

SECTION 2.2 - STORM DRAINS AND APPURTENANCES

2.02.01 GENERAL

- A. This section covers storm sewer pipe, precast manholes and precast catch basins.
- B. Prior to Town acceptance of the storm water system, a video shall be taken of the entire system from within the piping that shows all connections to manholes, inlets and pipes. The video shall be submitted to the Town for approval.**

2.02.02 REINFORCED CONCRETE PIPE

- A. Pipe shall be manufactured without lifting holes and shall be handled at all times by means of slings or other methods approved prior to start of construction. Defective or damaged pipe shall not be utilized.
- B. Pipe manufactured shall meet the applicable strength requirements contained in ASTM Designation C-76, Reinforced Concrete Culvert, Storm Drain and Sewer Pipe, minimum circumferential reinforcement shall be as prescribed for Class III. In non-paved areas, Class IV pipe shall be provided where depth of cover is less than two (2) feet. Where depth of cover in roadways is less than fifteen inches (15") to the bottom of the bituminous concrete, install Class IV, Wall B RCP. RCP shall be used in all paved areas.

2.02.03 HDPE PIPE

Storm drain shall be ADS N12 dual wall pipe per ASTM D2321 for pipe and fittings, or approved equal. Minimum cover shall be 24". HDPE shall not be installed beneath street pavements.

2.02.04 PIPE AND FITTINGS

- A. Pipe laying shall not begin until all stakeout and cut sheets have been approved by the Engineer.
- B. The Contractor shall utilize proper and suitable tools and equipment for the safe handling and laying of the pipe and fittings in accordance with the manufacturer's standards. Pipe and fittings shall be carefully handled and lowered into the trench.
- C. Should the pipe require cutting to fit in the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end perpendicular to the axis of the pipe.
- D. Before making joints, each pipe shall be well bedded on a solid foundation and no pipe shall

be brought into position until the preceding length has been thoroughly embedded and secured in place. No pipe shall be laid in wet trench conditions that preclude proper bedding or on a frozen trench bottom, or when in opinion of the Engineer, the trench or weather conditions are unsuitable for proper installation. No wedging or blocking will be permitted in laying any pipe unless by written order from the Engineer.

- E. In laying pipe, special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipeline.
- F. Pipe and appurtenances shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open end shall be kept closed with a plug until the next length is laid. At the close of work each day, the end of the pipeline shall be tightly closed with an expansion stopper so that no dirt or other foreign substances may enter the line, and this stopper shall be kept in place until pipe laying is again resumed.
- G. Manholes shall be built as pipe laying progresses.
- H. Manholes and Inlets shall utilize a water stop gasket, as manufactured by ADS, to be grouted into the pipe opening with non-shrink grout when utilizing HDPE pipe. Contractors shall follow the manufacturer's recommendations in regards to the pipe entry angle. Where pipelines enter structures on an angle, form and cast concrete collars.

2.02.05 PRECAST CONCRETE MANHOLES AND INLETS

- A. The Contractor shall construct manholes and inlets of precast reinforced concrete risers and base sections as indicated on the plans.
- B. Manholes and inlets shall be built as such points on the pipelines and of such form and dimensions as are shown on the drawings or as may be directed. Manholes and inlets shall be built as pipe laying progresses and the Town may stop work entirely on laying pipe if the manhole and inlet construction is delayed to such an extent as to be hazardous to construction or the public.
- C. Precast reinforced concrete risers, eccentric cones and bases shall be as detailed on the plans and in conformance with ASTM designation C-478. Joints between riser sections shall be fitted with an "O" ring rubber gasket, meeting the requirements of ASTM Designation C-443. Installation of risers shall be in accordance with manufacturer's recommendations.
- D. Precast reinforced concrete base riser sections shall be as manufactured by Atlantic Concrete Products or equal.
- E. Interior and exterior joint spaces of all manhole and inlet risers shall be filled with mortar

prior to application of the exterior waterproofing.

- F. Lifting holes in the walls of precast reinforced concrete risers will be allowed, but shall be plugged with rubber stoppers and grouted flush with face of manhole and inlets riser sections. Not more than two (2) holes shall be cast in the walls of each riser section for the purpose of handling.
- G. The exterior surface of all precast manholes and inlets shall receive a minimum two (2) coat application of sixty-eight (68%) percent solid coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the manufacturer's instructions and coatings applied in the field in an acceptable manner.
- H. Concrete utilized in poured in place structures shall have compressive strength of 3000 psi while precast concrete shall have a compressive strength of 5000 psi in 28 days.
- I. Storm water man holes shall not have flow channels.
- J. All transitions between pipe materials shall occur at a manhole, inlet or junction box.

2.02.06 CASTINGS

- A. Manhole frames and covers shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.
- B. Material for frames and covers shall be in accordance with the standard specifications for gray iron castings ASTM Designation A-48 for Class No. 35.
- C. All frames and covers shall be of the sizes and types detailed on the plans.
- D. Manhole frames and covers shall be installed on grade to match the slope of the paved surface. Use concrete leveling rings or pre-manufactured devices as approved by the Town Engineer, to build up from cone to grade as required to match the slope of the frame and cover to the slope of the paved surface.
- E. Inlet gratings shall conform with the detail shown on the plans and/or for the Maryland State Highway Administration Standard Specifications and Standard Details as appropriate.

2.02.07 BRICK AND MORTAR FOR INLET FLOW CHANNELS

- A. All brick shall conform to the "Standard Specifications for Sewer Brick", ASTM C-32, Grade SS.

- B. Cement shall be in accordance with the "Standard Specifications for Portland Cement", ASTM C-150 for Type II.
- C. Mortar shall be type S, in accordance with ASTM C-207.

2.02.08 MANHOLE AND INLET STEPS

- A. Manhole and inlet steps shall be made of steel bars, ASTM Designation A-615, grade 60, encased in polypropylene plastic. Manhole steps shall have tread ridge with retainer lug on each side.
- B. Manhole and inlet steps shall be cast-in-place during manufacture of precast reinforced concrete risers and eccentric top section or embedded during construction of cast-in-place manholes. Embedment length shall be suitable for minimum five (5") inch thick, precast reinforced concrete riser walls or eight (8") inch thick brick manhole walls.
- C. Manhole and inlet steps shall be OSHA approved and as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, ICM, Inc., Jacksonville, Arkansas or equal.
- D. Manhole steps shall be spaced twelve (12") inches apart. The maximum spacing from top of manhole to the first step shall not exceed sixteen (16") inches.

2.02.09 DETECTION TAPE

- A. Pipeline detectable tape shall be installed continuously along all storm drain. The tape shall be installed directly above the pipe, twelve (12) inches below the ground surface.
- B. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard, Inc. of Wheaton, Illinois or equal. The tape shall be a minimum of six (6") inches wide, white in color, imprinted with the words "CAUTION – STORM DRAIN BELOW".

END OF SECTION