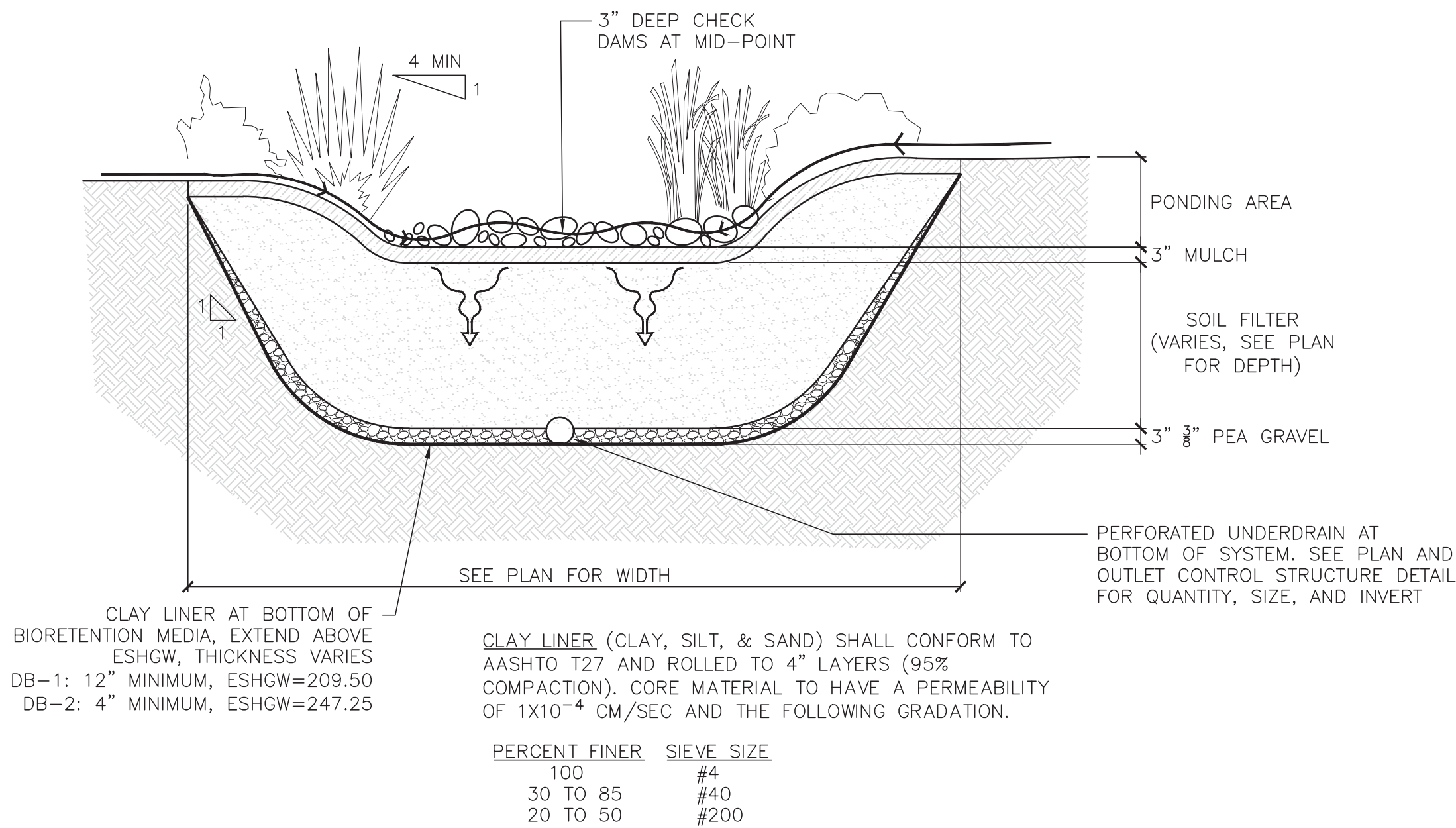


R:\PROJECTS\2513-02\CIVIL\DRAWINGS\CURRENT\C-2513-02_DETAILS.DWG



NOTES:

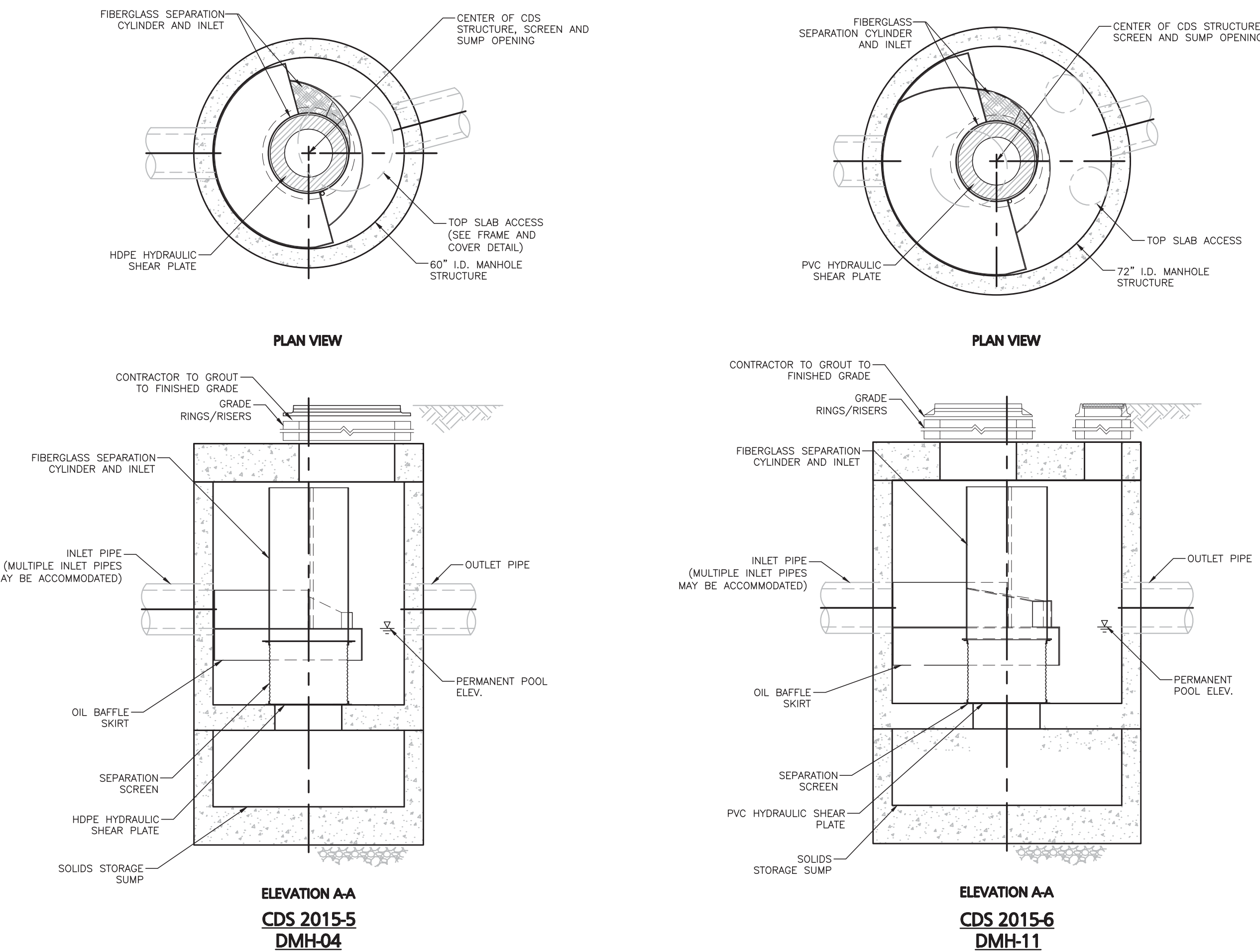
1. GRADING, AND PLANTING OF BIORETENTION SHALL BE COMPLETED IN EARLY PHASES OF CONSTRUCTION. PLANTS AND SEED ON SLOPES AND BOTTOM OF BASIN MUST BE ESTABLISHED PRIOR TO CONNECTING STORM DRAINAGE SYSTEM OUTLETS TO BIORETENTION AREA. PLANTS AND SEED MIX SHALL HAVE A MINIMUM OF 6 MONTHS GROWING, BE ESTABLISHED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO CONNECTING STORM DRAINAGE SYSTEM OUTLETS TO BIORETENTION AREA.
2. EXCAVATION, FILLING AND PLANTING SHALL OCCUR IN THE DRY. WATER LEVELS MUST BE LOWERED IN THE BIORETENTION AREA BY RELYING ON DRY SEASON AND OR DRY SPELLS; OR MAY BE ACCOMPLISHED THROUGH THE USE OF DEWATERING METHODS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ANY DEWATERING METHODS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
3. WATER FROM ANY DEWATERING OPERATION SHALL BE TREATED TO REDUCE TOTAL SUSPENDED SOLIDS AND BE IN COMPLIANCE WITH STATE AND FEDERAL STANDARDS.
4. TOPSOIL COMPONENT SHALL BE A SANDY LOAM, LOAMY SAND, OR LOAM TEXTURE.
5. THE COMPOST COMPONENT MUST BE PROCESSED FROM YARD WASTE IN ACCORDANCE WITH MASSDEP GUIDELINES. THE COMPOST SHALL NOT CONTAIN BIOSOLIDS.

SOIL FILTER MIX	
GRADATION OF MATERIAL	
AMOUNT	COMPONENT
40%	SAND
20-30%	TOPSOIL
30-40%	COMPOST

SAND GRADATION	
GRADATION OF MATERIAL	
SIEVE NO.	% PASSING
2-INCH	100
3/4-INCH	70-700
1/4-INCH	50-80
NO. 40	15-40
NO. 200	0-3

BIORETENTION SYSTEM DETAIL
NOT TO SCALE

1



GENERAL NOTES

1. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
2. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION.
3. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

- A. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
- B. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- C. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

HYDRODYNAMIC WATER QUALITY DEVICES
NOT TO SCALE

3

- 1 REMOVE A & B HORIZON SOILS BENEATH TRENCH AND EXTENDING 1:1 FROM THE OUTSIDE EDGE OF THE TRENCH OUTWARD.
- 2 FOUNDATION/BEDDING PREPARATION
PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FREE DRAINING FILL MATERIAL, COMPACTED IN 12" LIFTS TO 95% STANDARD PROCTOR, AS APPROVED BY THE ENGINEER.
- 5 HAUNCH ZONE MATERIAL SHALL BE PLACED AND UNIFORMLY COMPACTED WITHOUT SOFT SPOTS.

BACKFILL MATERIAL SHALL BE PLACED IN 8"-10" MAXIMUM LIFTS. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT.

MAINTAIN BALANCED LOADING ON ALL PIPES IN THE SYSTEM DURING ALL SUCH OPERATIONS.

CALCULATION DETAILS

- APPROX. CMP FOOTAGE = 260

PIPE DETAILS

- DIAMETER = 48 IN
- CORRUGATION = 2-2/3"x1/2"
- GAGE = 16
- COATING = ALUMINIZED STEEL (TYPE 2)
- WALL TYPE = PERFORATED

BACKFILL DETAILS

- WIDTH AT ENDS = 12 IN
- ABOVE PIPE = 24 IN
- WIDTH AT SIDES = 12 IN
- BELOW PIPE = 0 IN

NOTES

- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2 1/2" x 1/2" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- CONTRACTOR SHALL PROVIDE SHOP DRAWING TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO PURCHASE.

FG MIN ELEV. 226.00 (VARIES, SEE PLAN)

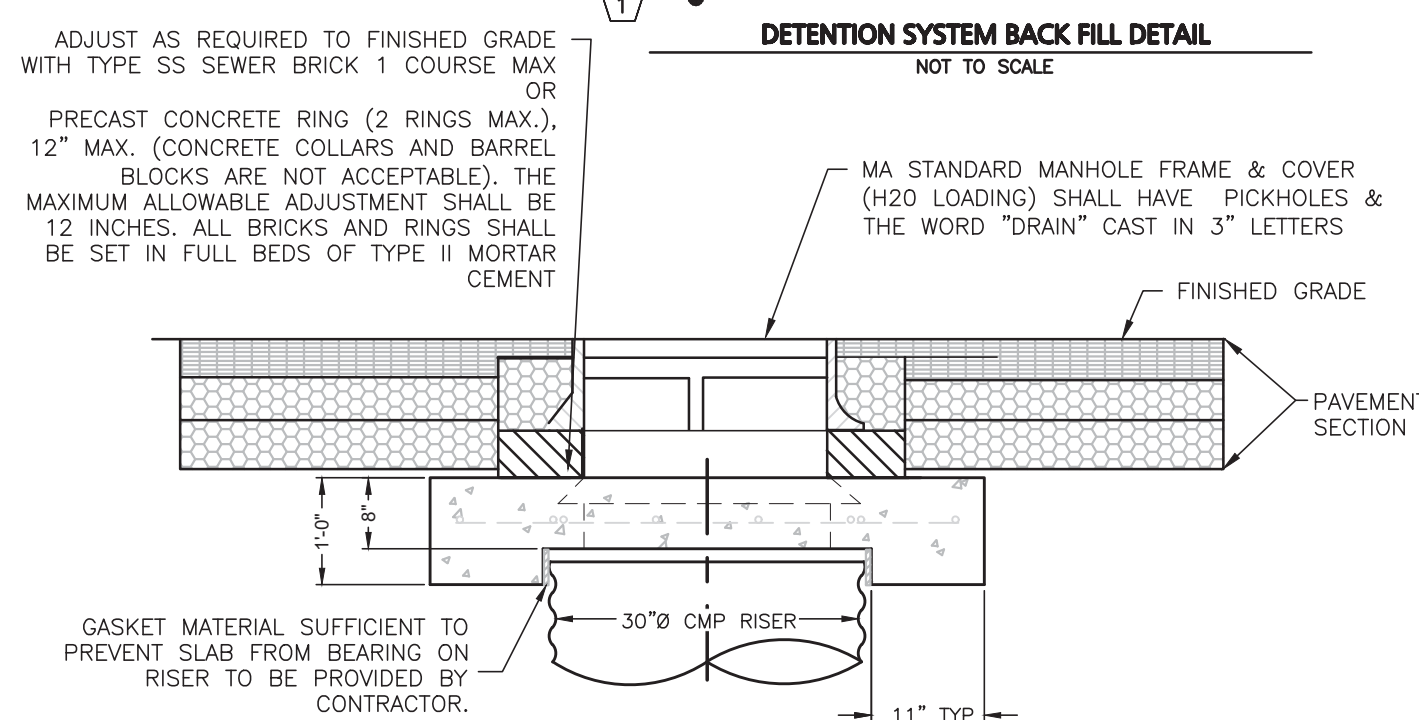
TOP STONE ELEV. 226.00
PIPE CROWN ELEV. 224.00

PLACE IMPERMEABLE LINER ON UP-HILL (WESTERLY) SIDE OF TRENCH, EXTEND TO PIPE INVERT ONLY

PIPE INVERT ELEV. 220.00

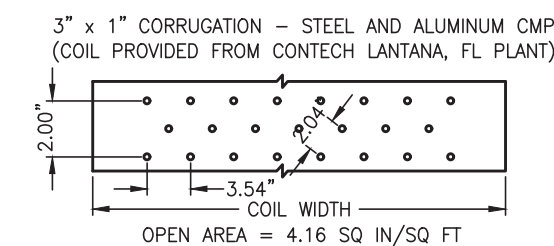
INFILTRATION SYSTEM CROSS SECTION
NOT TO SCALE

INFILTRATION SYSTEMS - CMP INFILTRATION & CMP PERFORATED DRAINAGE PIPE			
MATERIAL LOCATION	DESCRIPTION	MATERIAL DESIGNATION	DESIGNATION
6	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)		
7	DENSE-GRADED CRUSHED STONE SUBBASE COURSE (IF APPLICABLE)		
A	GEOTEXTILE LAYER	CONTECH C-40 OR C-45	GEOTEXTILE TO PREVENT SOIL MIGRATION INTO VARYING SOIL TYPES. WRAP THE TRENCH ONLY. NOT ON BOTTOM
6	INFILTRATION PIPE SYSTEMS BACKFILL	AASHTO M 145- A-1 OR AASHTO M 43 - 3, 4	INFILTRATION PIPE SYSTEMS HAVE A PIPE PERFORATION SIZED OF 3/8" DIAMETER. AN OPEN GRADED, FREE DRAINING STONE, WITH A PARTICLE SIZE OF 1/2" - 2 1/2" DIAMETER IS RECOMMENDED.
6	BEDDING STONE	AASHTO M 43 - 3, 357, 4, 467, 5, 56, 57	FOR SOIL AGGREGATES LARGER THAN 3/8" A DEDICATED BEDDING LAYER IS NOT REQUIRED FOR CMP. PIPE MAY BE PLACED ON THE TRENCH BOTTOM COMPRISED OF NATIVE SUITABLE WELL GRADED & GRANULAR MATERIAL. SOIL AGGREGATES LESS THAN 3/8" AND UNSUITABLE MATERIAL SHOULD BE OVER-EXCAVATED AND RE-PLACED WITH A 4"-6" LAYER OF WELL GRADED & GRANULAR STONE PER THE MATERIAL DESIGNATION.
* NOTE: THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATION ONLY. THE STONE MUST ALSO BE ANGULAR AND CLEAN.			



NOTES:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWING TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO PURCHASE.
2. CONTRACTOR SHALL FOLLOW INSTALLATION INSTRUCTIONS PROVIDED BY MANUFACTURER.



NOTES:

1. PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
2. PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
3. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
4. ALL HOLES #3/8".

48" PERFORATED CORRUGATED METAL PIPE DETAIL
NOT TO SCALE

4



PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
6	04-26-2021	REVS PER PEER REVIEW
5	04-09-2021	REVS PER PEER REVIEW
4	02-25-2021	CONVERSION TO SINGLE FAMILY HOMES
3	10-01-2020	ISSUED FOR ZBA APPLICATION
2	05-19-2020	MISC. REV. PER MASSHOUSING & ABUTTER WALK
1	01-21-2020	MISCELLANEOUS REVISIONS

APPLICANT/OWNER:

BARSKY ESTATE REALTY TRUST
23 HUNTING LANE
SHERBORN, MA 01770

PROJECT:

APPLE HILL ESTATES
31 HUNTING LANE
SHERBORN, MA 01770

PROJECT NO.	2513-02	DATE:	10-23-20
SCALE:	AS SHOWN	DWG. NAME:	C2513-02
DESIGNED BY:	SM	CHECKED BY:	MAM

PREPARED BY:



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