

1. NO CONSTRUCTION/FIELD CHANGES WITHOUT THE APPROVAL OF THE CONSULTING ENGINEER, COUNTY OF ROANOKE PLANNING, BUILDING, VDOT, AND/OR WESTERN VIRGINIA WATER AUTHORITY.
2. CONTRACTOR TO ENSURE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES WITH EXISTING UTILITIES ARE LOCATED DURING THE GRADING PROCESS FOR THE SITE.
4. G.C. TO COMPLY WITH ALL O.S.H.A. STANDARDS AND REGULATIONS DURING THE UNDERGROUND TANK INSTALLATION AND ALL UTILITY CONSTRUCTION.
5. G.C TO ENSURE POSITIVE DRAINAGE AWAY FROM THE PROPOSED KIOSK BUILDING.
6. SLOPES IN THE HANDICAPPED AREA SHALL NOT EXCEED THE MAXIMUM OF 2.0% IN ANY DIRECTION.
7. G.C. TO ENSURE THAT NO ASPHALTED AREAS ARE DRAINING OVER THE CONCRETE FUEL CENTER PAD.

1. THE G.C. SHALL COORDINATE INSTALLATION OF THE WATER LATERAL TO THE BUILDING WITH SUB-CONTRACTORS TO ENSURE THE EXACT LOCATIONS OF WATERLINES INTO THE KIOSK.

2. G.C. SHALL INSTALL A 1" LATERAL AND 5/8" WATER METER FOR THE SITE TO SERVE THE PROPOSED RESTROOM FACILITY.<sup>g</sup> THE UTILITY CONTRACTOR SHALL TIE THE PROPOSED 1" LATERAL INTO THE RELOCATED WATER METER.

(S1) ex. sanitary sewer manhole  
 TOP=1089.29'  
  
 (S2) sanitary sewer manhole  
 TOP=1086.67'  
 10" INV. IN=1069.22' FROM S1  
 10" INV. IN=1069.25' FROM S8  
 4" DIP INV. IN=1078.67' FROM ADJ. BLDG  
 10" DIP INV. OUT=1069.15' TO S3  
  
 (S3) ex. sanitary sewer manhole  
 TOP=1085.00'  
 10" DIP INV. IN=1065.29'  
 10" DIP INV. OUT=1063.35'  
  
 (S4) ex. sanitary sewer manhole  
 TOP=1084.98'  
 8" PVC INV. IN=1076.88'  
 8" PVC INV. OUT=1076.87'  
 SHELF=1079.46'  
  
 (S5) ex. sanitary sewer manhole  
 TOP=1074.02'  
 SEALED (NO DETAIL)  
  
 (S6) ex. sanitary sewer manhole  
 TOP=1067.01'  
 10" PVC INV. IN=1058.11' FROM S3  
 8" PVC INV. IN=1058.80' FROM S5  
 10" PVC INV. OUT=1057.07'  
 SHELF=1058.71'  
  
 (S7) ex. sanitary sewer manhole  
 TOP=1082.52'  
 4" PVC INV. IN=1079.52' FROM BLDG  
 4" PVC INV. OUT=1079.50'  
  
 (S8) ex. sanitary sewer manhole  
 TOP=1081.79'  
 10" INV. IN=1072.03'  
 10" INV. OUT=1071.85' TO S2  
 SHELF=1072.67'  
 \*TO BE ABANDONED PER WATER  
 AUTHORITY DETAIL S-16  
  
 (S9) ex. SEWER MANHOLE  
 TOP=1086.00'  
 10" DIP INV. IN=1075.71'  
 10" DIP INV. OUT=1075.67'  
 4" PVC INV. IN=1080.64'  
 SHELF=1076.43'  
  
 (S10) ex. SEWER MANHOLE  
 TOP=1086.00'  
 4" PVC INV. IN=1080.64'  
 4" PVC INV. OUT=1080.64'  
 SHELF=1080.81'  
  
 (S11) ex. SEWER MANHOLE  
 TOP=1080.55'  
 PAVED OVER  
  
 (S12) ex. SEWER MANHOLE  
 10" DIP INV. IN=1071.21'  
 10" DIP INV. OUT=1071.15'  
 SHELF=1072.03'  
  
 (S13) ex. SEWER MANHOLE  
 10" DIP INV. IN=1055.53'  
 10" DIP INV. OUT=1055.39'  
 SHFT=1056.37'

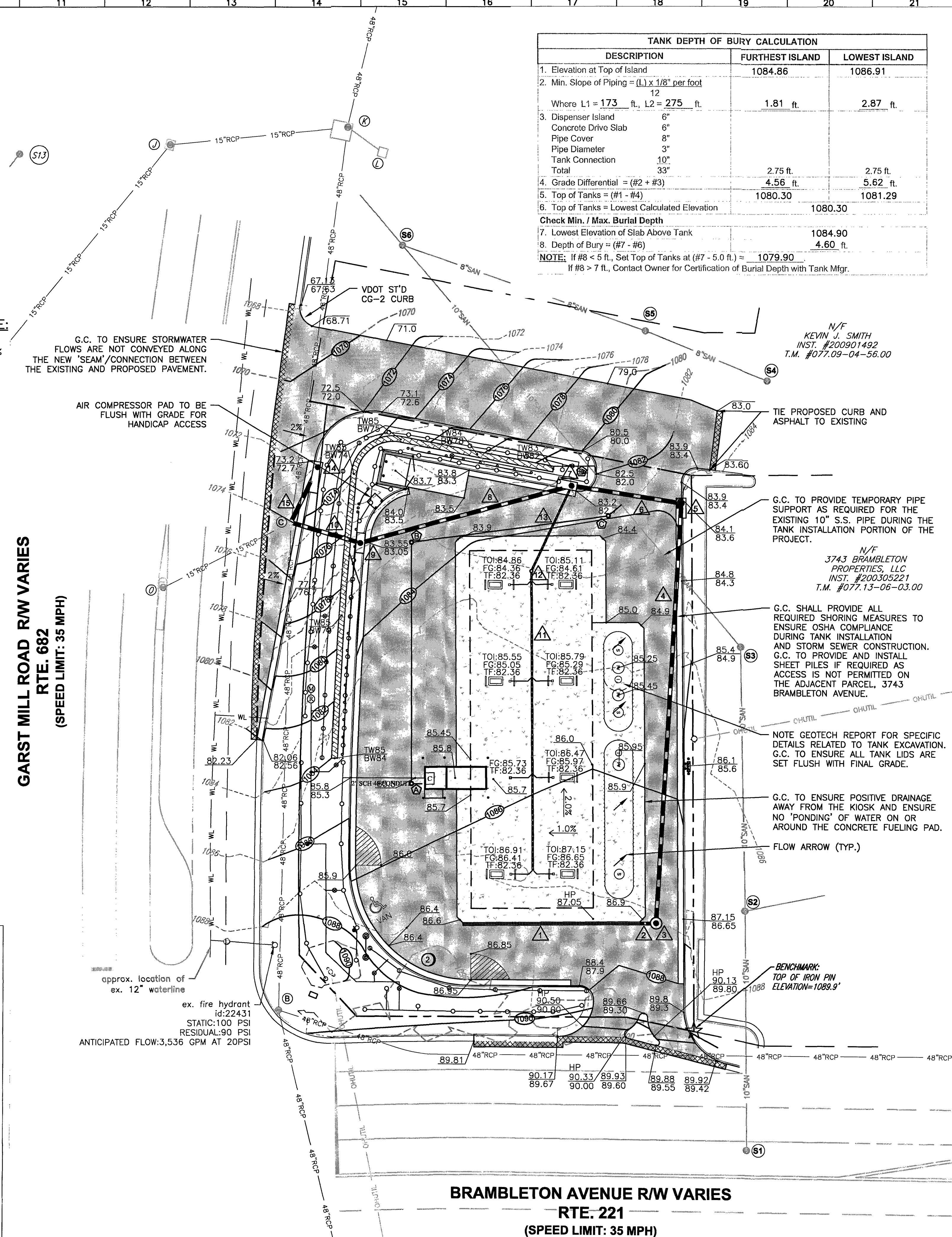
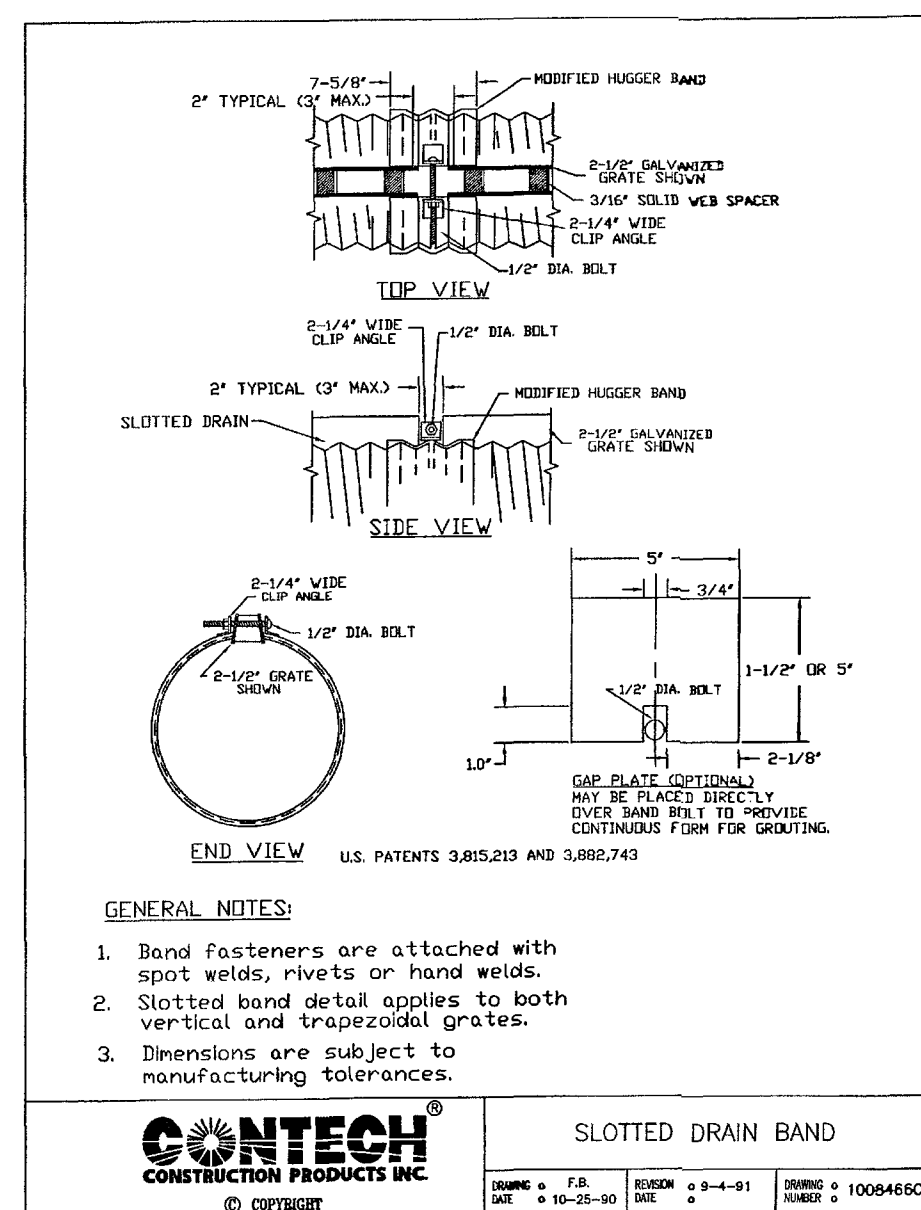
① **ex. STORM MANHOLE @ CURB INLET**  
 TOP=1089.54'  
 ② **ex. storm sewer manhole**  
 TOP=1089.63'  
 48" RCP INV. IN=1072.09', FROM A  
 48" RCP INV. IN=1083.63'  
 48" RCP INV. OUT=1083.53' TO C  
 ③ **STORM MANHOLE (CURB INLET)**  
 TOP=1074.88' (NEW TOP=1074.15')  
 48" RCP INV. IN=1061.34'  
 15" RCP INV. IN=1070.08' (STR. 0)  
 NEW 15" INV. IN=1068.98' (STR. 10)  
 NEW 15" INV. IN=1069.9' (STR. 15)  
 48" RCP INV. OUT=1061.04'  
 \*INLET TOP TO BE REMOVED AND  
 SLAB TOP WITH MANHOLE SHALL  
 BE INSTALLED AND LOWERED TO  
 FINISHED GRADE  
 ④ **STORM MANHOLE (CURB INLET)**  
 TOP=1088.33'  
 48" RCP INV. IN=1066.75'  
 48" RCP INV. OUT=1068.56'  
 ⑤ **STORM MANHOLE (CURB INLET) - T.B.R.**  
 TOP=1080.76'  
 SLOTTED IN (NO DETAIL)  
 ⑥ **12" RCP OUTLET TO POND - T.B.R.**  
 INV. IN=1076.21' (PER PLAN)  
 \*PIPE CROWN (NO ACCESS)  
 ⑦ **60" RCP RISER - T.B.R.**  
 TOP=1075.34'  
 12" RCP INV. OUT=1071.69'  
 ⑧ **12" RCP - T.B.R.**  
 INV. OUT=1068.42'  
 ⑨ **15" INV. OUT=1065.25'**  
 ⑩ **STORM MANHOLE (CURB INLET)**  
 TOP=1064.98'  
 15" RCP INV. IN=1058.96'  
 (ESTIMATED ... FILLED WITH DEBRIS)  
 15" RCP INV. OUT=1058.86'  
 ⑪ **STORM MANHOLE (CURB INLET)**  
 TOP=1064.98'  
 48" RCP INV. IN=1058.86'  
 48" RCP INV. IN=1060.40'  
 33" RCP INV. IN=1057.72'  
 15" RCP INV. IN=1057.72' (ESTIMATED)  
 ⑬ **GRATE INLET**  
 TOP=1062.24'  
 33" RCP INV. OUT=1058.47'  
 ⑭ **STORM MANHOLE**  
 TOP=1054.30' (ESTIMATED)  
 48" RCP INV. IN=1047.98'  
 54" RCP INV. OUT=1047.59' (ESTIMATED)  
 18" RCP INV. IN=1048.94'  
 ⑮ **STORM MANHOLE (CURB INLET)**  
 TOP=1055.05'  
 18" RCP INV. OUT=1048.91'  
 ⑯ **STORM MANHOLE (CURB INLET)**  
 TOP=1078.39'  
 15" RCP INV. OUT=1073.71'

A	<p>S.S. C.O. (TRAFFIC BEARING)          TOP=1085.5          INV. IN=1080.5          INV. OUT=1080.5</p>
B	<p>84 LF OF 6" SDR-26 PVC @ 5.36%</p>
B	<p>S.S. C.O. (TRAFFIC BEARING)          TOP=1083.55          INV. IN=1076.0          INV. OUT=1076.0</p>
C	<p>69 LF OF 6" SDR-26 PVC @ 19.13%</p>
C	<p>S.S. C.O. (TRAFFIC BEARING)          TOP=1083.9          INV. IN=1062.8          INV. OUT=1062.8</p>
C	<p>6 LF OF 6" SDR-26 PVC @ 19.17%</p>
S-12	<p>57 LF OF 8" SDR-35 PVC @ 7.98%</p>

1 62 LF OF CMP OPEN TOP SLOTTED  
 TRENCH DRAIN W/HEEL GUARD AT  
 PIPE SLOPE  
 TOP=1086.9  
 INV OUT=1083.45  
  
 2 6 LF OF 12"  
 CMP AT 2.50%  
  
 3 VDOT ST'D MH  
 TOP=1086.85  
 INV IN=1083.3  
 INV OUT=1083.2  
  
 4 148 LF OF 12" TYPE  
 S PIPE AT 2.36%  
  
 5 VDOT ST'D DI-2B  
 (6' THROAT)  
 TOP=1084.1  
 INV. IN=1079.7  
 INV. OUT=1079.6  
 (W/FLEXSTORM 62LHD W/PC+ BAG)  
  
 6 39 LF OF 15" TYPE  
 S PIPE AT 2.05%  
  
 7 VDOT ST'D. DI-3B  
 (6' THROAT)  
 TOP=1083.2  
 INV IN=1079.1 (STR. #13)  
 INV IN=1078.8 (STR. #6)  
 INV. OUT=1078.7  
 (W/FLEXSTORM 62LHD W/PC+ BAG)  
  
 8 77 LF OF 15" TYPE  
 S PIPE AT 2.08%  
  
 9 VDOT ST'D DI-3C  
 (6' THROAT)  
 TOP=1083.55  
 INV IN=1077.1  
 INV OUT=1070.3  
 (W/FLEXSTORM 62LHD W/PC+ BAG)  
  
 10 25 LF OF 15" CLASS III  
 RCP AT 2.00%  
  
 11 107 LF OF 6" N-12  
 HDPE PIPE AT 2.06%  
 INV OUT= 1079.8  
  
 12 TRAFFIC BEARING C.O.  
 TOP=1084.3  
 INV=1079.8  
  
 13 33 LF OF 6" TYPE  
 S PIPE AT 2.12%  
  
 14 VDOT ST'D DI-3B  
 (10' THROAT)  
 TOP=1073.2  
 INV OUT=1069.4.  
  
 15 22 LF OF 15" TYPE  
 S PIPE AT 2.77%

**NOTES:**

1. ALL SANITARY SEWER PIPE SHALL BE SDR-35 PVC PIPE UNLESS OTHERWISE SPECIFIED.
2. 6" S.S. LATERALS SHALL BE CONSTRUCTED AT MINIMUM 1.04% SLOPE PER THE BUILDING CODE.



TANK DEPTH OF BURY CALCULATION			
DESCRIPTION		FURTHEST ISLAND	LOWEST ISLAND
1. Elevation at Top of Island		1084.86	1086.91
2. Min. Slope of Piping = $(L_1 \times 1/8")$ per foot			
Where $L_1 = 173$ ft., $L_2 = 275$ ft.		1.81 ft.	2.87 ft.
3. Dispenser Island	6"		
Concrete Drive Slab	6"		
Pipe Cover	8"		
Pipe Diameter	3"		
Tank Connection	10"		
Total	33"	2.75 ft.	2.75 ft.
4. Grade Differential = $(\#2 + \#3)$		4.56 ft.	5.62 ft.
5. Top of Tanks = $(\#1 - \#4)$		1080.30	1081.29
6. Top of Tanks = Lowest Calculated Elevation			1080.30
<b>Check Min. / Max. Burial Depth</b>			
7. Lowest Elevation of Slab Above Tank			1084.90
8. Depth of Bury = $(\#7 - \#6)$			4.60 ft.
<b>NOTE:</b> If $\#8 < 5$ ft., Set Top of Tanks at $(\#7 - 5.0 \text{ ft.}) \approx$		1079.90	
If $\#8 > 7$ ft., Contact Owner for Certification of Burial Depth with Tank Mgr.			

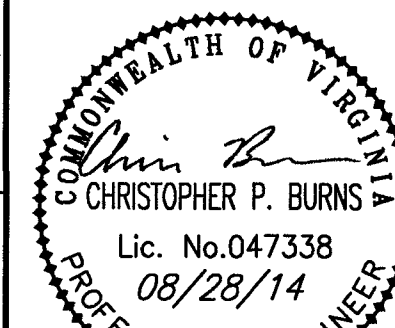
**BALZER**  
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**Balzer and Associates, Inc.**

1208 Corporate Circle  
Roanoke, VA 24018  
540-772-9580  
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**KROGER FUEL CENTER R-375**  
3755 BRAMBLETON AVENUE  
**GRADING PLAN**  
WINDSOR HILLS DISTRICT  
ROANOKE COUNTY, VIRGINIA

DRAWN BY BTC  
DESIGNED BY BTC  
CHECKED BY CPB  
DATE 7/21/2014  
SCALE 1"=20'

REVISIONS:  
8/8/2014  
8/12/2014  
8/28/2014

☒ APPROVED

SHEET NO.

# C5

JOB NO. R1100049.01