BIORETENTION - EROSION PREVENTION AND SEDIMENT CONTROL SEQUENCING

- 1. INSTALL SILT FENCE AND/OR OTHER APPROPRIATE TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO PREVENT SEDIMENT FROM ENTERING THE BIORETENTION DURING
- 2. RUNOFF SHALL NOT BE DIRECTED INTO THE BIORETENTION FACILITY UNTIL: A. ALL UPGRADIENT CONTRIBUTING AREAS HAVE BEEN PERMANENTLY STABILIZED. THE BIORETENTION FACILITY IS COMPLETE AND ALL AREAS SUBJECT TO RUNOFF HAVE BEEN PERMANENTI Y STABILIZED
- 4. REMOVE TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL DEVICES AFTER THE BIORETENTION IS PLACED ONLINE AND IS RECEIVING RUNOFF.
- 5. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BIORETENTION, THE SEDIMENT AND ALL CONTAMINATED MATERIAL (SUCH AS MULCH OR SOIL MIX) SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

BIORETENTION - GENERAL CONSTRUCTION SPECIFICATIONS

← 6" TOPSOIL AND

BIORETENTION

6" UNDERDRAIN PIPE INV.

- 1. THE BIORETENTION SHALL BE EXCAVATED TO THE DIMENSIONS, SIDE SLOPES, AND ELEVATIONS SHOWN ON THE DRAWINGS. THE METHOD OF EXCAVATION SHALL MINIMIZE THE COMPACTION OF THE SUBGRADE SOIL WITHIN THE FOOTPRINT OF THE BIORETENTION AREA.
- 2. THE BIORETENTION SOIL MIXTURE SHALL BE PLACED AND GRADED USING LOW GROUND CONTACT PRESSURE EQUIPMENT. TO THE EXTENT POSSIBLE, WORK SHALL BE PERFORMED BY EQUIPMENT OPERATING ON THE ADJACENT SLOPES.
- 3. ALL WORK RELATED TO PLACEMENT OF MULCH AND PLANT INSTALLATION SHALL BE ACCOMPLISHED WITH METHODS AND EQUIPMENT THAT DO NOT RESULT IN FURTHER COMPACTION OF THE BIORETENTION SOIL MIX.

- 6" PVC (SOLID) CLEANOUT,

PEA STONE ELEV.

RUSHED STONE ELEV.

MIRAFI 140N GEOTEXTILE, OR EQUAL, BETWEEN PEA

GRAVEL AND SOIL MEDIA. SEE CROSS-SECTION FOR WIDTH

UNDÍSTURBED NATIVE SOIL

6" TO 12" OF LOW PERMEABILITY SOIL, LINER, —

OR APPROVED EQUAL (SEE SPECIFICATIONS)

EXTEND 6" ABOVE FINISH

GRADE

BIORETENTION - MATERIAL SPECIFICATIONS:

MULCH SHALL BE HARDWOOD CHIP MULCH IF PLUGS OR PLANTINGS ARE USED AND STRAW MULCH IF SEED MIX IS SPECIFICED.

F HARDWOOD CHIP MULCH IS USED IT SHALL CONSIST OF RAW WOOD MATERIAL FROM ONLY HARDWOOD TIMBER AND SHALL BE A PRODUCT OF A MECHANICAL CHIPPER, HAMMERMILL, OR TUB GRINDER. MULCH CONSISTING OF SOFTWOOD TIMBER. MANUFACTURED BOARDS, AND/OR CHEMICALLY TREATED WOOD IS UNACCEPTABLE. THE MATERIAL SHALL BE UNIFORM IN COLOR AND SUBSTANTIALLY FREE OF MOLD, DIRT, SAWDUST, WEEDS, SEED AND FOREIGN MATERIAL. THE MATERIAL SHALL BE AGED A MINIMUM OF 12 MONTHS, BUT SHALL NOT BE IN AN ADVANCED STATE OF DECOMPOSITION.

THE MULCH MATERIAL, WHEN DRIED, SHALL ALL PASS A FOUR (4) INCH SCREEN AND NOT MORE THAN 20 PERCENT BY MASS SHALL PASS A ONE TENTH (0.1) INCH SCREEN. GRASS CLIPPINGS ARE UNSUITABLE FOR MULCH.

IF STRAW MULCH IS USED IT SHALL CONSIST OF AIR-DRIED MATERIAL. FREE OF UNDESERABLE SEEDS & COARSE MATERIALS. STRAW MULCH SHALL BE APPLIED DIRECTLY AFTER SEEDING AND SHALL BE PLACED AT AN APPLICATION RATE OF 90-100 LBS PER 1,000 SF OF SURFACE AREA (±2 TONS/ACRE). 90% OF THE SURFACE SHALL BE COVERED. WOOD FIBER MULCH (HYDROMULCH) MAY BE USED TO SECURE THE STRAW MULCH AND SHALL BE APPLIED WITH A HYDROSSDER IMMEDIATELY AFTER MULCHING AT AN APPLICAITON RATE OF 17 LBS PER 1,000 SF (±500 LBS/ACRE).

2" THICK HARDWOOD CHIP -

MULCH OR STRAW MULCH

(APPLY PER MATERIAL

SPECIFICATIONS

THE BIORETENTION SOIL CONSISTS OF TWO LAYERS: THE UPPER MEDIA LAYER AND THE LOWER MEDIA LAYER. THE UPPER MEDIA LAYER SHALL EXTEND 12" BELOW THE MULCH LAYER AND SHALL CONSIST OF USDA SAND TO LOAMY SAND CLASSIFICATION, OR A WELL BLENDED, HOMOGENOUS MIXTURE OF THE FOLLOWING COMPONENTS: 85-95% (NO MORE THAN 25% FINE OR VERY FINE SAND)

SEE OUTLET STRUCTURE DETAIL -

6" DIA. SOLID PVC SDR35 -

CAST-IRON DOME GRATE

CLEANOUT RISER WA

BIORETENTION

SOIL MIX

THIS SHEET FOR DETAILS

0-15% (NO MORE THAN 25% CLAY CONTENT BY WEIGHT) 0-3% (COMPOST) OR 3-7% (PEAT OR OTHER ORGANIC MATERIAL)

3/8" CLEAN, PEA STONE,

3" ABOVE UNDERDRAIN.

6" SDR-35 PVC PERFORATED -

LOT 30 BIORETENTION BASIN WITH UNDERDRAIN

SIDE VIEW

TOP OF UNDERDRAIN TO

UNDERDRAIN PIPE, LAID FLAT

3/4" TO 1-1/2" CLEAN, CRUSHED STONE, FROM 31" —

BELOW UNDERDRAIN TO TOP OF UNDERDRAIN

*ORGANICS SHOULD CONSIST OF COMPOST THAT MEETS THE DEFINITION OF "COMPOST" IN THE AGENCY'S SOLID WASTE MANAGEMENT RULES OR THE CONTAINMENT STANDARDS IN THE VERMONT SOLID WASTE MANAGEMENT RULES §6-1104(g)(6-7), §6-1105(e)(8-9), AND §6-1106(e)(7-9).

THE BIORETENTION SOIL MIX SHALL BE FREE OF STONES, STUMPS, OR ROOTS LARGER THAN TWO (2) INCHES IN ANY DIMENSION. THE SOIL MIX SHALL BE FREE OF NOXIOUS

THE BIORETENTION SOIL SHALL BE TESTED FOR A PHOSPHORUS SATURATION RATIO

SAMPLES ARE TO BE AIR DRIED AND SIEVED THROUGH 2 MM PRIOR TO

(PSR) LESS THAN OR EQUAL TO 0.10. TESTING OF THE SOIL SHALL FOLLOW THE

- AIR-DRY, SIEVED SOIL SAMPLES ARE THEN TO BE EXTRACTED WITH THE MEHLICH-3 SOLUTION (0.2 M CH₃COOH + 0.25 M NH₄NO₃ + 0.015 NH₄F + 0.013 M HNO₃ + 0.001 M EDTA) BY SHAKING A SOIL-SOLUTION SUSPENSION FOR 5 MINUTES AT A 1:10 (SOIL MASS:SOLUTION) RATIO, FOLLOWED BY FILTERING TO REMOVE PARTICLES ABOVE 2 μ M IN SIZE (0.45 μ M PORE SIZE IS ALSO ACCEPTABLE)
- EXTRACTS FROM THE MEHLICH-3 PROCEDURE ARE TO BE ANALYZED FOR P, Fe, AND AI BY ICP-OES.
- THE PSR IS THEN CALCULATED AS FOLLOWS: (P_{M3})

OUTLET PIPE

BFRM FI FV

GRATE ELEV.

MULCH ELEV.

FINISH GRADE

SOIL MEDIA ELEV

PEA STONE ELEV.

S" LINDERDRAIN PIPE

CRUSHED STONE ELEV.

C.O. RISER ORIFICE ELEV. (1" Ø)

FOLLOWING PROCEDURE:

 $(Fe_{M3}/56) + (Al_{M3}/27)$

P_{M3} = MEHLICH-3 P IN MG P PER KG DRY SOIL Fe_{M3} = MEHLICH-3 Fe IN MG Fe PER KG DRY SOIL AI_{M3} = MEHLICH-3 AI IN MG AI PER KG DRY SOIL

MEHLICH-3 EXTRACTIONS MUST BE USED FOLLOWING THE ABOVE PROTOCOL. OTHER SOIL TEST EXTRACTIONS, INCLUDING MODIFIED MORGAN TESTS, OXALATE EXTRACTIONS, WATER EXTRACTIONS, OR EXTRACTIONS USED TO QUANTIFY TOTAL ELEMENTS, ARE NOT ACCEPTABLE.

- NO WOODY VEGETATION GREATER THAN 2" IN

DIAMETER SHALL BE PLANTED OR ALLOWED

WITHIN 15' OF THE TOE OF EMBANKMENT OR

- SEE EARTH FILL NOTES (ABOVE)

BIORETENTION BASIN ELEVATION SCHEDULE

*SEE PLANS FOR OUTLET STRUCTURE SCHEDULE

329.25

328.90

328 00

327.83

325.83

325.58

FOR BERM REQUIREMENTS

WITHIN 25' OF A PRINCIPAL SPILLWAY.

THE LOWER MEDIA LAYER SHALL CONSIST OF USDA SAND TO LOAMY SAND AND GENERALLY MEET THE SAME GRADATION AS THE UPPER MEDIA LAYER. THE LOWER MEDIA LAYER SHALL NOT HAVE COMPOST OR OTHER ORGANIC MATERIAL, UNLESS TO SUPPORT A TREE PLANTING. ORGANIC MATERIAL SHALL ONLY BE ACCEPTABLE IN THE LOCATION THAT THE TREE IS PLANTED.

LOW PERMEABILITY SOIL:
THE SOIL SHALL CONSIST OF A MINIMUM OF 15% PASSING THE No. 200 SIEVE, PLACED AND COMPACTED TO PROVIDE A MAXIMUM PERMEABILITY RATE OF 1 X 10/25 CM/SEC (0.025

IN SUBSTITUTION OF LOW PERMEABILITY SOIL LINER THE FOLLOWING MAY BE USED:

30 MIL LINEAR LOW DENSITY POLYETHYLENE GEOMEMBRANE

- OVER EXCAVATE THE BOTTOM OF THE BIORETENTION BASIN BY 4".
- PLACE 4" OF SAND BARROW (VTRANS SPEC. 703.03). PLACE POLYETHYLENE GEOMEMBRANE AND WELD FIELD SEAMS PER MANUFACTURER SPECIFICATIONS.

BENTONITE:

- OVER EXCAVATE THE BOTTOM OF THE BIORETENTION BASIN BY 6". APPLY BENTONITE AT A MINIMUM RATE OF 2 LBS/SF (MINIMUM OF THICKNESS
- OF 1/4"), RAKE AS NEEDED TO PROVIDE A CONSISTENT LAYER. REPLACE THE OVER EXCAVATED SOIL AND COMPACT.

A MINIMUM OF TWO PIPE ANTI-SEEP COLLARS, CONSTRUCTED WITH CLAY OR FLOWABLE FILL, SHALL BE CONSTRUCTED ALONG THE LENGTH OF THE OUTLET PIPE. SEE DETAIL THIS SHEET.

EARTH FILL FOR STORMWATER BASINS NOTES

THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS ON OR

OFF-SITE. IT MUST BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES

GREATER THAN 6", FROZEN OR OTHER OBJECTIONALBE MATERIALS. FILL

MATERIAL FOR THE CENTER OF THE EMBANKMENT SHALL CONFORM TO

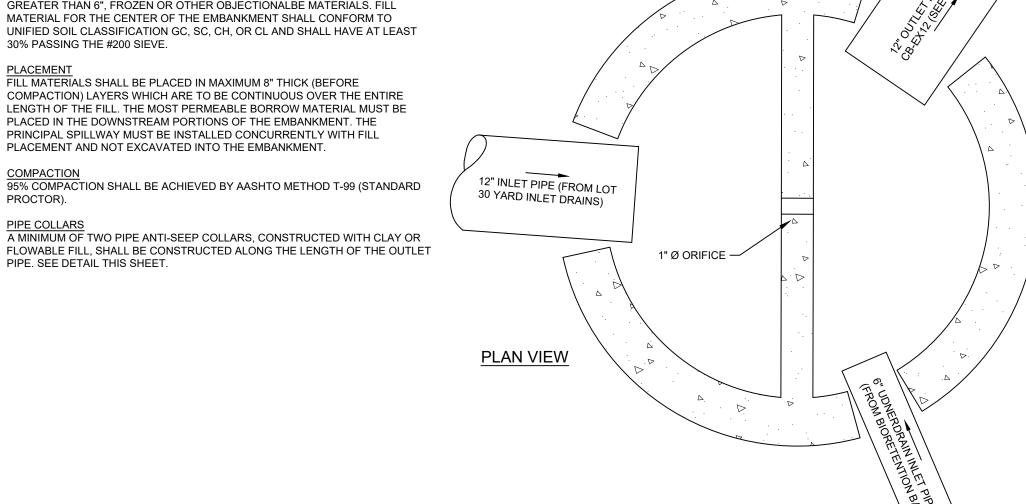
FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK (BEFORE

PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE

PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL

PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

30% PASSING THE #200 SIEVE.



- INTERIOR WEIR WALL

- 12" OUTLET PIPE TO

CB-EX12 (SEE SHEET 2)

ELEV. = 325.08

BIORETENTION - SEED MIX AND NOTES

- 1. USE "VERMONT NATIVE WILDFLOWER & GRASS SEED MIX" OR APPROVED EQUAL, WHERE SHOWN ON PLANS. SEE VERMONT WETLAND PLANT SUPPLY FOR SPECIES COMPOSITION AND APPLICATION SPECIFICATIONS.
- 2. DIVIDE THE REQUIRED AMOUNT OF SEED INTO TWO EQUAL PARTS, SPREAD ONE-HALF IN ONE DIRECTION, THE REMAINDER AT RIGHT ANGLES. USE AN APPLICATION RATE OF 18LBS/ACRE UNLESS OTHERWISE
- 3. WATER ONLY AS NEEDED. IF INSTALLATION OCCURS IN FALL WHEN SEED IS DORMANT, WATERING MAY NOT BE NECESSARY. CONTACT SEED SUPPLIER FOR THEIR RECOMMENDATION.
- 4. AFTER COMPLETION OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL DEBRIS, MATERIALS, RUBBISH, ETC. FROM THE SITE. DISPOSE OF TRASH MATERIALS IN A MANNER SATISFACTORY TO THE OWNER. THE PREMISES SHALL BE LEFT CLEAN, PRESENTABLE AND SATISFACTORY.

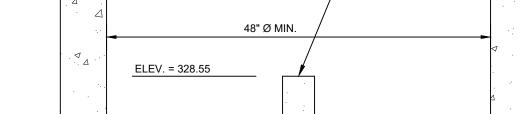
EARTH FILL FOR STORMWATER BASINS NOTES

THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS ON OR OFF-SITE. IT MUST BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONALBE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND SHALL HAVE AT LEAST 30% PASSING THE #200 SIEVE.

FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BÓRROW MATERIAL MUST BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT

A MINIMUM OF TWO PIPE ANTI-SEEP COLLARS, CONSTRUCTED WITH CLAY OR FLOWABLE FILL, SHALL BE

HE SOIL SHALL CONSIST OF A MINIMUM OF 15% PASSING THE No. 200 SIEVE, PLACED AND COMPACTED TO PROVIDE A MAXIMUM PERMEABILITY RATE OF 1 X 10^-5 CM/SEC (0.025 FT/DAY).



1" Ø ORIFICE -

ELEV. = 324.65

12" INLET PIPE (FROM LOT

30 YARD INLET DRAINS)

6" MIN.

SIDE VIEW

HEAVY DUTY CAST IRON -

FRAME AND GRATE

ELEV. = 330.25

FLEXIBLE WATERTIGHT RUBBER BOOT ANY SHIPLAP JOINTS LOCATED BELOW TH ORIFCE OR OUTLET PIPE SHALL BE MAST TAPED ON BOTH THE UPPER AND LOWER JOINTS TO PREVENT STORMWATER

INFILTRATION.

— TYPICAL WATERTIGHT RUBBER BOOT FOR ALL PIPES

6" UDNERDRAIN INLET PIPE

(FROM BIORETENTION BASIN)

ALL PIPE OPENINGS SHALL HAVE A

- ASTM 478 PRECAST REINFORCED

CONCRETE STRUCTURE DESIGNED

FOR AASHTO H-20 LOADING WITH

PRECAST OPENINGS

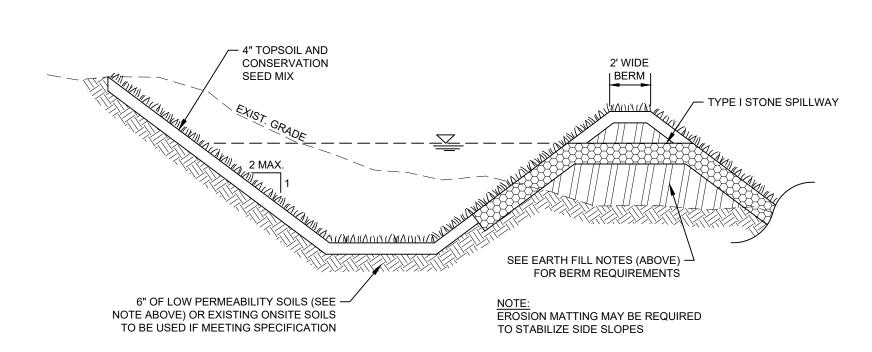
95% COMPACTION SHALL BE ACHIEVED BY AASHTO METHOD T-99 (STANDARD PROCTOR).

CONSTRUCTED ALONG THE LENGTH OF THE OUTLET PIPE. SEE DETAIL THIS SHEET.

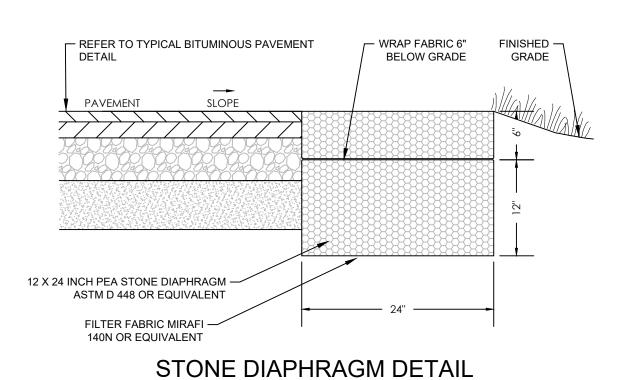
SEE PLAN FOR DIMENSIONS -GEOTEXTILE, OR EQUAL, BIORETENTION CENTERED OVER SOIL MIX UNDERDRAIN PIPE PEA STONE ELEV. 3/8" CLEAN, PEA STONE, TOP OF UNDERDRAIN TO "UNDERDRAIN PIPE INV. 3" ABOVE UNDERDRAIN. 6" SDR-35 PVC PERFORATED — UNDISTURBED NATIVE SOIL UNDERDRAIN PIPE, LAID FLAT 3/4" TO 1-1/2" CLEAN, CRUSHED STONE, FROM 31" - 6" TO 12" OF LOW PERMEABILITY SOIL, LINER, BELOW UNDERDRAIN TO TOP OF UNDERDRAIN OR APPROVED EQUAL (SEE SPECIFICATIONS)

NTS

LOT 30 BIORETENTION BASIN WITH UNDERDRAIN **CROSS-SECTION**



LOT 30 FOREBAY SECTION



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HINESBURG CENTER, LLC VT Route 116

EXTEND BEDDING TO LIMITS OF EXCAVATION

UNDISTURBED GROUND. REMOVE ALL MUCK, ORGANICS

OUTLET STRUCTURE #2 DETAIL

OR UNSUITABLE SOIL AND FILL WITH GRANULAR BORROW

01/11/23 MOVED KAILEY'S WAY DETAILS TO SHEET 11A 11/21/22 EDITS TO ADDRESS STATE SW COMMENTS Date

Construction

Record Drawing

Revision These plans shall only be used for the purpose shown below: Sketch/Concept Act 250 Review

Preliminary

STORMWATER DETAILS & SPECIFICATIONS

- 3/8" CRUSHED STONE BEDDING

LANDS OF



neet numbe

Hinesburg, VT NDS/RD

19054

AS NOTED