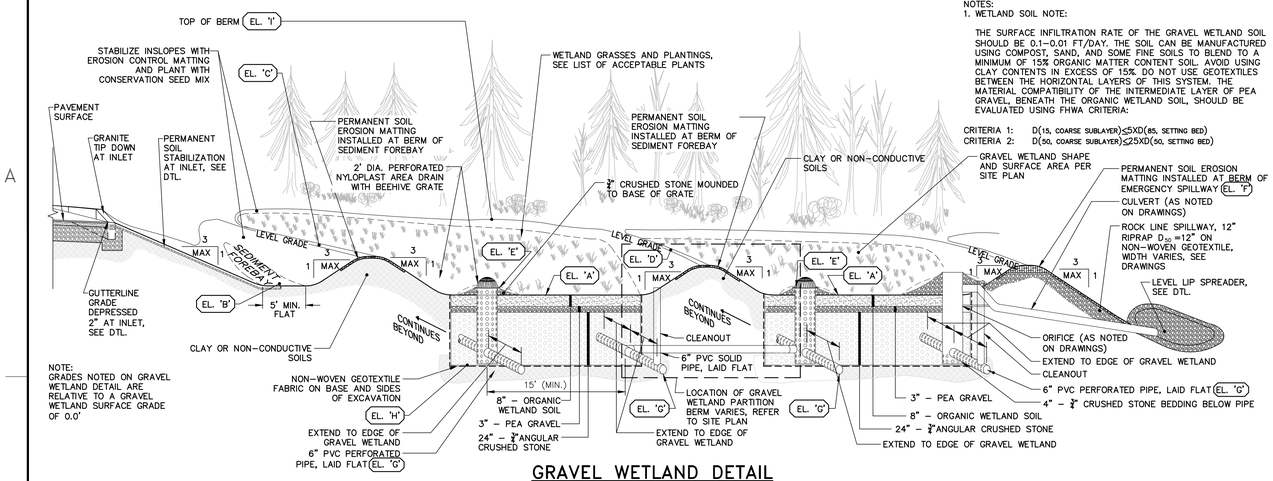


NOTE:
GRADES NOTED ON GRAVEL WETLAND DETAIL ARE RELATIVE TO A GRAVEL WETLAND SURFACE GRADE OF 0.0'

NOTES:
1. WETLAND SOIL NOTE:

THE SURFACE INFILTRATION RATE OF THE GRAVEL WETLAND SOIL SHOULD BE 0.1-0.01 FT/DAY. THE SOIL CAN BE MANUFACTURED USING COMPOST, SAND, AND SOME FINE SOILS TO BLEND TO A MINIMUM OF 15% ORGANIC MATTER CONTENT SOIL. AVOID USING CLAY CONTENTS IN EXCESS OF 15%. DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM. THE MATERIAL COMPATIBILITY OF THE INTERMEDIATE LAYER OF PEA GRAVEL, BENEATH THE ORGANIC WETLAND SOIL, SHOULD BE EVALUATED USING FHWA CRITERIA:

CRITERIA 1: D(15, COARSE SUBLAYER)≤5XD(85, SETTING BED)
CRITERIA 2: D(50, COARSE SUBLAYER)≤25XD(50, SETTING BED)

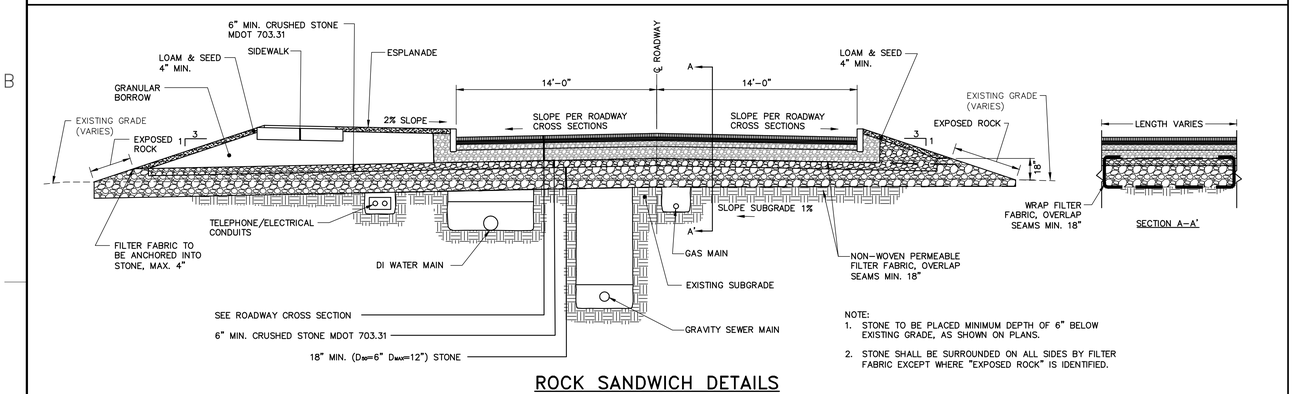
GRAVEL WETLAND DETAIL
N.T.S.

GRAVEL WETLAND SCHEDULE

GRAVEL WETLAND NO.	A	B	C	D	E	F	G	H	I
1	CONSTRUCTED								
2	67.40	68.00	68.20	67.80	67.65	69.15	64.82	64.48	69.60
3	CONSTRUCTED								
4	CONSTRUCTED								
5	65.60	–	–	66.00	65.85	66.70	63.02	62.68	67.80
6	65.60	66.20	66.40	66.00	65.85	67.10	63.02	62.68	67.60
7	64.60	65.20	65.40	65.00	64.85	65.90	62.02	61.68	66.60
8	66.60	66.85	67.35	67.10	66.85	67.60	64.02	63.69	68.40
9	ELIMINATED								
10	65.20	66.60	67.00	65.60	65.45	68.00	62.62	62.28	68.60
11	64.60	65.20	65.40	65.00	64.85	66.10	62.02	61.68	66.60
12	68.60	69.20	69.40	69.00	68.85	70.20	66.02	65.68	70.60

OUTLET CONTROL STRUCTURE SCHEDULE

GRAVEL WETLAND NO.	J	K	L	M	N
1	CONSTRUCTED				
2	0.75"	67.07	4"	68.65	69.98
3	CONSTRUCTED				
4	CONSTRUCTED				
5	0.75"	65.27	4"	66.30	67.63
6	1"	65.27	4"	66.60	67.93
7	1"	64.27	4"	65.20	66.53
8	2"	66.52	8"	66.94	67.90
9	ELIMINATED				
10	1.25"	65.07	6"	67.00	68.50
11	0.75"	64.27	6"	65.60	67.10
12	1.125"	68.27	6"	69.70	71.20



NOTE:
1. STONE TO BE PLACED MINIMUM DEPTH OF 6" BELOW EXISTING GRADE, AS SHOWN ON PLANS.
2. STONE SHALL BE SURROUNDED ON ALL SIDES BY FILTER FABRIC EXCEPT WHERE "EXPOSED ROCK" IS IDENTIFIED.

ROCK SANDWICH DETAILS
SCALE: 1"=5'

CONSTRUCTION OVERSIGHT NOTES:

AS A CONDITION OF THE SITE LOCATION OF DEVELOPMENT DEPARTMENT ORDER, THE OWNER IS REQUIRED TO RETAIN THE SERVICES OF A PROFESSIONAL ENGINEER TO OVERSEE THE CONSTRUCTION AND STABILIZATION OF ALL STORMWATER MANAGEMENT STRUCTURES. ONCE ALL STORMWATER MANAGEMENT STRUCTURES ARE CONSTRUCTED AND STABILIZED, THE INSPECTING ENGINEER IS REQUIRED TO NOTIFY THE DEPARTMENT IN WRITING WITHIN 30 DAYS TO STATE THAT THE BMP'S HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS, OR ANY DEPARTMENT APPROVED CHANGES TO THE PLANS. ACCOMPANYING THE ENGINEER'S NOTIFICATION MUST BE A LOG OF THE ENGINEER'S INSPECTIONS GIVING THE DATE OF EACH INSPECTION, THE TIME OF EACH INSPECTION, AND THE ITEMS INSPECTED ON EACH VISIT, AND INCLUDE ANY TESTING DATA OR SIEVE ANALYSIS DATA FOR THE SOIL, GRAVEL OR FILTER MEDIA COMPONENTS SPECIFIED IN THE PLANS AND USED IN THE CONSTRUCTION OF THE SYSTEMS.

UNDERDRAINED SOIL FILTERS:
CONSTRUCTION SEQUENCE: THE SOIL FILTER MEDIA AND VEGETATION MUST NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURE, 90% VEGETATION COVER, OR OTHER PERMANENT STABILIZATION UNLESS THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA IS DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED.
COMPACTION OF SOIL FILTER: FILTER SOIL MEDIA AND UNDERDRAIN BEDDING MATERIAL MUST BE COMPACTED TO BETWEEN 90% AND 92% STANDARD PROCTOR. THE BED SHOULD BE INSTALLED IN AT LEAST 2 LIFTS OF 9 INCHES TO PREVENT POCKETS OF LOOSE MEDIA.
CONSTRUCTION OVERSIGHT: INSPECTION BY A PROFESSIONAL ENGINEER WILL OCCUR AT A MINIMUM:
- AFTER THE PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED BUT NOT BACKFILLED,
- AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE FILTER MEDIA,
- AFTER THE FILTER MEDIA HAS BEEN INSTALLED AND SEEDED. BIO-RETENTION CELLS MUST BE STABILIZED PER THE PROVIDED PLANTING SCHEME AND DENSITY FOR THE CANOPY COVERAGE OF 30 AND 50%.
- AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS, AND
- ALL THE MATERIAL USED FOR THE CONSTRUCTION OF THE FILTER BASIN MUST BE CONFIRMED AS SUITABLE BY THE DESIGN ENGINEER. TESTING MUST BE DONE BY A CERTIFIED LABORATORY TO SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.

TESTING AND SUBMITTALS: THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MEDIA. ALL RESULTS OF FIELD AND LABORATORY TESTING SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR CONFIRMATION. THE CONTRACTOR SHALL:
- SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE REQUIRED WILL BE DETERMINED BY THE TESTING LABORATORY.
- PERFORM A SIEVE ANALYSIS CONFORMING TO STM C136 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COURSE AGGREGATES 1996A) ON EACH TYPE OF THE SAMPLE MATERIAL. THE RESULTING SOIL FILTER MEDIA MIXTURE MUST HAVE 8% TO 12% BY WEIGHT PASSING THE #200 SIEVE, A CLAY CONTENT OF LESS THAN 2% (DETERMINED HYDROMETER GRAIN SIZE ANALYSIS) AND HAVE 10% DRY WEIGHT OF ORGANIC MATTER.
- PERFORM A PERMEABILITY TEST ON THE SOIL FILTER MEDIA MIXTURE CONFORMING TO ASTM D2434 WITH THE MIXTURE COMPACTED TO 90-92% OF MAXIMUM DRY DENSITY BASED ON ASTM D698.

GRAVEL WETLANDS:
CONSTRUCTION SEQUENCE: THE WETLAND SOIL AND VEGETATION MUST NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE SYSTEM HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURE, 90% VEGETATION COVER, OR OTHER PERMANENT STABILIZATION UNLESS THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA IS DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED.
CONSTRUCTION OVERSIGHT: INSPECTION BY A PROFESSIONAL ENGINEER WILL OCCUR AT A MINIMUM:
- AFTER THE EXCAVATION OF THE TREATMENT CELLS AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED BUT NOT BACKFILLED,
- AFTER THE CRUSHED STONE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE WETLAND SOIL,
- AFTER THE WETLAND SOIL HAS BEEN INSTALLED AND SEEDED
- AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS, AND
- ALL THE MATERIAL USED FOR THE CONSTRUCTION OF THE WETLAND SYSTEM MUST BE CONFIRMED AS SUITABLE BY THE DESIGN ENGINEER. TESTING MUST BE DONE BY A CERTIFIED LABORATORY TO SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.

TESTING AND SUBMITTALS: THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE WETLAND SOIL, PEA GRAVEL AND CRUSHED STONE LAYERS. ALL RESULTS OF FIELD AND LABORATORY TESTING SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR CONFIRMATION.

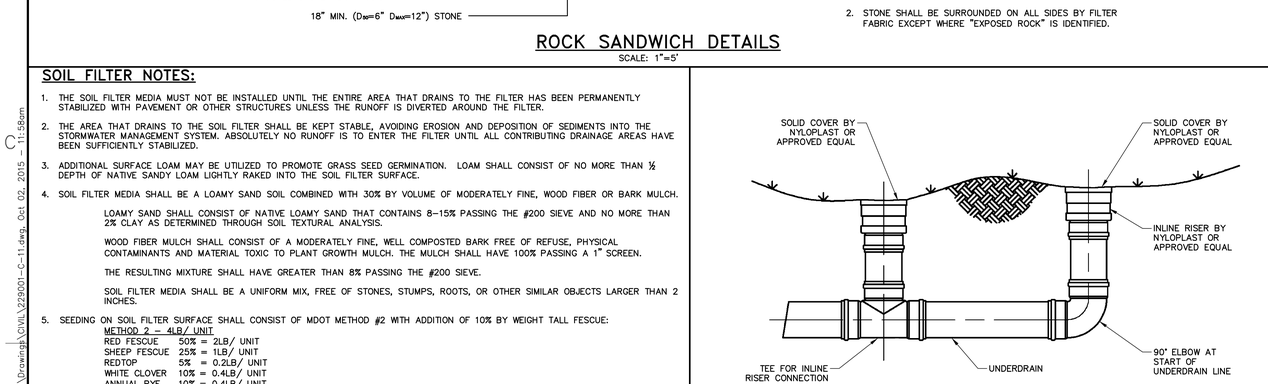
ROADWAY AND SITE GRADING: INSPECTIONS A PROFESSIONAL ENGINEER WILL CONSIST OF A VISIT TO THE SITE PRIOR TO CONSTRUCTION TO CONSULT WITH THE EARTHWORK CONTRACTOR AND A POST CONSTRUCTION MEETING TO CONFIRM GRADING OF THE ROADWAY AND SITE AREAS TO ENSURE RUNOFF IS DIRECTED ACCORDING TO PLANS AND TO OVERSEE THE RE-STABILIZATION OF THE LOT INTO A VEGETATED COVER.

STONE BERMED LEVEL LIP SPREADER: A LEVEL SPREADER MUST BE INSTALLED CORRECTLY WITH 0% GRADE ON THE SPREADER BASE AND LIP TO ENSURE A UNIFORM DISTRIBUTION OF FLOW. INSPECTIONS SHALL BE PERFORMED BY A PROFESSIONAL ENGINEER AND SHALL CONSIST OF VISITS TO THE SITE TO INSPECT THE FINISHED CONSTRUCTION OF EACH LEVEL SPREADER TO ENSURE THE STONE MATERIAL AND PLACEMENT MEETS THE DESIGN REQUIREMENTS OF THE PLANS AND SPECIFICATIONS.

DEWATERING:
A DEWATERING PLAN SHALL BE DEVELOPED BY THE CONTRACTOR IN ACCORDANCE WITH PLAN NOTES, DETAILS AND CONTRACT SPECIFICATIONS TO ADDRESS EXCAVATION DE-WATERING FOLLOWING HEAVY RAINFALL EVENTS OR WHERE THE EXCAVATION MAY INTERCEPT THE GROUNDWATER TABLE DURING CONSTRUCTION. THE DEWATERING PLAN SHOULD ADDRESS TREATMENT AND IDENTIFY DISCHARGE POINTS THAT WILL NOT CAUSE DOWNGRADIENT EROSION AND OFFSITE SEDIMENTATION OR WITHIN A RESOURCE.

BASIC STANDARDS - EROSION CONTROL MEASURES:
MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED BY THE RESIDENT INSPECTOR FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE

THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES AS PUBLISHED IN 1991 BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS BEEN CHANGED TO THE "MAINE EROSION AND SEDIMENT CONTROL BMPS" PUBLISHED BY THE MAINE DEP IN 2003. ALL REFERENCES SHOULD BE CHANGED TO THE NEW MANUAL.
HTTP://WWW.MAINE.GOV/DEP/BLWQ/DOCSTAND/ESCBMPS/INDEX.HTM



CLEAN-OUT DETAIL
N.T.S.

SOIL FILTER NOTES:

1. THE SOIL FILTER MEDIA MUST NOT BE INSTALLED UNTIL THE ENTIRE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURES UNLESS THE RUNOFF IS DIVERTED AROUND THE FILTER.
2. THE AREA THAT DRAINS TO THE SOIL FILTER SHALL BE KEPT STABLE, AVOIDING EROSION AND DEPOSITION OF SEDIMENTS INTO THE STORMWATER MANAGEMENT SYSTEM. ABSOLUTELY NO RUNOFF IS TO ENTER THE FILTER UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN SUFFICIENTLY STABILIZED.
3. ADDITIONAL SURFACE LOAM MAY BE UTILIZED TO PROMOTE GRASS SEED GERMINATION. LOAM SHALL CONSIST OF NO MORE THAN ½ DEPTH OF NATIVE SANDY LOAM LIGHTLY RAKED INTO THE SOIL FILTER SURFACE.
4. SOIL FILTER MEDIA SHALL BE A LOAMY SAND SOIL COMBINED WITH 30% BY VOLUME OF MODERATELY FINE, WOOD FIBER OR BARK MULCH.

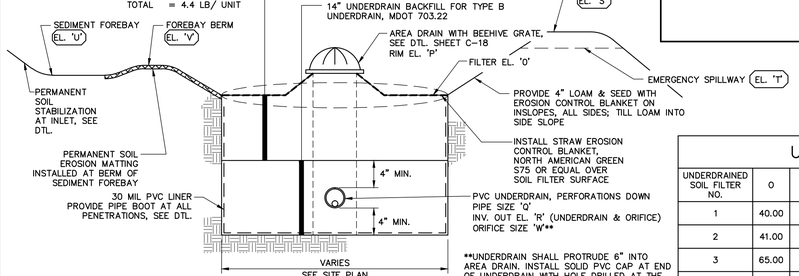
   LOAMY SAND SHALL CONSIST OF NATIVE LOAMY SAND THAT CONTAINS 8-15% PASSING THE #200 SIEVE AND NO MORE THAN 2% CLAY AS DETERMINED THROUGH SOIL TEXTURAL ANALYSIS.

   WOOD FIBER MULCH SHALL CONSIST OF A MODERATELY FINE, WELL COMPOSTED BARK FREE OF REFUSE, PHYSICAL CONTAMINANTS AND MATERIAL TOXIC TO PLANT GROWTH MULCH. THE MULCH SHALL HAVE 100% PASSING A 1" SCREEN.

   THE RESULTING MIXTURE SHALL HAVE GREATER THAN 8% PASSING THE #200 SIEVE.

   SOIL FILTER MEDIA SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS, OR OTHER SIMILAR OBJECTS LARGER THAN 2 INCHES.
5. SEEDING ON SOIL FILTER SURFACE SHALL CONSIST OF MDOT METHOD #2 WITH ADDITION OF 10% BY WEIGHT TALL FESCUE:

METHOD 2 - 4LB/ UNIT	
RED FESCUE	50% = 2LB/ UNIT
SHEEP FESCUE	25% = 1LB/ UNIT
REDTOP	5% = 0.2LB/ UNIT
WHITE CLOVER	10% = 0.4LB/ UNIT
ANNUAL RYE	10% = 0.4LB/ UNIT
METHOD 2 TOTAL	= 4LB/ UNIT
+ TALL FESCUE 10%	= 0.4LB/ UNIT
TOTAL	= 4.4 LB/ UNIT

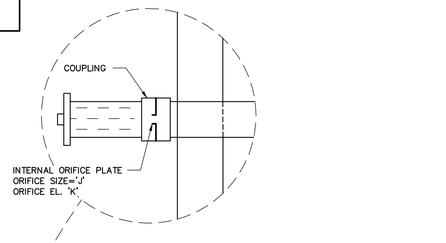


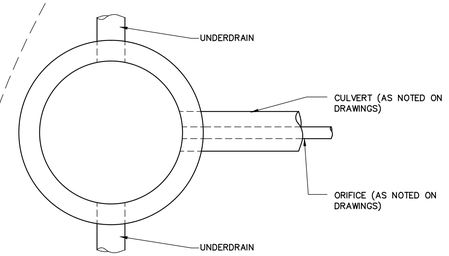
UNDERDRAINED SOIL FILTER
N.T.S.

UNDERDRAINED SOIL FILTER SCHEDULE

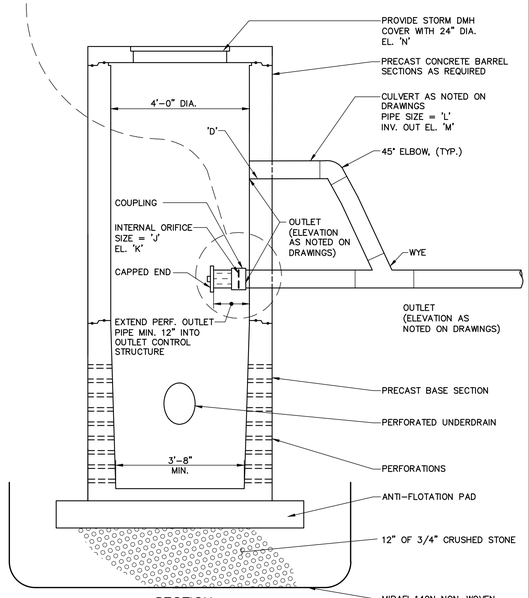
UNDERDRAINED SOIL FILTER NO.	O	P	Q	R	S	T	U	V	W
1	40.00	41.80	4"	37.84	42.50	42.00	N/A	N/A	1"
2	41.00	42.70	4"	38.84	43.50	43.00	N/A	N/A	1"
3	65.00	67.00	4"	62.84	67.60	67.00	66.00	66.30	0.4"
4	61.00	64.00	4"	58.84	64.60	64.00	63.00	63.30	0.9"
5	61.00	63.00	6"	58.84	63.70	63.00	62.00	62.30	0.6"

**UNDERDRAIN SHALL PROTRUDE 6" INTO AREA DRAIN. INSTALL SOLID PVC CAP AT END OF UNDERDRAIN WITH HOLE DRILLED AT THE BASE OF CAP. HOLE DIAMETER SHALL BE 'W' DIMENSION NOTED IN TABLE.





PLAN



SECTION

OUTLET CONTROL STRUCTURE
N.T.S.

41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

DAVID A. SENUS — 10/2/2015

REV	DESCRIPTION	DATE
DESIGNED BY: AEA/JLS	CHECKED BY: DAS	
DRAWN BY: JBC	22900-C-11.dwg	

CIVIL DETAILS 1

CITY OF PORTLAND
ECONOMIC DEVELOPMENT OFFICE
PORTLAND, MAINE
& PATRONS OXFORD INSURANCE CO.

PORTLAND TECHNOLOGY PARK UPDATE
& LCE 4 DEVELOPMENT

JOB NO.:229001.01
DATE: OCTOBER 2015
SCALE: AS NOTED
SHEET: 12 OF 17

C-11

PERMITTING SET - NOT FOR CONSTRUCTION