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STORM SEWER
(OAKDALE 2503)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Construction or reconstruction of sewer access structures.
   2. Adjustment of frame and ring castings to the final elevation.
   3. Furnishing and installing new castings.

B. Related Sections:
   1. Section 2451 – Trench Excavation and Backfill
   2. MnDOT 2501 – Pipes
   3. MnDOT 2506 – Manholes and Catch Basins

C. Method of Measurement:
   1. Structure Reconstruction:
      a. Measure by height in feet to the nearest 1/10 foot.
      b. Measure the difference in elevation of the top of the casting after reconstruction and the bottom of the reconstructed section.
      c. Includes all labor, equipment, and materials to perform the work indicated on the plans.
   2. Castings:
      a. Measure as individual unit.
      b. Measure each type separately.
      c. Includes furnishing and installing new castings, removing and replacing existing adjusting rings.
   3. Casting Adjustments:
      a. Measure as salvage and install castings, as an individual unit regardless of type.
      b. No measurements will be made at reconstructed or new structures.
   4. Pipe:
      a. Pipe shall be measured and paid by the lineal foot for each size and class regardless of the excavation depth.
      b. Elbows, tees, reducers, wyes, sections and connectors will be incidental to the pipe.
   5. Manholes and Catch Basins:
      a. Measure by the lineal foot from the invert of the outlet to the top of the manhole castings or to the flow line of the catch basin.
   6. Aprons with Trash Guards:
      a. Measure by the unit for each size.
   7. Random Riprap with Geotextile Filter Fabric:
      a. Measure by the cubic yard in place.
   8. Drain Tile:
      a. Measure by the lineal foot inplace including tubing and filter sock.

9. Construction of Catch Basin over Existing CMP Culvert:
   a. Measure by the unit
   b. Includes labor, equipment and materials necessary to construct the catch basin over an existing culvert.

D. Basis of Payment:
   1. Payment for acceptable quantities of catch basin items shall be at the Contract Unit Price as listed on the Bid Form. All associated work items shall be considered incidental.
   2. Payment for acceptable quantities of storm sewer pipe shall be at the unit prices as listed on the Bid Form. Granular pipe bedding and fabric shall be incidental and included in unit price of pipe.

1.02 SUBMITTALS

A. Submit certification as required under 1.03.

B. Provide shop drawing for each structure.

1.03 QUALITY ASSURANCE

A. Provide certification from manufacturer meeting the respective requirements listed in MnDOT 2506 – Manholes and Catch Basins.
   1. Sectional Concrete Manhole/Catch Basin Units.
   2. Metal Castings.
   3. Concrete Drainage Castings.

PART 2 PRODUCTS

2.01 MATERIALS

A. All materials shall be in accordance with the respective MnDOT Specifications as follows:
   1. Concrete
   2. MnDOT 3622 – Sectional Concrete Manhole/Catch Basin Unit
   3. Metal Castings – MnDOT 3321 – Gray Iron Castings
   4. MnDOT 3149 – Granular Material

B. Mortar:
   1. 1 part Portland Cement
   2. 3 parts Mortar Sand
   3. Sufficient water for proper consistency
   4. Entrained Air Content – 7 to 10 percent

C. Adjusting Rings:
   1. Use plastic ring sections, in largest thickness available (to avoid joints between rings – i.e. 6 inches, 12 inches).

Description	Class or Type	Specification	Joint
Reinforced Plastic Pipe	Class shown on Plans	ASTM C-76	ASTM C-361 Type R-4
Cast Iron Frame and Cover	Cast Iron	ASTM A48	Water Tight
Precast Plastic Concrete Manhole		ASTM C478	Round O-Ring Gasket

2.02 MANHOLES AND CATCH BASINS

A. Precast manholes and catch basins shall meet the requirements of ASTM Specifications C-478 (Reference Plat ST-1 to ST-5)

B. Reference MnDOT 2506 – Manholes and Catch Basins

C. Submit certification as required under 1.03.

2.03 CASTINGS

A. Manhole and catch basin castings shall be Neenah foundry or approved equal with numbers shown on the plans (Reference Plate ST-1 to ST-1B).

2.04 MANHOLE STEPS

A. 12” wide step in accordance with the following:
   1. Manhole steps shall be aluminum alloy equal to Neenah R-1980-I and spaced at 16”.
   2. Polypropylene coated steel by M.A. Industries, Inc.

2.05 APRONS WITH TRASH GUARDS

A. Provide the same strength class as the pipe. App aprons will be furnished with galvanized trash guards and tied to the next 3 upstream pipes using galvanized “U” bolt fasteners. NOTE: 6” clear space between concrete apron and first galvanized bar (Reference Plate ST-3).

2.06 RANDOM RIPRAP

A. Random riprap shall meet MnDOT 3601 – Class IV stone.

B. Geotextile fabrics shall installed under Class IV stone.

C. Geotextile fabric shall be Type IV meeting MnDOT 3733 – Geotextiles (Reference Plate ST-3).

2.07 DRAIN TILE

A. Drain tile shall be 4” perforated corrugated polyethylene drain tubing meeting MnDOT 3278 with filter sock meeting MnDOT 3733 or approved equal (Reference Plate ST-8).

2.08 INSULATION

A. Insulation shall be equal to Dow Chemical Company STYROFOAM HI brand plastic foam.

PART 3 CONSTRUCTION REQUIREMENTS

3.01 INSPECTION

A. During the process of unloading, the Contractor shall inspect all pipe and accessories. The Contractor shall notify the Engineer of all material found that has cracks, flaws or other defects. The Engineer shall inspect the material and have the right to reject any materials he finds unsatisfactory. The Contractor shall promptly remove all rejected material from the site.

3.02 TRENCH EXCAVATION AND BACKFILL

A. Trench excavation and backfill shall be in accordance with the provisions of the Grading Section of these specifications.

3.03 ALIGNMENT, GRADE AND UTILITIES

A. All pipes shall be laid and maintained to the lines and grades as shown on the Plan. In certain locations where storm sewer is in direct conflict with an existing watermain and water services, it shall be lowered to provide at least 18 inches of vertical distance between the watermain or service and storm sewer, or relocated in accordance with the Plans.

B. When local conditions prevent a vertical separation as described, the following construction shall be used;
   1. Sewers passing over or under watermains shall be constructed of materials equal to watermain standards of construction.
   2. Watermains passing under sewers shall, in addition, be protected by providing:
      a. Vertical separation of at least 18” between the bottom of the sewer and the top of the watermain
      b. Adequate structural support for the sewers to prevent excessive deflection of joints and settling or breaking of the watermains.

C. Watermains shall be laid at least 10’ horizontally from any sanitary sewer, storm sewer or manhole, whenever possible. When local conditions prevent a horizontal separation of 10’, a watermain may be laid closer to a storm or sanitary sewer provided that:
   1. The bottom of the watermain is at least 18’ above the top of the sewer
   2. Where the vertical separation cannot be obtained, the sewer shall be constructed of materials and with joints that are equivalent to watermain standards of construction and shall be pressure tested to assure water tightness prior to backfilling.

D. Fittings and other materials used for lowering of watermains and services shall be furnished to satisfy dimensional requirements found in the field.

E. Only representatives of the City of Oakdale Public Works Water Department are permitted to operate valves on the existing water system. The Contractor shall give the City of Oakdale Public Works Water Department 1 day notice when it is necessary to take a line out of service. Disruption of the service shall be during the period of day in which the least inconvenience will be caused for the customer.

3.04 LAYING PIPE

A. Before lowering into the trench and while suspended, the pipe shall be inspected for defects and cracks. Any defective, damaged, or unsound pipe shall be rejected and removed from the site.

B. Pipe laying shall proceed from the lowest grade uphill and bell ends of the pipe shall face uphill.

C. Lay all pipe using grade boards, furnished and set by the Contractor according to the grade stakes established by the Owner. No pipe shall be laid unless there is a minimum of 4 grade boards set to check the proper grade and alignment ahead. The Contractor shall provide and use a suitable grade rod to insure the proper grade of the pipe. Grade boards shall be no more than 25' apart.

D. The Contractor shall provide competent workmen to operate the laser equipment.

3.05 SETTING MANHOLES

A. Excavation shall be to a depth and size to provide for construction of the manhole as shown in the detail on the plans.

B. Concrete base for manhole construction shall be of size and depth shown on the plans. Concrete used for this purpose shall be 3,000 psi concrete. Material used for this purpose shall be subject to the approval of the Engineer. Base shall be poured on undisturbed earth or if precast manhole bases are used, they shall be placed on compacted sandy subgrade material. The sandy subgrade material may be obtained from within the job site excavated material.

C. Manhole castings shall be set 0.5 feet below the finished pavement surface for non-inlet structures or as indicated in the Plans.

3.06 RANDOM RIPRAP

A. Random riprap shall meet MnDOT requirements 2511 (Reference Plate ST-6).

3.07 DRAIN TILE

A. Drain tile shall be installed where directed by the Engineer to provide positive drainage of the 3' select granular borrow. Granular materials shall be in accordance with MnDOT 3149 as follows: fine filter aggregate. Drain tile shall be connected to catch basins or manholes with a watertight connection. The unit price shall be valid for any quantity required by the Engineer (Reference Plate ST-8).

B. Pipe materials shall be in accordance with the respective MnDOT section as follows:
   1. Corrugated Polyethylene Drainage Tubing (PE) 3278.
   2. Polyvinyl Chloride (PVC).

C. Provide with perforations and factory seamed geotextile wrap.

D. Pipe joint sealer materials shall be in accordance with the respective MnDOT Specification as follows:
   1. Preformed Rubber, Type A 3726
   2. Preformed Rubber, Type B 3726
   3. Bituminous Mastic 3728
   4. Geotextile (Type 1) shall be in accordance with MnDOT 3733
   5. P.E. Yard Drain – Tuf-Tie brand drain sump or approved equal.

END OF SECTION