

**CONSTRUCTION SPECIFICATIONS**

1. ENSURE THAT THE SUBGRADE FOR THE FILTER AND RIPRAP FOLLOWS THE REQUIRED LINES AND GRADES SHOWN IN THE PLAN. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO THE DENSITY OF THE SURROUNDING UNDISTURBED MATERIAL. LOW AREAS IN THE SUBGRADE ON UNDISTURBED SOIL MAY ALSO BE FILLED BY INCREASING THE RIPRAP THICKNESS.
2. THE RIPRAP AND GRAVEL FILTER MUST CONFORM TO THE SPECIFIED GRADING LIMITS SHOWN ON THE PLANS.
3. FILTER CLOTH MUST MEET DESIGN REQUIREMENTS AND BE PROPERLY PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION. REPAIR ANY DAMAGE BY REMOVING THE RIPRAP AND PLACING ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA. ALL CONNECTING JOINTS SHOULD OVERLAP A MINIMUM OF 1 FT IF THE DAMAGE IS EXTENSIVE, REPLACE THE ENTIRE FILTER CLOTH.
4. RIPRAP MAY BE PLACED BY EQUIPMENT, BUT TAKE CARE TO AVOID DAMAGING THE FILTER.
5. THE MINIMUM THICKNESS OF THE RIPRAP SHOULD BE 1.5 TIMES THE MAXIMUM STONE DIAMETER.
6. RIPRAP MAY BE FIELD STONE OR ROUGH QUARRY STONE. IT SHOULD BE HARD, ANGULAR, HIGHLY WEATHER-RESISTANT AND WELL GRADED.
7. CONSTRUCT THE APRON ON ZERO GRADE WITH NO OVERFALL AT THE END MAKE THE TOP OF THE RIPRAP AT THE DOWN-STREAM END LEVEL WITH THE RECEIVING AREA OR SLIGHTLY BELOW IT.
8. ENSURE THAT THE APRON IS PROPERLY ALIGNED WITH THE RECEIVING STREAM AND PREFERABLY Y STRAIGHT THROUGHOUT ITS LENGTH. IF A CURVE IS NECESSARY TO FIT SITE CONDITIONS, PLACE IT IN THE UPPER SECTION OF THE APRON.
9. IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION (PRACTICES 6.10, TEMPORARY SEEDING, AND 6.11, PERMANENT SEEDING).

**MAINTENANCE**

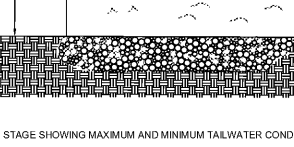
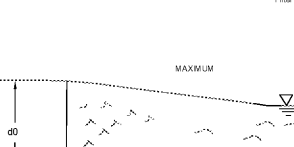
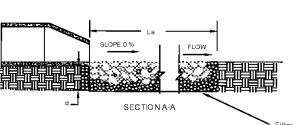
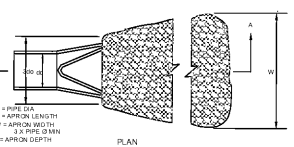
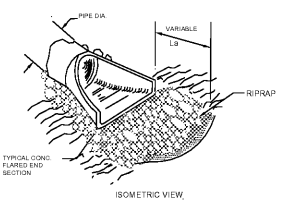
INSPECT RIPRAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

**NOTES**

SEE APPROPRIATE SCHEDULE FOR DIMENSIONS

1. L IS THE LENGTH OF THE RIPRAP APRON.
2. S IS 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".
3. IN WELL-DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 1' ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK WHICH EVER IS LESS.
4. A FILTER BLANKET OR FILTER FABRIC SHALL BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

**PIPE OUTLET TO FLAT AREA - NO WELL DEFINED CHANNEL**



STAGE SHOWING MAXIMUM AND MINIMUM TAILWATER CONDITION

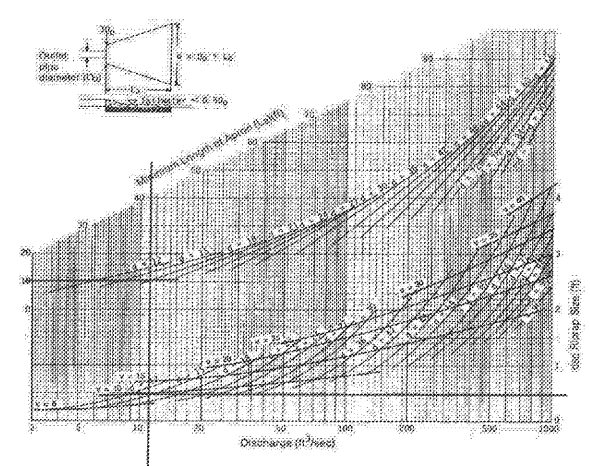
**OUTLET STABILIZATION STRUCTURE (NCDENR 6.41) N.T.S.**

**Rip Rap Apron Design**

Project: **Sam's Xpress Car Wash - Indian Trail**  
Structure: **FES-5**

**NCDENR Erosion and Sediment Control Planning and Design Manual**

$D_{50} = 18$ in.	$d_{50} (6" \text{ min.}) = 6$ in.
$Q_{50} = 11.0 \text{ cfs}$	$d_{max} = 9.00$ in.
$3D_{50} = 4.5$ ft.	$th = 13.50$ in.
$L_p = 10$ ft.	
$W = 11.50$ ft.	



Figures 6.6 and 6.7 are not to scale. Figures 6.6 and 6.7 are not to scale. Figures 6.6 and 6.7 are not to scale.

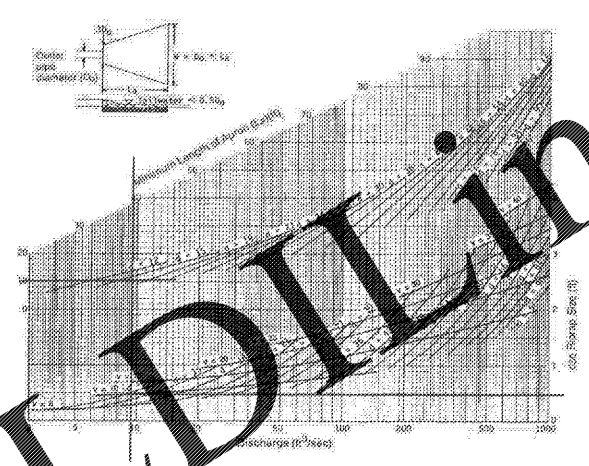
EEl Project No. 5858  
Rip Rap Apron Design

**Rip Rap Apron Design**

Project: **Sam's Xpress Car Wash - Indian Trail**  
Structure: **BMP Outlet FES-7**

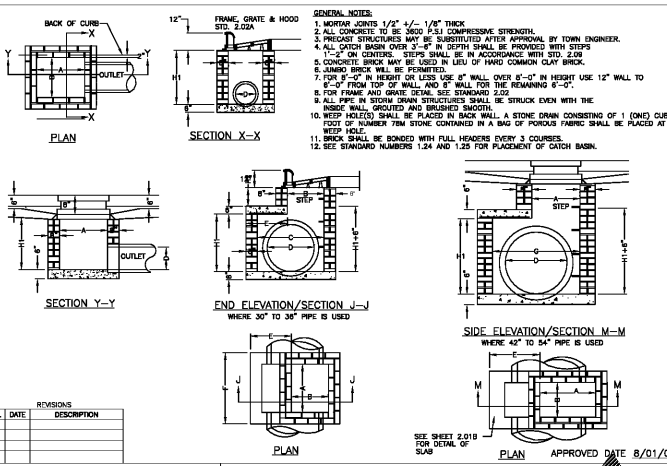
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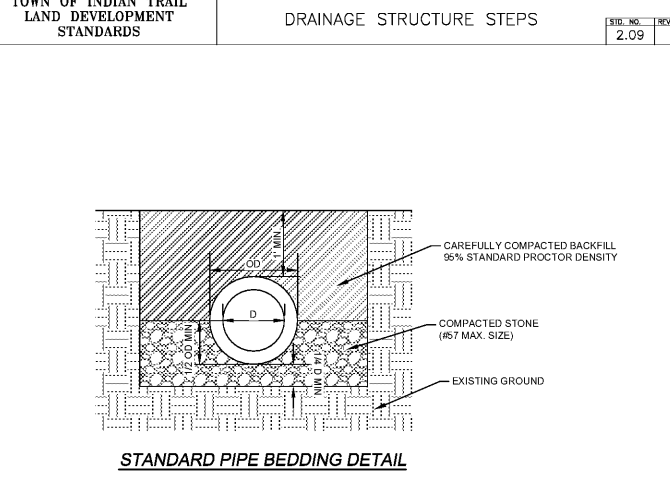
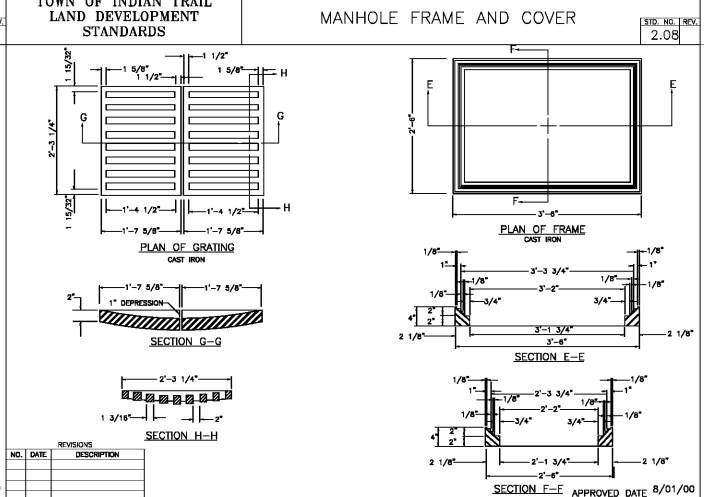
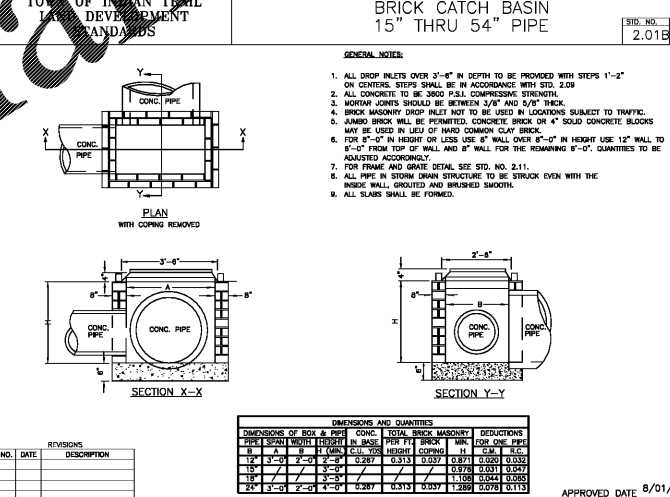
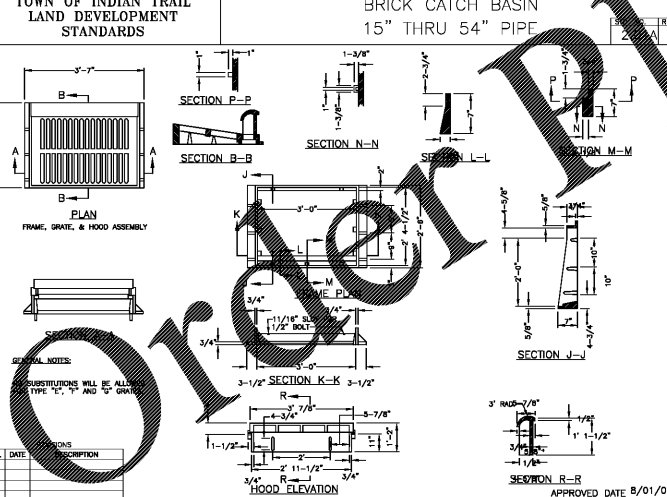
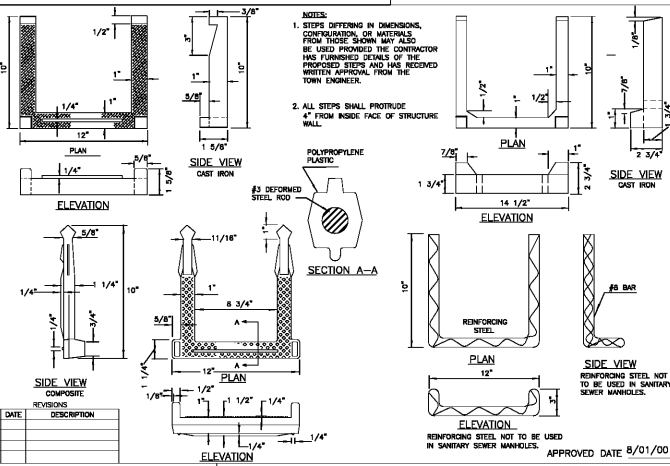
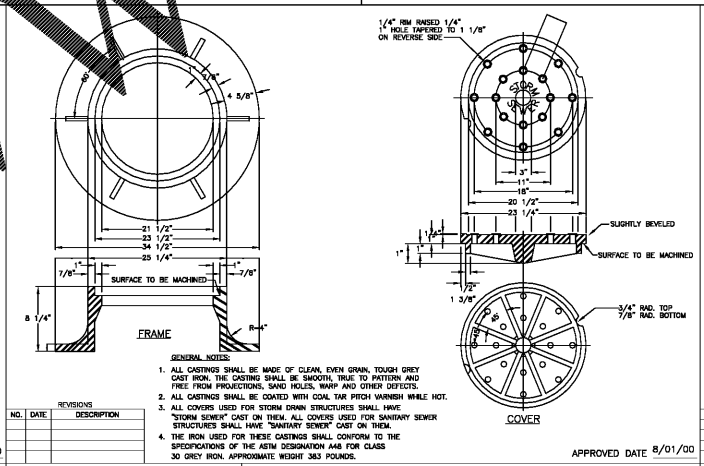
EEl Project No. 5858  
Rip Rap Apron Design



**TOWN OF INDIAN TRAIL LAND DEVELOPMENT STANDARDS**

**BRICK CATCH BASIN 15" THRU 54" PIPE**

PIPE SIZE (IN)	MINIMUM LENGTH (FT)	MINIMUM WIDTH (FT)	MINIMUM DEPTH (FT)	MINIMUM COVER (IN)	MINIMUM SLOPE (PERCENT)
15"	10'	10'	18"	12"	0.5%
18"	10'	10'	18"	12"	0.5%
24"	10'	10'	18"	12"	0.5%
30"	10'	10'	18"	12"	0.5%
36"	10'	10'	18"	12"	0.5%
42"	10'	10'	18"	12"	0.5%
48"	10'	10'	18"	12"	0.5%
54"	10'	10'	18"	12"	0.5%



TOWN OF INDIAN TRAIL LAND DEVELOPMENT STANDARDS  
FRAME, GRATE AND HOOD FOR USE ON STANDARD CATCH BASIN  
STANDARD NO. 2.02A  
APPROVED DATE 8/01/00

TOWN OF INDIAN TRAIL LAND DEVELOPMENT STANDARDS  
BRICK DROP INLET  
STANDARD NO. 2.10  
APPROVED DATE 8/01/00

TOWN OF INDIAN TRAIL LAND DEVELOPMENT STANDARDS  
FRAME AND GRATE FOR DROP INLET  
STANDARD NO. 2.11  
APPROVED DATE 8/01/00

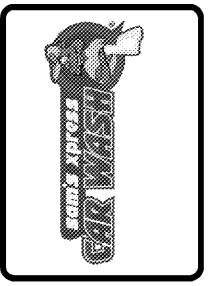
TOWN OF INDIAN TRAIL LAND DEVELOPMENT STANDARDS  
DRAINAGE STRUCTURE STEPS  
STANDARD NO. 2.09  
APPROVED DATE 8/01/00

**ENGINEERING**

FIRM LICENSE # C-0873  
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www.eegonline.net

**SEAL**  
14959  
NORTH CAROLINA  
REGISTERED PROFESSIONAL ENGINEER  
EXPIRES 12/31/17

NO.	DATE	BY	REVISION



**SAM'S XPRESS CAR WASH**  
TECHNOLOGY DRIVE  
INDIAN TRAIL, NC  
SAM'S REAL ESTATE  
7935 COUNCIL PLACE, SUITE 102  
MATTHEWS, NC 28105

**DETAILS**

DESIGNED BY	JLR	SCALE	AS SHOWN
DRAWN BY	JAR	CHECKED BY	JHR
DATE	07/05/17	JOB NUMBER	5658

Sheet  
**C-6.2**