Colonial Green Medical

Roanoke, VA

Lane CMP Stormwater Management System

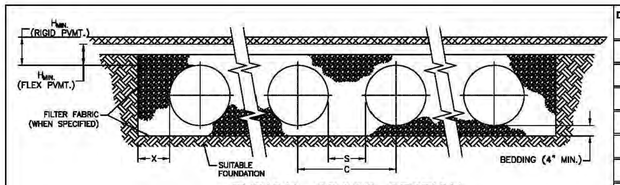
Lane Salesperson: Joe Hunsberger
Phone Number: (540) 921-7978

STORMSTORAGE

LANE

Notes:

1. The Lane CMP storm water management system shall be installed in accordance with industry standard installation practices adapted to the special installation procedures contained herein.
2. Construction equipment shall not traverse or otherwise be located atop the pipe system or its components until sufficient cover is properly placed and compacted. Construction loading restrictions are contained herein. The installer shall contact the manufacturer to address any uncertainties in this regard.
3. The foundation and/or bedding stone must be properly leveled to the elevation shown on the project plans prior to the placement of any pipe or fittings.
4. Spacings shown between pipe runs are standard and will ensure sufficient space for material placement and compaction. Considerations for spacing reductions will not be made unless the installer formally acknowledges that the desired reduction will not compromise the ability to properly place and compact backfill in affected areas.
5. Backfill and bedding materials shall be as specified in the project plans and consistent with the notes contained herein.
6. The placement of a geomembrane over the entire system is considered a best management practice when the system is located beneath pavement in the more northern regions where severe winters include heavier uses of deicing salts.
7. Contact your local Lane sales representative for any modifications needed to the system design.

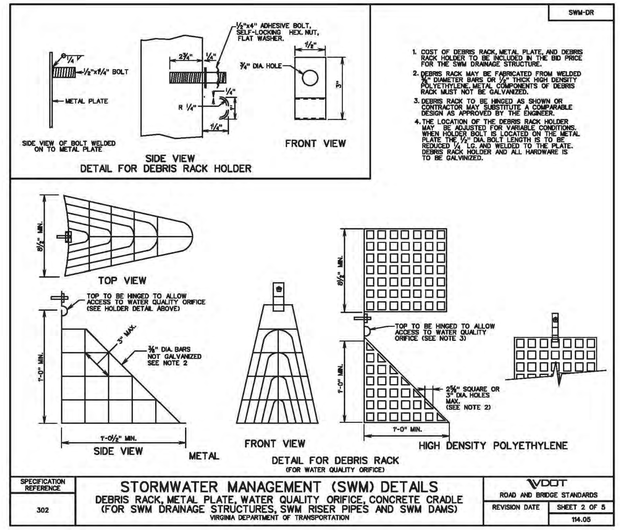


TYPICAL CROSS SECTION

DIAMETER (In)	Standard Spacing S (ft)	C (ft)	X (ft)	H_{MIN} (ft)
24"	2.0	4.0	2.0	1.00
30"	2.0	4.5	2.0	1.00
36"	2.0	5.0	2.0	1.00
42"	2.0	5.5	2.0	1.00
48"	2.0	6.0	2.0	1.00
54"	2.25	6.75	2.0	1.00
60"	2.5	7.5	2.0	1.00
66"	2.75	8.25	2.0	1.00
72"	3.0	9.0	2.0	1.00
78"	3.0	9.5	2.0	1.00
84"	3.0	10.0	2.0	1.00
90"	3.0	10.5	2.0	1.00
96"	3.0	11.0	2.0	1.00
102"	3.0	11.5	2.0	1.25
108"	3.0	12.0	2.0	1.25
114"	3.0	12.5	2.0	1.25
120"	3.0	13.0	2.0	1.25
126"	3.0	13.5	2.0	1.50
132"	3.0	14.0	2.0	1.50
138"	3.0	14.5	2.0	1.50
144"	3.0	15.0	2.0	1.50

1. All corrugated metal pipe (CMP) shall be the diameter, corrugation size, and gauge specified on the plans. Corrugated steel pipe with a metallic coating shall conform to AASHTO M36 and/or ASTM A760. Corrugated steel pipe with a polymer coating shall conform to AASHTO M245 and/or ASTM A762. Corrugated aluminum alloy pipe shall conform to AASHTO M196 and/or ASTM B745. All risers and stubs are 16-gauge with a 2⅔" x ½" corrugation unless otherwise noted. Fittings shall meet the minimum design requirements of ASTM A998 for the burial depth shown on the plans.
2. It shall be the responsibility of the general contractor or their agent to research and implement applicable safety, hazard, and health regulations; and obtain the necessary approvals, consents or permits from applicable agencies, private landowners, or public road authorities.
3. The contractor shall be advised that corrugated metal pipe is flexible and therefore derives structural stability from the strength and relative stiffness of the surrounding backfill material. The resulting soil-culvert interaction system defines the ability of the flexible pipe to withstand anticipated loads.
4. Pipe bedding and embedment shall be select granular materials meeting the requirements of AASHTO M145 for A-1, A-2 and A-3 classifications. Well-graded embedment materials shall be free of organics, rock fragments larger than three inches, and frozen lumps. Applications that involve perforated pipe for retention purposes shall be bedded and backfilled with a clean, open-graded, angular stone with a size distribution between 0.75 and 2 inches. Open-graded embedment materials require the use of a filter fabric to eliminate the potential of soil migration from adjacent soils.
5. All CMP shall be installed in accordance with the plans and specifications, the manufacturer's recommendations, ASTM A798 for corrugated steel pipe or ASTM B788 for corrugated aluminum alloy pipe, and/or Section 26 of the AASHTO LRFD Bridge Construction Specifications. In general, bedding shall be a minimum of 4 inches in depth and left loosely placed under and roughly shaped to the middle-third of the pipe span, and the embedment shall be installed in loose lifts not exceeding 8 inches and compacted to a minimum 90% AASHTO T99 Standard Proctor Density. Embedment shall be raised evenly, as described below, with a maximum side-to-side differential of 24 inches or one-third of the pipe diameter, whichever is less. Select embedment materials shall extend above the pipe a minimum distance of one-eighth the diameter or 12 inches, whichever is greater.
6. Published installation standards referenced above shall be supplemented with the following instructions to account for the presence of manifolds and parallel pipe runs: The backfill operation shall commence and progress evenly on both sides of the manifold and alongside the pipe runs simultaneously. In this manner, the overall backfill operation shall progress in the direction of the pipe runs and towards the opposite manifold, where care is again taken to ensure the backfilling is done evenly. Perimeter backfill must be brought up evenly as well, and extended horizontally to stable and/or undisturbed trench walls. Special care shall be taken to ensure the haunch regions of the pipe are completely filled and properly compacted. Filling the inside haunch regions of the manifold between stubs is more challenging and will require additional care.
7. No equipment shall be operated on the system until a minimum of 12 inches of cover has been established, at which time only walk-behind compaction equipment and small spreading equipment may be used. Excavators must be located off the bed, and dump trucks shall not dump stone directly on to the bed.

File Name:	XX	LANE ENTERPRISES, INC.	LANE
Page Number:	1 OF 2	STANDARD CMP DETENTION/RETENTION CONSTRUCTION NOTES AND DETAILS	
Date Drawn:	8/24/17		
Drawn By:	JDS		



SPECIFICATION REFERENCE	STORMWATER MANAGEMENT (SWM) DETAILS DEBRIS RACK, METAL PLATE, WATER QUALITY ORIFICE, CONCRETE CRADLE (FOR SWM DRAINAGE STRUCTURES, SWM RISER PIPES AND SWM DAMS) VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS REVISION DATE / SHEET 2 OF 5
302		114.05

TRASH RACK INSTALLATION NOTE:
C.C. SHALL MODIFY THE PROPOSED TRASH RACK TO ENSURE A FLUSH CONNECTION WITH ALL SIDES OF THE PIPE. VDOT STANDARD TRASH RACK SWM-DR OR APPROVED EQUAL.

Access Riser Notes

1. The access riser detail shall be considered conceptual with the intention of illustrating how loads placed on the cover or surrounding pavement will be transferred to the subgrade and not be brought to bear directly on the riser pipe.
2. All risers shall be field cut to the elevation needed to accommodate construction of the riser detail.
3. Poured-in-place concrete collars shall be properly formed to provide a small gap around the outside diameter of the riser, with the top level of the collar set approximately two inches above the top of the riser pipe.
4. Flat tops, manhole openings, and appurtenances shall be constructed and/or provided in accordance with the standard details and specifications of the state or local road authority for an H25/HS25 highway truck loading.
5. Standard riser diameters are between 12 and 48 inches, and their fittings/stubs are subject to reinforcement considerations in accordance with ASTM A998. Related requirements are dependent on the mainline diameter and the burial depth and may be negated by opting for a smaller diameter riser in this range.
6. Stubs for risers and in general are determined by the manufacturer based on fabrication standards and/or shipping limitations.

Temporary Minimum Cover for Construction Equipment Notes

1. During construction and prior to the construction of pavement additional temporary cover may be required to accommodate construction equipment traffic over the pipe system in accordance with Table 1.
2. Minimum cover is measured from the top of the pipe to the top of the maintained construction roadway surface.
3. Temporary cover shall be duly compacted and maintained at the proper elevation to ensure no loss of required cover over time. Clean, open-graded manufactured aggregate may be unsuitable for these purposes unless properly locked-in place or confined with a binder material.

Standard Connecting Band Notes

1. Pipe ends shall be rerolled to form an annular 2⅔" x ½" corrugation with sufficient corrugations to accommodate the minimum width of a fully corrugated connecting band.
2. Fully corrugated connecting band thickness shall be in accordance with Table 2, and shall have a minimum width of 12 inches for pipe diameters up to and including 96 inches, and a minimum width of 24 inches thereafter.
3. Standard lug connectors shall be used on fully corrugated connecting bands.
4. Standard sleeve gaskets, when required, shall be ⅛" thick neoprene meeting the material requirements of ASTM D1056, and shall completely underlie the connecting band.
5. All joint performance requirements shall be in accordance with Section 9 of ASTM A760. Standard sleeve gaskets shall be required for joints specified to meet any level of leak resistant performance as well as silt tight performance. In lieu of a gasket, a geotextile wrap shall be considered sufficient to meet silt tight joint performance. Gaskets shall not be required for perforated pipe systems and joints specified to meet soil tight requirements.
6. Connecting bands for 12 through 48-inch diameter pipe shall be a one-piece band. Connecting bands for 54 through 96-inch diameter pipe shall be a two-piece band. Connecting bands for 102 through 144-inch diameter pipe shall be a three-piece band.
7. Connecting band material and/or coating shall match the pipe material.

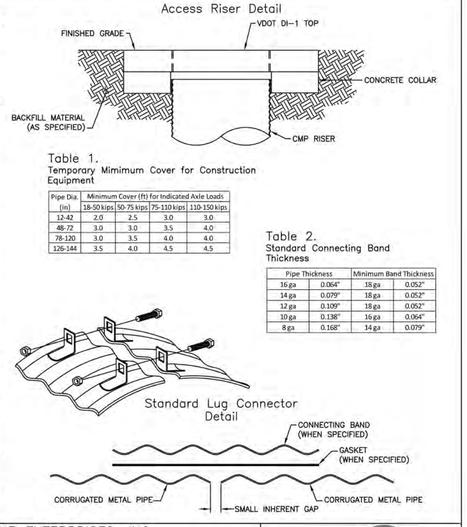


Table 1.
Temporary Mimimum Cover for Construction Equipment

Pipe Dia. (in)	Minimum Cover (ft) for Indicated Axle Loads: 18-50 kips	50-75 kips	75-110 kips	110-150 kips
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

Table 2.
Standard Connecting Band Thickness

Pipe Thickness		Minimum Band Thickness	
16 ga	0.064"	18 ga	0.052"
14 ga	0.079"	18 ga	0.052"
12 ga	0.109"	18 ga	0.052"
10 ga	0.138"	16 ga	0.064"
8 ga	0.168"	14 ga	0.079"

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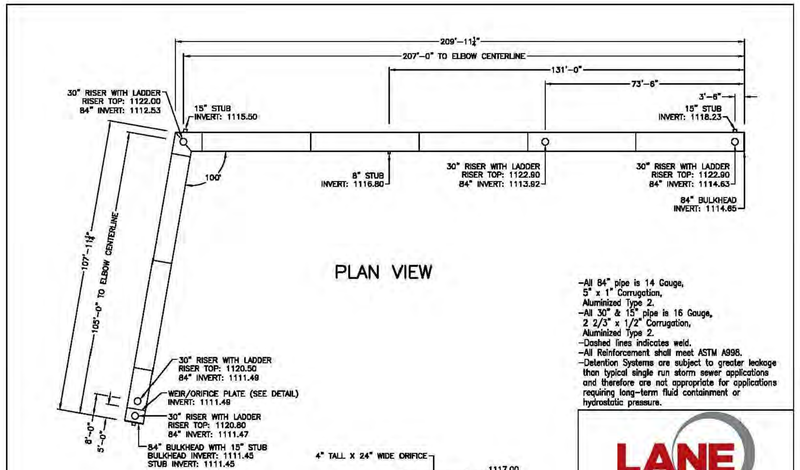

- All 84" pipe is 14 Gauge, 5" x 1" Corrugation, Aluminized Type 2.
- All 30" & 15" pipe is 16 Gauge, 2 2/3" x 1/2" Corrugation, Aluminized Type 2.
- Dashed lines indicates weld.
- All Reinforcement shall meet ASTM A998.
- Detention Systems are subject to greater leakage than typical single run storm sewer applications and therefore are not appropriate for applications requiring long-term fluid containment or hydrostatic pressure.

LANE

LANE ENTERPRISES, INC.

TITLE:	COLONIAL GREEN MEDICAL ROANOKE, VA BALZER & ASSOCIATES, INC. 84" SWM DETENTION BASIN
DRAWN BY:	JCH
DRAWING NUMBER:	
PAGE:	1 OF 1
DATE:	5/21/2018

City of Roanoke
Planning, Building, & Development
COMPREHENSIVE DEVELOPMENT PLAN
APPROVED
by plkr1 08/17/2018

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PROFESSIONAL ENGINEER

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STORMWATER MANAGEMENT DETAILS
CITY OF ROANOKE, VIRGINIA

DRAWN BY BTC
DESIGNED BY BTC
CHECKED BY CPB
DATE 4/13/2018
SCALE AS SHOWN

REVISIONS:
5/18/2018
6/12/2018

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