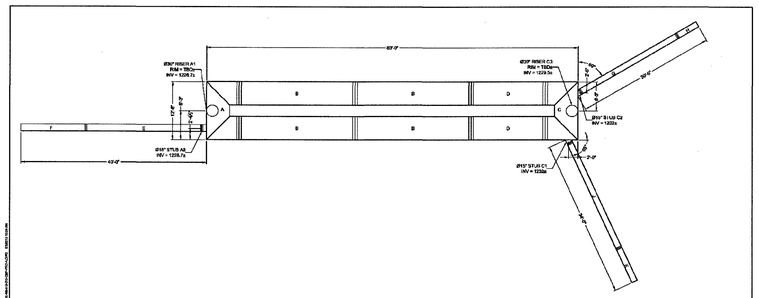


THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (3) PAGES INCLUDING THE FOLLOWING:

- VOLUME = 3,240 C.F.
- MAINLINE PIPE GAUGE = 16
- WALL TYPE = SOLID
- DIAMETER = 60"
- FINISH = ALT2

CUSTOMER DATE

ASSEMBLY
SCALE: 1" = 10'
VOLUME: 3,240 C.F.
LOADING: HS20-44
STRUTS/BM SLOPE = 0.01

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTER-LINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE CONTRACTOR AND RECORD PRIOR TO FABRICATION FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x 5⅓" CORRUGATION WITH 60 CF/FT, 16 GAUGE, SOLID WALL STEEL.
- RISERS TO BE FIELD FRAMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM IS DETAILED TO MEET YOUR PLAN. ADDITIONAL PIPE IS NEEDED FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

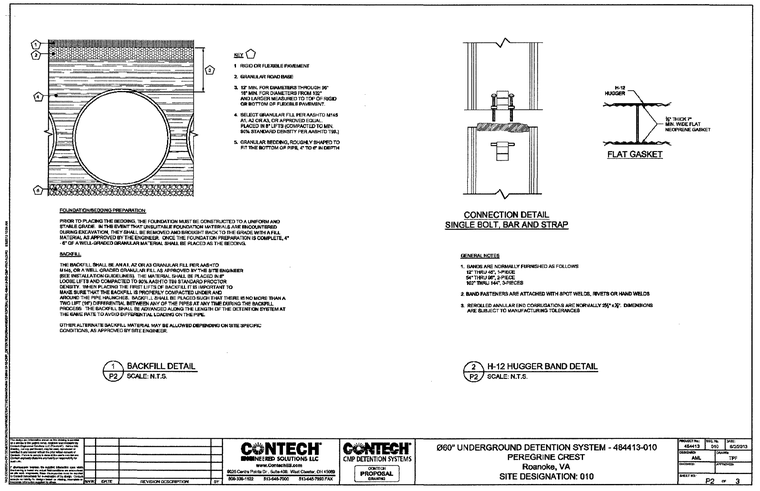
REV.	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.conteches.com
9025 Centre Pointe Dr. Suite 400 West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

Ø60" UNDERGROUND DETENTION SYSTEM - 484413-010
PEREGRINE CREST
Roanoke, VA
SITE DESIGNATION: 010

PROJECT No. 484413 | FILE No. 010 | DATE 6/25/013
DRAWN AML | CHECKED TPF
APPROVED | APPROVED
SHEET No. P1 OF 3



SITE

1. RIGID OR FLEXIBLE PAVEMENT
2. GRANULAR ROAD BASE
3. 12" MIN. FOR DIAMETERS THROUGH 36" 18" MIN. FOR DIAMETERS FROM 102" AND LARGER MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
4. SELECT GRANULAR FILL PER AASHTO M145 A1, A2 OR A3, OR APPROVED EQUAL. PLACED IN 9" LIFTS (SCENARIO 1,2) TO MIN. 90% BENDAVED DENSITY PER AASHTO T180.
5. GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 4" TO 9" IN DEPTH

FOUNDATION PREPARATION

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4" OF GRANULAR BEDDING MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL SHALL BE AN ACI 00-03 GRANULAR FILL PER AASHTO M145, OR A WELL GRADED GRANULAR FILL AS APPROVED BY THE SITE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 9" LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO ENSURE THAT THE FILL MATERIAL UNDER THE HAUNCHES OF THE PIPE AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED EVEN THAT THERE IS NO MORE THAN A TWO LIFT (18") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

1 BACKFILL DETAIL
P2 SCALE: N.T.S.

CONNECTION DETAIL
SINGLE BOLT, BAR AND STRAP

FLAT GASKET

GENERAL NOTES

1. RANGE ARE NORMALLY FIRMED-ED AS FOLLOWS
   12" THRU 48", 1-PIECE
   54" THRU 96", 2-PIECE
   102" THRU 144", 3-PIECE
2. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
3. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2⅔" x ½". DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

2 H-12 HUGGER BAND DETAIL
P2 SCALE: N.T.S.

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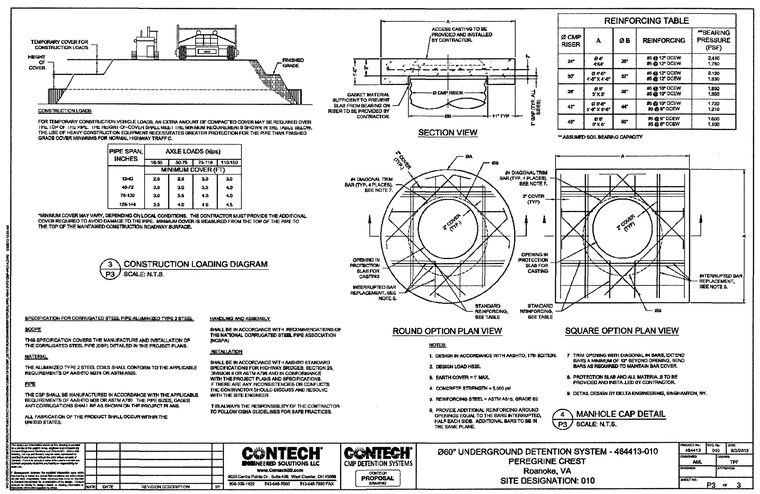

CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER 12IN. (30 CM) OF 12IN. (30IN. (76 CM)OF COVER SHALL INSULT 12IN. MINIMUM REQUIREMENT IS SHOWN IN 3IN. (76LB. (34.5KN. (SEE TABLE BELOW. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

PIPE SPAN, INCHES	AXLE LOADS (kips)				
	18-50	50-75	75-110	110-150	
	MINIMUM COVER (ft[1])				
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	

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

3 CONSTRUCTION LOADING DIAGRAM
P3 SCALE: N.T.S.

REINFORCING TABLE				
Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	8'-6" 0'x8"	28"	#5 @ 12" OC EW #5 @ 12" OC EW	2,450 1,750
30"	8'-6" 0'-5"x 6'-6"	32"	#5 @ 12" OC EW #5 @ 12" OC EW	2,150 1,530
36"	8'-6" 0"x 6"	36"	#5 @ 12" OC EW #5 @ 12" OC EW	1,850 1,350
42"	8'-6" 0'-5"x 6'-6"	42"	#5 @ 12" OC EW #5 @ 12" OC EW	1,750 1,210
48"	8'-6" 0"x 6"	48"	#5 @ 12" OC EW #5 @ 12" OC EW	1,650 1,150

** ASSUMED SOIL BEARING CAPACITY

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIAL IS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

4 MANHOLE CAP DETAIL
P3 SCALE: N.T.S.

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APPROVED | APPROVED
SHEET No. P3 OF 3

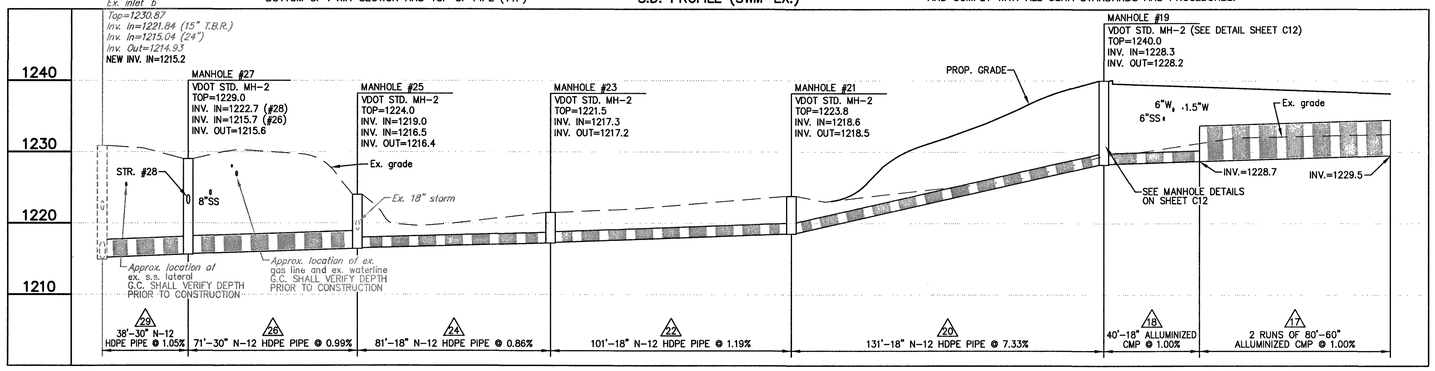
STORMWATER MANAGEMENT SYSTEM DETAILS

N.T.S.

S.D. PROFILE (SWM-EX.)

*NOTE: MIN. 1' COVER TO BE MAINTAINED BETWEEN BOTTOM OF PVMT SECTION AND TOP OF PIPE (TYP)

*NOTE: G.C. SHALL PROVIDE ALL TRENCH BOXES FOR PIPE CONSTRUCTION AND COMPLY WITH ALL OSHA STANDARDS AND PROCEDURES.



STORM STRUCTURE SCHEDULE:

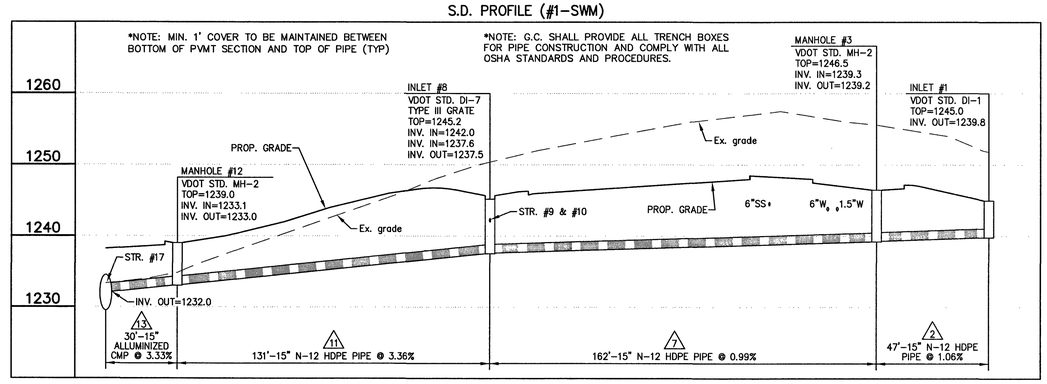
1. VDOT STD. DI-1
   TOP=1245.0
   INV. OUT=1239.8
2. 47 LF 15" N-12 HDPE PIPE @ 1.06%
3. VDOT STD. MH-2
   TOP=1246.5
   INV. IN=1239.3
   INV. OUT=1239.2
4. 4' X 4' FILTERRA SWQ INLET
   TOP=1245.5
   INV. OUT=1242.0
5. VDOT STD. DI-7
   TOP=1244.9
   INV. IN=1241.5
   INV. OUT=1240.4
6. 52 LF 15" N-12 HDPE PIPE @ 2.11%
7. 162 LF 15" N-12 HDPE PIPE @ 0.99%
8. VDOT STD DI-7 TYPE III GRATE
   TOP=1245.2
   INV. IN=1242.0
   INV. IN=1237.6
   INV. OUT=1237.5
9. 4' X 12' FILTERRA SWQ INLET
   TOP=1245.9
   INV. OUT=1242.4
10. 6' X 8' FILTERRA SWQ INLET
    TOP=1245.9
    INV. OUT=1242.4
11. 131 LF OF 15" N-12 HDPE PIPE @ 3.36%
12. VDOT STD. MH-2
    TOP=1239.0
    INV. IN=1233.1
    INV. OUT=1233.0
13. 30 LF OF 15" ALLUMINIZED CMP @ 3.33%
    INV. OUT=1232.0
14. 6' X 10' FILTERRA SWQ INLET
    TOP=1237.2
    INV.=1233.7
15. VDOT STD. DI-7 TYPE III GRATE
    TOP=1237.0
    INV. IN=1233.1
    INV. OUT=1233.0
16. 34 LF OF 15" ALLUMINIZED CMP @ 2.94%
    INV. OUT=1232.0
17. 2 RUNS OF 80'-60" ALLUMINIZED CMP @ 1%
    INV. IN=1229.5
    INV. OUT=1228.7
18. 40 LF OF 18" ALLUMINIZED CMP @ 1.00%
19. VDOT STD. MH-2 (SEE DETAIL SHEET C12)
    TOP=1240.0
    INV. IN=1228.3
    INV. OUT=1228.2
20. 131 LF OF 18" N-12 HDPE PIPE @ 7.33%
21. VDOT STD. MH-2
    TOP=1223.8
    INV. IN=1218.6
    INV. OUT=1218.5
22. 101 LF OF 18" N-12 HDPE PIPE @ 1.19%
23. VDOT STD. MH-2
    TOP=1221.5
    INV. IN=1217.3
    INV. OUT=1217.2
24. 81 LF OF 18" N-12 HDPE PIPE @ 0.86%
25. VDOT STD. MH-2
    TOP=1224.0
    INV. IN=1219.0
    INV. IN=1216.5
    INV. OUT=1216.4
26. 71 LF OF 30" N-12 HDPE PIPE @ 0.99%
27. VDOT STD. MH-2
    TOP=1229.0
    INV. IN=1222.7 (STR. #28)
    INV. IN=1215.7 (STR. #26)
    INV. OUT=1215.6
28. 22 LF OF 15" N-12 HDPE PIPE @ 2.59%
29. 38 LF OF 30" N-12 HDPE PIPE @ 1.05%

NOTES:
1. VDOT STD IS-1 INLET SHAPING SHALL BE PROVIDED IN ALL PROPOSED STRUCTURES AND IN ALL EXISTING STRUCTURES IF NOT ALREADY IN PLACE.
2. NON-SHRINK GROUT SHALL BE USED FOR ALL STORM SEWER PIPE CONNECTIONS.
3. G.C. IS RESPONSIBLE FOR CONNECTING TO ALL DOWNSPOUTS PER ARCHITECTURAL PLANS AND ENSURING POSITIVE DRAINAGE.

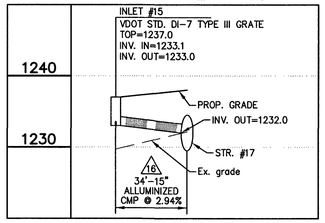
S.D. PROFILE (#1-SWM)

*NOTE: MIN. 1' COVER TO BE MAINTAINED BETWEEN BOTTOM OF PVMT SECTION AND TOP OF PIPE (TYP)

*NOTE: G.C. SHALL PROVIDE ALL TRENCH BOXES FOR PIPE CONSTRUCTION AND COMPLY WITH ALL OSHA STANDARDS AND PROCEDURES.



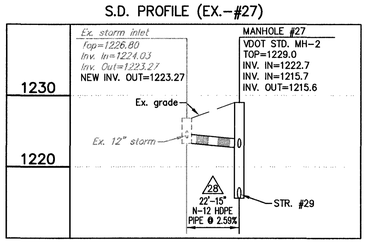
S.D. PROFILE (#15-SWM)



*NOTE: MIN. 1' COVER TO BE MAINTAINED BETWEEN BOTTOM OF PVMT SECTION AND TOP OF PIPE (TYP)

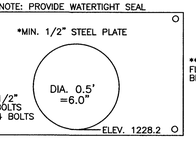
*NOTE: G.C. SHALL PROVIDE ALL TRENCH BOXES FOR PIPE CONSTRUCTION AND COMPLY WITH ALL OSHA STANDARDS AND PROCEDURES.

S.D. PROFILE (EX.-#27)



*NOTE: MIN. 1' COVER TO BE MAINTAINED BETWEEN BOTTOM OF PVMT SECTION AND TOP OF PIPE (TYP)

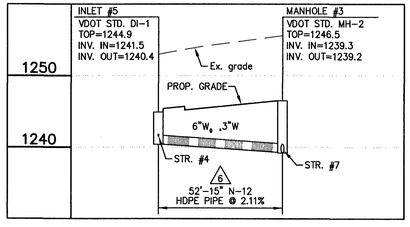
*NOTE: G.C. SHALL PROVIDE ALL TRENCH BOXES FOR PIPE CONSTRUCTION AND COMPLY WITH ALL OSHA STANDARDS AND PROCEDURES.



ORIFICE PLATE TO BE FLUSH WITH CINDER BLOCK WALL.

ORIFICE PLATE DETAIL

S.D. PROFILE (#5-#3)



*NOTE: MIN. 1' COVER TO BE MAINTAINED BETWEEN BOTTOM OF PVMT SECTION AND TOP OF PIPE (TYP)

*NOTE: G.C. SHALL PROVIDE ALL TRENCH BOXES FOR PIPE CONSTRUCTION AND COMPLY WITH ALL OSHA STANDARDS AND PROCEDURES.

PROFILE SCALES
HORZ. SCALE: 1"=30'
VERT. SCALE: 1"=10'

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COMMONWEALTH OF VIRGINIA
CHRISTOPHER P. BURNS
Lic. No.047338
8/28/13
PROFESSIONAL ENGINEER

PEREGRINE CREST
UTILITY PROFILES & SCHEDULES
WINDSOR HILLS DISTRICT
ROANOKE COUNTY, VIRGINIA

DRAWN BY CPB
DESIGNED BY CPB
CHECKED BY BTC
DATE 06/05/2013
SCALE AS SHOWN
REVISIONS:
07/30/2013
08/28/2013

APPROVED

SHEET NO.
C08
JOB NO. R1300014.00