



STORMWATER MANAGEMENT STRUCTURE NOTES

May 2012

General

1. All work and materials for construction shall be in accordance with the latest general specifications and standard details of the Maryland State Highway Administration (MSHA), Montgomery County, Maryland Department of the Environment Stormwater Design Manual and NRCS-MD No. 378 Pond Standards/Specifications.
2. Care of Water During Construction – All work on permanent structures shall be carried out in areas free from water. The Applicant shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels and stream diversions necessary to protect the areas to be occupied by the permanent work. The Applicant also shall furnish, install, operate and maintain all necessary pumping and other equipment required for removal of water from the various parts of the work and for maintaining the excavations, foundation and other parts of the work free from water as required or directed by the Department of Public Works (DPW) for constructing each part of the work. After having served its purpose, all temporary protective work shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet and so as not to interfere, in any way, with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent work.

The removal of water from the required excavation and/or foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom of required excavation and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations, which may require draining the water to sumps from which the water shall be pumped. An exception to this will be made when compacting a filter diaphragm under a stormwater management (SWM) structure barrel; it is acceptable to flood the sand diaphragm with water to enhance compaction.

3. Silt and debris shall not be allowed to enter any SWM storage or control structure. Runoff shall not enter structures until the contributing drainage areas have been stabilized. All openings shall be protected with appropriate sediment control measures during construction. Where storm drainpipes convey construction runoff to sediment control traps or basins, the pipes shall be flushed clean at the end of construction prior to the removal of the sediment control trap/basin. Under no circumstances should water be discharged without using proper dewatering procedures.
4. All sand used in SWM facilities must be washed silica sand. Limestone sand is unacceptable.

5. All proprietary stormwater management structures and facilities shall be installed and maintained according to manufacturer's recommendations.

Concrete

1. Concrete design shall meet the requirements of ACI 350, Environmental Engineering Concrete Structures, with freezing and thawing exposures. Concrete mix shall use type II or IIA cement, with a 28-day compressive strength of 4500 psi for cast in place and 5000 psi for pre-cast structures. Concrete shall also meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 420 and 902.10, Mix No. 6.
2. The Applicant shall supply DPW with certified concrete strength results from an independent firm, stamped by a Professional Engineer who is licensed in the State of Maryland.
3. Reinforcing steel to be ASTM A615, Grade 60. Epoxy coated reinforcing, when specified, shall conform to ASTM A775. Minimum steel spacing requirement to be in accordance with ACI 350, $A_s = 0.003 bh$ at maximum rebar spacing of 12-inches. Minimum concrete cover over steel is 2-inches for walls or slabs; 3-inches for base slabs cast against earth or mud mat. Wall thickness and clear distance to reinforcing shall be as shown on the drawings. All bars to be lapped 30 bar diameters unless noted otherwise. Top slab steel shall be lapped over a support wall. Walls greater than 10-inches in thickness shall have reinforcement on both faces.
4. Construction joints on structures, including SWM risers and weir walls, shall be located as shown or as directed by DPW. All construction joints shall have a 2-inch x 4-inch keyway with rubber, neoprene or silicon water stop. Bentonite water stops are not acceptable.
5. DPW must approve any changes to the SWM riser structure at least 48 hours prior to ordering of the pre-cast structure. If a pre-cast structure is substituted for a designed cast-in-place structure, DPW must be provided new anti-flotation computations, sealed by Professional Engineer who is licensed in the State of Maryland, for the pre-cast structure if the structure has smaller dimensions than the original structure.

Corrugated Metal Pipe Used For Stormwater Management Storage

1. Corrugated metal pipe shall be aluminized Type 2 corrugated steel pipe. The pipe and its appurtenances shall conform to AASHTO M-36, AASHTO M-274, ASTM A760 and ASTM A929. Pipe over 60-inches shall be 12 gauge with 5-inch x 1-inch corrugations. All pipe 60-inches and less shall be 14 gauge with 2-2/3-inch x 1/2-inch corrugations.
2. Aluminized steel pipe that comes in contact with concrete shall be coated with zinc chromate primer.
3. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 millimeters thickness.
4. All connections with pipes must be completely watertight. The drainpipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars and ariser shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight. All connections shall use a rubber or neoprene gasket when joining pipe

sections. The end of each pipe shall be re-rolled with an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24-inches in diameter: flanges on both ends of the pipe, a 12-inch wide standard lap type band with 12-inches wide by 3/8-inches thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with O-ring gaskets having a minimum diameter of 1/2-inch greater than the corrugation depth. Pipes 24-inches in diameter and larger shall be connected by a 24-inch long annular corrugated band using rods and lugs (two on each side of the lugs). A 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed on the end of each pipe for a total of 24-inches. Gaskets shall be pre-stressed in accordance with manufacturer's installation specifications.

5. Corrugated metal pipe shall be constructed in accordance with MSHA specifications, Sections 303 and 304. Pipe over 60-inches shall have a minimum 2-foot of cover.

All pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy, or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support to a minimum depth of 6-inches below sub-grade.