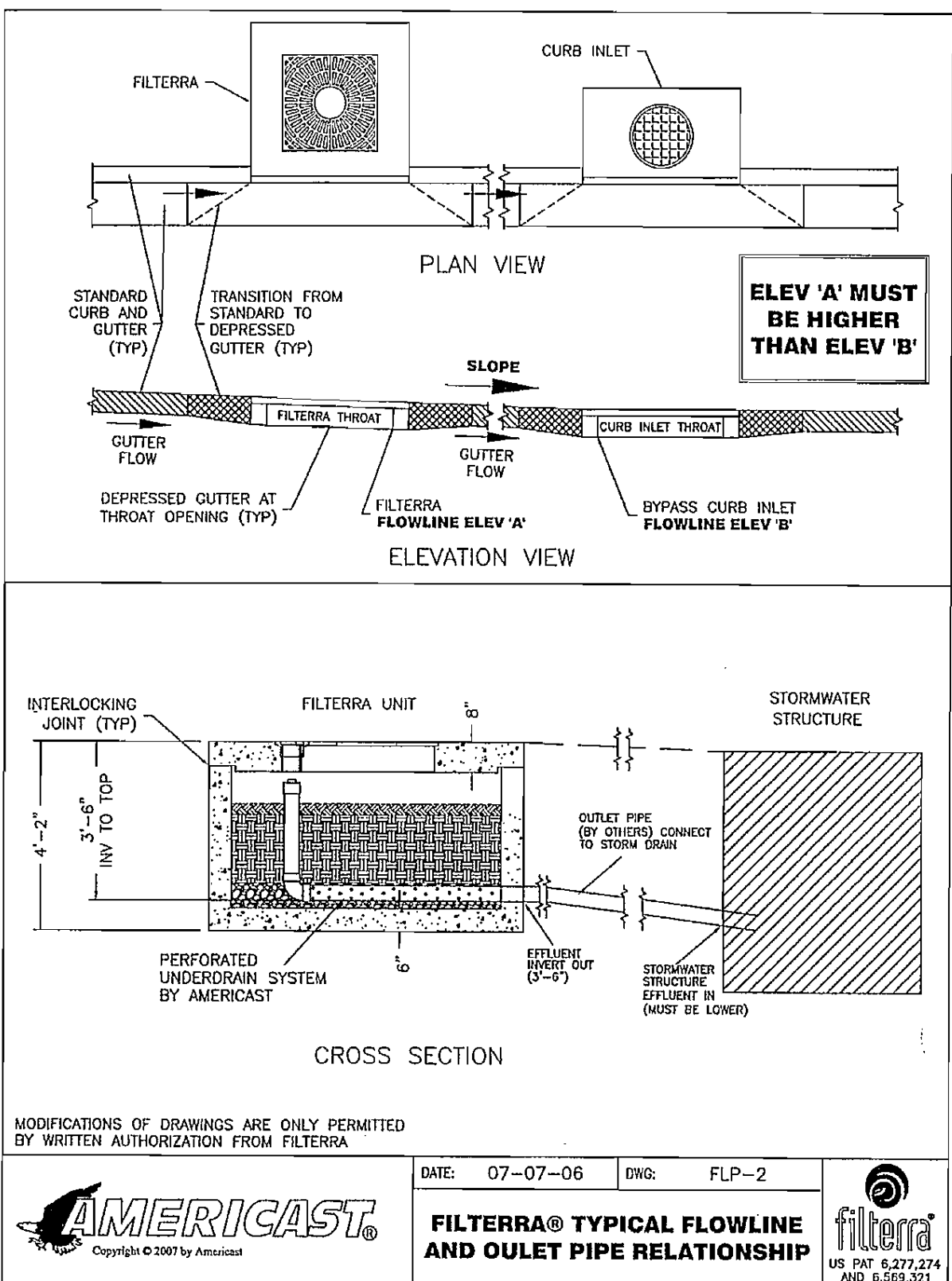
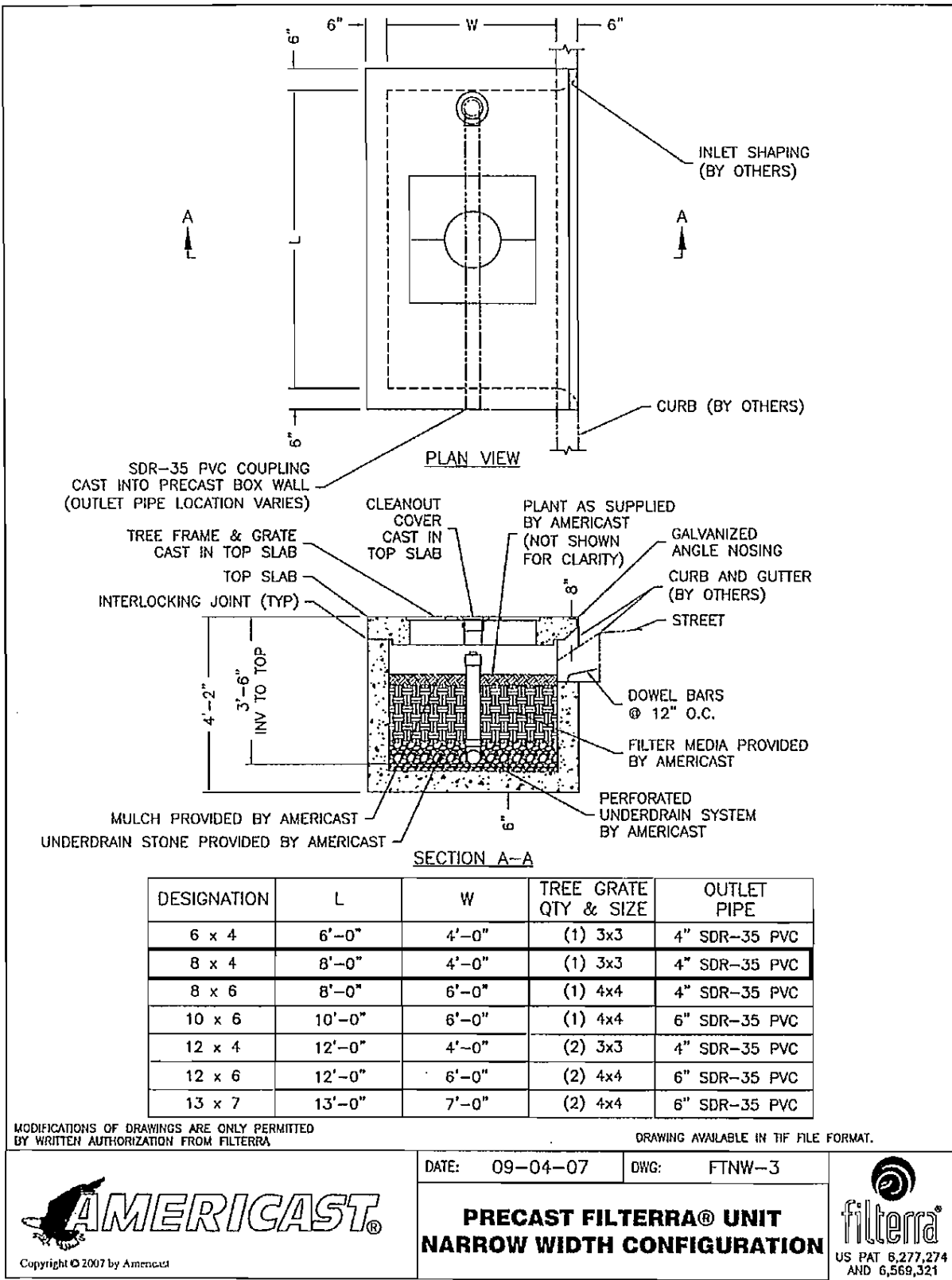




FILTERRA CONSTRUCTION & INSTALLATION NOTES:

1. EACH UNIT SHALL BE CONSTRUCTED AT THE LOCATIONS AND ELEVATIONS ACCORDING TO THE SIZES SHOWN ON THE APPROVED DRAWINGS. ANY MODIFICATIONS TO THE ELEVATION OR LOCATION SHALL BE AT THE DIRECTION OF AND APPROVED BY THE ENGINEER.
2. IF THE FILTERRA IS STORED BEFORE INSTALLATION, THE TOP SLAB MUST BE PLACED ON THE BOX USING THE 2x4 WOOD PROVIDED, TO PREVENT ANY CONTAMINATION FROM THE SITE. ALL INTERNAL FITTINGS SUPPLIED (IF ANY), MUST BE LEFT IN PLACE AS PER THE DELIVERY.
3. THE UNIT SHALL BE PLACED ON A COMPACTED SUBGRADE WITH A MINIMUM 6-INCH GRAVEL BASE MATCHING THE FINAL GRADE OF THE CURB LINE IN THE AREA OF THE UNIT. THE UNIT TO BE PLACED SUCH THAT THE UNIT AND TOP SLAB MATCH THE GRADE OF THE CURB IN THE AREA OF THE UNIT.
4. OUTLET CONNECTIONS SHALL BE ALIGNED AND SEALED TO MEET THE APPROVED DRAWINGS WITH MODIFICATIONS NECESSARY TO MEET SITE CONDITIONS AND LOCAL REGULATIONS.
5. ONCE THE UNIT IS SET, THE INTERNAL WOODEN FORMS AND PROTECTIVE MESH COVER MUST BE LEFT INTACT. REMOVE ONLY THE TEMPORARY WOODEN SHIPPING BLOCKS BETWEEN THE BOX AND TOP SLAB. THE TOP LID SHOULD BE SEALED ONTO THE BOX SECTION BEFORE BACKFILLING, USING A NON-SHRINK GROUT, BUTYL RUBBER OR SIMILAR WATERPROOF SEAL. THE BOARDS ON TOP OF THE LID AND BOARDS SEALED IN THE UNIT'S THROAT MUST NOT BE REMOVED. THE SUPPLIER (AMERICAST OR ITS AUTHORIZED DEALER) WILL REMOVE THESE SECTIONS AT THE TIME OF ACTIVATION. BACKFILLING SHOULD BE PERFORMED IN A CAREFUL MANNER, BRINGING THE APPROPRIATE FILL MATERIAL UP IN 6" LIFTS ON ALL SIDES. PRECAST SECTIONS SHALL BE SET IN A MANNER THAT WILL RESULT IN A WATER-TIGHT JOINT. IN ALL INSTANCES, INSTALLATION OF FILTERRA UNIT SHALL CONFORM TO ASTM SPECIFICATION C891 "STANDARD PRACTICE FOR INSTALLATION OF UNDERGROUND PRECAST UTILITY STRUCTURES", UNLESS DIRECTED OTHERWISE IN CONTRACT DOCUMENTS.
6. CURB AND GUTTER CONSTRUCTION (WHERE PRESENT) SHALL ENSURE THAT THE FLOWLINE OF THE FILTERRA UNITS IS AT A GREATER ELEVATION THAN THE FLOWLINE OF THE BYPASS STRUCTURE OR RELIEF (DROP INLET, CURB CUT OR SIMILAR). FAILURE TO COMPLY WITH THIS GUIDELINE MAY CAUSE FAILURE AND/OR DAMAGE TO THE FILTERRA ENVIRONMENTAL DEVICE.
7. EACH FILTERRA UNIT MUST RECEIVE ADEQUATE IRRIGATION TO ENSURE SURVIVAL OF THE LIVING SYSTEM DURING PERIODS OF DRIER WEATHER. THIS MAY BE ACHIEVED THROUGH GUTTER FLOW OR THROUGH THE TREE GRATE.

ACTIVATION:

1. ACTIVATION OF THE FILTERRA UNIT IS PERFORMED ONLY BY THE SUPPLIER. PURCHASER IS RESPONSIBLE FOR FILTERRA INLET PROTECTION AND SUBSEQUENT CLEAN OUT COST. THIS PROCESS CANNOT COMMENCE UNTIL THE PROJECT SITE IS FULLY STABILIZED AND CLEANED (FULL LANDSCAPING, GRASS COVER, FINAL PAVING AND STREET SWEEPING COMPLETED), NEGATING THE CHANCE OF CONSTRUCTION MATERIALS CONTAMINATING THE FILTERRA SYSTEM. CARE SHALL BE TAKEN DURING CONSTRUCTION NOT TO DAMAGE THE PROTECTIVE THROAT AND TOP PLATES.
2. ACTIVATION INCLUDES INSTALLATION OF PLANT(S) AND MULCH LAYERS AS NECESSARY.
3. THE G.C. SHALL ENSURE THAT A COPY OF THE ACTIVATION LETTER FROM THE SUPPLIER IS PROVIDED TO ROANOKE COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT.

INCLUDED MAINTENANCE:

1. EACH CORRECTLY INSTALLED FILTERRA UNIT IS TO BE MAINTAINED BY THE SUPPLIER, OR A SUPPLIER APPROVED CONTRACTOR FOR A MINIMUM PERIOD OF 1 YEAR. THE COST OF THIS SERVICE IS TO BE INCLUDED IN THE PRICE OF EACH FILTERRA UNIT. EXTENDED MAINTENANCE CONTRACTS ARE AVAILABLE AT EXTRA COST UPON REQUEST.
2. ANNUAL INCLUDED MAINTENANCE CONSISTS OF A MAXIMUM OF TWO (2) SCHEDULED VISITS. THE VISITS ARE SCHEDULED SEASONALLY; THE SPRING VISIT AIMS TO CLEAN UP AFTER WINTER LOADS THAT MAY INCLUDE SALTS AND SANDS. THE FALL VISIT HELPS THE SYSTEM BY REMOVING EXCESS LEAF LITTER.
3. EACH INCLUDED MAINTENANCE VISIT CONSISTS OF THE FOLLOWING TASKS:
 - A. FILTERRA UNIT INSPECTION
 - B. FOREIGN DEBRIS, SILT, MULCH, AND TRASH REMOVAL
 - C. FILTER MEDIA EVALUATION AND RECHARGE AS NECESSARY
 - D. PLANT HEALTH EVALUATION AND PRUNING OR REPLACEMENT AS NECESSARY
 - E. REPLACEMENT OF MULCH
 - F. DISPOSAL OF ALL MAINTENANCE REFUSE ITEMS
 - G. MAINTENANCE RECORDS UPDATED AND STORED (REPORTS AVAILABLE UPON REQUEST)
4. THE BEGINNING AND ENDING DATE OF SUPPLIER'S OBLIGATION TO MAINTAIN THE INSTALLED SYSTEM SHALL BE DETERMINED BY THE SUPPLIER AT THE TIME THE SYSTEM IS ACTIVATED. OWNERS MUST PROMPTLY NOTIFY THE SUPPLIER OF ANY DAMAGE TO THE PLANT(S), WHICH CONSTITUTE(S) AN INTEGRAL PART OF THE BIORETENTION TECHNOLOGY.

STORM STRUCTURE SCHEDULE:

- | | |
|--|---|
| 1. VDOT STD DI-3C (8' THROAT)
TOP=1154.5
INV. OUT=1150.5 | 3. CLEANOUT TYP.
TOP=1154.2
INV. IN=1151.75 |
| 2. 78 LF OF 15" N-12 HDPE PIPE AT 0.74% | 4. 36 LF OF 8" SDR-35 PIPE AT 3.47%
INV. OUT=1150.5 (STR.#11) |
| 3. VDOT STD MH-2
TOP=1157.9
INV. IN=1149.92
INV. OUT=1149.82 | 5. FLAT TOP MANHOLE
TOP=1160.25
INV. IN=1156.90
INV. OUT=1156.80 |
| 4. 100 LF OF 15" N-12 HDPE PIPE AT 0.65% | 6. 138 LF OF 15" RCP PIPE AT 3.30% |
| 5. VDOT STD MH-2
TOP=1154.60
INV. IN=1149.17 (STR.#4)
INV. IN=1149.70 (STR.#12)
INV. OUT=1149.07 | 7. VDOT STD MH-2
TOP=1156.90
INV. IN=1152.25 (STR. #16)
INV. IN=1152.25 (STR. #20)
INV. OUT=1152.15 |
| 6. 100 LF OF 15" N-12 HDPE PIPE AT 0.65%
INV. OUT=1148.47
INTO EX. STORM B | 8. 16 LF OF 15" RCP PIPE AT 2.50%
W/VDOT STD ES-1
INV. OUT=1151.75 |
| 7. 4" SDR-35 ROOFLEADER 8LF PER COLUMN (6 TOTAL CONNECTIONS)
MIN. SLOPE 2% | 9. VDOT STD DI-3B (8' THROAT)
TOP=1156.75
INV. OUT=1152.75 |
| 8. 57 LF OF 8" SDR-35 PIPE AT 1% TO STR. #9
INV. IN=1152.8
INV. OUT=1152.23 | 10. 8 LF OF 15" RCP PIPE AT 6.25%
INV. OUT=1152.25 (STR. #17) |
| 9. 10 LF OF 8" SDR-35 PIPE AT 1% TO STR. #9
INV. IN=1152.33
INV. OUT=1152.23 | 11. 8"x4" FILTERRA (8' THROAT)
TOP=1155.8
INV. OUT=1147.3 |
| 10. CLEANOUT TYP. (TRAFFIC BEARING)
TOP=1156.2
INV. IN=1152.23 | 12. 255 LF OF 4" SDR-35 PVC PIPE AT 2.5%
(G.C. TO PROVIDE 3 C.O. W/MAX. SPACING 100LF 8/T)
(G.C. TO SET C.O. TOPS FLUSH W/F.G.) |
| 11. 78 LF OF 8" SDR-35 PIPE AT 2%
INV. OUT=1149.7 (STR. #5) | 13. ex. storm inlet e
top=1144.04'
inv out=1139.13'
NEW INV. IN=1140.78' |
| 12. CLEANOUT TYP. (TRAFFIC BEARING)
TOP=1154.8
INV. IN=1152.23 | |
| 13. 42 LF OF 8" SDR-35 PIPE AT 1.9%
INV. OUT=1149.7 (STR. #5) | |

UNDERGROUND FUEL TANK INFO:

* CITY OF ROANOKE SITE PLAN APPROVAL DOES NOT APPLY TO THIS CHART *
(THIS INFORMATION IS FOR GENERAL REFERENCE ONLY)

TANK DEPTH OF BURY CALCULATION		
DESCRIPTION	FURTHEST ISLAND	LOWEST ISLAND
1. Elevation at Top of Island	1156.0	1155.75
2. Min. Slope of Piping = $(1.1) \times (1/8")$ per foot		
Where L1 = 1.93 ft., L2 = 1.93 ft.	185 ft.	185 ft.
3. Dispenser Island		
Concrete Drive Slab	6"	
Pipe Cover	8"	
Pipe Diameter	3"	
Tank Connection	10"	
Total	33"	
4. Grade Differential = (#2 + #3)	2.75 ft.	2.75 ft.
5. Top of Tanks = (#1 - #4)	1151.32	1151.07
6. Top of Tanks = Lowest Calculated Elevation		1151.07
Check Min. / Max. Fuel Tank Depth		
7. Lowest Elevation of Slab Above Tank	1153.45	
8. Depth of Bury = (#7 - #6)	2.38' ft.	
NOTE: IF #8 < 5 ft., Set Top of Tanks at (#7 - 5.0 ft.) = 1148.45		
IF #8 > 7 ft., Contact Owner for Certification of Burial Depth with Tank Mfr.		

FILTERRA DETAIL (STR. #21)

NO SCALE

Benjamin T. Crew
Balzer & Associates, Inc.
1208 Corporate Circle
Roanoke, VA 24018

May 17, 2012

Plan Review of Filterra® Kroger Fuel Center R-209, Roanoke, VA

Dear Sirs,

Thank you for submitting the plans on 16 May, 2012 for our review of the Kroger Fuel Center R-209 project.

Filterra® structure 21 (8x4) was studied for:

- Planned Filterra® box size
- Filterra® contributing drainage area meeting project's regional sizing specification
- Filterra® invert elevations are higher than effluent invert elevations
- The bypass is lower than the Filterra® elevation (spot elevations)
- The grading pattern encourages cross linear flow and not head-on flow
- The Filterra® outlet drain pipe is sized correctly and exists perpendicular to the wall
- For any conflicting structures such as storm drain pipes below Filterra®
- For most efficient placement of Filterra® units

The plan review concluded that the Filterra® structure listed above is sited and sized appropriately to treat stormwater to our published specifications.

Operational consistency with these specifications is contingent upon the stormwater unit being installed correctly and according to the plans, as well as regular maintenance being performed. Installation help documents will be forwarded to the Buyer at time of order. The Filterra® Installation, Operation and Maintenance Manual will be made available upon request.

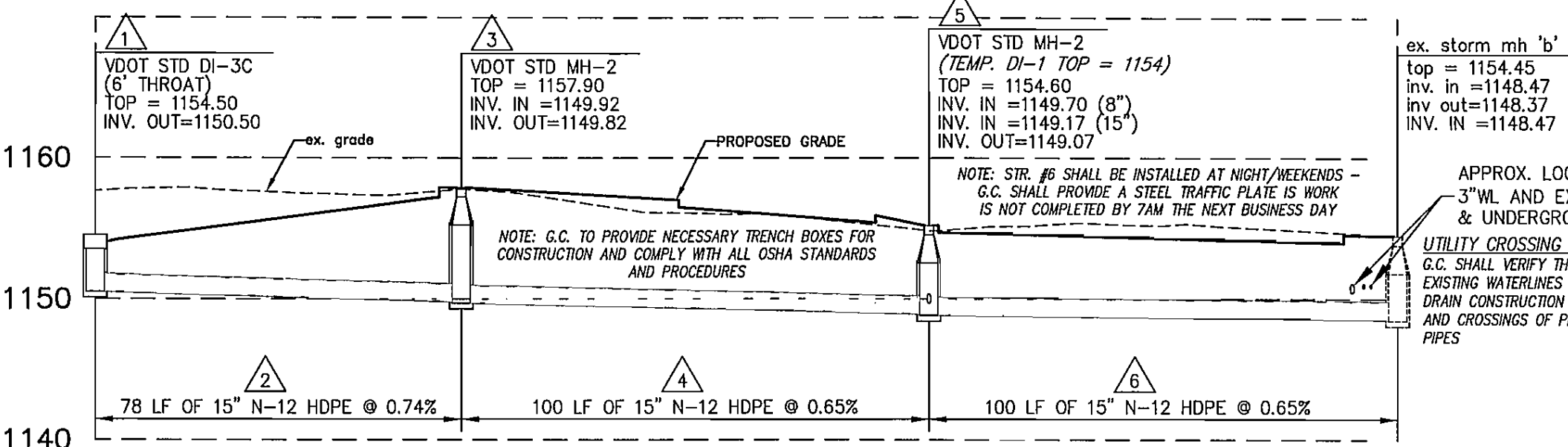
Yours sincerely

Duane Vincent
Engineer Support
Filterra® Bioretention Systems

Manufactured by Americast
11552 Virginia Precast Road
Ashland, VA 23015

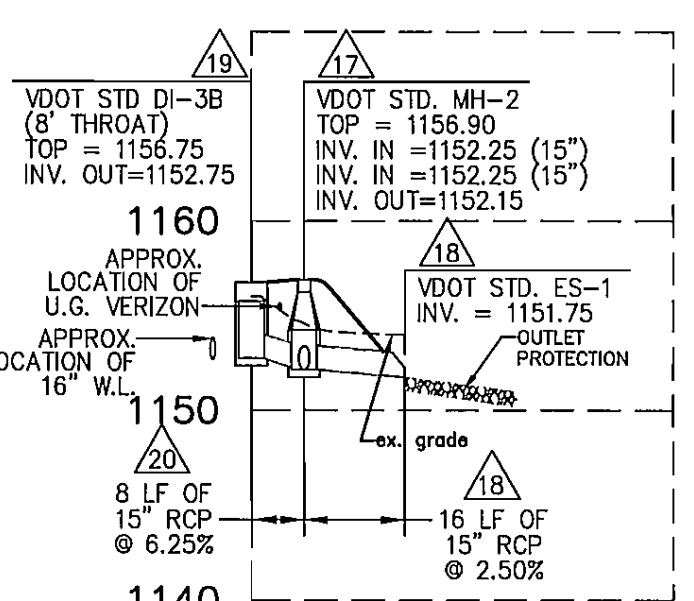
T: (804) 798-6168
F: (804) 798-8400
E: design@filterra.com

AMERICAST
not just concrete, concrete solutions.
www.filterra.com



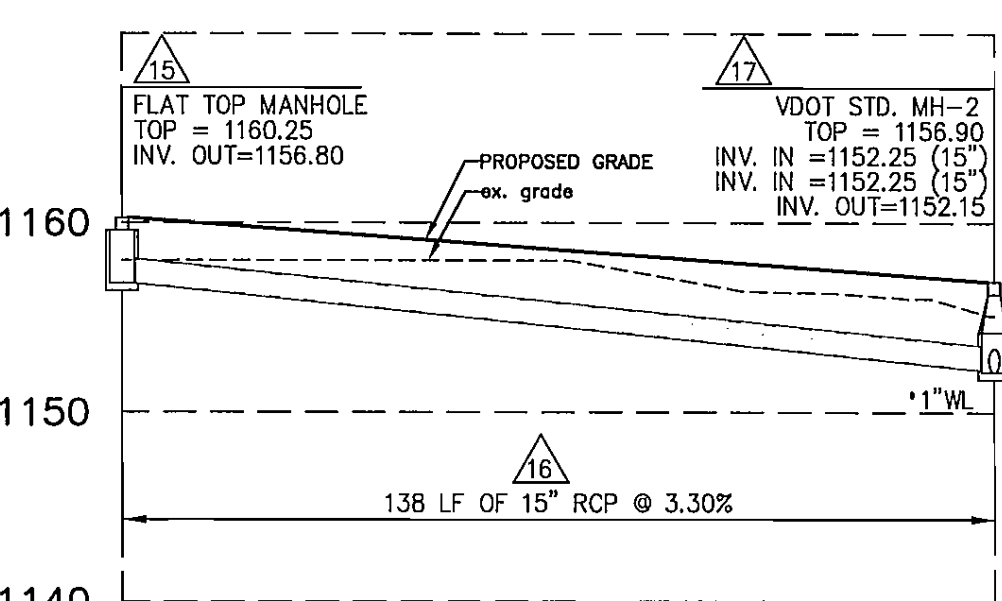
STORM SEWER PROFILE (1-6)

1"=30' HORIZONTAL
1"=10' VERTICAL



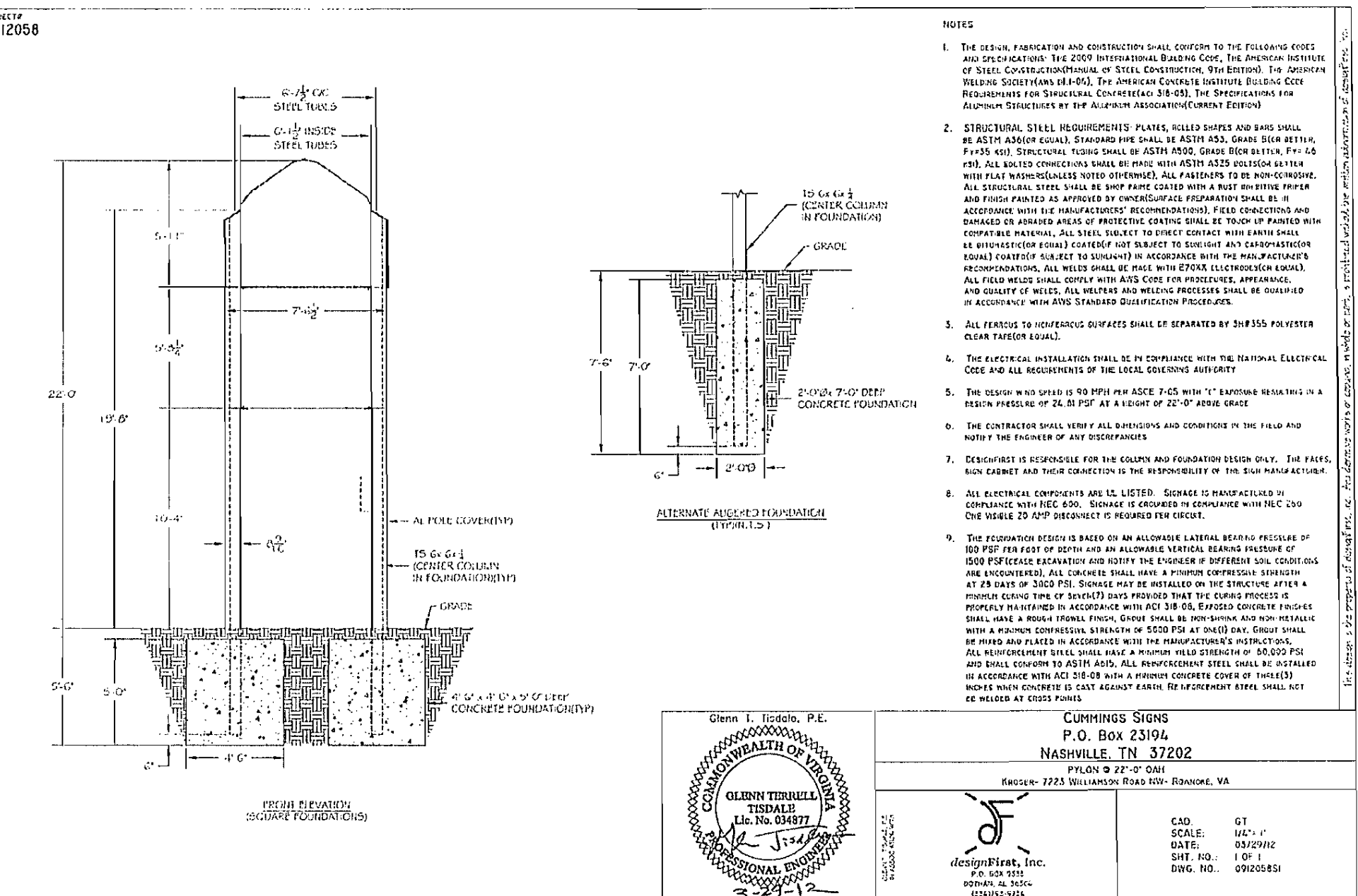
STORM SEWER PROFILE (17-20)

1"=30' HORIZONTAL
1"=10' VERTICAL



STORM SEWER PROFILE (15-17)

1"=30' HORIZONTAL
1"=10' VERTICAL



SITE SIGNAGE DETAIL

NO SCALE

* A SEPARATE PERMIT SHALL BE REQUIRED FOR ALL ON-SITE SIGNAGE *
(THIS INFORMATION IS FOR GENERAL REFERENCE ONLY)

BALZER
AND ASSOCIATES, INC.
www.balzer.cc

New River Valley
Richmond
Roanoke
Shenandoah Valley

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WETLAND DELINEATIONS & STREAM EVALUATIONS

Balzer and Associates, Inc.
1208 Corporate Circle
Roanoke, VA 24018
540-772-9580
FAX 540-772-8050

COMMONWEALTH OF VIRGINIA
CHRISTOPHER P. BURNS
Lic. No. 047338
6/13/12
PROFESSIONAL ENGINEER

KROGER FUEL CENTER R-209
PROFILES
CITY OF ROANOKE, VIRGINIA

DRAWN BY BTC
DESIGNED BY BTC
CHECKED BY CPT
DATE 4-25-12
SCALE AS SHOWN

REVISIONS:
5-23-12
6-13-12

APPROVED
JUL 12 2012

SHEET NO.

C08

JOB NO. R1100071.00