

Clothier Road Structure Replacement over White Creek Drain

Letting Date – February 16<sup>th</sup>, 2023, 08:15am

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

Address: \_\_\_\_\_

\_\_\_\_\_

Sign & Print: \_\_\_\_\_

Date: \_\_\_\_\_

Phone & Fax \_\_\_\_\_

Email: \_\_\_\_\_

- Clothier Road Culvert Over White Creek Drain LSUM Price \$ \_\_\_\_\_  
Koylton Township  
Box Culvert Replacement

**Project Completion Date: October 31<sup>th</sup>, 2023**

**Signed Insurance, Agreement, ROW Permit and bid tab shall be enclosed.**

**Bids are to be submitted on the Road Commission forms in a plainly marked, sealed envelope. No faxed or emailed bids accepted. Plans and specifications are available online at [www.tuscolaroad.org](http://www.tuscolaroad.org). Please contact Brent Dankert, Tuscola County Highway Engineer at 989-233-7472 or [highwayengineer@tuscolaroad.org](mailto:highwayengineer@tuscolaroad.org) with any questions. Any addenda must be noted and initialed.**

**If you are interested in bidding and have downloaded plans from the website please email [highwayengineer@tuscolaroad.org](mailto:highwayengineer@tuscolaroad.org) to be added to the plan holders list to make sure you receive addendums.**

The Contractor has examined the proposal, permits, plans, and the location of the work described here in and is fully informed as to the nature of the work and the conditions relating to its performance.

**General:**

This project includes the removal and replacement of the structure on Clothier Road over The White Creek Drain. The quantities on the plan sheets are estimated quantities and differing quantities will need to be discussed with the engineer before work begins.

The Contractor hereby proposed to furnish all necessary labor, equipment, and materials to complete the work called out and shown on the plan sheets, for the lump sum price listed, herein described in strict accordance with the requirements of the Michigan Department of Transportation 2020 Standard Specifications for Construction (MDOT 2020 SSFC), and/or such other special provisions and supplemental specifications as may be listed or attached to this proposal.

An EGLE Permit has been issued for the project, but a revised permit will be issued prior to construction commencing.

**Construction:**

1. **Work Schedule** - Construction can start within 10 days of award. Contract completion is scheduled for October 31th, 2023, unless arranged with Engineer. Once work begins it must continue until the project is completed. Liquidated damages may be assessed at a rate of \$1,000.00 per day, starting November 1<sup>st</sup>, 2023 per the discretion of the Engineer.
2. **Utility Coordination** - The Contractor is responsible for coordinating all utility relocations as needed. See *attached Utility Coordination* for a list of the contact information for the utilities on site. **Note: Miss Dig must be contacted 72 hours prior to start of work.**

3. **Staking and Material Testing** - The Tuscola County Road Commission will provide construction staking, inspection, and material testing on the project. The contractor shall provide 48 hours advance notice prior to scheduling of the work.
4. **Material Tickets** - Material tickets for concrete, HMA, aggregate, and backfill shall be provided by the contractor to the Tuscola County Road Commission.
5. **Clearing** – Material and work shall meet the requirements of Section 201 of the MDOT 2020 SSFC. The contractor is responsible for all stump removal within the project limits and any minor brush removal necessary. All trees, stumps, brush, and rock removed shall be limited to the right-of-way unless indicated on the plans. Property owners have first choice of claiming wood. Any materials not claimed shall be disposed of at approved locations. The Road Commission shall be given a copy of agreement signed by the property owner accepting the material. Burning will not be allowed within the road right-of-way. All costs are to be included in other items of work.
6. **Culv, Rem, XX inch** – Material and work shall meet requirements of Section 203 of the MDOT 2020 SSFC. The unit price includes all cost to completely remove the culvert, dispose of offside; provide, place and compact necessary backfill of material for a complete removal.
7. **XXXX, Rem** - Materials and work shall meet the requirements of Section 204 of the MDOT 2020 SSFC. The unit price includes all cost to completely remove the indicated item, dispose of offsite; provide, place and compact necessary backfill material for a complete removal.
8. **Earthwork** – Includes Embankment, CIP; Excavation, Channel; Excavation, Earth; Backfill Structure CIP; Excavation, Fnd; All work shall be performed in accordance with Section 205 and 206 of the 2020 MDOT SSFC.
9. **Non-Hazardous Contaminated Material Handling and Disposal, LM** – Shall be completed per section 205 of the 2020 MDOT SSFC. Includes all cost associated to removal, excavation, disposal, storage, trucking and testing of material deemed Non-Hazardous Contaminated by the Engineer. If such materials are encountered all work shall stop immediately and the Engineer shall be notified. Work shall resume once a plan of action has been agreed to between the contractor and the Tuscola County Road Commission. The Plan of Action shall include defined limits, proposed solution, and proposed cost.
10. **Subgrade Undercutting, Type II** - Material and work shall meet the requirements of Section 205 of the MDOT 2020 SSFC and as modified here. Subgrade Undercutting includes the excavation, disposal of the unsuitable material, backfill, and compaction of suitable material as indicated by the Engineer. If such materials are encountered all work shall stop immediately and the Engineer shall be notified. Work shall resume once a plan of action has been agreed to between the contractor and the Tuscola County Road Commission. The Plan of Action shall include defined limits, proposed solution, and proposed cost.

11. **Subbase, CIP** - Material shall meet requirements of Section 902 of the MDOT 2020 SSFC. Subbase, CIP shall be installed in accordance with Section 301 the MDOT 2020 SSFC. The unit price includes all costs for placement, grading, and compacting the material for a complete installation.
12. **Aggregate** - The aggregate used for the items Aggregate Surface Course (section 306), Shoulder, CI II (section 307), Approach CI II (section 307), and Maintenance Gravel (section 306) shall be 23A. Material shall meet requirements of section 902 of MDOT 2020 SSFC. The use of crushed concrete is prohibited within 500 feet of any water course (stream, river, county drain, etc.) and lake, regardless off the application or location of the water course relative to the project limits.
13. **Geotextile Separator** – Material and work shall meet requirements of section 308 of the MDOT 2020 SSFC and as modified here. Material is included in other items of work as shown on plans or as notified by the engineer.
14. **Culv, CI X, XX inch** - Material shall meet requirements of section 909 of MDOT 2020 SSFC and as modified here. All cross culverts underneath the roadway shall be poly coated. All work shall be completed in accordance with section 401. Installation includes the compaction of backfill material.
15. **Drainage Structure XX inch Dia Modified** – Materials and work shall be completed in accordance with Section 403 of MDOT 2020 SSFC and MDOT Standard Plan R-1G and as modified here. Drainage Structure Cover Type E, MDOT Standard Plan R-10-D shall be included in the pay item. All adjustments necessary to bring the cover to final grade shall be included in the pay item.
16. **Underdrain, XXXX, XX inch** - Includes Underdrain, Subbase, XX inch, Underdrain, Subgrade, XX inch, Underdrain Outlet, XX inch, Underdrain Outlet Ending, XX inch. Material and work shall be completed in accordance with Section 404 of the MDOT 2020 SSFC and as modified here. Pay item includes all materials, equipment, and labor for a complete installation.
17. **Precast Box Culvert** - The Precast Box Culvert and culvert bedding shall be constructed in accordance with Section 406 of MDOT 2020 SSFC. The contractor shall make all completed joints watertight as per section 406. The engineer reserves the right to determine that a joint is not watertight, should said joint have visible signs of leakage during any duration of the project after it has been completed. As per section 406, if the joint is not watertight, the contractor is responsible for making the joint watertight at no additional cost to the owner. Shop Drawings need to be submitted and approved prior to order being placed with supplier.
18. **N/A HMA** – Includes all Hand Patching, HMA Approach, and HMA, \_EL, \_EML, \_EMH, and \_EH. The HMA shall be placed in accordance with the plan sheets, section 501 of the MDOT 2020 SSFC, and as modified here. Pay item includes pavement cleaning, tack coat, bag joint removal, sweeping, transportation, hauling, delivering, compaction, materials, equipment, and labor for a complete installation.

19. **Concrete** – Materials shall meet requirements of section 901, 902, 903, and 905 of the MDOT 2020 SSFC. Contractor is to provide a concrete mix design for review and approval prior to use along with a Contractor’s Quality Control Plan in accordance with Division 10 of the MDOT 2020 SSFC. All costs associated to the complete installation of the concrete connections pours are included in the box culvert pay items.
20. **Guardrail** – Includes Post, Mailbox, Guardrail Approach Terminal Type XX, Guardrail Departing Terminal Type XX, Guardrail Post Culv, Guardrail Reflector, Guardrail Curved Type XX inch Post, Guardrail, Type XX inch Post. Materials shall meet requirements of Section 908 of MDOT 2020 SSFC. Guardrail shall be installed per section 807 of MDOT 2020 SSFC and the *attached Special Details*. Pay item includes all materials, equipment, and labor for a complete installation.
21. **N/A Pavement Markings** – All permanent pavement markings shall be completed by the Tuscola County Road Commission.
22. **Riprap, Plain** - The Riprap material shall meet requirements of Section 916 of MDOT 2020 SSFC. The riprap shall be installed in accordance with section 813 of MDOT 2020 SSFC.
23. **Slope Restoration** - Slope Restoration should be completed in accordance with the MDOT 2020 SSFC, the *attached Special Provision*, and as modified here. The contractor is responsible for maintaining/repairing the site until permanent vegetation is established. A retainer of up to 10%, at the Engineer’s discretion, of the project cost will be held until the project has permanent vegetation. The contractor will not be compensated for extra restoration due to staging of material and equipment, those areas shall be repaired at the contractor’s expense.
24. **Permanent Signing** - All permanent sign installation, salvage, and removal shall be coordinated with and completed by the Tuscola County Road Commission. Contractor to provide 48 hours advance notification.
25. **Soil Erosion and Sedimentation Control** – The contractor is responsible for all temporary and permanent control measures such as silt fence, check dams, sediment traps, riprap, temporary slope restoration and dust control to prevent loss of soils from the road right-of-way or into the county drains.
26. **Maintaining Traffic** - Temporary Traffic Control required to close Clothier Road shall be provided by and maintained by the Tuscola County Road Commission. The contractor is required to maintain the barricades to block access to the structure on the weekends and after work is complete every night. The contractor is responsible for the project site and shall provide any additional measures needed to separate the public from the work zone. All costs for maintaining traffic control and any additional devices shall be included in the item minor traffic control devices.

**Payment and Paperwork:**

**Liability:**

The Contractor shall at all times exercise extreme care and shall assume all liability for any damages resulting from his operation and shall hold the Tuscola County Road Commission harmless from any such claims or damages.

The contractor must obtain a Tuscola County Right of Way Permit before any work can begin.

The successful bidder must also furnish certificates for policies giving satisfactory evidence of insurance coverage to the minimum extent of \$500,000.00 property damage and \$1,000,000.00 personal liability to insure adequate payment for any damage caused by his operations.

The Contractor shall, prior to the start of work, file with the Tuscola County Road Commission a certificate that he carries worker's compensation insurance.

**Payment:**

These projects are quoted on a "NOT TO EXCEED" total basis for all work necessary to complete each project. Payment shall be made by the Tuscola County Road Commission upon receipt of site-specific invoice. Invoice shall be accompanied by all necessary material tickets. The lump sum amount bid shall be payment in full for all labor, materials, and equipment needed to accomplish the work.

All invoices **MUST** include TCRC job number and project location.

**NON-COMPLIANCE WITH PROJECT SPECIFICATION PROVISIONS:**

Any variation from the specifications of the project herein without written approval from the Tuscola County Road Commission and/or its authorized representative may result in, at the discretion of the Road Commission, the voiding and/or canceling of the acceptance of any bid and/or contract, resulting from this project.

**The Board reserves the right to accept or reject any or all proposals and to re-advertise or to accept the proposal that, in their opinion, is in the best interest of Tuscola County.**

**Documents Attached:**

- Breakdown of Quantities
- Title IV and VI Compliance
- Agreement
- ROW Permit
- Utility Coordination
- EGEL Permit
- Special Provision – Slope Restoration, Non-Freeway, Modified
- Special Detail – R-60-J, Guardrail Types A, B, BD, T, TD, MGS-8, & MGS-8D
- Special Detail – R-62-H, Guardrail Approach Terminal Type 2M
- Special Detail – R-73-F, Guardrail over Box or Slab Culverts
- Special Detail – 21, Guardrail at Intersections
- Special Provision – 20SP-1003B-01 Concrete Quality Index for Local Agency Projects

**Separate Documents:**

- Plan Sheets 1 of 8

**Clothier Rd. over White Creek Drain  
Culvert Replacement #10627  
Tuscola County, MI**

<b>Item No</b>	<b>Quantity</b>	<b>Unit</b>	<b>Description</b>	<b>Unit Price</b>	<b>Amount</b>
1	1	LSUM	Mobilization, (Max \$60,000)	_____	_____
2	2	EA	Culv Rem, Less Than 24 Inch	_____	_____
3	234	CYD	Embankment, CIP	_____	_____
4	183	CYD	Excavation, Channel	_____	_____
5	503	CYD	Excavation, Earth	_____	_____
6	270	FT	Erosion Control, Silt Fence	_____	_____
7	520	CYD	Subbase, CIP	_____	_____
8	796	SYD	Aggregate Surface Cse, 8 Inch	_____	_____
9	25	TON	Maintenance Gravel	_____	_____
10	20	TON	Approach, CI II	_____	_____
11	24	FT	Culv, CI A, 12 Inch	_____	_____
12	41	FT	Culv, CI A, 18 Inch	_____	_____
13	56	FT	Culv, CI A, 24 Inch	_____	_____
14	1	EA	Dr Structure, 48 inch dia, Modified	_____	_____
15	2	EA	Guardrail Approach Terminal, Type 2M	_____	_____
16	2	EA	Guardrail Departing Terminal, Type MGS	_____	_____
17	8	EA	Guardrail Post, Culv	_____	_____
18	26	EA	Guardrail Reflector	_____	_____
19	1	EA	Post, Mailbox	_____	_____
20	25	FT	Guardrail, Curved, Type MGS-8, 72 inch Post	_____	_____

21	37.5	FT	Guardrail, Curved, Type MGS-8, 108 inch Post	_____	_____
22	275	FT	Guardrail, Type MGS-8, 72 inch Post	_____	_____
23	150	FT	Guardrail, Type MGS-8, 108 inch Post	_____	_____
24	2	EA	Delineator Reflector, Green	_____	_____
25	2	EA	Post, Rigid, Delineator	_____	_____
26	155	SYD	Riprap, Plain	_____	_____
27	950	SYD	_Slope Restoration, Type D, Modified	_____	_____
28	1	LSUM	Structures, Rem	_____	_____
29	885	CYD	Backfill, Structure, CIP	_____	_____
30	993	CYD	Excavation, Fdn	_____	_____
31	40	SYD	Shld, Cl II, 4 inch	_____	_____
32	200	FT	Underdrain, Fdn, 4 inch	_____	_____
33	20	FT	Underdrain Outlet, 4 inch	_____	_____
34	4	EA	Underdrain, Outlet Ending, 4 inch	_____	_____
35	120	CYD	Culv Bedding, Box Culv	_____	_____
36	46	FT	_Culv, Precast Conc Box, 18 Foot by 11 Foot	_____	_____
37	264	Sft	Joint Waterproofing	_____	_____
38	1	LSUM	Minor Traf Devices (Max \$5,000)	_____	_____

**TOTAL**

**Total**

\_\_\_\_\_

## TUSCOLA COUNTY ROAD COMMISSION

### TITLE IV COMPLIANCE

#### APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulations: The contractor shall comply with the Regulations relative to non-discrimination in Federally-assisted programs of the Department of Transportation, Title 49, code of Federal Regulations, Part 21 as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
2. Non-discrimination: The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment.
3. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulation, including employment practices when the contractor covers a program set forth in Appendix B of the Regulations.
4. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to non-discrimination on the grounds of race, color, or national origin.
5. Information and Reports: The contractor shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Tuscola County Road Commission to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses this information, the contractor shall so certify to the State highway department, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.
6. Sanctions for Non-compliance: In the event of the contractor's non-compliance with the non-discrimination provisions of this contract, the Tuscola County Road Commission Shall Impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - a) Withholding of payments to the contractor under the contract until the contractor complies, and/or
  - b) Cancellation, termination, or suspension of the contract, in whole or in part.
7. Incorporation of Provisions: The contractor shall Include the provisions of paragraphs (1) through (6) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives Issues pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Tuscola County Road Commission may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that, in the event u contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Tuscola County Road Commission to enter into such litigation to protect the interests of the County, and, in addition, the contractor may request the State highway department to enter into such litigation to protect the interests of the State and/or the United States to enter into such litigation to protect the interests of the United States.

"The TUSCOLA COUNTY ROAD COMMISSION, in accordance with Title VI of the Civil Rights Act of 1964, 78-252, 42 U.S.C. 2000d-222d-4, the Civil Rights Act of 1987, P.L. 100-259, and Title 49, Code of Federal Regulations, Department of Transportation, subtitle A, Office of the Secretary, Part 21, Non- discrimination in federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, Disadvantaged Business Enterprise firms will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of Race, Color, Sex, Age, National Origin, or Handicap in consideration for an award. For additional compliance information, please see Appendix A."

**AGREEMENT**

TUSCOLA COUNTY ROAD COMMISSION – 1733 S. MERTZ ROAD, CARO, MI 48723  
PAGE 1 OF 1

This agreement made this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_  
by and between the Board of Tuscola County Road Commissioners and \_\_\_\_\_  
\_\_\_\_\_.

1. \_\_\_\_\_ hereby agrees to undertake the following work  
in the status of an independent contractor performing the following job:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_.

2. Said contractor, \_\_\_\_\_, shall at all  
times exercise extreme care and shall assume any and all liability for property damage or bodily  
injury resulting from the above operation by this employees, agents, assigns, sub-contractors  
and anyone else acting under his control or direction; and will indemnify, hold harmless and  
defend the Tuscola County Road Commission, its Commissioners or employees from any and all  
claims for property damage or bodily injury arising out of this Agreement.

3. Said contractor, \_\_\_\_\_, while  
engaged in said job shall maintain and furnish certificates of insurance, naming the Tuscola  
County Road Commission and Commissioners as an additional insured under the policy, with  
policy limits of \$500,000/\$1,000,000 for property damage and bodily injury, and shall furnish  
the Tuscola County Road Commission copies of said certificates of insurance prior to  
commencing any work on said project.

Additionally, said contractor, \_\_\_\_\_, shall furnish  
prior to start of said job with the Board of Tuscola County Road Commissioners, a policy of  
insurance certifying he carries and has in effect worker's compensation insurance on all those  
required to be covered under Michigan law.

4. The address of the Board of Tuscola County Road Commissioners is 1733 S, Mertz Rd., Caro, MI  
48723.

Witnessed:

\_\_\_\_\_  
Board of Tuscola County Road Commissioners

\_\_\_\_\_  
Contractor

**Contractor bid will not be accepted unless the enclosed Agreement is Signed and Returned with you bid.**

TUSCOLA COUNTY ROAD COMMISSION

Right - of - Way Permit Worksheet

DATE: \_\_\_\_\_

Applicant/Property Owner:

Contractor:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Applicant Signature

Contractor Signature

Phone: \_\_\_\_\_

Phone: \_\_\_\_\_

Project Locations:

\_\_\_\_\_  
\_\_\_\_\_

BETWEEN

DISTANCE FROM

\_\_\_\_\_  
\_\_\_\_\_

Township: \_\_\_\_\_

Section: \_\_\_\_\_

TYPE OF WORK:

Driveway: Residential \_\_\_\_\_ Farm \_\_\_\_\_ Commercial \_\_\_\_\_

Special Use: Utility \_\_\_\_\_ Type \_\_\_\_\_

Misc.: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

REVIEWER'S RECOMMENDATIONS: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Reviewer's Signature: \_\_\_\_\_

Flagged: \_\_\_\_\_

**NOTICE TO BIDDERS  
UTILITY COORDINATION**

CON:SGI

1 of 1

1/30/23

The contractor shall cooperate and coordinate construction activities with the owners of utilities as stated in Section 104.08 of the 2020 Michigan Department of Transportation (MDOT) Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the 2020 MDOT Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Section 108.09 of the 2020 MDOT Standard Specifications for Construction.

The following utilities have facilities located within the right-of-way.

<b>UTILITY</b>	<b>OWNER</b>	<b>CONTACT</b>
Owner	Tuscola County Road Commission 1766 Mertz Rd. Caro, MI 48723	Brent Dankert, P.E. (989) 751-3873
Drain	Tuscola County Drain Commission 125 W. Lincoln St. Caro, MI 48723	Bob Mantey (989) 672-3820
Electric	DTE Energy 4100 Doerr Rd. Cass City, MI 48726	Lisa Gremel (989) 670-4460 Lisa.Gremel@dteenergy.com
Gas	Consumers Energy 2400 Weiss St Saginaw, MI 48602	Benjamin Lewis (517) 581-1424 Benjamin.Lewis@cmsenergy.com
Cable/Fiber	Frontier Communications 303 S. Main St. Mt. Pleasant, MI 48858	Doug Hovey (989) 463-5497

For protection of underground utilities and in conformance with Public Act 53, the Contractor shall dial 1-800-482-7171 a minimum of three full working days, excluding Saturdays, Sundays and holidays, prior to excavating. Members will thus be routinely notified. This does not relieve the Contractor of the responsibility of notifying utility owners who may not be a part of the "Miss Dig" alert system.

The Contractor shall coordinate proposed work schedule with all affected utilities prior to starting work to ensure those utilities requiring temporary relocation will not affect the contractor's operations.

The Contractor shall coordinate with the utility owner in order to locate any affected utilities.

Emergency utility repairs may occur. The Contractor will be required to coordinate and schedule his work in conjunction with said utility improvements.

The owners of existing service facilities that are within grading or structure limits will move them to locations designated by the Engineer or will remove them entirely from the highway Right-of-Way as shown on the plans. Owners of Public Utilities will not be required by the County/City to move additional poles or structures in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structure constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operations. The Contractor is responsible for verifying utility requirements with the utility.



## NOTICE OF AUTHORIZATION

**Permit Number: WRP035193 v. 1**  
**Site Name: 79 - Clothier Road over White Creek**

**Date Issued: October 17, 2022**  
**Expiration Date: October 17, 2027**

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.
- Part 315, Dam Safety.
- Part 323, Shorelands Protection and Management.
- Part 325, Great Lakes Submerged Lands.
- Part 353, Sand Dunes Protection and Management.

### Authorized activity:

**At the Clothier Road crossing over White Creek, remove the existing dual culverts and install an 18.0 foot-span by 11.0-foot rise by 46.0-foot-long concrete box culvert recessed 2.0 feet below the ordinary high-water mark, excavate 309 cubic yards of material and place 85.0 cubic yards of fill for slope and bank restoration and 0.3 cubic yards of riprap for bank stabilization. Excavate 54.0 cubic yards of material and place 218 cubic yards of fill and 47.85 cubic yards of riprap in the floodplain. Work also includes installation of a 24-inch diameter by 24-foot-long corrugated metal pipe culvert to convey flow from the existing roadside ditch to the streambank in the northeast stream quadrant.**

To be conducted at property located in: Tuscola County, Waterbody: White Creek  
Section 14, Town 11N, Range 11E, Koylton Township

Permittee:  
Brent Dankert  
Tuscola County Road Commission  
1733 Mertz Road  
Caro, Michigan 48723

Issued By:  for Mike Prysby  
James Watling, P.E.  
Transportation Review Unit  
Water Resources Division  
517-599-9002

*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-WRD**  
**WRP035193 v1.0**  
**Approved**  
**Issued On:10/17/2022**  
**Expires On:10/17/2027**



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

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**Issued To:**

**Brent Dankert  
Tuscola County Road Commission  
1733 Mertz Road  
Caro, Michigan 48723**

Permit No: WRP035193 v.1  
Submission No.: HPJ-FKDZ-47JM6  
Site Name: 79 - Clothier Road over White Creek  
Issued: October 17, 2022  
Revised:  
Expires: October 17, 2027

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

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

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:**

**At the Clothier Road crossing over White Creek, remove the existing dual culverts and install an 18.0 foot-span by 11.0-foot rise by 46.0-foot-long concrete box culvert recessed 2.0 feet below the ordinary high-water mark, excavate 309 cubic yards of material and place 85.0 cubic yards of fill for slope and bank restoration and 0.3 cubic yards of riprap for bank stabilization. Excavate 54.0 cubic yards of material and place 218 cubic yards of fill and 47.85 cubic yards of riprap in the floodplain. Work also includes installation of a 24-inch diameter by 24-foot-long corrugated metal pipe culvert to convey flow from the existing roadside ditch to the streambank in the northeast stream quadrant.**

Waterbody Affected: White Creek

Property Location: Tuscola County, Koylton Township, Town/Range/Section 11N11E14,

**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 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 (MDNR), Fisheries Division.
- Y. Work to be done under authority of this permit is further subject to the following special instructions and specifications:
1. 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.

2. The authority to conduct the activity as authorized by this permit is granted solely under the provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, state, or federal approval or authorization necessary to conduct the activity.
3. No fill, excess soil, or other material shall be placed in any wetland, floodplain, or surface water area not specifically authorized by this permit, its plans, and specifications.
4. This permit does not authorize or sanction work that has been completed in violation of applicable federal, state, or local statutes.
5. The 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.
6. 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 EGLE, will be for a five-year period beginning on the date of issuance. If the project is not completed by the expiration date, a new permit must be sought.
7. All work shall be completed in accordance with plans attached and kept on file with EGLE, WRD, Transportation Review Unit.
8. 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.
9. 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.
10. 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.

11. 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 20th for the Upper Peninsula, October 1st for the Lower Peninsula north of US-10, and October 10th for the Lower Peninsula south of US-10.
12. 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.
13. All ripraps 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, contaminants, and other foreign material may be used.
14. 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.
15. 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.
16. All cofferdam and temporary steel sheet pile shall then be removed in its entirety, unless specifically shown to be left in place 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 foot below the stream bottom.
17. The existing structure shall be kept open to pass flow during removal of the existing road fill.
18. The construction sequence shall be conducted in a manner that minimizes erosion and discharge of sediment. The fill material used shall be washed gravel, coarse aggregate, or rock below normal water level.
19. 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.

20. Road fill side slopes shall not be steeper than 1-on-2 (1 vertical to 2 horizontal) except where headwalls of reinforced concrete, mortar masonry, dry masonry, or other acceptable methods are used.
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. 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.
24. 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.
25. No work shall be done in the stream during periods of above-normal flows except as necessary to prevent erosion.
26. No instream work authorized by this permit is allowed from May 1st to June 30th due to critical spawning and migration periods.
27. Any alterations to the existing road grade elevations other than that shown on the plans will require prior approval from the WRD.
28. **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.**

**29. Stormwater shall not directly outlet to the stream.**

Issued By:  for Mike Prysby  
 James Watling, P.E.  
 Transportation Review Unit  
 Water Resources Division  
 517-599-9002

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

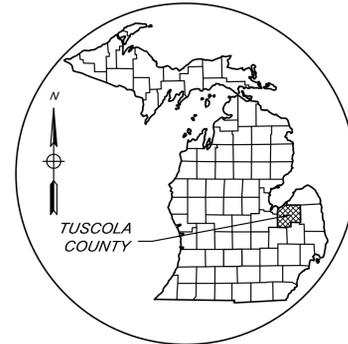
I hereby assure that I have read, am familiar with, and agree to adhere to the terms and conditions of this permit.

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

\_\_\_\_\_  
 Date

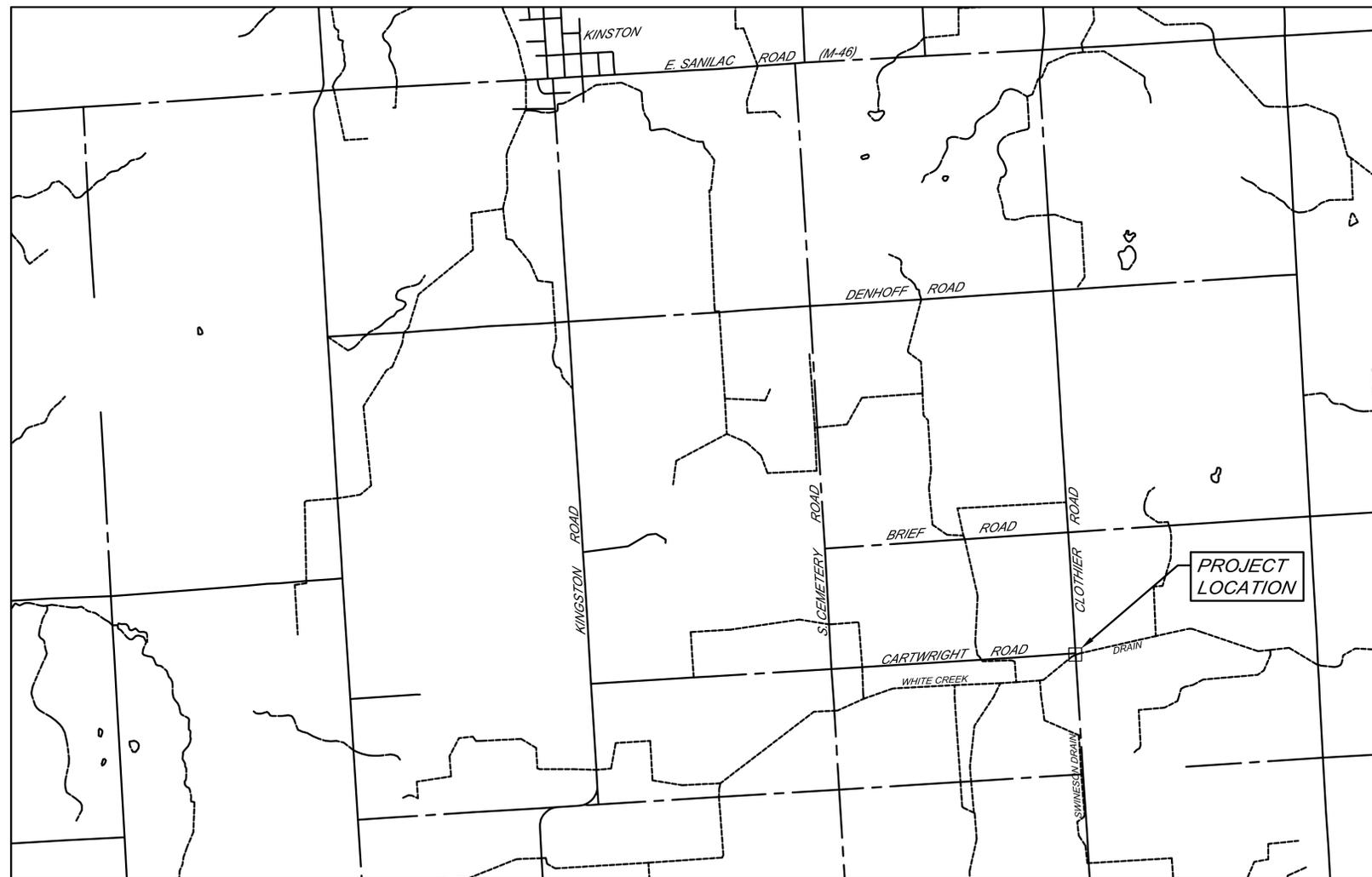
cc: Koylton Township Clerk  
 Tuscola County Drain Commissioner  
 Tuscola County CEA  
 Joseph Robison, MDNR  
 Jeff Jolley, MDNR

# CLOTHIER ROAD CROSSING REPLACEMENT WHITE CREEK DRAIN TUSCOLA COUNTY ROAD COMMISSION

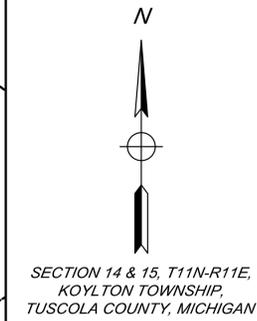


AREA MAP  
NOT TO SCALE

PLAN INDEX		
FILE NO.	DESCRIPTION	NO.
DR-4274-01	COVER SHEET	1
DR-4274-02	CONTACTS, GENERAL NOTES, LINE TYPE LEGEND, AND SESC MEASURE LEGEND	2
DR-4274-03	SOIL EROSION AND SEDIMENTATION CONTROL PLAN	3
DR-4274-04	CLOTHIER ROAD CROSS SECTIONS	4
DR-4274-05	PLAN VIEW	5
DR-4274-06	PROFILE VIEW	6
DR-4274-07	WINGWALL/HEADWALL DETAILS AND STANDARD DETAILS	7
DR-4274-08	GUARDRAIL DETAILS	8



LOCATION MAP  
NOT TO SCALE



BY	MARK	REVISIONS	DATE
THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREON IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.			
<b>CLOTHIER ROAD CROSSING REPLACEMENT TUSCOLA COUNTY, MICHIGAN</b>			
<b>COVER SHEET</b>			
		SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel: 989-754-4717 Fax: 989-754-4440 www.SpicerGroup.com	
DE. BY:	MITS/DPZ	CH. BY:	PROJECT NO.
DR. BY:	MITS	APP. BY:	132095SG2022
STDS.		SHEET 01 OF 08	<b>DR</b>
DATE	JULY, 2022	FILE NO.	<b>01</b>
SCALE	AS SHOWN	DR-4274-01	

**GENERAL NOTES**

NO WORK SHALL BE PERFORMED BEFORE 7:00 AM OR AFTER 7:00 PM MONDAY THROUGH SATURDAY. NO WORK SHALL HAPPEN ON SUNDAYS OR HOLIDAYS, UNLESS AUTHORIZED BY THE OWNER.

CONTRACTOR SHALL NOTIFY ENGINEER 48 HOURS PRIOR TO START OF CONSTRUCTION, CONSTRUCTION STAKING AND INSPECTION.

CONTRACTOR SHALL MAINTAIN ACCESS FOR MAIL DELIVERY AND GARBAGE PICKUP AT ALL PARCELS. IF THESE SERVICES CANNOT BE PERFORMED, CONTRACTOR IS RESPONSIBLE FOR TAKING THE NECESSARY MEASURES TO CARRY THEM OUT.

COORDINATE DRIVE CLOSURES AND MAIL BOX RELOCATION WITH LANDOWNERS A MINIMUM OF ONE DAY IN ADVANCE.

CONTRACTOR TO PROVIDE DUST CONTROL AND SWEEP ROADS DAILY.

ALL EXCAVATED MATERIAL NOT TO BE REUSED OR DISPOSED OF ON SITE SHALL BE REMOVED FROM SITE. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSING OF MATERIALS ACCORDING TO LOCAL AND STATE REQUIREMENTS.

**UNDERGROUND UTILITIES/MISS DIG**

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174, 2013, THE CONTRACTOR SHALL DIAL 1-800-482-7171 OR 811 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS, PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

THE EXISTING UTILITIES ON THESE DRAWINGS HAVE BEEN SHOWN ACCORDING TO THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION AND SHALL NOTIFY THE ENGINEER AS TO WHERE POSSIBLE CONFLICT EXISTS.

ALL CONSTRUCTION UNDER EXISTING UTILITIES, INCLUDING HOUSE SERVICES, SHALL BE COMPLETELY BACKFILLED WITH SAND, IN 12" LAYERS, AND COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM UNIT WEIGHT.

ANY UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE SUPPORTED, PER THE SPECIFICATIONS OF THE INDIVIDUAL UTILITY COMPANY CLAIMING OWNERSHIP OF THE UTILITY.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES APPROPRIATE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTH-DISTURBING ACTIVITIES. PLACE TURF ESTABLISHMENT ITEMS AS SOON AS POSSIBLE ON POTENTIAL ERODABLE SLOPES AS DIRECTED BY OWNER. CRITICAL DITCH GRADES SHALL BE PROTECTED WITH EITHER SOD, SEED/MULCH, OR SEED/MULCH BLANKET AS DIRECTED BY OWNER.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ARE IN PLACE AND MAINTAINED UNTIL THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MEASURES SHALL ONLY BE PAID FOR ONCE.

ALL CATCHBASINS AND SEDIMENTATION TRAPS/BASINS SHALL BE CLEANED OUT UPON COMPLETION OF THE PROJECT.

CONTRACTOR SHALL CONFORM TO SOIL EROSION AND SEDIMENTATION CONTROL ACT, PART 91 OF ACT 451 OF 1994.

PROPERTY OWNERS' NAMES, WHERE SHOWN, ARE FOR INFORMATION ONLY, AND THEIR ACCURACY IS NOT GUARANTEED.

**ADJUSTING MONUMENT BOXES**

ALL GOVERNMENT CORNERS ON THIS PROJECT SHALL BE PRESERVED, WHETHER SHOWN OR NOT. IT MAY BE NECESSARY TO PLACE OR ADJUST MONUMENT BOXES, AS REQUIRED.

**TRAFFIC**

THE CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC AT ALL TIMES. SIGNAGE MUST BE IN ACCORDANCE WITH THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SHALL BE COORDINATED WITH THE ENGINEER AND GOVERNING ROAD AGENCY. PERMITS MAY BE REQUIRED.

**PERMITS**

PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED BY THE APPROPRIATE AGENCIES.

CONSTRUCTION PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF THE APPROPRIATE AGENCIES.

**CONTACTS**

BRENT J. DANKERT P.E. TUSCOLA COUNTY ROAD COMMISSION 1733 MERTZ ROAD CARO, MI 48723 (989) 751-3873	OWNER
BOB MANTEY TUSCOLA COUNTY DRAIN COMMISSION 125 W. LINCOLN ST. CARO, MI 48723 (989) 672-3820	DRAIN
DANIEL ZEDDIES P.E. SPICER GROUP, INC. 230 S. WASHINGTON AVENUE SAGINAW, MI 48605 (989) 245-1468	ENGINEER
SARA FORCE DTE ENERGY SARA.FORCE@DTEENERGY.COM (586) 994-1204	ELECTRIC
JOE RODEA CONSUMERS ENERGY 2400 WEISS ST SAGINAW, MI 48602 (989) 791-5669	GAS
DOUG HOVEY FRONTIER COMMUNICATIONS 303 S. MAIN ST MT. PLEASANT, MI 48858 (989) 463-5497	CABLE/FIBER

**GENERAL NOTES CONT.**

ALL WORK SHALL BE CONFINED TO THE RIGHT-OF-WAY OR CONSTRUCTION LIMITS SHOWN ON THE PLANS. ANY WORK OUTSIDE OF THESE LIMITS SHALL BE AGREED TO BY THE CONTRACTOR AND THE LANDOWNER IN WRITING.

RESTORE ALL LAWN AREAS PER SPECIFICATIONS AND PLANS.

CONTRACTOR TO RESTORE INCIDENTAL DAMAGES ON THE PROJECT AS DIRECTED BY OWNER AND ENGINEER AT THE CONTRACTOR'S EXPENSE.

ALL DRAIN SIDE SLOPES SHALL BE 2H:1V OR FLATTER, UNLESS SPECIFIED OTHERWISE.

THE WORDS "RIGHT SIDE" OR "LEFT SIDE" IMPLY A REFERENCE TO THE DRAIN FACING UPSTREAM.

REMOVE EXISTING FENCES, LANDSCAPING, AND OTHER STRUCTURES IN RIGHT-OF-WAY OR CONSTRUCTION LIMITS AS-NEEDED FOR CONSTRUCTION. COST TO BE INCLUDED IN SITE CLEARING.

REINSTALLATION OF FENCES MUST BE COORDINATED WITH THE LAND OWNER AT THE LAND OWNER'S EXPENSE, UNLESS STATED OTHERWISE IN THE PLANS.

ALL SPRINKLER SYSTEMS DAMAGED SHALL BE REPAIRED BY CONTRACTOR. COST OF THE PAY ITEM BEING INSTALLED, UNLESS OTHERWISE NOTED.

CONTRACTOR TO CLEAR TREES WITHIN THE RIGHT-OF-WAY OR CONSTRUCTION LIMITS AS NECESSARY TO CONSTRUCT PROJECT AND LEVEL SPOILS AS SHOWN IN DETAILS. COORDINATE REMOVALS WITH THE ENGINEER/LANDOWNER.

ROADS, DRIVEWAYS AND SIDEWALKS ALL JOINTS AT INTERSECTION APPROACHES AND DRIVEWAYS SHALL BE SAW-CUT WITH BUTT-JOINTS.

FOR OPEN CUT PAVEMENT REMOVAL, CONTRACTOR SHALL SAW CUT THE EXISTING PAVEMENT FULL DEPTH PRIOR TO REMOVAL.

ALL DRIVING SURFACES ARE TO BE RESTORED TO IN-KIND DEPTH AND MATERIAL, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROTECT ALL ROADS NOT SPECIFIED TO BE REMOVED DURING CONSTRUCTION. REPAIR ANY UNAUTHORIZED DAMAGE AT CONTRACTOR'S EXPENSE.

BROKEN CONCRETE AND DEBRIS SHALL BE CONSIDERED WASTE AND SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE. COST SHALL BE INCLUDED IN THE OTHER PAY ITEMS OF THE PROJECT.

MATCH EXISTING TYPE FOR CONCRETE CURB AND GUTTER RESTORATION.

CONTRACTOR SHALL REMOVE AND REPLACE ALL STREET AND TRAFFIC SIGNAGE AS NECESSARY FOR CONSTRUCTION. ALL COST SHALL BE INCLUDED IN THE BID PRICE FOR SITE CLEARING.

CONTRACTOR SHALL COORDINATE LOCATION OF ANY ACCESS ROADS WITH THE LANDOWNER AND THE ENGINEER. ANY ACCESS ROAD SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.

ALL WORK WITHIN THE ROAD RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND GENERAL SPECIFICATIONS OF THE AGENCY WITH JURISDICTION OVER THE ROAD.

**MAIL BOXES**

CONTRACTOR SHALL REMOVE AND TEMPORARILY RELOCATE ALL EXISTING MAIL BOXES AS NEEDED FOR CONSTRUCTION. COSTS TO BE INCLUDED IN THE UNIT PRICE BID FOR SITE CLEARING.

ALL TEMPORARILY RELOCATED MAIL BOXES, STREET AND TRAFFIC SIGNS TO BE REINSTALLED TO ORIGINAL LOCATIONS AS CONSTRUCTION ALLOWS. COSTS TO BE INCLUDED IN THE UNIT PRICE BID FOR CLEANUP AND RESTORATION.

**UTILITIES**

UTILITIES LOCATED IN THE ROAD AND DRAIN RIGHTS-OF-WAY WILL BE RELOCATED BY OTHERS, UNLESS OTHERWISE NOTED ON THE PLANS.

THE DRAIN COMMISSIONER'S MINIMUM CLEARANCE STANDARDS SHALL BE MET WHENEVER RELOCATING EXISTING UTILITIES WITHIN THE DRAIN RIGHT-OF-WAY.

ALL WATER VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADE. COST SHALL BE INCLUDED IN THE PAY ITEM BEING INSTALLED.

ANY UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

ALL MANHOLE RIMS IN ROADWAYS AND DRIVES SHALL BE ADJUSTED PRIOR TO FINAL PAVING TO BE FLUSH WITH FINISHED GRADE.

GRADING AROUND MANHOLES/CATCHBASINS, FLARED END SECTIONS, AND OTHER INLETS SHALL BE SMOOTH AND SHAPED TO PROVIDE POSITIVE DRAINAGE INTO THE INLETS.

DEMOLISH EXISTING STRUCTURE(S) AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. COST TO BE INCLUDED WITH THE ITEM BEING INSTALLED AS DIRECTED BY OWNER/ENGINEER.

CONTRACTOR SHALL CONNECT ANY AND ALL FIELD TILE OUTLETS AND OTHER STORM LEADS TO PROPOSED STORM SEWER WITH PREMANUFACTURED TEES, WYES, GASKETS, SEALS, COUPLERS, BOOTS, ETC. PER SPECIFICATIONS.

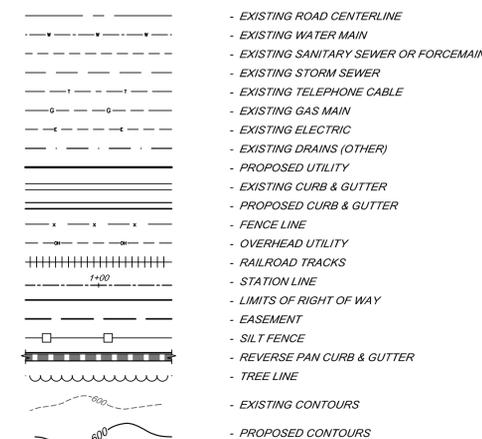
SOIL EROSION SEDIMENT CONTROL ALL RIPRAP MATERIAL SHALL BE APPROVED BY THE ENGINEER. OWNER AND ENGINEER RESERVES THE RIGHT TO REJECT ANY AND ALL RIPRAP.

CONTRACTOR SHALL FINISH GRADE, SEED, FERTILIZE, AND MULCH DAILY ON ALL DISTURBED AREAS AS DESCRIBED IN THE SPECIFICATIONS.

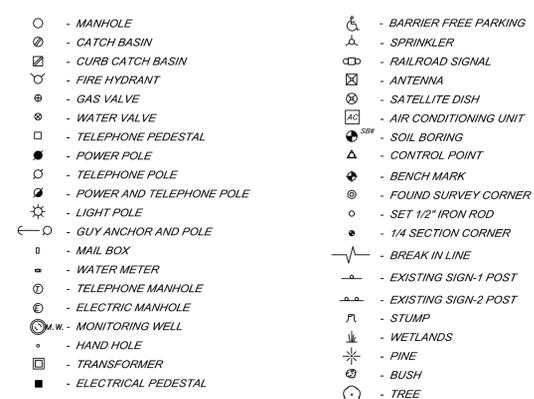
**ABBREVIATIONS**

- BC = BACK OF CURB
- BM = BENCH MARK
- CB = CATCH BASIN
- C/C = CENTER TO CENTER
- CJ = CONSTRUCTION JOINT
- CL = CENTERLINE
- CMP = CORRUGATED METAL PIPE
- CONC = CONCRETE
- CORR = CORRUGATED
- CSP = CORRUGATED STEEL PIPE
- DI = DUCTILE IRON PIPE
- EF = EACH FACE
- ELEC = ELECTRIC
- EL OR ELEV = ELEVATION
- EOM = EDGE OF METAL
- EOP = EDGE OF PAVEMENT
- EQ/SP = EQUALLY SPACED
- ESMT = EASEMENT
- EW = EACH WAY
- EX OR EXIST = EXISTING
- FES = FLARED END SECTION
- FF = FINISH FLOOR
- FG = FINISH GROUND
- FL = FLOW LINE
- FS = FINISH SURFACE
- FT = FEET
- GALV = GALVANIZED
- G = GUTTER
- GA = GAUGE
- HDC = HOT DIP GALVANIZED
- HDPE = HIGH DENSITY POLYETHYLENE
- HMA = HOT MIX ASPHALT
- HOR = HORIZONTAL
- HP = HIGH POINT
- HYD = HYDRANT
- INV = INVERT
- LP = LOW POINT
- OC = ON CENTER
- OH = OVERHEAD
- MH = MANHOLE
- MIN = MINIMUM
- MON = MONUMENT
- NFL = NOT FIELD LOCATED
- NTS = NOT TO SCALE
- PROP = PROPOSED
- PVC = POLYVINYL CHLORIDE
- RCP = REINFORCED CONCRETE PIPE
- ROW = RIGHT OF WAY
- SAN = SANITARY
- SB = SOIL BORING
- SS = STAINLESS STEEL
- STA = STATION
- STM = STORM
- SWR = SEWER
- T/B = TOP AND BOTTOM
- TC = TOP OF CURB
- TOB = TOP OF BANK
- TOS = TOE OF SLOPE
- TELE = TELEPHONE
- TRW = TOP OF RETAINING WALL
- TW = TOP OF WALK
- UG = UNDERGROUND
- UNO = UNLESS NOTED OTHERWISE
- VERT = VERTICAL
- WM = WATER MAIN
- WSEL = WATER SURFACE ELEVATION

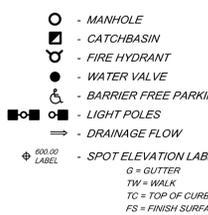
**LINE TYPE LEGEND**



**SYMBOL LEGEND EXISTING SYMBOLS**



**PROPOSED SYMBOLS**



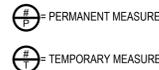
PROJECT DATUM			
HORIZONTAL:	STATE PLANE SOUTH MI 83 2113		
VERTICAL:	NORTH AMERICAN VERTICAL DATUM 88		
BY	MARK	REVISIONS	DATE
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<b>CLOTHIER ROAD CROSSING REPLACEMENT TUSCOLA COUNTY, MICHIGAN</b>			
<b>CONTACTS, GENERAL NOTES, LINE TYPE LEGEND, AND SESC MEASURE LEGEND</b>			
		<small>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel 989-754-4717 Fax 989-754-4440 www.SpicerGroup.com</small>	
DE. BY:	MTS/DPZ	CH. BY:	PROJECT NO.
DR. BY:	MTS	APP. BY:	132095SG2022
STDS.	SHEET 02 OF 08	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>DR</b> 02                 </div>	
DATE	JULY, 2022		
SCALE	NOT TO SCALE	FILE NO.	DR-4274-02

MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS  
SOIL EROSION AND SEDIMENTATION CONTROL KEYING SYSTEM

KEY	SESC MEASURE	SYMBOL	WHERE USED
1	Seeding		When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
2	Mulch		On flat areas, slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles when areas are subject to raindrop impact, and erosive forces from wind or water.
15	Riprap		Riprap and toe of slope protection is used in areas where velocities are causing drain bank erosion and are too high to stabilize using other methods.
16	Riprap Toe of Slope		Along drain banks, shorelines, or where concentrated flows occur, slows velocity, reduces erosion and sediment load.
A	Debris Removal		
B	Sediment Removal		
D	Drain Crossing Maintenance		

DETAILED DRAWINGS AND SPECIFICATIONS ARE LOCATED IN THE MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS SOIL EROSION AND SEDIMENTATION CONTROL AUTHORIZED PUBLIC AGENCY PROCEDURES MANUAL.

SYMBOLGY FOR INSERTION INTO CONSTRUCTION DRAWINGS:



**GENERAL TIMING & SEQUENCE**

ALL PROPOSED CHANNEL EXCAVATION ACTIVITIES FOR THIS PROJECT MUST ADHERE TO THE FOLLOWING SEQUENCE.

- CONTRACTOR MUST CLEAR THE DRAIN CHANNEL AND RIGHT-OF-WAY AS NOTED PLANS. THIS INCLUDES ALL DEBRIS AND STUMP REMOVAL AS NOTED ON PLANS. CONTRACTOR MUST VERIFY WITH ENGINEER THAT CLEARING REQUIREMENTS HAVE BEEN MET PRIOR TO MOVING FORWARD WITH EXCAVATION.
- DRAIN EXCAVATION STAKES WILL BE PLACED FOLLOWING APPROVAL OF SITE CLEARING.
- CONTRACTOR IS TO PERFORM PROPOSED EXCAVATION ACTIVITIES REQUIRED TO OBTAIN PROPOSED GRADES AND SIDE SLOPES AS DESIGNATED ON PLANS.
- CONTRACTOR MUST PERFORM DAILY RAKING, SEEDING, AND MULCHING OF DRAIN BANKS AND SPOILS.
- ENGINEER WILL STAKE ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES ALONG PORTIONS OF DRAIN THAT HAVE BEEN EXCAVATED DURING ROUTINE INSPECTIONS.
- CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING SOIL EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE ENTIRE PROJECT.
- FINAL PAYMENT WILL BE MADE ONCE ALL DRAIN BANKS, SPOILS, AND DISTURBED AREAS HAVE ESTABLISHED VEGETATION GROWING. ALL LAWN AREAS MUST BE RESTORED TO IN KIND CONDITIONS PRIOR TO FINAL PAYMENT.

GENERAL TIMING & SEQUENCE
INSTALL TEMPORARY CONTROL MEASURES
SITE CLEARING
UPDATE PER CONSTRUCTION TYPE <i>example: (OPEN CHANNEL CONSTRUCTION)</i>
RESTORATION
INSTALL AND ESTABLISH PERMANENT CONTROL MEASURES
REMOVE TEMPORARY CONTROL MEASURES

**MAINTENANCE PROGRAM FOR SESC MEASURES**

GENERAL MAINTENANCE

- CONTRACTOR SHALL MAINTAIN ALL PERMANENT SESC MEASURES FOR A PERIOD OF 1 YEAR FOLLOWING THEIR INSTALLATION.
- TEMPORARY SESC MEASURES MUST BE INSTALLED, MAINTAINED, AND REMOVED BY THE CONTRACTOR.
- TEMPORARY MEASURES MUST BE MAINTAINED AND IN PLACE UNTIL AREAS ARE PERMANENTLY STABILIZED.
- PERMANENT MEASURES MUST BE INSTALLED AND MAINTAINED BY THE CONTRACTOR UNTIL FINAL COMPLETION.
- DAILY MAINTENANCE IS THE CONTRACTOR'S RESPONSIBILITY.
- TEMPORARY SESC MEASURES MUST BE REMOVED AT THE END OF THE PROJECT ONCE PERMANENT MEASURES ARE ESTABLISHED.
- TEMPORARY SESC MEASURES MUST BE INSTALLED PRIOR TO OR AT THE TIME OF EARTH DISTURBANCE.
- INSPECT WEEKLY AND AFTER EACH RAIN EVENT UNTIL VEGETATION HAS BEEN ESTABLISHED.
- IF NECESSARY, REPAIR AND RE-SEED OR REPLANT ERODED AREAS IMMEDIATELY.

SEEDING AND MULCHING

- SEEDING PRACTICES INCLUDE TOPSOIL (AS DIRECTED BY ENGINEER), SEED, POLYMER, AND MULCH OR MULCH MATTING (AS DIRECTED BY ENGINEER OR WHERE SHOWN ON PLANS).
- WHERE NECESSARY, APPROPRIATE MULCH MUST BE APPLIED BASED ON SLOPE AND GROWING CONDITIONS AS APPROVED BY THE PROJECT ENGINEER.
- ALL SLOPES AND HIGHLY ERODIBLE AREAS MUST BE SEEDED, POLYMER APPLIED AND MULCHED AS NEEDED WHEN CONSTRUCTION ACTIVITY IS NOT TAKING PLACE.
- SEED AND MULCH IS TO BE INSPECTED DAILY FOLLOWING EACH RAIN EVENT TO DETERMINE IF CONCENTRATED FLOWS ARE PRESENT.
- IN THE EVENT THAT SEED AND MULCH ARE REMOVED BY ERODIBLE RUNOFF, REPAIRS ARE TO BE MADE IMMEDIATELY.
- ALL AREAS DURING CONSTRUCTION MUST BE PERMANENTLY STABILIZED WITHIN 72 HOURS OF FINAL GRADE (GRADE LISTED ON PLAN).

SILT FENCE

- SILT FENCE IS TO BE TRENCHED IN NO LESS THAN 6 INCHES BELOW THE GROUND SURFACE.
- INSPECT SILT FENCE DAILY AND IMMEDIATELY FOLLOWING EACH RAINFALL.
- REPAIR WHEN SILT FENCE IS SAGGING OR HAS BEEN REMOVED/TORN DOWN.
- WHEN SILT COLLECTS TO HALF THE HEIGHT OF THE FENCE ALL SILT IS TO BE REMOVED AND FENCE REPAIRED.
- REMOVE SILT FENCE WHEN PERMANENT SESC MEASURES ARE IN PLACE AND VEGETATION IS ESTABLISHED.

COMPLIANCE WITH PART 91 OF PA 451

- RESPOND IMMEDIATELY TO STORMWATER OPERATOR AND/OR SOIL EROSION AND SEDIMENTATION CONTROL INSPECTOR CONCERNS. MAKE CORRECTIVE MEASURES AS REQUIRED IMMEDIATELY AS DETAILED BY THE APPROVED APA MANUAL(S).

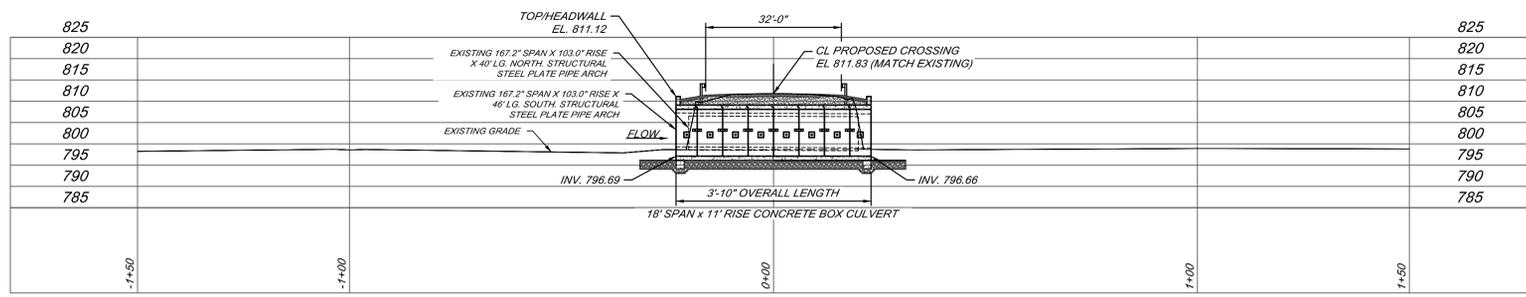
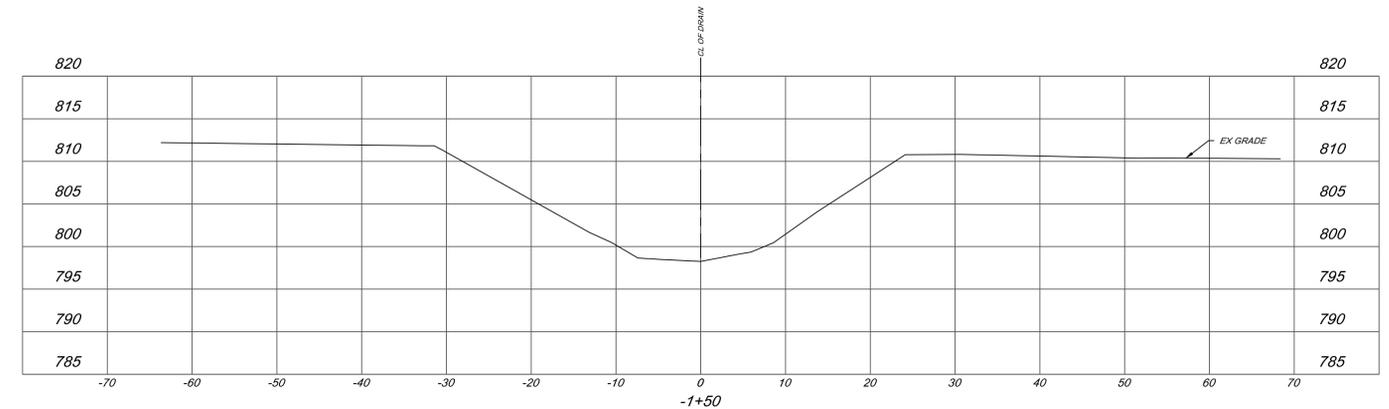
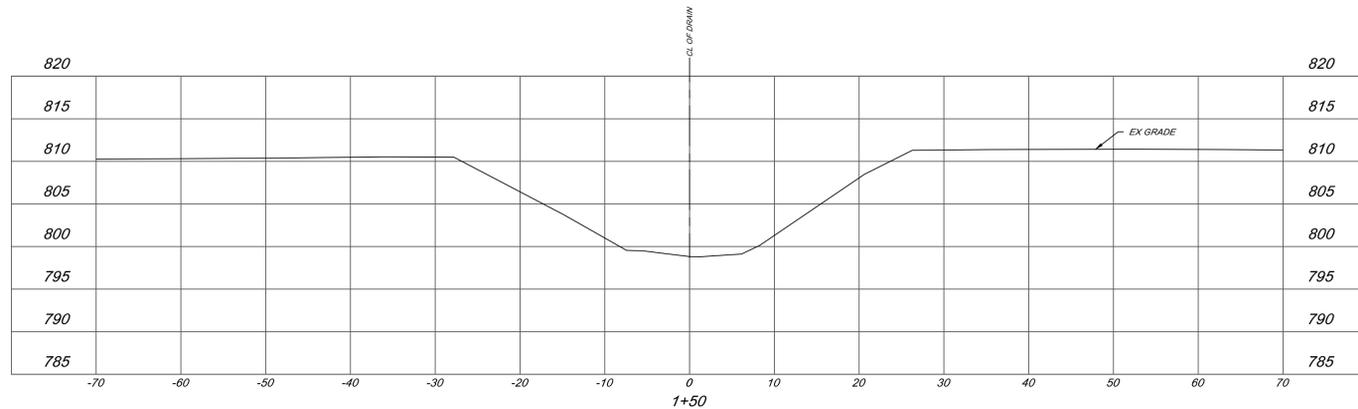
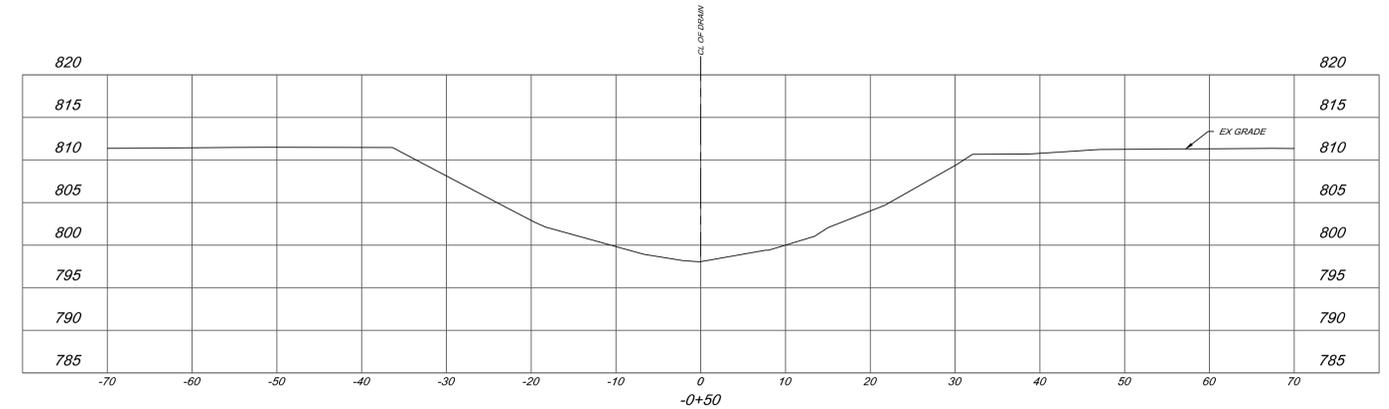
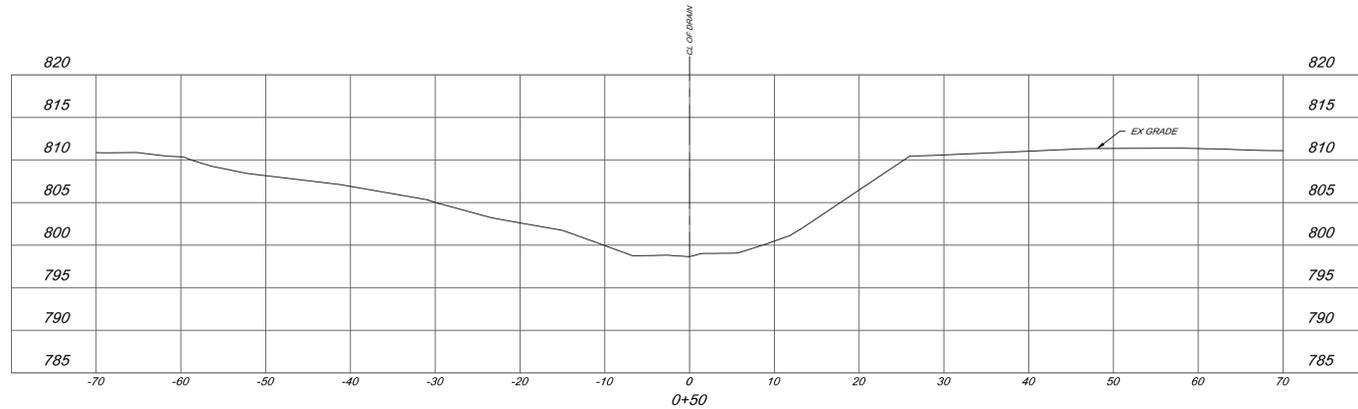
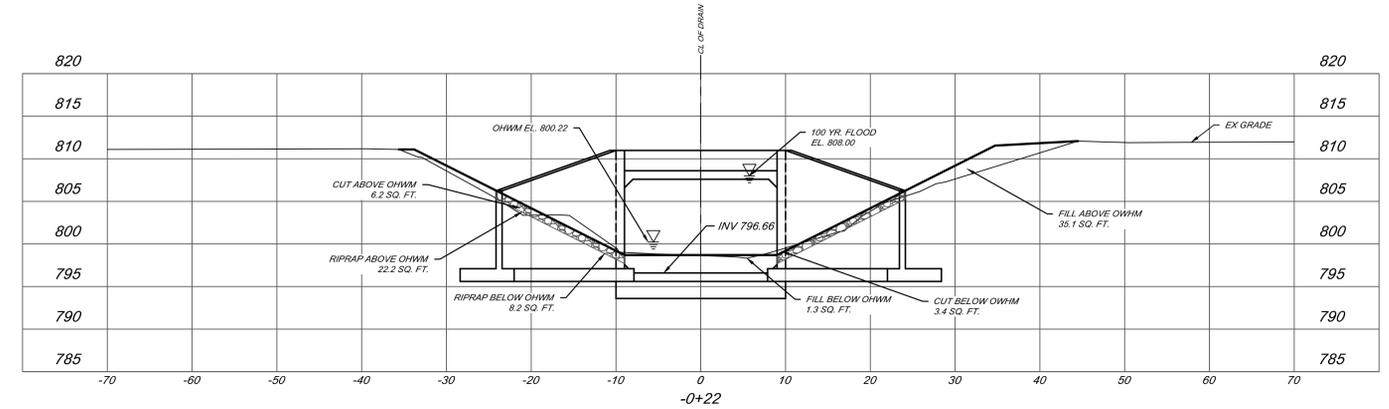
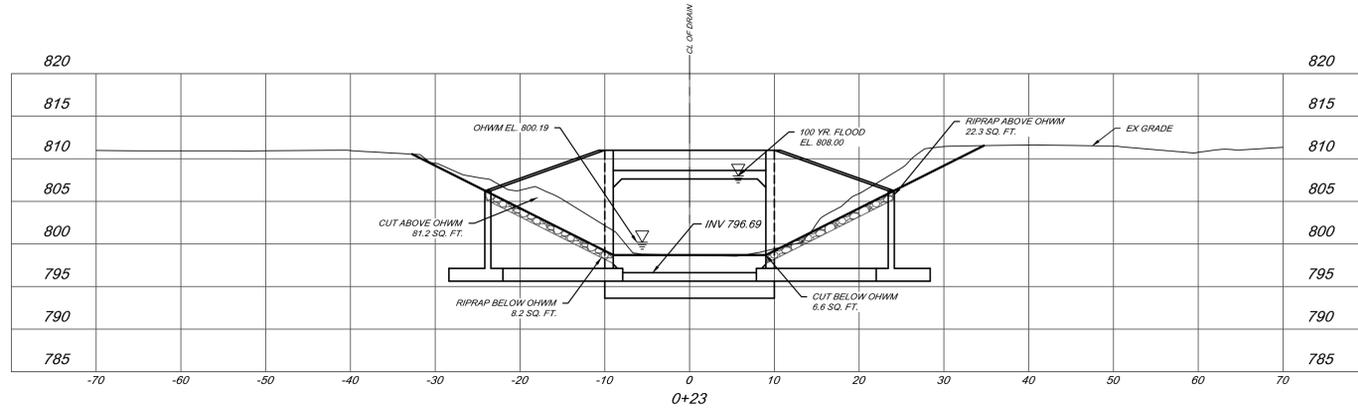
**SOIL EROSION AND SEDIMENTATION CONTROL NOTES**

- INSTALL AND MAINTAIN ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES IN ACCORDANCE WITH THE APPROVED PLAN PRIOR TO COMMENCEMENT OF CONSTRUCTION OR MASS GRADING. ALL SESC MEASURES MUST BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE BELL CREEK DRAIN SESC PLAN AND PROJECT SPECIFICATIONS.
- SOIL EROSION CONTROL MEASURES MUST BE INSPECTED BY A STATE CERTIFIED INSPECTOR AFFILIATED WITH THE COUNTY DRAIN COMMISSIONER'S OFFICE PRIOR TO COMMENCEMENT OF CONSTRUCTION OR MASS GRADING.
- DAILY INSPECTION AND MAINTENANCE MUST BE MADE TO ENSURE ALL EROSION CONTROL MEASURES ARE FUNCTIONING PROPERLY AND INTACT. NECESSARY REPAIRS MUST BE PERFORMED WITHIN 24 HOURS.
- ADDITIONAL SOIL EROSION CONTROL MEASURES MUST BE PROVIDED THROUGHOUT CONSTRUCTION ACTIVITY AS NEEDED AND DETERMINED BY THE AP/ENGINEER. THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN IS TO BE AMENDED TO INCLUDE ADDITIONAL EROSION CONTROL MEASURES IMPLEMENTED ON-SITE.
- SEDIMENT FROM WORK ON THIS SITE IS TO BE CONTAINED ON THE SITE AND IS NOT TO BE ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, PONDS, AND WETLANDS.
- ALL VISUAL TRACKING INCLUDING MUD, DIRT, AND DEBRIS TRACKED ONTO EXISTING ROADWAYS MUST BE IMMEDIATELY REMOVED NO LESS THAN ON A DAILY BASIS BY SCRAPING AND SWEEPING AND/OR AS DIRECTED BY THE ENGINEER.
- DUST CONTROL MUST BE EXERCISED AT ALL TIMES DURING THE PROJECT AND AS DIRECTED BY THE ENGINEER OR APA. APPLY DUST SUPPRESSANT TO SURFACES USING A PRESSURE TYPE WATER DISTRIBUTOR TRUCK EQUIPPED WITH A SPRAY SYSTEM.
- ALL PERMANENT SOIL EROSION CONTROL MEASURES MUST BE IN PLACE WITHIN 24 HOURS OF FINAL GRADING (GRADE LISTED ON PLANS). THIS INCLUDES ALL VEGETATIVE STABILIZATION. VEGETATIVE STABILIZATION WILL BE ONGOING. TOPSOIL, FERTILIZER, SEED, POLYMER, SILT STOP (OR EQUAL), MULCH AND OR RIPRAP MUST BE IN PLACE BEFORE PROCEEDING TO THE NEXT WORK AREA. ALL TEMPORARY MEASURES SUCH AS SILT FENCE AND INLET PROTECTION BAGS ARE TO BE REMOVED ONCE PERMANENT SESC MEASURES ARE IN PLACE AND VEGETATION IS ESTABLISHED. REMOVAL OF TEMPORARY MEASURES, FOLLOWING ACCEPTANCE OF THE PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- PRIOR TO WINTER CONSTRUCTION, ALL EXPOSED SOILS MUST BE STABILIZED WITH A COMBINATION OF SILT STOP 705 POLYMER BLEND, NORTH AMERICAN GREEN EROSION CONTROL BLANKETS, MULCH, OR OTHER APPROVED METHOD IF VEGETATION COULD NOT BE ESTABLISHED DURING THE GROWING SEASON AS DETERMINED BY THE APA OR ENGINEER.
- WORK AREAS MUST BE STABILIZED WITH TOPSOIL, SEED, FERTILIZER, AND MULCH WITHIN 24 HOURS FOLLOWING CONSTRUCTION. VEGETATIVE STABILIZATION IS ONGOING THROUGHOUT THE PROJECT.
- ALL SOIL EROSION CONTROL MEASURES MUST BE INSPECTED DAILY. THE STORM WATER OPERATOR IS TO MAKE A WEEKLY INSPECTION OR INSPECT AFTER EACH RAIN EVENT THAT RESULTED IN A DISCHARGE TO ENSURE PROPER MAINTENANCE OF THE SOIL EROSION CONTROL MEASURES. ANY DEFICIENCIES OR REPAIRS TO SOIL EROSION CONTROL MEASURES MUST BE CORRECTED IMMEDIATELY. INLET PROTECTION MEASURES, DANDY BAG II (OR EQUAL), FLEX STORM (OR EQUAL), MUST BE INSTALLED IN CATCHBASINS BEFORE ANY STORMWATER RUNOFF IS ALLOWED TO ENTER THE TOP OF THE STRUCTURES. THE SILT AND SEDIMENT MUST BE REMOVED FROM INLET PROTECTION MEASURES AS NEEDED TO ENSURE PROPER FUNCTION OF THE BAGS.
- THE NEED FOR TEMPORARY MEASURES SUCH AS SILT FENCE AND DANDY BAG II (OR EQUAL), FLEX STORM (OR EQUAL) FOR EXISTING OR NEW CATCHBASINS MUST BE ASSESSED ON A DAILY BASIS. PIPES ARE TO BE CAPPED AT THE END OF EACH WORKDAY. AT NO TIME SHOULD SEDIMENT COLLECT IN A CATCHBASIN OR AN OFF-SITE AREA. TEMPORARY MEASURES MUST BE REMOVED ONCE PERMANENT MEASURES ARE IN PLACE AND VEGETATION IS ESTABLISHED.
- IF DEWATERING IS NECESSARY, CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE APA FOR APPROVAL.
- THE NOTICE OF COVERAGE (IF REQUIRED), SOIL EROSION AND SEDIMENTATION CONTROL PLAN, AND STORMWATER OPERATOR LOGS MUST BE LOCATED ON SITE AT ALL TIMES.
- ALL RESTORATION TO OCCUR WITHIN 24 HOURS OF FINAL GRADING.

**SOIL EROSION & SEDIMENTATION CONTROL PLAN**

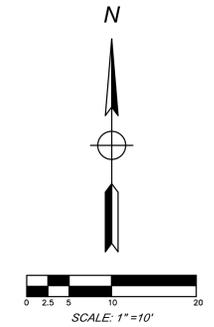
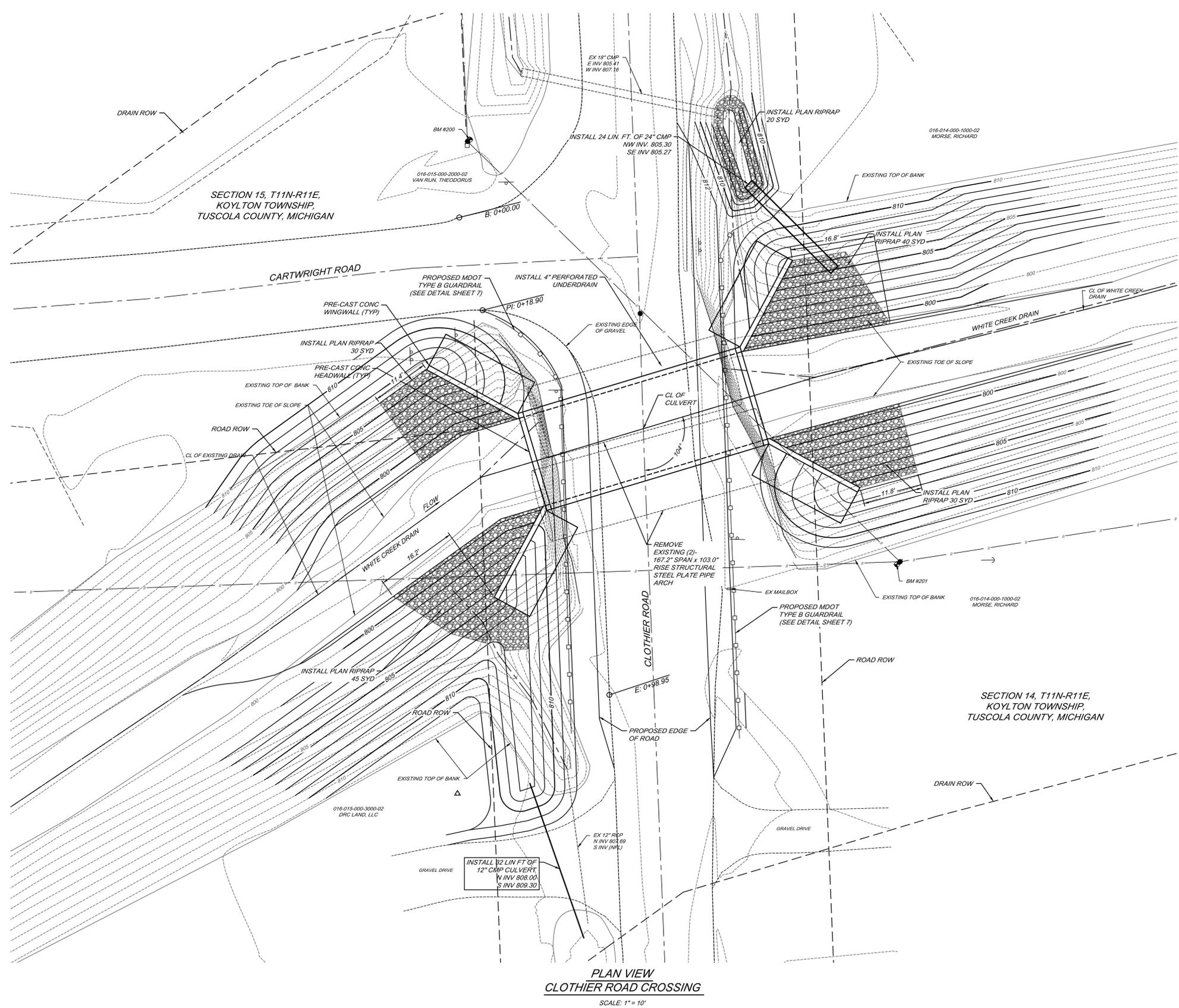
IN COMPLIANCE WITH SECTION 323.1703 OF PART 91, SOIL EROSION AND SEDIMENTATION CONTROL OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED.

BY	MARK	REVISIONS	DATE
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<b>CLOTHIER ROAD CROSSING REPLACEMENT TUSCOLA COUNTY, MICHIGAN</b>			
<b>SOIL EROSION AND SEDIMENTATION CONTROL PLAN</b>			
		<small>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel: 989-754-4717 Fax: 989-754-4440 www.SpicerGroup.com</small>	
DE. BY:	MTS/DPZ	CH. BY:	PROJECT NO.
DR. BY:	MTS	APP. BY:	132095SG2022
STDS.	SHEET 03 OF 08	DR	
DATE	JULY, 2022	FILE NO.	03
SCALE	NOT TO SCALE	DR-4274-03	



PROFILE VIEW  
CLOTHIER ROAD CROSSING  
SCALE: 1" = 20'

BY	MARK	REVISIONS	DATE
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<b>CLOTHIER ROAD CROSSING REPLACEMENT TUSCOLA COUNTY, MICHIGAN</b>			
<b>CLOTHIER ROAD CROSS SECTIONS</b>			
SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel: 989-754-4111 Fax: 989-754-4440 www.SpicerGroup.com		PROJECT NO. 132095SG2022	
DE. BY: MTS/DPZ	CH. BY:	PROJECT NO.	
DR. BY: MTS	APP. BY:	132095SG2022	
STDS.	SHEET 04 OF 08	<b>DR</b> <b>04</b>	
DATE: JULY, 2022	FILE NO. DR-4274-04		
SCALE: AS SHOWN			



EROSION CONTROL TABLE					
KEY*	FROM STATION	TO STATION	DESCRIPTION	QTY	
1 P			SEEDING	ALL DISTURBED AREAS	LUMP SUM
2 T			MULCHING	ALL DISTURBED AREAS	LUMP SUM
15 P			CROSSING	AS SHOWN ON PLANS	165 SYD

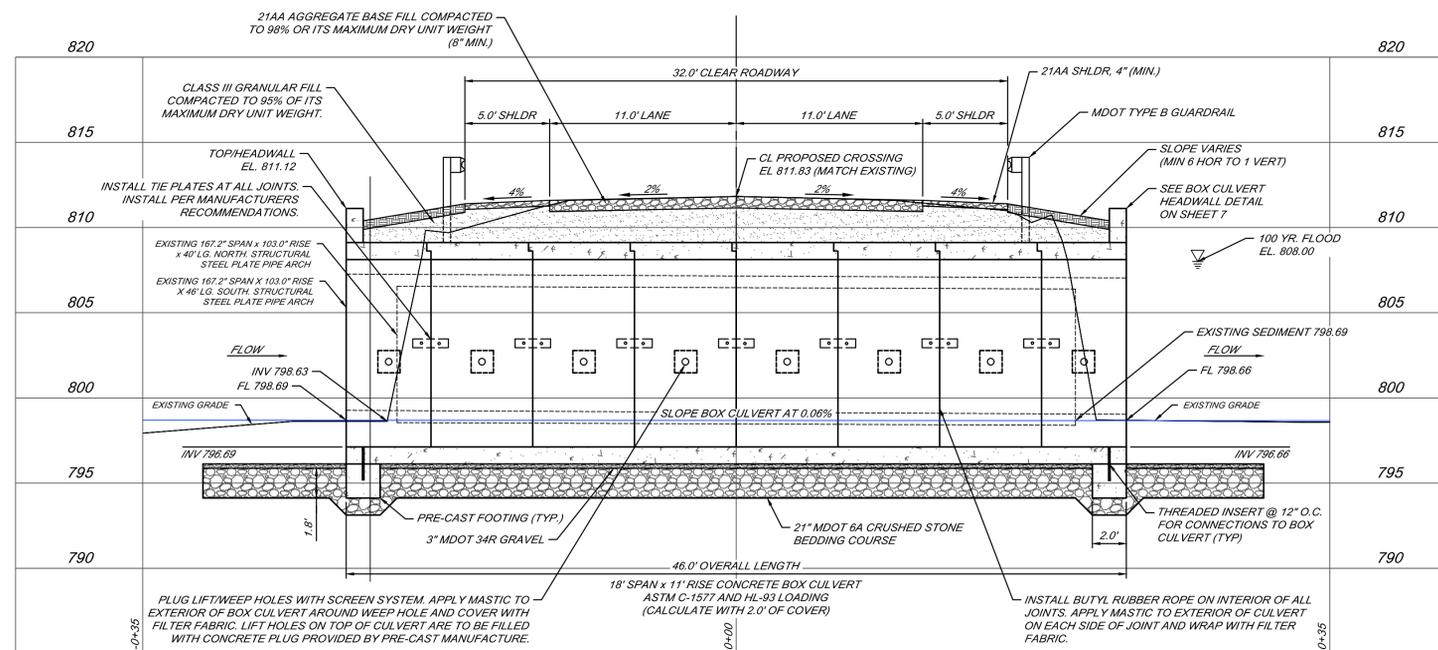
NOTE: COORDINATE INSTALLATION OF EROSION CONTROL STRUCTURES WITH ENGINEER PRIOR TO CONSTRUCTION. LOCATIONS, QUANTITIES, OR TYPES MAY VARY BASED ON FIELD DECISIONS.

**CONSTRUCTION NOTES**

- ALL JOINTS SHALL BE SEALED ACROSS THE TOP AND 2 FEET VERTICALLY DOWN THE SIDES WITH MDOT APPROVED JOINT WATER PROOFING.
- LOAD RATING TO BE SUBMITTED WITH SHOP DRAWINGS BY PRE-CAST MANUFACTURER. CULVERT MUST MEET ALL MICHIGAN LEGAL LOADS AND OVERLOAD CLASS A.
- FOOTING DESIGN AND STRUCTURE DESIGN OF ALL PRE-CAST COMPONENTS TO BE VERIFIED BY MANUFACTURER.
- FOOTING SHALL BE CONNECTED TO BOX WITH GROUT AND PIN CONNECTION. USING NO. 5 BAR PINS @ 12" SPACING.
- CULVERT SHALL BE COMPLETELY BACKFILLED WITH MDOT CLASS III SAND. ALL COSTS FOR SAND BACKFILL AND SAND SUBGRADE ARE INCLUDED IN THE UNIT PRICE FOR LIN FT OF BOX CULVERT.
- BOX CULVERT AND PRE-CAST WINGWALL FOOTINGS SHALL HAVE 3" OF 3/4" GRAVEL AND 21" OF MDOT 6A CRUSHED LIMESTONE BEDDING. ALL COST FOR BEDDING MATERIALS ARE INCLUDED IN THE UNIT PRICE FOR CULVERT AND PRE-CAST WINGWALLS.
- THE PROPOSAL INCLUDES A SUB-GRADE UNDERCUTTING LINE ITEM THAT IS TO BE USED AS NEEDED IF UN-SUITABLE SOILS OR VOIDS UNDER EXISTING STRUCTURE ARE ENCOUNTERED BELOW THE ELEVATION OF THE PROPOSED BEDDING. ALL UNDERCUTTING PERFORMED MUST BE APPROVED BY THE OWNER OR ENGINEER PRIOR TO TAKING PLACE. THE SUB-GRADE UNDERCUTTING BID ITEM INCLUDES EXCAVATION, HAULING, DISPOSAL, FILLING WITH MDOT 6A CRUSHED LIMESTONE, WRAPPED IN GEO-TEXTILE FABRIC.
- CONTRACTOR TO PROVIDE S-75 OR EQUAL STRAW MULCH BLANKET ON ALL FILL SLOPES. LOOSE STRAW MULCH MAY BE USED IN ALL OTHER AREAS. ALL COSTS INCLUDED IN LUMP SUM BID FOR SEEDING AND MULCHING.
- FOLLOWING INSTALLATION OF PROPOSED BOX CULVERT CONTRACTOR SHALL PERFORM GRADING TO EXISTING ROAD SIDE DITCHES, COUNTY DRAIN CHANNEL, AND ROAD EMBANKMENT AS SHOWN. ALL COST TO BE INCLUDED IN THE BID PRICES FOR INSTALLATION OF BOX CULVERT AND CLEANUP AND RESTORATION.

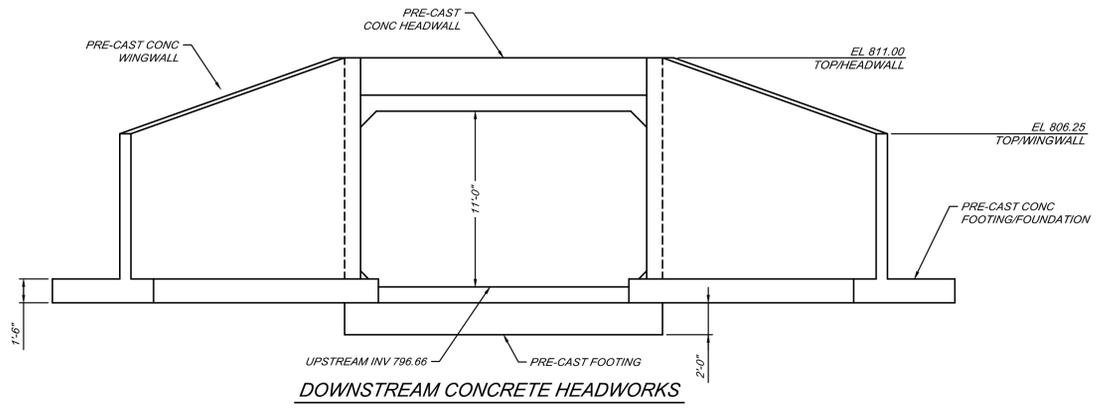
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<b>CLOTHIER ROAD CROSSING REPLACEMENT TUSCOLA COUNTY, MICHIGAN</b>			
<b>PLAN VIEW</b>			
		<small>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 49807 Tel: 989-754-4111 Fax: 989-754-4440 www.SpicerGroup.com</small>	
DE. BY:	MTS/DPZ	CH. BY:	PROJECT NO.
DR. BY:	MTS	APP. BY:	132095SG2022
STDS.		SHEET 05 OF 08	<b>DR</b> <b>05</b>
DATE	JULY, 2022	FILE NO.	
SCALE	AS SHOWN		

**PLAN VIEW  
CLOTHIER ROAD CROSSING**  
SCALE: 1" = 10'

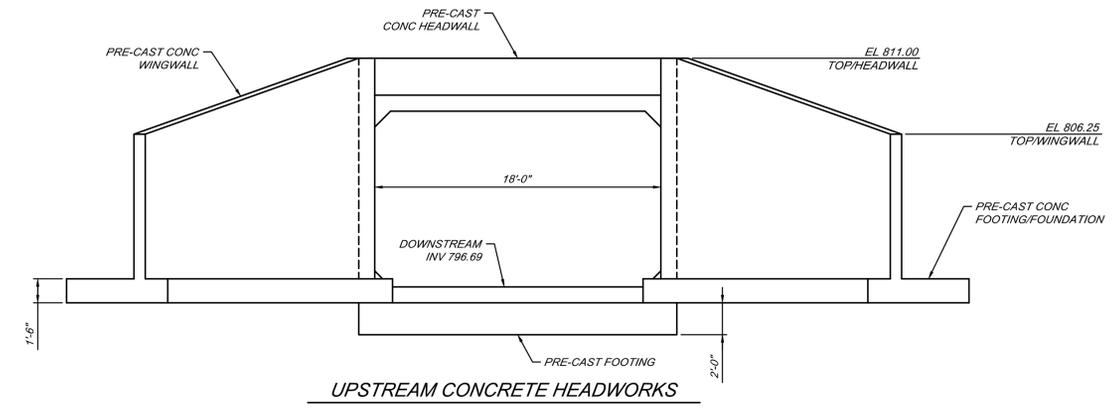


**PROFILE VIEW  
CLOTHIER ROAD CROSSING**  
SCALE: 1" = 5'

BY	MARK	REVISIONS	DATE
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<b>CLOTHIER ROAD CROSSING REPLACEMENT TUSCOLA COUNTY, MICHIGAN</b>			
<b>PROFILE VIEW</b>			
		<small>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel: 989-754-4111 Fax: 989-754-4440 www.SpicerGroup.com</small>	
DE. BY:	MITS/DPZ	CH. BY:	PROJECT NO.
DR. BY:	MITS	APP. BY:	132095SG2022
STDS.	SHEET 06 OF 08	FILE NO.	DR 06
DATE	JULY, 2022	FILE NO.	DR-4274-06
SCALE	AS SHOWN		

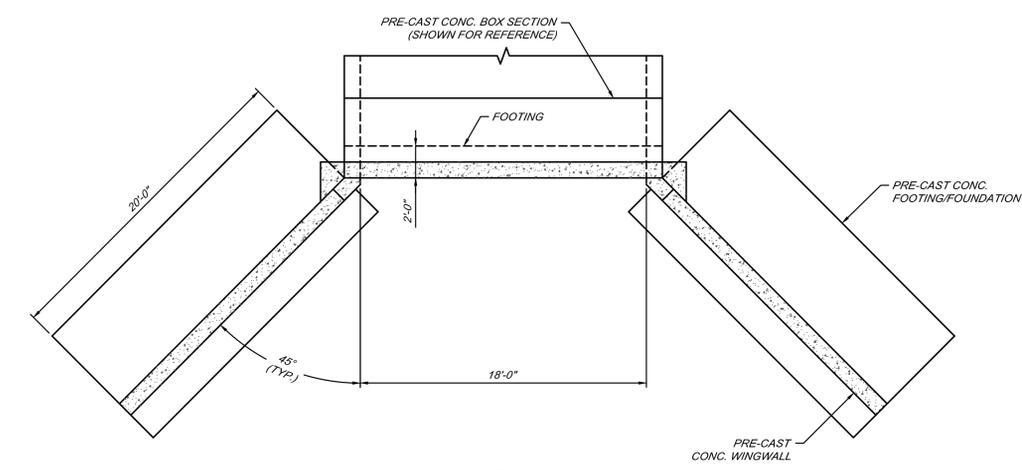


**DOWNSTREAM CONCRETE HEADWORKS**



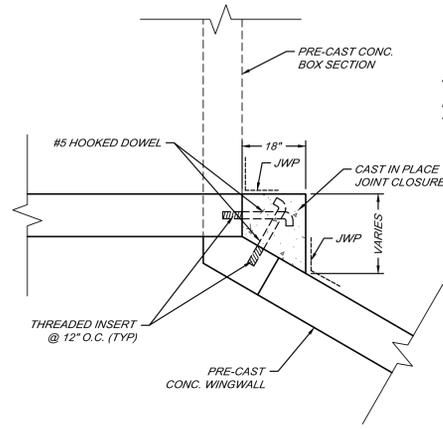
**UPSTREAM CONCRETE HEADWORKS**

**WINGWALL/HEADWALL ELEVATION VIEW**  
 NOT TO SCALE  
 \*\* FINAL DESIGN/DETAILS BY PRE-CAST CONCRETE MANUFACTURE



**TYPICAL CONCRETE HEADWORKS WINGWALL/HEADWALL PLAN VIEW**

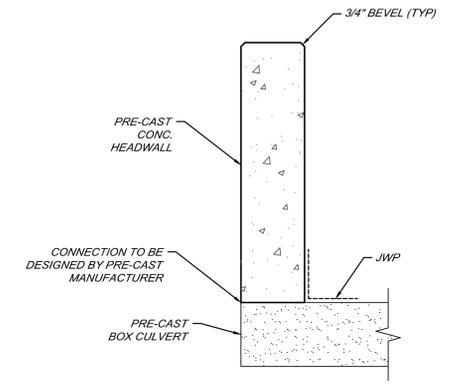
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 \*\* FINAL DESIGN/DETAILS BY PRE-CAST CONCRETE MANUFACTURE



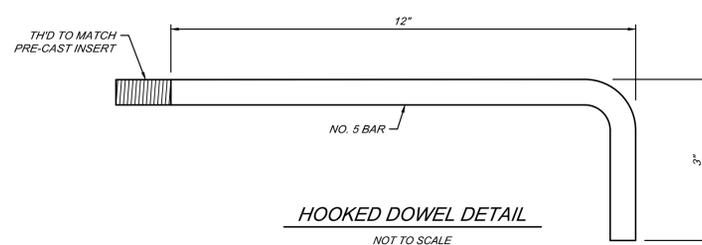
**CONNECTION DETAIL**  
 NOT TO SCALE

\*\* FINAL DESIGN/DETAILS BY PRE-CAST CONCRETE MANUFACTURER

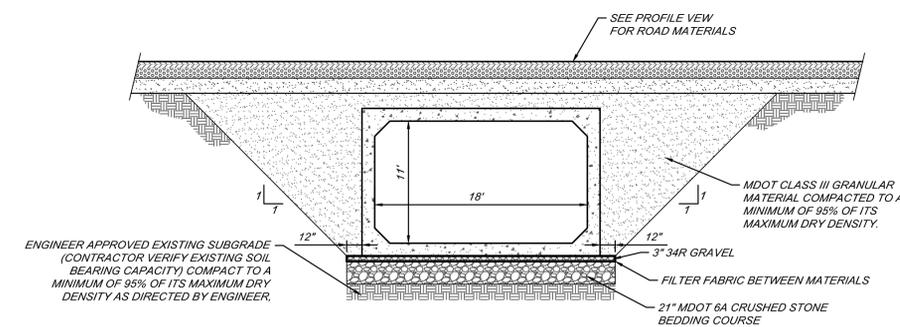
**GENERAL NOTES**  
 JWP DENOTES JOINT WATERPROOFING  
 FOR BEVEL AND MOLDING DETAILS, SEE STANDARD PLAN B-103 SERIES



**BOX CULVERT HEADWALL DETAIL**  
 NOT TO SCALE

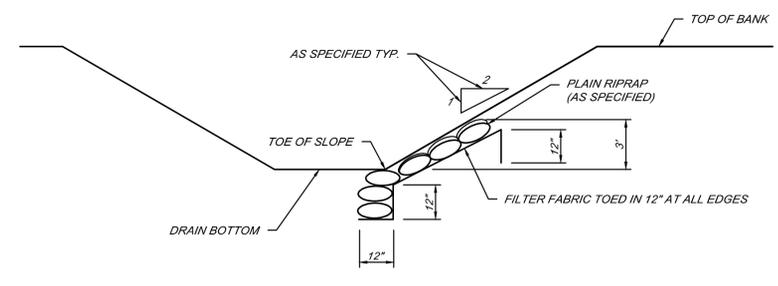


**HOOKED DOWEL DETAIL**  
 NOT TO SCALE

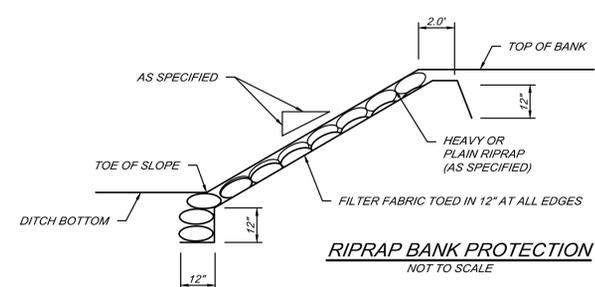


**TYPICAL BOX CULVERT TRENCH DETAIL**  
 NOT TO SCALE

ENGINEER APPROVED EXISTING SUBGRADE (CONTRACTOR VERIFY EXISTING SOIL BEARING CAPACITY) COMPACT TO A MINIMUM OF 95% OF ITS MAXIMUM DRY DENSITY AS DIRECTED BY ENGINEER.



**RIPRAP TOE OF SLOPE PROTECTION TYPICAL CROSS-SECTION**  
 NOT TO SCALE



**RIPRAP BANK PROTECTION**  
 NOT TO SCALE

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<b>CLOTHIER ROAD CROSSING REPLACEMENT          TUSCOLA COUNTY, MICHIGAN</b>			
<b>WINGWALL/HEADWALL DETAILS          AND STANDARD DETAILS</b>			
<small>SAGINAW OFFICE          230 S. Washington Ave.          Saginaw, MI 48607          Tel: 989-754-4111          Fax: 989-754-4440          www.SpicerGroup.com</small>		<small>PROJECT NO.          132095SG2022</small>	
<small>DE. BY: MTS/DPZ          DR. BY: MTS</small>	<small>CH. BY:          APP. BY:</small>	<small>PROJECT NO.          132095SG2022</small>	
<small>STDS.</small>	<small>SHEET 07 OF 08</small>	<small>DR</small>	
<small>DATE: JULY, 2022          SCALE: AS SHOWN</small>	<small>FILE NO.          DR-4274-07</small>	<small>07</small>	

Existing structure info		
Double Barrel Pipe Arch's	North Pipe	South Pipe
Length (Feet)	40	46
Width (Feet)	13.93	13.93
Height (Feet)	8.58	8.58
Area (Sft)	93.87	93.87
Volume (Cft)	3754.81	4318.03

Floodplain Impacts	MDOT Plain Riprap below Floodplain
Riprap Fill (SYD)	145
Riprap Fill (CYD)	47.85
Total Cut (CYD)	54

Excavation Below OHWM	
Depth of Cut (Feet)	5
Length of Cut (Feet)	56
Width of Cut (Feet)	30
Volume of cut (Cft)	8350
Volume of cut (CYD)	309

Structure Below OHWM	
Depth of structure (Feet)	6.5
Length of structure (Feet)	46
Width of structure (Feet)	20
Volume of structure (Cft)	6007.6
Volume of structure (CYD)	222.5

TUSCOLA COUNTY ROAD COMMISSION

SPECIAL PROVISION  
FOR  
**SLOPE RESTORATION, NON-FREEWAY, MODIFIED**

CON:SGI 816

1 of 5

02-15-22

**a. Description.** This work consists of preparing all lawns and slopes on non-freeway projects designated for slope restoration on the plans or as directed by the Engineer and applying topsoil, fertilizer, hydroseed, hydromulch, or mulch blanket, high velocity mulch blanket and permanent turf reinforcement mat to those areas. Turf establishment must be in accordance with section 816 of the Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction and Standard Plan R-100 Series, except as modified herein or otherwise directed by the Engineer.

**b. Materials.** The materials and application rates specified in sections 816 and 917 of the MDOT 2020 Standard Specifications for Construction apply unless modified by this special provision or otherwise directed by the Engineer. The following materials must be used on this project:

1. Seeding mixture as called for on the plans.
2. Fertilizer, Chemical Nutrient, Class A.
3. Topsoil Surface, Furnished or Salvaged, 4 inch. Remove any stones greater than 1 inch in diameter or other debris from all topsoil.
4. Mulch shall be straw with an applied Mulch Anchor tackifier.
5. Mulch Blanket and High Velocity Mulch Blanket.
6. Permanent Turf Reinforcement Mat (TRM) must be 100 percent synthetic and consist of 100 percent ultraviolet (UV) stabilized polyolefin fibers sewn between two layers of black UV stabilized polypropylene netting with polyolefin thread. The TRM must meet the "minimum average roll value" requirements in Table 1:

**Table 1: Permanent Turf Reinforcement Mat requirements**

Property	Test Method	Requirement
Mass/Unit Area	ASTM D 6566	10 oz/syd
Ultraviolet Stability @ 1000 hrs	ASTM D 4355	80 percent
Tensile Strength (MD)	ASTM D 6818	165 lbs/ft

Acceptance. Supply a Test Data Certification for the permanent TRM from one of the following manufacturers:

- Recyclex - American Excelsior Co., Arlington, TX (800) 777-7645
- P300 - North American Green, Poseyville, IN (800) 772-2040
- Landlok 450 - Propex, Inc., Chattanooga, TN (800) 621-1273

PP5-10 - Western Excelsior, Mancos, CO (800) 833-8573

7. Hydromulch – Wood Fiber; shall be 100 percent wood fiber thermally refined with a premium tackifier (preblended high viscosity colloidal polysaccharide).

8. Hydromulch – BFM; Bonded Fiber Matrix (BFM), hydro applied mulch. ProMatrix EFM manufactured by Profile Products, LLC or an approved equal.

The Bonded Fiber Matrix shall conform to the typical property values in Table 2 when uniformly applied at a rate of 3,500 pounds per acre (3,900 kilograms/hectare) under laboratory conditions:

**Table 2: Typical property values for Bonded Fiber Matrix**

Property	Test Method	Tested Value (English)	Tested Value (SI)
<b>Physical</b>			
Mass Per Unit Area	ASTM D6566 <sup>1</sup>	≥ 11.6 oz/yd <sup>2</sup>	≥ 390 g/m <sup>2</sup>
Thickness	ASTM D6525 <sup>1</sup>	≥ 0.16 inch	≥ 4 mm
Ground Cover	ASTM D6567 <sup>1</sup>	≥ 98%	≥ 98%
Water Holding Capacity	ASTM D7367	≥ 1,400%	≥ 1,400%
Material Color	Observed	Green	Green
<b>Performance</b>			
Cover Factor <sup>2</sup>	Large Scale Testing <sup>4</sup>	≤ 0.05	≤ 0.05
% Effectiveness <sup>3</sup>	Large Scale Testing <sup>4</sup>	≥ 95%	≥ 95%
Cure time	Observed	4 – 24 hours	4 – 24 hours
Vegetation Establishment	ASTM D7322 <sup>1</sup>	≥ 600%	≥ 600%
Functional Longevity <sup>5</sup>	Observed	≤ 12 months	≤ 12 months
<b>Environmental</b>			
Ecotoxicity	EPA 2021.0	48-hr LC <sub>50</sub> > 100%	48-hr LC <sub>50</sub> > 100%
Biodegradability	ASTM D5388	Yes	Yes

1. ASTM test methods developed for Rolled Erosion Control Products and have been modified to accommodate Hydraulically-Applied Erosion Control Products.
2. Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.
3. % Effectiveness = One minus Cover Factor multiplied by 100%.
4. Large scale testing conducted at Utah Water Research Laboratory. For specific testing information please contact a Manufacturer representative.
5. Functional Longevity is the estimated time period, based upon ASTM D5338 testing and field observations, that a material can be anticipated to provide erosion control and agronomic benefits as influenced by composition, as well as site-specific conditions, including; but not limited to – temperature, moisture, light conditions, soils, biological activity, vegetative establishment and other environmental factors.

All components of the BFM shall be pre-packaged by the Manufacturer to assure both material performance and compliance with the following values. Under no circumstances shall field mixing of components be permitted. No chemical additives with the exception of fertilizer, soil neutralizers and biostimulant materials should be added to this product.

1. Thermally Processed\* (within a pressurized vessel) Virgin Wood Fibers – 77%  
\*Heated to a temperature greater than 380 degrees Fahrenheit (193 degrees Celsius) for 5 minutes at a pressure greater than 50 psi (345 kPa).

2. Wetting agents (including high-viscosity colloidal polysaccharides, cross-linked biopolymers, and water absorbents) – 18 percent
3. Crimped Biodegradable Interlocking Fibers – 2.5 percent
4. Micro-Pore Granules – 2.5 percent
5. If multiple grades of the selected product are available, use the grade appropriate for the application as approved by the Engineer. Approved equal BFMs must consist of long strand, virgin wood fibers (90 percent by weight) bound together by a pre-blended, high strength polymer adhesive (10 percent by weight). The virgin wood fibers will be thermally refined from clean whole wood chips. Ensure the organic binders are a high viscosity colloidal polysaccharide tackifier with activating agents to render the resulting matrix insoluble upon drying.

**c. Construction.** Construction methods must be in accordance with subsection 816.03 of the MDOT 2020 Standard Specifications for Construction. Begin this work as soon as possible after final grading of the areas designated for slope restoration but no later than the maximum time frames stated in subsection 208.03 of the MDOT 2020 Standard Specifications for Construction. It may be necessary, as directed by the Engineer, to place materials by hand.

Shape, compact and assure all areas to be seeded are weed free prior to placing topsoil. Place topsoil to the minimum depth indicated above, to meet proposed finished grade. If the area being restored requires more than the minimum depth of topsoil to meet finished grade, this additional depth must be filled using topsoil or, at the Contractor's option, embankment. Furnishing and placing this additional material is included in this item of work.

Topsoil must be weed and weed seed free and friable prior to placing seed. Remove any stones greater than 1 inch in diameter or other debris. Apply seed mixture and fertilizer to prepared soil surface. If using hydroseeding equipment, incorporate the seed into the friable topsoil using the handgun/reel and spray directly into the seed bed. If using other methods of seed application, incorporate the seed into top 1/2 inch of topsoil.

Place Mulch and Mulch Anchoring over the mulch at a rate specified in subsection 816.03.F of the MDOT 2020 Standard Specifications for Construction. Mulch Blanket and High Velocity Mulch Blanket must be placed in accordance with subsection 816.03.G of the MDOT 2020 Standard Specifications for Construction and as shown on Standard Plan R-100 Series.

Place Hydromulch – Wood fiber applications: Add the seed mixture, fertilizer, wood fiber mulch with tackifier at a rate of 2500 pounds for each acre covered in accordance with the manufacturer's recommendations to the prepared topsoil surface at the specified rates for seed and fertilizer. Hydraulically apply the hydromulch to fully cover 100 percent of the soil surface.

Place Hydromulch - BFM applications: Apply the seed mixture and fertilizer to the prepared topsoil surface at the specified rates. Mix the BFM and organic binders thoroughly in the hydro seed machine at a rate of 40 pounds for each 100 gallons of water or as otherwise recommended by the manufacture. Hydraulically apply the BFM slurry in successive layers, from two or more directions, to fully cover 100 percent of the soil surface. Ensure the minimum application rate for the given gradient as specified in Table 3.

**Table 3: Bonder Fiber Matrix (BFM) application rates**

Install BFM at the following typical application rates	
Slope Gradient (ft/ft)	Application Rate
1 on 4 to 1 on 3	3000 lbs/ac
1 on 3 to 1 on 2	3500 lb/ac
Steeper than 1 on 2	4000 lb/ac

Do not apply the BFM product to saturated soils or immediately before, during or after a rainfall.

Do not apply fertilizer to frozen soil or soil saturated with water. Any fertilizer released onto a hard surface, such as a sidewalk or driveway must be cleaned up promptly. Maintain at least a 15 foot application buffer from surface water (lake, river, stream). If a spreader guard, deflector shield, or drop spreader is used, then maintain at least a 3 foot buffer. If a continuous natural vegetative buffer separates the turf and surface water, then maintain at least a 10 foot buffer from the water.

Turf or lawn areas that soil tests, performed within the past three years by the Michigan State University Extension Service or other qualified or recognized authority in the area of soil analysis, confirm are below phosphorus levels established by the Michigan State University Extension Service. The lawn fertilizer application shall not contain an amount of phosphorus exceeding the amount and rate of application recommended in the soil test evaluation.

Areas constructed with the TRM must be installed on prepared (seeded) grades as shown on the plans in strict accordance with the manufacturer's published installation guidelines. The top edge of the TRM must be anchored in a minimum 6-inch-deep trench. Operation of equipment on the slope will not be allowed after placement of the TRM. No credit for splices, overlaps, tucks or wasted material will be made.

If an area washes out after this work has been properly completed and approved by the Engineer, make the required corrections to prevent future washouts and replace the topsoil, fertilizer, seed and mulch. This replacement will be paid for as additional work using the applicable contract items.

If an area washes out for reasons attributable to the Contractor's activity or failure to take proper precautions, replacement will be at the Contractor's expense.

The Engineer will inspect the seeded turf to ensure the end product is well established, weed free, in a vigorous growing condition, and contains the species called for in the seeding mixture.

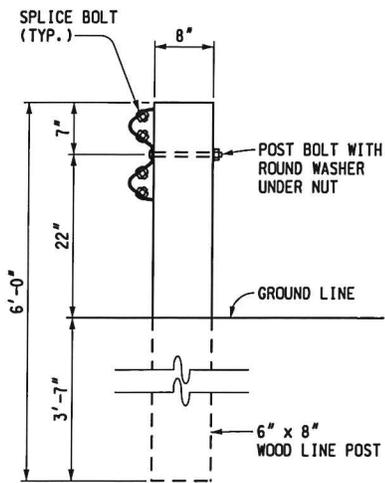
If the seeded turf is not well established at the end of the first growing season, the Contractor is responsible to re-seed until the turf is well established and approved by the Engineer at his own cost.

If weeds are determined by the Engineer to cover more than 10 percent of the total area of slope restoration, the Contractor must provide weed control in accordance with subsection 816.03.I of the MDOT 2020 Standard Specifications for Construction. Weed control will be at the Contractor's expense with no additional charges to the project.

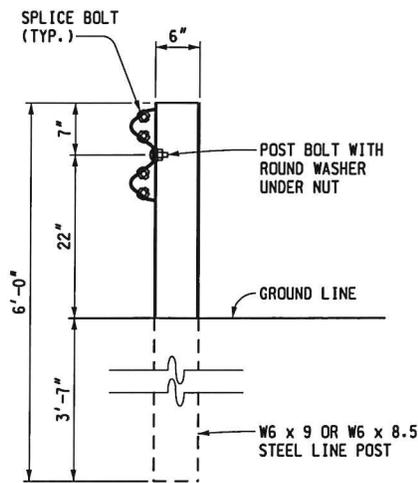
**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
Slope Restoration, Type __, Modified .....	Square Yard
<p>1. Place <b>Slope Restoration, Type A, Modified</b> in all areas not described in the other types of slope restoration and will be measured by area in square yards in place. <b>Slope Restoration, Type A, Modified</b> includes all labor, equipment and materials required to install Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; Seeding Mixture; and Mulch mechanically crimped and sprayed with Much Anchor which will not be paid for separately but is included in the contract unit price for <b>Slope Restoration, Type A, Modified</b>.</p> <p>2. Place <b>Slope Restoration, Type B, Modified</b> in areas that have a 1 on 4 up to 1 on 3 slope and in any ditch with a grade less than 1.5 percent, or as directed by the Engineer. <b>Slope Restoration, Type B, Modified</b> will be measured by area in square yards in place. <b>Slope Restoration, Type B, Modified</b> includes all labor, equipment and materials required to install Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; Seeding Mixture; Mulch with one of the following options:</p> <ul style="list-style-type: none"> <li>a. Hydromulch – Wood Fiber and Mulch Blanket or</li> <li>b. Hydromulch – BFM</li> </ul> <p>which will not be paid for separately but is included in the contract unit price for <b>Slope Restoration, Type B, Modified</b>.</p> <p>3. Place <b>Slope Restoration, Type C, Modified</b> in areas that have a slope steeper than 1 on 3 or to a 1 on 2 slope, in any ditch with a grade of 1.5 percent to 3 percent, or as directed by the Engineer. <b>Slope Restoration, Type C, Modified</b> will be measured by area in square yards in place. <b>Slope Restoration, Type C, Modified</b> includes all labor, equipment and materials required to install Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; Seeding Mixture; Mulch with one of the following options:</p> <ul style="list-style-type: none"> <li>a. Hydromulch – Wood Fiber and High Velocity Mulch Blanket or</li> <li>b. Hydromulch – BFM</li> </ul> <p>which will not be paid for separately but is included in the contract unit price for <b>Slope Restoration, Type C, Modified</b>.</p> <p>4. Place <b>Slope Restoration, Type D, Modified</b> in areas that have a slope steeper than 1 on 2, in any ditch with a grade steeper than 3 percent, or as directed by the Engineer. <b>Slope Restoration, Type, Modified D</b> will be measured by area in square yards in place. <b>Slope Restoration, Type D, Modified</b> includes all labor, equipment and materials required to install Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; Seeding Mixture; Mulch with one of the following options:</p> <ul style="list-style-type: none"> <li>a. Hydromulch – Wood Fiber and Turf Reinforcement Mat (TRM) or</li> <li>b. Hydromulch – BFM</li> </ul> <p>which will not be paid for separately but is included in the contract unit price for <b>Slope Restoration, Type D, Modified</b>.</p>	

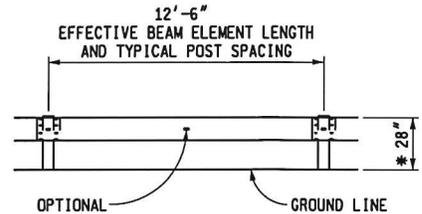
**Note:** Areas where unsatisfactory grass growth is evident as determined by the Engineer prior to or during the Final Project Inspection, shall be re-worked, re-seeded, re-fertilized, and re-mulched to the satisfaction of the Engineer, at the Contractor's expense. The end product shall be well established, weed free, in a growing and vigorous condition, and shall contain the species called for in the seeding mixture.



WOOD POST

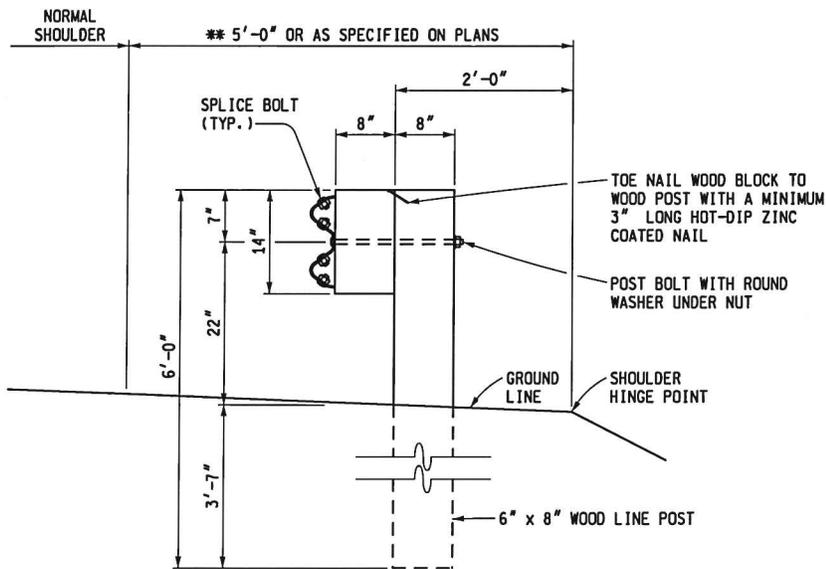


STEEL POST

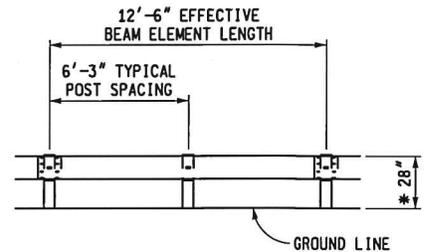


ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE A



\*\* FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-0".



ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE B  
( WOOD POST )



DEPARTMENT DIRECTOR  
Paul C. Ajegba

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D

PREPARED  
BY  
DESIGN DIVISION

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

DRAWN BY: B.L.T.

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

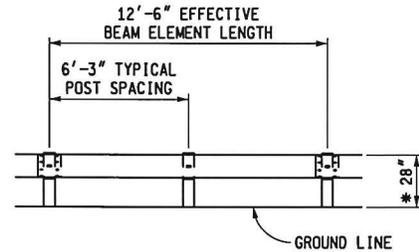
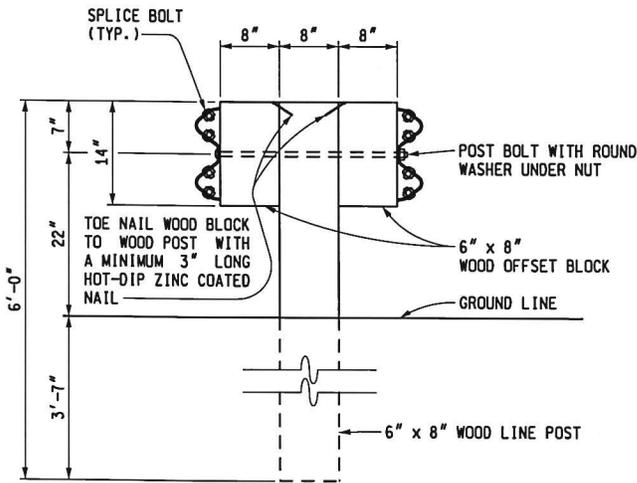
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F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

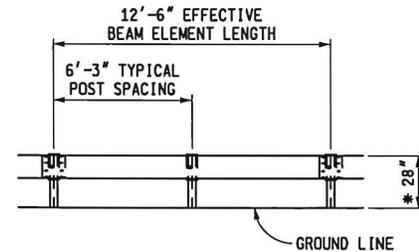
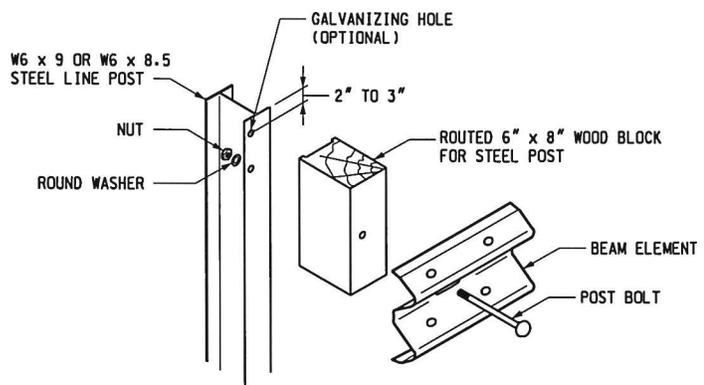
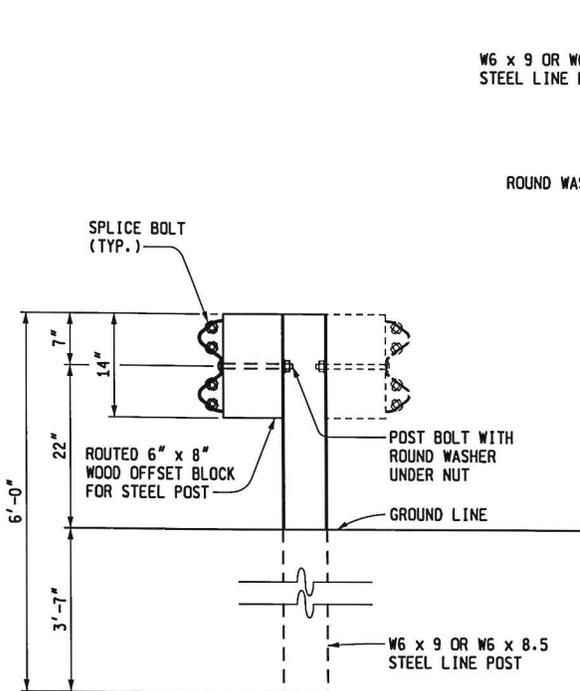
R-60-J

SHEET  
1 OF 17



ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE BD  
( WOOD POST )



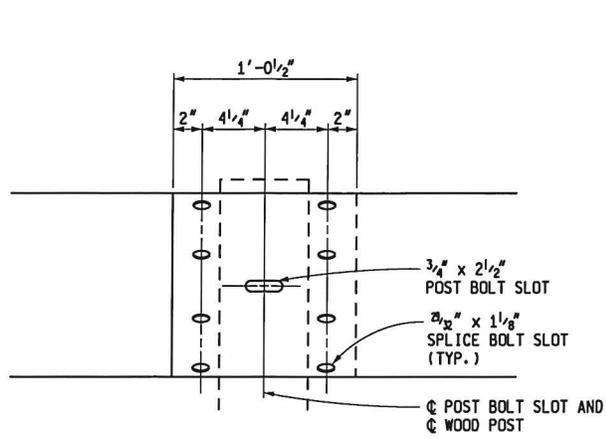
ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE B (OR BD)  
( STEEL POST )

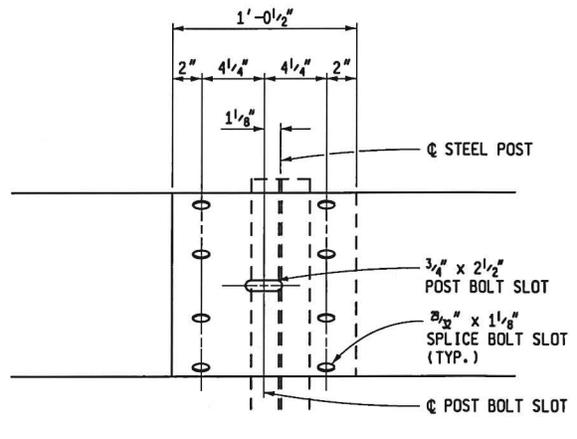
MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D

F.H.W.A. APPROVAL	2-27-2019 PLAN DATE	R-60-J	SHEET 2 OF 17
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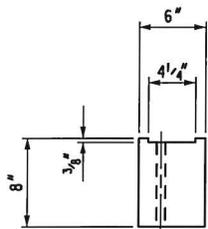


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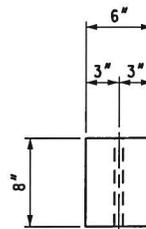


STEEL POST

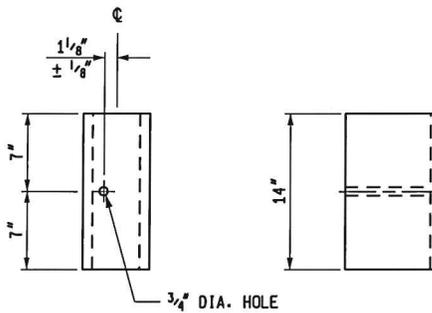
BEAM ELEMENT SPLICE DETAILS



TOP



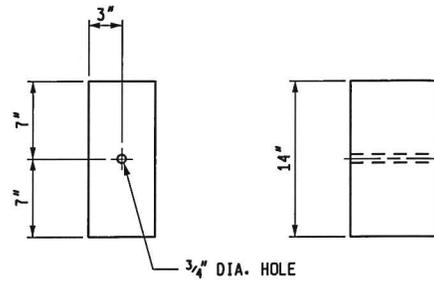
TOP



FRONT

SIDE

FOR USE ON STEEL POSTS



FRONT

SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE B AND TYPE BD

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

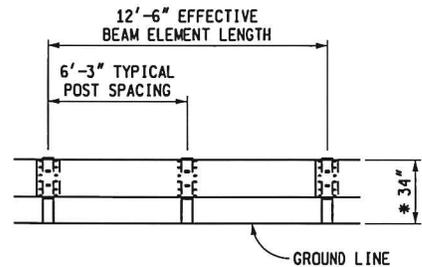
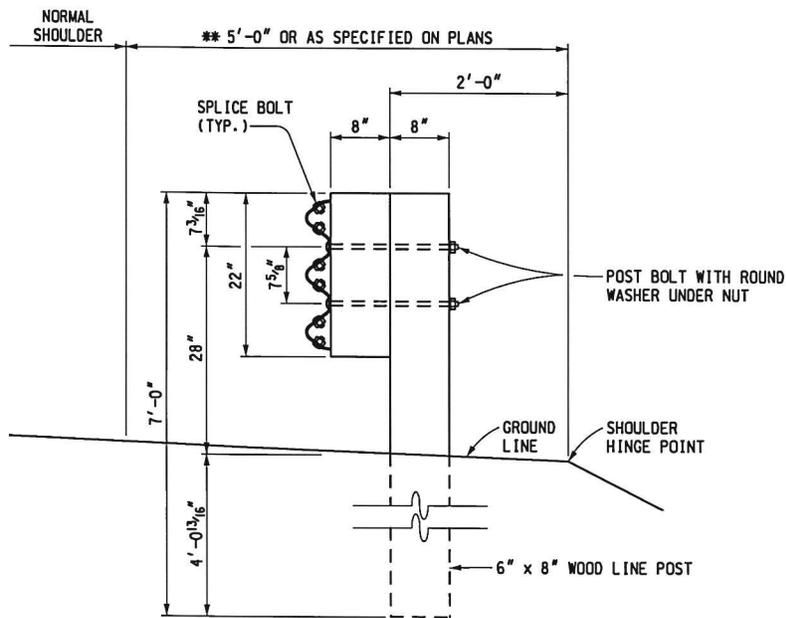
**GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D**

F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

R-60-J

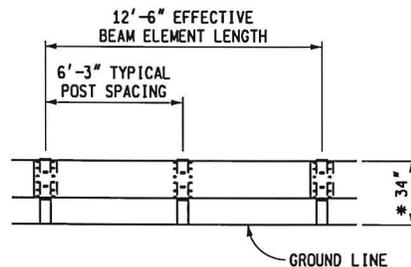
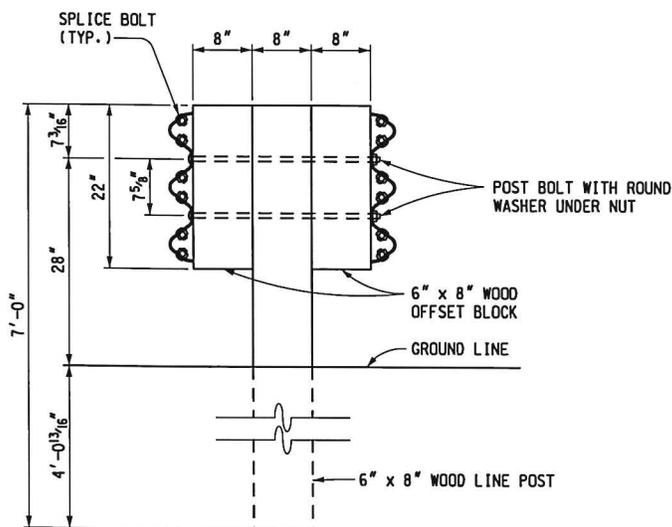
SHEET  
3 OF 17



ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

\*\* FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-0".

GUARDRAIL, TYPE T  
( WOOD POST )



ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE TD  
( WOOD POST )

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

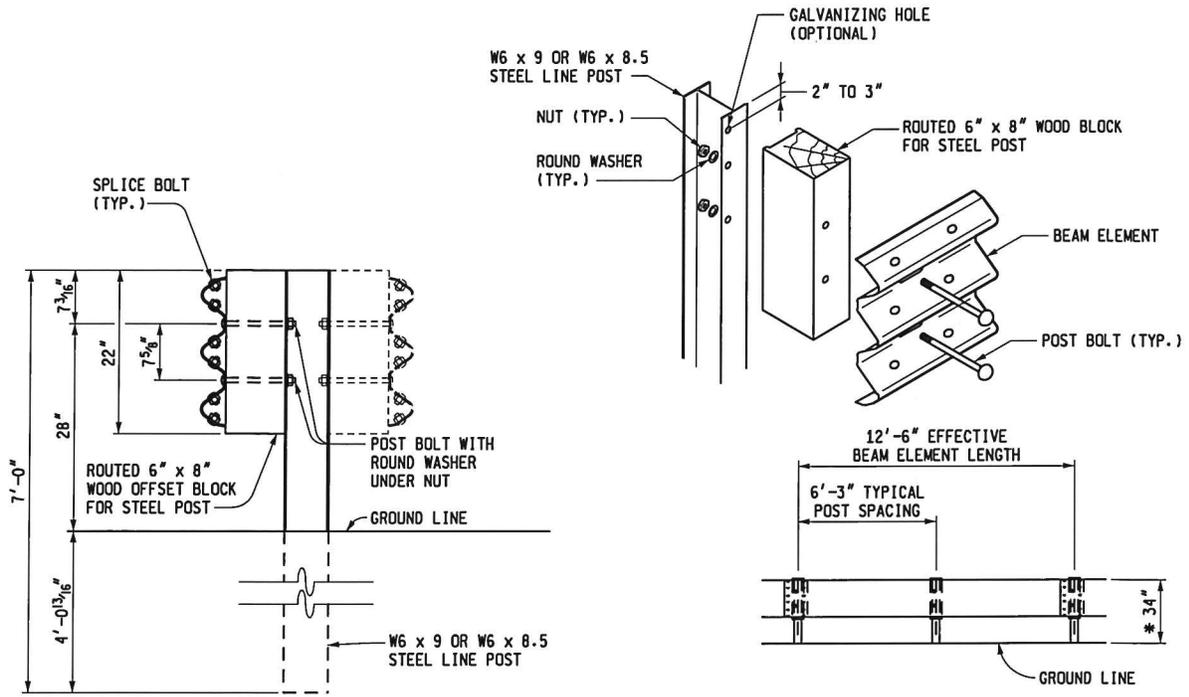
**GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D**

F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

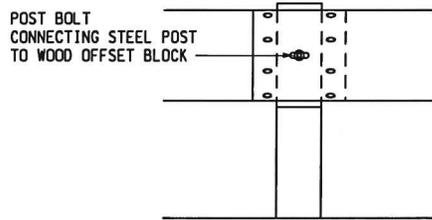
R-60-J

SHEET  
4 OF 17

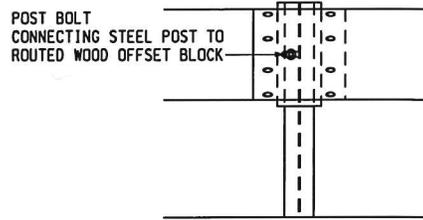


ELEVATION SHOWING POST SPACING  
\* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

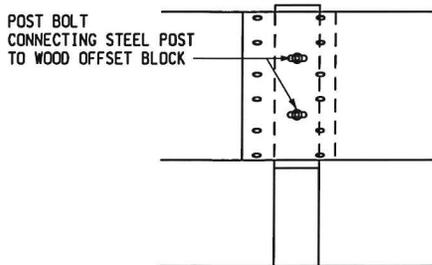
GUARDRAIL, TYPE T OR TD  
(STEEL POST)



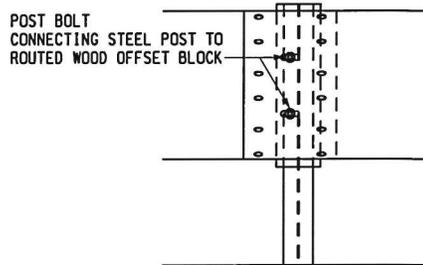
GUARDRAIL, TYPE B  
WOOD POST



GUARDRAIL, TYPE B  
STEEL POST



GUARDRAIL, TYPE T  
WOOD POST



GUARDRAIL, TYPE T  
STEEL POST

BLOCK AND POST CONNECTION DETAILS

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

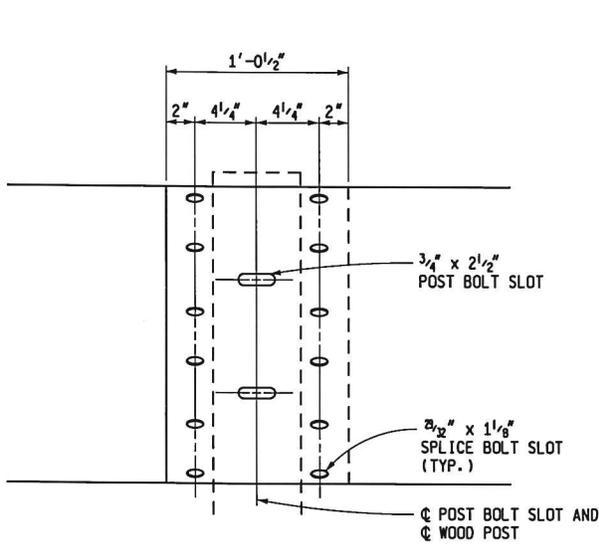
GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D

F.H.W.A. APPROVAL

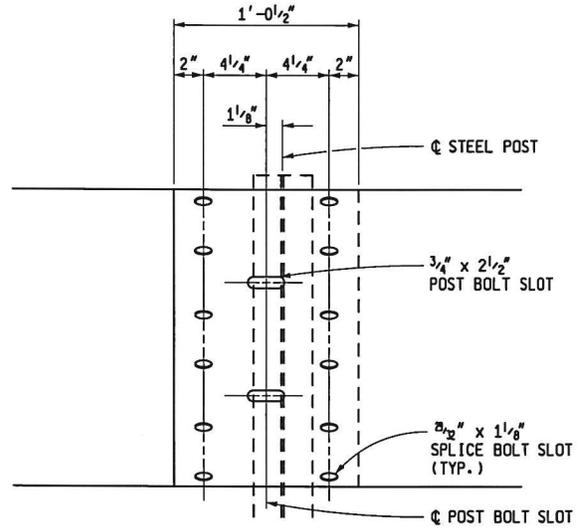
2-27-2019  
PLAN DATE

R-60-J

SHEET  
5 OF 17

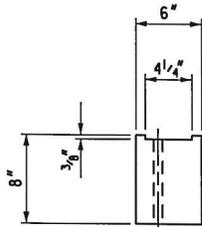


WOOD POST

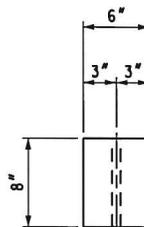


STEEL POST

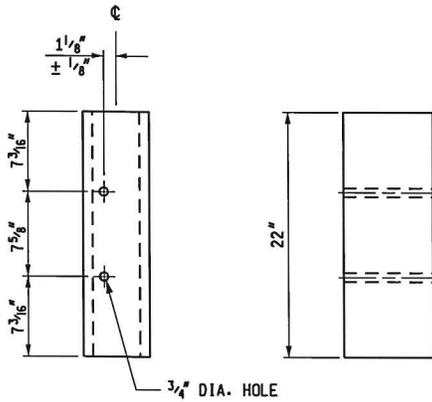
THREE BEAM ELEMENT SPLICE DETAILS



TOP



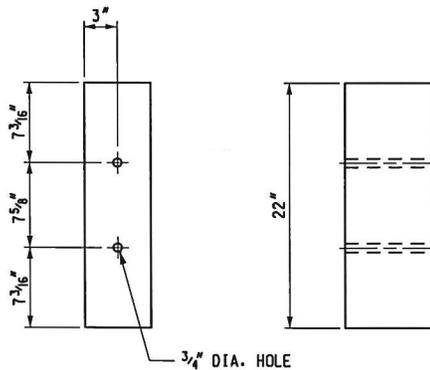
TOP



FRONT

SIDE

FOR USE ON STEEL POSTS



FRONT

SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE T AND TYPE TD

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

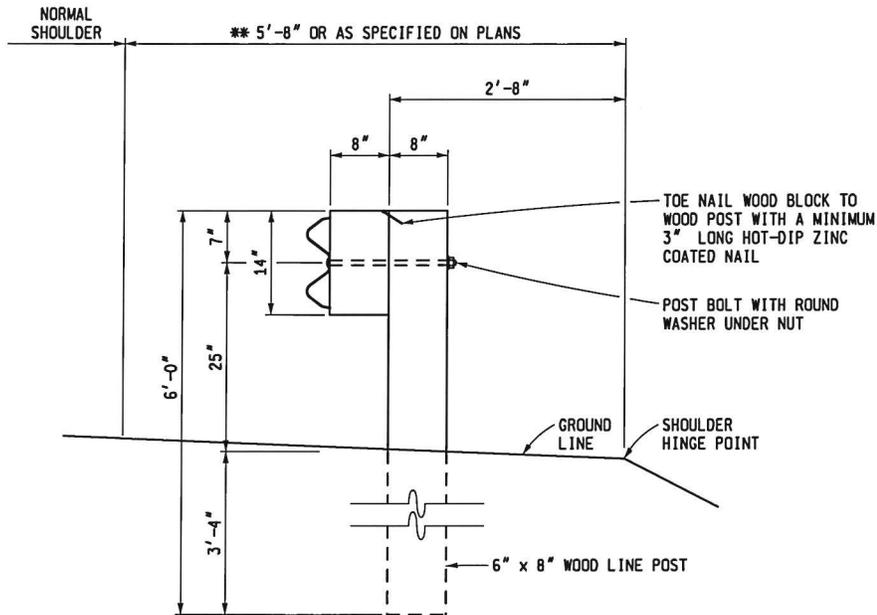
**GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D**

F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

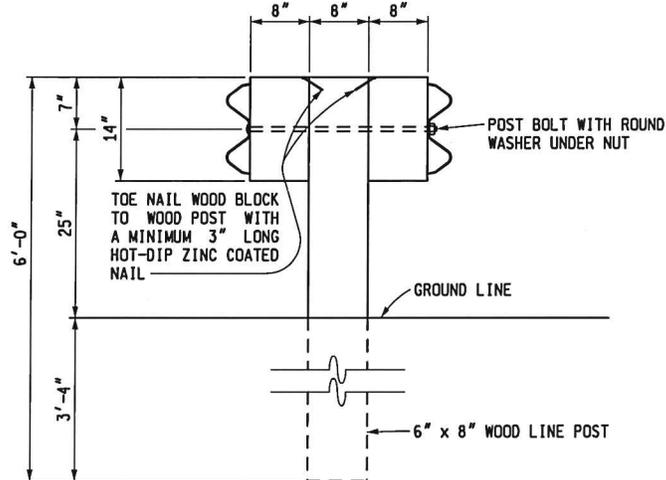
**R-60-J**

SHEET  
6 OF 17



\*\* FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-8".

**GUARDRAIL, TYPE MGS-8  
( WOOD POST )**



\*\* FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-0".

**GUARDRAIL, TYPE MGS-8D  
( WOOD POST )**

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

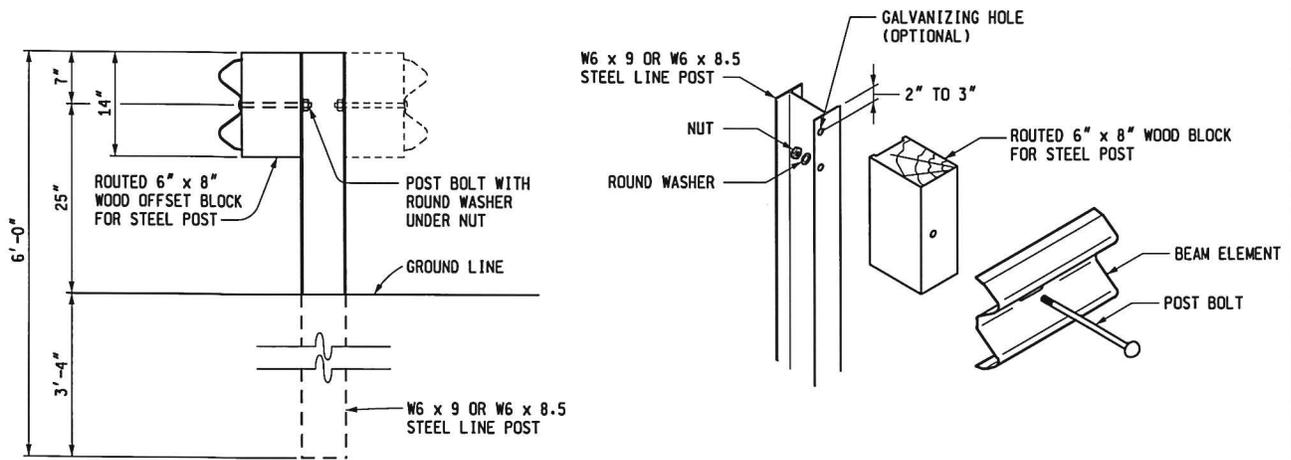
**GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D**

F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

R-60-J

SHEET  
7 OF 17



GUARDRAIL, TYPE MGS-8 (OR MGS-8D)  
( STEEL POST )

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D**

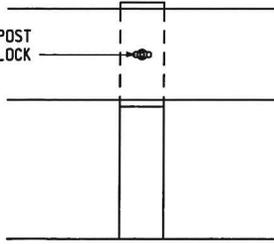
F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

R-60-J

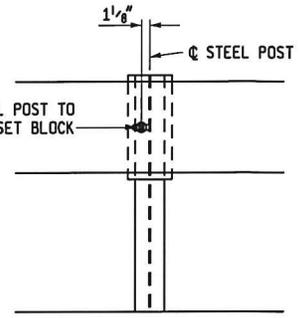
SHEET  
8 OF 17

POST BOLT  
CONNECTING WOOD POST  
TO WOOD OFFSET BLOCK



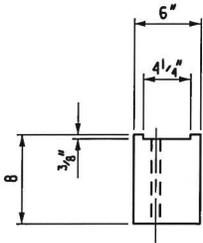
WOOD POST

POST BOLT  
CONNECTING STEEL POST TO  
ROUTED WOOD OFFSET BLOCK

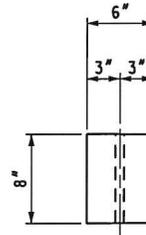


STEEL POST

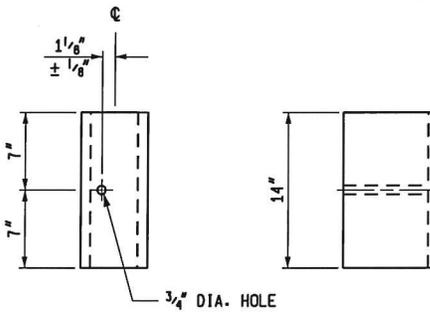
BLOCK AND POST CONNECTION DETAILS



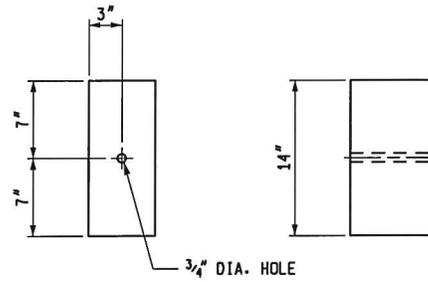
TOP



TOP



FRONT SIDE  
FOR USE ON STEEL POSTS



FRONT SIDE  
FOR USE ON WOOD POSTS  
(SEE NOTES ON SHEET 16 OF 16)

WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE MGS-8 AND TYPE MGS-8D

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

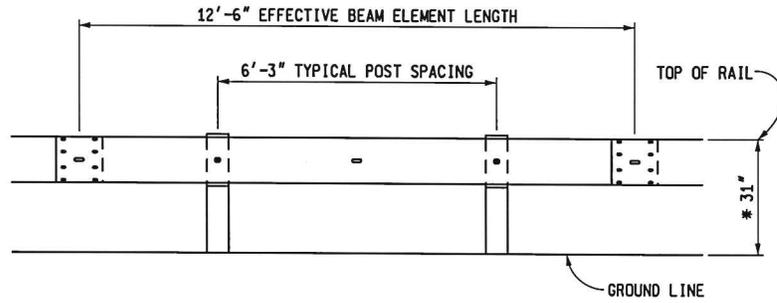
GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D

F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

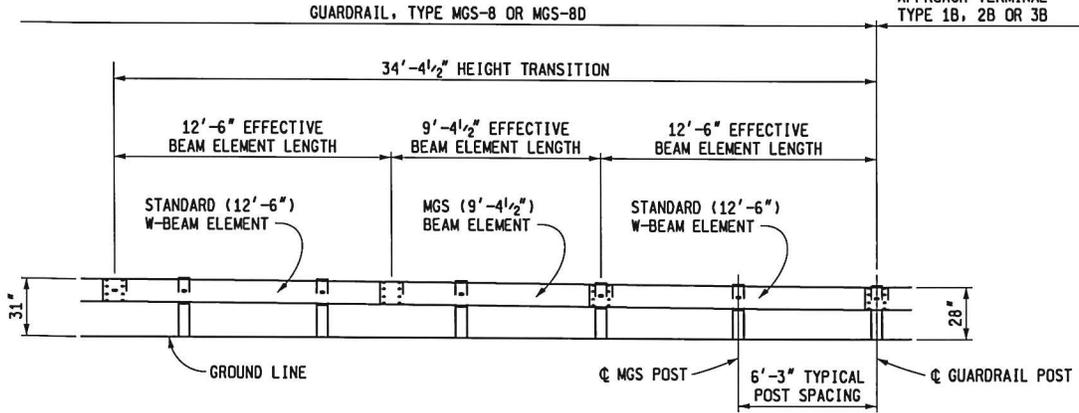
R-60-J

SHEET  
9 OF 17



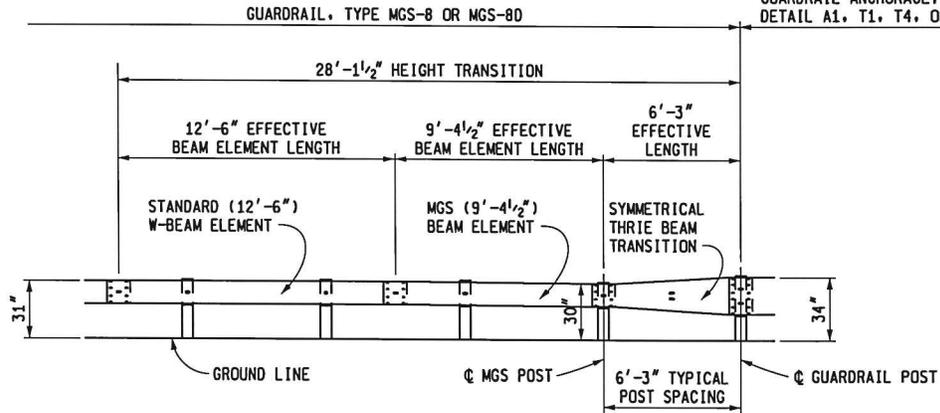
ELEVATION SHOWING POST SPACING FOR  
 GUARDRAIL, TYPE MGS-8 OR MGS-8D  
 \* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE B  
 GUARDRAIL, TYPE BD  
 OR GUARDRAIL  
 APPROACH TERMINAL  
 TYPE 1B, 2B OR 3B



ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING  
 GUARDRAIL, TYPE MGS-8 OR MGS-8D TO  
 GUARDRAIL, TYPE B, GUARDRAIL, TYPE BD, OR  
 GUARDRAIL APPROACH TERMINAL TYPE 1B, 2B, OR 3B

GUARDRAIL, TYPE T  
 GUARDRAIL, TYPE TD  
 GUARDRAIL ANCHORAGE, MEDIAN  
 GUARDRAIL ANCHORAGE, BRIDGE  
 DETAIL A1, T1, T4, OR T6



ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING  
 GUARDRAIL, TYPE MGS-8 OR MGS-8D TO  
 GUARDRAIL, TYPE T, GUARDRAIL, TYPE TD,  
 GUARDRAIL ANCHORAGE, MEDIAN,  
 GUARDRAIL ANCHORAGE, BRIDGE DETAIL A1, T1, T4 OR T6

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

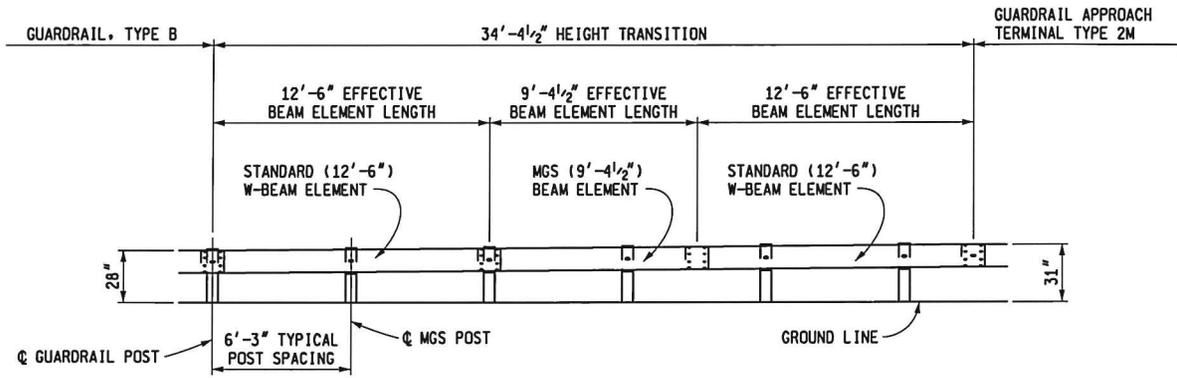
**GUARDRAIL,  
 TYPES A, B, BD, T, TD,  
 MGS-8, & MGS-8D**

F.H.W.A. APPROVAL

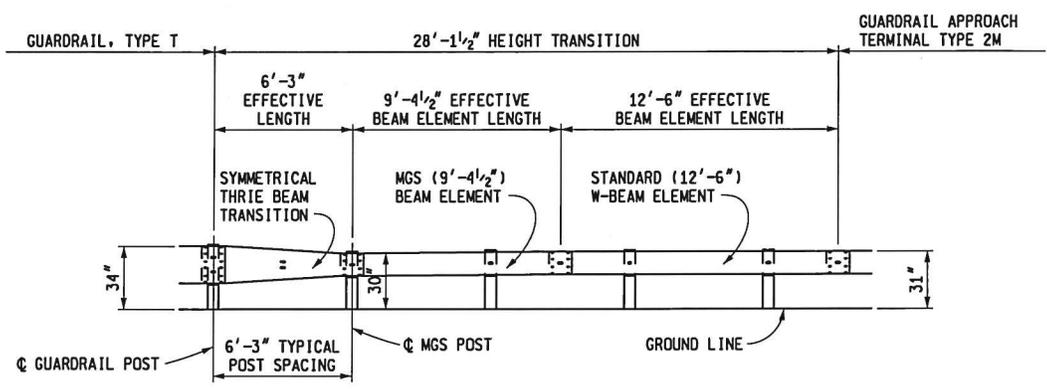
2-27-2019  
 PLAN DATE

**R-60-J**

SHEET  
 10 OF 17



ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING  
 GUARDRAIL, TYPE B TO  
 GUARDRAIL APPROACH TERMINAL TYPE 2M

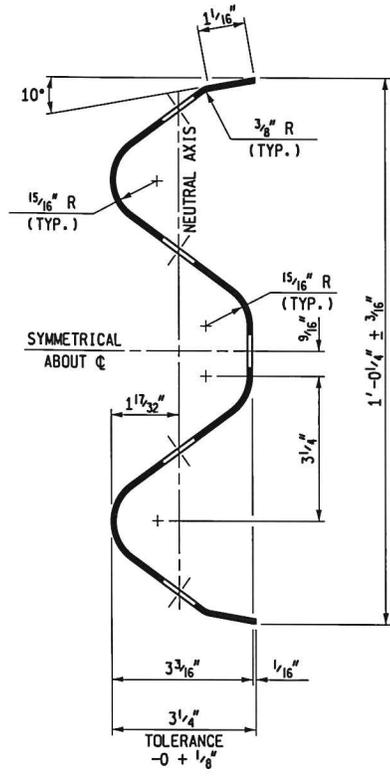


ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING  
 GUARDRAIL, TYPE T TO  
 GUARDRAIL APPROACH TERMINAL TYPE 2M

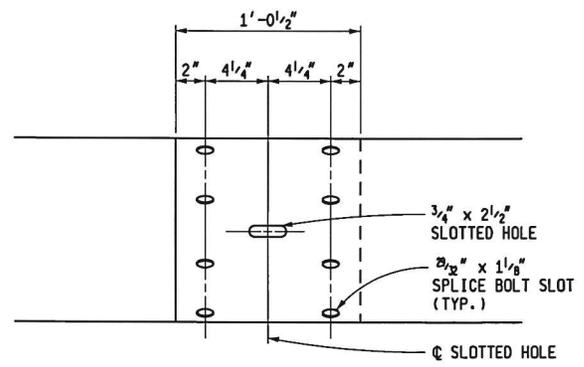
MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**GUARDRAIL,  
 TYPES A, B, BD, T, TD,  
 MGS-8, & MGS-8D**

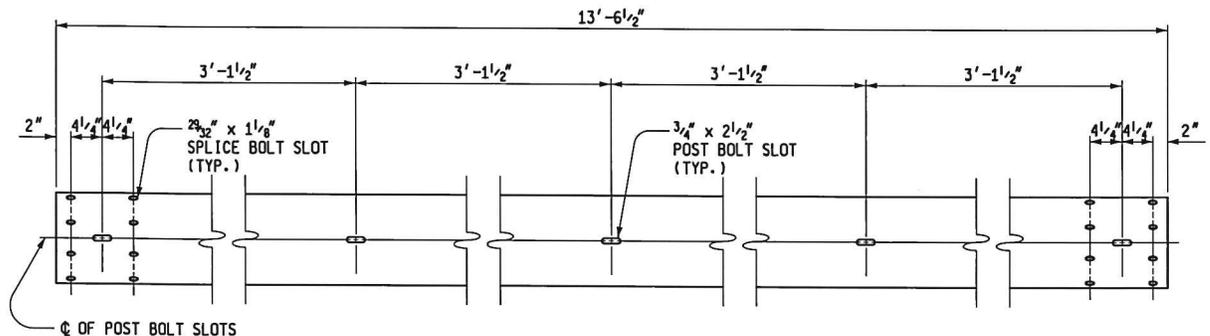
F.H.W.A. APPROVAL	2-27-2019 PLAN DATE	R-60-J	SHEET 11 OF 17
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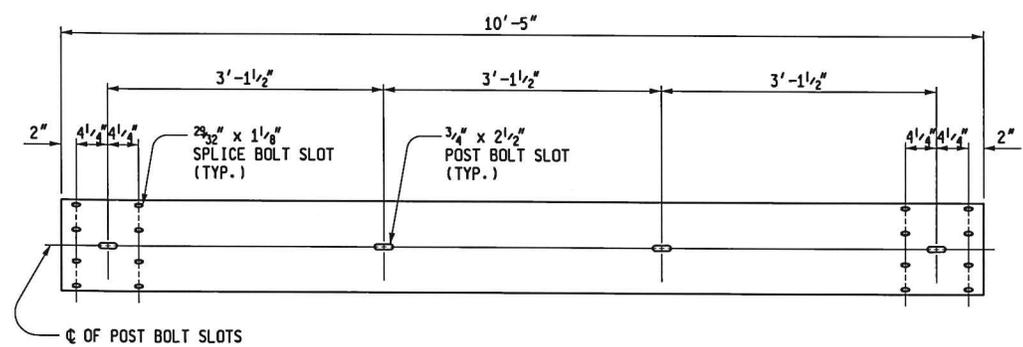
SECTION THROUGH BEAM ELEMENT



BEAM ELEMENT SPLICE DETAILS



FRONT ELEVATION OF BEAM ELEMENT



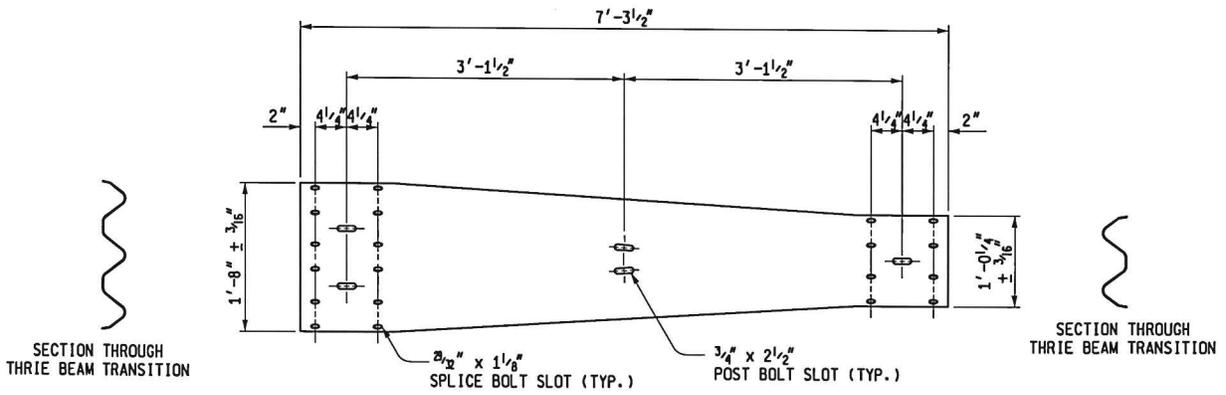
FRONT ELEVATION OF MGS (9'-4 1/2") BEAM ELEMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

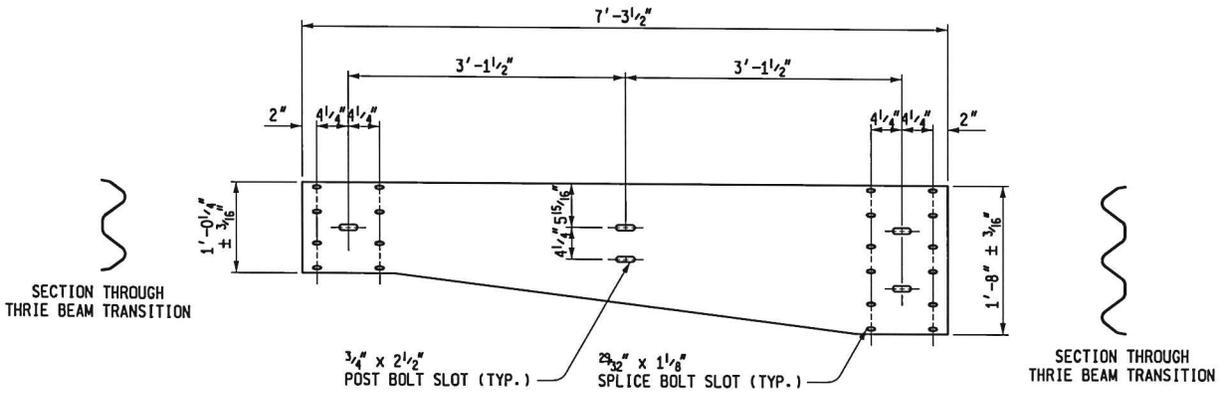
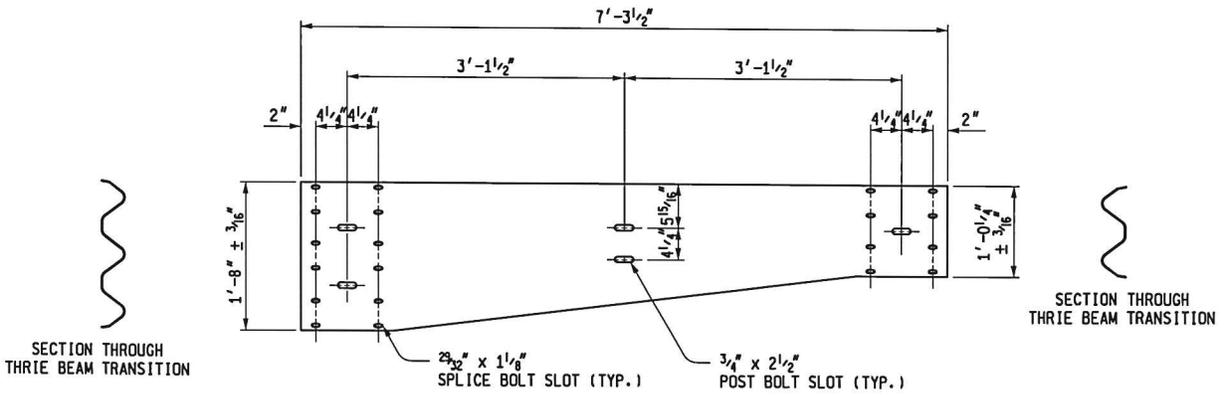
**GUARDRAIL,  
 TYPES A, B, BD, T, TD,  
 MGS-8, & MGS-8D**

F.H.W.A. APPROVAL	2-27-2019 PLAN DATE	R-60-J	SHEET 12 OF 17
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SYMMETRICAL THRIE BEAM TRANSITIONS



ASYMMETRICAL THRIE BEAM TRANSITIONS

NOTE: ASYMMETRICAL TRANSITION TYPE WILL VARY BY LOCATION DEPENDING ON GUARDRAIL LAYOUT

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

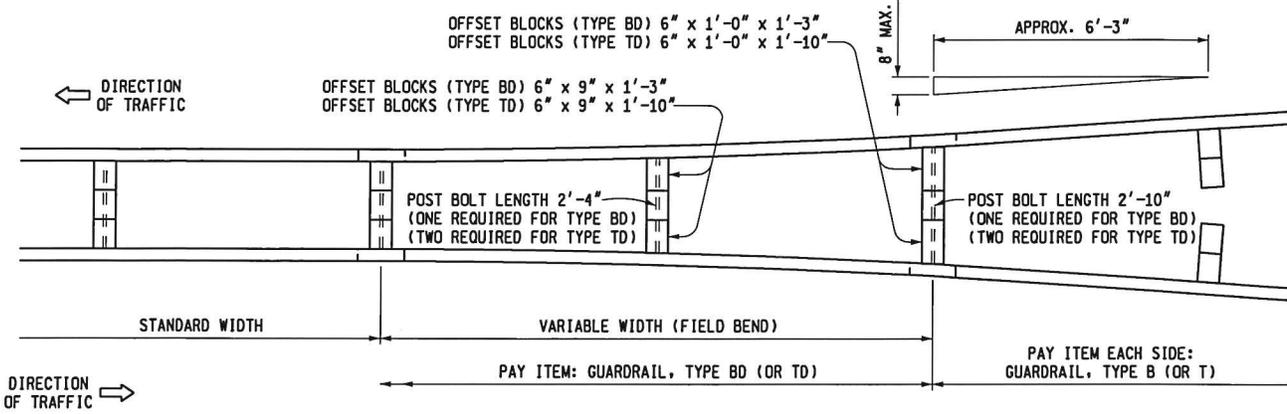
**GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D**

F.H.W.A. APPROVAL

2-27-2019  
PLAN DATE

R-60-J

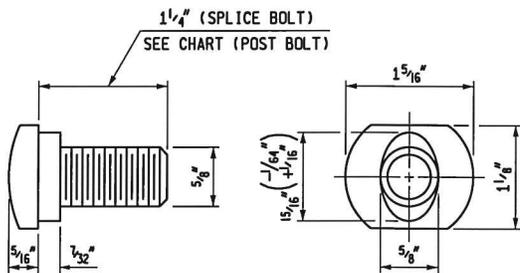
SHEET  
14 OF 17



DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD)

POST BOLTS, SPLICE BOLTS AND WASHERS AT BEAM ELEMENT SPLICE POSTS AND AT INTERMEDIATE POSTS						
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS		SPLICE BOLTS (1 1/4" LONG) (NO. REQ'D)	WASHERS (ROUND) (NO. REQ'D)
			NO. REQ'D	LENGTH		
A	WOOD	N/A	1	9 1/2"	8	1
	STEEL	N/A	1	2"		
B	WOOD	WOOD	1	18"	8	1
	STEEL	WOOD	1	9 1/2"		
BD	WOOD	WOOD	1	*26 1/2"	16	2
	STEEL	WOOD	2	9 1/2"		
T	WOOD	WOOD	2	18"	12	2
	STEEL	WOOD	2	9 1/2"		
TD	WOOD	WOOD	2	*26 1/2"	24	4
	STEEL	WOOD	4	9 1/2"		

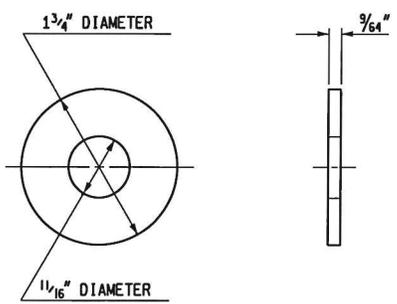
MINIMUM POST BOLT THREAD LENGTH	
BOLT LENGTH	MINIMUM THREAD LENGTH
9 1/2"	1 3/4"
18"	2 1/2"
26 1/2"	3"



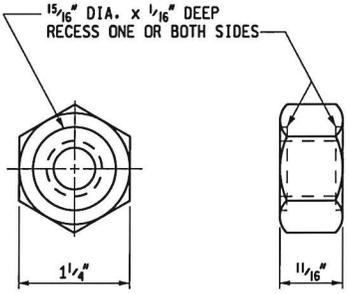
THREE BEAM TRANSITIONS REQUIRE 20 SPLICE BOLTS EACH (12 ON TYPE T END AND 8 ON TYPE B END).

\* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD). POST BOLTS SHALL NOT EXTEND MORE THAN 1/2" BEYOND NUT.

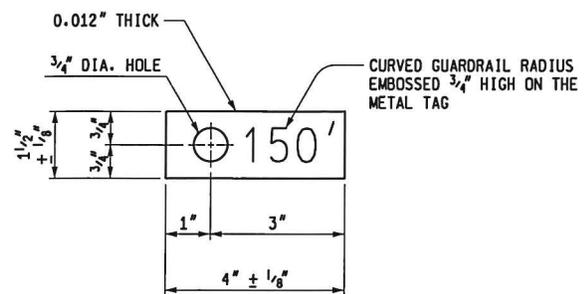
SPLICE BOLT AND POST BOLT



ROUND WASHER



NUT

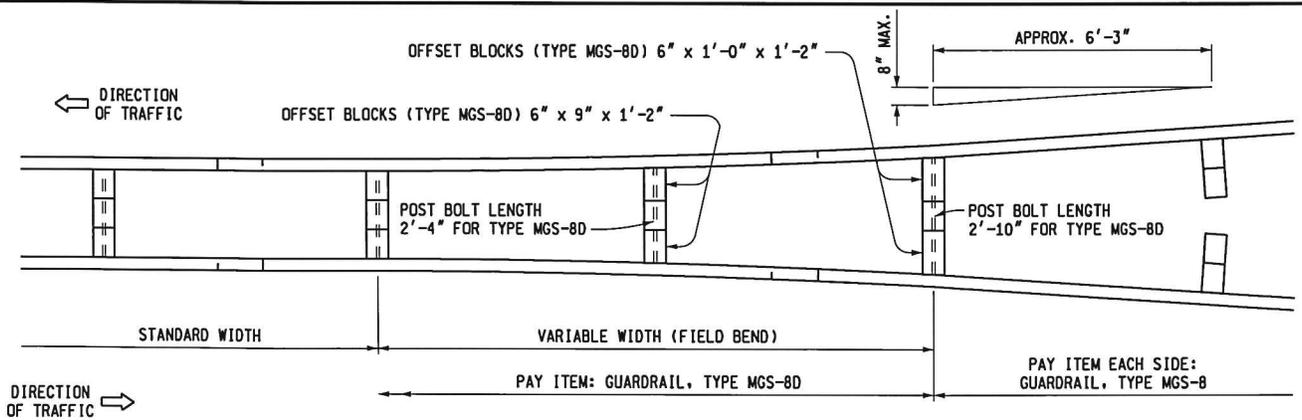


METAL TAG

FOR CURVED GUARDRAIL WITH RADIUS OF 150' OR LESS

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR  
**GUARDRAIL,  
 TYPES A, B, BD, T, TD,  
 MGS-8, & MGS-8D**

F.H.W.A. APPROVAL	2-27-2019 PLAN DATE	R-60-J	SHEET 15 OF 17
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**DETAIL SHOWING TRANSITION FROM  
GUARDRAIL, TYPE MGS-8 TO GUARDRAIL, TYPE MGS-8D**

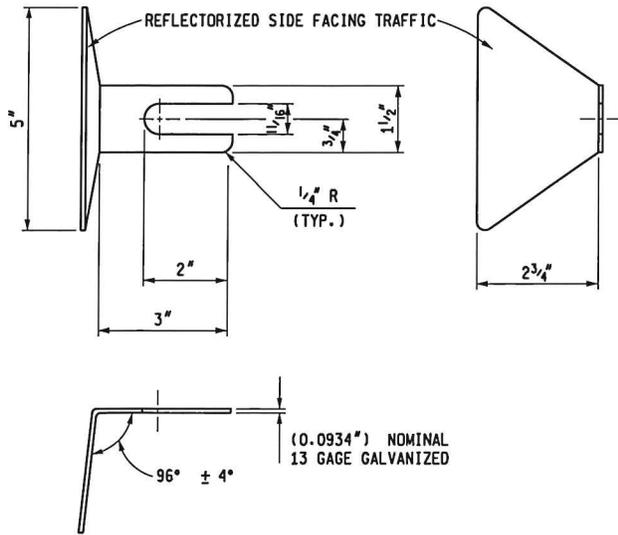
POST BOLTS, SPLICE BOLTS AND WASHERS AT BEAM ELEMENT SPLICE POSTS AND AT INTERMEDIATE POSTS						
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS		SPLICE BOLTS (1 1/4" LONG) (NO. REQ'D)	WASHERS (ROUND) (NO. REQ'D)
			NO. REQ'D	LENGTH		
MGS-8	WOOD	WOOD	1	18"	8	1
	STEEL	WOOD	1	9 1/2"		1
MGS-8D	WOOD	WOOD	1	*26 1/2"	16	—
	STEEL	WOOD	2	9 1/2"		2

THREE BEAM TRANSITIONS REQUIRE 20 SPLICE BOLTS EACH (12 ON TYPE T END AND 8 ON TYPE MGS END).

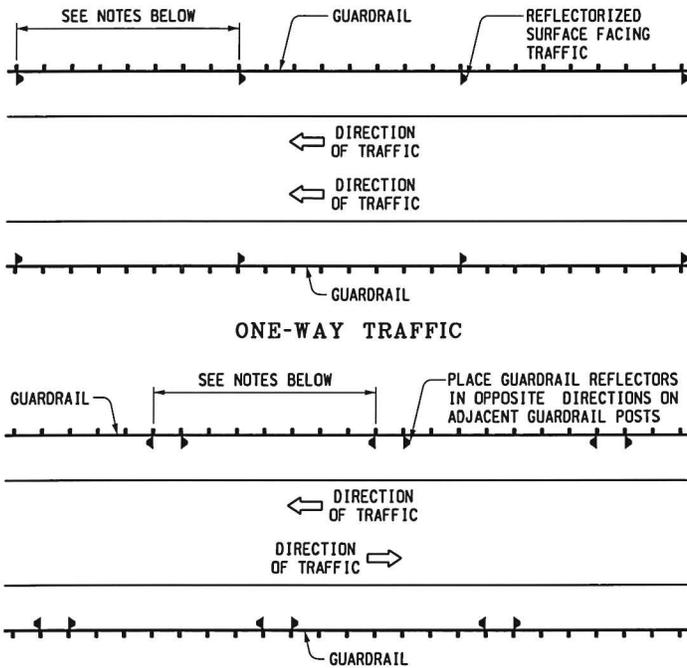
\* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE MGS-8 TO GUARDRAIL, TYPE MGS-8D POST BOLTS SHALL NOT EXTEND MORE THAN 1/2" BEYOND NUT.

MINIMUM POST BOLT THREAD LENGTH	
BOLT LENGTH	MINIMUM THREAD LENGTH
9 1/2"	1 3/4"
18"	2 1/2"
26 1/2"	3"

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR <b>GUARDRAIL,          TYPES A, B, BD, T, TD,          MGS-8, &amp; MGS-8D</b>			
F.H.W.A. APPROVAL	2-27-2019 PLAN DATE	<b>R-60-J</b>	SHEET 16 OF 17



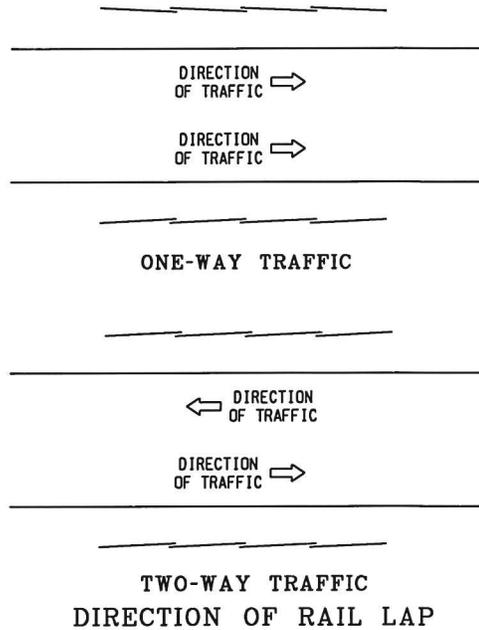
GUARDRAIL REFLECTOR



TWO-WAY TRAFFIC  
PLACEMENT OF GUARDRAIL REFLECTORS

NOTES GOVERNING THE USE OF GUARDRAIL REFLECTORS

1. GUARDRAIL REFLECTORS SHALL BE USED ON ALL STANDARD GUARDRAIL RUNS, REGARDLESS OF ROADWAY LIGHTING.
2. GUARDRAIL REFLECTORS ARE TO BE SPACED AT THE FOLLOWING INTERVALS:
  - a) 50'-0" ON TANGENT SECTIONS AND CURVES WITH A RADIUS OF 1150' OR MORE.
  - b) 25'-0" ON CURVES WITH A RADIUS LESS THAN 1150'.
3. FOR GUARDRAIL REFLECTOR PLACEMENT ON APPROACH TERMINALS, SEE THE APPROPRIATE GUARDRAIL APPROACH TERMINAL STANDARD PLAN.
4. A GUARDRAIL REFLECTOR IS TO BE PLACED ON THE SECOND POST FROM THE GUARDRAIL DEPARTING TERMINAL.
5. ON GUARDRAIL, TYPE T AND TYPE TD GUARDRAIL REFLECTORS ARE TO BE PLACED ON THE UPPER POST BOLT.
6. GUARDRAIL REFLECTORS SHALL MATCH COLOR OF EDGE LINE.



TWO-WAY TRAFFIC  
DIRECTION OF RAIL LAP

NOTES:

DETAILS SPECIFIED ON THIS STANDARD ARE ACCORDING TO THE AASHTO-AGC-ARTBA JOINT COMMITTEE, TASK FORCE 13 PUBLICATION TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE."

BEAM ELEMENTS SHALL BE SHOP BENT TO PLAN RADIUS FOR CURVE RADII 150' OR LESS. A TAG IDENTIFYING THE CURVATURE OF THE SHOP BENT SECTION WILL BE REQUIRED FOR EACH CURVED ELEMENT.

SEE STANDARD PLAN R-61-SERIES, R-62-SERIES OR R-63-SERIES FOR GUARDRAIL APPROACH TERMINALS, STANDARD PLAN R-66-SERIES FOR GUARDRAIL DEPARTING TERMINALS AND STANDARD PLAN R-67-SERIES FOR GUARDRAIL ANCHORAGE, BRIDGE.

WHEN THE PLANS SPECIFY GUARDRAIL (TYPE B OR T) TO BE PLACED ON THE SHOULDER HINGE POINT, RATHER THAN AS SPECIFIED ON THIS PLAN, 8'-0" POSTS SHALL BE PROVIDED, WITH THE ADDITIONAL LENGTH EMBEDDED FOR ADDED STABILITY. (NOT NECESSARY WHEN THE SLOPE IS REASONABLY LEVEL BEYOND THE SHOULDER HINGE POINT, AS DETERMINED BY THE ENGINEER.)

WHEN THE PLANS SPECIFY GUARDRAIL TYPE MGS-8 TO BE PLACED ON THE SHOULDER HINGE POINT, RATHER THAN AS SPECIFIED ON THIS PLAN, 9'-0" POSTS SHALL BE PROVIDED, WITH THE ADDITIONAL LENGTH EMBEDDED FOR ADDED STABILITY. (NOT NECESSARY WHEN THE SLOPE IS REASONABLY LEVEL BEYOND THE SHOULDER HINGE POINT, AS DETERMINED BY THE ENGINEER.)

WOOD POSTS WITH 1/2" BEVELS AT THE TOP MAY BE USED IN LIEU OF WOOD POSTS WITHOUT BEVELS SPECIFIED. THE LENGTH, WIDTH AND DEPTH OF THE POST SHALL BE AS SPECIFIED ON THIS STANDARD AND THE POST BOLT HOLES SHALL BE LOCATED TO ENSURE PROPER RAIL HEIGHT.

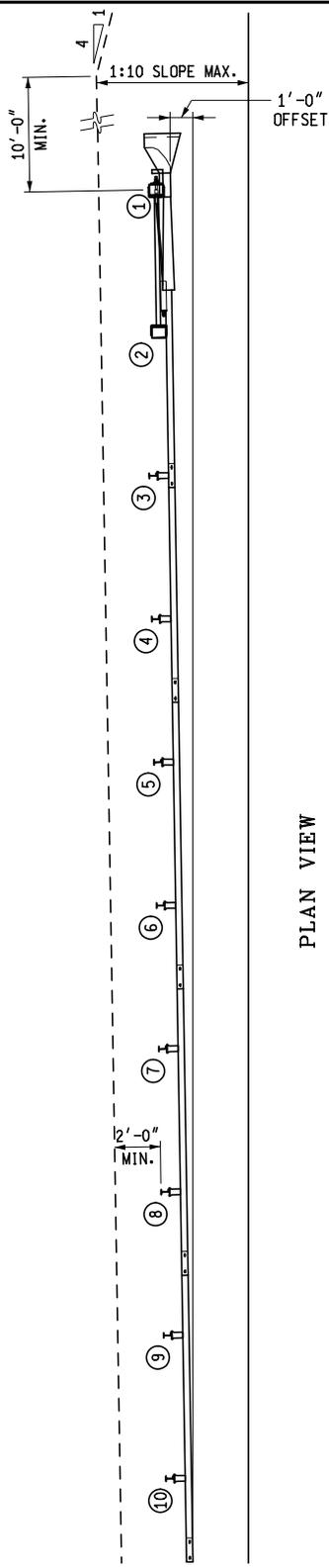
WOOD OFFSET BLOCKS WITH 1/2" BEVELS AT THE TOP AND BOTTOM OR A 1" BEVELED TOP MAY BE USED IN LIEU OF WOOD BLOCKS WITHOUT BEVELS SPECIFIED. THE LENGTH (FRONT AND BACK FACE), WIDTH AND DEPTH OF THE BLOCK SHALL BE AS SPECIFIED ON THIS STANDARD AND THE POST BOLT HOLES SHALL BE LOCATED TO ENSURE PROPER RAIL HEIGHT AND COMPATIBILITY WITH POST HOLES.

WHEN THE FACE OF GUARDRAIL IS PLACED FLUSH WITH FACE OF CURB, THE RAIL HEIGHT SHOULD BE MEASURED FROM THE FRONT EDGE OF THE GUTTER PAN, WHICH IS THE POINT ON THE GUTTER PAN THAT IS CLOSEST TO THE EDGE OF THE TRAVELED LANE. WHEN THE FACE OF THE GUARDRAIL PANEL IS LOCATED BEHIND THE CURB THE RAIL HEIGHT SHOULD BE MEASURED FROM THE GROUND JUST IN FRONT OF THE GUARDRAIL.

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

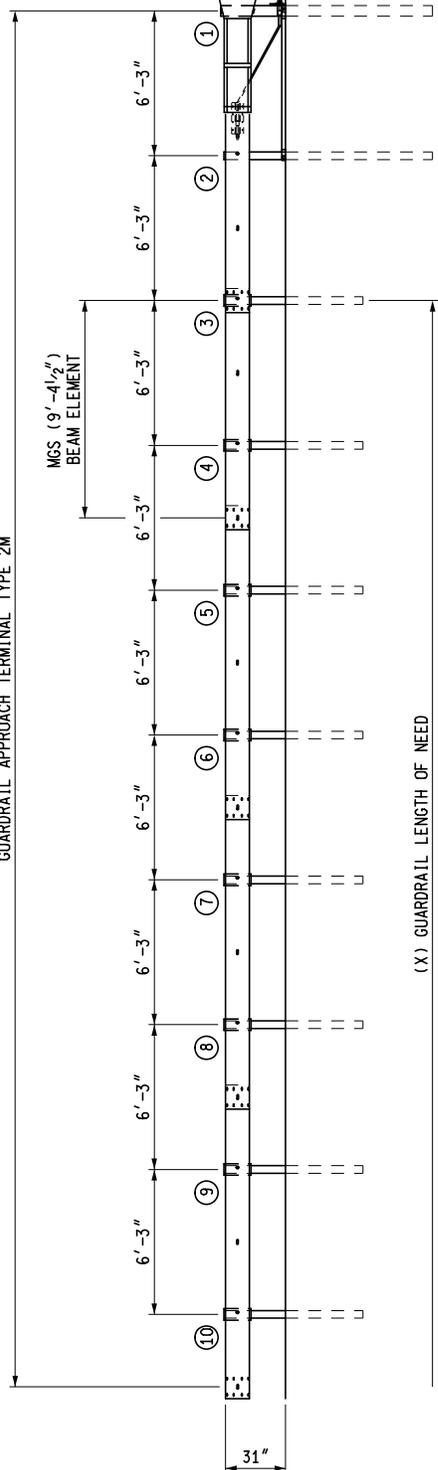
GUARDRAIL,  
TYPES A, B, BD, T, TD,  
MGS-8, & MGS-8D

F.H.W.A. APPROVAL	2-27-2019 PLAN DATE	R-60-J	SHEET 17 OF 17
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PLAN VIEW

59' -4 1/2"  
GUARDRAIL APPROACH TERMINAL TYPE 2M



ELEVATION  
GUARDRAIL APPROACH TERMINAL TYPE 2M  
"MSKT"

OPTION 1



PREPARED BY  
DESIGN DIVISION  
DRAWN BY: B.L.T.  
CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR  
Paul C. Ajegba

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

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

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

GUARDRAIL APPROACH  
TERMINAL TYPE 2M

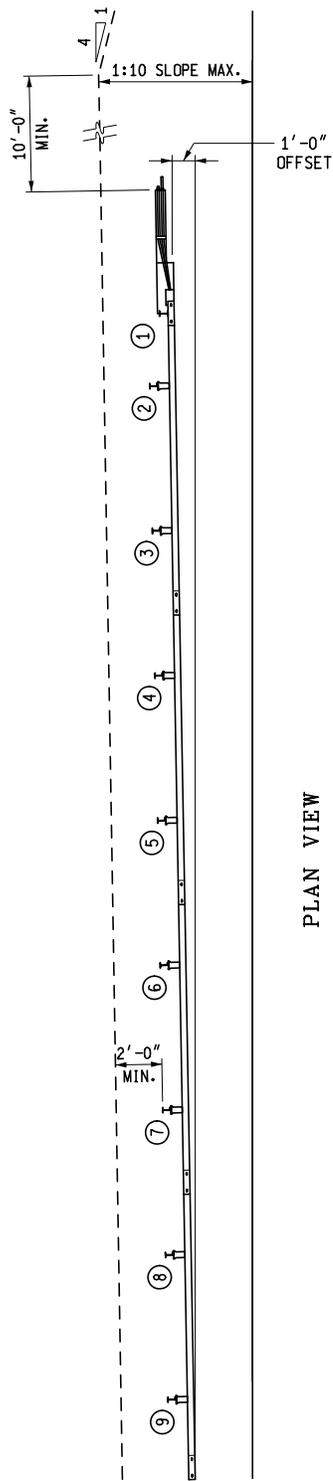
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F.H.W.A. APPROVAL

9-22-2020  
PLAN DATE

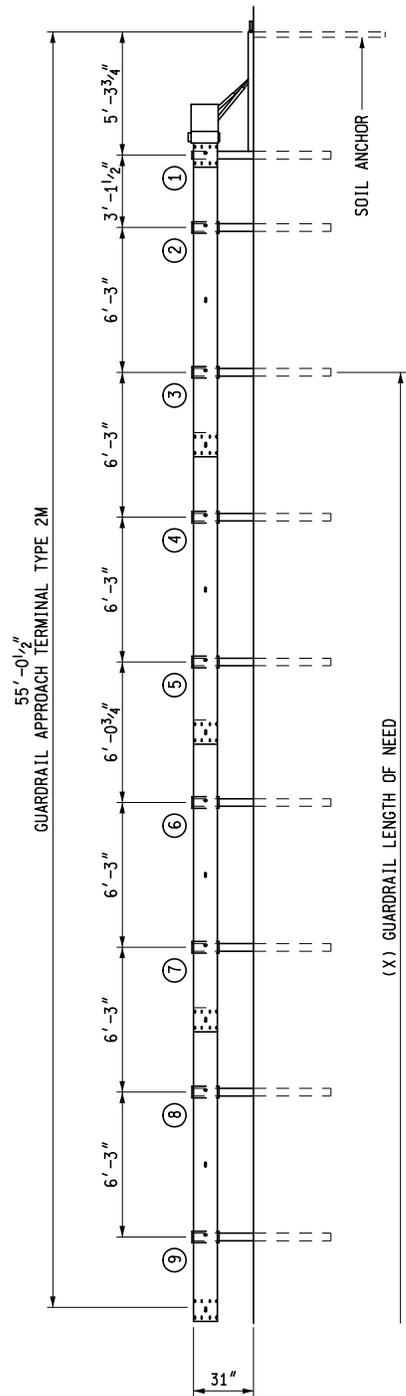
R-62-H

SHEET  
1 OF 4





PLAN VIEW



ELEVATION  
 GUARDRAIL APPROACH TERMINAL TYPE 2M  
 "MAX-TENSION"

OPTION 3

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		
<h2 style="margin: 0;">GUARDRAIL APPROACH          TERMINAL TYPE 2M</h2>		
F.H.W.A. APPROVAL	9-22-2020 PLAN DATE	R-62-H SHEET 3 OF 4

NOTES:

ALL POSTS, OFFSET BLOCKS, BEAM ELEMENTS, AND HARDWARE (INCLUDING BOLTS, NUTS, AND WASHERS) SHALL CONFORM TO THE MANUFACTURER'S DETAILS AND SPECIFICATIONS.

ALL 1:10 SLOPES SHALL BE GRADED TO CLASS A SLOPE TOLERANCES.

WHEN SITE CONDITIONS WARRANT AND WITH THE APPROVAL OF THE ENGINEER, GUARDRAIL APPROACH TERMINAL TYPE 2M CAN BE INSTALLED STRAIGHT (WITHOUT THE 1'-0" OFFSET FROM THE TANGENT LINE TO THE TRAFFIC FACE OF POST 1).

GUARDRAIL REFLECTORS AND OTHER ATTACHMENTS ARE NOT TO BE USED ON THE GUARDRAIL APPROACH TERMINAL. PLACE REFLECTORS BEGINNING ON STANDARD RUN OF GUARDRAIL.

USE REFLECTIVE SHEETING ACCORDING TO THE FOLLOWING TRAFFIC CONDITIONS: (NOTE: ALTERNATE 3" BLACK AND 3" YELLOW STRIPES ON A 45° ANGLE)



TRAFFIC PASSING ON  
THE LEFT SIDE



TRAFFIC PASSING ON  
BOTH SIDES



TRAFFIC PASSING ON  
THE RIGHT SIDE

THE PORTION OF THE IMPACT HEAD ASSEMBLY FACING TRAFFIC SHALL BE COMPLETELY COVERED WITH HIGH INTENSITY ADHESIVE REFLECTIVE SHEETING.

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

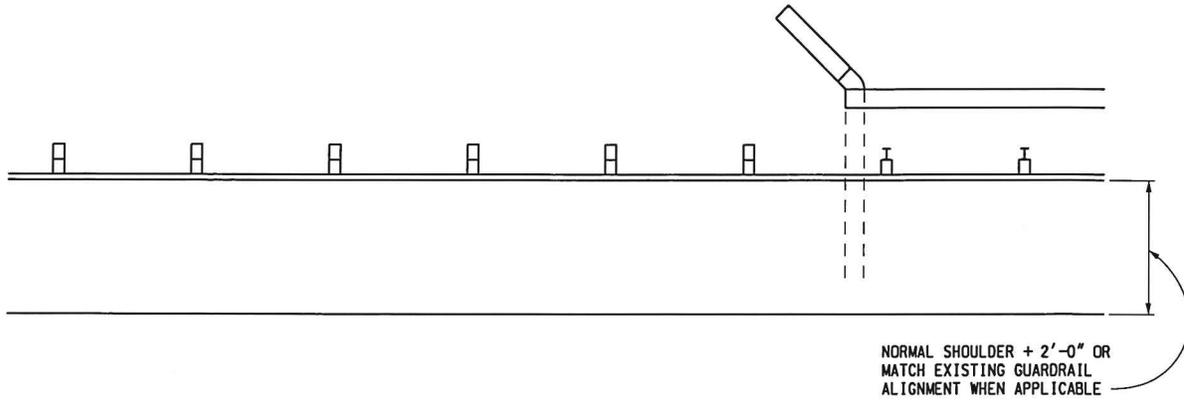
**GUARDRAIL APPROACH  
TERMINAL TYPE 2M**

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

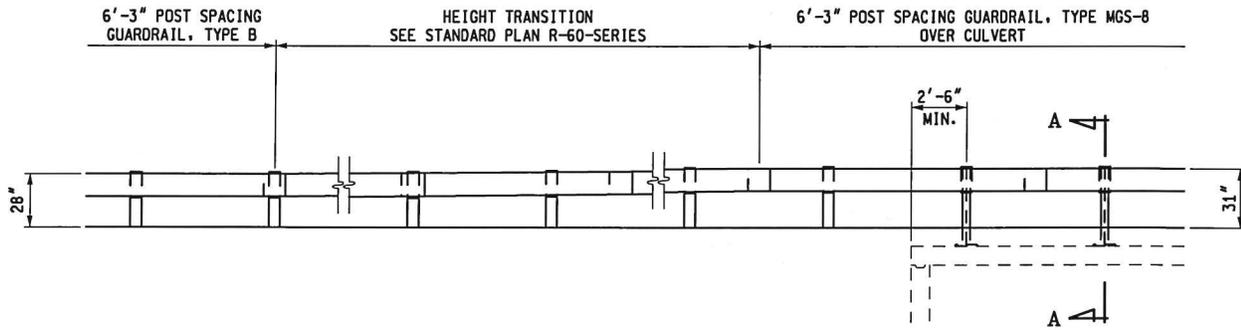
9-22-2020  
\_\_\_\_\_  
PLAN DATE

**R-62-H**

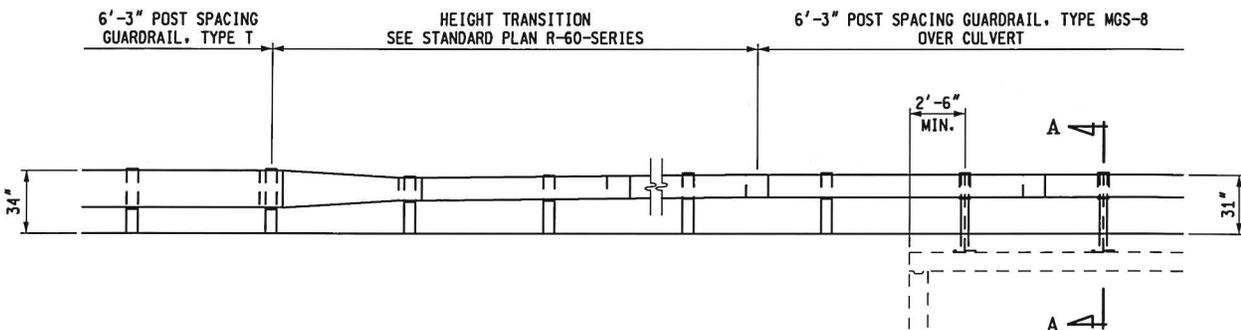
SHEET  
4 OF 4



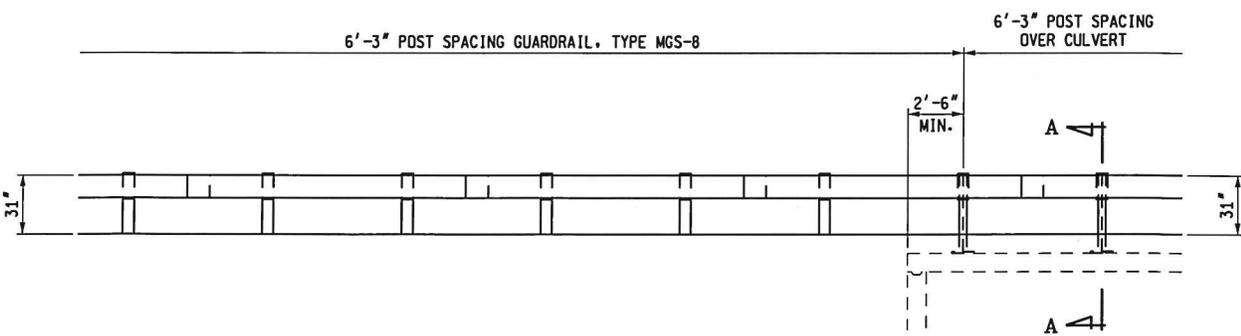
**PLAN VIEW**



**ELEVATION SHOWING GUARDRAIL, TYPE B**



**ELEVATION SHOWING GUARDRAIL, TYPE T**



**ELEVATION SHOWING GUARDRAIL, TYPE MGS-8**



PREPARED BY  
DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR  
Paul C. Ajegba

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

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

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

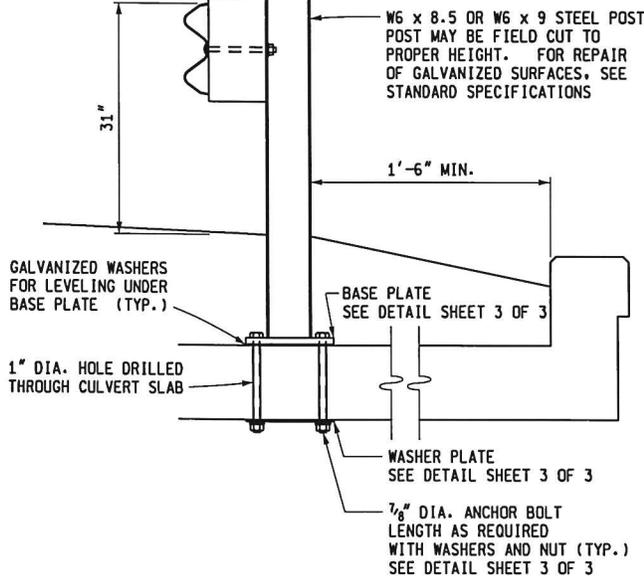
**GUARDRAIL OVER  
BOX OR SLAB CULVERTS**

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

8-1-2019  
PLAN DATE

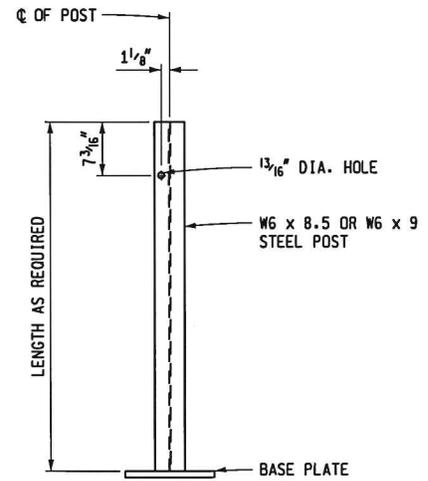
**R-73-F**

SHEET  
1 OF 3

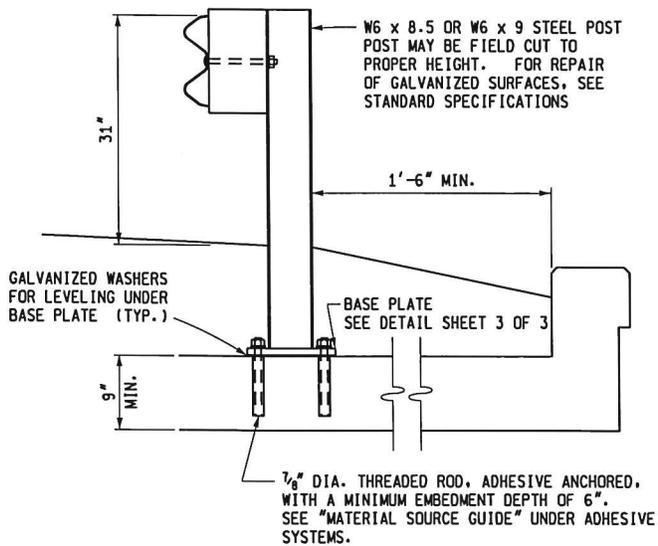


SECTION A - A

PREFERRED CONSTRUCTION METHOD

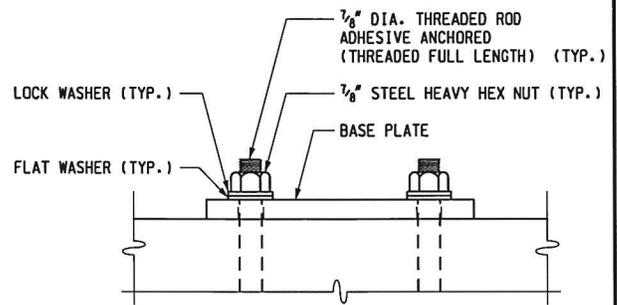


STEEL POST DETAIL FOR GUARDRAIL, TYPE MGS-8



SECTION A - A

ALTERNATE CONSTRUCTION METHOD



ANCHOR DETAIL

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

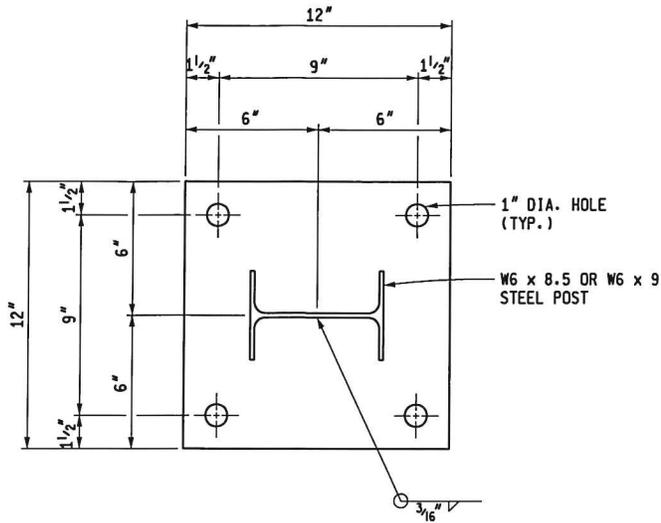
GUARDRAIL OVER  
BOX OR SLAB CULVERTS

F.H.W.A. APPROVAL

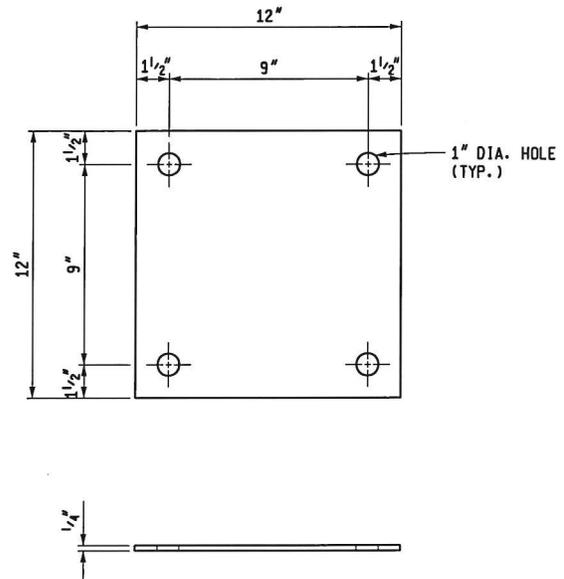
8-1-2019  
PLAN DATE

R-73-F

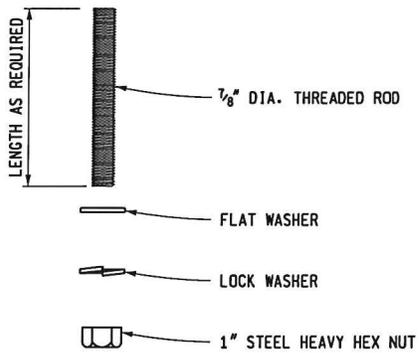
SHEET  
2 OF 3



**BASE PLATE DETAIL**



**WASHER PLATE DETAIL**



**THREADED ROD DETAIL**

**NOTES:**

GUARDRAIL SHALL BE CONSTRUCTED AND PAID FOR ACCORDING TO THE CURRENT STANDARD PLAN R-60-SERIES AND THE CURRENT STANDARD SPECIFICATIONS. IN ADDITION, POSTS ANCHORED TO THE CULVERT SLAB WILL BE PAID FOR AS "GUARDRAIL POST, CULV", WHICH INCLUDES ALL LABOR AND MATERIALS REQUIRED TO CONSTRUCT THE POST AS DETAILED ON THIS PLAN.

ALL MATERIALS FOR GUARDRAIL POST, CULVERT SHALL MEET THE CURRENT STANDARD SPECIFICATIONS FOR BRIDGE RAILINGS.

ALL WORK AND MATERIALS SHALL BE ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS.

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

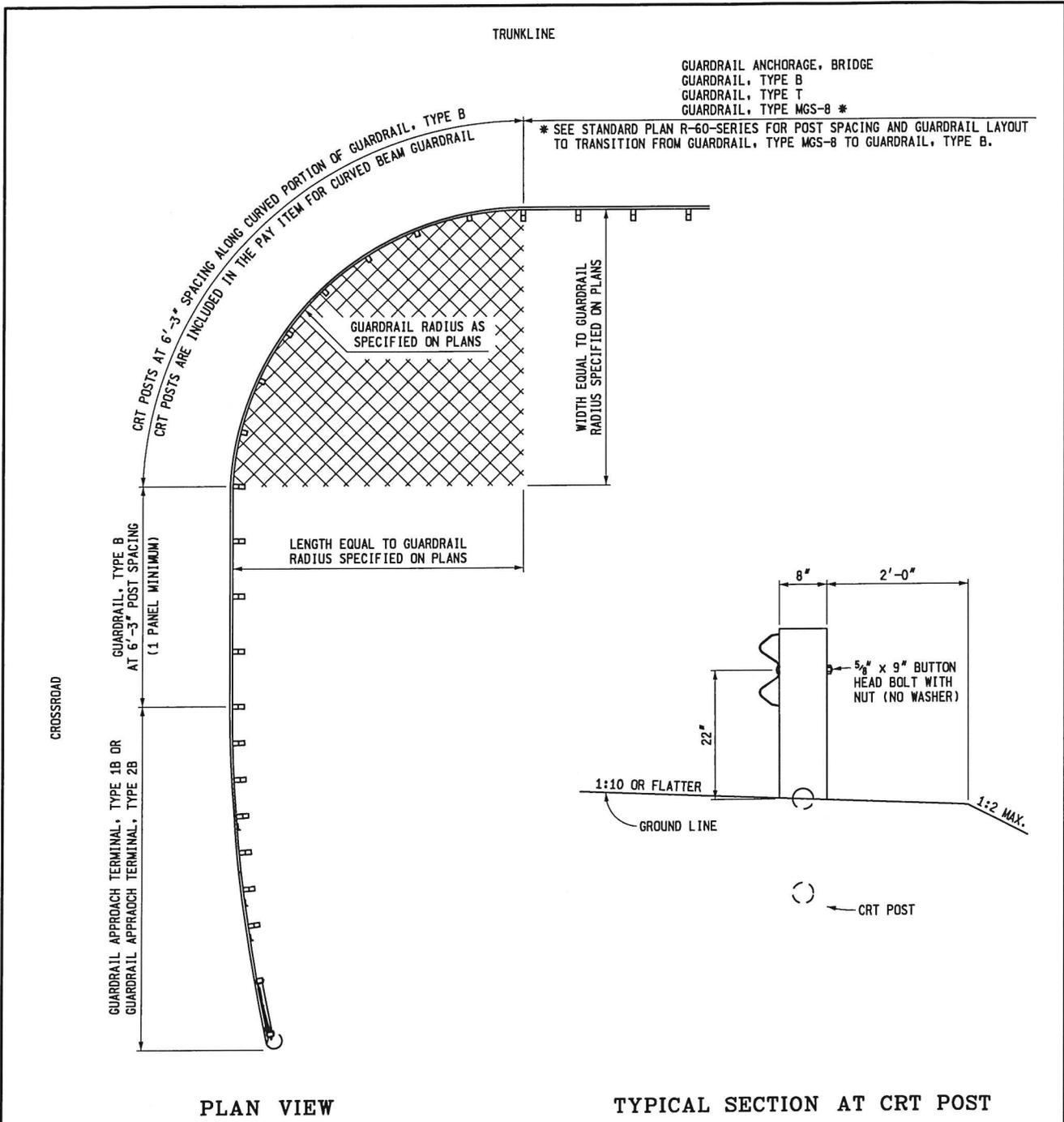
**GUARDRAIL OVER  
BOX OR SLAB CULVERTS**

F.H.W.A. APPROVAL

8-1-2019  
PLAN DATE

**R-73-F**

SHEET  
3 OF 3

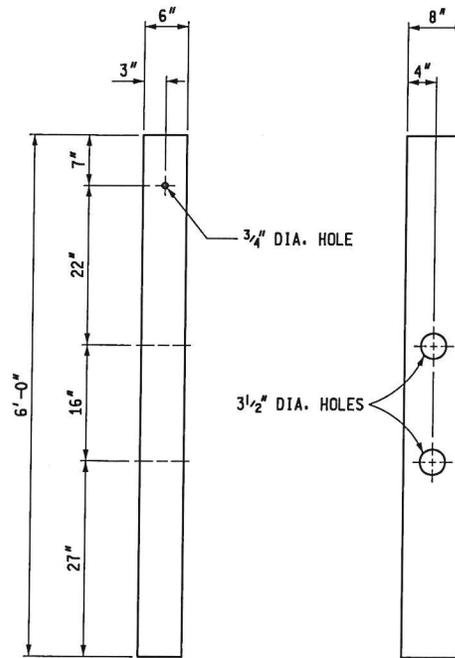


PLAN VIEW

TYPICAL SECTION AT CRT POST

NOTE:  
 FOR DRIVEWAYS, IF R.O.W. ALLOWS, USE DEPARTING END TERMINAL. (SEE STANDARD PLAN R-66-SERIES). IF R.O.W. IS LIMITED SUCH THAT A TYPICAL DEPARTING END TERMINAL CANNOT BE FIT IN, DRILL 8 HOLES IN THE CURVED BEAM GUARDRAIL TO ACCOMMODATE AN ANCHOR PLATE AND INSTALL A CABLE ANCHOR SIMILAR TO THAT OF THE DEPARTING END TERMINAL ON STANDARD PLAN R-66-SERIES. THIS WILL BE PAID FOR AS GUARDRAIL, DEPARTING TERMINAL.

 PREPARED BY DESIGN DIVISION DRAWN BY: B.L.T. CHECKED BY: W.K.P.	DEPARTMENT DIRECTOR Kirk T. Stuedle  APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT SPECIAL DETAIL  <b>GUARDRAIL AT INTERSECTIONS</b>	
	APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT	F.H.W.A. APPROVAL	3-14-2016 PLAN DATE



**CONTROLLED RELEASING TERMINAL POST  
( CRT )**

**NOTES:**

THE SLOPE IN FRONT OF THE INSTALLATION SHOULD NOT EXCEED 1:10 AND EXTEND TO 2'-0" BEYOND THE GUARDRAIL POST. THE SLOPE BEYOND THIS HINGE LINE SHALL BE 1:2 OR FLATTER.

THE CROSS HATCHED AREA BEHIND THE CURVED GUARDRAIL SHOULD BE KEPT FREE OF FIXED OBJECTS.

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT SPECIAL DETAIL

**GUARDRAIL AT INTERSECTIONS**

	3-14-2016 PLAN DATE	<b>SPECIAL DETAIL 21</b>	SHEET 2 OF 2
F.H.W.A. APPROVAL			

MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
**QUALITY INDEX FOR PORTLAND CEMENT CONCRETE (FOR LOCAL AGENCY  
PROJECTS ONLY)**

CFS:CPM

1 of 4

APPR:TES:JFS:05-28-20  
FHWA:APPR:06-04-20

**a. Description.** This special provision establishes pay factor and price adjustments for Portland cement concrete (PCC) based on Quality Assurance (QA) testing of 28-day compressive strength and fresh concrete air content of PCC. Perform all work in accordance with the standard specifications and this special provision.

**b. Materials.** Mixture requirements will be in accordance with section 1004 of the Standard Specifications for Construction, unless otherwise specified in the contract.

**c. Sampling.** Sampling will be in accordance with subsections 1003.03.H and 1003.03.L of the Standard Specifications for Construction, except as modified herein. A sample is defined as a representative quantity of concrete taken during production which is used to measure the quality characteristics for the concrete. Compressive strength specimens for each sample consist of two cylinders, either 4-inch by 8-inch or 6-inch by 12-inch. A random number will be generated for each respective subplot. The sampling frequency for a production lot is one QA sample per subplot.

See subsection 1003.03.J in the Standard Specifications for Construction for reduced sampling and testing for small incidental quantities.

**d. Quality Index Analysis.** The Engineer's QA test results will be used to determine the pay factor (PF) and price adjustment (ADJ). The Contractor QC test results will be not used for PF and ADJ analysis. The Engineer will complete PF and ADJ analysis within 7 working days after completion of all 28-day compressive strength testing for the represented production lot or quantity of concrete. All values of PF and OLPF in these formulas are decimal, not percent. All values of PF and OLPF are rounded to two decimal places.

**Table 1: Quality Index Parameter Specification Limits**

Quality Characteristic	Specification Limits
Air Content of Fresh Concrete (percent)	5.5 – 8.5
Rejection Limit (percent)	<5.0 or >9.0
Conc. Temp. (deg. F)	45 - 90 at time of placement
Slump (max.) (inch)	See footnotes a through I in Table 1004-1 of the Standard Specifications for Construction
28-day Compressive Strength (psi)	For LSL see Table 2
Rejection Limit - 28-day Compressive Strength	See Table 2

**Table 2: Quality Index Parameter Specification Limits for 28-Day Compressive Strength**

Parameter	Grade of Concrete						
	3000	3500	3500HP	4000	4000HP	4500	4500HP
Lower Specification Limit (psi)	3000	3500	3500	4000	4000	4500	4500
Rejection Limit for an Individual Strength Sample Test Result (psi)	2500	3000	3000	3500	3500	4000	4000

1. Pay Factor for 28-Day Compressive Strength ( $PF_s$ ). (not to exceed 1.00)

$$PF_s = (\text{QA Test Strength})/\text{LSL}$$

Where:

QA Test Strength = QA 28-day compressive strength sample test result.

LSL = Lower specification limit (see Table 2).

If the tested strength does not meet the rejection limit specified in Table 2, the Engineer will require additional evaluation as described in section e of this special provision.

2. Pay Factor for Air Content of Fresh Concrete ( $PF_{ac}$ ). The pay factor for air content of fresh concrete ( $PF_{ac}$ ) will be in accordance with Table 3.

**Table 3: Air Content of Fresh Concrete Pay Factor ( $PF_{ac}$ )**

Air Content of Fresh Concrete (percent)	Pay Factor ( $PF_{ac}$ )
5.5 – 8.5	1.00
5.0 – 5.4	0.50
Below 5.0	Rejection
8.6 – 9.0	0.75
Above 9.0	Rejection

If the air content of fresh concrete is below 5.0 or above 9.0 percent, the Engineer will elect to do one of the following:

A. Require removal and replacement of the entire quantity of concrete represented by the test with new testing conducted on the replacement concrete and repeat the evaluation procedure.

B. Allow submittal of a corrective action plan for the Engineer's approval. If the Engineer does not approve the plan for corrective action, subsection d.2.A. will be applied. All costs associated with plan submittal and corrective action under this subsection will be borne by the Contractor.

3. Overall Lot Pay Factor (OLPF). Use the following formula to determine the OLPF and ADJ. The OLPF will not exceed 1.00:

$$\text{OLPF} = (0.60 \times \text{PF}_s) + (0.40 \times \text{PF}_{ac})$$

Where:

$\text{PF}_{ac}$  = Pay factor for Air Content (see Table 3)

4. Price Adjustment (ADJ). Use the following formula to determine the ADJ.

$$\text{ADJ} = (\text{OLPF} - 1)(\text{Price})$$

5. Price Adjustment for Small Incidental Quantities. Price adjustment for 28-day compressive strength deficiencies will be based on test results for the corresponding weekly QA test specimens and the pay factor ( $\text{PF}_s$ ) calculated in accordance with the formula defined in subsection d.1. The price adjustment is calculated by the following equation:

$$(\text{ADJ}) = (\text{PF}_s - 1)(\text{Price})$$

Where:

ADJ = Price adjustment per pay unit to be applied to the quantity represented by the QA test.

$\text{PF}_s$  = Pay Factor for 28-day compressive strength (not to exceed 1.00).

Price = Base price when established for the pay item or the Contractors unit price bid when concrete is included in another pay item without a base price.

**e. Evaluation of Rejectable Concrete.** The Engineer will require additional evaluation to decide what further action may be warranted. Acceptance for air content of fresh concrete will be based on QA test results reported at the time of concrete placement.

If the Engineer determines that non-destructive testing (NDT) is appropriate, this work will be done by the Contractor in the presence of the Engineer within 45 calendar days of concrete placement. All costs associated with this work will be borne by the Contractor. Ensure complete set of non-destructive tests is conducted (in accordance with the respective standard test method) at a minimum three randomly selected locations. If NDT is used to estimate the in-situ strength, a calibrated relationship between the project job mix formula (JMF) under evaluation and the NDT apparatus must have been established prior to NDT testing in accordance with its respective standard test method.

If the 28-day compressive strength QA test results show that the rejection limit (as specified in Table 2) has not been achieved, the quantity of concrete under evaluation will be rejected and the Engineer will require additional evaluation to decide what further action may be warranted.

Propose an evaluation plan and submit it to the Engineer for approval before proceeding. The results from NDT will be used only to decide what further action is required. This determination will be made by the Engineer, as follows:

1. For Non-structural Concrete. If no test result from non-destructive testing falls below the lower specification limit (LSL) 28-day compressive strength, the represented quantity of

concrete under evaluation will remain in place and a pay factor for 28-day compressive strength ( $PF_s$ ) of 1.00 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations in accordance with section d of this special provision.

2. For Structural Concrete (including overhead sign foundations). If no test result from non-destructive testing falls below the lower specification limit (LSL), the represented quantity of concrete under evaluation will remain in place and a pay factor for 28-day compressive strength ( $PF_s$ ) of 0.85 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations will be in accordance with section d of this special provision.

3. If one or more of the non-destructive test results fall below the lower specification limit (LSL) 28-day compressive strength, the Engineer may elect to do one of the following:

A. Require removal and replacement of the entire rejected quantity of concrete, including new initial tests for quality index analysis conducted in accordance with section d of this special provision.

B. Allow the Contractor to submit a plan for corrective action, for the Engineer's approval, to address the disposition of the rejected concrete. If the Engineer does not approve the plan for corrective action, subsection e.3.A of this special provision will be applied. All costs associated with plan submittal and corrective action under this subsection will be borne by the Contractor.

C. Allow the in-situ quantity of concrete under evaluation to remain in place and a pay factor ( $PF_s$ ) of 0.50 will be applied for overall lot pay factor (OLPF) and price adjustment (ADJ) determinations will be in accordance with section d of this special provision.

**f. Measurement and Payment.** If a price adjustment is made for reasons included in this special provision, that adjustment will be made using the base price established for the specific item. If a contract unit price requires adjustment for other reasons not described in this special provision, the adjustments will be made using the original unit price and the adjustments will be cumulative.