY THE ROADWAY ADT, GEOMETRICS, AND AS DIRECTED BY THE ENGINEER.
- TR2: PROVIDE APPROPRIATE BALLOON LIGHTING TO SUFFICIENTLY ILLUMINATE TRAFFIC REGULATOR'S STATIONS WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS.
- TR3: PROVIDE EITHER A STOP/SLOW AFAD OR A RED/YELLOW LENS AFAD, MEETING THE REQUIREMENTS OF THE MMUTCD

**TEMPORARY TRAFFIC CONTROL DEVICE NOTES**

- TCD1: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD NOT EXCEED 1.0 TIMES THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 50 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TAPERS ARE NOT TO EXCEED 25 FEET AT NIGHT.
- TCD2: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TANGENT SHOULD NOT EXCEED TWICE THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 100 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TANGENTS ARE NOT TO EXCEED 50 FEET AT NIGHT.
- TCD3: TYPE III BARRICADES MUST BE LIGHTED FOR OVERNIGHT CLOSURES.
- TCD4: WHEN THE HAUL ROAD IS NOT IN USE, PLACE LIGHTED TYPE III BARRICADES WITH "ROAD CLOSED" EXTENDING COMPLETELY ACROSS THE HAUL ROAD.
- TCD5: USE OBJECT MARKER SIGNS IN LIEU OF THE TYPE B HIGH INTENSITY LIGHT SHOWN IN THE STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER (R-53, AND R-126) WHEN USED WITH A TEMPORARY SIGNAL SYSTEM. THE OBJECT MARKERS MUST BE A MINIMUM OF 12 INCHES IN WIDTH AND 36 INCHES IN HEIGHT AND HAVE ORANGE AND WHITE RETROREFLECTIVE SHEETING. THE RETROREFLECTIVE SHEETING MUST HAVE ALTERNATING DIAGONAL ORANGE AND WHITE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION VEHICULAR TRAFFIC IS TO PASS.
- TCD6: PLACE LIGHTED ARROW PANELS AS CLOSE TO THE BEGINNING OF TAPERS AS PRACTICAL, BUT NOT IN A MANNER THAT WILL OBSCURE OR CONFUSE APPROACHING MOTORISTS WHEN PHYSICAL LIMITATIONS RESTRICT PLACEMENT. IN CURBED SECTIONS, IF ARROW BOARD CANNOT BE PLACED BEHIND CURB, PLACE ARROW BOARD IN THE CLOSED LANE AS CLOSE TO THE BEGINNING OF TAPER AS POSSIBLE.
- TCD7: ADDITIONAL TYPE III BARRICADES MAY BE REQUIRED TO COMPLETELY CLOSE OFF ROAD FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT.
- TCD8: WHERE THE SHIFTED SECTION IS SHORTER THAN 600 FEET, A DOUBLE REVERSE CURVE SIGN (W24-1) CAN BE USED INSTEAD OF THE FIRST REVERSE CURVE SIGN, AND THE SECOND REVERSE CURVE SIGN CAN BE OMITTED.
- TCD9: RUMBLE STRIPS ARE TO BE PLACED AS SPECIFIED IN THE CONTRACT. IF NOT SPECIFIED IN THE CONTRACT, PLACE RUMBLE STRIPS AS SHOWN, AND IN ACCORDANCE WITH THE RUMBLE STRIP MANUFACTURER'S RECOMMENDATIONS. AN ARRAY OF RUMBLE STRIPS CONTAINS THREE RUMBLE STRIPS. PLACE THE RUMBLE STRIPS IN THE ARRAY AT A CONSISTENT DISTANCE, BETWEEN 10' AND 20' APART.
- TCD10: SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, PORTABLE CHANGEABLE MESSAGE SIGN GUIDELINES FOR RECOMMENDED AND CORRECT PCMS MESSAGING. STAGGER PCMS THAT ARE ON OPPOSING SIDES OF THE ROAD 1000 FEET FROM EACH OTHER.

**RAMP NOTES**

- RMP1: WHEN CONDITIONS ALLOW, E5-1 SIGNS MUST BE REMOVED OR COVERED AND CHANNELIZING DEVICES MUST BE POSITIONED TO ENABLE RAMP TRAFFIC TO DIVERGE IN A FREE MANNER
- RMP2: STOP AND YIELD CONDITIONS SHOULD BE AVOIDED WHENEVER PRACTICAL. WHEN CONDITIONS WARRANT, R1-1 SIGNS MAY BE USED IN PLACE OF R1-2 SIGNS. WHEN R-1 SIGNS ARE USED, W3-1 SIGNS MUST BE USED IN PLACE OF W3-2 SIGNS. CONSIDERATION SHOULD BE GIVEN TO CLOSING THE RAMP TO COMPLETE WORK TO ALLOW AN ADEQUATE MERGE DISTANCE. WORK SHOULD BE EXPEDITED TO AVOID THE STOP AND/OR YIELD CONDITIONS.

	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	<b>TRAFFIC TYPICALS NOTE SHEET</b>	DATE: MAY 2022
		NO: <b>102-GEN-NOTES</b>		SHEET:  1 OF 2
FILE: 102-GEN-NOTES.dgn				

THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

**SIGNAL NOTES**

- SIG1: EXISTING SIGNAL MUST BE EITHER 4-WAY FLASHING RED, BAGGED, OR TURNED OFF.
- SIG2: SIGNAL IS IN OPERATION.
- SIG3: DELINEATE THE WORK ZONE AREA WITH 28 INCH CONES FOR DAYTIME WORK, OR 42 INCH CHANNELIZING DEVICES FOR NIGHTTIME WORK.
- SIG4: THE CONTRACTOR MUST HAVE A DESIGNATED SPOTTER IF THE AERIAL BUCKET TRUCK IS LOCATED OVER ACTIVE TRAVEL LANES.
- SIG5: THE LOWEST POINT OF THE BUCKET MAY NOT TRAVEL BELOW 14 FOOT VERTICAL CLEARANCE. THE CONTRACTOR MUST UTILIZE AN ALTERNATE SET UP, OR PLACE THE INTERSECTION IN A 4 WAY STOP IF THE 14 FOOT VERTICAL CLEARANCE IS COMPROMIZED. USE TRAFFIC REGULATORS TO CONTROL TRAFFIC THROUGH THE INTERSECTION WHEN TRAFFIC IS PLACED IN A 4 WAY STOP.
- SIG6: DELINEATE THE TRUCK WITH CHANNELIZING DEVICES. THE POSITION OF THE TRUCK MAY BE MOVED TO FACILITATE WORK.

**MAINTENANCE AND SURVEYING NOTES**

- MS1: WHENEVER STOPPING SIGHT DISTANCE EXISTS TO THE REAR, THE SHADOW VEHICLES SHOULD MAINTAIN THE RECOMENDED DISTANCE FROM THE WORK AREA AND PROCEED AT THE SAME SPEED. THE SHADOW VEHICLE SHOULD SLOW DOWN AND TRAVEL AT A FARTHER DISTANCE TO PROVIDE ADEQUATE SIGHT DISTANCE IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES.
- MS2: WORKERS OUTSIDE OF VEHICLES SHOULD WORK WITHIN 150' OF WORK VEHICLES WITH AN ACTIVATED BEACON, BETWEEN THE "BEGIN WORK CONVOY" SIGN AND THE "END WORK CONVOY" SIGN, OR BETWEEN THE "WORK ZONE BEGINS" AND "END ROAD WORK" SIGN.
- MS3: WORK OR SHADOW VEHICLES WITH OR WITHOUT A TMA MAY BE USED TO SEPARATE THE WORK SPACE FROM TRAFFIC. IF USED, THE VEHICLES SHOULD BE PARKED ACCORDING TO THE ROLL AHEAD DISTANCE TABLES.
- MS4: WORK AND SHADOW VEHICLES SHALL BE APPROPRIATELY EQUIPPED WITH AN ACTIVATED AMBER BEACON.
- MS5: WHEN WORKERS ARE OUTSIDE THEIR VEHICLES IN AN EXISTING LANE WHILE A MOBILE OPERATION IS OCCURRING DURING THE NIGHTTIME HOURS, CHANNELIZING DEVICES TO DELINEATE OPEN OR CLOSED LANES AT 50 FT SPACING MUST BE USED. AN EXAMPLE OF AN OPERATION (BUT NOT LIMITED TO) IS THE LAYOUT OF CONCRETE PATCHES.
- MS6: W21-6 AND W20-1 SIGNS MAY BE SUBSTITUTED AS DETERMINED BY THE TYPE OF WORK TAKING PLACE AS PER THE ENGINEER.



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL







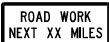
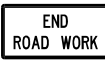
































































NO: 102-GEN-NOTES

TRAFFIC TYPICALS  
NOTE SHEET

DATE: MAY 2022  
SHEET:

2 OF 2

## SIGN NUMBER KEY

 E5-1f 48" x 48" 60" x 48"	 E5-2 48" x 36"	 E5-2a 48" x 36"	 E5-3 48" x 36"	 E13-1P VAR x 24"	 E13-1aP 36" x 24"	 G20-1 60" x 24"	 G20-2 48" x 24"
 G20-4 36" x 18"	 I-6a 18" x 18" 24" x 24" 30" x 30"	 M1-1 18" x 18" 24" x 24" 36" x 36" 48" x 48"	 M1-1 22.5" x 18" 30" x 24" 45" x 36" 60" x 48"	 M1-2 18" x 18" 24" x 24" 36" x 36" 48" x 48"	 M1-2 22.5" x 18" 30" x 24" 45" x 36" 60" x 48"	 M1-3 18" x 18" 24" x 24" 36" x 36" 48" x 48"	 M1-3 22.5" x 18" 30" x 24" 45" x 36" 60" x 48"
 M1-4 18" x 18" 24" x 24" 36" x 36" 48" x 48"	 M1-4 22.5" x 18" 30" x 24" 45" x 36" 60" x 48"	 M1-5 18" x 18" 24" x 24" 30" x 30" 36" x 36"	 M1-5a 18" x 18" 24" x 24"	 M1-6 18" x 18" 24" x 24" 36" X 36"	 M1-6 22.5" x 18" 30" x 24" 45" x 36"	 M3-1 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M3-2 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"
 M3-3 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M3-4 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-1 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-1a 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-2 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-3 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-4 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-5 12" x 6" 18" x 9" 24" X 12" 30" X 15" 36" X 18"
 M4-6 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-7 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-7a 12" x 6" 18" x 9" 24" x 12" 30" x 15" 36" x 18"	 M4-8 12" x 6" 18" x 9" 24" x 12" 30" x 15"	 M4-8a 24" x 18"	 M4-8b 24" x 12"	 M4-9L 30" x 24" 48" x 36" 60" x 48"	 M4-9R 30" x 24" 48" x 36" 60" x 48"
 M4-9j 30" x 24" 48" x 36" 60" x 48"	 M4-9kL 30" x 24" 48" x 36" 60" x 48"	 M4-9kR 30" x 30" 48" x 42" 60" x 54"	 M4-9mL 30" x 30" 48" x 42" 60" x 54"	 M4-9mR 30" x 30" 48" x 42" 60" x 54"	 M4-9dL 12" x 18"	 M4-9dR 12" x 18"	 M4-9e 12" x 18"
 M4-9f 12" x 18"	 M4-9gL 12" x 18"	 M4-9gR 12" x 18"	 M4-9h 12" x 24"	 M4-9i 12" x 18"	 M4-10L 48" x 18"	 M4-10R 48" x 18"	 M4-11a 12" X 6" 18" x 9" 24" X 12" 30" X 15" 36" X 18"
 M5-1L 12" x 9" 21" x 15" 30" x 21"	 M5-1R 12" x 9" 21" x 15" 30" x 21"	 M5-2L 12" x 9" 21" x 15" 30" x 21"	 M5-2R 12" x 9" 21" x 15" 30" x 21"	 M5-3 12" x 9" 21" x 15" 30" x 21"	 M6-1L 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-1R 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-2L 12" x 9" 18" x 12" 21" x 15" 30" x 21"
 M6-2R 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-3 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-4 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-5 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-6L 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-6R 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-7L 12" x 9" 18" x 12" 21" x 15" 30" x 21"	 M6-7R 12" x 9" 18" x 12" 21" x 15" 30" x 21"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS

 NO SCALE	<b>MAINTAINING TRAFFIC TYPICAL</b>	<b>STANDARD HIGHWAY SIGNS</b>	DATE: 10/17/24
	CODE: <b>103-GEN-SIGN</b>		SHEET: 1 OF 5

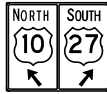
SIGN NUMBER KEY



M8-1gL  
36" x 66"



M8-1gR  
36" x 66"



M8-2d  
60" x 48"



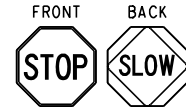
OM-3L  
12" x 36"  
24" x 48"  
36" x 72"



OM-3R  
12" x 36"  
24" x 48"  
36" x 72"



R1-1  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



R1-1a  
18" x 18"  
24" x 24"



R1-2  
18"  
24"  
30"  
36"  
48"  
60"



R1-2aP  
24" x 18"  
36" x 30"  
48" x 36"



R2-1  
18" x 24"  
24" x 30"  
30" x 36"  
36" x 48"  
48" x 60"



R2-1a  
48" x 60"



R3-1  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



R3-2  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



R3-3  
24" x 24"  
36" x 36"  
48" x 48"



R3-4  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



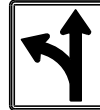
R3-5L  
30" x 36"  
36" x 48"



R3-5R  
30" x 36"  
36" x 48"



R3-5a  
30" x 36"  
36" x 48"



R3-6L  
30" x 36"  
42" x 48"



R3-6R  
30" x 36"  
42" x 48"



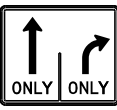
R3-7L  
30" x 30"  
36" x 36"



R3-7R  
30" x 30"  
36" x 36"



R3-8c  
36" x 30"



R3-8d  
36" x 30"



R4-1  
12" x 18"  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



R4-2  
12" x 18"  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



R4-7  
12" x 18"  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



R4-8  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



R4-9  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



R5-1  
30" x 30"  
36" x 36"  
48" x 48"



R5-1a  
30" x 18"  
36" x 24"  
42" x 30"



R5-18b  
48" x 60"



R5-18c  
48" x 48"



R5-18d  
78" x 12"



R5-18e  
72" x 12"



R5-18f  
48" x 60"



R5-18g  
30" x 42"



R5-18h  
48" x 60"



R6-1L  
36" x 12"  
54" x 18"



R6-1R  
36" x 12"  
54" x 18"



R6-2L  
12" x 16"  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



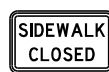
R6-2R  
12" x 16"  
18" x 24"  
24" x 30"  
36" x 48"  
48" x 60"



R8-3  
12" x 12"  
18" x 18"  
24" x 24"  
36" x 36"  
48" x 48"



R9-8  
36" x 18"



R9-9  
24" x 12"  
30" x 18"



R9-10  
24" x 12"  
48" x 24"



R9-11L  
24" x 12"  
48" x 36"



R9-11R  
24" x 12"  
48" x 36"



R9-11aL  
24" x 12"  
48" x 24"



R9-11aR  
24" x 12"  
48" x 24"



R10-6b  
36" x 54"



R11-2  
48" x 30"



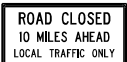
R11-2a  
48" x 30"



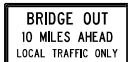
R11-2b  
48" x 30"



R11-2c  
60" x 30"



R11-3a  
60" x 30"



R11-3b  
60" x 30"



R11-4  
60" x 30"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS

	MAINTAINING TRAFFIC TYPICAL	STANDARD HIGHWAY SIGNS	DATE: 10/17/24
	CODE: 103-GEN-SIGN		SHEET: 2 OF 5
NO SCALE			

SIGN NUMBER KEY



W1-1L  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-1R  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-2L  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-2R  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-2bL  
36" x 36"  
48" x 48"



W1-2bR  
36" x 36"  
48" x 48"



W1-3L  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-3R  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-4L  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-4R  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-4bL  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-4bR  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-4cL  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W1-4cR  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



30" x 30"  
36" x 36"  
48" x 48"



W24-1cP  
24" x 18"  
30" x 24"



W24-1R  
30" x 30"  
36" x 36"  
48" x 48"



W24-1aL  
30" x 30"  
36" x 36"  
48" x 48"



W24-1aR  
30" x 30"  
36" x 36"  
48" x 48"



W24-1bL  
30" x 30"  
36" x 36"  
48" x 48"



W24-1bR  
30" x 30"  
36" x 36"  
48" x 48"



W1-6L  
24" x 12"  
36" x 18"  
48" x 24"  
60" x 30"  
96" x 48"



W1-6R  
24" x 12"  
36" x 18"  
48" x 24"  
60" x 30"  
96" x 48"



W1-8L  
12" x 18"  
18" x 24"  
24" x 30"  
30" x 36"  
36" x 48"



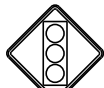
W1-8R  
12" x 18"  
18" x 24"  
24" x 30"  
30" x 36"  
36" x 48"



W3-1  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W3-2  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W3-3  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W3-4  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W3-4b  
30" x 30"  
36" x 36"  
48" x 48"



W3-5  
36" x 36"  
48" x 48"



W3-5a  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W3-5b  
30" x 30"  
36" x 36"  
48" x 48"



W4-1L  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W4-1R  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W4-2L  
30" x 30"  
36" x 36"  
48" x 48"



W4-2R  
30" x 30"  
36" x 36"  
48" x 48"



W4-3L  
30" x 30"  
36" x 36"  
48" x 48"



W4-3R  
30" x 30"  
36" x 36"  
48" x 48"



W4-5L  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W4-5R  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W4-5P  
18" x 24"  
24" x 30"



W4-6L  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W4-6R  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W4-7L  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W4-7R  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W5-1  
30" x 30"  
36" x 36"  
48" x 48"



W5-2  
18" x 18"  
30" x 30"  
36" x 36"  
48" x 48"



W5-3  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W5-4  
30" x 30"  
36" x 36"  
48" x 48"



W6-1  
30" x 30"  
36" x 36"  
48" x 48"



W6-2  
30" x 30"  
36" x 36"  
48" x 48"



W6-3  
30" x 30"  
36" x 36"  
48" x 48"



W6-4  
12" x 18"



W7-1  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W7-1a  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-1  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS



MAINTAINING TRAFFIC TYPICAL

STANDARD HIGHWAY SIGNS

DATE:  
10/17/24

CODE:

103-GEN-SIGN

SHEET:  
3 OF 5

NO SCALE

## SIGN NUMBER KEY



W8-2  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-3  
18" x 18"  
30" x 30"  
36" x 36"  
48" x 48"



W8-4  
18" x 18"  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-5  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-5P  
24" x 18"  
30" x 24"  
36" x 30"



W8-7  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-8  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-9  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-11  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-12  
30" x 30"  
36" x 36"  
48" x 48"



W8-14  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-15  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-15P  
24" x 18"  
30" x 24"  
36" x 30"



W8-17L  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-17R  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-17P  
24" x 18"  
30" x 24"  
36" x 30"



W8-18  
24" x 24"  
36" x 36"  
48" x 48"



W8-23  
24" x 24"  
36" x 36"  
48" x 48"



W8-24  
30" x 30"  
36" x 36"  
48" x 48"



W8-25  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W8-26  
36" x 36"  
48" x 48"



W9-1L  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W9-1R  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W9-2L  
30" x 30"  
36" x 36"  
48" x 48"



W9-2R  
30" x 30"  
36" x 36"  
48" x 48"



W9-3C  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W9-3L  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W9-3R  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W9-3a  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W9-3b  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W11-10  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W11-10a  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W11-24  
36" x 36"  
48" x 48"



W12-1  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W12-2  
18" x 18"  
30" x 30"  
36" x 36"  
48" x 48"



W13-1P  
18" x 18"  
24" x 24"  
30" x 30"



W13-2  
24" x 30"  
36" x 48"  
48" x 60"



W13-3  
24" x 30"  
36" x 48"  
48" x 60"



W13-4P  
24" x 24"  
36" x 36"



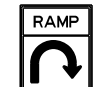
W13-6  
24" x 42"  
36" x 60"  
48" x 84"



W13-6a  
24" x 42"  
36" x 60"  
48" x 84"



W13-7  
24" x 42"  
36" x 60"  
48" x 84"



W13-7a  
24" x 42"  
36" x 60"  
48" x 84"



W14-3  
36" x 24"  
40" x 30"  
48" x 36"  
64" x 48"



W16-2P  
18" x 12"  
24" x 18"  
30" x 24"



W16-4aP  
18" x 12"  
24" x 18"  
30" x 24"  
36" x 30"



W16-12P  
24" x 18"



W16-13P  
24" x 18"  
30" x 24"



W20-1  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W20-1a  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W20-1b  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W20-1c  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W20-1d  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W20-2  
30" x 30"  
36" x 36"  
48" x 48"



W20-3  
30" x 30"  
36" x 36"  
48" x 48"



W20-3a  
30" x 30"  
36" x 36"  
48" x 48"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS



MAINTAINING TRAFFIC TYPICAL

STANDARD HIGHWAY SIGNS

DATE:  
10/17/24

CODE:

103-GEN-SIGN

SHEET:  
4 OF 5

NO SCALE

## SIGN NUMBER KEY



W20-3b  
30" x 30"  
36" x 36"  
48" x 48"



W20-4  
30" x 30"  
36" x 36"  
48" x 48"



W20-4c  
36" x 36"  
48" x 48"



W20-5C  
30" x 30"  
36" x 36"  
48" x 48"



W20-5L  
30" x 30"  
36" x 36"  
48" x 48"



W20-5L1  
30" x 30"  
36" x 36"  
48" x 48"



W20-5L2  
30" x 30"  
36" x 36"  
48" x 48"



W20-5R  
30" x 30"  
36" x 36"  
48" x 48"



W20-5R1  
30" x 30"  
36" x 36"  
48" x 48"



W20-5R2  
30" x 30"  
36" x 36"  
48" x 48"



W20-5aL2  
30" x 30"  
36" x 36"  
48" x 48"



W20-5aL3  
30" x 30"  
36" x 36"  
48" x 48"



W20-5aR2  
30" x 30"  
36" x 36"  
48" x 48"



W20-5aR3  
30" x 30"  
36" x 36"  
48" x 48"



W20-7a  
30" x 30"  
36" x 36"  
48" x 48"



W20-8  
24" x 18"



W20-9  
54" x 48"



W20-10  
48" x 24"  
66" x 30"



W20-11  
12" x 18"



W20-12P  
VARIABLE x 12"



W20-13P  
VARIABLE x 12"



W20-14L  
36" x 36"  
48" x 48"



W20-14R  
36" x 36"  
48" x 48"



W20-14aP  
36" x 12"  
48" x 12"



W20-14bP  
36" x 12"  
48" x 12"



W20-15  
36" x 36"  
48" x 48"



W20-16  
36" x 36"  
48" x 48"



W20-17  
36" x 36"  
48" x 48"



W20-18  
48" x 54"



W20-18a  
48" x 54"



W21-1  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W21-2  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W21-2  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W21-3  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W21-4  
36" x 18"



W21-5  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W21-5aL  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W21-5aR  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W21-5bL  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W21-5bR  
30" x 30"  
36" x 36"  
48" x 48"  
60" x 60"



W21-6  
24" x 24"  
30" x 30"  
36" x 36"  
48" x 48"



W21-7  
30" x 30"  
36" x 36"  
48" x 48"



W21-8  
30" x 30"  
36" x 36"  
48" x 48"



W22-1  
30" x 30"  
36" x 36"  
48" x 48"



W22-2  
42" x 36"



W22-3  
36" x 30"  
42" x 36"



W23-1  
48" x 24"



W23-2  
36" x 36"  
48" x 48"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS



MAINTAINING TRAFFIC TYPICAL

STANDARD HIGHWAY SIGNS

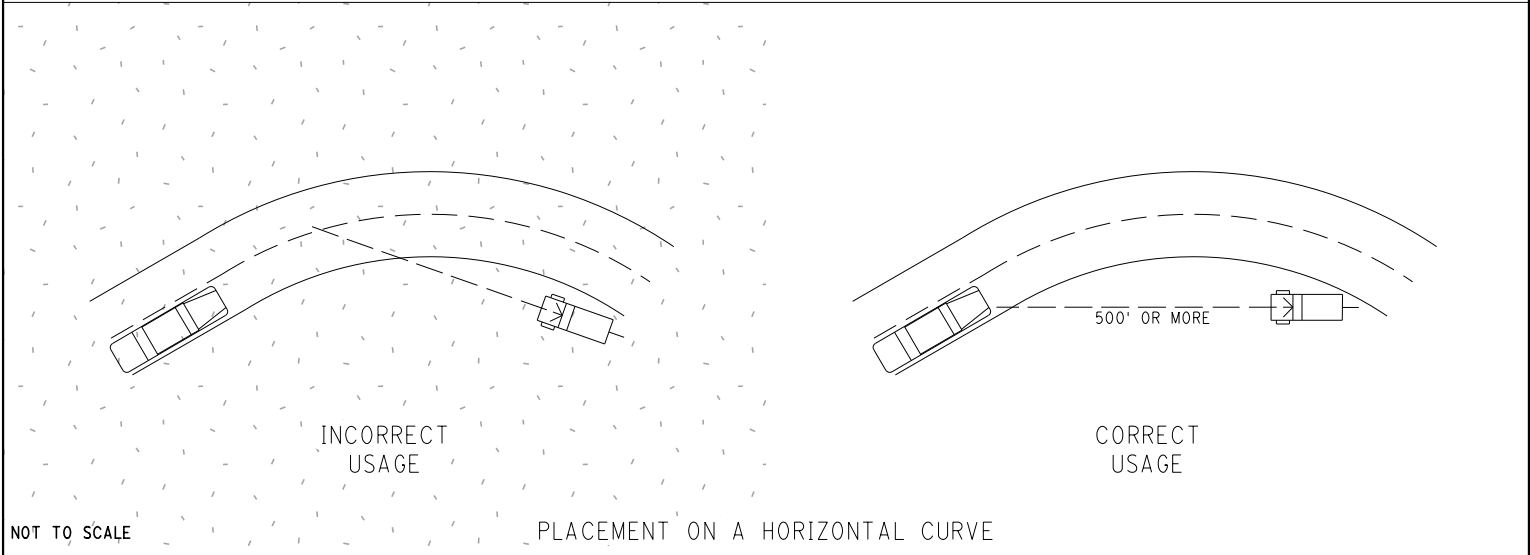
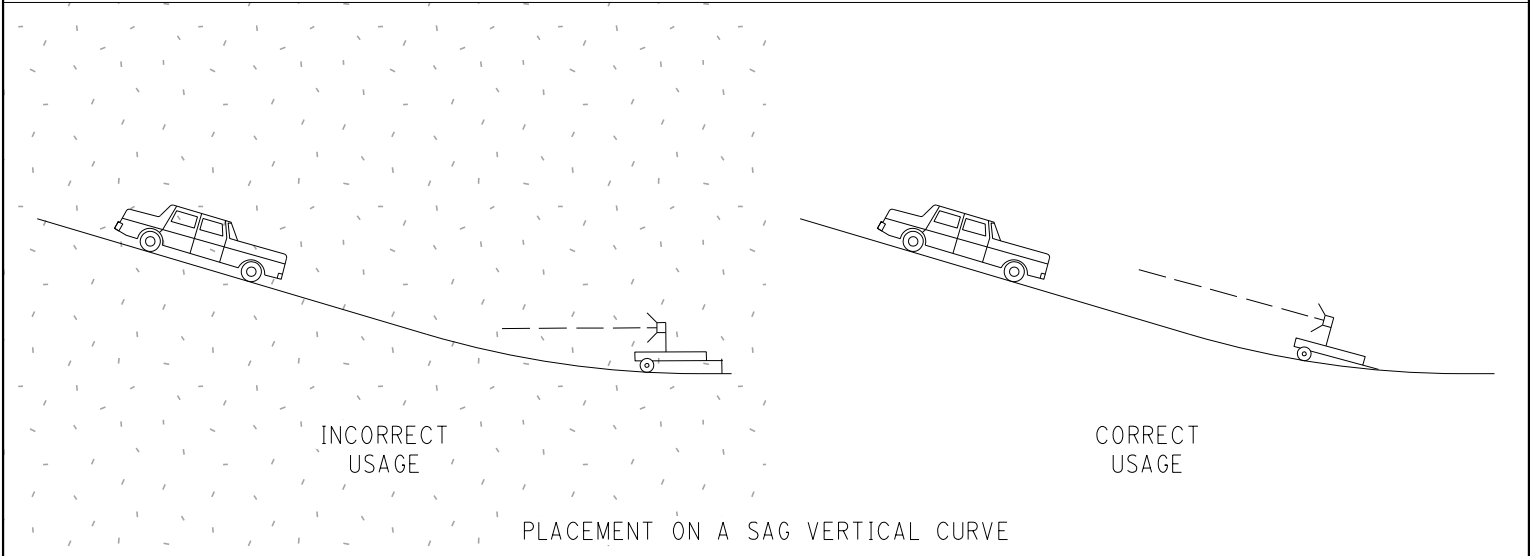
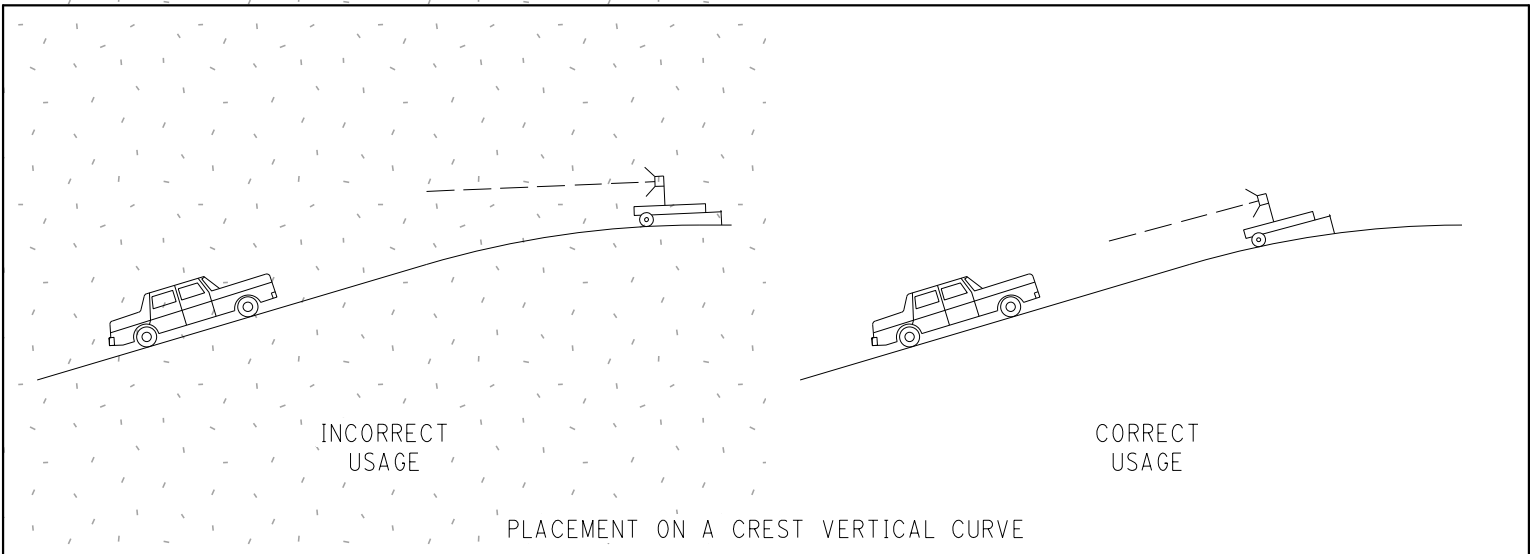
DATE:  
10/17/24

CODE:

103-GEN-SIGN

SHEET:  
5 OF 5

NO SCALE

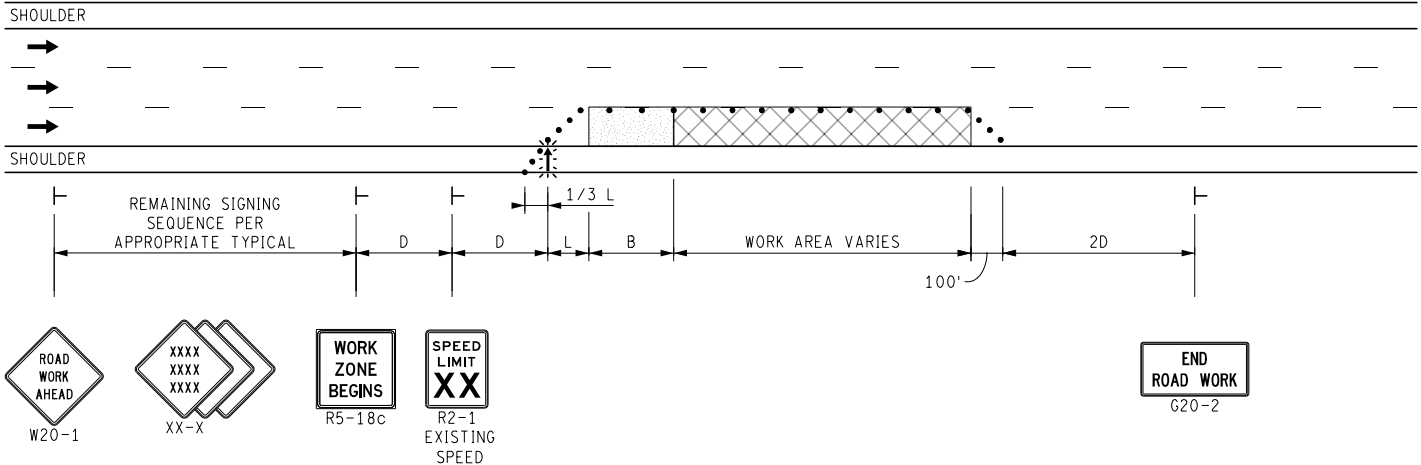


**NOTE:**

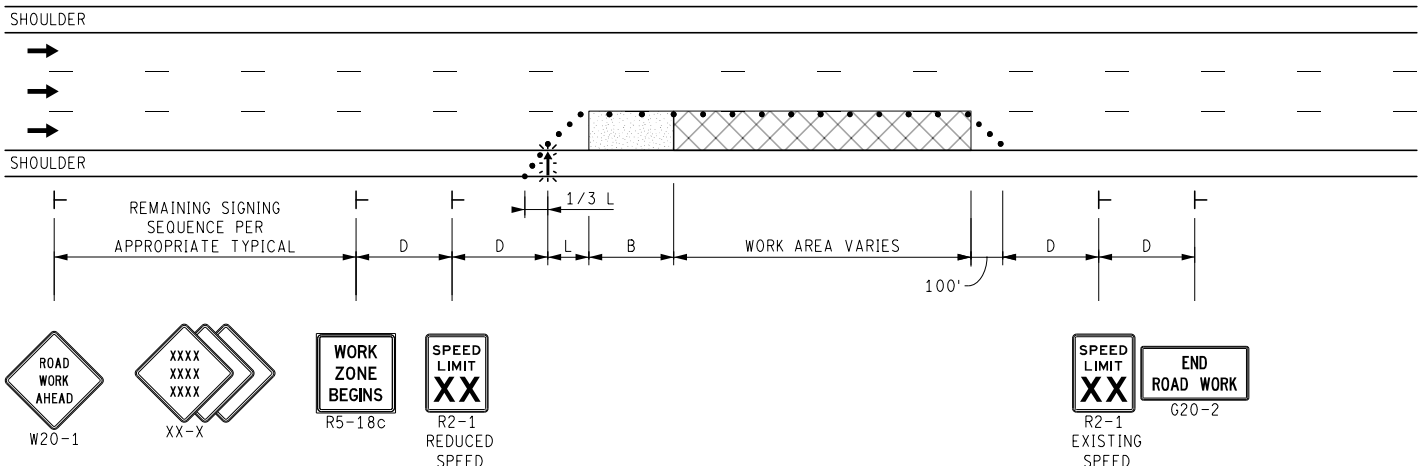
ENSURE THE ARROW REMAINS CLEARLY LEGIBLE AT DISTANCES FROM 2,500 FEET TO 200 FEET, FROM ALL TRAFFIC LANES AND ROADWAY ENTRANCES. DO NOT PLACE THE LIGHTED ARROW ON A HORIZONTAL OR VERTICAL CURVE THAT MIGHT INTERFERE WITH THIS LEGIBILITY REQUIREMENT.

	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	<b>USE OF ARROW BOARD ON HILL OR CURVE AND WORK ZONE LAYOUT</b>	DATE: MAY 2021
		NO: 104-GEN-AB		SHEET: 1 OF 1

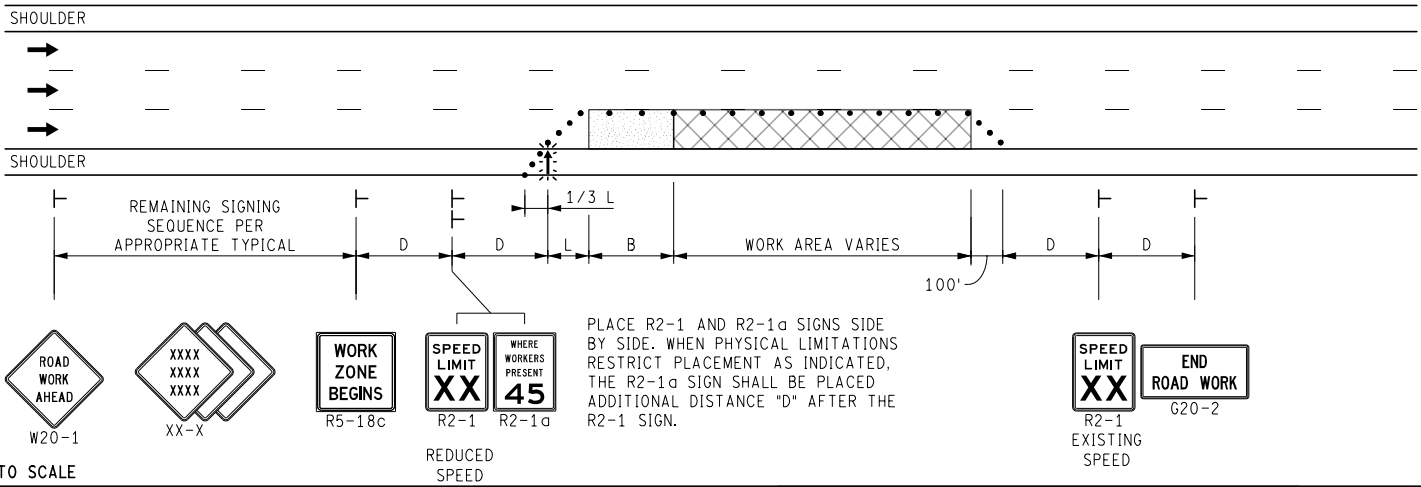
## NO SPEED REDUCTION THROUGH WORK ZONE



## REDUCED SPEED THROUGH WORK ZONE



## REDUCED SPEED THROUGH WORK ZONE USING "WHERE WORKERS PRESENT"



NOT TO SCALE



NOT TO SCALE

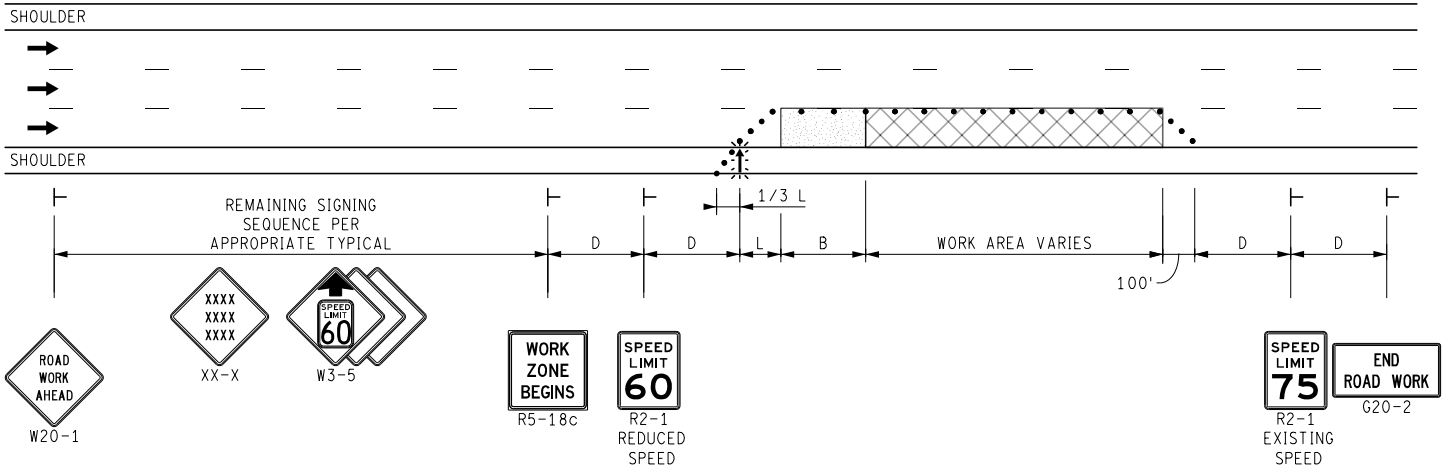
MAINTAINING TRAFFIC TYPICAL

NO: **107-GEN-SPEED**

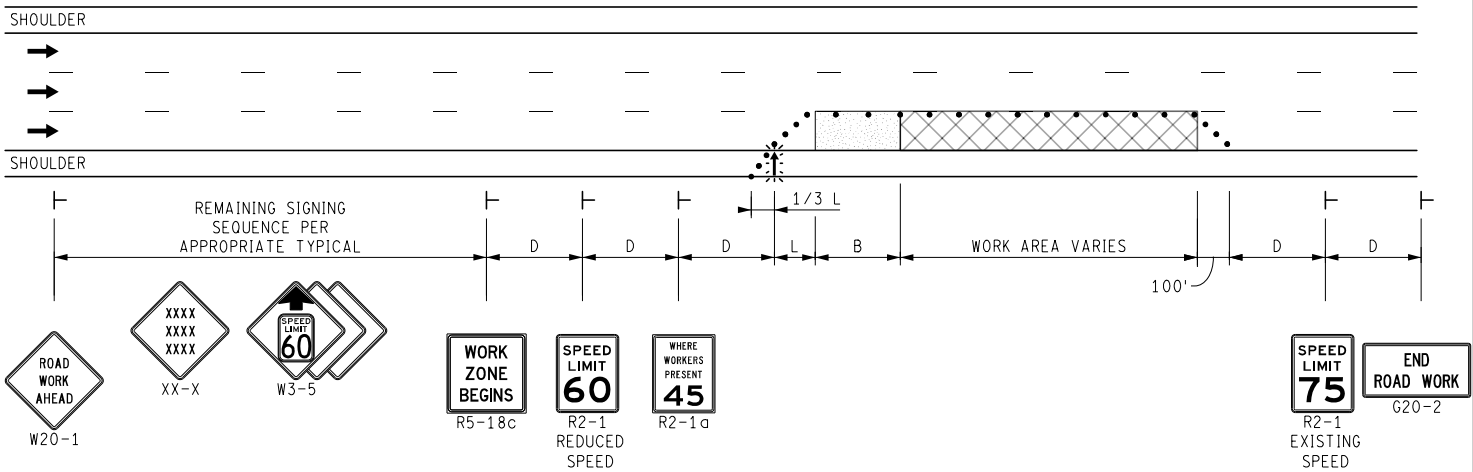
**SPEED LIMIT LAYOUT**

DATE: MAY 2021  
SHEET: 1 OF 2

# REDUCED SPEED FROM 75 TO 60 THROUGH WORK ZONE



# REDUCED SPEED FROM 75 TO 45 WWP THROUGH WORK ZONE



NOT TO SCALE



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 107-GEN-SPEED








SPEED LIMIT LAYOUT

DATE: MAY 2021  
SHEET:

FILE: 107-GEN-SPEED.dgn

2 OF 2

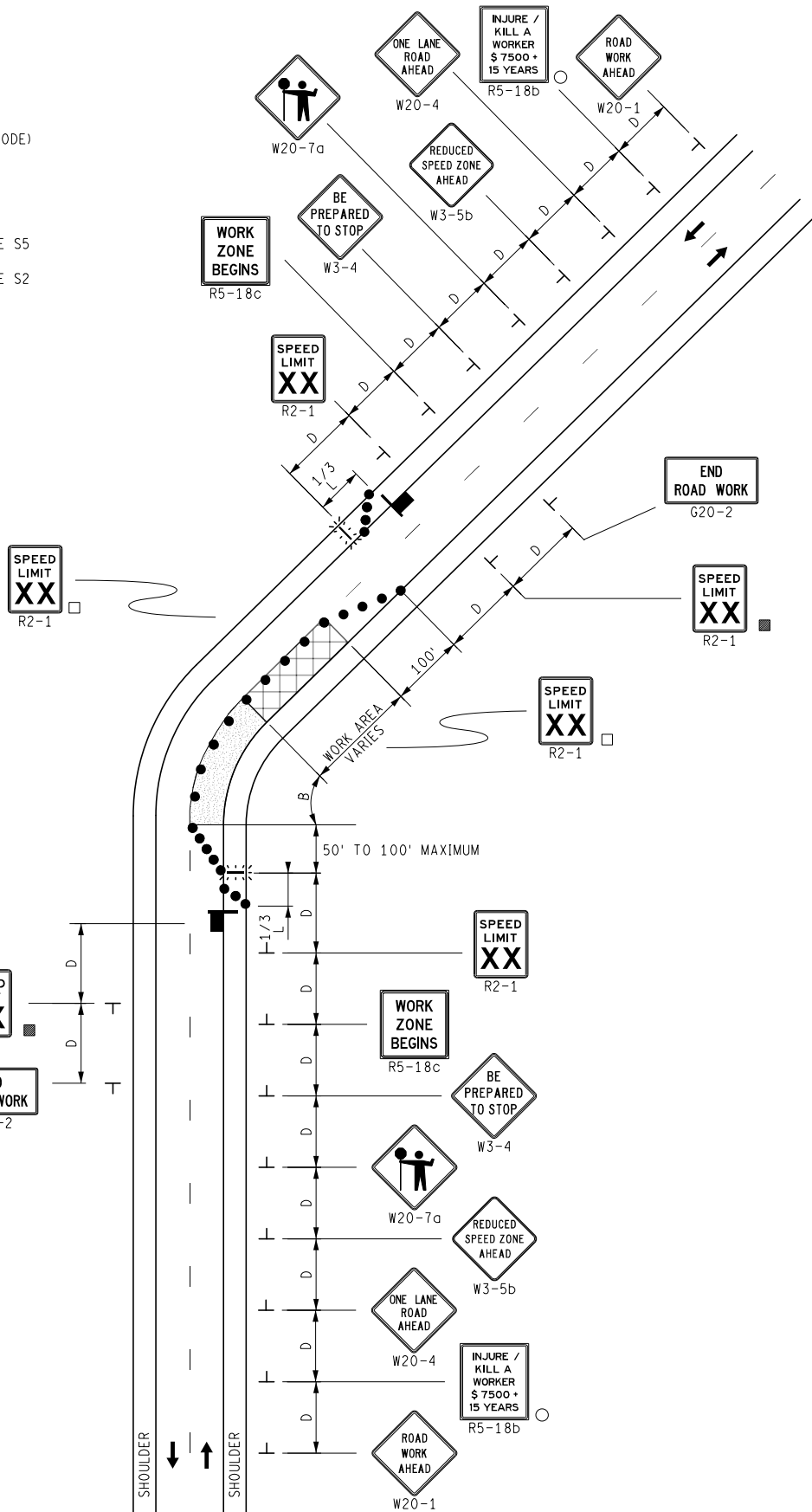
# KEY

-  TRAFFIC REGULATOR
-  CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
-  REFLECTS EXISTING SPEED LIMIT
-  PLACE SIGN AS INDICATED IN NOTE S5
-  PLACE SIGN AS INDICATED IN NOTE S2

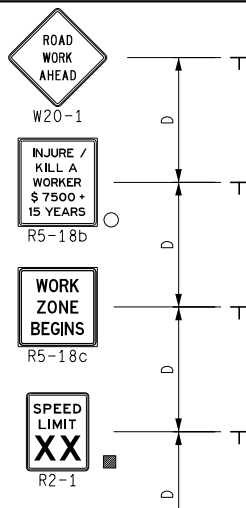
## STANDARD NOTES

(SEE GEN-NOTES)

GENERAL: G1, G2, G3, G4  
 SIGNING: S1, S2, S3, S4, S5  
 TRAF REG: TR1, TR2  
 DEVICES: TCD1, TCD2, TCD6

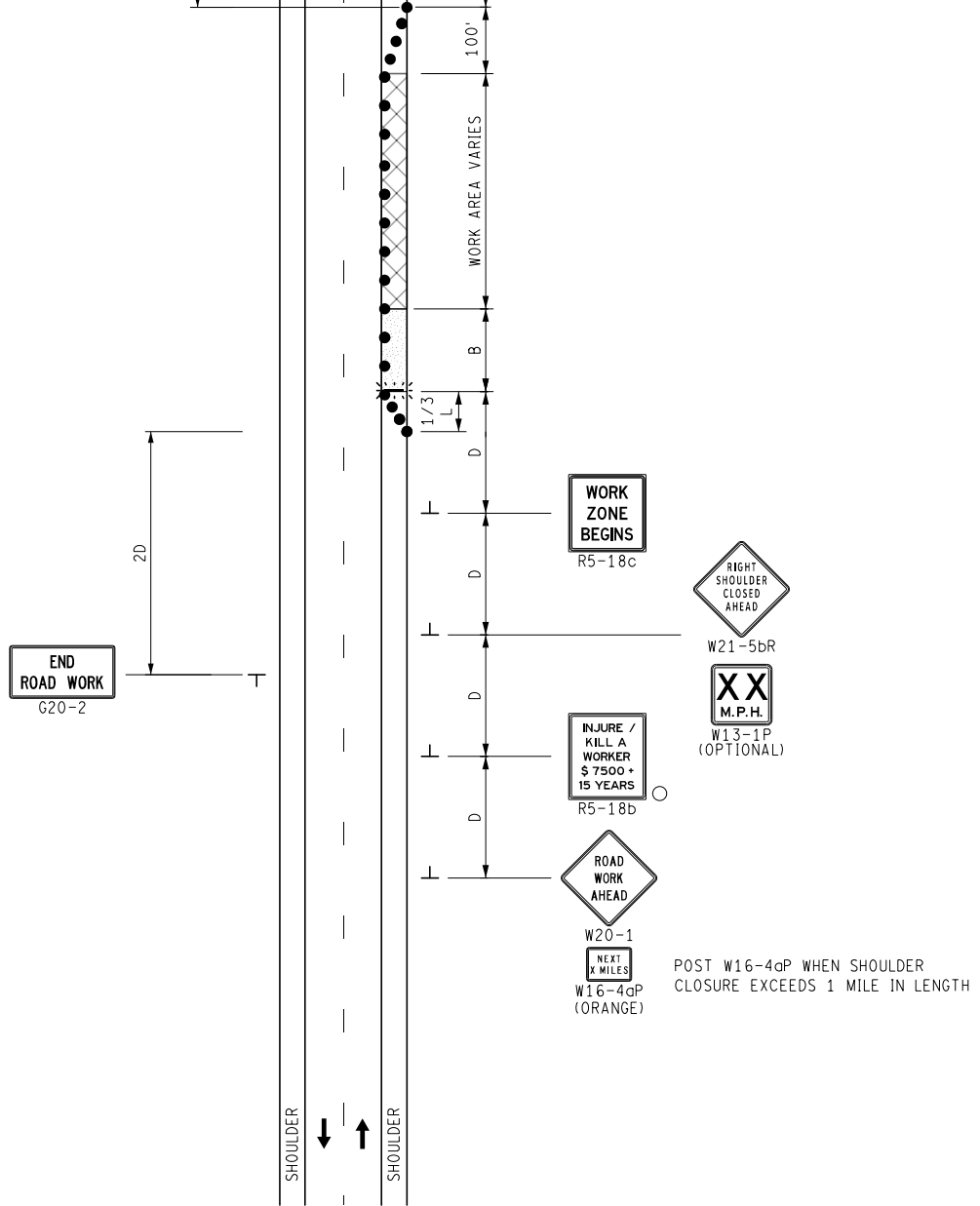


	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	<b>LANE CLOSURE</b> UTILIZING TRAFFIC REGULATORS ON A 2-LANE UNDIVIDED ROADWAY	DATE: MAY 2021
		NO: 110-TR-NFW-2L		SHEET: 1 OF 1



- KEY**
- CHANNELIZING DEVICES
  - ⚡ LIGHTED ARROW PANEL (CAUTION MODE)
  - ← TRAFFIC FLOW
  - REFLECTS EXISTING SPEED LIMIT
  - PLACE SIGN AS INDICATED IN NOTE S2

**STANDARD NOTES**  
 (SEE 102-GEN-NOTES)  
 GENERAL: G1, G2, G3, G4  
 SIGNING: S1, S2, S3, S5  
 DEVICES: TCD1, TCD2, TCD6, TCD7



POST W16-4aP WHEN SHOULDER CLOSURE EXCEEDS 1 MILE IN LENGTH

## SIGN MATERIAL SELECTION TABLE

SIGN SIZE	SIGN MATERIAL TYPE		
	TYPE I	TYPE II	TYPE III
≤ 36" X 36"		X	X
>36" X 36" ≤ 96" TO WIDE		X	
> 96" WIDE TO 144" WIDE	X	X	
> 144" WIDE	X		


TYPE I           ALUMINUM EXTRUSION  
 TYPE II          PLYWOOD  
 TYPE III         ALUMINUM SHEET

ROUNDING OF CORNERS IS NOT REQUIRED FOR TYPE I OR II SIGNS.  
 VERTICAL JOINTS ARE NOT PERMITTED.  
 HORIZONTAL JOINTS THROUGH SIGN LEGEND OR SYMBOLS ARE NOT PERMITTED.

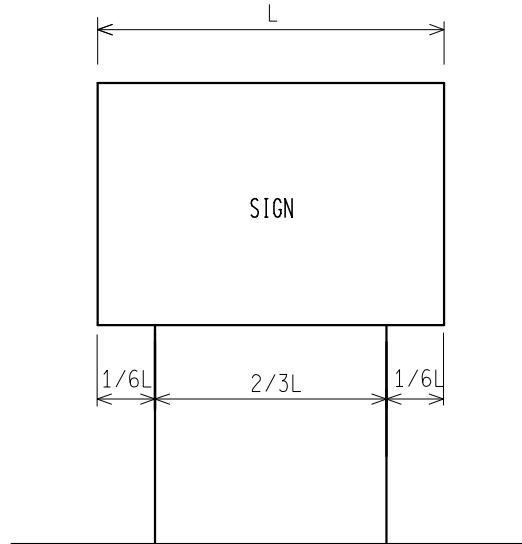
## POST SIZE REQUIREMENTS TABLE

SIGN AREA (ft <sup>2</sup> )	POST TYPE		
	U-CHANNEL STEEL	SQUARE TUBULAR STEEL	WOOD
≤ 9	1 - 3 lb/ft*	1 - 2" 12 or 14 GA*	N/A
9 ≤ 20	2 - 3 lb/ft	2 - 2" 12 or 14 GA	1 - 4" X 6"*
> 20 ≤ 30	N/A	N/A	2 - 4" X 6"
> 30 ≤ 60	N/A	N/A	2 - 6" X 8"
> 60 ≤ 84	N/A	N/A	3 - 6" X 8"

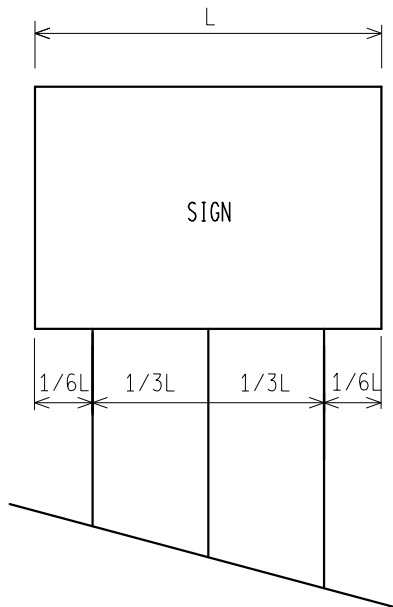
\*SIGNS 4 FEET AND GREATER IN WIDTH REQUIRE 2 POSTS.  
 SIGNS GREATER THAN 8 FEET IN WIDTH REQUIRE 2 OR 3 WOOD  
 POSTS DEPENDING ON AREA OF SIGN.  
 A MAXIMUM OF 2 POSTS WITHIN A 7' PATH IS PERMITTED.

  PREPARED BY DESIGN DIVISION	DEPARTMENT DIRECTOR Kirk T. Steudle	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		
	APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES	<h1 style="margin: 0;">GROUND DRIVEN SIGN SUPPORTS FOR TEMP SIGNS</h1>		
DRAWN BY: <u>CON/ECH</u> CHECKED BY: <u>AUG</u>	APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT	_____ F.H.W.A. APPROVAL	<u>11/2/2017</u> PLAN DATE	<u>WZD-100-A</u> SHEET 1 OF 11

## 2 POST SIGN SUPPORT SPACING



## 3 POST SIGN SUPPORT SPACING



\* FOR ALL 11' AND 12' LONG SIGNS ON 3 WOOD SUPPORTS, SPREAD POSTS SO AS TO HAVE A 8' MIN. TO 9' MAX. DISTANCE BETWEEN OUTSIDE POSTS.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

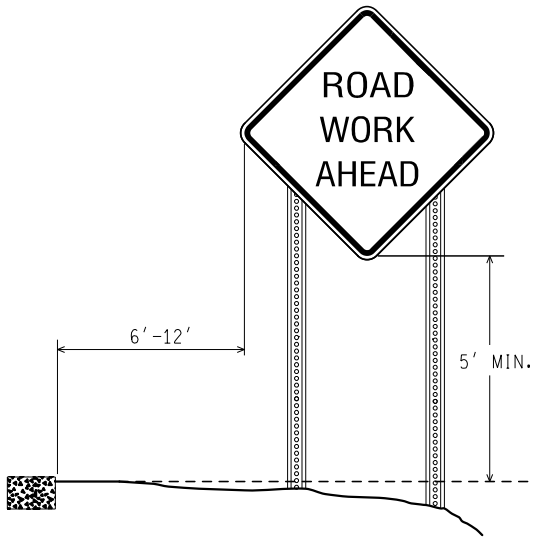
F.H.W.A. APPROVAL

11/2/2017  
PLAN DATE

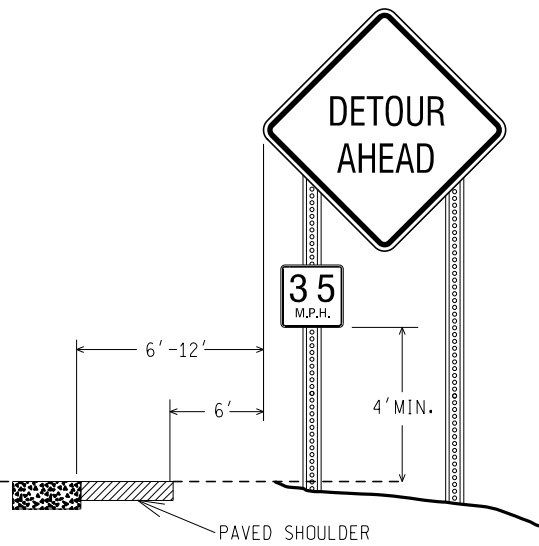
WZD-100-A

SHEET  
2 OF 11

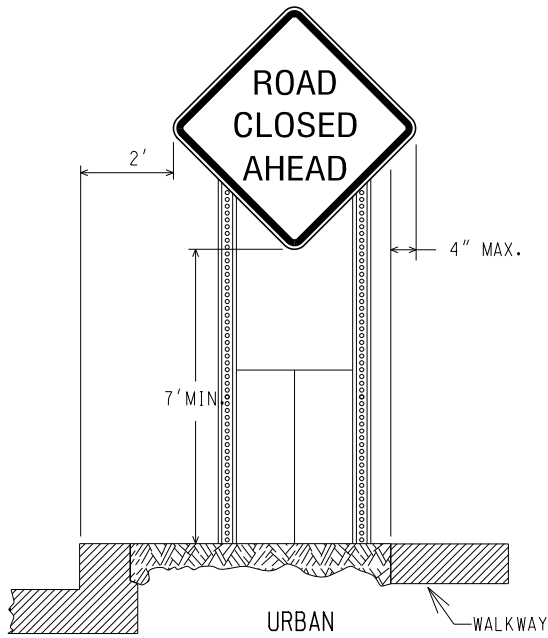
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



RURAL

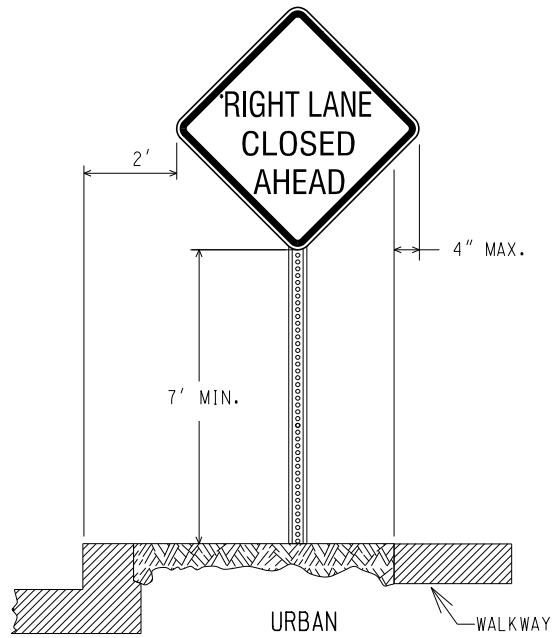


RURAL WITH ADVISORY SPEED PLATE



URBAN

(CURBED AREAS OR WHERE WALKWAYS ARE PRESENT)



URBAN

(CURBED AREAS OR WHERE WALKWAYS ARE PRESENT)

BOTTOM HEIGHT AND OFFSET

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

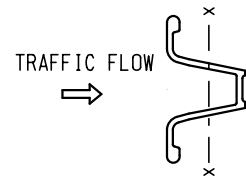
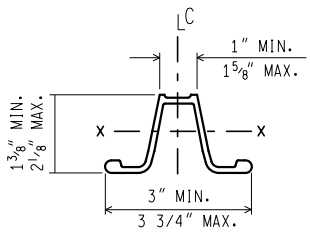
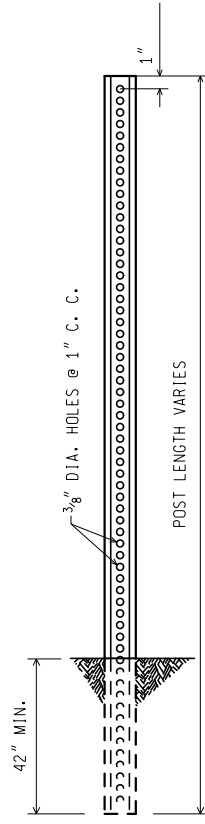
F.H.W.A. APPROVAL

11/2/2017  
PLAN DATE

WZD-100-A

SHEET  
3 OF 11

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



WEIGHT = 3 lbs/ft  
 SECT. MOD. X.-X. = 0.31 CUBIC INCHES MIN.

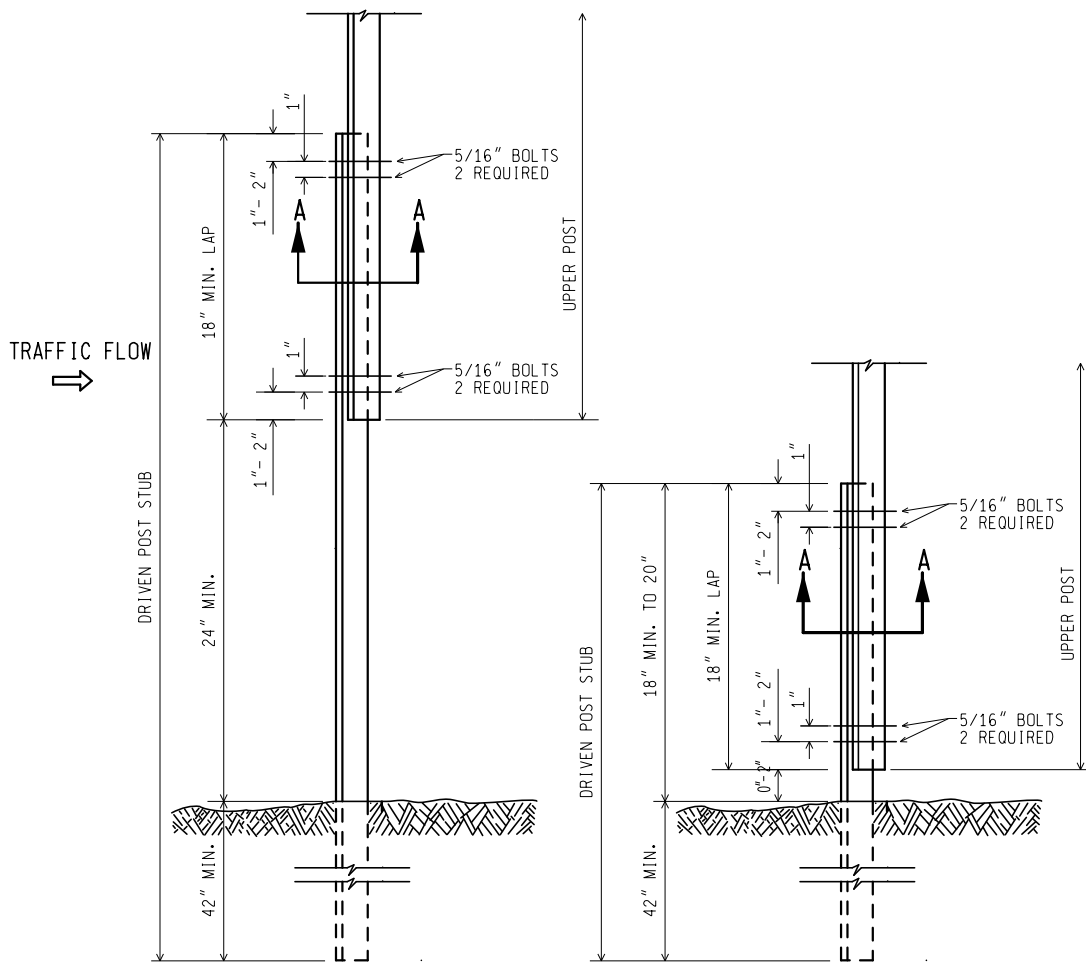
**3 lb. U - CHANNEL STEEL POST**  
 (NO SPLICE)

MOUNT SIGN ON OPEN FACE OF  
 U - CHANNEL STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 4 OF 11
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UPPER SPLICE

LOWER SPLICE

3 lb. U - CHANNEL STEEL POST  
(WITH SPLICE)

MOUNT SIGN ON OPEN FACE OF  
UPPER U - CHANNEL STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

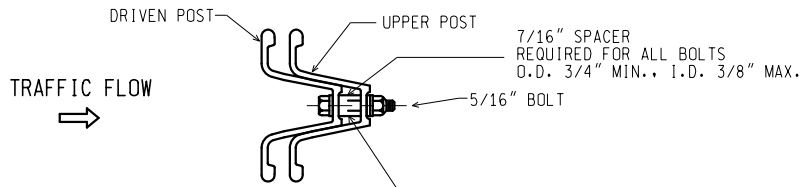
F.H.W.A. APPROVAL

11/2/2017  
PLAN DATE

WZD-100-A

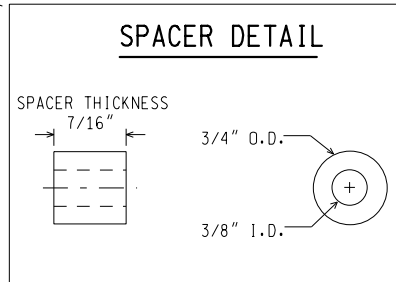
SHEET  
5 OF 11

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SECTION A-A

7/16" SPACER  
 REQUIRED FOR ALL BOLTS  
 O.D. 3/4" MIN., I.D. 3/8" MAX.



NOTES:

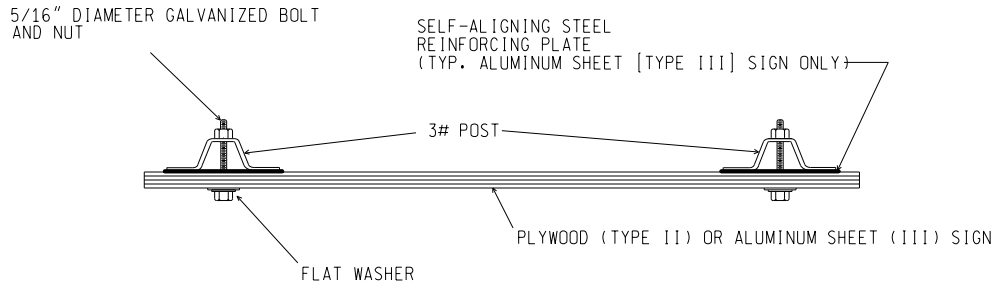
1. THE SPACER THICKNESS SHALL BE 1/16" LESS THAN THE GAP BETWEEN THE POST WHEN POSITIONED IN THE UNBOLTED CONFIGURATION.
2. THE EXTERIOR BOLT (CLOSEST TO LAP), SPACER, WASHER, AND NUT SHALL BE INSTALLED IN A PREPUNCHED HOLE 1" TO 2" FROM THE END OF THE LAP.
3. THE INTERIOR BOLT (FARTHEST FROM LAP), SPACER, WASHER, AND NUT SHALL BE INSTALLED IN THE NEXT PREPUNCHED HOLE.
4. THE DRIVEN POST SHALL ALWAYS BE MOUNTED IN FRONT OF THE UPPER POST WITH RESPECT TO THE ADJACENT ONCOMING TRAFFIC, REGARDLESS OF THE DIRECTION THE SIGN IS FACING.
5. THE SPLICE LAP SHALL BE FASTENED BY FOUR-5/16" DIA. GALVANIZED A449 BOLTS (SAE J429 GRADE 5) OR GALVANIZED A325 BOLTS.

3 lb. U - CHANNEL STEEL POST  
 (WITH SPLICE)

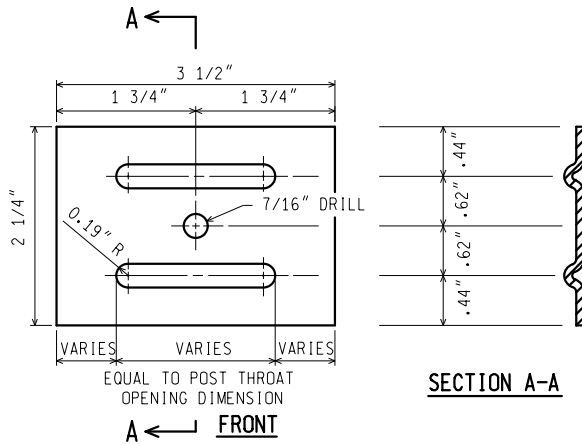
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 6 OF 11
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SIGN TO 3 lb. POST CONNECTION



NOTES: (FOR STEEL SIGN REINF' PLATE)

1. MATERIAL: 12 GAUGE CARBON STEEL.
2. TOLERANCE ON ALL DIMENSIONS  $\pm 0.0625"$
3. FINISH-AFTER STAMPING AND PUNCHING, GALVANIZE ACCORDING TO CURRENT SPECIFICATIONS FOR ZINC (HOT GALVANIZE) COATINGS ON PRODUCTS FABRICATED FROM PLATES OR STRIPS

STEEL SIGN REINFORCING PLATE  
REQUIRED FOR TYPE III SIGNS ONLY

3 lb. U - CHANNEL STEEL POST SIGN CONNECTION

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN

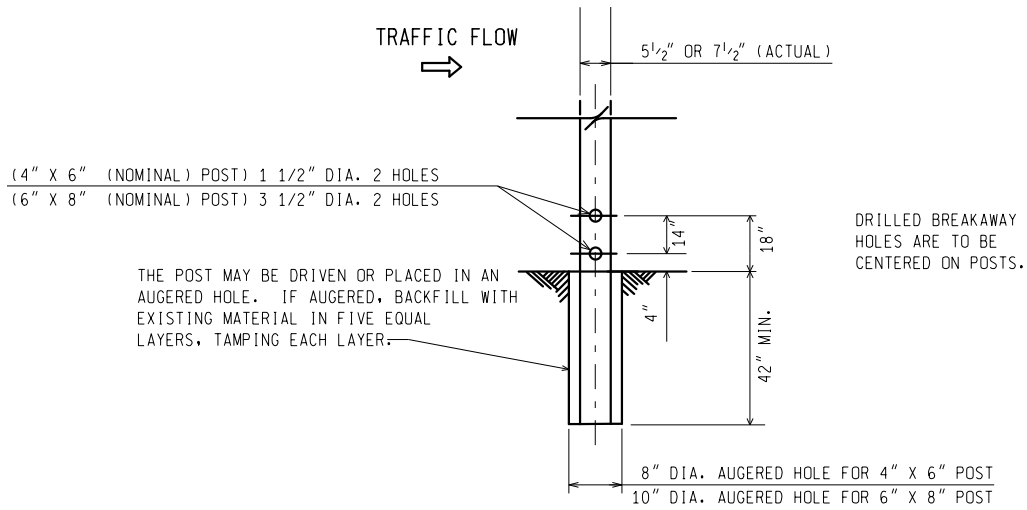
F.H.W.A. APPROVAL

11/2/2017  
 PLAN DATE

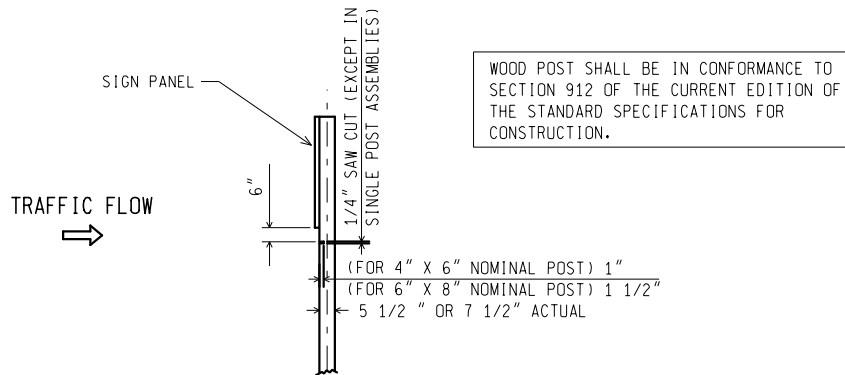
WZD-100-A

SHEET  
 7 OF 11

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**WOOD POST BREAKAWAY HOLES/  
 DIRECT EMBEDMENT DETAILS**



**SAW CUT DETAIL  
 (MULTIPLE POST INSTALLATIONS)**

**WOOD POST DETAILS**

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN

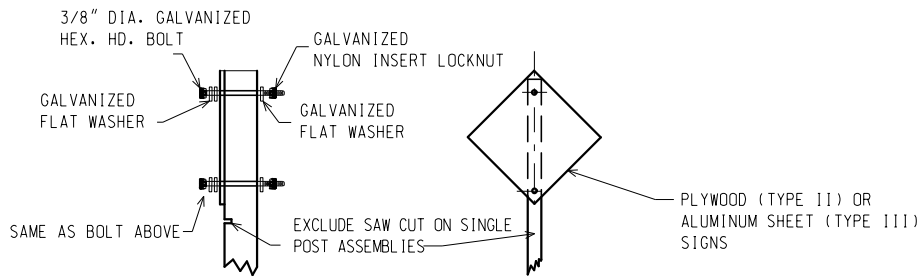
F.H.W.A. APPROVAL

11/2/2017  
 PLAN DATE

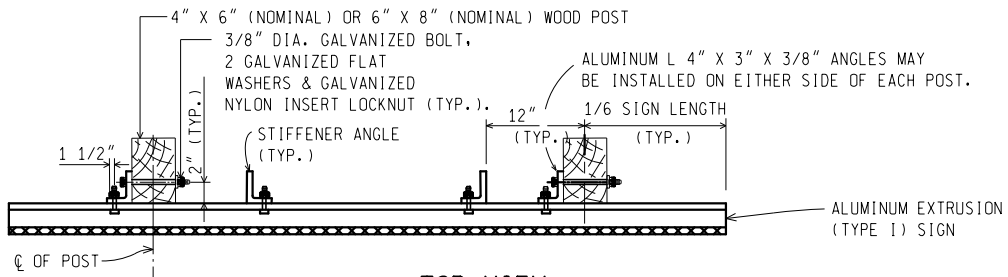
WZD-100-A

SHEET  
 8 OF 11

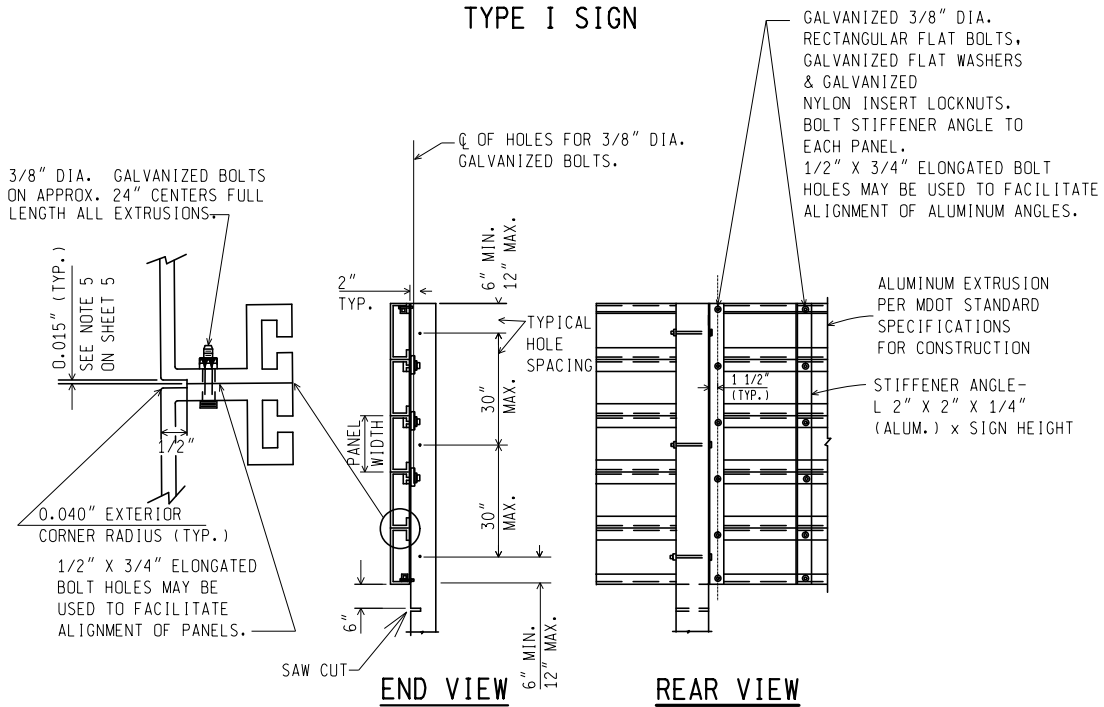
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



**TYPE II AND TYPE III SIGNS**



**TOP VIEW  
 TYPE I SIGN**



**TYPE I SIGN - ERECTION DETAILS**

**WOOD POST CONNECTIONS**

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN

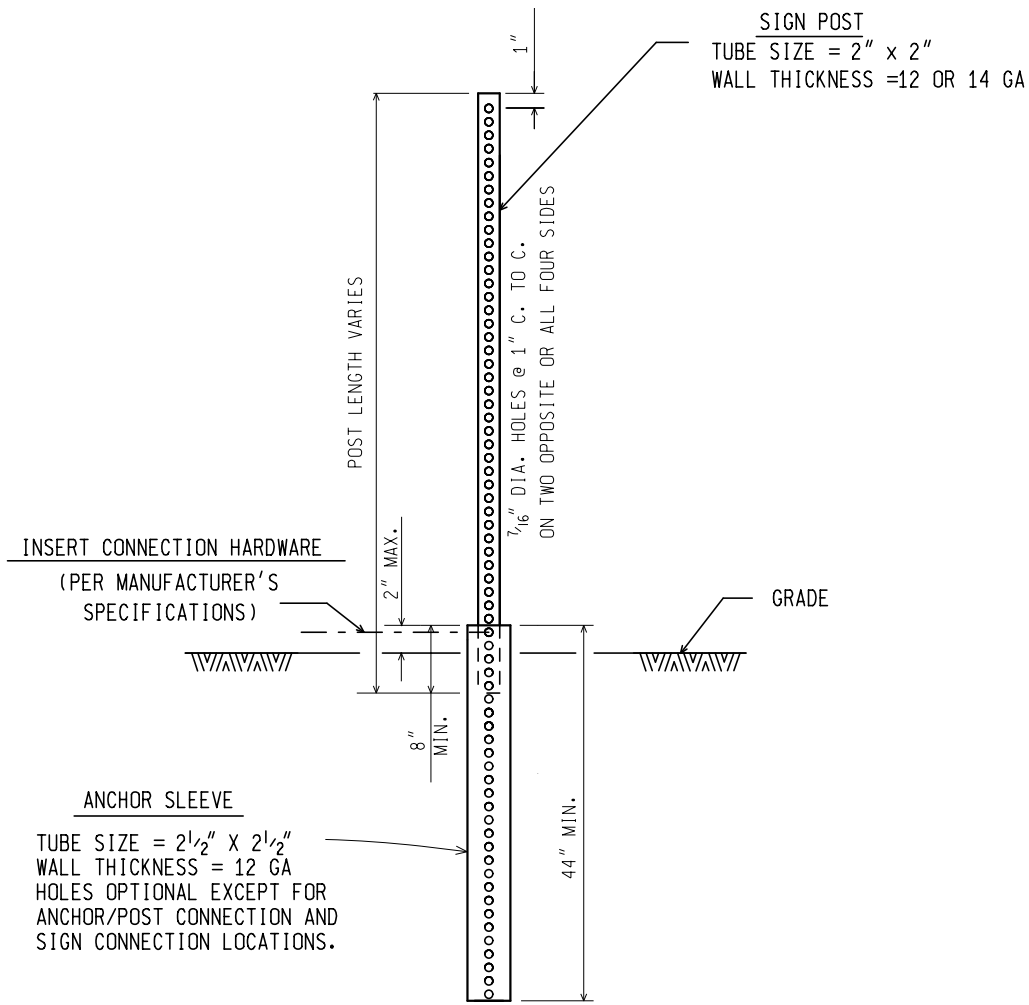
F.H.W.A. APPROVAL

11/2/2017  
 PLAN DATE

WZD-100-A

SHEET  
 9 OF 11

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SQUARE TUBULAR STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 10 OF 11
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NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

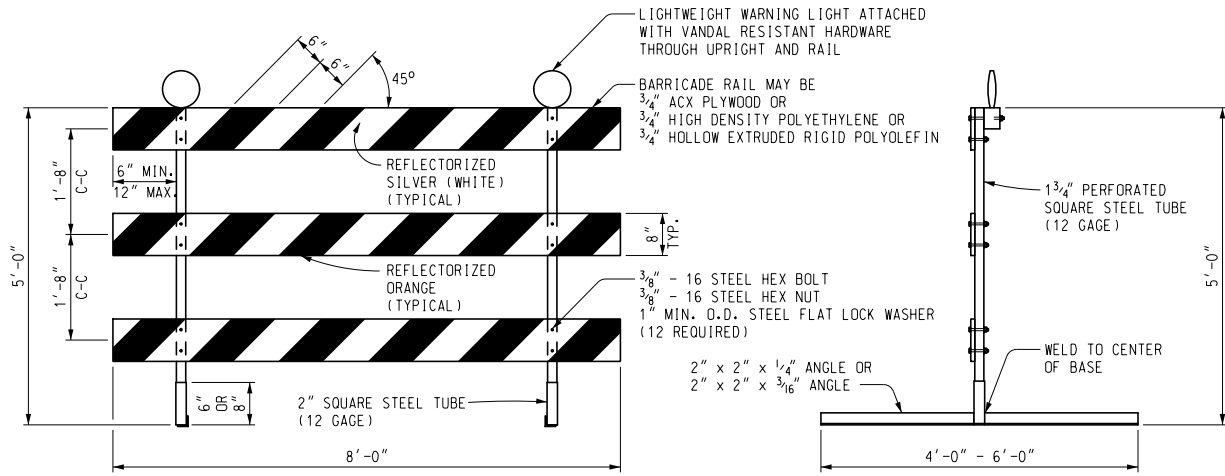
GENERAL NOTES:

1. A MAXIMUM OF TWO POSTS WITHIN A 7 FOOT PATH IS PERMITTED.
2. ALL SIGN POSTS SHALL COMPLY WITH NCHRP 350.
3. ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 42".
4. BRACING OF POST IS NOT PERMITTED.
5. SIGN SHALL BE LEVEL, AND UPRIGHT FOR THE DURATION OF INSTALLATION.
6. ERECT POSTS SO THE SIGN FACE AND SUPPORTS DO NOT VARY FROM PLUMB BY MORE THAN 3/16" IN 3'. PROVIDE A CENTER-TO-CENTER DISTANCE BETWEEN POSTS WITHIN 2 PERCENT OF PLAN DISTANCE.
7. NO MORE THAN ONE SPLICE PER POST, AS SHOWN, WILL BE PERMITTED.
8. POST TYPES SHALL NOT BE MIXED WITHIN A SIGN SUPPORT INSTALLATION.
9. NO VERTICAL JOINTS ARE PERMITTED IN SIGN. NO HORIZONTAL JOINTS THROUGH SIGN LEGEND OR SYMBOLS ARE PERMITTED IN SIGN
10. REMOVE SIGN POSTS AND/OR POST STUBS IN THEIR ENTIRETY WHEN NO LONGER REQUIRED.
11. ALL LABOR, MATERIALS, AND EQUIPMENT, INCLUDING TEMPORARY SUPPORTS REQUIRED TO INSTALL, MAINTAIN, RELOCATE, AND/OR REMOVE THE TEMPORARY SIGN, INCLUDING SUPPORTS, ARE CONSIDERED TO BE INCLUDED IN THE COST OF THE TEMPORARY SIGN.
12. SAW CUTS IN WOOD POSTS ARE TO BE PARALLEL TO THE BOTTOM OF THE SIGN.
13. POSTS SHALL NOT EXTEND MORE THAN 4" ABOVE TOP OF SIGN.
14. TEMPORARY WOOD SUPPORTS DO NOT REQUIRE PRESERVATIVE TREATMENT.

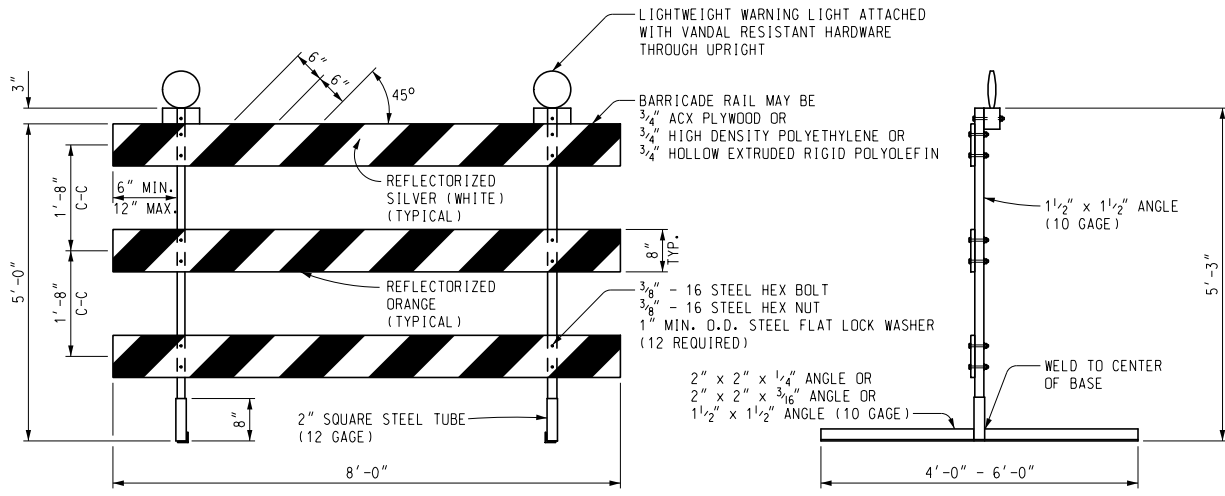
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 11 OF 11
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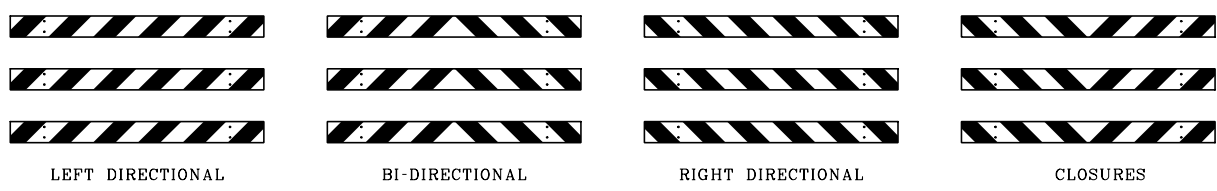
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FRONT ELEVATION SIDE VIEW  
**PERFORATED SQUARE STEEL TUBE OPTION**



FRONT ELEVATION SIDE VIEW  
**ANGLE IRON OPTION**



**BARRICADE RAIL SHEETING OPTIONS  
 TYPE III BARRICADES**

Other Type III Barricades meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at [http://safety.fhwa.dot.gov/roadway\\_dept/road\\_hardware/wzd.htm](http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm)

**MDOT**  
 Michigan Department of Transportation

PREPARED BY  
 OPERATIONS  
 FIELD SERVICES

DRAWN BY: ECH

CHECKED BY: MWB

DEPARTMENT DIRECTOR  
 Paul C. Ajegba

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

APPROVED BY: \_\_\_\_\_  
 (SPECIAL DETAIL)  
 DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF FIELD SERVICES SPECIAL DETAIL FOR

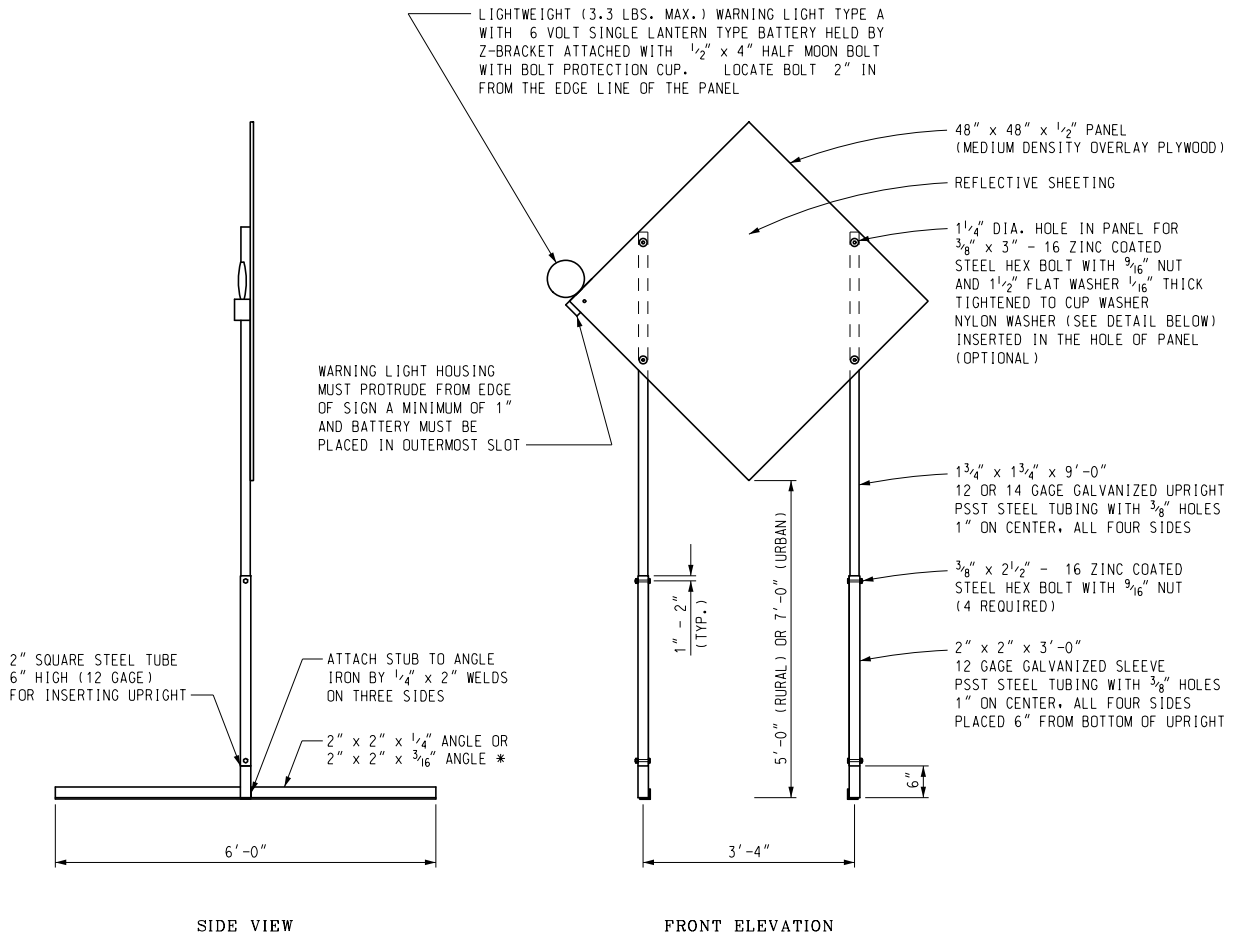
Temporary  
 Traffic Control Devices

F.H.W.A. APPROVAL \_\_\_\_\_

6/16/22  
 PLAN DATE

WZD-125-E

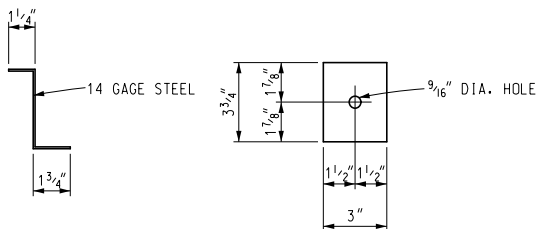
SHEET  
 1 OF 3



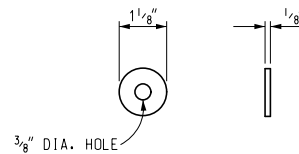
### TEMPORARY SIGN SUPPORT

(WARNING LIGHT PLACED ON SIDE CLOSEST TO TRAFFIC)

\* SIGN STAND IS BALLASTED WITH FOUR OR MORE 35 LB SANDBAGS. A MINIMUM OF ONE ON EACH END. UPRIGHTS SHALL NOT EXTEND ABOVE THE SIGN PANEL.



Z-BRACKET DETAIL



OPTIONAL NYLON WASHER

Other temporary sign supports meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at [http://safety.fhwa.dot.gov/roadway\\_dept/road\\_hardware/wzd.htm](http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm)

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF FIELD SERVICES SPECIAL DETAIL

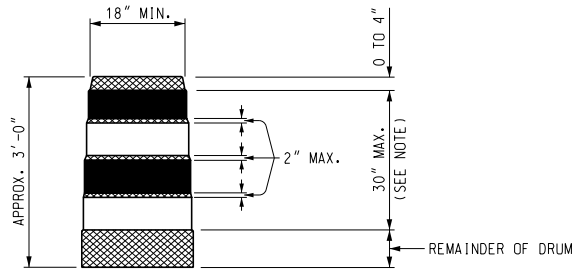
SPECIAL DETAIL  
F.H.W.A. APPROVAL

6/16/22  
PLAN DATE

WZD-125-E

SHEET  
2 OF 3

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- REFLECTORIZED ORANGE
- REFLECTORIZED WHITE
- NON REFLECTORIZED ORANGE

NOTE:  
 DRUMS SHALL HAVE AT LEAST 4 HORIZONTAL REFLECTORIZED STRIPES (2 ORANGE AND 2 WHITE) OF 6" UNIFORM WIDTH, ALTERNATING IN COLOR WITH THE TOPMOST REFLECTORIZED STRIPE BEING ORANGE. NON REFLECTORIZED SPACES BETWEEN THE HORIZONTAL REFLECTORIZED ORANGE AND WHITE STRIPES SHALL BE ORANGE IN COLOR AND EQUAL IN WIDTH.

### PLASTIC DRUM

NOTES:

2" PERFORATED SQUARE STEEL TUBES MAY BE USED TO FABRICATE THE HORIZONTAL BASE OF THE TYPE III BARRICADE.

WARNING LIGHTS SHALL BE PLACED ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND ALL OTHER PROVISIONS IN THE CONTRACT ON TYPE III BARRICADES.

SEE ROAD STANDARD PLANS R-113-SERIES FOR TEMPORARY CROSSOVERS FOR DIVIDED ROADWAY, AND R-126-SERIES FOR TYPICAL LOCATION AND SPACING OF PLASTIC DRUMS FOR PLACEMENT OF TEMPORARY CONCRETE BARRIER.

SIGNS, BARRICADES, AND PLASTIC DRUMS SHALL BE FACED WITH PRESSURE-SENSITIVE REFLECTIVE SHEETING ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

SANDBAGS SHALL BE USED WHEN SUPPLEMENTAL WEIGHTS ARE REQUIRED TO ACHIEVE STABILITY OF THE BARRICADE. THE SANDBAGS SHALL BE PLACED SO THEY WILL NOT COVER OR OBSTRUCT ANY REFLECTIVE PORTION OF THE TRAFFIC CONTROL DEVICE.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF FIELD SERVICES SPECIAL DETAIL

(SPECIAL DETAIL)  
 F.H.W.A. APPROVAL

6/16/22  
 PLAN DATE

WZD-125-E

SHEET  
 3 OF 3

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MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
**CONSTRUCTION DAM AND BYPASS PUMPING**

CFS:TWK

1 of 2

APPR:DMG:DBP:01-26-21

**a. Description.** This work consists of designing, installing, maintaining, and removing construction dams (including dewatering) and bypass pumping to work in a dry condition and to maintain water flows. Ensure this work is in accordance with sections 208 and 704 of the Standard Specifications for Construction, Michigan Department of Environment, Great Lakes, and Energy (EGLE) Permit, as directed by the Engineer and this special provision.

**b. Materials.** Ensure steel sheet piling is of the continuous interlocking type, either new or used in good condition. Temporary steel sheet piling must have a minimum nominal section modulus of 18.1 inches cubed per foot of wall. Cold-rolled sheeting will be permitted for all applications. Furnish materials in accordance with the following sections of the Standard Specifications for Construction as applicable:

Coarse Aggregate, 6A.....	902
Open-Graded Aggregate, 34R .....	902
Filter Bags.....	910
Geosynthetics .....	910
Sand and Stone Bags .....	916

**c. Construction.** Install a construction dam, at the locations shown on the plans, to provide a dry construction site. The construction dam must only consist of one of the following: steel sheet piling, stone/sand bags, or a Department approved proprietary product.

1. Design and Installation. Design, installation, maintenance and removal of the temporary construction dam, dewatering, and bypass pumping are the responsibility of the Contractor. In accordance with subsection 104.02 of the Standard Specifications for Construction, the Contractor must submit a proposed design to the Engineer for review 10 working days before starting work. Work may begin after the Engineer’s approval of the design.

2. Dewatering and Bypass Pumping. Perform the dewatering and bypass pumping operations in a proper and predetermined sequence such as to create a dry and stable area to work in. Ensure dewatering and bypass pumping is performed and sufficiently maintained to not cause damage to upstream or downstream properties, utilities and pavements. Ensure the consequences of surface runoff and surface flood water caused by climatic conditions are taken into consideration in designing the dewatering and bypass pumping system.

3. Filter Bags or Sediment Basins. Dewatering and bypass pumping operations must utilize a sediment basin or filter bag to settle out or filter out sediment from water discharged into the watercourse. Locate the sediment basin or filter bag a sufficient distance from the watercourse or wetland to allow for adequate settling or filtering through natural vegetation and/or gravel filter berm. Ensure the sediment basin or filter bag is provided, installed,

maintained and removed in accordance with section 208 of the Standard Specifications for Construction.

A series of gravel filter berms may also be necessary for use in conjunction with the sediment basin to filter the water prior to re-entry into the watercourse.

Ensure the sediment basin and gravel filter berms are of adequate size to still the water for a sufficient time to remove the suspended particles. If the water returning to the watercourse remains turbid, the sediment basin may need to be expanded. A second sediment basin may be required in conjunction with a filter bag, in addition to the original sediment basin and gravel filter berms.

Discharging sediment laden water to a watercourse is prohibited.

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

Pay Item	Pay Unit
Construction Dam.....	Each
Bypass Pumping .....	Each

1. **Construction Dam** includes designing, furnishing, installing, maintaining, and removing the temporary construction dam, including dewatering and filtration as noted in this special provision. The pay unit each for **Construction Dam** includes both the upstream dam and the downstream dam to isolate the construction area and provide a dry construction site.

2. **Bypass Pumping** includes designing, furnishing, installing, maintaining, and removing the required materials, supplies, and equipment needed to maintain the watercourse while the construction dam(s) are in place. Also included in the contract unit price for **Bypass Pumping** is the design, construction, maintenance, and removal of the sediment basin, gravel filter berms or filter bag required to settle or filter out sediment prior to discharging back to the watercourse. If a larger or second sediment basin in conjunction with a filter bag is required to reduce sediment, this work will not be paid for separately but will be considered included in the pay item for **Bypass Pumping**. **Bypass Pumping** will be paid for on an each basis for each dry construction site created.

MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
**BIDIRECTIONAL ENHANCED DELINEATION - GUARDRAIL POST MOUNT**

PMK:MKB

1 of 2

APPR:MWB:CT:04-23-20

**a. Description.** This work consists of preparing surfaces and applying retroreflectorized white, yellow and/or red reflectors or reflective sheeting reflector systems for enhanced linear delineation. Complete this work in accordance with this special provision, the project plans, the *MMUTCD*, the standard specifications, and as directed by the Engineer.

**b. Materials.** Provide all reflectors and reflective sheeting reflectors and supports meeting the requirements of section 919 of the Standard Specifications for Construction, and the manufacturer's specifications.

For dual-color and/or bidirectional delineation (i.e. white/red or yellow/yellow), choose from the following, or approved equal:

1. Shur-Tite Guardrail Post Flat Mount Delineator "Shortie", 19 inch height.
2. Impact Recovery GRP Guardrail Delineator, 19 inch height.
3. Trinity Highway/Safe-Hit Flexible Guardrail Delineator, 27 inch height.

Reflector or sheeting application is required on both faces of each unit for bidirectional viewing. Ensure the reflective area on each face is a minimum of 18 square inches.

**c. Construction.** Clean and dry the guardrail post surface and remove any obstacles or debris that can interfere with the installation of the linear delineation system.

Post mount guardrail delineation is to be mounted to the front side of guardrail posts and not the blocks unless otherwise approved by the Engineer.

Do not install enhanced linear delineation on guardrail approach terminals. Place enhanced linear delineation beginning on standard run of guardrail.

Mechanically fasten the selected line delineation system to the clean, dry surface in accordance with this special provision, the manufacturer's requirements, and as directed by the Engineer. Adhesives may be used to supplement mechanical fasteners, but not in lieu of them. Install the selected delineation system at the spacing shown in Table 1 or as directed by the Engineer:

**Table 1: Delineation System Spacing**

Delineation System	Spacing (Center-to-Center in feet)
Shur-Tite Flat Mount Guardrail Delineator "Shortie"	50
Impact Recovery GRP Guardrail Delineator	50
Trinity Highway/Safe-Hit Flexible Guardrail Delineator	50

Approved Equal	As directed by the Engineer
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Orient reflectors on the selected delineation system per the manufacturer’s requirements so that the reflective sheeting and optical performance requirements of section 919 of the Standard Specifications for Construction are met. Match the color of reflectors with the color of pavement edge lines stipulated in the MMUTCD. When installing a dual color and/or bidirectional post mount delineation system, install and match the color of the pavement edge lines on both sides of the traveled roadway. Use of adhesive as the permanent attachment is prohibited; a mechanical attachment is required. Do not damage the guardrail during installation. Repair any damage caused by the installation as directed by the Engineer at the Contractor’s expense.

Perform final cleanup of the completed area prior to moving to the next section of installation.

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

<b>Pay Item</b>	<b>Pay Unit</b>
Enhanced Delineation, Bidirectional, Guardrail, Post Mtd .....	Foot

**Enhanced Delineation, Bidirectional, Guardrail, Post Mtd** includes the cost of preparing the surfaces for enhanced delineation installation, removal of any existing guardrail delineators, providing and installing the selected system and all its supporting elements for installation, and final cleanup of the entire project.

The completed work will be measured by the foot along the entire length of the guardrail to which the system is being applied from the beginning of the first system section to the end of the last system section, including gaps between system sections. Exclude sections gapped for bridges, discontinuities in the guardrail, or as directed by the Engineer.

The cost of repairs to any damaged guardrail is included in the unit price for the related repair pay items.

MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
**RIPRAP, SPECIAL**

HYD:EJC

1 of 2

APPR:RWS:DMG:11-13-23

**a. Description.** This work consists of diverting stream flow, preparing channel grades, installing geotextile liner and furnishing and placing well-graded riprap on channel bottoms, side slopes, and adjacent to structures. Complete all work in accordance with the plans and the standard specifications.

**b. Materials.** Use sound durable rock for riprap that is quarried rock or waste mine rock, free from shale, spoil, and organic material, as well as seams, cracks, or other structural defects which may cause accelerated weathering. Ensure the rock is hard, angular, durable and resistant to weathering and water action, having 2.5 minimum bulk dry specific gravity and 2.5 percent maximum 24 hour soak absorption in accordance with *ASTM D6473*. The weight loss in 5 cycles by use of sulfate soundness testing must not exceed 10 percent in accordance with *ASTM D5240/D5240M*. The ratio of the greatest (axis A) to least (axis C) dimension must not exceed 3:1 for any individual rock for at least 80 percent of the material, as depicted in Figure 1 below. *ASTM D4992* provides guidance on evaluating and selecting rock from a source.

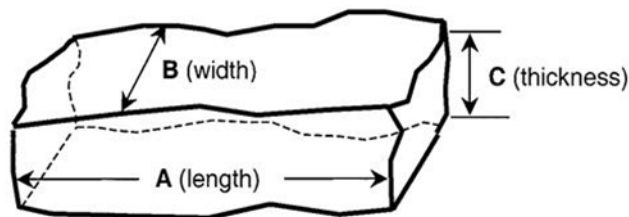


Figure 1: Riprap shape depicting A, B and C axis

Ensure the gradation meets the requirements specified in Table 1 herein.

The basis of acceptance of the riprap rock will be Test Data Certification in accordance with the *MQAP Manual for ASTM D6473 and ASTM D5240/D5240M* tests performed annually by an independent testing firm hired by the quarry.

The basis of acceptance of the riprap gradation will be by *Federal Lands Highways test FLH T 521-13 Determining Riprap Gradation by Wolman Count*. One Wolman count will be performed by the Engineer at the quarry for each 20,000 tons of riprap. Additional Wolman counts may be performed on each job site as determined by the Engineer.

Furnish geotextile liner and geotextile liner, heavy in accordance with section 910 of the Standard Specifications for Construction. Furnish geotextile liner for Class I riprap gradation and geotextile liner, heavy for Class II and Class III riprap gradations.

**c. Construction.** Place riprap in accordance with subsection 813.03 of the Standard Specifications for Construction, on prepared grades to the elevations, thickness, and lateral limits

as shown on the plans. Clear areas to be protected by riprap of brush, trees, stumps and debris. Shape and compact all grades to the required cross section, including excavation for toe and header plan details. Place geotextile liner and geotextile liner, heavy on prepared grades in accordance with the *Soil Erosion and Sedimentation Control Manual*. Ensure the riprap installation does not damage the geotextile liner. Ensure damaged geotextile liner is repaired or removed and replaced as directed by the Engineer at no cost to the contract.

Careful placement of riprap with a clam bucket or other approved method is required to assure that there is no damage to structure footings and no material loss around or under structure foundations. Use a skeleton bucket or similar equipment to minimize placement of fines. Repair any structure damage caused by the Contractor operations as directed by the Engineer at no cost to the contract.

On slopes, placement of riprap must start at the toe and proceed up the slope, with each rock firmly embedded into the slope and against adjoining rocks. Construct the riprap to minimize voids by select placement of optimum rock sizes from the gradation specified. If placed riprap contains large voids, the Engineer will direct the Contractor to place additional rocks of the appropriate gradation sizes to fill the voids. The finished surface of the riprap must present a tight, even surface.

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

<b>Pay Item</b>	<b>Pay Unit</b>
Riprap, Spec, CI _____	Square Yard

**Riprap, Spec, CI** \_\_\_ includes diverting stream flow, clearing and preparing grades, excavation and disposal of surplus or unsuitable materials, furnishing and placing geotextile liner or heavy geotextile liner as applicable, and placing the riprap, including headers, in accordance with this special provision.

**Table 1: Gradation Requirements for Riprap-Special, Individual Rocks**

Nominal Riprap Class by Median Particle Width		15% passing (inches) (a)		50% passing (inches) (a)		85% passing (inches) (a)		100% passing (inches) (a)
Class	Size (a)	Min	Max	Min	Max	Min	Max	Max
I	9 inch	5	8	8	11	11	14	18
II	12 inch	7	11	11	14	15	19	24
III	24 inch	14	21	23	28	31	37	48

a. Corresponds to the intermediate axis (B) in Figure 1.

## UTILITY COORDINATION WITH CHARTER COMMUNICATIONS

Charter Communications has a buried fiber optic line in 2-inch conduit under both culvers at the north end. This line is a critical utility that services cell phone towers in the area. Charter will arrange to have a representative on site to assist in location of the line during excavation. If needed Charter can lower the line and conduit to facilitate the installation of the new culverts.

Contact Charter Communications a minimum of **14 calendar days** prior to any work on or near the existing fiberoptic cable. Charter will arrange for a representative to be on site during the proposed work.

Contact the Charter Communications personnel below to coordinate.

Charter Communications  
Kevin T Morrison  
Phone: (231) 463-1936  
Email: Kevin.morrison2@charter.com

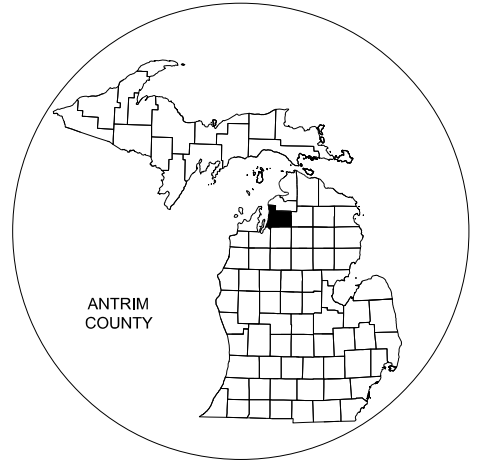
Charter Communications  
Drew Marsh  
Phone: (231) 932-8135  
Email: Drew.marsh@charter.com

PERFORM ALL WORK COVERED BY THESE PLANS IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION.

PHYSICAL ROAD NUMBER (PR#) & MILEPOST (MP) DATA ARE FROM MICHIGAN GEOGRAPHIC FRAMEWORK VERSION # 24.

# MICHIGAN DEPARTMENT OF TRANSPORTATION

ROUTE: M-88  
CENTRAL LAKE TOWNSHIP  
ANTRIM COUNTY



COUNTY KEY

TRAFFIC DATA				SPEED DATA			LIMITS
ROAD	YEAR	ADT	DHV	COMM	DESIGN	POSTED	
M-88	2023	3390		4.4%	55	55	POB TO POE

SECTION 1 CONTROL SEC 05031 JOB NO. 221459A FED AID PROJ YES

R08W

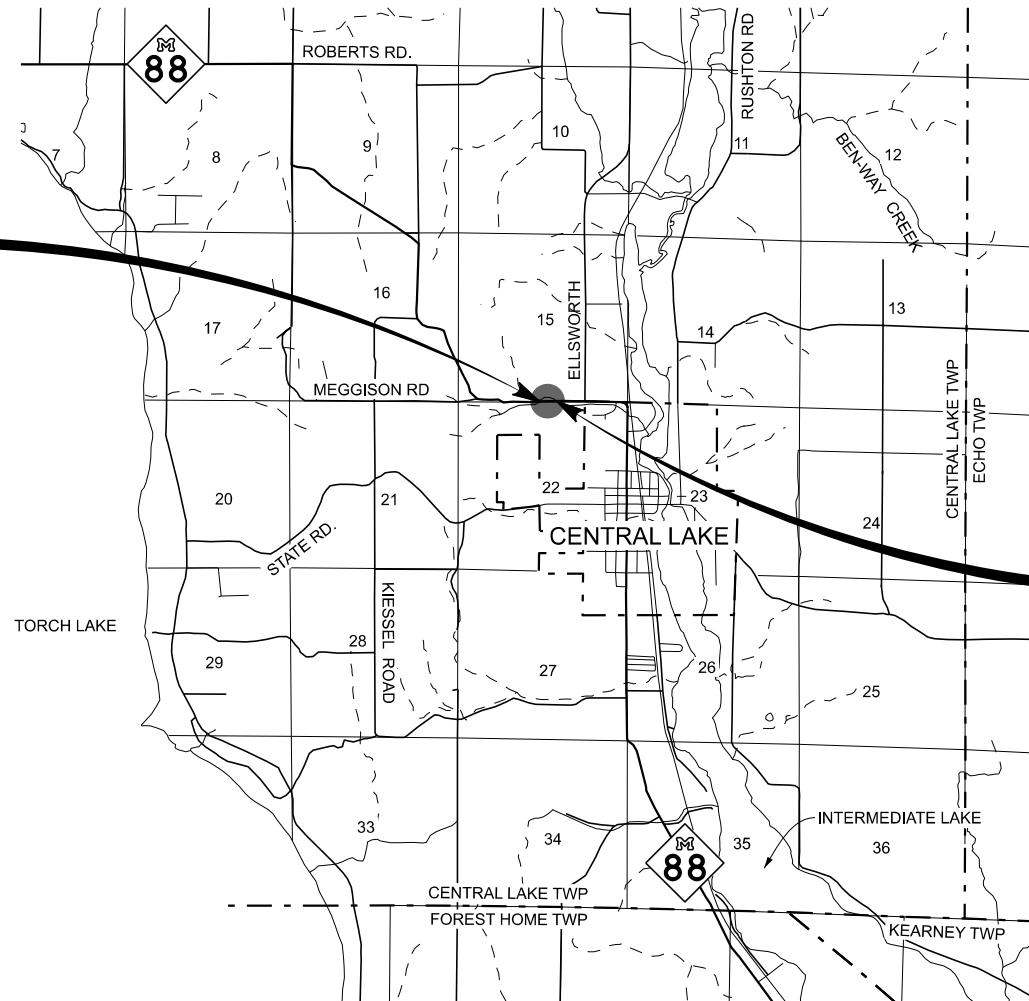
R07W

T31N

T30N

JN 221459  
POE STA 1083+13.50  
CS 05031  
CS MP 21.048  
PR 3050060  
PR MP 21.048

JN 221259  
POB STA 1073+64.40  
CS 05031  
CS MP 20.868  
PR 3050060  
PR MP 20.868

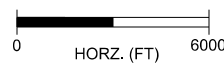


**MICHIGAN DEPARTMENT OF TRANSPORTATION**

BRADLEY C. WIEFERICH, P.E. - DIRECTOR

MILES: 0.180  
CONTRACT FOR:  
CULVERT RECONSTRUCTION, GUARDRAIL RECONSTRUCTION

FINAL ROW PLAN REVISIONS				SUBMITTAL DATE:			
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



FILE: 221459\_m88\_title.dgn

DATE: 02/05/26  
DESIGN UNIT: MONROE  
TSC: GAYLORD  
CS: 05031  
JN: 221459

TITLE		DRAWING	SHEET
M-88 TITLE 001			SECT 1 1

### LABELING

#### GENERAL

- LEFT TURN ARROW
- RIGHT TURN ARROW
- TRAFFIC FLOW ARROW

#### REMOVAL

- ABANDON
- BULKHEAD
- CLEARING
- REMOVE
- SALVAGE
- SAVE

#### CONSTRUCTION

- ADJUST
- ADJUST - STRUC COVER WITH TYPE
- ADJUST - BY OTHERS

#### REMOVAL AND CONSTRUCTION

- RELOCATE - WITH CASE NUMBER
- RELOCATE - BY OTHERS

#### BOUNDARY

- CONTIGUOUS PROPERTY SYMBOL
- MDOT PARCEL NUMBER BOX
- PROPERTY OWNERSHIP ARROW
- PROPERTY OWNERSHIP ARROW - DOUBLE

#### MONUMENT PRESERVATION

- ADJUST MONUMENT BOX
- PRESERVE MONUMENT
- PROTECT MONUMENT

#### STRUCTURES

- REFERENCE POINT
- STRUCTURE NO. + CONTROL SECTION

#### BARRIERS

- CABLE BARRIER - NOT TO SCALE
- CABLE BARRIER - TRUE SCALE
- CONCRETE BARRIER - DOUBLE FACE
- CONCRETE BARRIER - SINGLE FACE
- FENCE
- GUARDRAIL - NOT TO SCALE
- GUARDRAIL - TRUE SCALE
- NOISE BARRIER
- GUARDRAIL RUN NUMBER
- IMPACT ATTENUATOR

### BORINGS

BH# BORING

### BOUNDARIES

- CITY LIMIT
- CONDO - LIMIT - LEGAL
- CONDO - LIMIT - NON-LEGAL
- CONDO - UNIT LINE - LEGAL
- CONDO - UNIT LINE - NON-LEGAL
- EASEMENT - LEGAL
- EASEMENT - NON-LEGAL
- MEANDER - LEGAL
- MEANDER - NON-LEGAL
- PARCEL - LEGAL
- PARCEL - NON-LEGAL
- PLAT - BLOCK LINE - LEGAL
- PLAT - BLOCK LINE - NON-LEGAL
- PLAT - LOT LINE - LEGAL
- PLAT - LOT LINE - NON-LEGAL
- PLAT - LIMIT - LEGAL
- PLAT - LIMIT - NON-LEGAL
- ROW - FREE ACCESS
- ROW - LIMITED ACCESS
- SECTION LINE - GOVERNMENT LOT - LEGAL
- SECTION LINE - GOVERNMENT LOT - NON-LEGAL
- SECTION LINE - MEANDER - LEGAL
- SECTION LINE - MEANDER - NON-LEGAL
- SECTION LINE - PRIVATE CLAIM - LEGAL
- SECTION LINE - PRIVATE CLAIM - NON-LEGAL
- SECTION LINE - LEGAL
- SECTION LINE - NON-LEGAL
- SECTION LINE - QUARTER - LEGAL
- SECTION LINE - QUARTER - NON-LEGAL
- SECTION LINE - EIGHTH - LEGAL
- SECTION LINE - EIGHTH - NON-LEGAL
- SECTION LINE - SIXTEENTH - LEGAL
- SECTION LINE - SIXTEENTH - NON-LEGAL
- TOWNSHIP LINE

### CONSTRUCTION LIMITS

- SLOPE STAKE LINE

### CONTROL, CORNERS & MONUMENTS

- ALIGNMENT POINT MONUMENT
- BENCHMARK
- CONCRETE MONUMENT
- CONTROL POINT
- PARCEL CORNER - CAPPED IRON
- PARCEL CORNER - IRON PIN
- PARCEL CORNER - IRON PIPE
- PARCEL CORNER - NO ID
- PLAT CORNER
- MONUMENT BOX
- ROW MONUMENT
- SECTION CORNER - CENTER
- SECTION CORNER - GOVERNMENT LOT
- SECTION CORNER - MEANDER
- SECTION CORNER - PRIVATE CLAIM
- SECTION CORNER - QUARTER
- SECTION CORNER - QUARTER - HALF
- SECTION CORNER - SECTION
- SECTION CORNER - SECTION - HALF
- SECTION CORNER - SIXTEENTH
- SECTION CORNER - WITNESS

### CURB & GUTTER

- CURB & GUTTER REMOVAL
- CURB RAMP OPENING

### ENVIRONMENTAL

- EROSION CONTROL - SILT FENCE
- WETLAND - LEGAL
- WETLAND - NON-LEGAL
- CONTAMINATION - MONITORING WELL
- EROSION CONTROL NUMBER
- EROSION CONTROL - RIPRAP
- WATER SURFACE - ELEV
- WATER TABLE - ELEV
- WETLAND SPOT
- POTENTIALLY CONTAMINATED SITE

### POSTS

- POST - FENCE
- POST - MAILBOX
- POST - NO ID

### RAILROAD

- TRACK
- CROSSING - GATE
- CROSSING - SIGNAL BOX
- CROSSING - SIGNAL FLASHING
- CROSSING - SYMBOL

### ROADSIDE / SITE

- ANTENNA
- BIG ROCK
- FLAG POLE
- PICNIC STOVE
- PICNIC TABLE
- SATELLITE DISH

### SIGNS

- BAND - DOUBLE
- BAND - SINGLE
- POST - CROSS STREET
- POST - DOUBLE
- POST - DOUBLE - WITH BACK PANEL
- POST - SINGLE
- POST - SINGLE - WITH BACK PANEL
- STRUCTURE - CANTILEVER - EXISTING
- STRUCTURE - CANTILEVER
- STRUCTURE - TRUSS - EXISTING
- STRUCTURE - TRUSS
- SUSPENDED

### VEGETATION

- BRUSH LINE
- HEDGE LINE
- TREE LINE - CANOPY OR TRUNK
- TREE LINE - TRUNK
- TRUNK LINE
- SHRUB
- TREE - CONIFER
- TREE - DECIDUOUS
- TREE - STUMP

### TYPICAL SECTION

- CONCRETE - PROPOSED
- HMA - PROPOSED

### SURFACING

#### REMOVAL

- CONCRETE RUBBLIZING OR HMA CRUSH & SHAPE
- HMA COLDMILLING
- HMA SURFACE REMOVAL AND / OR PAVEMENT REMOVAL

#### PROPOSED

- AGGREGATE APPROACH
- BRIDGE APPROACH
- HMA APPROACH
- MISCELLANEOUS CONCRETE

#### SIDEWALK & CURB RAMPS

- SIDEWALK REMOVAL
- CURB RAMP
- LANDING
- CURB RAMP TYPE
- DETECTABLE WARNING SURFACE

### NOTE:

EXISTING ITEMS ARE REPRESENTED BY THIN LINE WEIGHTS.  
PROPOSED ITEMS ARE REPRESENTED BY HEAVIER LINE WEIGHTS.

## UTILITIES

### COMBINED SEWER

- COMBINED SEWER
- COMBINED SEWER - OUT OF SERVICE
- COMBINED SEWER - TO BE TAKEN OUT OF SERVICE
- COMBINED SEWER - TO BE REMOVED

### COMMUNICATION

- FIBER OPTIC
- FIBER OPTIC - OUT OF SERVICE
- FIBER OPTIC - OVERHEAD
- FIBER OPTIC MARKER
- CABLE
- CABLE - OUT OF SERVICE
- CABLE - OVERHEAD
- CABLE MARKER
- CABLE PEDESTAL
- TELEPHONE
- TELEPHONE - OUT OF SERVICE
- TELEPHONE - OVERHEAD
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL

### FUEL / PETROLEUM

- GASOLINE FILLER PIPE
- GASOLINE PUMP
- GASOLINE UNDERGROUND TANK
- PETROLEUM PIPELINE
- PETROLEUM PIPELINE - OUT OF SERVICE
- PETROLEUM PIPELINE MARKER
- PETROLEUM WELL
- PROPANE TANK

### NATURAL GAS

- GAS LINE
- GAS LINE - OUT OF SERVICE
- MARKER
- VALVE
- WELL

### SANITARY SEWER

- MANHOLE WITH COVER (DIA VARIES)
- SEWER
- SEWER - OUT OF SERVICE
- SEWER - TO BE TAKEN OUT OF SERVICE
- SEWER - TO BE REMOVED

### WATER

- FIRE HYDRANT
- GATE VALVE AND BOX
- GATE VALVE IN WELL
- IRRIGATION CONTROL VALVE
- IRRIGATION SPRINKLER HEAD
- SERVICE METER
- SERVICE SHUTOFF
- WATER WELL
- IRRIGATION
- WATER MAIN
- WATER MAIN - OUT OF SERVICE
- WATER MAIN - TO BE TAKEN OUT OF SERVICE
- WATER MAIN - TO BE REMOVED

### STEAM

- STEAM
- STEAM - OUT OF SERVICE

### GENERIC EXISTING UTILITIES

- GUY ANCHOR
- MARKER
- PEDESTAL
- POLE
- UTILITY BOX
- UTILITY

## DRAINAGE

- CATCH BASIN COVER - EXISTING
- CATCH BASIN W/ COVER (DIA VARIES)
- DRAINAGE STRUCTURE NUMBER
- DRAIN CASTING
- DROP INLET
- END SECTION (SIZE VARIES)
- FLOW DIRECTION ARROW
- HEADWALL (SIZE VARIES)
- MANHOLE COVER - EXISTING
- MANHOLE W/ COVER (DIA VARIES)
- MANHOLE BASE W/ COVER (SIZE VARIES)
- MANHOLE TEE W/ COVER (SIZE VARIES)
- OUTLET HEADWALL (SIZE VARIES)
- SEWER CLEANOUT ACCESS - EXISTING
- STRUCTURE BOTTOM - EXISTING (DIA VARIES)

- CULVERT - EXISTING
- CULVERT (SIZE VARIES)
- DITCH CENTERLINE
- STORM SEWER - EXISTING
- STORM SEWER
- STORM SEWER - TO BE REMOVED
- UNDERDRAIN
- UNDERDRAIN - TO BE REMOVED
- WATER EDGE

## MAINTAINING TRAFFIC

- TYPE III BARRICADE
- CHANNELIZING DEVICE - 42 INCH
- CHANNELIZING DEVICE - DRUM
- CHANNELIZING DEVICE - TUBULAR MARKER
- LIGHT - HIGH INTENSITY TYPE B
- LIGHT - STEADY BURN TYPE C
- LIGHTED ARROW PANEL - BAR
- LIGHTED ARROW PANEL
- PORTABLE CHANGEABLE MESSAGE SIGN
- PORTABLE WATER FILLED BARRIER
- TRAFFIC REGULATOR
- TEMPORARY BARRIER - 24 INCH
- TEMPORARY BARRIER - 28 INCH
- TEMPORARY BARRIER ENDING
- TEMPORARY SIGN
- TEMPORARY SPEED RADAR TRAILER
- TEMPORARY TRAFFIC SIGNAL
- WORK AREA

### NOTE:

EXISTING ITEMS ARE REPRESENTED BY THIN LINE WEIGHTS.  
PROPOSED ITEMS ARE REPRESENTED BY HEAVIER LINE WEIGHTS.

FINAL ROW PLAN REVISIONS				SUBMITTAL DATE:			
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



NO SCALE

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DATE: 02/05/26

DESIGN UNIT: MONROE

TSC: GAYLORD

CS: 05031

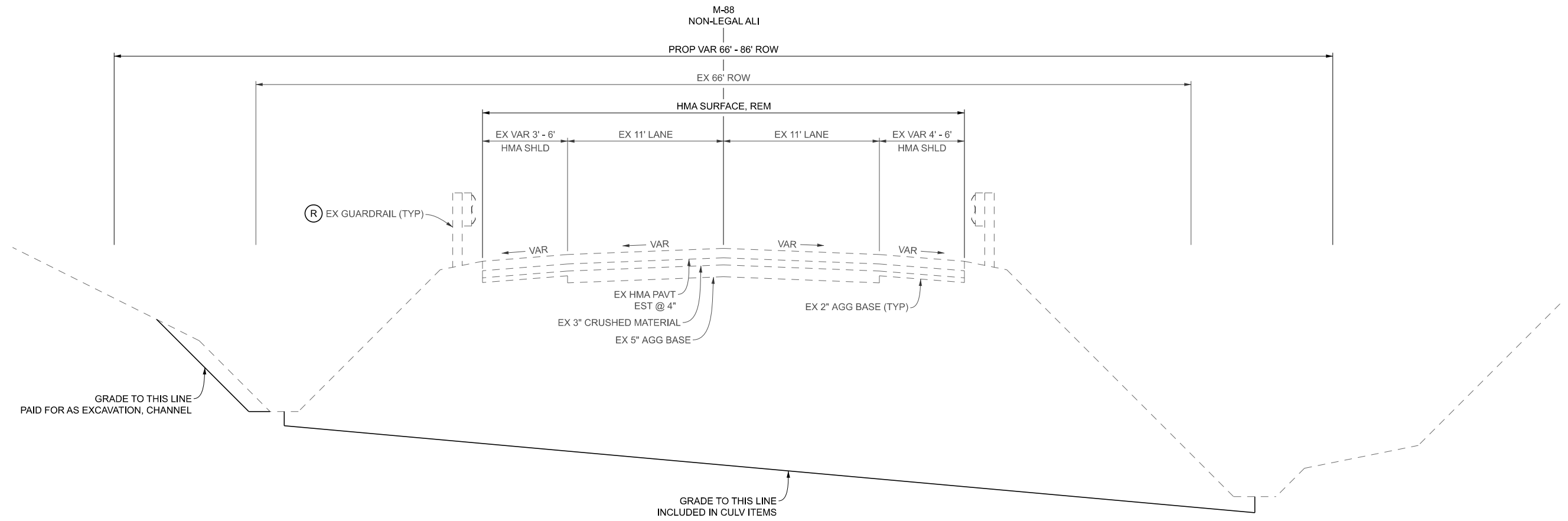
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LEGEND

DRAWING SHEET

M-88 SECT 1

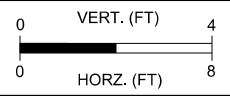
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**EXISTING TYPICAL SECTION**

SECTION APPLIES TO:  
 STA 1075+17.00 TO STA 1075+95.00  
 STA 1080+53.00 TO STA 1081+13.00

FINAL ROW PLAN REVISIONS				SUBMITTAL DATE:			
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



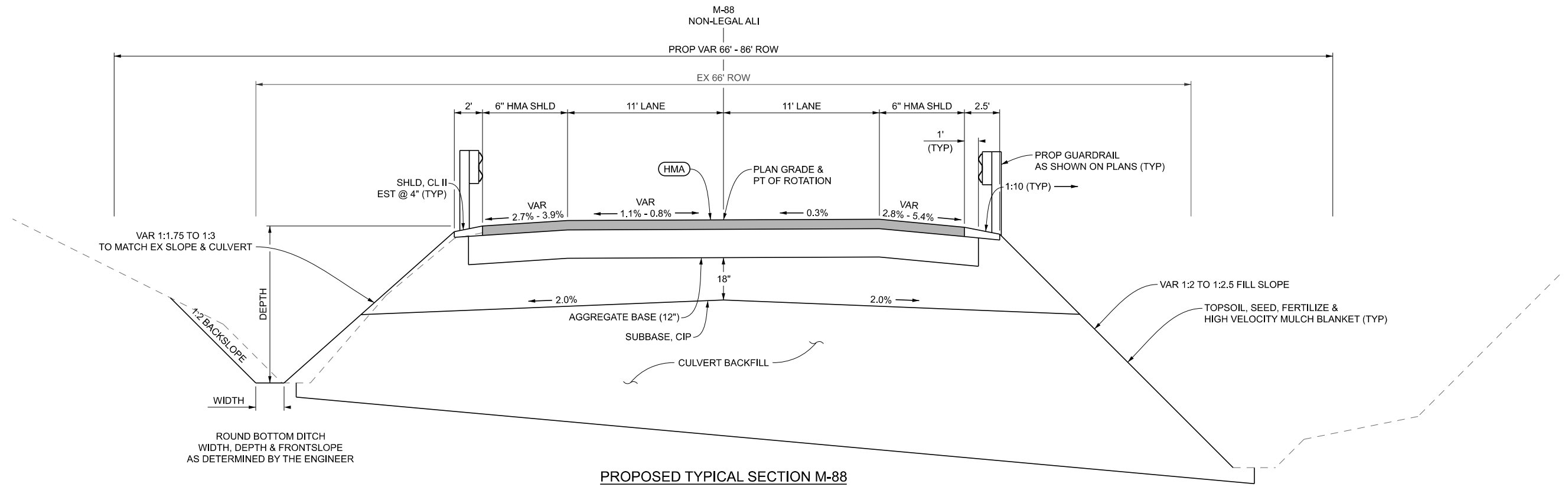
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 TSC: GAYLORD

CS: 05031  
 JN: 221459

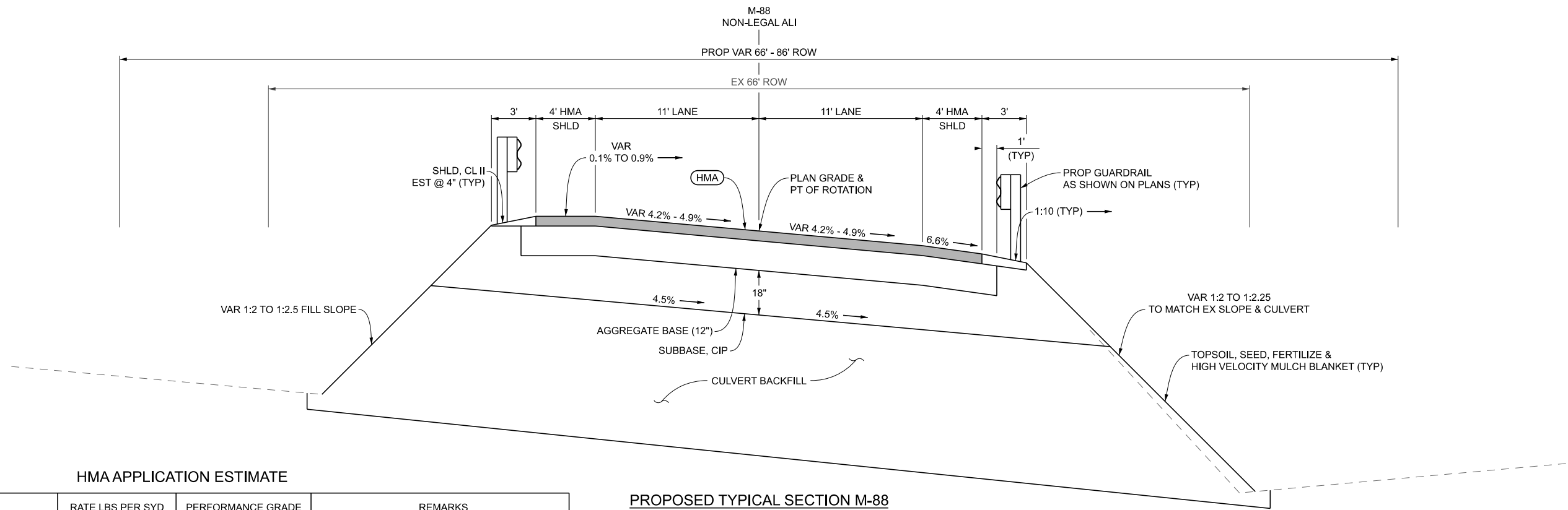
TYPICAL CROSS SECTIONS  
 EXISTING

DRAWING SHEET  
 M-88 TYP 001 SECT 1  
 4



**PROPOSED TYPICAL SECTION M-88**

SECTION APPLIES TO:  
STA 1075+17.00 TO STA 1075+95.00



**PROPOSED TYPICAL SECTION M-88**

SECTION APPLIES TO:  
STA 1080+53.00 TO STA 1081+13.00

**HMA APPLICATION ESTIMATE**

IDENT NO.	ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
HMA	HMA APPROACH	440	58-28	4EL - AWI=220 - 2" MAX. LIFT
	* BOND COAT	0.05-0.15 GAL		

\* FOR INFORMATION ONLY

FINAL ROW PLAN REVISIONS		SUBMITTAL DATE:	
NO.	DATE	NO.	DATE



FILE: 221459\_m88\_typ001.dgn

DATE: 02/05/26  
DESIGN UNIT: MONROE  
TSC: GAYLORD

CS: 05031  
JN: 221459

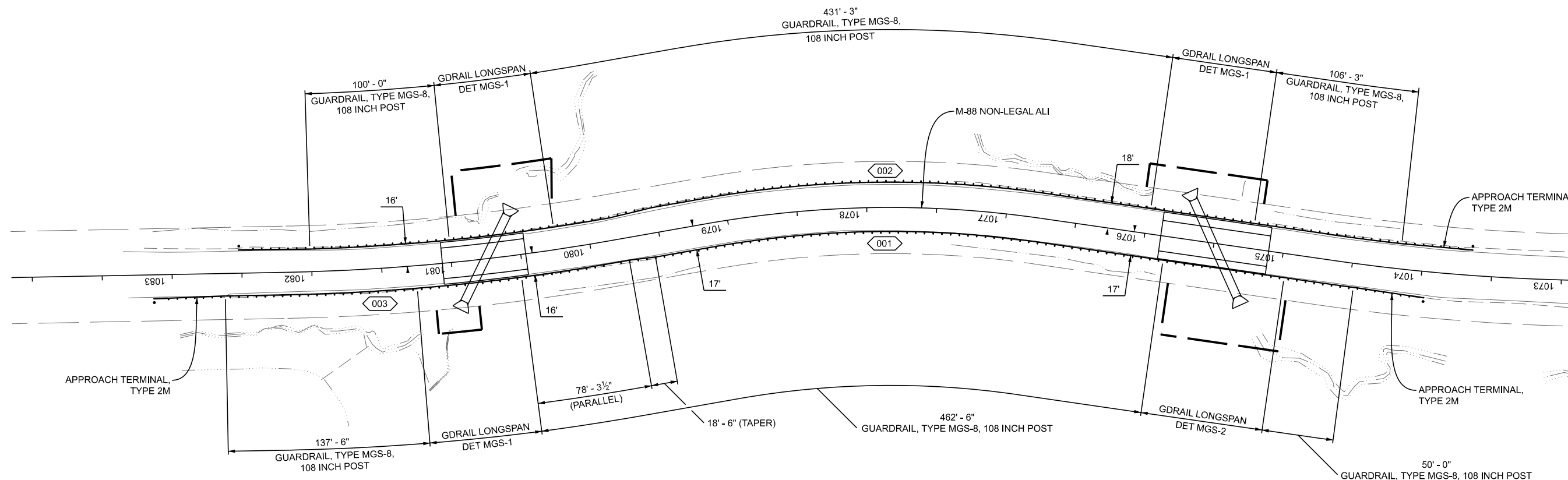
TYPICAL CROSS SECTIONS  
PROPOSED

DRAWING SHEET  
M-88 TYP 002 SECT 1  
5



**GUARDRAIL QUANTITIES - RUN 002**

2	Ea	Guardrail Approach Terminal, Type 2M
32	Ea	Guardrail Reflector
2	Ea	Guardrail, Long Span, Det MGS-1
638	Ft	Guardrail, Type MGS-8, 108 inch Post
2	Ea	Delineator Reflector, Green
2	Ea	Post, Rigid, Delineator
788	Ft	Enhanced Delineation, Bidirectional, Guardrail, Post Mtd



**GUARDRAIL QUANTITIES - RUN 001**

2	Ea	Guardrail Approach Terminal, Type 2M
34	Ea	Guardrail Reflector
1	Ea	Guardrail, Long Span, Det MGS-1
1	Ea	Guardrail, Long Span, Det MGS-2
650	Ft	Guardrail, Type MGS-8, 108 inch Post
2	Ea	Delineator Reflector, Green
2	Ea	Post, Rigid, Delineator
813	Ft	Enhanced Delineation, Bidirectional, Guardrail, Post Mtd

FINAL ROW PLAN REVISIONS				SUBMITTAL DATE:			
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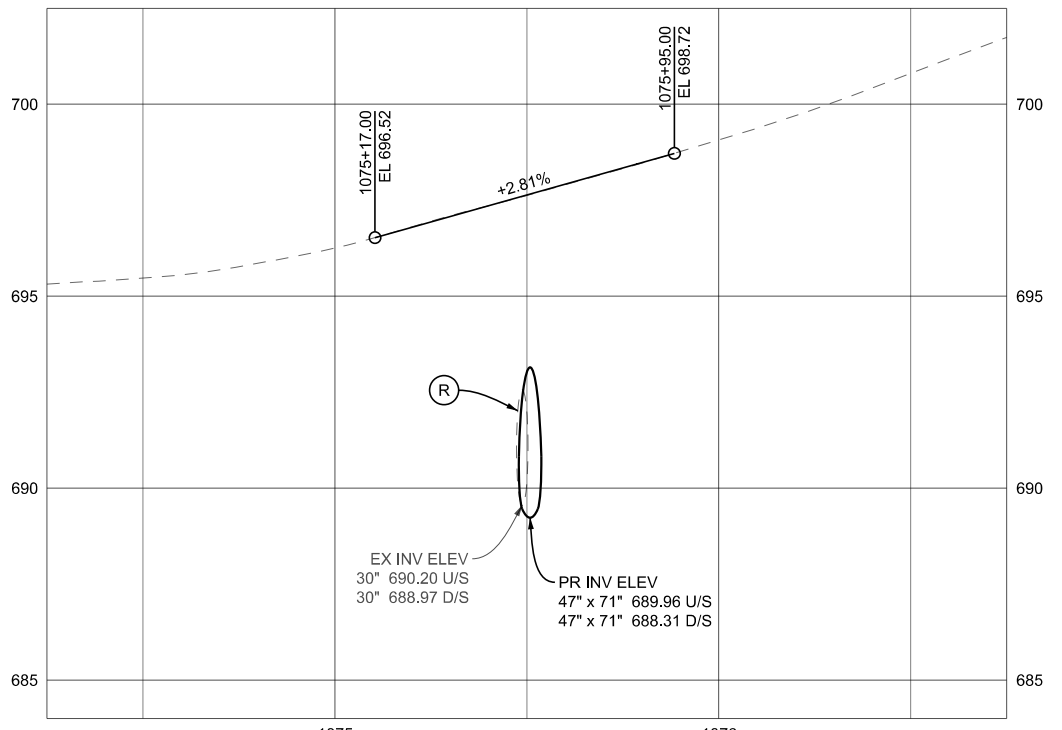
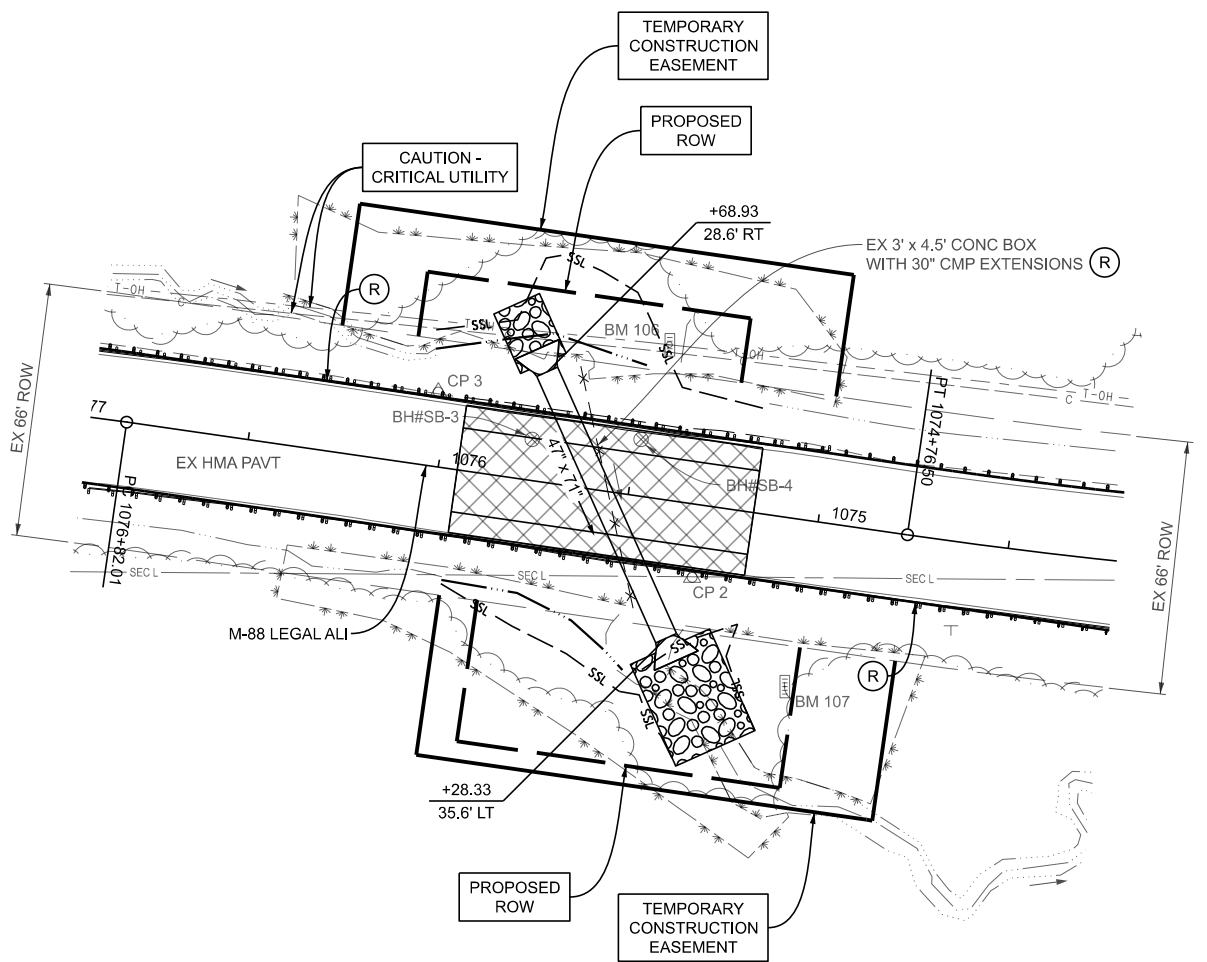
DATE: 02/05/26	CS: 05031
DESIGN UNIT: MONROE	JN: 221459
TSC: GAYLORD	

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MISCELLANEOUS DETAILS	
GUARDRAIL DETAILS	

DRAWING	SHEET
M-88 MSCDET 001	6





TEST HOLE NO. SB-3		TEST HOLE NO. SB-4	
LOCATION STATION: N.A. LAT: 45.078943843231° N, LON: -85.272694973897° W 643775.406 N., 19451011.199 E. (MI CENTRAL 2112 FT) SEE SOIL BORING LOCATION MAP GROUND SURFACE ELEVATION: 94.16 FT		LOCATION STATION: N.A. LAT: 45.078944645850° N, LON: -85.272585261204° W 643775.382 N., 19451039.540 E. (MI CENTRAL 2112 FT) SEE SOIL BORING LOCATION MAP GROUND SURFACE ELEVATION: 93.53 FT	
0	ASPHALT PAVEMENT	0	ASPHALT PAVEMENT
0.6	AGGREGATE BASE COURSE	0.6	AGGREGATE BASE COURSE
1.6	VERY DENSE, BROWN, MOIST, FINE, POORLY-GRADED SAND, TRACE GRAVEL (FILL)	1.4	MEDIUM DENSE, BROWN, MOIST, FINE, SILTY SAND, TRACE GRAVEL (FILL)
2.5	STIFF, GRAY, MOIST LEAN CLAY (FILL)	2.5	MEDIUM DENSE, BROWN, MOIST, FINE, POORLY-GRADED SAND WITH GRAVEL (FILL)
		4.5	LOOSE, DARK BROWN, MOIST, FINE, SILTY SAND, WITH ORGANIC ODOR (FILL)
7.0	MEDIUM DENSE, BROWN, WET, SILTY GRAVEL WITH SAND, SUBANGULAR TO SUBROUNDED (GM)	7.0	MEDIUM DENSE, BROWN, WET, SILTY GRAVEL WITH SAND, SUBANGULAR TO SUBROUNDED (GM)
9.5	VERY DENSE, BROWN, WET, POORLY-GRADED GRAVEL WITH SILT AND SAND, ANGULAR TO SUBROUNDED (GP-GM)		
		12.0	MEDIUM DENSE, BROWN, WET, FINE, POORLY-GRADED SAND WITH GRAVEL (SP)
14.5	DENSE, BROWN, WET, POORLY-GRADED GRAVEL WITH SILT, SUB-ANGULAR TO SUB-ROUNDED (GP-GM)		
		17.5	MEDIUM DENSE, BROWN, WET, SILTY SAND WITH GRAVEL, FINE (SM)
21.5	VERY DENSE, BROWN, WET, FINE POORLY-GRADED SAND WITH GRAVEL (SP)		
30.0	E.O.B. 30.0 FT	30.0	E.O.B. 30.0 FT
BORING DATE 5/29/25 GROUNDWATER OBSERVED AT 8.5' DURING DRILLING		BORING DATE 5/29/25 GROUNDWATER OBSERVED AT 8.8' DURING DRILLING AND 9.0' AFTER DRILLING	

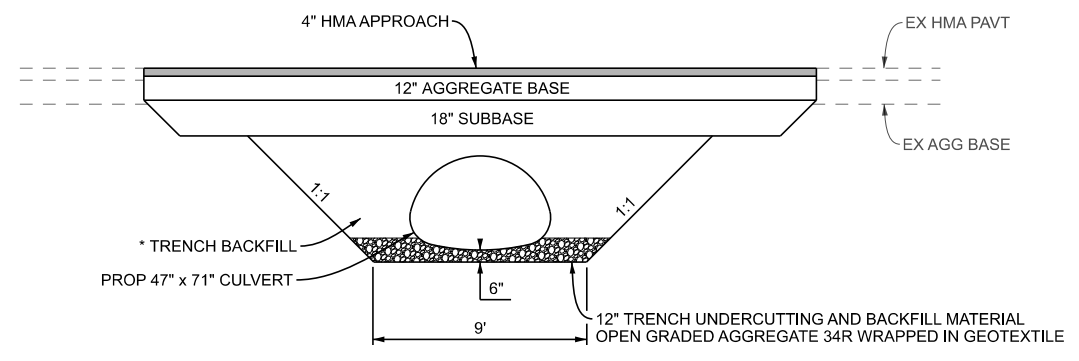
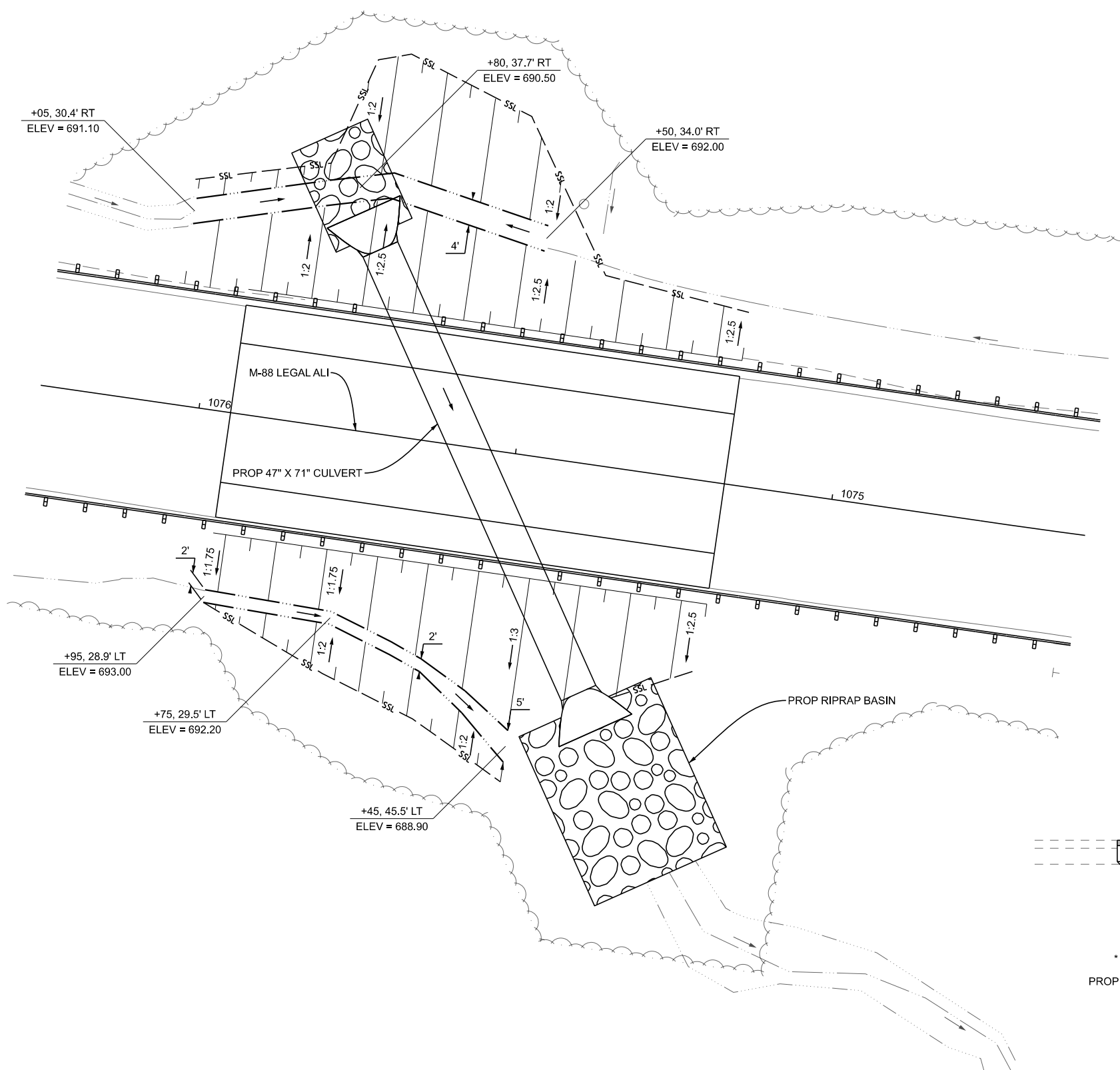
**NOTES:**

- 0 0 0 1ST 6 INCHES
- 0 0 0 2ND 6 INCHES
- 0 0 0 3RD 6 INCHES
- 0 0 RECOVER (%)
- 0 0 ROCK QUALITY DESIGNATION (%)
- #/X.X
- E.O.B. - END OF BORING
- NUMBERS IN CIRCLES DENOTE NUMBER OF BLOWS REQUIRED TO DRIVE A 2-INCH O.D. (1.5-INCH I.D.) SPLIT-SPOON SAMPLER 3 SUCCESSIVE 6-INCH INCREMENTS USING A 140-POUND HAMMER FALLING 30 INCHES.
- WOH DENOTES "WEIGHT OF HAMMER"
- WOR DENOTES "WEIGHT OF RODS"
- PAVEMENT BORINGS WERE ADVANCED WITH A DIEDRICH D-50 ATV UTILIZING 4-1/4 INCH HOLLOW STEM AUGERS.
- THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUBSURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE BORING.
- COORDINATES WERE CONVERTED FROM LATITUDE-LONGITUDE TO NORTHING-EASTING, MICHIGAN STATE PLANE CENTRAL (2112) (INTERNATIONAL FEET)

**REMOVAL AND CONSTRUCTION QUANTITIES**

2	Ea	Culv, Rem, 24 inch to 48 inch
1	Ea	Culv, Other than Pipe, Rem
675	Ft	Guardrail, Rem
35	Cyd	Embankment, CIP
400	Cyd	Excavation, Earth
245	Cyd	Subbase, CIP
205	Ton	Aggregate Base
14	Ton	Shld, CI II
2	Ea	Dr Marker Post
76	Ft	Culv, CSP Arch, CI A, 47 inch by 71 inch, Polymer Coated
2	Ea	Culv End Sect, CSP, Arch Pipe, 47 inch by 71 inch
30	Cyd	Trench Undercut and Backfill
289	Syd	HMA Surface, Rem
64	Ton	HMA Approach
1	Ea	Bypass Pumping
1	Ea	Construction Dam
98	Syd	Riprap, Spec, CI II
19	Lb	Fertilizer, Chemical Nutrient, CI B
750	Syd	Mulch Blanket, High Velocity
34	Lb	Seeding, Mixture TDS
750	Syd	Topsoil Surface, Salv, 4 inch

COULTER CREEK  
M-88



\* TRENCH BACKFILL MATERIAL WILL BE GRANULAR MATERIAL, CL II  
**CULVERT TRENCH DETAIL**  
NOT TO SCALE

COULTER CREEK

FINAL ROW PLAN REVISIONS		SUBMITTAL DATE:	
NO.	DATE	AUTH	DESCRIPTION



DATE: 02/05/26  
DESIGN UNIT: MONROE  
TSC: GAYLORD  
FILE: 221459\_m88\_culv002.dgn

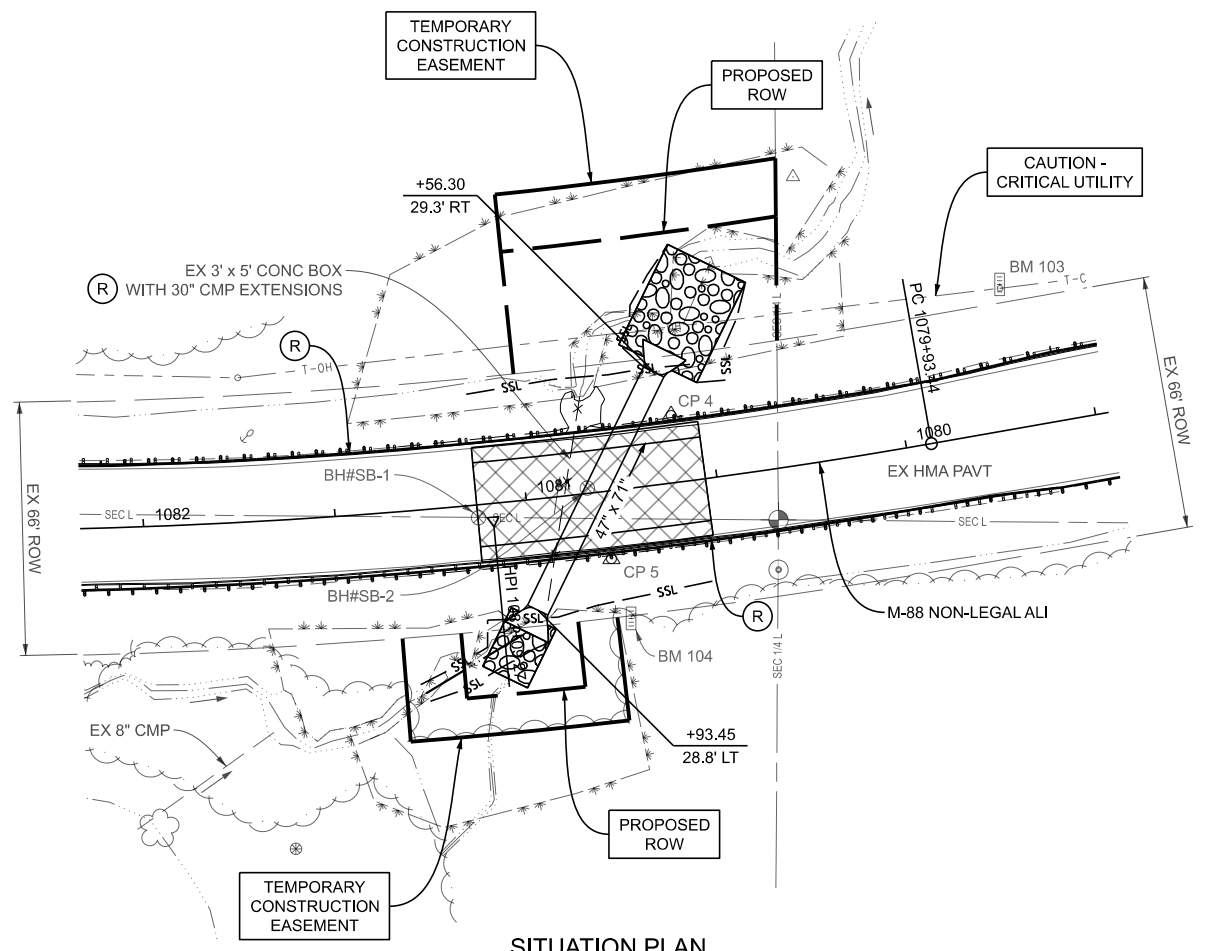
CS: 05031  
JN: 221459

PROPOSED 47" x 71" CULVERT  
M-88 STA 1075+51  
GRADING AND TRENCH DETAILS

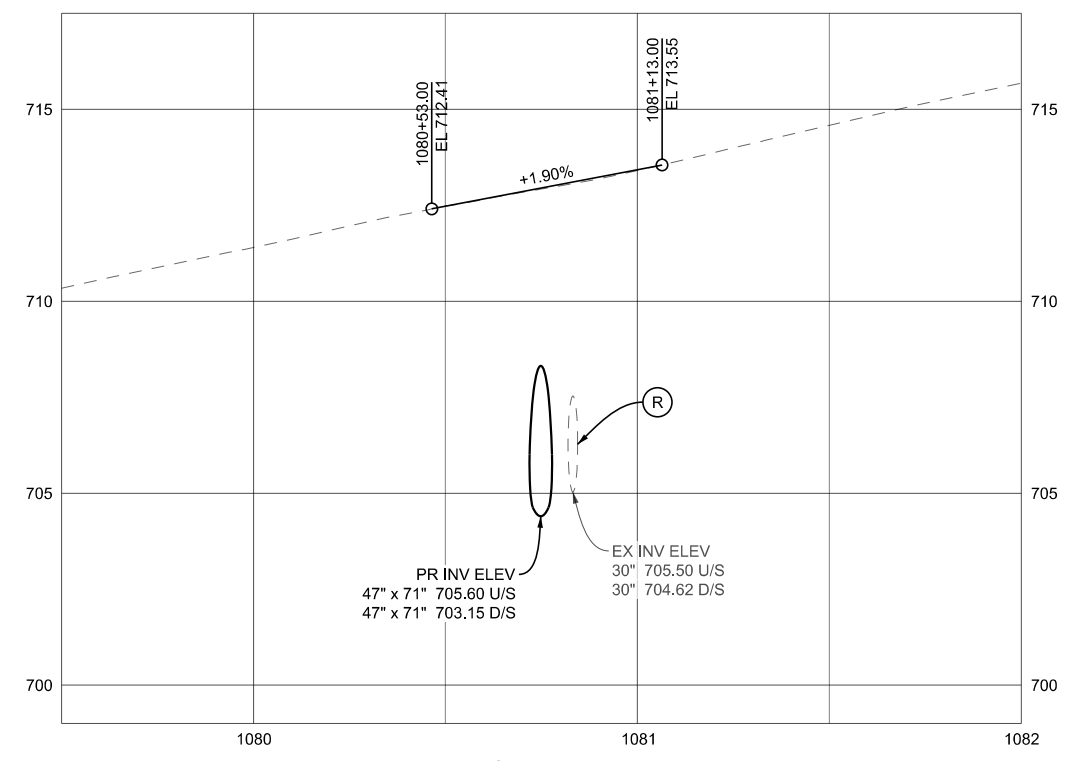
DRAWING SHEET  
M-88 CULVRT 002  
SECT 1  
9

M-88

COULTER CREEK



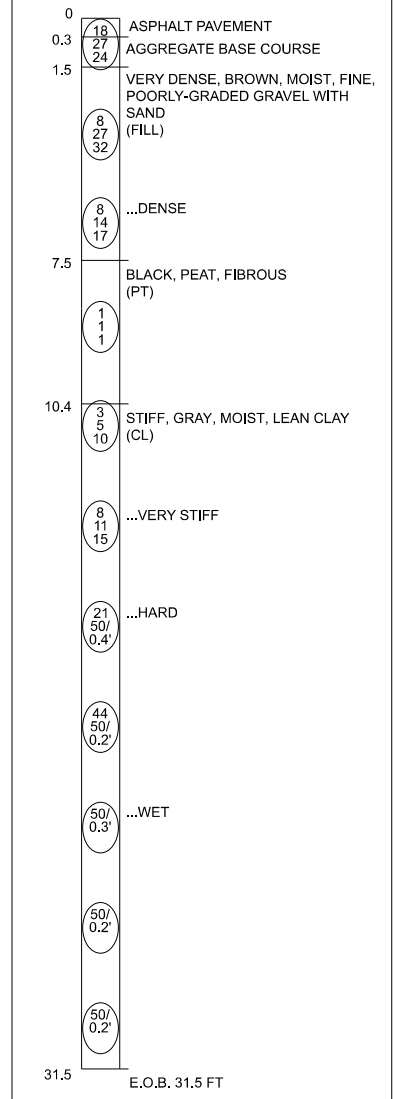
SITUATION PLAN



PROFILE VIEW  
SCALE: HORIZ 1" = 50'  
VERT 1" = 5'

TEST HOLE NO. SB-1

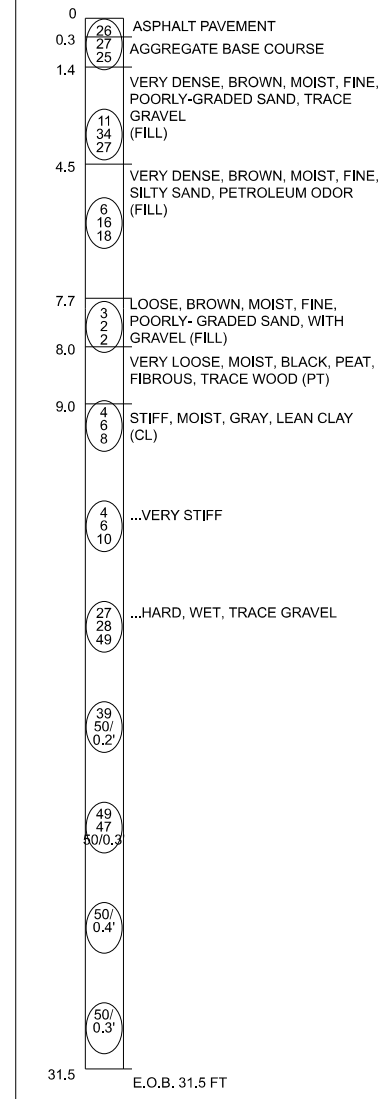
LOCATION STATION: N.A.  
LAT: 45.078842012766° N, LON: -85.274756737082° W  
643744.238 N., 19450478.250 E. (MI CENTRAL 2112 FT)  
SEE SOIL BORING LOCATION MAP  
GROUND SURFACE ELEVATION: 98.07 FT



31.5 E.O.B. 31.5 FT  
BORING DATE 5/28/25  
GROUNDWATER OBSERVED AT 14.0' AFTER DRILLING

TEST HOLE NO. SB-2

LOCATION STATION: N.A.  
LAT: 45.078864057466° N, LON: -85.274647314740° W  
643751.958 N., 19450506.603 E. (MI CENTRAL 2112 FT)  
SEE SOIL BORING LOCATION MAP  
GROUND SURFACE ELEVATION: 97.54 FT



31.5 E.O.B. 31.5 FT  
BORING DATE 5/28/25  
GROUNDWATER OBSERVED AT 12.5' DURING AND AFTER DRILLING

NOTES:

- 0 0 0 1ST 6 INCHES
- 0 0 0 2ND 6 INCHES
- 0 0 0 3RD 6 INCHES
- 0 0 RECOVER (%)
- 0 0 ROCK QUALITY DESIGNATION (%)
- # / X.X

E.O.B. - END OF BORING  
NUMBERS IN CIRCLES DENOTE NUMBER OF BLOWS REQUIRED TO DRIVE A 2-INCH O.D. (1.5-INCH I.D.) SPLIT-SPOON SAMPLER 3 SUCCESSIVE 6-INCH INCREMENTS USING A 140-POUND HAMMER FALLING 30 INCHES.  
WOH DENOTES "WEIGHT OF HAMMER"  
WOR DENOTES "WEIGHT OF RODS"

PAVEMENT BORINGS WERE ADVANCED WITH A DIEDRICH D-50 ATV UTILIZING 4-1/4 INCH HOLLOW STEM AUGERS.

THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUBSURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE BORING.

COORDINATES WERE CONVERTED FROM LATITUDE-LONGITUDE TO NORTHING-EASTING, MICHIGAN STATE PLANE CENTRAL (2112) (INTERNATIONAL FEET)

REMOVAL AND CONSTRUCTION QUANTITIES

2	Ea	Culv. Rem, 24 inch to 48 inch
1	Ea	Culv. Other than Pipe, Rem
675	Ft	Guardrail, Rem
10	Cyd	Embankment, CIP
275	Cyd	Excavation, Earth
155	Cyd	Subbase, CIP
143	Ton	Aggregate Base
9	Ton	Shld, CI II
2	Ea	Dr Marker Post
70	Ft	Culv, CSP Arch, CI A, 47 inch by 71 inch, Polymer Coated
2	Ea	Culv End Sect, CSP, Arch Pipe, 47 inch by 71 inch
48	Cyd	Trench Undercut and Backfill
195	Syd	HMA Surface, Rem
45	Ton	HMA Approach
1	Ea	Bypass Pumping
1	Ea	Construction Dam
98	Syd	Riprap, Spec, CI II
12	Lb	Fertilizer, Chemical Nutrient, CI B
500	Syd	Mulch Blanket, High Velocity
22	Lb	Seeding, Mixture TDS
500	Syd	Topsoil Surface, Salv, 4 inch

FINAL ROW PLAN REVISIONS		SUBMITTAL DATE:	
NO.	DATE	AUTH	DESCRIPTION



FILE: 221459\_m88\_culv003.dgn

DATE: 02/05/26  
DESIGN UNIT: MONROE  
TSC: GAYLORD

CS: 05031  
JN: 221459

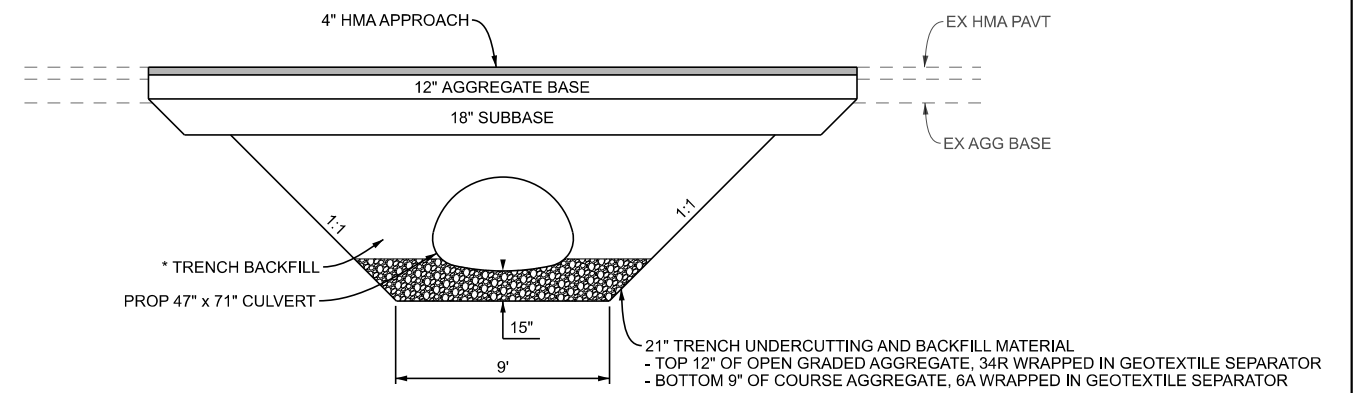
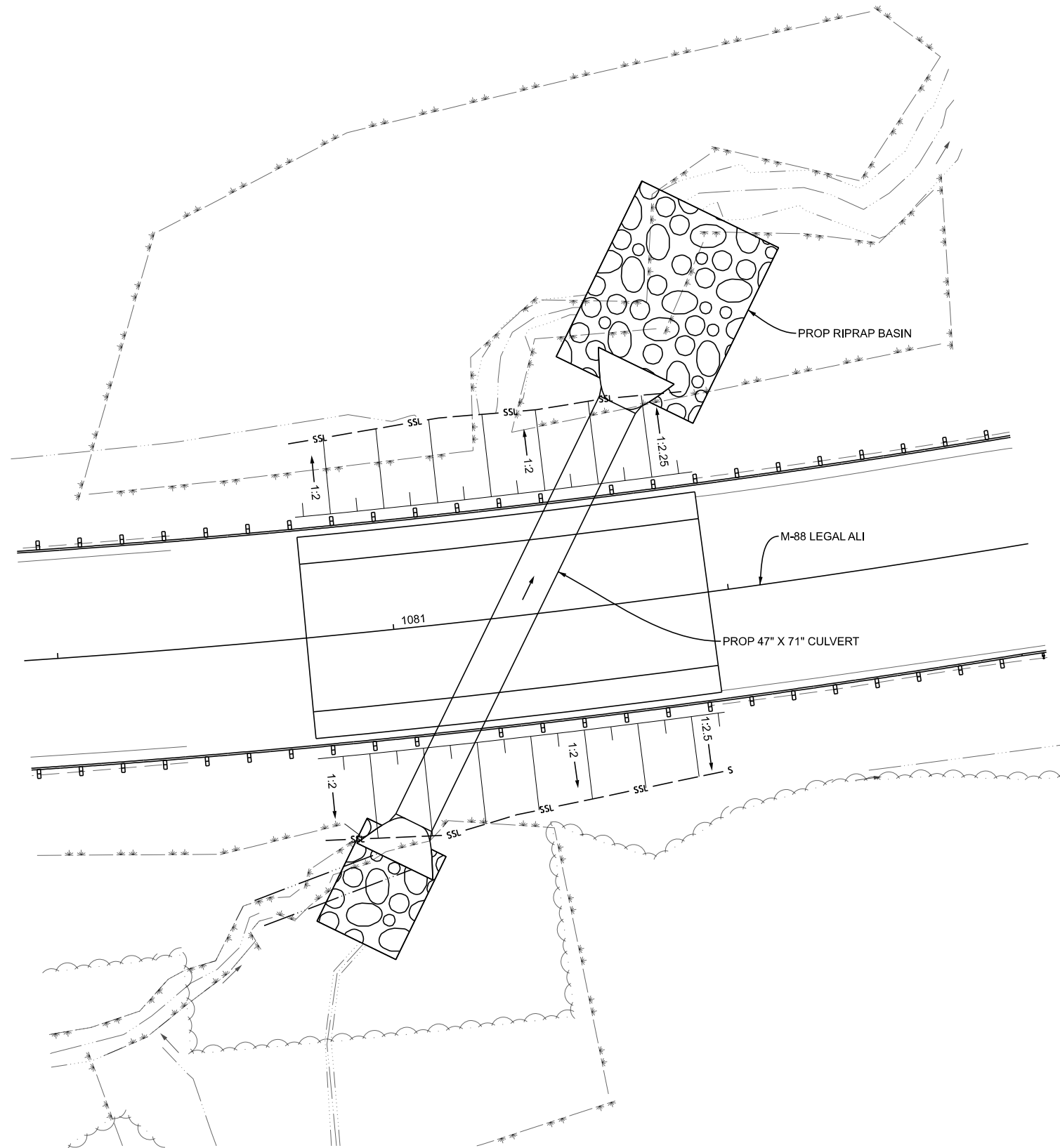
PROPOSED 47" x 71" CULVERT  
M-88 STA 1080+75  
GENERAL PLAN

DRAWING SHEET  
M-88 CULVRT 003  
SECT 10



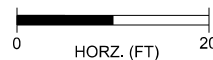
M-88

COULTER CREEK



\* FOR TRENCH BACKFILL MATERIAL WILL BE GRANULAR MATERIAL, CLASS II  
**CULVERT TRENCH DETAIL**  
 NOT TO SCALE

FINAL ROW PLAN REVISIONS		SUBMITTAL DATE:	
NO.	DATE	AUTH	DESCRIPTION



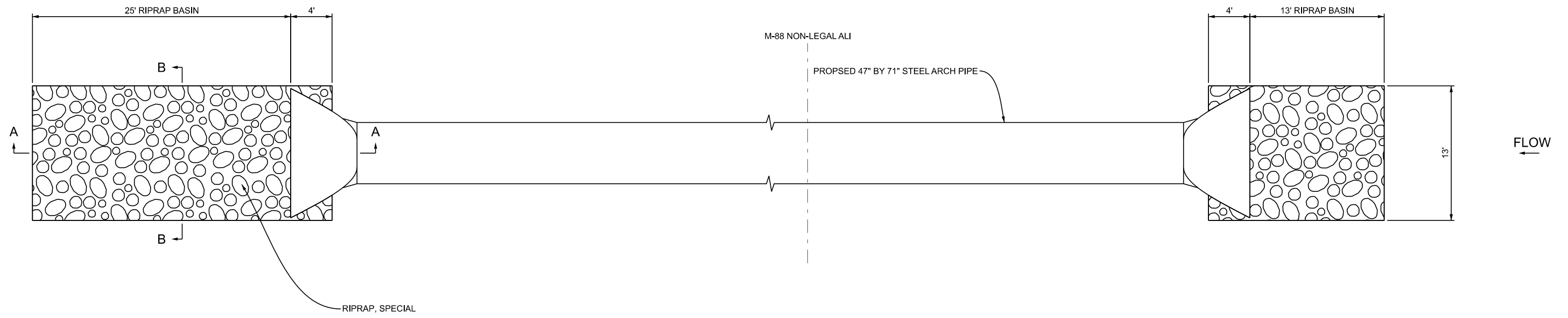
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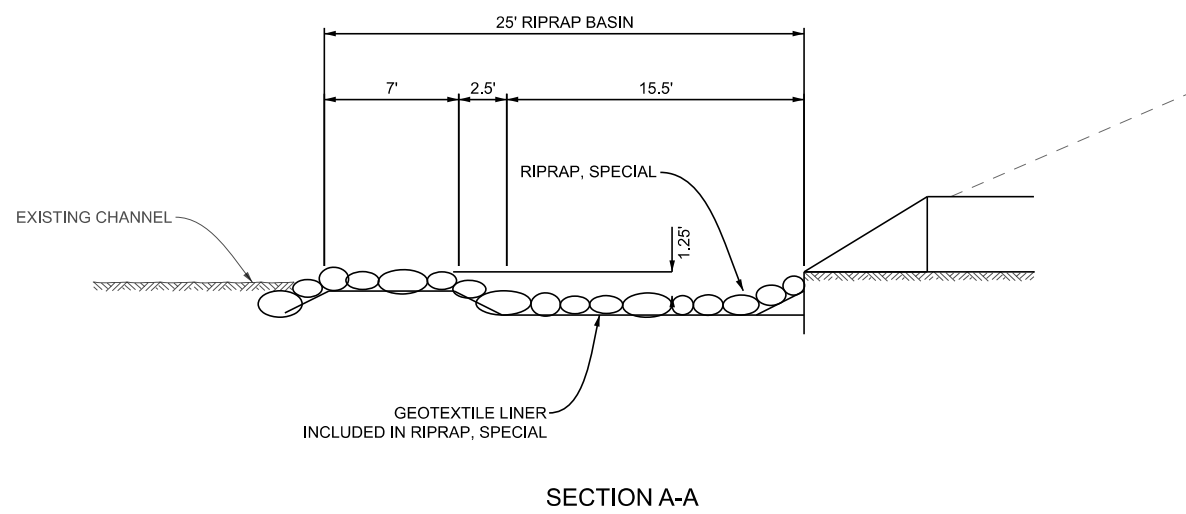
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 JN: 221459

PROPOSED 47" x 71" CULVERT  
 M-88 STA 1080+75  
 GRADING AND TRENCH DETAILS

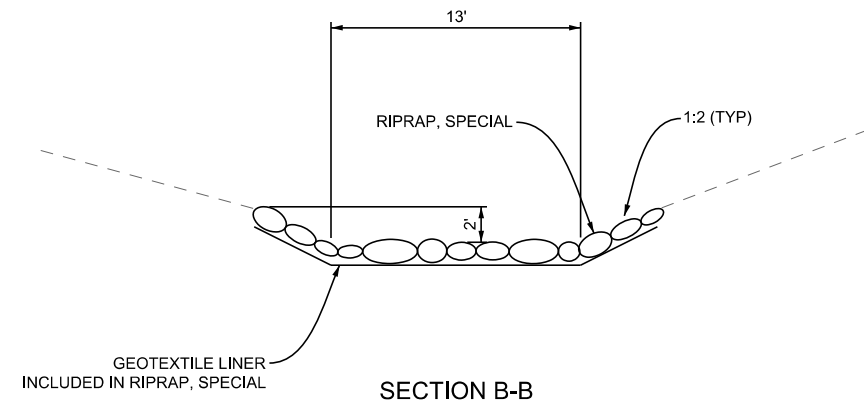
DRAWING SHEET  
 M-88 CULVRT 004  
 SECT 1  
 11



CULVERT PLAN

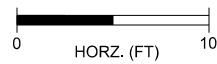


SECTION A-A



SECTION B-B

FINAL ROW PLAN REVISIONS				SUBMITTAL DATE:			
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DATE: 02/05/26	CS: 05031
DESIGN UNIT: MONROE	JN: 221459
TSC: GAYLORD	

PROPOSED 47" x 71" CULVERT		DRAWING	SHEET
RIPRAP DETAILS		M-88	SECT 1
		CULVRT	
		005	12

FILE: 221459\_m88\_culv005.dgn

T31N

T32N

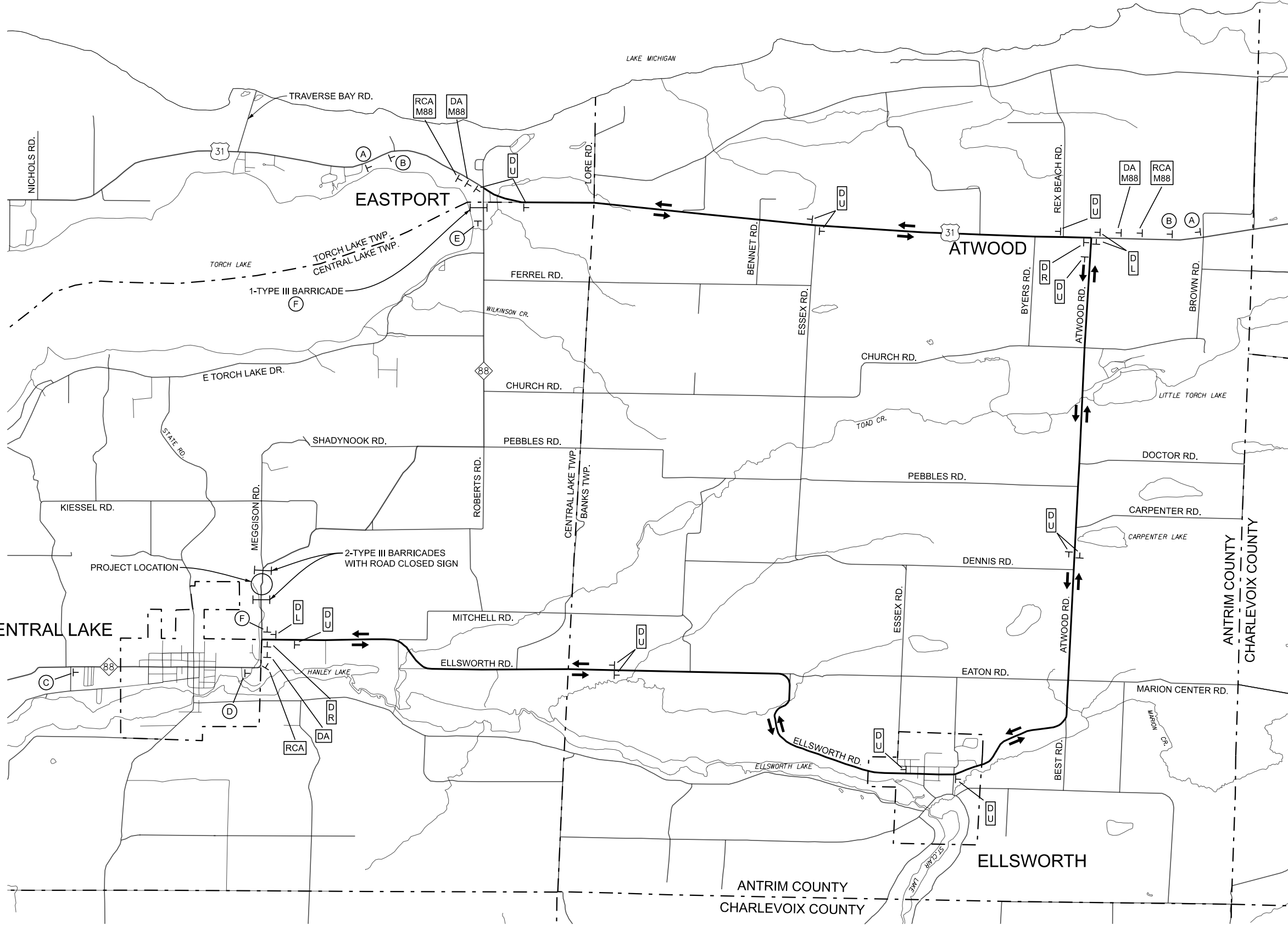
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R9W

R8W

R7W



D/R

D/L

D/U



W20-3



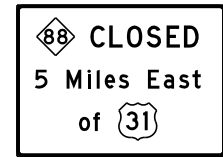
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RCA M88



W20-3

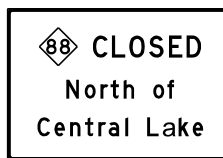
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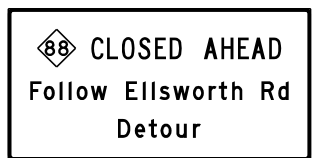
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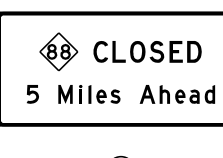
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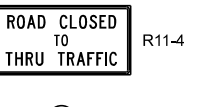
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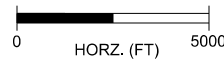


E



F

FINAL ROW PLAN REVISIONS				SUBMITTAL DATE:			
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



FILE: 221459\_m88\_mtdtr001.dgn

DATE: 01/02/26

DESIGN UNIT: MONROE

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CS: 05031

JN: 221459

DETOUR SHEET

DRAWING SHEET

M-88 MTDTR 001 SECT 1 13

