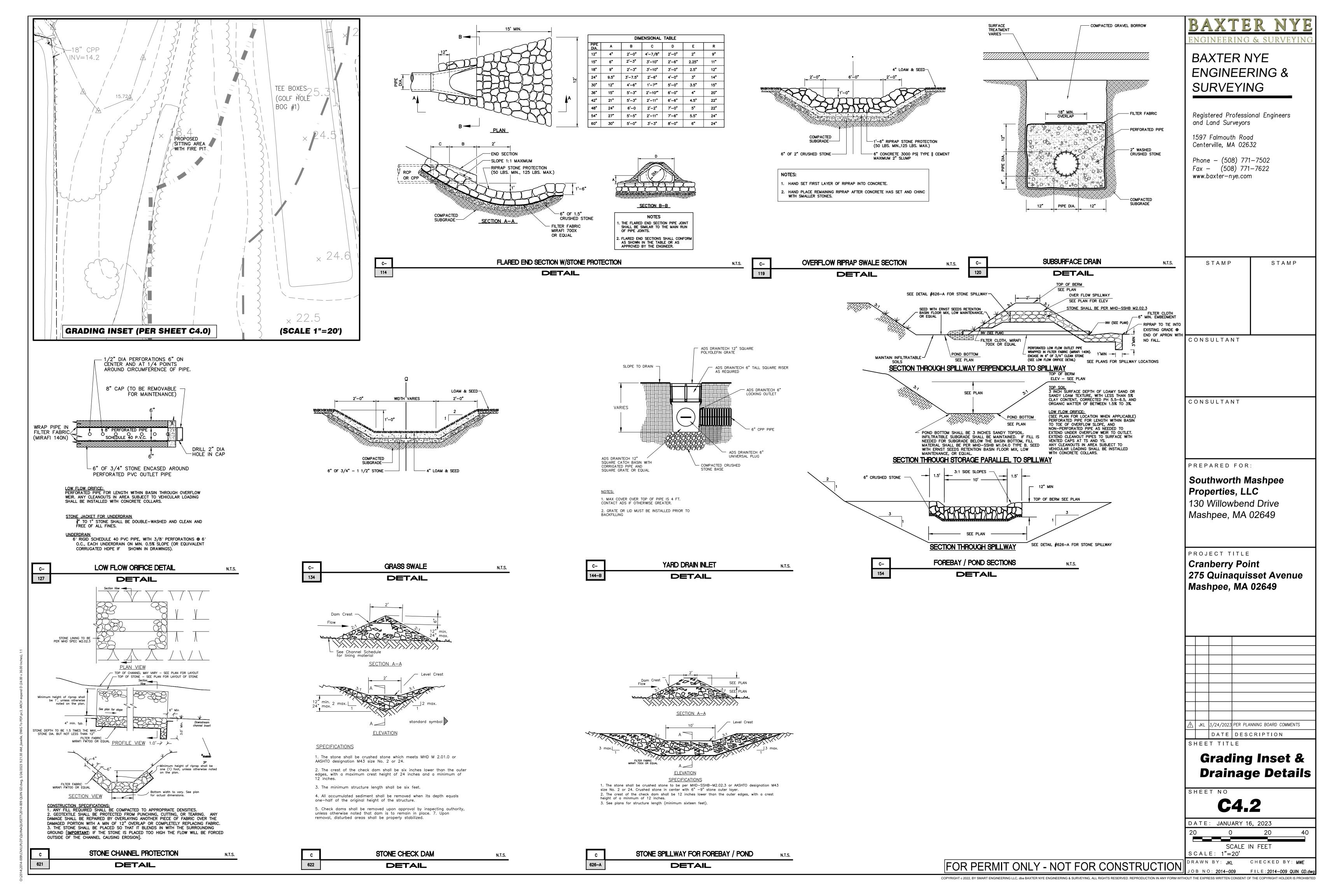


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SWM SPECIFICATIONS

ALL MATERIALS AND WORK SHALL BE IN ACCORDANCE WITH THE MASSDOT/MASSHIGHWAY STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES (MHDSS), SPECIFIC ON-SITE SOIL SPECIFICATIONS IF A GEOTECHNICAL REPORTS WAS PERFORMED, AND THE PLANS HEREIN. WHERE CONFLICTS OF INFORMATION EXIST, THE MORE RESTRICTIVE SHALL APPLY. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.

(NOTE: THE CONTRACTOR SHALL BE RESPONSIBLE TO FULLY UNDERSTAND THIS INFORMATION AND INTENT OF THE SWM FACILITIES AND SHALL REVIEW THIS INFORMATION WITH THE ENGINEER AS NEEDED.

SITE PREPARATION AND GRADING:

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER

AREAS TO BE COVERED BY THE INFILTRATION AREA, BASIN OR RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 50-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED. ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM, BASIN AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE

THE CONTRACTOR SHALL ENSURE ALL SWM AREAS WHICH ARE DESIGNED FOR INFILTRATION SHALL HAVE THEIR EXISTING INFILTRATABLE SUBSOIL CONDITIONS UNCHANGED AT THE HEREIN SPECIFIED ELEVATIONS FOR THE STORMWATER MANAGEMENT FACILITY. THE INFILTRATABLE LAYER BELOW THE DESIGN ELEVATION SHALL NOT BE MINED, ALTERED OR AFFECTED FROM CONSTRUCTION IN ANY WAY. WITHIN BASIN FOOTPRINTS, BOTTOMS, AND NON-EMBANKMENT (NON-DAM) SIDESLOPES, NO UNSUITABLE OR LESS PERVIOUS MATERIAL SHALL BE PLACED OVER THESE LAYERS WHICH COULD AFFECT THE INFILTRATION RATE, UNLESS OTHERWISE SPECIFICALLY IDENTIFIED BY THE ENGINEER. IF SUBGRADE FILL IS NEEDED FOR SWM INFILTRATION BOTTOM AND NON-EMBANKMENT (NON-DAM) SIDE SLOPE AREAS. THE FILL SHALL MEET THE SPECIFICATIONS OF MHD-SSHB M.1.04.0 TYPE B. FILL IN AREAS OF INFILTRATION SHALL NOT BE OVERLY COMPACTED. INFILTRATION AREAS SHALL BE PROTECTED FROM EXCESSIVE CONSTRUCTION EQUIPMENT MOVEMENT AND SEDIMENT/EROSION RUNOFF SO AS TO PRESERVE THE INFILTRATION CHARACTERISTICS. THE CONTRACTOR
SHALL BE RESPONSIBLE TO FULLY UNDERSTAND THIS INFORMATION AND INTENT OF THE SWM FACILITIES AND
SHALL REVIEW THIS INFORMATION WITH THE ENGINEER AS NEEDED.

TOPSOIL OR PLANTING MATERIAL REQUIRED FOR SEEDING, SOD OR VEGETATION GROWTH ON THE BASIN BOTTOM AND NON-EMBANKMENT SIDESLOPES, SHALL BE PLACED IN ONLY A THREE (3) INCH SURFACE DEPTH OF LOAMY SAND OR SANDY LOAM TOPSOIL (EXCESSIVE TOPSOIL SHALL NOT BE PLACED WHERE INFILTRATION IS USED). THE TOPSOIL SHALL NOT INHIBIT THE INFILTRATION RATE OF THE FACILITY. THE TOPSOIL SHALL BE LESS THAN 5% CLAY CONTENT (AND <5% MATERIALS PASSING THE #200 SIEVE), CORRECTED PH 5.5-6.5, AND ORGANIC MATTER OF BETWEEN 1.5% TO 3%.

THREE (3) INCHES OF HARDWOOD MULCH SHALL BE PLACED AROUND REQUIRED SHRUBS AND OTHER SPECIFIÈD LANDSCAPE PLANTINGS, MULCH SHALL BE PLACED ACROSS THE BOTTOM OF BIO-RETENTION AREAS IF SPECIFIED IN THE PLAN DETAILS. WHERE A PLANTING PLAN OR SCHEDULE IS NOT IDENTIFIED FOR THE SWM FACILITIES, THEN THE BOTTOM AND SIDE SLOPES OF SWM BASINS AND BIORETENTION FACILITIES SHALL BE STABILIZED AND SEEDED AS FOLLOWS:

- BOTTOM AND SIDE SLOPES OF BASINS/FACILITES SHALL BE SEEDED AND STABILIZED WITH ERNST SEEDS RETENTION BASIN FLOOR MIX, LOW MAINTENANCE, OR EQUAL.
- GENERAL SLOPES SHALL BE SEEDED AND STABILIZED WITH "NEW ENGLAND EROSION
- CONTROL/RESTORATION SEED MIX".
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EROSION, CLEANOUT OF SEDIMENT FROM EROSION, AND RESEEDING AS NEEDED UNTIL FULL STABILIZATION IS ACHIEVED. THIS SHALL BE REQUIRED THROUGH TWO GROWING SEASONS.

NO OTHER MATERIALS UNLESS SPECIFICALLY IDENTIFIED AND REVIEWED BY THE ENGINEER, SHALL BE PLACED ON THE BASIN BOTTOM.

EARTH FILL FOR EMBANKMENTS ONLY:

MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6". FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE DAM EMBANKMENT AND CUT OFF TRENCH WHICH ARE TO BE IMPERMEABLE SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH OR CL. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGN AND CONSTRUCTION ARE SUPERVISED BY A GEOTECHNICAL ENGINEER.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS AND ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE DAM EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE EMBANKMENT FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF THE EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIRED OR VIBRATORY ROLLER (COMPACTION OF 95% STANDARD PROCTOR SHALL BE ACHIEVED). FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.

A MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN ±2% OF OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE TESTED AND CERTIFIED BY A GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99.

STRUCTURE BACKFILL

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATIONS SHALL DRIVEN EQUIPMENT BE ALLOWED OVER OR WITHIN 4 FEET OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

RIP-RAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MHDSS.

THE RIPRAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THAT THE RIPRAP IN PLACE SHALL BE REASONABLY HOMOGENEOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS. FILTER CLOTH SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MHDSS.

CHAMBERS

ALL CHAMBERS (PLASTIC AND CONCRETE) SHALL BE HANDLED AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, GUIDELINES, AND REQUIREMENTS.

PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION. REINFORCED CONCRETE PIPE-

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361. THIS BEDDING SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 10% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 3 INCHES, OR AS SHOWN ON THE DRAWINGS.

2. BEDDING - ALL REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING FOR THEIR ENTIRE LENGTH.

3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 2 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

POLYVINYL CHLORIDE (PVC) PIPE-ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR POLYVINYL CHLORIDE (PVC) PIPE:

1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATERTIGHT.

3. BEDDING — THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

<u>CONCRETE</u>

CONCRETE SHALL MEET THE REQUIREMENTS OF MHDSS.

ROCK RIPRAP ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MHDSS.

THE RIPRAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THE RIPRAP IN PLACE SHALL BE REASONABLY HOMOGENEOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS. FILTER CLOTH SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MHDSS.

ANY CLEANOUTS IN AREA SUBJECT TO VEHICULAR LOADING SHALL BE INSTALLED WITH CONCRETE COLLARS.

LOW FLOW ORIFICE (IF IDENTIFIED ON PLAN AS NEEDED): PERFORATED PIPE FOR LENGTH WITHIN BASIN TO UPSTREAM SIDE TOE OF OVERFLOW SLOPE, AND

NON-PERFORATED PIPE AS NEEDED TO EXTEND UNDER OVERFLOW WEIR TO OUTLET. EXTEND CLEANOUT PIPES TO SURFACE WITH VENTED CAPS AT TEES AND WYES.

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFER DAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM THE VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATIONS AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM OF REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER TO SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH MHDSS OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. DETAIL EROSION AND SEDIMENT CONTROL MEASURES TO BE EMPLOYED DURING THE CONSTRUCTION PROCESS SHALL BE IN ACCORDANCE WITH THE SEDIMENT EROSION CONTROL PLAN HEREIN AND GENERALLY ACCEPTED PRACTICES.

STORMWATER MANAGEMENT FACILITIES SHALL BE PROTECTED FROM SEDIMENT AND SILTATION AT ALL TIMES. JUST PRIOR TO COMPLETION, THE SITE SUBCONTRACTOR SHALL PERFORM A FINAL INSPECTION AND CLEANING OF THE STORM WATER MANAGEMENT SYSTEM. ALL SEDIMENT AND SILTATION SHALL BE REMOVED FROM THE BASINS, FOREBAYS, ETC. AND THESE AREAS SHALL BE SHAPED TO FINAL CONTOURS AND ELEVATION PER THE PLANS. ALL REPAIRS SHALL BE MADE AS NECESSARY TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACING FINAL TOPSOIL, MULCH, VEGETATION, SEEDING, ETC.

EXCAVATION/FILL NOTES:

1. SIDE SLOPES OF TRENCH EXCAVATIONS DEEPER THAN 4 FEET SHOULD BE FLATTENED (AS REQUIRED BY SITE CONDITIONS) TO AT LEAST 1H:1V OR SUPPORTED WITH TRENCH BOX OR SIMILAR DEVICE. ALL WORK SHALL BE PERFORMED SAFELY AND IN ACCORDANCE WITH OSHA AND MOSHA REQUIREMENTS. CONTRACTOR SHALL OBTAIN TRENCH PERMIT AS REQUIRED.

2. AFTER REMOVAL OF TOPSOIL AND INADEQUATE MATERIALS, GENERAL FILL SUBGRADE SHOULD BE PROOF-ROLLED WITH A LOADED 10-WHEEL TANDEM-AXLE DUMP TRUCK. THE PROOF-ROLLING SHOULD BE PERFORMED AS DIRECTED BY A GEOTECHNICAL ENGINEER. NO FILL SHOULD BE PLACED UNTIL THE SUBGRADE IS APPROVED BY A GEOTECHNICAL ENGINEER. BORROW MATERIALS FOR FILL OPERATIONS FOR GENERAL SITE GRADING SHOULD MEET AASHTO DESIGNATION A-2-4 (CLASS III) OR MORE GRANULAR AND BE APPROVED BY A GEOTECHNICAL ENGINEER. ALL FILLS SHOULD BE CONSTRUCTED IN 8" LOOSE LIFTS AND COMPACTED AS FOLLOWS, UNLESS OTHERWISE NOTED IN PROJECT SPECIFICATIONS:

- FILLS SUPPORTING FOUNDATIONS AND FLOOR SLABS, 95% OF ASTM D-1557 (AASHTO T-180) - TOP 24 INCHES OF ROADWAY SUBGRADE AND SUBBASE, 95% OF ASTM D-1557 (AASHTO T-180) - RETAINING WALLS AND FILLS WITHIN ROADWAY (BELOW TOP 24 INCHES OF SUBGRADE AND SUBBASE), 92% OF ASTM D-1557 (AASHTO T-180)

- FILLS UNDER AND AROUND STRUCTURES, MANHOLES, TANKS, VAULTS, ETC. AND PIPE EMBEDMENT (BEDDING, HAUNCHING AND INITIAL BACK FILL), 95% OF ASTM D-1557 (AASHTO T-180)

GRADING AND DRAINAGE NOTES:

1. THE PROJECT ELEVATIONS ARE BASED ON THE NAVD VERTICAL DATUM.

- FILLS IN GREEN SPACE, 90% OF ASTM D-1557 (AASHTO T-180)

2. DEBRIS, STUMPS, EXCESS, AND UNSUITABLE MATERIALS FROM THE CLEARING & DEMOLITION OPERATIONS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MANNER BY THE CONTRACTOR.

3. DISTURBED AREAS SHALL BE PROTECTED AT ALL TIMES TO CONTROL SEDIMENT TRANSPORT BEYOND THE LIMIT OF WORK.

4. DISTURBED AREAS SHALL BE TREATED WITH WATER DURING EXCAVATION, OR APPROVED ALTERNATIVE, TO

5. THE SITE SUBCONTRACTOR SHALL PROVIDE ALL EXCAVATION, BACKFILL AND COMPACTION NECESSARY TO ACHIEVE THE FINISH GRADES SHOWN ON THE PLANS AND FOR INSTALLATION OF BUILDING STRUCTURES, PAVING. STORMWATER MANAGEMENT AND ALL UTILITIES (INTERIOR AND EXTERIOR). SITE CONTRACTOR TO REFER TO SITÉ ELECTRICAL, MEP AND LANDSCAPE PLANS FOR ADDITIONAL INFORMATION AND DETAIL. EXISTING PAVING EDGES SHALL BE SAWCUT TO CREATE A CLEAN EDGE WHERE IT IS TO BE TIED INTO NEW PAVING, OR WHERE ASPHALT IS REMOVED ADJACENT TO ASPHALT WHICH IS TO REMAIN. BROKEN OR UNSTABLE PAVEMENT SHALL BE REMOVED AND SUBBASE REPLACED WITH SUITABLE COMPACTED MATERIAL PER PAVEMENT SECTION DETAIL HEREIN. ANY SAWCUT LINES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE EXACT EDGE OF SAWCUT SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO PROPERLY BLEND TO THE SURROUNDING GRADES. PROPOSED ASPHALT SHALL BE PROPERLY BUTTED AND BLENDED TO SURROUNDING ASPHALT WHICH IS TO REMAIN. THE BLENDED TRANSITION BETWEEN PROPOSED AND EXISTING ASPHALT SHALL BE ACCOMPLISHED WITH AN APPROXIMATE 1.5% GRADE UNLESS OTHERWISE IDENTIFIED. THE JOINT SHALL NOT

6. ALL PIPE OUTFALLS, CURB OPENINGS, STONE WEIRS, AND OTHER DRAINAGE OVERFLOW AND OUTLET AREAS SHALL HAVE RIPRAP EXTENDED FROM THE OUTLET TO THE BOTTOM OF SLOPE WITH A MINIMUM 10 FT x 10 FT RIPRAP LEVEL SPREADER, UNLESS OTHERWISE SPECIFICALLY DETAILED. ALL STONE OUTFALLS SHALL BE PROPERLY SHAPED SO THE RUNOFF IS CONTAINED WITH THE STONE LINING. SEE TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

7. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL BE STABILIZED WITH 4" LOAM, SEED. & MULCH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AREAS UNTIL VEGETATION HAS BEEN PERMANENTLY ESTABLISHED. SLOPES IN EXCESS OF 3:1 AND AREAS THAT SHOW SIGNS OF EROSION FROM CONCENTRATED FLOWS SHALL BE FURTHER STABILIZED WITH EROSION CONTROL BLANKETS (ECB) OF CURLEX DOUBLE NET -CURLEX II .98 BY AMERICAN EXCELSIOR COMPANY OR EQUAL. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE REQUIRED ECB'S AND PROPERLY STABILIZE ALL AREAS OF THE SITE.

8. ALL DRAINAGE STRUCTURES AND PIPING SHALL BE DESIGNED AND INSTALLED FOR H-20 LOADING. SETTING OF CATCH BASINS AND MANHOLE STRUCTURES SHALL BE ADJUSTED WITH CONCENTRIC OR OFFSET TOPS AS NEEDED FOR MINOR ADJUSTMENTS TO AVOID CONFLICTS WITH UNDERGROUND UTILITIES OR OTHER STRUCTURES. THE GRATE OR MANHOLE COVER SHALL ALSO BE ADJUSTED OVER THE STRUCTURE TO NOT CONFLICT WITH STEPS INSIDE THE STRUCTURE.

9. A 10 FOOT MINIMUM SEPARATION SHALL BE MAINTAINED BETWEEN ALL SWM INFILTRATION FACILITIES AND SANITARY SEWER LINES AND MANHOLES.

10. CPP - HIGH DENSITY POLYETHYLENE CORRUGATED PIPE WITH SMOOTH INTERIOR WALL TO MEET ADS N-12 PIPE SPECIFICATION OR EQUAL. CPP PIPE USE SHALL BE ALLOWED AS NOTED, WITH A DIAMETER UP TO AND INCLUDING 24". BACKFILLING CPP MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS AND SPECIAL CARE MUST BE EXERCISED (SEE ADS PRODUCT NOTE 3.115).

11. ALL COTTAGES ROOF DOWNSPOUTS SHALL BE TIED INTO ROOF DRAINS. REFER TO ARCHITECTURAL PLANS FOR ALL LOCATIONS OF DOWNSPOUTS. CONTRACTOR SHALL PROVIDE TIE-INS TO ALL DOWNSPOUT LOCATIONS. ROOF DRAINS TO BE AT LEAST 4" CPP AT 1% SLOPE MINIMUM WITH 1 FOOT MINIMUM COVER, TYPICAL, UNLESS OTHERWISE NOTED ON THE PLAN. GARAGES SHALL BE PROVIDED WITH STONE DRIP STRIPS ALONG FOUNDATION OUT PAST ROOF LINES TO CONTROL ALL GARAGE ROOF RUNOFF.

12. ALL GRADING WORK SHALL BE DONE IN A WORKMANLIKE MANNER ACCOMPLISHED TO CREATE POSITIVE DRAINAGE AND ELIMINATE ANY PUDDLING OR PONDING. WHERE NOT OTHERWISE NOTED OR DEFINED ON THE PLAN, ALL CUT AND FILL SHALL BE BLENDED TO DAYLIGHT AT EXISTING GRADE WITH A 3:1 SLOPE.

13. THE CONTRACTOR SHALL NOTIFY THE ENGINEER WITH ANY GRADE ISSUES OR QUESTIONS PRIOR TO PERFORMING THE FINISH GRADING WORK.

14. ALL PROPOSED WALKWAYS WILL HAVE RUNNING SLOPES OF LESS THAN 5% AND ALL CROSS SLOPES < 2%, U.O.N. THESE ARE MAXIMUM SLOPES WITH NO TOLERANCE. ALL WORK WILL BE IN ACCORDANCE WITH THE MOST CURRENT REQUIREMENTS OF THE U.S. ACCESS BOARD, AMERICANS WITH DISABILITIES ACT & COMMONWEALTH OF MASSACHUSETTS, ARCHITECTURAL ACCESS BOARD, WHERE REQUIRED.

15. CONTRACTOR SHALL CONFIRM AND PROVIDE ALL LANDINGS OUTSIDE OF DOORWAYS, AT THE TOP AND BOTTOM OF STEPS, AND AT TOP AND BOTTOM OF RAMPS, TO BE CONSTRUCTED SO THE LANDING IS 5 FT X 5 FT MIN. (UON) AND IS LESS THAN A 2% SLOPE IN ALL DIRECTIONS ON THE LANDING. THE CONTRACTOR SHALL VERIFY THE LANDING CONDITIONS IN THE FIELD AND CONTACT THE SITE ENGINEER WITH ANY QUESTIONS PRIOR

STAIRS REPRESENTED ON THE SITE PLANS DO NOT INDICATE THE EXACT NUMBER OF TREADS AND RISERS NEEDED. THESE WILL VARY BASED ON SPECIFIC FIELD CONDITIONS. THE CONTRACTOR SHALL VERIFY THE CONDITION IN THE FIELD AND DETERMINE TREADS AND RISERS REQUIRED PER THE BUILDING CODE. REFERENCE SHALL BE MADE TO THE ARCHITECTURAL PLANS. THE CONTRACTOR SHALL CONTACT THE SITE ENGINEER AS NEEDED WITH QUESTIONS REGARDING SPECIFIC TREADS AND RISERS PRIOR TO INSTALLING THE

16. BOTTOM OF WALL (BOW) OR TOP OF WALL (TOW) ELEVATIONS FOR RETAINING WALLS NOTED ON THE PLAN ARE APPROXIMATE ELEVATIONS WHERE THE WALL IS EXPECTED TO DAYLIGHT WITH EXISTING GRADE. STRUCTURAL RETAINING WALL DESIGN IS DONE BY OTHERS AND THE BOW OR TOW EXISTING GROUND ELEVATIONS FOR WHERE THE WALL WOULD DAYLIGHT TO EXISTING GRADES SHALL BE VERIFIED AS NEEDED FOR THE STRUCTURAL DESIGN. THE ACTUAL BOW OR TOW ELEVATION AT THE PROPOSED WALL(S) MAY DIFFER FROM CONTOURS SHOWN ON THE PLANS ESPECIALLY AT STEEP SLOPES AREAS.

17. STORMWATER MANAGEMENT FACILITIES SHALL BE PROTECTED FROM SEDIMENT AND SILTATION AT ALL TIMES. JUST PRIOR TO COMPLETION, THE SITE SUBCONTRACTOR SHALL PERFORM A FINAL INSPECTION AND CLEANING OF THE STORMWATER MANAGEMENT SYSTEM. ALL SEDIMENT AND SILTATION SHALL BE REMOVED FROM THE BASINS, FOREBAYS, ETC. AND THESE AREAS SHALL BE SHAPED TO FINAL CONTOURS AND ELEVATION PER THE PLANS. ALL REPAIRS SHALL BE MADE AS NECESSARY TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACING FINAL TOPSOIL, MULCH, VEGETATION, SEEDING, ETC

18. ANY DEWATERING OPERATION, WHEN REQUIRED AS PART OF THE CONSTRUCTION PROCESS, SHALL ENSURE ALL DEWATERING OCCURS THROUGH A PROPER DEWATERING BASIN (STONE, FILTER FABRIC AND HAYBALES OR OTHER ACCEPTABLE MEANS) PRIOR TO DISCHARGE FROM THE SITE.

19. ALL WORK WITHIN THESE PLANS SHALL BE PERFORMED AND PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONSTRUCTION DETAILS PROVIDED IN THIS PLAN SET WHETHER OR NOT THE DETAIL NUMBER IS SPECIFICALLY REFERENCED.

20. FOUNDATION DRAINS ARE REQUIRED. REFER TO STRUCTURAL AND ARCHITECTURAL PLANS (SEE DETAIL

CONSTRUCTION SEQUENCE

1. INSTALL SILT FENCING AND WATTLES TO ESTABLISH THE LIMIT OF WORK AROUND THE PERIMETER OF THE PROJECT AND ANY AREAS WHICH HAVE GROUND DISTURBANCE BASED ON THE PROJECT WORK AND CONTRACTORS STAGING AREAS. SILT FENCE, WATTLES AND OTHER PERIMETER CONTROL SHALL BE INSTALLED TO PREVENT TRANSPORT OF SEDIMENT OUTSIDE OF THE PROJECT AREA. SILT FENCE AND OTHER EROSION CONTROLS MAY BE REQUIRED BEYOND WHAT IS SPECIFICALLY SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND PROVIDE ALL THE NECESSARY EROSION CONTROLS TO PREVENT SEDIMENT AND OTHER DELETERIOUS RUNOFF MATERIAL FROM LEAVING THE PROJECT AREA DURING CONSTRUCTION.

. INSTALL TEMPORARY CONSTRUCTION ENTRANCE/EXIT STONE AREAS WHERE EVER CONSTRUCTION TRAFFIC ENTERS OR EXITS THE PROJECT AREA.

3. DISCHARGES FROM DEWATERING OF EXCAVATIONS SHALL NOT BE DIVERTED DIRECTLY INTO ANY WETLANDS OR EXISTING STORM DRAINS WITHOUT PRETREATMENT VIA SEDIMENT BASINS AND/OR SETTLING BASINS.

4. INSTALL HAY BALE AND/OR STONE CHECK DAMS ALONG CENTER OF SWALES/FLOW LINES AT 100' O.C., AS

5. CLEAR AND GRUB SITE WITHIN THE LIMIT OF WORK.

6. ESTABLISH ROUGH SUB GRADES OF SITE FOR ROAD AND BUILDING PADS. THE SOILS FROM WETLAND AREA SHALL BE SAVED FOR REUSE IN MITIGATION PLANS. INSTALL SEDIMENT BASINS IN AREAS OF FOREBAYS TO CONTAIN LARGER RUNOFF FLOWS DURING CONSTRUCTION.

7. WHERE BASINS ARE USED AS SEDIMENT BASINS DURING CONSTRUCTION, THE BASIN GROUND ELEVATION SHALL BE KEPT ONE FOOT ABOVE THE FINAL BASIN ELEVATION. THESE BASINS SHALL THEN BE CLEANED AND EXCAVATED TO FINAL ELEVATIONS UPON COMPLETION OF THE CONSTRUCTION PROJECT.

8. PERFORM BUILDING, DRAINAGE, UTILITY AND SITE CONSTRUCTION. INSTALL BASE COURSE PAVING AS SOON AS PRACTICAL.

9. INSPECT AND MAINTAIN EROSION CONTROL MEASURES AFTER RAINFALL EVENTS AND A MINIMUM OF ONCE

SITE IN CONFORMANCE WITH EARTHWORK SPECIFICATIONS. 11. ONCE ALL DRAINAGE STRUCTURES ARE INSTALLED, INSTALL SILT SAC OR FILTER FABRIC AND STONE/HAY

BALES AROUND ALL NEW STRUCTURES AND MAINTAIN THEM UNTIL PAVEMENT IS IN PLACE AND CONTRIBUTING

10. REMOVE SEDIMENT BUILDUP AT EROSION CONTROL DEVICES AS NEEDED. REDISTRIBUTE MATERIAL OVER

REQUIRED WHETHER GRAPHICALLY SHOWN ON THE PLAN OR NOT. 12. ALL CUT AND FILL SLOPES SHALL BE TEMPORARILY STABILIZED WITH TOP SOIL, SEED AND MULCH OR CURLEX AS REQUIRED IF CONSTRUCTION ACTIVITY CEASES ON SAID SLOPES FOR A PERIOD OF 7 DAYS OR

DRAINAGE AREAS ARE STABLIZED. ALL OUT FALLS SHALL BE STABILIZED WITH STONE PROTECTION AS

GREATER. ALL SLOPES SHALL BE PERMANENTLY STABILIZED AS REQUIRED IMMEDIATELY UPON COMPLETION OF FINAL GRADING. 13. COMPLETE FINISH GRADING, LANDSCAPING AND FINAL STABILIZATION OF SITE. PLACE FINAL PAVING

14. REMOVE SEDIMENT FROM ALL BASINS, DRAINAGE STRUCTURES, DRAIN MANHOLES, PIPES AFTER COMPLETION OF CONSTRUCTION. REMOVE AND REGRADE TEMPORARY BERMS, SWALES, CHECK DAMS, ETC. STABILIZE DISTURBED AREAS.

15. CLEAN OUT ALL SEDIMENT FROM SWM FOREBAYS/BASINS AND OUTLET STRUCTURES. REGRADE TO FINAL CONTOURS PER DESIGN. STABILIZE ALL SLOPES AS REQUIRED. REPLACE AND/OR CLEAN FILTER FABRIC AND STONE AT SWM FOREBAYS. ALL AREAS CONTRIBUTING RUNOFF TO THE PROPOSED INFILTRATION DEVICES/BASINS SHALL BE STABILIZED PRIOR TO THE REMOVAL OF SEDIMENT AND EROSION CONTROL DEVICES PROTECTING THESE AREAS.

16. UPON ESTABLISHMENT OF PERMANENT GROUND COVER AND APPROVAL BY THE ENGINEER, REMOVE WATTLES & SILT FENCE. STABILIZE ALL AREAS WHERE WATTLES WHERE REMOVED.

OPERATION/MAINTENANCE PLAN

1. THIS OPERATION AND MAINTENANCE PLAN SHALL BE PERFORMED BY THE GENERAL CONTRACTOR DURING CONSTRUCTION OPERATIONS AND BY THE OWNER ONCE THE FACILITIES ARE COMPLETED AND PUT INTO

2. PERSONNEL ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT SHALL BE INFORMED THAT THE MAINTENANCE OF SILTATION CONTROLS TAKES PRECEDENCE OVER NORMAL CONSTRUCTION ACTIVITIES. ADJACENT PROPERTIES AND STREETS SHALL BE PROTECTED FROM EROSION OR SILTATION CONDITIONS.

3. INSPECTION AND MAINTENANCE, AS OUTLINED HEREIN, SHALL BE PERFORMED FOUR TIMES WITHIN THE FIRST YEAR OF OPERATION. THENCE, INSPECTIONS AND MAINTENANCE SHALL BE CONDUCTED ON A SEMIANNUAL BASIS (2 TIMES A YR.) AND AFTER ALL LARGE STORMS. AN INSPECTION REPORT SHALL BE MAINTAINED.

4. ACCUMULATED DEBRIS IN CATCH BASINS, SEDIMENT FOREBAYS, AND DRAINAGE BASINS SHALL BE REMOVED BEFORE IT EXCEEDS 12 INCHES IN DEPTH AND DISPOSED OF PROPERLY. BROKEN OR DAMAGED GAS TRAPS/HOODS SHALL BE IMMEDIATELY REPAIRED OR REPLACED TO ENSURE ADEQUATE FUNCTION.

5. A VISUAL INSPECTION SHALL BE MADE AT ALL ACCESS MANHOLES, CATCH BASINS, OUTFALLS, LEACHING BASINS. PIPES AND DRAINAGE CHANNELS FOR THE ENTIRE STORM DRAINAGE SYSTEM. THE GENERAL CONDITION OF THESE STRUCTURES SHOULD BE REVIEWED AND ACCUMULATED DEBRIS SHALL BE REMOVED. THE CONDITION OF ALL OUTLETS SHALL BE NOTED AND A DESCRIPTION OF THE DRAINAGE STRUCTURES SHALL BE INCLUDED IN THE REPORT. DELETERIOUS MATERIALS SHALL BE REMOVED FROM THESE STRUCTURES AND THE DRAINAGE CHANNELS IN ORDER FOR THE SYSTEM TO FUNCTION PROPERLY.

6. ALL OUTLETS, DRAINING CHANNELS, AND SLOPES SHALL BE KEPT STABILIZED. ANY EROSION SHALL BE

7. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE SWM BASINS BEFORE IT EXCEEDS 1' IN DEPTH, OR AT LEAST ONCE EVERY 5 YEARS. THE SPILLWAYS OUTLETS SHALL BE CLEANED AND INSPECTED FOR PROPER FUNCTIONING. ALL DEBRIS OR DELETERIOUS MATERIAL SHALL BE REMOVED FROM OUTLET STRUCTURES. BASIN SLOPES SHALL BE MAINTAINED WITH A GRASS STAND OF AT LEAST 3". GRASS SHALL BE MOWED AT LEAST TWICE A YEAR AND CLIPPINGS SHALL NOT BE LEFT IN BASIN. ANY TREES OR OTHER WOODY VEGETATION GROWING IN EMBANKMENTS OR NEAR OUTLET CONTROL STRUCTURES SHALL BE REMOVED.

8. THE FOLLOWING MINIMUM INFORMATION SHALL BE RECORDED:

* DATE OF INSPECTION REPORT

REPAIRED IMMEDIATELY.

* GENERAL CONDITION OF THE ENTIRE SYSTEM * CORRECTIVE ACTIONS TAKEN TO ENSURE ADEQUATE FUNCTION AND WHEN PERFORMED. * A COPY OF THESE REPORTS SHALL BE FURNISHED TO THE PLANNING BOARD UPON REQUEST.

9. MAINTENANCE OF THE STORMWATER MANAGEMENT FACILITIES SHALL BE IN ACCORDANCE WITH THE EXECUTED INSPECTION AND MAINTENANCE AGREEMENT FOR PRIVATE STORMWATER MANAGEMENT FACILITIES AND SHALL BE THE RESPONSIBILITY OF THE OWNER AND THE ASSIGNEES.

OWNER SIGNATURE (OWNER UNDERSTANDS RESPONSIBILITIES OF OPERATION AND MAINTENANCE REQUIREMENTS OF STORMWATER MANAGEMENT SYSTEMS)

INGINEERING & SURVEYIN

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STAMP

CONSULTANT

STAMP

CONSULTANT

PREPARED FOR:

Southworth Mashpee Properties, LLC

130 Willowbend Drive Mashpee, MA 02649

PROJECT TITLE | Cranberry Point

Mashpee, MA 02649

275 Quinaquisset Avenue

/\ JKL 3/24/2023 PER PLANNING BOARD COMMENTS |DATE | DESCRIPTION

Drainage Notes

SHEET NO

SHEET TITLE

C4.3

DATE: JANUARY 16, 2023 0 20

SCALE: 1"=20' RAWN BY: JKL CHECKED BY:**MWE**

FILE2014-009 QUIN GD.dwe

SCALE IN FEET