

SECTION 02751

DRAIN CROSSINGS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Drain Crossings.
- B. Remove Existing Structure.
- C. Remove and Reinstall Guardrail.
- D. Concrete Box Culvert.

1.2 RELATED SECTIONS

- A. Section 02110 – Site Clearing.
- B. Section 02140 – Dewatering.
- C. Section 02211 – Rough Grading.
- D. Section 02222 – Excavation.
- E. Section 02223 – Backfilling.
- F. Section 02226 – Storm Sewer Trenching and Backfill.
- G. Section 02271 – Slope Protection and Erosion Control.
- H. Section 02279 – Filter Fabric.
- I. Section 02923 – Landscape Grading.
- J. Section 02936 – Seeding.

1.3 REFERENCES

- A. AASHTO M-218 and ASTM A-444.
- B. AASHTO M-219 and ASTM B-746.
- C. AASHTO M-246 and ASTM A-742.
- D. AASHTO M-245 and ASTM A-762.
- E. AASHTO M-36 and ASTM A-929.
- F. ASTM B-209.
- G. ASTM B-789.
- H. ASTM B-790.

- I. AASHTO Standard Bridge Specification - Section 12.7.
- J. MDOT Standard Specifications for Construction, Section 807.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Submit shop drawings and product data for all items to be installed and/or constructed within this Section.
- C. Provide 2 copies of permits for road and highway crossing permits to Engineer.

1.5 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Drain Crossings:
 - 1. Basis of Measurement: At the unit price bid per linear foot as stated in the proposal.
 - 2. Basis of Payment: Includes material, labor, and equipment for installation of culvert, removal of existing crossing (if any), backfill materials, filter fabric, grout, any prefabricated tees, underdrains, mitering or end sections, field tile connections and/or relocations and outlets, dewatering, transportation of salvaged pipe, removal and reinstallation of guardrails, if any, and native or gravel drive restoration as shown in the plans. In summary crossing complete as shown on plans and in specifications except for headwalls and plain riprap.
- B. Remove Existing Structure:
 - 1. Basis of Measurement: Included in the unit price bid for drain crossing or concrete box culvert or at the lump sum price bid for remove existing structure as stated in the proposal.
 - 2. Basis of Payment: Includes all equipment, labor and material to remove and dispose of the existing structure complete. Unless otherwise specified, removed crossing shall become property of the Contractor to be disposed offsite.
- C. Concrete Box Culvert:
 - 1. Basis of Measurement: At the unit price bid per linear foot as stated in the proposal.
 - 2. Basis of Payment: Includes material, labor, and equipment for installation of precast concrete box culvert, bedding materials, backfill materials, filter fabric, grout, field tile connections, cobblestone and concrete curbs in box culverts where indicated, relocations, outlets, and dewatering. Also includes clearing of trees, grubbing and removal of all items necessary for installation of the box culverts as shown on the plans.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. All Corrugated metal pipe shall be galvanized unless otherwise noted.
- B. Galvanized Pipe Material: steel coils shall conform to applicable requirements of AASHTO M-218 or ASTM A-444.
- C. Polymer Precoated Material: steel coils shall conform to applicable requirements of AASHTO M-246 or ASTM A-742.

- D. Galvanized Pipe: corrugated metal pipe – size, corrugations and gauge as indicated on the plans or Engineer approved equal. Manufactured in accordance with the applicable requirements of AASHTO M-36 or ASTM A-929.
- E. Polymer Precoated Pipe: corrugated metal pipe – size, corrugations and gauge as indicated on the plans. Manufactured in accordance with the applicable requirements of AASHTO M-245 or ASTM A-762.
- F. All corrugated steel joints must be banded according to manufacturers instructions and must be wrapped with a 3 feet band of filter fabric. Joints must fit within .10 feet.
- G. Coupling bands shall be corrugated with rubber gasket and shall be same material as pipe. Bands shall be manufactured by pipe supplier and approved by Engineer.
- H. Precast concrete box culvert – HS-20 loading as indicated on the plans. Manufactured according to ASTM C-789 or C-850. Joints shall be sealed with bitumastic rope.
- I. Backfill - See Section 02223 - Backfilling.
- J. Drive Surface - See Section 02575 - Pavement Repair.
- K. Native Crossings.
 - 1. Bedding: Type A – Crushed angular MDOT 6A coarse aggregate.
 - 2. Backfill: Type B – MDOT Class II granular material to springline of pipe and Engineer approved Type D, native material, or MDOT Class II granular material installed to bottom of road subbase.
 - 3. Drive Surface –Match existing native surface.
- L. Gravel Crossings.
 - 1. Bedding: Type A – Crushed angular MDOT 6A coarse aggregate.
 - 2. Backfill: Type B – MDOT Class II granular material installed to bottom of road subbase.
 - 3. Drive Surface: minimum 8 inches MDOT 23A dense graded aggregate
- M. Bituminous Drive / Road Crossing
 - 1. Bedding: Type A – Crushed angular MDOT 6A coarse aggregate.
 - 2. Backfill: Type B – MDOT Class II granular material installed to bottom of road subbase.
 - 3. See plans for pavement restoration.

3. PART 3 EXECUTION

3.1 PREPARATION

- A. Contact Engineer 48 hours prior to any Work on crossings to verify construction and installation schedule and to schedule necessary inspection time for installation.
- B. Verify that backfill and roadway requirements meet specifications of Authority having jurisdiction.
- C. Verify acceptability of backfill material with Engineer.
- D. Verify approval of all shop drawing submittals with Engineer.
- E. Verify benchmarks and required culvert placement elements and alignment.

- F. Verify that all traffic and other safety requirements have been met of the authority having jurisdiction.

3.2 DRAIN CROSSING AND CONCRETE BOX CULVERT INSTALLATION

- A. Contractor shall maintain flow at all times through drain. Contractor shall submit proposed procedure to Engineer for approval prior to construction. Cost shall be included in the cost per linear foot of drain crossing.
- B. Special care shall be taken when storing handling, and placing culverts so they are not cracked, dented, scaled, or the galvanized coating is not damaged.
- C. Assemble crossings according to manufacturer's specifications.
- D. Excavate to required dimensions and remove existing culvert or structure where applicable.
- E. Cut out soft areas not capable of insitu compaction. Backfill with Type A fill and compact to a minimum of 95 percent of the materials maximum dry density as determined by modified proctor method. See Section 02222 – Excavation, Subgrade Undercutting and Backfilling.
- F. Subgrade undercutting shall be per Section 02222 – Excavation, Subgrade Undercutting and Backfilling.
- G. Place bedding according to detail shown on plans.
- H. Compact all subsoil and bedding material to a minimum of 95 percent of the materials maximum dry density as determined by modified proctor method.
- I. Place structure according to the planned elevations and alignment.
- J. Install butyl rubber rope on concrete box culvert joints to completely seal all joints. Wrap exterior of joints with filter fabric.
- K. Recess inverts of crossings 6 inches or as shown on plans.
- L. Landscape areas as outlined in Section 02923 - Landscape Grading and Section 02936 - Seeding.
- M. Excavate in accordance with Section 02225 – Trenching.
- N. Backfill in accordance with Section 02223 - Backfilling.

3.3 REMOVE EXISTING STRUCTURE

- A. Remove existing structure as indicated on the plans.
- B. Removed culverts shall become property of the Contractor unless otherwise noted by the Engineer or Owner.
- C. Grade and restore area around removed culvert to match proposed contours, elevations, and cross sections.

3.4 REMOVE AND REINSTALL GUARDRAIL

- A. Remove existing guardrails where indicated.
- B. Care should be taken when removing guardrail, as no additional payment will be made for guardrail damaged during removal.
- D. Damaged guardrail shall be replaced at no additional cost.
- E. Reinstall guardrail according to the latest standards of the authority having jurisdiction over the roadway.

3.5 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400 - Quality Control.
- B. Compaction testing will be performed in accordance with MDOT standard requirements.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to the Owner.
- D. Frequency of the tests: At the discretion of the Engineer.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01560 - Construction Facilities and Temporary Controls.
- B. Recompact fills subject to vehicular traffic.

3.7 CLEANOUT EXISTING STRUCTURE

- A. Remove all sediment and debris from culverts to remain in place.
- B. Spoils and debris become the property of the Contractor.

3.8 SALVAGING REPLACED CROSSINGS

- A. Care shall be taken when removing, storing, handling, and placing culverts so they are not damaged.
- B. Removed culverts shall become property of the Contractor unless otherwise noted by the Engineer or Owner.

3.9 UNSALVAGEABLE CROSSING

- A. Unsalvageable crossing become property of the Contractor and removed from the Site.
- B. Concrete from existing crossings will NOT be acceptable in lieu of riprap bank and grade protection.

END OF SECTION