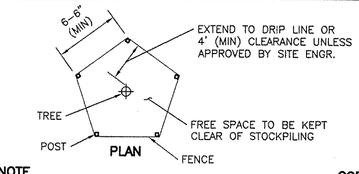
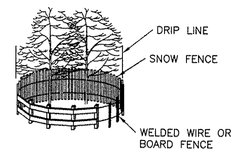
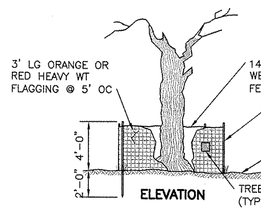




CORRECT METHOD OF TREE FENCING

NOTE

THE TREE PROTECTION SHOULD BE INSTALLED PRIOR TO ANY WORK IN AREA, AND REMAIN UNTIL END OF ALL WORK.



SILT FENCE TO BE INSTALLED ON GRADE WITH NO TRENCH. MATTING TO BE INSTALLED OVER SILT FABRIC AND ANCHORED BY MIN 12" LANDSCAPE NAIL @1' O.C. SPACING. INSTALLATION TO BE PERFORMED BY A QUALIFIED ARBORIST AND SUPERVISED BY A CERTIFIED ARBORIST

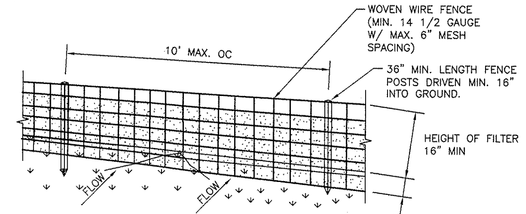
ROOT PROTECTION MATTING DETAIL

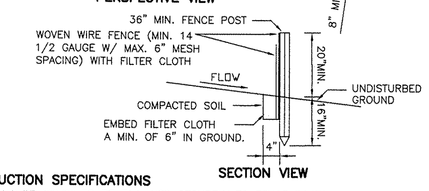
CONSTRUCTION SPECIFICATIONS

1. TREE PROTECTION AREA WILL BE DETERMINED AS PART OF THE PLAN REVIEW PROCESS. EXACT LOCATION, DEPTH AND METHODS OF ROOT PRUNING TO BE DETERMINED IN FIELD BY PROJECT FORESTER.
2. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING.
3. TRENCH SHOULD BE BACKFILLED IMMEDIATELY OR INCORPORATED WITH SILT FENCE INSTALLATION.
4. ROOTS SHOULD BE SEVERED BY TRENCHER, VIBRATORY PLOW OR APPROVED EQUIVALENT. ROOTS OVER 1.5" DIAMETER SHOULD BE CLEANLY CUT BY HAND. ROOT PRUNING ADJACENT TO SPECIMEN TREES MAY REQUIRE SOIL REMOVAL BY SUPERSONIC AIR TOOL TO MINIMIZE TREE AND ROOT IMPACTS.

TREE/VEGETATION PROTECTION BARRIER

NTS





CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

SILT FENCE INSTALLATION DETAIL

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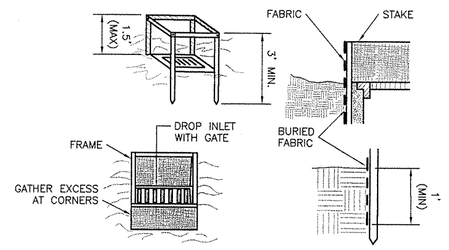
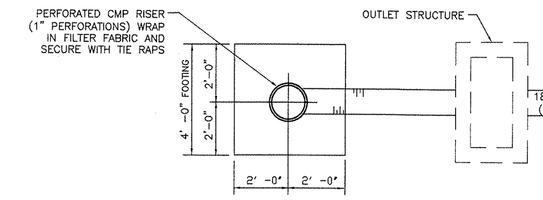


FIELD INLET CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2"x4" WOOD OR EQUIVALENT. METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2"x4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY. MAXIMUN DRAINAGE AREA 1 ACRE

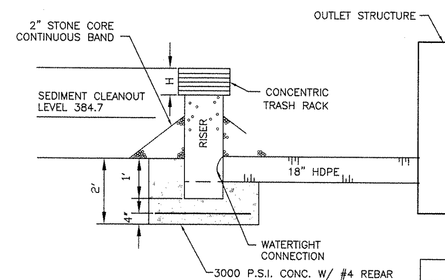
INLET PROTECTION

NTS



NOTES

1. SEDIMENT BASIN TO BE CONSTRUCTED AS PERMANENT EXTENDED DETENTION BASIN WITH MODIFICATIONS.
   A. CONSTRUCT TEMPORARY PERFORATED RISER AS SHOWN.
   B. PROTECT RISER WITH TRASH RACK.
   C. PERFORATIONS MUST NOT BE MADE ANY LOWER THAN 6" ABOVE TOP OF THE HORIZONTAL OUTFALL BARREL.
2. PERIODIC MAINTENANCE OF REMOVING SEDIMENT FROM BASIN WILL BE ANNUAL, OR AS NECESSARY WHEN SEDIMENT REACHES CLEANOUT LEVEL INDICATED BELOW.
3. UPON COMPLETION OF SITE CONSTRUCTION AND STABILIZATION OF TOPSOIL, TEMPORARY SEDIMENT BASIN OUTLET CONTROL STRUCTURE IS TO BE REMOVED AND PERMANENT OUTLET STRUCTURE INSTALLED.
   A. REMOVE TEMPORARY RISER STRUCTURE.
   B. REMOVE SEDIMENT WHERE NEEDED, FINAL GRADE THE DETENTION BASIN AND STABILIZE.
   C. CUT BARREL TO FINAL LENGTH FOR PERMANENT OUTLET STRUCTURE (SEE UTILITY PLANS).
   D. INSTALL PERMANENT OUTLET STRUCTURE.



NOTES

TEMPORARY RISER WILL CONNECT TO BARREL AT SAME ELEVATION AS PROPOSED ON UTILITY PLAN FOR OUTLET STRUCTURE.

TEMPORARY OUTLET STRUCTURE					
RISER (HDPE)			TRASH RACK		SEDIMENT CLEANOUT
DIAM.	LENGTH	CREST ELEV.	DIAM.	H	
24"	3.2'	387.2	36"	13"	384.7

TEMPORARY OUTLET STRUCTURE

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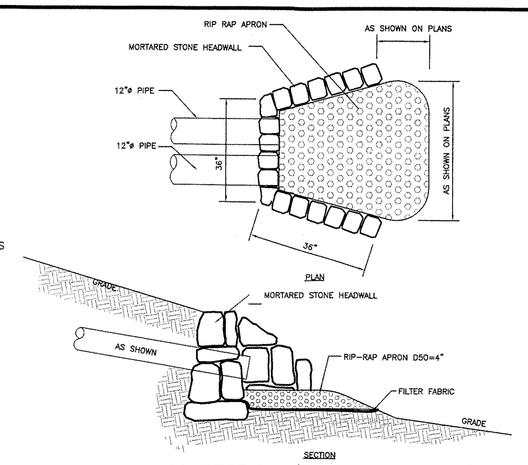
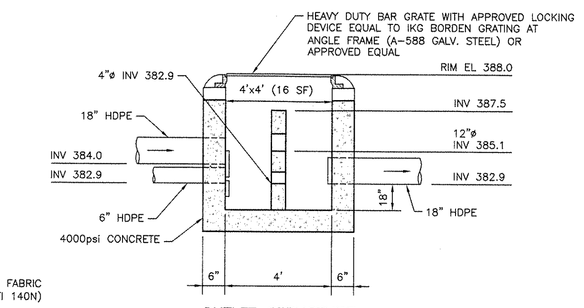


END SECTION (FOR ES 6 & 10)

NOT TO SCALE

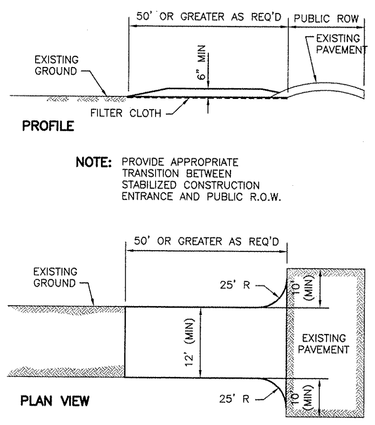


OUTLET STRUCTURE

NTS

NOTES

1. USE 3000 PSI CONCRETE.
2. MAINTAIN A MINIMUM 6" COVER OVER ANTI-SEEP COLLAR.
3. THE CONNECTION OF ANTI-SEEP COLLARS TO OUTLET PIPES SHALL BE WATERTIGHT.
4. O-RING GASKETS SHALL BE USED ON BASIN DISCHARGE PIPES THROUGH BERM AREAS.
5. MAXIMUM SPACING OF ANTI-SEEP COLLARS THROUGH BERM AREAS SHALL BE 40 FEET.



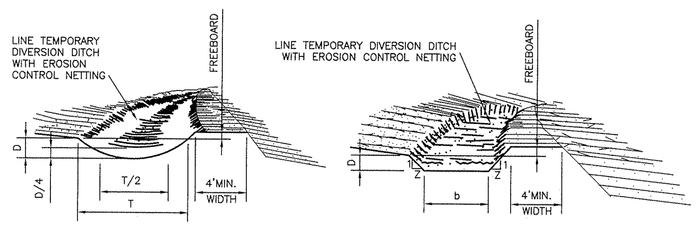
NOTE: PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND PUBLIC R.O.W.

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FOOT MINIMUM. BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SIGHT.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUITED, IT SHALL BE DONE ON A AREA STABILISED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE

NTS



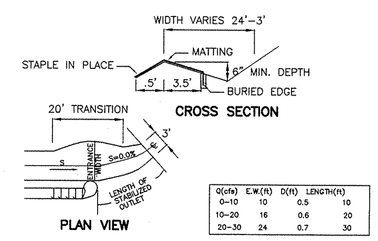
PARABOLIC CROSS-SECTION **TRAPEZOIDAL CROSS-SECTION**

CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIVERSION.
2. THE DIVERSION SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE DIVERSION.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIVERSION.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.
   A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT/SEC, SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY DIVERSIONS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE DIVERSION DURING THE ESTABLISHMENT OF THE VEGETATION.
   B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT/SEC, THE DIVERSION SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND THE VEGETATION IS ESTABLISHED.

TEMPORARY DIVERSION DITCH

NTS



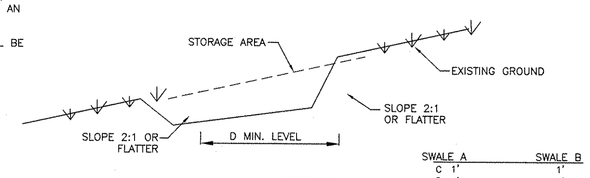
Q(cfs)	E.W.(ft)	D(ft)	LENGTH(ft)
0-10	10	0.5	10
10-20	16	0.6	20
20-30	24	0.7	30

CONSTRUCTION SPECIFICATIONS

1. THE MATTING SHOULD BE A MINIMUM OF 4FT. WIDE EXTENDING 6 INCHES OVER THE LIP AND BURIED 6 INCHES DEEP IN A VERTICAL TRENCH ON THE LOWER EDGE. THE UPPER EDGE SHOULD BUTT AGAINST SMOOTHLY CUT SOD AND BE SECURELY HELD IN PLACE WITH CLOSELY SPACED HEAVY DUTY WIRE STAPLES AT LEAST 12 INCHES IN LENGTH.
2. ENSURE THAT THE LIP IS LEVEL TO UNIFORMLY SPREAD DISCHARGE.
3. THE LIP SHALL BE CONSTRUCTED ON UNDISTURBED SOIL NOT FILL.
4. A 20 FOOT TRANSITION SECTION WILL BE CONSTRUCTED FROM THE DIVERSION CHANNEL TO THE SPREADER TO SMOOTHLY BLEND THE DIFFERENT DIMENSION AND GRADES.
5. THE RUNOFF DISCHARGE WILL BE OUTLETED ONTO A STABILIZED VEGETATED SLOPE NOT EXCEEDING 10%.
6. SEED AND MULCH THE DISTURBED AREA IMMEDIATELY AFTER CONSTRUCTION.

LEVEL SPREADER

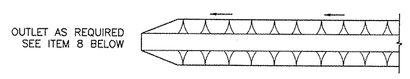
NTS



SWALE A	SWALE B
C 1'	1'
D 4'	6'

SECTION

POSITIVE DRAINAGE: 0.5% OR STEEPER DEPENDENT ON TOPOGRAPHY



PLAN VIEW

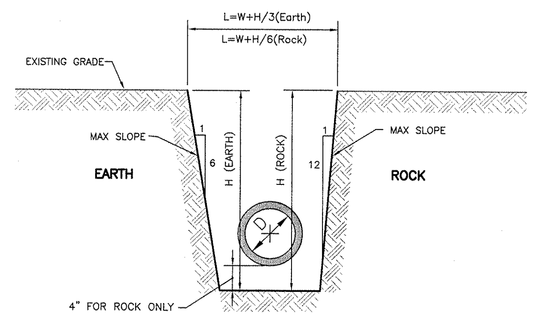
CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.
9. STABILIZATION SHALL BE AS PER THE FLOW CHANNEL STABILIZATION CHART BELOW.

TYPE OF TREATMENT	CHANNEL GRADE	A(S AC. OR LESS)	B(S AC -10AC)
1	0.5%-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1%-5.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR
3	5.1%-8.0%	SEED WITH JUTE OR EXCELSIOR SOD	LINED WITH 4-8" RIPRAP OR RECYCLED CONCRETE EQUIVALENT
4	8.1%-20%	LINED WITH 4-8" RIPRAP	ENGINEERED DESIGN

TEMPORARY SWALE

NTS



PIPE EMBEDMENT ZONE WIDTH SCHEDULE FOR PIPE MATERIAL OTHER THAN HDPE

INSIDE DIA. OF PIPE (D)	6" or less	8'	10"-12"	14"-18"	20"-30"	36"	
EMBEDMENT ZONE WIDTH (W)	2'- 0"	2'-6"	3'- 0"	3'- 6"	4'- 0"	4'-6"	
INSIDE DIA. OF PIPE (D)	48"	54"	60"	66"	72"	78"	84"
EMBEDMENT ZONE WIDTH (W)	6'- 0"	6'- 6"	7'- 0"	7'- 6"	8'- 0"	9'- 0"	9'- 6"	10'- 0"

TRENCH EXCAVATION AND BACKFILL NOTES

1. THE MAXIMUM DRY DENSITIES SHALL BE DETERMINED IN ACCORDANCE WITH ASTM DESIGNATION D1557. THE MINIMUM PERCENTAGE OF COMPACTION TO BE ACHIEVED BY THE CONTRACTOR IN THE VARIOUS ZONES IS AS FOLLOWS:

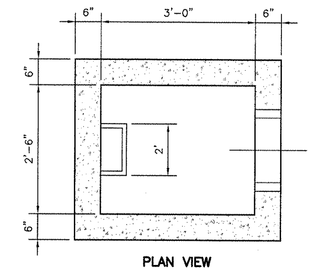
	PIPE MATERIAL	LOCATION	INITIAL COMPACTION
SURFACE ZONE	ALL	ALL	95%
TRENCH BACKFILL ZONE			90%
PIPE EMBEDMENT ZONE			95%

THE MINIMUM COMPACTION IN EMBANKMENTS SHALL BE 90%

2. THE PIPE EMBEDMENT ZONE WIDTH AND THE MAXIMUM TRENCH WIDTH SHALL NOT EXCEED THE PERMISSIBLE WIDTHS SHOWN. IF THE PERMISSIBLE WIDTH IS EXCEEDED, THE PIPE SHALL BE INSTALLED IN A HIGHER CLASS BEDDING THAN SHOWN ON THIS DRAWING OR THE SPECIFIED PIPE SHALL BE REPLACED WITH PIPE OF GREATER CRUSHING STRENGTH OR BOTH, TO ACHIEVE SUITABLE CONDITIONS.
3. SUITABLE MATERIAL FROM EXCAVATION SHALL BE FREE FROM OBJECTIONABLE QUANTITIES OF ORGANIC MATTER, CLAY, TREES, STUMPS, FROZEN MATERIAL, RUBBLE, CINDERS, ROCKS, AND OTHER MATERIALS CONSIDERED DELETERIOUS BY THE ENGINEER AND SHALL NOT HAVE FINES IN EXCESS OF 10 PERCENT PASSING THE NO. 200 SIEVE NOR STONE OR GRAVEL LARGER THAN 2 INCHES.

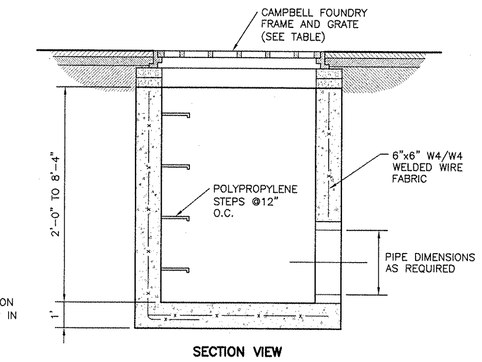
TRENCH EXCAVATION

NTS



PLAN VIEW

FRAMES AND GRATES		
PATTERN NO.	A	B
3087	30"	36"



SECTION VIEW

FIELD INLET CATCH BASIN

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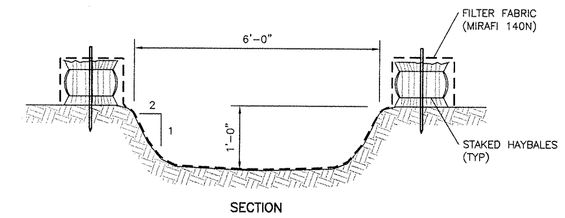
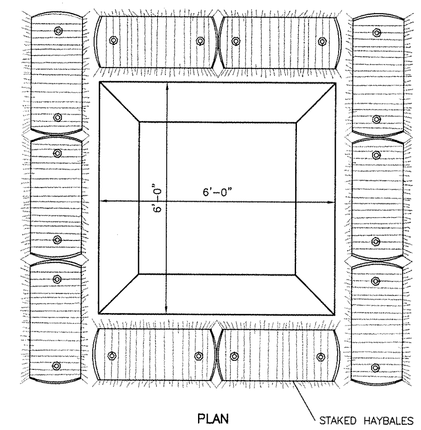


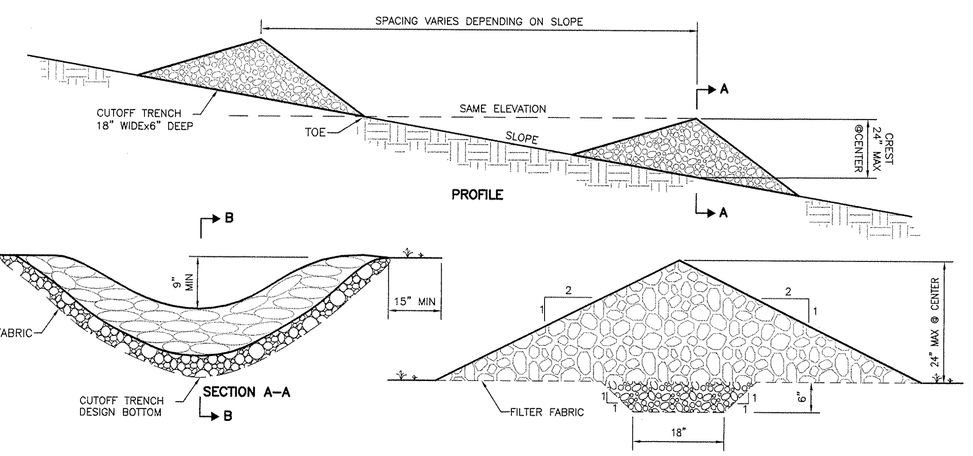
SECTION



PLAN

TEMPORARY CONCRETE WASH

NTS

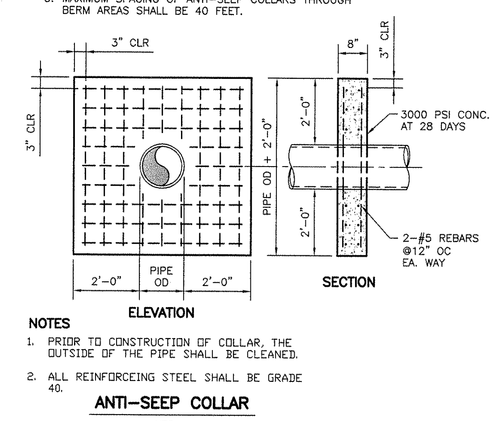


CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
6. MAXIMUM DRAINAGE AREA 2 ACRES.

CHECK DAM

NTS



NOTES

1. PRIOR TO CONSTRUCTION OF COLLAR, THE OUTSIDE OF THE PIPE SHALL BE CLEANED.
2. ALL REINFORCEING STEEL SHALL BE GRADE 40.

ANTI-SEEP COLLAR

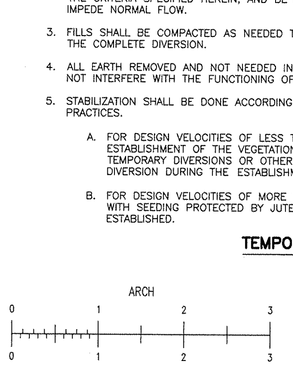
NTS

GENERAL NOTES

1. AFTER FINAL GRADES ARE ESTABLISHED, DISTURBED AREAS SHALL BE COVERED WITH FOUR INCHES OF TOPSOIL AND PLANTED AS SHOWN ON THE PLAN.
2. TREES, ROOT SYSTEMS AND OTHER VEGETATION REMOVED FOR CONSTRUCTION PURPOSES SHALL BE CHIPPED OR REMOVED FROM SITE. NO ON-SITE BURIAL OR BURNING SHALL BE PERMITTED.
3. THE CONTRACTOR OR CONSTRUCTION MANAGER SHALL CONTACT THE OWNERS OF ALL UTILITIES AFFECTING THE SITE PRIOR TO THE START OF CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE EXACT LOCATION OF UTILITIES FROM THE OWNERS PRIOR TO CONSTRUCTION. UNDERGROUND UTILITIES CALL CENTER OF NEW YORK (800-245-2828).
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TAKE THOSE STEPS NECESSARY TO PREVENT ILLEGAL DUMPING TO TAKE PLACE ON THE SITE. ANY MATERIAL FOUND UNSATISFACTORY TO THE ENGINEER WILL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE.

EROSION CONTROL NOTES

1. PRIOR TO THE START OF CONSTRUCTION EROSION CONTROL DEVICES SHALL BE IN PLACE AS SHOWN ON THESE PLANS.
2. FINAL GRADES SHALL BE ESTABLISHED AS SOON AS POSSIBLE AND TOP SOILED AND SEEDED TO PROVIDE A TURF, WHICH WILL STABILIZE SLOPES AND PREVENT EROSION.
3. SLOPES TO REMAIN OPEN FOR MORE THAN THREE WEEKS SHALL BE PROTECTED WITH TEMPORARY SEEDING OR STAKED NETTING.
4. EROSION CONTROL DEVICES SHALL BE INSPECTED AFTER EACH RAINFALL AND SHALL BE CLEANED, REPAIRED OR REPLACED AS NECESSARY.
5. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH WESTCHESTER COUNTY BEST MANAGEMENT PRACTICES MANUAL FOR EROSION AND SEDIMENT CONTROL.
6. THE ENGINEER MAY AT HIS DISCRETION REQUIRE ADDITIONAL EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION TO MITIGATE UNFORESEEN EROSION AND SILTATION.



REDUCTION RATIO

REV	REVISION	DWN	DES	CHKD	DATE
C	FEIS REVISIONS	JYP	MF	MF	4/27/12
B	RESPONSE TO DEIS COMMENTS	JP	JP	MF	4/04/12

ORANGE AND ROCKLAND UTILITIES, INC.
PEARL RIVER NEW YORK

CMX
CMX ENGINEERING, SURVEY & LANDSCAPE ARCHITECTS, PC OF NEW YORK
AN AFFILIATE OF BRIDGAL, WEINSTEIN, STERN

STATE OF NEW YORK
W. CHARLES UTSCHIG, JR.
PROFESSIONAL ENGINEER
SESSIONS

ENGINEERING REVIEW		
DEPT.	SIGNATURE	DATE
CIVIL/SURVEY		4/26/12
TELECOM/MKT.		
TRANS & SUB.		
RELAY		

DWN	DES	CHKD
JP	FM	WCU
DESIGN REVIEW		DATE
		4/2012

APPROVED
DATE 4/26/12
☐ INFORMATION
☐ COMMENTS
☐ BID
☐ CONSTRUCTION
☒ PERMIT

HARTLEY ROAD SUBSTATION

CONSTRUCTION DETAILS

SCALE	FILE NO.	DRAWING NUMBER	SHEET	REV.
NONE		K F 6427	9 OF 12	C

ORFRMF.DWG

DATE: 00
TIME: 000