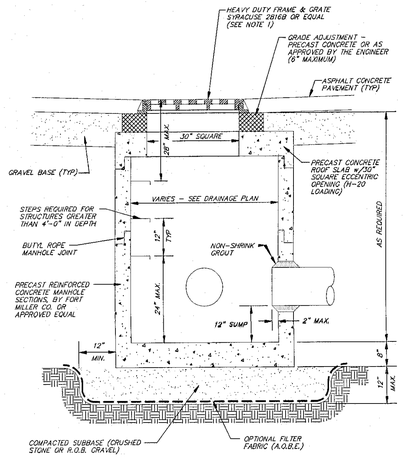
Planning Approval
10-01000019_SPA121

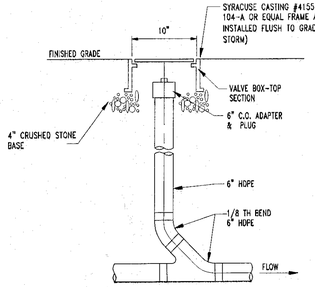


NOTES :

1. FRAME AND GRATE/COVER FOR EACH STORM STRUCTURE SHALL BE SET IN MORTAR BED.

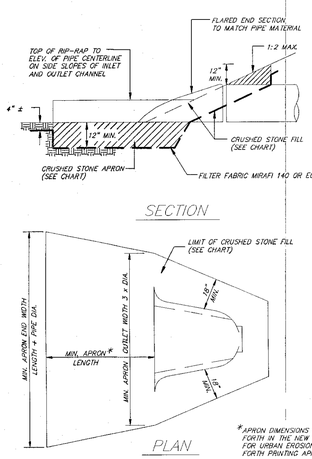
PRECAST CONCRETE STORM MANHOLE

NOT TO SCALE



STORM-LINE CLEANOUT DETAIL

N.T.S.



ES-1
OUTLET PROTECTION
SIZING CALCULATIONS:
GIVEN:
CIRCULAR PIPE FLOWING FULL
LOW TAILWATER CONDITIONS:
Q=14.13cfs, DIA.=18"
MIN. STONE DIA.= 0.5'.
MIN. APRON LENGTH= 14'
MIN. APRON OUTLET WIDTH=1.5'(3)=4.5'
MIN. APRON END WIDTH=1.5'+14'= 15.5'
MIN. APRON DEPTH=30"
PROVIDED:
20'x18'x30" STONE PAD
MEDIUM STONE FILL
NYSDOT ITEM # 620.04

ES-3&4
OUTLET PROTECTION
SIZING CALCULATIONS:
GIVEN:
CIRCULAR PIPE FLOWING FULL
LOW TAILWATER CONDITIONS:
Q=1.18cfs, DIA.=12"
MIN. STONE DIA.= 0.3'
MIN. APRON LENGTH= 6'
MIN. APRON OUTLET WIDTH=1'(3)=3'
MIN. APRON END WIDTH=1'+6'= 7'
MIN. APRON DEPTH=12"
PROVIDED:
10'x10'x12" STONE PAD
LIGHT STONE FILL
NYSDOT ITEM # 620.03

ES-5
OUTLET PROTECTION
SIZING CALCULATIONS:
GIVEN:
CIRCULAR PIPE FLOWING FULL
LOW TAILWATER CONDITIONS:
Q=6.06cfs, DIA.=18"
MIN. STONE DIA.= 0.3'
MIN. APRON LENGTH= 8'
MIN. APRON OUTLET WIDTH=1.5'(3)=4.5'
MIN. APRON END WIDTH=1.5'+8'= 9.5'
MIN. APRON DEPTH=12"
PROVIDED:
10'x10'x12" STONE PAD
LIGHT STONE FILL
NYSDOT ITEM # 620.03

CRUSHED STONE FILL:
MEDIUM STONE FILL
NYSDOT ITEM # 620.04
50%-100% HEAVIER THAN 110LBS.
0%-10% SMALLER THAN 6"DIA.
SEE NYSDOT STANDARDS SECTION 620-2 FOR FURTHER SPECIFICATIONS

LIGHT STONE FILL
NYSDOT ITEM # 620.03
90%-100% LIGHTER THAN 110LBS.
50%-10% LARGER THAN 6"DIA.
0%-10% SMALLER THAN 1/2"DIA.
SEE NYSDOT STANDARDS SECTION 620-2 FOR FURTHER SPECIFICATIONS

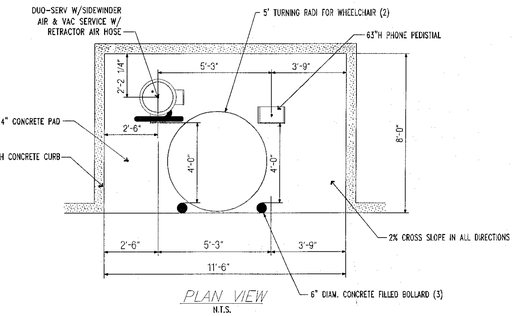
NOTES:

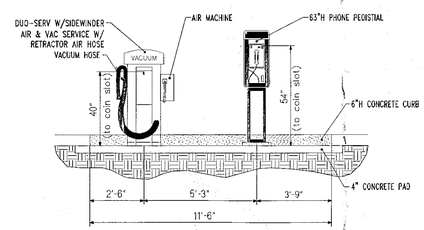
1. MATERIALS SHALL CONTAIN LESS THAN 20% OF STONES WITH A RATIO OF MAX. TO MIN. DIMENTIONS GREATER THAN 3.
2. MATERIALS SHALL CONTAIN A SUFFICIENT AMOUNT OF STONES SMALLER THAN THE AVERAGE STONE SIZE TO FILL IN THE SPACES BETWEEN THE LARGER STONES.

*APRON DIMENSIONS ARE PER STANDARDS SET FORTH IN THE NEW YORK GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL FORTH PRINTING APRIL 1997

STORM SEWER END SECTION DETAILS

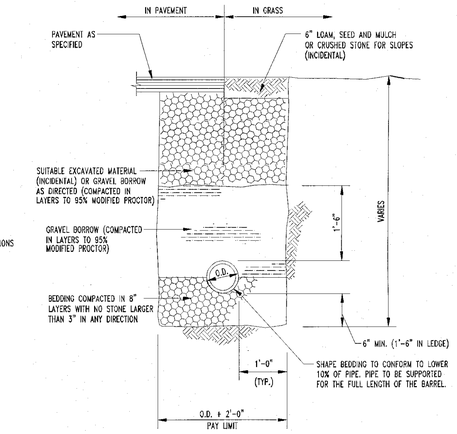
N.T.S.





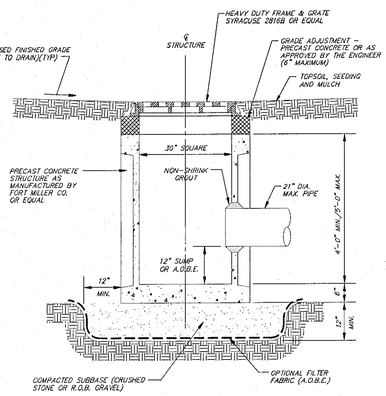
CUSTOMER SERVICE PAD DETAILS

NOT TO SCALE



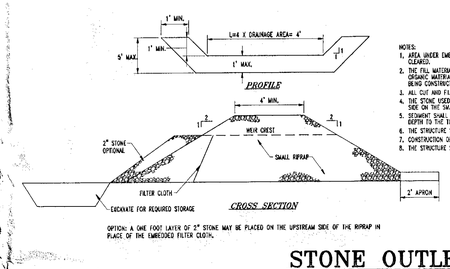
ONSITE PIPE TRENCH DETAIL

NOT TO SCALE



PRECAST CONCRETE CATCH BASIN

NOT TO SCALE



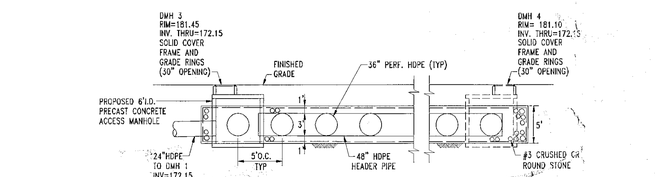
OPTION: A ONE FOOT LAYER OF 2" STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP IN PLACE OF THE EMBEDDED FILTER CLOTH.

NOTES:

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER UNSUITABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIPRAP ON EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO IT'S ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH TO THE TRAP.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IN MINIMIZED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

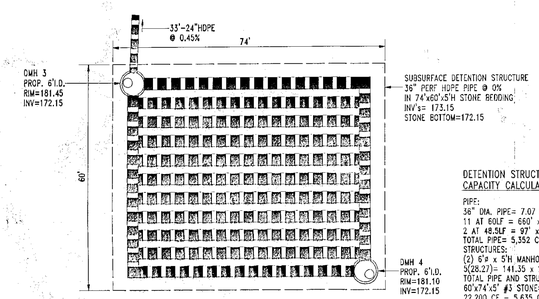
STONE OUTLET SEDIMENT TRAP DETAIL

NOT TO SCALE



DETENTION STRUCTURE SECTION

SCALE: NONE



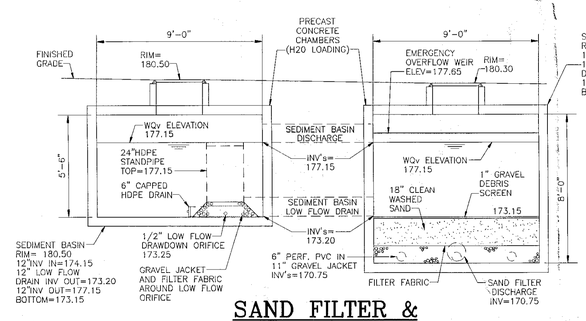
DETENTION STRUCTURE CAPACITY CALCULATIONS

PIPE:
36" DIA. PIPE= 7.07 CF/FOOT
11 AT 60LF = 660' x 7.07 CF/FT= 4,666.2 CF
2 AT 48.5LF = 97' x 7.07 CF/FT= 685.8 CF
TOTAL PIPE= 5,352 CF
STRUCTURES:
(2) 6'ø x 5'H MANHOLES
5(28.27)= 141.35 x 2= 283 CF
TOTAL PIPE AND STRUCTURES= 5,635 CF
60'x74'x5' #3 STONE= 22,200 CF
22,200 CF - 5,635 CF= 16,565 CF x .4 (40% VOIDS)= 6,626 CF
5,635 CF (PIPE & STRUC.) + 6,626 CF (STONE)= 12,261 CF

TOTAL DETENTION STRUCTURE STORAGE= 12,261 CF

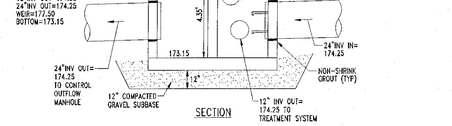
DETENTION STRUCTURE PLAN

SCALE: NONE



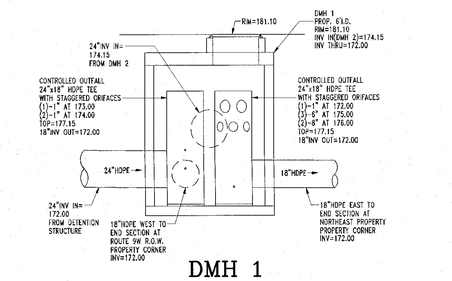
SAND FILTER & SEDIMENT CHAMBER SECTION

SCALE: 1/4"=1'-0"



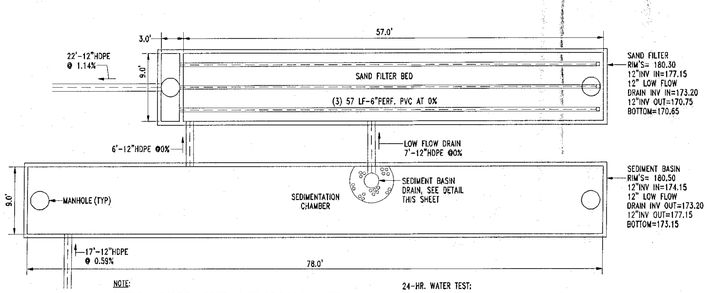
DMH 2 DIVERSION MANHOLE DETAIL

NOT TO SCALE



DMH 1 CONTROLLED OUTFLOW DETAIL

SCALE: 1/4"=1'-0"



NOTE:

THE DIMENSIONS OF THE SANDFILTER AND SEDIMENT BASIN SHOWN HEREIN ARE INSIDE DIMENSIONS ONLY FOR THE PURPOSE OF PROVIDING REQUIRED CAPACITY. THE STRUCTURAL DESIGN WILL BE PROVIDED BY THE MANUFACTURER AND WILL MEET THE REQUIRED INTERIOR DIMENTIONS AND SPECIFICATIONS AS SHOWN.

SAND FILTER & SEDIMENT CHAMBER PLAN

SCALE: 1"=10'

24-HR. WATER TEST:

TO INSURE THE FILTER BED CHAMBER IS WATER TIGHT, THE OPERATOR SHALL CONDUCT A 24-HOUR WATER TEST. THE OPERATOR SHALL MAKE ARRANGEMENTS FOR THE DELIVERY OF APPROXIMATELY 26,000 GALLONS OF WATER TO FILL THE CHAMBER. PRIOR TO THE PLACEMENT OF FILTER MATERIAL, THE OPERATOR SHALL PLUG THE DISCHARGE PIPE AND FILL THE FILTER BED CHAMBER WITH WATER. THE HIGH WATER MARK SHALL BE MARKED AND THE OPERATOR SHALL MEASURE ANY DROP IN WATER ELEVATION AFTER A 24 HOUR PERIOD. THE RESULTS SHALL BE RECORDED AND FORWARD TO THE PROJECT ENGINEER FOR REVIEW. FILTER BED MATERIAL SHALL NOT BE PLACED UNTIL THE RESULTS ARE REVIEWED AND APPROVED BY THE PROJECT ENGINEER.

MATERIAL SPECIFICATIONS:

SAND: CLEAN AASHTO M-6 OR ASTM C-33 CONCRETE SAND .02" TO 0.04". SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR COLOMIUC SAND SUBSTITUTIONS ARE ACCEPTABLE. "ROCK DUST" CANNOT BE SUBSTITUTED FOR SAND.

UNDERDRAIN GRAVEL: AASHTO M-43 NO.67 0.25" TO 0.75"

GEOTEXTILE FABRIC: ASTM D-751 (PUNCTURE STRENGTH=125LB) ASTM D-1117 (MULLEN BURST STRENGTH-400PSI) ASTM D-1682 (TENSILE STRENGTH=300LB.) 0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE. MUST MAINTAIN 125 GPM PER SQ. FT. FLOW RATE.

UNDERDRAIN PIPING: ASTM D-1785 OR AASHTO M-278. 8" RIGID SCHEDULE 40 PVC 3/8" PERF. 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES.

CONCRETE: (CAST-IN-PLACE) SEE LOCAL DOT STANDARDS AND SPECS. f'c= 3500 PSI, NORMAL WEIGHT, AIR-ENTRAINED; REINFORCING TO MEET ASTM 615-60. ON-SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED. 28 DAY STRENGTH AND SLUMP TEST. ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A LICENSED PROFESSIONAL STRUCTURAL ENGINEER.

NON-REBAR STEEL: ASTM A-36. STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM A123

WATER QUALITY VOLUME (WQv) CALCULATIONS:

90% RULE:
P=1.0
I=93%
R_v=0.05+0.009(93)=0.89
A=1.99

WQ_v=[(P)(R_v)(A)]/12=
[(1.0)(0.89)(1.99)]/12=0.148 AF
0.148 AF= 6,447 CF

SAND FILTER REQUIREMENTS:

REQUIRED:
STORAGE OF 75% OF WQv= 4,836 CF
PROVIDED:
SEDIMENT BASIN VOLUME AT 4.0' DEPTH= 78'x9'x4'= 2,808 CF
FILTER BASIN VOLUME AT 4.0' DEPTH= 57'x9'x4'= 2,052 CF
TOTAL VOLUME= 4,860 CF

REQUIRED:
25% OF WQv STORAGE IN SEDIMENT BASIN= 1,612 CF
PROVIDED:
SEDIMENT BASIN AREA AT 2.50' DEPTH= 78'x9'x2.5'= 1,755 CF

REQUIRED:
FILTER AREA= (WQv)(df)/[(k)(hf+Df)(tf)]
WQv=6,447 CF
df= FILTER BED DEPTH= 1.5'
k= COEFFICIENT OF PERMEABILITY OF FILTER MEDIA (ft/day)
SAND= 3.5 ft/day
hf= AVERAGE HEIGHT OF WATER ABOVE FILTER BED= 1.25'
tf= DESIGN FILTER BED DRAIN TIME (days)
RECOMMENDED MAXIMUM tf FOR SAND FILTERS= 1.67 days
(6,447)(1.5)/[(3.5)(1.75+1.5)(1.67)]= 510 SF
PROVIDED:
57'x9' FILTER BED= 513 SF

PLANNING BOARD
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK
This Site Plan Approved.
Chairman
Title
Date 6-6-06

TOWN OF BETHLEHEM APPROVAL AREA

Rev.	Date	Comment	By
7	8/24/06	REVISED PER TOWN ENGINEERING COMMENTS	JRG
6	7/17/06	REVISED PER DPW COMMENTS	RJS
5	5/31/06	EROSION CONTROL DETAILS ADDED	JRG
4	5/1/06	REVISED PER TOWN COMMENTS	RJS
3	3/10/06	REVISED PER TOWN COMMENTS	RJS
2	9/14/05	REVISED PER CLIENT COMMENTS	RJS
1	5/6/05	REVISED PER CLIENT COMMENTS	RJS

INCHES
Town of Bethlehem, NY

AUG 28 2006
TOWN OF BETHLEHEM

Cumberland Farms
777 Dedham Street Canton, Massachusetts 02021

BOHLER ENGINEERING, P.C.
• CIVIL & CONSULTING ENGINEERS • PROJECT MANAGERS • ENVIRONMENTAL & SITE PLANNERS • MUNICIPAL ENGINEERS •

352 TURNPIKE ROAD, SUITE 105
SOUTHBOROUGH, MA 01772
(508) 480-9900

5 COMPUTER DRIVE WEST, SUITE 203
ALBANY, NEW YORK 12205
(518) 438-9900

776 MOUNTAIN BLVD.
WATCHUNG, NEW JERSEY 07060
(908) 668-8300

PROJECT: CUMBERLAND FARMS, INC.
PROP. FOOD STORE & GAS STATION
68 ROUTE 9W - NYS RTE 9W & NYS RTE 5
TOWN OF BETHLEHEM, ALBANY COUNTY

TITLE: DETAILS

L.H. BOHLER
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 27410
PENNSYLVANIA LICENSE No. 37184
NEW YORK LICENSE No. 63409
CONNECTICUT LICENSE No. 17518
MASSACHUSETTS LICENSE No. 37025

WILLIAM DAVID GOBEL
STATE OF NEW YORK
LICENSED PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 37773

SCALE:(H) NONE (V) NONE	DATE: 4/11/05	SHEET No: 12
DRAWN BY: SMV	PROJECT No: b040587	12 OF 16
CHECKED BY: RJS	CAD I.D.: b040587sd0	
CONSTRUCTION CHECK	DATE	REV. No. 7