

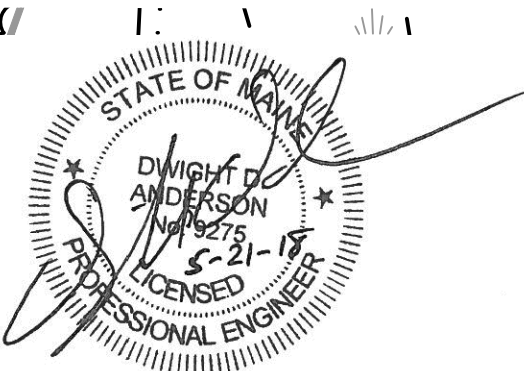
PROJECT PARCEL SITE
TOWN OF WINDHAM TAX ASSESSOR'S MAP & LOT NUMBERS

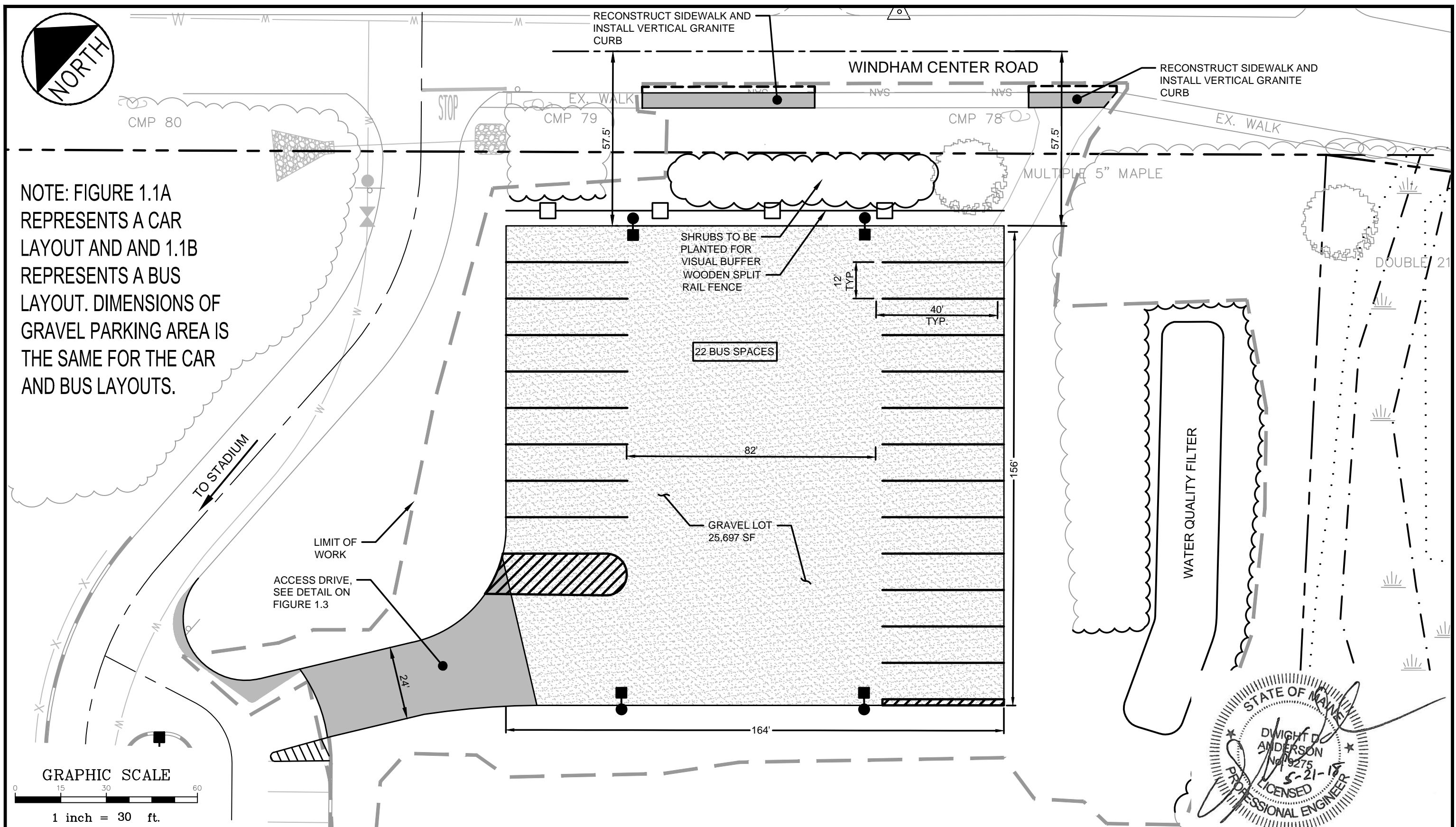
MAP	LOT
12	25

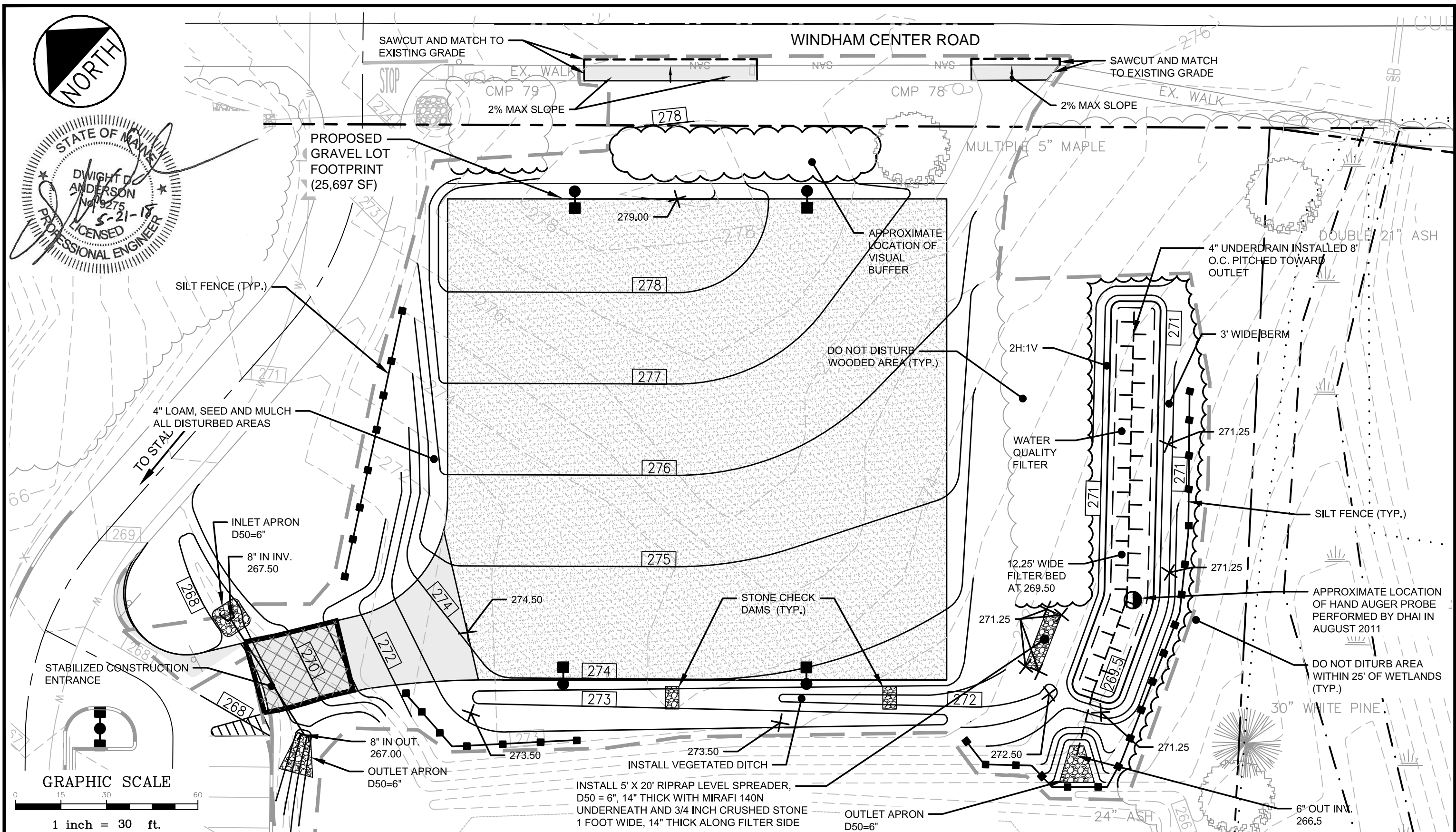
ZONE: FARM RESIDENTIAL

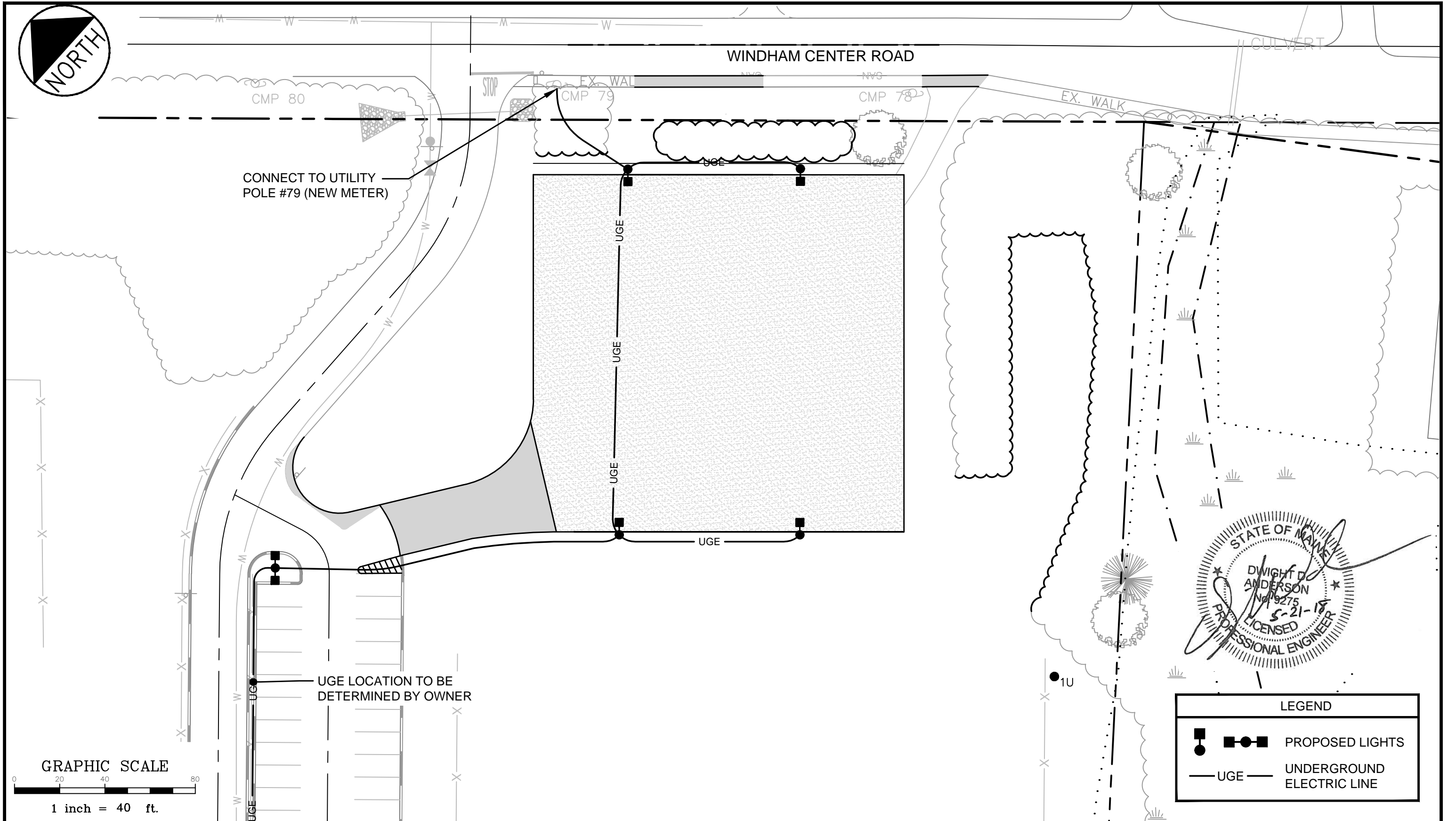
**APPROVAL - TOWN OF WINDHAM
PLANNING BOARD**

DATE _____

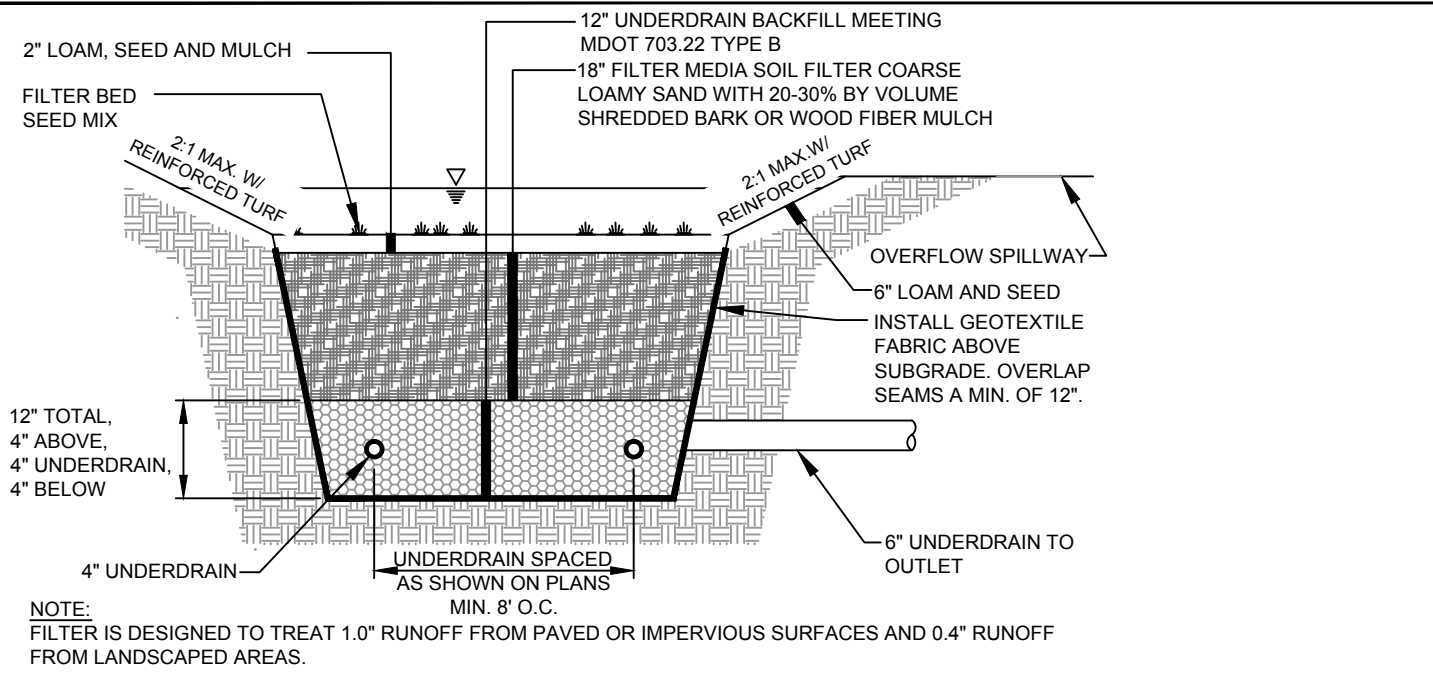








<p>Stantec 482 Payne Road Scarborough Court Scarborough, Maine 04074-8929 Tel. 207.883.3355 www.stantec.com</p>	DRAWN: LA	DATE: 05.11.18	RSU #14 WINDHAM SCHOOL CAMPUS	GRAVEL PARKING AREA - UTILITY PLAN	FIGURE 1.3
	DESIGNED: DDA	SCALE: 1"=40'			
	CHECKED: DDA	JOB NO. 195350302			
	FILE NAME: 50302_UTIL				



UNDERDRAIN SOIL FILTER CONSTRUCTION NOTES

1. SPECIFIC DESIGN CRITERIA

A. UNDERDRAIN PIPE: PROPER LAYOUT OF THE PIPE UNDERDRAIN SYSTEM IS NECESSARY TO EFFECTIVELY DRAIN THE ENTIRE FILTER AREA. THERE MUST BE AT LEAST ONE LINE OF UNDERDRAIN PIPE FOR EVERY FIFTEEN FEET OF FILTER AREA'S WIDTH. THE SLOPE OF THE INSTALLED UNDERDRAIN PIPE MUST BE POSITIVE. THE UNDERDRAIN PIPING SHOULD BE 4" TO 6" SLOTTED, RIGID SCHEDULE 40 PVC OR SDR35. STRUCTURE JOINTS SHALL BE SEALED SO THAT THEY ARE WATERTIGHT.

B. PIPE BEDDING AND TRANSITION ZONE: THE 4 TO 6 INCH DIAMETER PERFORATED UNDERDRAIN PIPE(S) MUST BE BEDDED IN 12 TO 14 INCHES OF UNDERDRAIN MATERIAL WITH AT LEAST 4 INCHES OF MATERIAL BENEATH THE PIPE AND 4 INCHES ABOVE. TWO OPTIONS FOR PIPE BEDDING ARE PROVIDED BELOW; HOWEVER OPTION 1 IS PREFERRED.

THE UNDERDRAIN MATERIAL CONSISTS OF WELL GRADED, CLEAN, COARSE GRAVEL MEETING THE MEDOT SPECIFICATION 703.22 UNDERDRAIN TYPE B FOR UNDERDRAIN BACKFILL. THE MATERIAL MUST CONTAIN LESS THAN 5% FINES PASSING THE #200 SIEVE. NO TRANSITION ZONE IS NECESSARY SINCE THE DRAINAGE PIPE IS BEDDED IN LESS PERVIOUS GRAVEL AND THIS DESIGN IS ACCEPTABLE FOR AREAS WHERE THE HEAD OR DEPTH TO SEASONAL HIGH GROUNDWATER IS CLOSE TO THE BOTTOM OF THE DRAINAGE LAYER. UNDERDRAIN PIPES MUST BE PLACED NO FURTHER THAN 15 FEET APART.

C. SOIL FILTER BED: THE SOIL FILTER MUST BE AT LEAST 18 INCHES DEEP ON TOP OF THE GRAVEL UNDERDRAIN PIPE BEDDING AND MUST EXTEND ACROSS THE BOTTOM OF THE ENTIRE FILTER AREA. THIS SOIL MIXTURE SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS, OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS CAN BE MIXED WITHIN THE FILTER.

SOIL FILTER MEDIA: SOIL MEDIA MUST CONSIST OF SILTY SAND OR SOIL MIXTURE COMBINED WITH A MATURE, MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH 20% OR 25% BY VOLUME (NO LESS THAN 10% BY DRY WEIGHT). THE RESULTING MIXTURE SHOULD HAVE 8% TO 12% PASSING THE NO. 200 SIEVE AND A CLAY CONTENT OF LESS THAN 2%. THE PROPORTIONS OF THE MIXTURE CAN BE ADJUSTED SO IT WILL CONTAIN SUFFICIENT FINES AND ORGANIC MATTER.

THE SYSTEM MUST BE DESIGNED TO DRAIN THE SURFACE STORAGE VOLUME IN NO LESS THAN 24 HOURS AND NO MORE THAN 48 HOURS.

AS AN EXAMPLE, THE MIXTURE MAY CONTAIN BY THE FOLLOWING:
50% OF SAND (MEDOT #703.01 CONTAINS INSUFFICIENT FINE FOR THE MEDIA)
20% OF LOAMY TOPSOIL (SEE TABLE BELOW)
30% OF COMPOSTED WOODY FIBERS AND SHREDDED BARK MULCH

SIEVE #	% PASSING BY WEIGHT
4	75 - 95
10	60 - 90
40	35 - 85
200	20 - 70
200 CLAY SIZE	2.00

E. CLAY CONTENT: USE OF SOILS WITH MORE THAN 2% CLAY CONTENT COULD CAUSE FAILURE OF THE SYSTEM AND CARE SHOULD BE TAKEN, ESPECIALLY IN AREAS WHERE THE PREDOMINANT SOIL CONTAINS MARINE CLAY, THAT THE SAND AND TOPSOIL USED IN THE MIXTURE HAVE VERY LITTLE OR NO CLAY CONTENT.

F. FILTER PERMEABILITY: THE FILTER MUST BE PERMEABLE ENOUGH TO INSURE DRAINAGE WITHIN 48 HOURS MAXIMUM. YET HAVE SUFFICIENT FINES TO INSURE FILTRATION OF FINE PARTICLES AND REMOVAL OF DISSOLVED POLLUTANTS. THE DESIGN MAY EITHER RELY ON THE SOIL PERMEABILITY, IF KNOWN, TO PROVIDE THE SLOW RELEASE OF THE WATER TREATMENT VOLUME OVER A MINIMUM OF 24 HOURS, OR MAY INSURE THIS RATE BY INSTALLING A CONSTRUCTIVE ORIFICE OR VALVE ON THE UNDERDRAIN OUTLET. IN DETERMINING THE PERMEABILITY OF THE MEDIA, THE PERCENT FINES OF THE MIXTURE AND THE LEVEL OF COMPACTION SHOULD BE CONSIDERED. GENERALLY, THE SOIL MEDIA SHOULD BE ONLY LIGHTLY COMPACTED BETWEEN 90 AND 92% STANDARD PROCTOR (ASTM D698) AND SHALL HAVE A PERMEABILITY OF 2.4 IN/HR TO 4 IN/HR.

G. GRADATION TESTING: GRADATION TESTS, INCLUDING HYDROMETER TESTING FOR CLAY CONTENT, AND PERMEABILITY TESTING OF THE SOIL FILTER MATERIAL, SHALL BE PERFORMED BY A QUALIFIED SOIL TESTING LABORATORY AND SUBMITTED TO THE PROJECT ENGINEER FOR REVIEW BEFORE PLACEMENT AND COMPACTION.

H. GEOTEXTILE FABRIC: A GEOTEXTILE FABRIC WITH SUITABLE CHARACTERISTICS SHALL BE PLACED BETWEEN THE SIDES OF THE FILTER LAYER AND ADJACENT SOIL. THE FABRIC WILL PREVENT THE SURROUNDING SOIL FROM MIGRATING INTO AND CLOGGING THE FILTER AND CLOGGING THE OUTLET. OVERLAP SEAMS MUST BE A MINIMUM OF 12 INCHES. DO NOT WRAP FABRIC OVER THE TOP OF THE PIPE BEDDING AS IT WILL CAUSE CLOGGING AND WILL PREVENT FLOWS OUT OF THE FILTER. THE GEOTEXTILE FABRIC SHALL BE MIRAFI 170N OR EQUIVALENT.

I. VEGETATION: THE SOIL FILTER SURFACE MUST BE PLANTED WITH A CONSERVATION MIX OF GRASS SPECIES THAT IS TOLERANT OF FREQUENT INUNDATION AND WELL DRAINED SOILS. UPON SEEDING, THE SOIL FILTER SHALL BE MULCHED WITH HAY OR AN EROSION CONTROL BLANKET. AN APPROPRIATE SEED MIXTURE SHOULD CONTAIN THE FOLLOWING OR BE AN APPROVED EQUIVALENT CONSERVATION TYPE MIXTURE:

TALL FESCUE	0.46	LBS/M. SQ. FT.
CREeping RED FESCUE	0.46	LBS/M. SQ. FT.
BIRDFOOT TREFOIL	0.18	LBS/M. SQ. FT.
TOTAL	1.1	LBS/M. SQ. FT.

J. ROCK FOREBAY: A ROCK FOREBAY IS RECOMMENDED TO REDUCE FLOW VELOCITY INTO THE GRASSED FILTER BASIN. IT SHALL REMAIN CLEAR OF SEDIMENT UNTIL THE UPGRADIENT TRIBUTARY AREA IS FULLY VEGETATED.

2. CONSTRUCTION CRITERIA

A. BASIN EXCAVATION: THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND CAN BE USED FOR A SEDIMENT TRAP FROM THE SITE DURING CONSTRUCTION. AFTER EXCAVATION OF THE BASIN, THE OUTLET STRUCTURE AND PIPING SYSTEM MUST BE INSTALLED AT THE APPROPRIATE ELEVATION AND PROTECTED WITH A SEDIMENT BARRIER. IF THE BASIN IS TO BE USED AS A SEDIMENT TRAP, THE SIDES OF THE EMBANKMENTS MUST BE MULCHED AND MAINTAINED TO PREVENT EROSION.

B. 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.

C. OUTLET DISCHARGE: OUTFLOW OF THE FILTER BASIN UNDERDRAIN WILL BE CONTROLLED BY THE SOIL FILTER PERMEABILITY.

(A) TYPICAL SECTION FOR WATER QUALITY FILTER
N.T.S.

D. CONSTRUCTION SEQUENCE: EROSION AND SEDIMENTATION FROM UNSTABLE SUBCATCHMENTS IS THE MOST COMMON REASON FOR FILTER FAILURE. NOT REEING THE CONSTRUCTION SEQUENCING CRITERIA IS LIKELY TO RESULT IN THE NEED TO REPLACE THE SOIL FILTER. 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. OTHERWISE, THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA MUST BE DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED UNLESS THE DEPARTMENT HAS DETERMINED, ON A CASE-BY-CASE BASIS, THAT SUFFICIENT MEASURES ARE BEING TAKEN TO PREVENT EROSION OF MATERIAL FROM THE UNSTABLE CATCHMENT AREA AND DEPOSITION ON THE FILTER.

E. REMEDIAL LOAM COVER: TO RAPIDLY ESTABLISH VEGETATION IN THE FILTER AREA, THE CONTRACTOR WILL INSTALL A 2.3 INCH LAYER OF SANDY LOAM TOPSOIL (WITH LESS THAN 2% CLAY AS TESTED VIA HYDROMETER TEST) ABOVE THE GRASS FILTER PRIOR TO SEEDING, MULCHING AND ANCHORING EROSION CONTROL MESH.

F. CONSTRUCTION OVERSIGHT: INSPECTION OF THE FILTER BASIN SHALL BE PROVIDED FOR EACH PHASE OF CONSTRUCTION BY THE DESIGN ENGINEER WITH REQUIRED REPORTING TO THE OWNER AND THE MD&P. AT A MINIMUM, INSPECTIONS WILL OCCUR:

- AFTER 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.
- AFTER 1 YEAR, TO INSPECT VEGETATION AND MAKE CORRECTIONS.

G. 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 ASTM C136 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES, 1996A) ON EACH TYPE OF THE SAMPLE MATERIAL. THE RESULTING SOIL FILTER MEDIA MIXTURE MUST HAVE NO MORE THAN 8% 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.

3. MAINTENANCE CRITERIA

DURING THE FIRST YEAR, THE BASIN WILL BE INSPECTED SEMI-ANNUALLY AND FOLLOWING MAJOR STORM EVENTS.

DEBRIS AND SEDIMENT BUILDUP SHALL BE REMOVED FROM THE FOREBAY AND BASIN AS NEEDED.

MOVING OF A GRASSED BASIN CAN OCCUR SEMIANNUALLY TO A HEIGHT NO LESS THAN 6 INCHES.

ANY BARE AREA OR EROSION RILLS SHALL BE REPAIRED WITH NEW FILTER MEDIA OR SANDY LOAM THEN SEEDED AND MULCHED.

MAINTAINING GOOD GRASS COVER WILL MINIMIZE CLOGGING WITH FINE SEDIMENTS AND IF PONDING EXCEEDS 48 HOURS, THE TOP OF THE FILTER BED MUST BE ROTOTILLED TO REESTABLISH THE SOIL'S FILTRATION CAPACITY IF EXTENDED PONDING IS OBSERVED.

A. MAINTENANCE AGREEMENT: AN AGENT OF THE OWNER IS RESPONSIBLE FOR INSPECTING AND MAINTAINING ANY UNDERDRAINED FILTER. OTHER STORMWATER O&M REQUIREMENTS ARE INCLUDED WITH THE EXISTING DEP PERMIT.

B. SOIL FILTER INSPECTION: THE SOIL FILTER SHOULD BE INSPECTED AFTER EVERY MAJOR STORM IN THE FIRST YEAR TO BE SURE IT IS FUNCTIONING PROPERLY. THEREAFTER, THE FILTER SHOULD BE INSPECTED AT LEAST ONCE EVERY SIX MONTHS TO ENSURE THAT IT IS DRAINING WITHIN 48 HOURS FOLLOWING A ONE INCH STORM OR GREATER.

C. DRAINAGE: THE FILTER SHOULD DRAIN WITHIN 24 TO 48 HOURS FOLLOWING A ONE-INCH STORM OR GREATER. IF THE SYSTEM DRAINS TO FAST, AN ORIFICE MAY NEED TO BE ADDED ON THE UNDERDRAIN OUTLET OR MAY NEED TO BE MODIFIED IF ALREADY PRESENT.

D. SOIL FILTER REPLACEMENT: THE TOP SEVERAL INCHES OF THE FILTER SHALL BE REPLACED WITH FRESH MATERIAL WHEN WATER PONDS ON THE SURFACE OF THE BED FOR MORE THAN 72 HOURS. THE REMOVED SEDIMENTS SHOULD BE DISPOSED OF IN AN ACCEPTABLE MANNER.

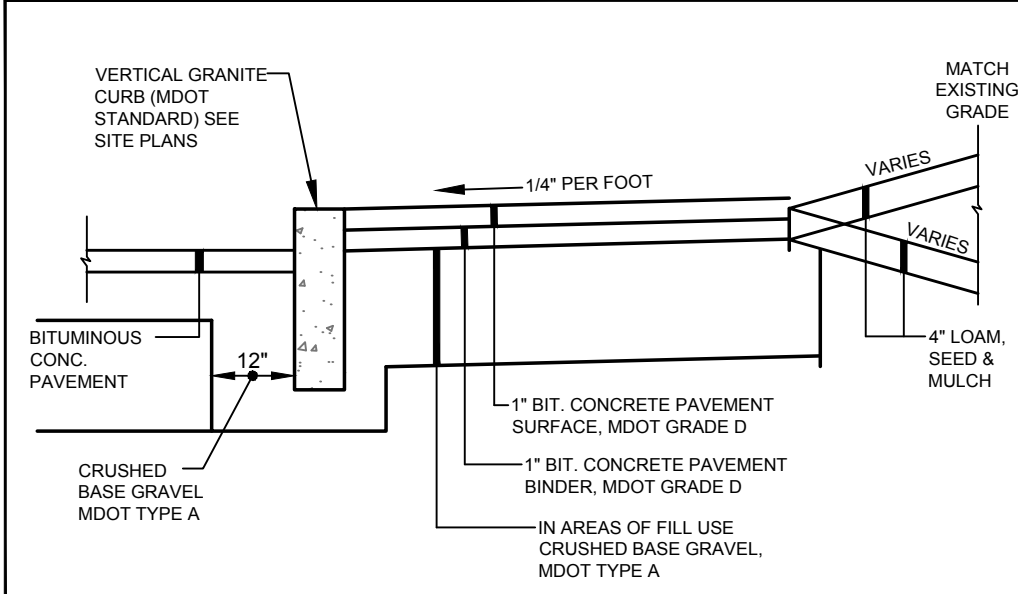
E. SEDIMENT REMOVAL: SEDIMENT AND PLANT DEBRIS SHOULD BE REMOVED FROM THE PRETREATMENT STRUCTURE AT LEAST ANNUALLY.

F. MOVING: IF MOVING IS DESIRED, ONLY HANDHELD STRING TRIMMERS OR PUSH-MOWERS ARE ALLOWED ON THE FILTER (NO TRACTOR) AND THE GRASS BED SHOULD BE MOWED NO MORE THAN 2 TIMES PER GROWING SEASON TO MAINTAIN GRASS HEIGHTS OF NO LESS THAN 6 INCHES.

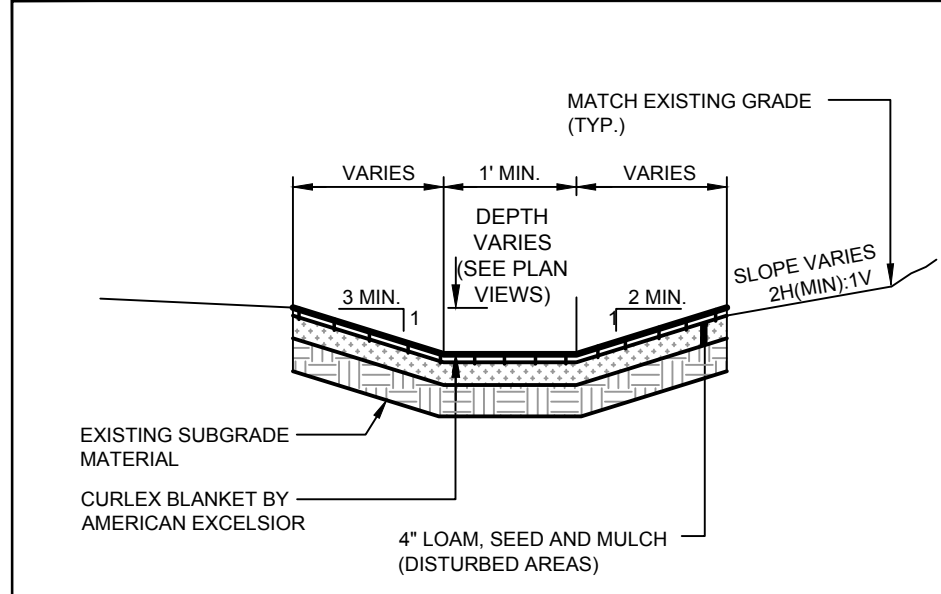
G. FERTILIZATION: FERTILIZATION OF THE UNDERDRAINED FILTER AREA SHOULD BE AVOIDED UNLESS ABSOLUTELY NECESSARY TO ESTABLISH VEGETATION.

H. HARVESTING AND WEEDING: HARVESTING AND PRUNING OF EXCESSIVE GROWTH WILL NEED TO BE DONE OCCASIONALLY. WEEDING TO CONTROL UNWANTED OR INVASIVE PLANTS MAY ALSO BE NECESSARY. ADD NEW MULCH ONLY AS NECESSARY FOR BIORETENTION CELL.

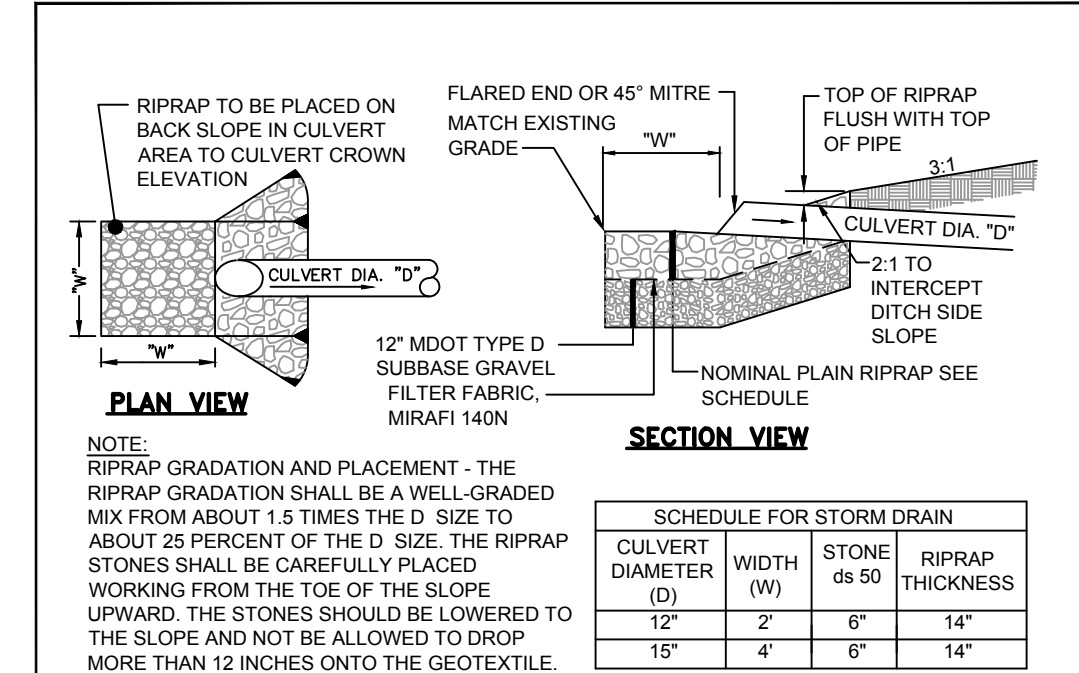
I. GRASS COVER: MAINTAINING A HEALTHY COVER OF GRASS WILL MINIMIZE CLOGGING WITH FINE AND SEDIMENTS. IF PONDING EXCEEDS 48 HOURS, THE TOP OF THE FILTER BED SHOULD BE ROTOTILLED TO REESTABLISH THE SOIL'S FILTRATION CAPACITY.



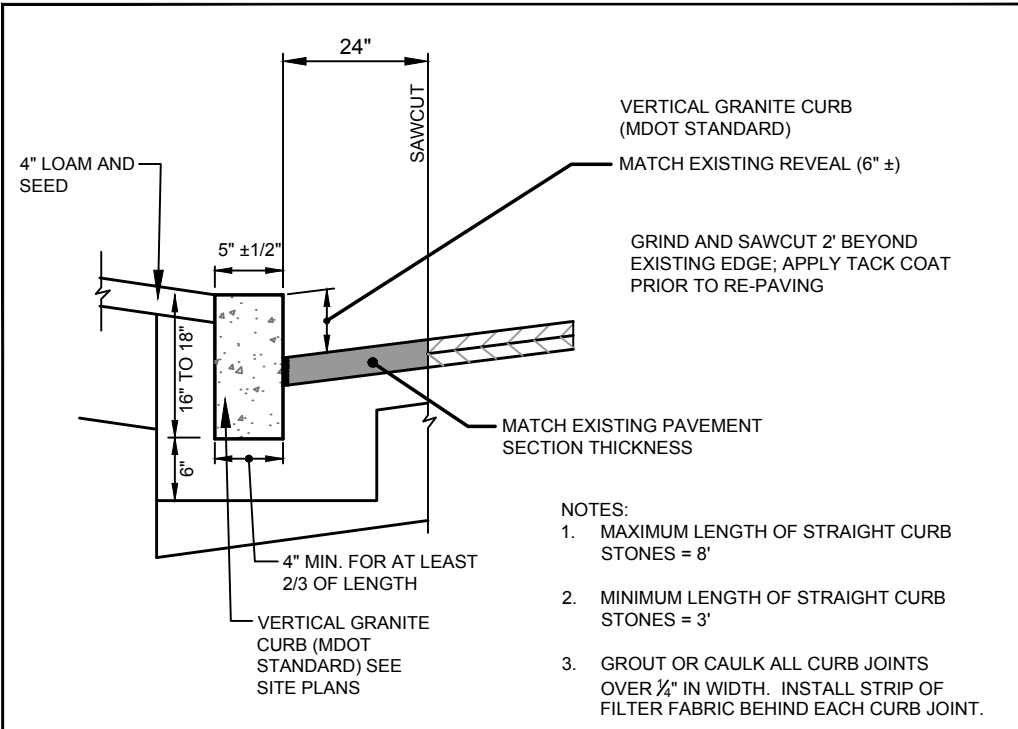
(B) BITUMINOUS SIDEWALK WITH VERTICAL GRANITE CURB DETAIL
N.T.S.



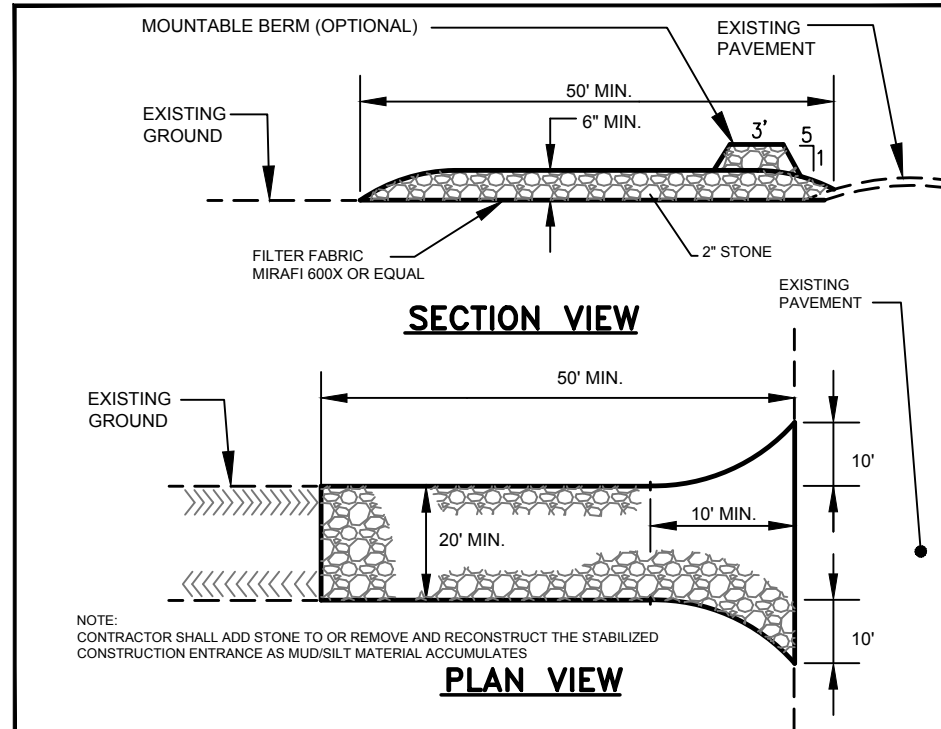
(F) VEGETATED DITCH
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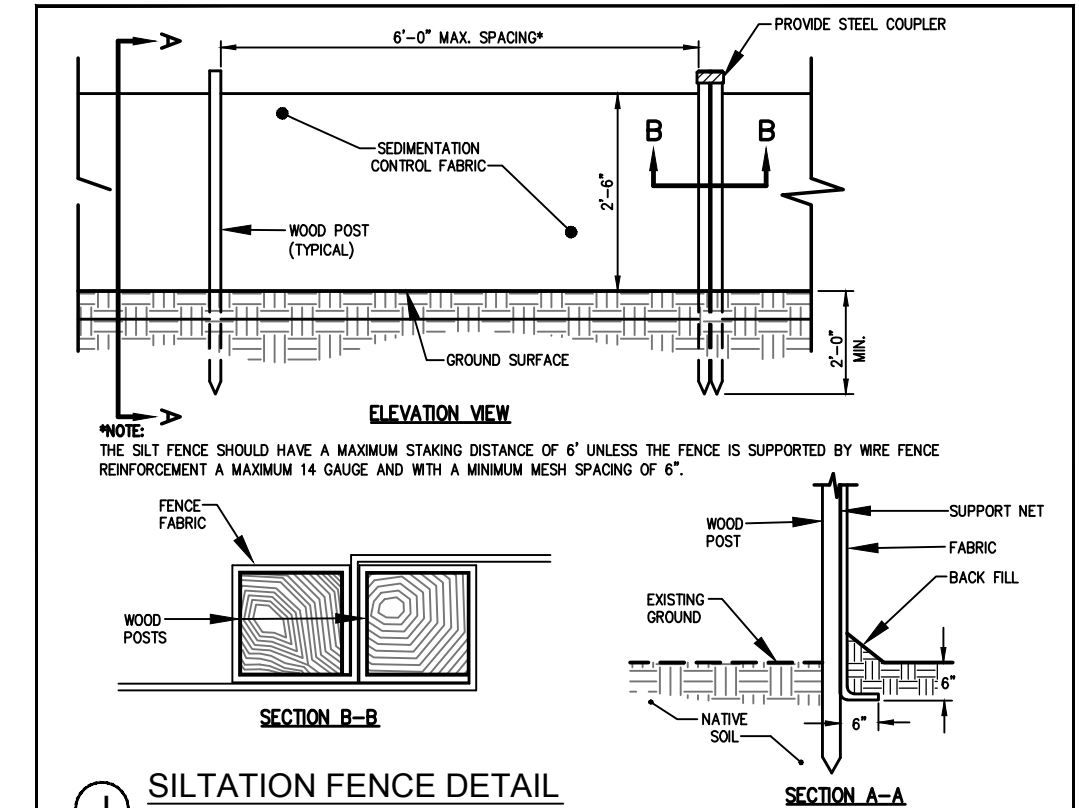
(I) CULVERT INLET APRON IN FILL AREAS
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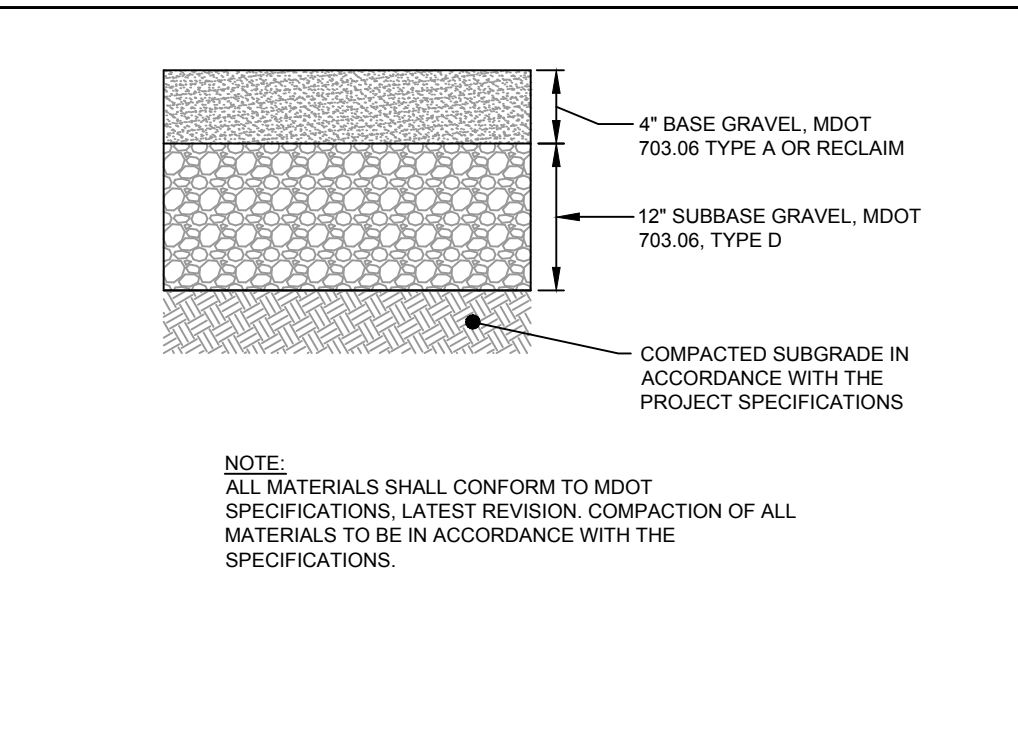
(C) VERTICAL GRANITE CURB INSTALLATION DETAIL
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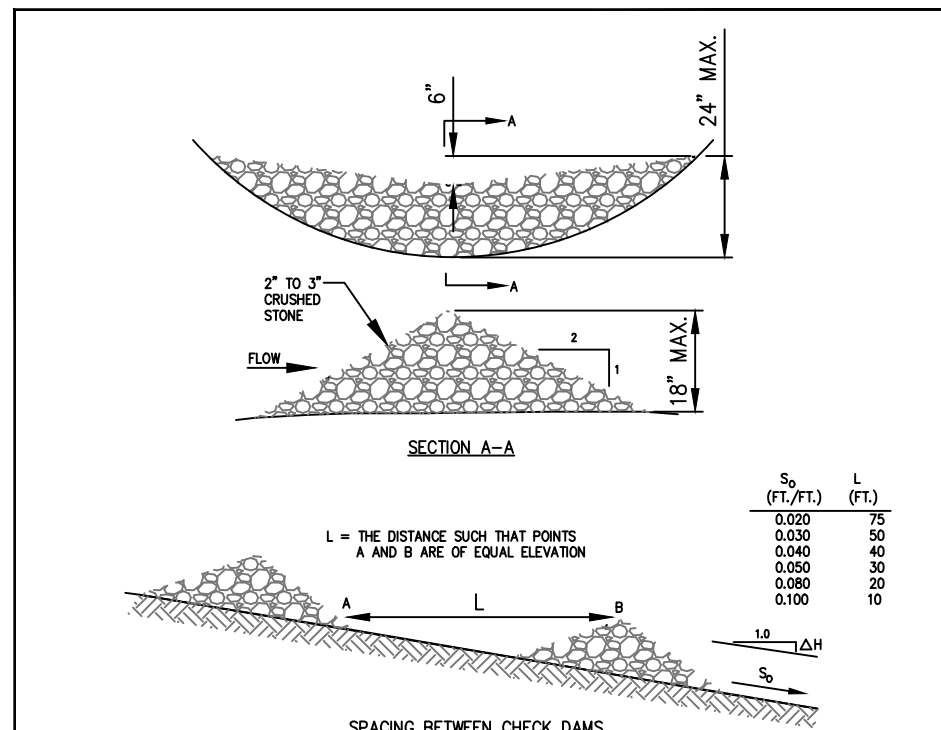
(G) STABILIZED CONSTRUCTION ENTRANCE DETAIL
N.T.S.



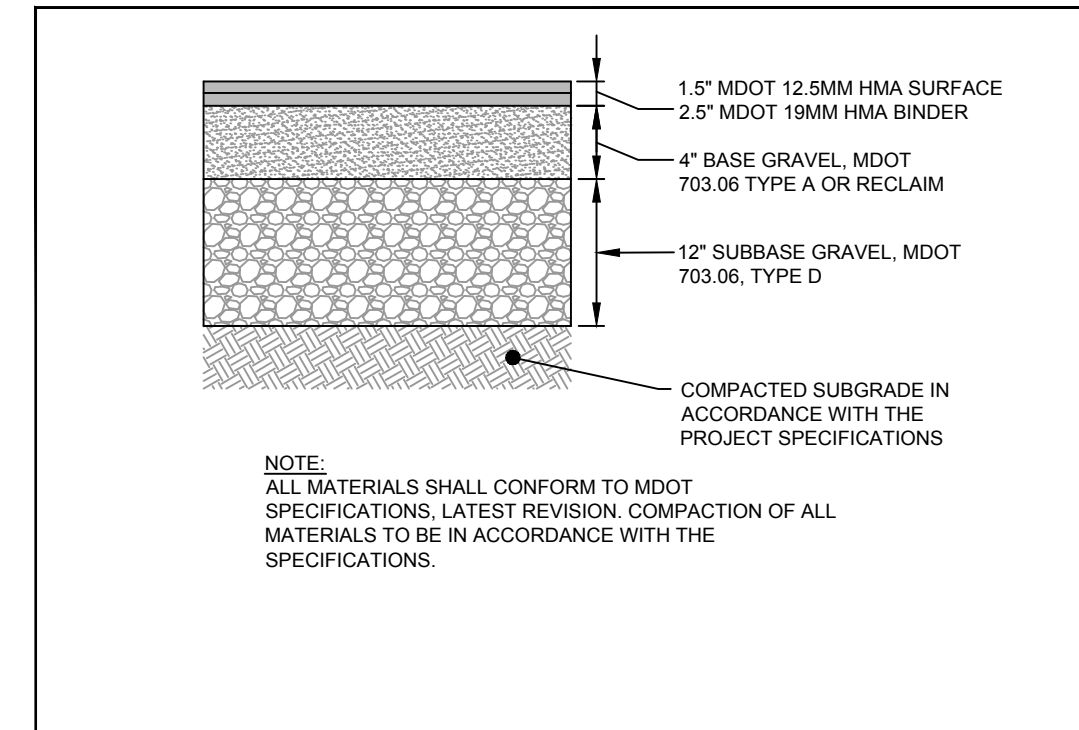
(J) SILTATION FENCE DETAIL
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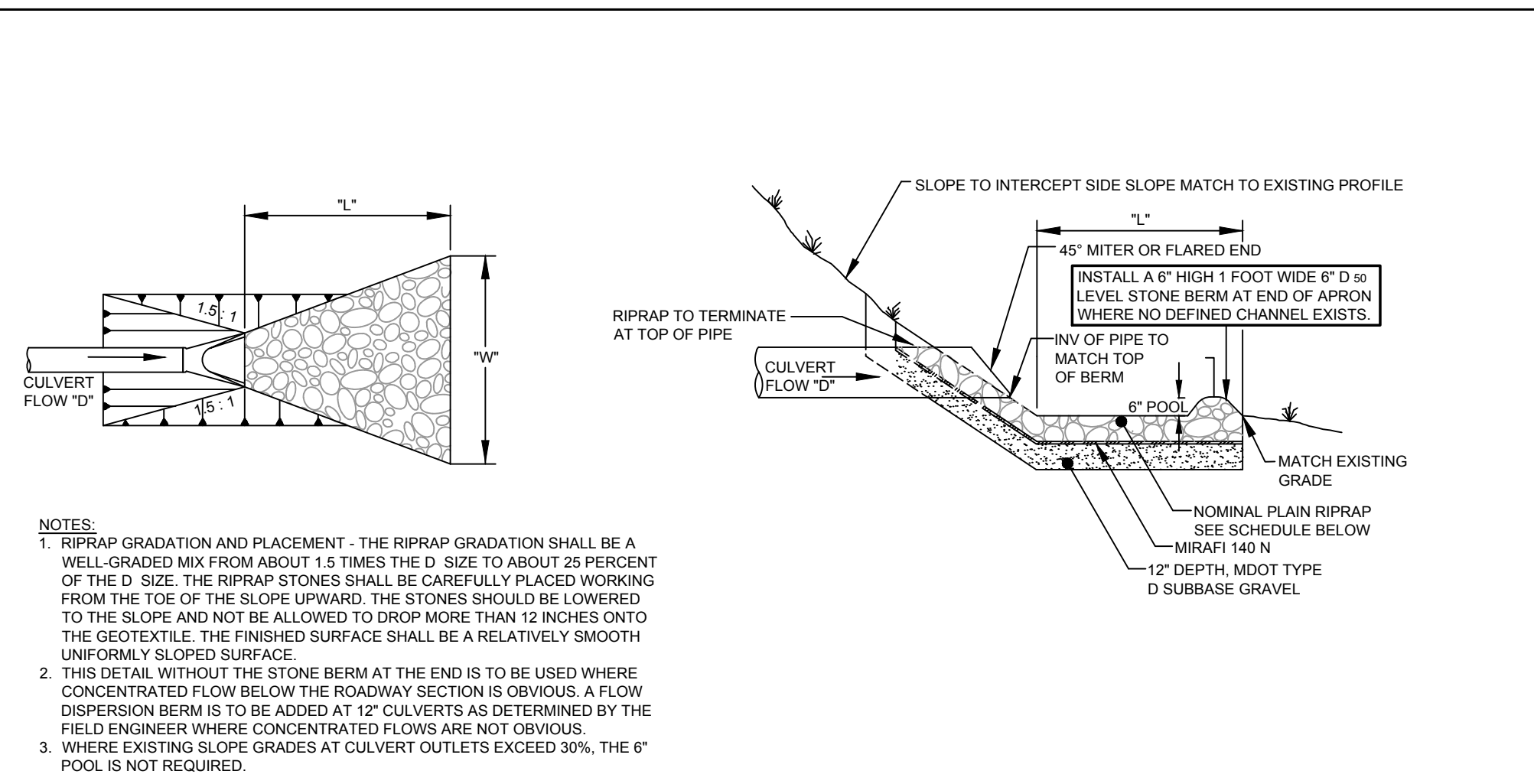
(D) GRAVEL PARKING LOT
N.T.S.



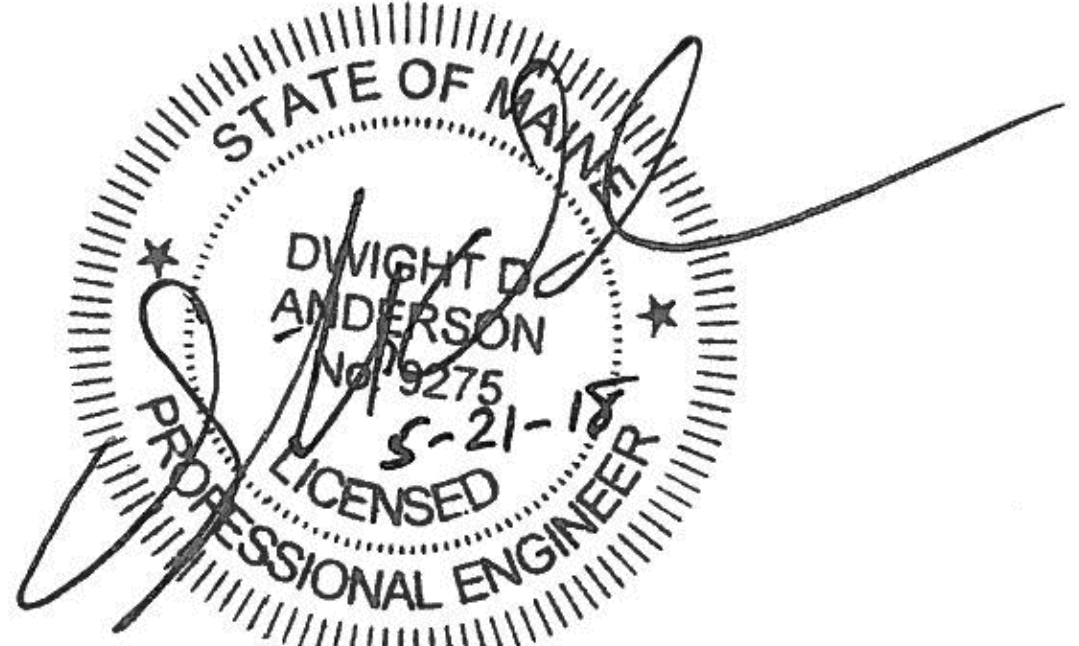
(H) STONE CHECK DAMS
N.T.S.



(K) PAVED ACCESS DRIVE SECTION
N.T.S.



(E) CULVERT OUTLET APRON
N.T.S.



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RSU #14
WINDHAM SCHOOL CAMPUS

GRAVEL PARKING AREA
DETAILS

FIGURE
1.4

OVERVIEW OF SOIL EROSION AND SEDIMENTATION CONCERNS

THE PRIMARY EMPHASIS OF THE EROSION AND SEDIMENTATION CONTROL PLAN TO BE IMPLEMENTED FOR THIS PROJECT IS AS FOLLOWS:

1. DEVELOPMENT OF A CAREFUL CONSTRUCTION SEQUENCE THAT INCLUDES THE INITIAL INSTALLATION OF TEMPORARY EROSION AND SEDIMENT CAPTURE MEASURES. THE USE OF SEDIMENT BARRIERS AND SUMPS WILL BE PRIORITIZED.
2. RAPID STABILIZATION OF DENUDDED AREAS TO MINIMIZE THE PERIOD OF SOIL EXPOSURE. THE PLAN INCLUDES MEASURES TO INTERCEPT AND CONVEY RUNOFF TO TEMPORARY SEDIMENT CONTROL DEVICES AS THE CONSTRUCTION OF THE PROJECT OCCURS. WHERE POSSIBLE, RUNOFF SHOULD BE DIVERTED TO TEMPORARY AND/OR STABILIZED MEASURES THAT ARE INTENDED TO CAPTURE SEDIMENT AND/OR RUNOFF.
3. INSTALLING SEDIMENT SUMPS AND SWALES EARLY IN THE CONSTRUCTION SEQUENCE TO PROVIDE SECONDARY RELIEF FOR EROSION CONTROL MEASURES WITHIN THE SITE UNTIL LATE IN THE PROJECT WHEN THE SEDIMENTATION AREAS NEED TO BE REMOVED FOR FINAL RESTORATION
4. STABILIZATION OF AREAS DENUDDED TO UNDERLYING PARENT MATERIAL TO MINIMIZE THE PERIOD OF SOIL EXPOSURE.
5. RAPID STABILIZATION OF DRAINAGE PATHS TO AVOID RILL AND GULLY EROSION MAY NEED TO BE INSTALLED MULTIPLE TIMES AS WORK ZONES SHIFT AND WORK IS COMPLETED.
6. THE USE OF ON-SITE MEASURES TO CAPTURE SEDIMENT (HAY BALES/SILT FENCE, ETC.) BEFORE RUNOFF IS CONVEYED TO SEDIMENT SUMPS OR OTHER STORMWATER MEASURES.
7. PROTECTION OF NATURAL RESOURCE AREAS INCLUDING WETLANDS THROUGH BUFFERING AND BMPs.
8. THE IMPLEMENTATION OF LONG-TERM MEASURES FOR EROSION/SEDIMENT CONTROL AND POLLUTANT TREATMENT THROUGH THE CONSTRUCTION OF PERMANENT SURFACE STABILIZATION AND LONG-TERM SITE MAINTENANCE BY THE OWNER.
9. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL.
10. TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDING AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM DIRT BAG &. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE.

EROSION/SEDIMENTATION CONTROL DEVICES

THE FOLLOWING EROSION AND SEDIMENT CONTROL DEVICES WILL BE IMPLEMENTED BY THE CONTRACTOR AS PART OF THE SITE DEVELOPMENT. THESE DEVICES SHALL BE INSTALLED AS INDICATED ON THE PLANS OR AS DESCRIBED WITHIN THIS REPORT. FOR FURTHER REFERENCE, SEE THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES DATED MARCH 2003.

1. SILTATION FENCE OR EQUIVALENT SEDIMENT BARRIER SHALL BE INSTALLED DOWNSLOPE OF ANY DISTURBED AREAS TO TRAP RUNOFF-BORNE SEDIMENTS UNTIL THE SITE IS REVEGETATED. THE SILT FENCE SHALL BE INSTALLED PER THE DETAIL PROVIDED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL, AND IN ACCORDANCE WITH THE MAINE CONSTRUCTION GENERAL PERMIT REQUIREMENTS. REPAIRS SHALL BE MADE IMMEDIATELY BY THE CONTRACTOR IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THE FENCE LINE. PROPER PLACEMENT OF STAKES AND KEYING THE BOTTOM OF THE FABRIC INTO THE GROUND ARE CRITICAL TO THE EFFECTIVENESS OF THE FENCE. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDINGS OF LARGE VOLUMES OF WATER BEHIND THE FENCE, THE BARRIER SHALL BE REPLACED WITH A STONE CHECK DAM AND MEASURES SHALL BE TAKEN TO AVOID THE CONCENTRATION OF FLOWS NOT INTENDED TO BE DIRECTED TO SILT FENCE OR OTHER SEDIMENTATION BARRIER.
2. STRAW OR HAY MULCH INCLUDING HYDROSEEDING IS INTENDED TO PROVIDE COVER FOR DENUDDED OR SEEDED AREAS UNTIL REVEGETATION IS ESTABLISHED. MULCH PLACED ON SLOPES OF LESS THAN 10 PERCENT SHALL BE ANCHORED BY APPLYING WATER; MULCH PLACED ON SLOPES STEEPER THAN 10 PERCENT SHALL BE COVERED WITH A FABRIC NETTING AND ANCHORED WITH STAPLES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. PROPOSED DRAINAGE CHANNELS THAT ARE TO BE REVEGETATED SHALL RECEIVE CURVEWAY BLANKETS BY AMERICAN EXCELSIOR OR EQUIVALENT. ALL BLANKETS SHALL BE SELECTED BASED ON THE CHANNEL SLOPE, FLOW VELOCITY, AND WHETHER THE MEASURES ARE TEMPORARY OR LONG-TERM IN NATURE. ALL FABRIC NETTING SHALL BE BIODEGRADABLE UNLESS OTHERWISE SPECIFIED. MULCH APPLICATION RATES ARE PROVIDED TO THE RIGHT ON THIS PLAN. HAY MULCH SHALL BE AVAILABLE ON SITE AT ALL TIMES IN ORDER TO PROVIDE IMMEDIATE TEMPORARY STABILIZATION WHEN NECESSARY. WHERE NECESSARY, A WINDROW OF CRUSHED STONE AND/OR GRAVEL SHALL BE PLACED AT THE TOP OF A SLOPE AND FLOWS MAY BE DIRECTED TO A TEMPORARY STONE CHANNEL PIPE SLUICE THAT SHALL BE USED TO CONVEY RUNOFF DOWN STEEPER SLOPES. A DISSIPATION DEVICE SUCH AS STONE OR A PLUNGE POOL SHOULD BE INSTALLED AT THE BASE OF THE SLOPE AND SLUICE OUTLET TO DISSIPATE THE ENERGY OF THE RUNOFF.
3. RIPRAP SLOPES, DITCH LININGS, STONE CHECK DAMS, HAY BALE BARRIERS, AND CULVERT OUTLET APRONS ARE INTENDED TO REDUCE RUNOFF VELOCITIES AND PROTECT DENUDDED SOIL SURFACES FROM CONCENTRATED FLOWS. INSTALLATION DETAILS AND STONE SIZES ARE PROVIDED IN THE CONSTRUCTION PLAN SET ON THE EROSION CONTROL DETAIL SHEETS.
4. ONE OR MORE CONSTRUCTION ENTRANCES WILL BE PREPARED AND MAINTAINED AT ACCESS POINTS ONTO THE SITE TO PREVENT TRACKING OF SOIL ONTO ADJACENT LOCAL ROADS AND PARKING LOTS.
5. LOAM AND SEED IS INTENDED TO SERVE AS THE PRIMARY PERMANENT REVEGETATIVE MEASURE FOR ALL DENUDDED AREAS NOT PROVIDED WITH OTHER EROSION CONTROL MEASURES, SUCH AS PAVING OR GRAVEL. APPLICATION RATES ARE PROVIDED IN THIS SECTION FOR PERMANENT SEEDING IN NON-WETLAND AREAS.

TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES

THE FOLLOWING ARE PLANNED AS TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION:

1. ONE OR MORE CRUSHED STONE-STABILIZED CONSTRUCTION ENTRANCES SHALL BE PLACED AND MAINTAINED AT ANY ACCESS POINTS. STONE-STABILIZED CONSTRUCTION ENTRANCES REQUIRE THE STONE BE REMOVED AND REPLACED AS IT BECOMES COVERED OR FILLED WITH MUD AND MATERIAL. ENTRANCES MAY REQUIRE RELOCATION AS THE COURSE OF SITE ACTIVITY OCCURS.
2. SILTATION FENCE OR OTHER ACCEPTABLE SILTATION BARRIER SHALL BE INSTALLED ALONG THE DOWNGRADIENT SIDE OF THE PROPOSED IMPROVEMENT AREAS. THE SILTATION BARRIER WILL REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE SITE IS REVEGETATED TO AT LEAST A 90% COVERAGE LEVEL.
3. TEMPORARY STOCKPILES OF STUMPS, GRUBBINGS OR COMMON EXCAVATION WILL BE PROTECTED AS FOLLOWS:
 - A) TEMPORARY STOCKPILES SHALL NOT BE LOCATED WITHIN 25 FEET OF ANY DRAINAGE DITCHES AND AT LEAST 10 FEET UPGRADEMENT OF A DOUBLE ROW OF PERIMETER SILT BARRIER.
 - B) INACTIVE STOCKPILES SHALL BE STABILIZED WITHIN 5 DAYS BY EITHER TEMPORARILY SEEDING THE STOCKPILE WITH A HYDROSEED METHOD CONTAINING AN EMULSIFIED MULCH TACKIFIER OR BY COVERING THE STOCKPILE WITH MULCH. IF NECESSARY, MESH SHALL BE INSTALLED TO PREVENT WIND FROM REMOVING THE MULCH.
4. SLOPES STEEPER THAN 3:1 SHALL RECEIVE REINFORCED TURF SUCH AS MANUFACTURED BY NORTH AMERICAN GREEN OR EQUIVALENT. IN AREAS TO BE ROUTINELY MOWED OR MAINTAINED, THE FABRIC NETTING SHALL BE BIODEGRADABLE.
5. TEMPORARY DIVERSION BERMS SHALL BE USED TO DIVERT RUNOFF AROUND WORK AREAS OR TO STABILIZED CONVEYANCE MEASURES.

STANDARDS FOR STABILIZING SITES FOR THE WINTER

1. THE CONSTRUCTION OF THE PROJECTS WILL OCCUR PRIOR TO THE WINTER SEASON. IN THE CASE THAT CONSTRUCTION CONTINUES INTO WINTER THE FOLLOWING STANDARDS SHALL APPLY:
 - I. STANDARD FOR THE TIMELY STABILIZATION OF DITCHES AND CHANNELS: THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE ALL STONE-LINED DITCHES AND CHANNELS ON THE SITE BY NOVEMBER 15. THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE ALL GRASS-LINED DITCHES AND CHANNELS ON THE SITE BY SEPTEMBER 15. IF THE CONTRACTOR FAILS TO STABILIZE A DITCH OR CHANNEL TO BE GRASS-LINED BY SEPTEMBER 15, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.
 - I. INSTALL A SOD LINING IN THE DITCH. THE CONTRACTOR SHALL LINE THE DITCH WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING THE SOD WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD STRIPS FROM SLOUGHING DURING FLOW CONDITIONS.
 - II. INSTALL A STONE LINING IN THE DITCH. THE CONTRACTOR SHALL LINE THE DITCH WITH STONE RIPRAP BY NOVEMBER 15. THE CONTRACTOR SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR SHALL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO AS TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
 3. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES: THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE CONTRACTOR SHALL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% (10H:1V) TO BE A SLOPE. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
 - I. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MESH. BY OCTOBER 1 THE CONTRACTOR SHALL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE CONTRACTOR SHALL MONITOR GROWTH OF THE RYE OVER THE NEXT 45 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 15, THEN THE CONTRACTOR SHALL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM III OF THIS STANDARD OR WITH STONE RIP RAP AS DESCRIBED IN ITEM IV OF THIS STANDARD.
 - II. STABILIZE THE SLOPE WITH SOD. THE CONTRACTOR SHALL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR SHALL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - III. STABILIZE THE SLOPE WITH WOOD WASTE COMPOST. THE CONTRACTOR SHALL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE CONTRACTOR SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE CONTRACTOR SHALL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - IV. STABILIZE THE SLOPE WITH STONE RIP RAP. THE CONTRACTOR SHALL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE CONTRACTOR SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
 4. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOIL: BY SEPTEMBER 15, THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
 - I. STABILIZE THE SOIL WITH TEMPORARY VEGETATION. BY OCTOBER 1, THE CONTRACTOR SHALL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET. LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR SHALL MONITOR THE GROWTH OF THE RYE OVER THE NEXT 45 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE CONTRACTOR SHALL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
 - II. STABILIZE THE SOIL WITH SOD. THE CONTRACTOR SHALL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
 - III. STABILIZE THE SOIL WITH MULCH. BY NOVEMBER 15, THE CONTRACTOR SHALL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE CONTRACTOR SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE CONTRACTOR SHALL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

SPECIAL MEASURES FOR SUMMER CONSTRUCTION

THE SUMMER PERIOD IS GENERALLY OPTIMUM FOR CONSTRUCTION IN MAINE, BUT IT IS ALSO THE PERIOD WHEN INTENSE, SHORT-DURATION STORMS ARE MOST COMMON, MAKING DENUDDED AREAS VERY SUSCEPTIBLE TO EROSION, WHEN DUST CONTROL NEEDS TO BE THE MOST STRINGENT, AND WHEN THE POTENTIAL TO ESTABLISH VEGETATION IS OFTEN RESTRICTED BY MOISTURE DEFICIT. DURING THESE PERIODS THE CONTRACTOR MUST:

IMPLEMENT A PROGRAM TO APPLY DUST CONTROL MEASURES ON A DAILY BASIS EXCEPT THOSE DAYS WHERE THE PRECIPITATION EXCEEDS 0.25 INCH. THIS PROGRAM SHALL EXTEND TO AND INCLUDE ADJACENT STREETS.

1. SPRAY ANY MULCHES WITH WATER AFTER ANCHORING TO DAMPEN THE SOIL AND ENCOURAGE EARLY GROWTH. SPRAYING MAY BE REQUIRED SEVERAL TIMES. TEMPORARY SEED MAY BE REQUIRED UNTIL THE LATER SUMMER SEEDING SEASON.
2. MULCH, COVER, AND MOISTEN STOCKPILES OF FINE-GRAINED MATERIALS WHICH ARE SUSCEPTIBLE TO EROSION. IN THE SUMMER MONTHS THE POTENTIAL FOR WIND EROSION IS OF CONCERN, AS WELL AS EROSION FROM THE INTENSE, SHORT-DURATION STORMS WHICH ARE MORE PREVALENT IN THE SUMMER MONTHS.
3. TAKE ADDITIONAL STEPS NEEDED TO CONTROL FUGITIVE DUST EMISSIONS TO MINIMIZE REDUCTIONS IN VISIBILITY AND THE AIRBORNE DISBURSEMENT OF FINE-GRAINED SOILS. THIS IS PARTICULARLY IMPORTANT ALONG THE ADJACENT STREETS.

THESE MEASURES MAY ALSO BE REQUIRED IN THE SPRING AND FALL DURING THE DRIER PERIODS OF THESE SEASONS.

PERMANENT EROSION CONTROL MEASURES

THE FOLLOWING PERMANENT EROSION CONTROL MEASURES HAVE BEEN DESIGNED AS PART OF THE EROSION/SEDIMENTATION CONTROL PLAN:

1. ALL STORM DRAIN PIPES SHALL HAVE RIPRAP APRONS AT THEIR OUTLET TO PROTECT THE OUTLET AND RECEIVING CHANNEL OF THE CULVERTS FROM SCOUR AND DETERIORATION. INSTALLATION DETAILS ARE PROVIDED IN THE PLAN SET. THE APRONS SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUNOFF TO THE TRIBUTARY PIPE OR CULVERT.
2. ALL AREAS DISTURBED DURING CONSTRUCTION, BUT NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC.) WILL BE LOAMED, LIMED, FERTILIZED, MULCHED, AND SEEDED, FABRIC NETTING, ANCHORED WITH STAPLES, SHALL BE PLACED OVER THE MULCH IN AREAS WHERE THE FINISH GRADE SLOPE IS GREATER THAN 10 PERCENT. NATIVE TOPSOIL SHALL BE STOCKPILED AND TEMPORARILY STABILIZED WITH SEED AND MULCH AND REUSED FOR FINAL RESTORATION WHEN IT IS OF SUFFICIENT QUALITY.

TIMING AND SEQUENCE OF EROSION/SEDIMENTATION CONTROL MEASURES

THE FOLLOWING GENERAL CONSTRUCTION SEQUENCE SHALL BE REQUIRED TO ENSURE THE EFFECTIVENESS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES ARE OPTIMIZED. THE CONTRACTOR SHALL USE THIS SEQUENCE TO FORM THE BASIS OF THEIR CONSTRUCTION SCHEDULE, WHICH SHALL BE PROVIDED FOR THE OWNER'S REVIEW.

NOTE: FOR ALL GRADING-RELATED ACTIVITIES, THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO OVEREXPOSE THE SITE BY LIMITING THE DISTURBED AREA. THE CONTRACTOR SHALL STABILIZE ANY STEEP SLOPES (>3:1) WITHIN 24 HOURS IF FINAL STABILIZATION AND STABILIZATION PLAN WILL NOT BE COMPLETED WITHIN 7 DAYS. ALL SLOPES THAT HAVE REACHED FINAL GRADE SHALL HAVE PERMANENT STABILIZATION MEASURES INSTALLED WITHIN 7 DAYS OF COMPLETION.

1. INSTALL AND MAINTAIN CRUSHED STONE STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON THE GRADING & DRAINAGE PLAN AT ALL DESIGNATED ACCESS POINTS.
2. INSTALL ALL SAFETY AND CONSTRUCTION FENCING TO SECURE ACTIVE CONSTRUCTION AREAS.
3. INSTALL SILTATION FENCE OR OTHER SILTATION BARRIER.
4. CONDUCT DEMOLITION ACTIVITIES AND EARTHWORK TO BRING SITE AREAS TO SUBGRADE.
5. INSTALL STONE CHECK DAMS OR EQUIVALENT VELOCITY-REDUCING MEASURE AT ANY CONCENTRATED FLOW DISCHARGE POINTS.
6. INSTALL STORM DRAIN AND APPURTENANCE STRUCTURES, UNDERGROUND ELECTRIC, FOUNDATIONS, IRRIGATION AND OTHER UTILITY WORK. INSTALL INLET AND OUTLET PROTECTION IMMEDIATELY AFTER THE INSTALLATION OF ANY CULVERTS.
7. REMOVE, REPAIR OR RELOCATE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE COURSE OF EARTHWORK ACTIVITY AS NECESSARY TO MINIMIZE EROSION AND SEDIMENT TRANSPORT ACROSS THE SITE.
8. THE TEMPORARY PLACEMENT OF EROSION CONTROL MEASURES SUCH AS, BUT NOT LIMITED TO, MULCH, EROSION CONTROL BLANKET, CRUSHED STONE, SOD OR OTHER MEASURE SHALL BE INSTALLED WITHIN 7 DAYS OF REACHING FINAL GRADE OR IN ADVANCE OF PREDICTED RAINFALL EVENT OF 0.5" OR GREATER.
9. BRING SITE TO SUBGRADE AND COMPLETE TEMPORARY SLOPE STABILIZATION AS NECESSARY IF SLOPES WILL NOT BE ACTIVELY WORKED WITHIN 7 DAYS.
10. COMPLETE DRIVEWAY CONSTRUCTION GRAVELS.
11. CONSTRUCT OTHER SITE IMPROVEMENTS AND UTILITIES.
12. INSTALL PAVEMENT AS DETAILED ON THE SITE PLANS.
13. COMPLETE LANDSCAPE PLANTING.
14. LOAM, LIME, FERTILIZE, SEED, AND MULCH ALL REMAINING DISTURBED AND DENUDDED AREAS.
15. REMOVE ACCUMULATED SEDIMENT FROM SILT BARRIERS.
16. REVIEW STABILITY OF THE SITE. IF A 90% CATCH OF GRASS IS ACHIEVED, REMOVE TEMPORARY EROSION CONTROL DEVICES INCLUDING ALL SILT BARRIERS, CONSTRUCTION ENTRANCES, ETC.

SOIL WILL BE CONSIDERED DISTURBED IF IT DOES NOT HAVE AN ESTABLISHED STAND OF VEGETATION COVERING AT LEAST 90% OF THE SOIL SURFACE OR HAS NOT BEEN MULCHED WITH HAY APPLIED AT A RATE OF 230 LB./1,000 SQ. FT.

CONSTRUCTION PROCEDURE

THE PROJECT WILL BE CONSTRUCTED BY A GENERAL CONTRACTOR UNDER CONTRACT TO RSU 14. THE CONTRACTOR SHALL SUBMIT A SCHEDULE FOR THE COMPLETION OF THE WORK THAT WILL SATISFY THE FOLLOWING CRITERIA:

1. THE ABOVE CONSTRUCTION SEQUENCE SHOULD GENERALLY BE COMPLETED IN THE SPECIFIED ORDER; HOWEVER, SEVERAL SEPARATE ITEMS MAY BE CONSTRUCTED SIMULTANEOUSLY. WORK MUST ALSO BE SCHEDULED OR PHASED TO LIMIT THE EXTENT OF THE EXPOSED AREAS AS SPECIFIED BELOW. THE INTENT OF THIS SEQUENCE IS TO PROVIDE FOR EROSION CONTROL AND TO HAVE STRUCTURAL MEASURES SUCH AS SILT FENCE AND CONSTRUCTION ENTRANCES IN PLACE BEFORE LARGE AREAS OF LAND ARE DENUDDED.
2. THE WORK SHALL BE CONDUCTED IN SECTIONS WHICH WILL:
 - a) LIMIT THE AMOUNT OF EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDERTAKEN DURING THE PRECEDING 30 DAYS.
 - b) REVEGETATE DISTURBED AREAS AS RAPIDLY AS POSSIBLE. ALL AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING OR BEFORE A PREDICTED STORM EVENT, OR TEMPORARILY STABILIZED WITHIN 14 DAYS FOR ALL OTHER AREAS.
 - c) INCORPORATE PLANNED INLETS AND DRAINAGE SYSTEM AS EARLY AS POSSIBLE INTO THE CONSTRUCTION PHASE. THE DITCHES SHALL BE IMMEDIATELY LINED OR REVEGETATED AS SOON AS THEIR INSTALLATION IS COMPLETE.
3. THE AREA OF DENUDDED NON-STABILIZED CONSTRUCTION SHALL BE LIMITED TO THE MINIMUM AREA PRACTICABLE. AN AREA SHALL BE CONSIDERED TO BE DENUDDED UNTIL THE SUBGRADE GRAVEL IS INSTALLED, OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED, AND MULCHED. THE MULCH RATE SHALL BE TWICE THE RATE SPECIFIED IN THE SEEDING PLAN. [FOR EXAMPLE: 115#/1,000 S.F. X 2 = 230#/1,000 S.F.]
4. THE CONTRACTOR MUST MAINTAIN AN ACCURATE SET OF RECORD DRAWINGS INDICATING THE DATE WHEN AN AREA IS FIRST DENUDDED, THE DATE OF TEMPORARY STABILIZATION, AND THE DATE OF FINAL STABILIZATION. ON OCTOBER 1 OF ANY CALENDAR YEAR, THE CONTRACTOR SHALL SUBMIT A DETAILED PLAN FOR STABILIZING THE SITE FOR THE WINTER AND A DESCRIPTION OF WHAT ACTIVITIES ARE PLANNED DURING THE WINTER.
5. THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS.

WATER QUALITY FILTER

1. SPECIFIC DESIGN CRITERIA

- A. **UNDERDRAIN PIPE:** PROPER LAYOUT OF THE PIPE UNDERDRAIN SYSTEM IS NECESSARY TO EFFECTIVELY DRAIN THE ENTIRE FILTER AREA. THERE MUST BE AT LEAST ONE LINE OF UNDERDRAIN PIPE FOR EVERY EIGHT FEET OF FILTER AREA'S WIDTH. THE SLOPE OF THE INSTALLED UNDERDRAIN PIPE MUST BE POSITIVE. THE UNDERDRAIN PIPING SHOULD BE 4" TO 6" SLOTTED, RIGID SCHEDULE 40 PVC OR SDR35. STRUCTURE JOINTS SHALL BE SEALED SO THAT THEY ARE WATERTIGHT.
- B. **PIPE BEDDING AND TRANSITION ZONE:** THE 4 TO 6 INCH DIAMETER PERFORATED UNDERDRAIN PIPE(S) MUST BE BEDDED IN 12 TO 14 INCHES OF UNDERDRAIN MATERIAL WITH AT LEAST 4 INCHES OF MATERIAL BENEATH THE PIPE AND 4 INCHES ABOVE.

THE UNDERDRAIN MATERIAL CONSISTS OF WELL GRADED, CLEAN, COARSE GRAVEL MEETING THE MEDOT SPECIFICATION 703.22 UNDERDRAIN TYPE B FOR UNDERDRAIN BACKFILL. THE MATERIAL MUST CONTAIN LESS THAN 5% FINES PASSING THE #200 SIEVE. NO TRANSITION ZONE IS NECESSARY SINCE THE DRAINAGE PIPE IS BEDDED IN LESS PERVIOUS GRAVEL AND THIS DESIGN IS ACCEPTABLE FOR AREAS WHERE THE HEAD OR DEPTH TO SEASONAL HIGH GROUNDWATER IS CLOSE TO THE BOTTOM OF THE DRAINAGE LAYER. UNDERDRAIN PIPES MUST BE PLACED NO FURTHER THAN 8 FEET APART.
- C. **CLAY CONTENT:** USE OF SOILS WITH MORE THAN 2 % CLAY CONTENT COULD CAUSE FAILURE OF THE SYSTEM AND CARE SHOULD BE TAKEN, ESPECIALLY IN AREAS WHERE THE PREDOMINANT SOIL CONTAINS MARINE CLAY, THAT THE SAND AND TOPSOIL USED IN THE MIXTURE HAVE VERY LITTLE OR NO CLAY CONTENT.
- D. **FILTER PERMEABILITY:** THE FILTER MUST BE PERMEABLE ENOUGH TO INSURE DRAINAGE WITHIN 48 HOURS MAXIMUM, YET HAVE SUFFICIENT FINES TO INSURE FILTRATION OF FINE PARTICLES AND REMOVAL OF DISSOLVED POLLUTANTS. THE DESIGN MAY EITHER RELY ON THE SOIL PERMEABILITY, IF KNOWN, TO PROVIDE THE SLOW RELEASE OF THE WATER TREATMENT VOLUME OVER A MINIMUM OF 24 HOURS, OR MAY INSURE THIS RATE BY INSTALLING A CONSTRUCTIVE ORIFICE OR VALVE ON THE UNDERDRAIN OUTLET. IN DETERMINING THE PERMEABILITY OF THE MEDIA, THE PERCENT FINES OF THE MIXTURE AND THE LEVEL OF COMPACTION SHOULD BE CONSIDERED. GENERALLY, THE SOIL MEDIA SHOULD BE ONLY LIGHTLY COMPACTED BETWEEN 90 AND 92% STANDARD PROCTOR (ASTM D698) AND SHALL HAVE A PERMEABILITY OF 2.4 INHR TO 4 INHR.
- E. **GRADATION TESTING:** GRADATION TESTS, INCLUDING HYDROMETER TESTING FOR CLAY CONTENT, AND PERMEABILITY TESTING OF THE SOIL FILTER MATERIAL SHALL BE PERFORMED BY A QUALIFIED SOIL TESTING LABORATORY AND SUBMITTED TO THE PROJECT ENGINEER FOR REVIEW BEFORE PLACEMENT AND COMPACTION.
- F. **GEOTEXTILE FABRIC:** A GEOTEXTILE FABRIC WITH SUITABLE CHARACTERISTICS MAY BE PLACED BETWEEN THE SIDES OF THE FILTER LAYER AND ADJACENT SOIL. THE FABRIC WILL PREVENT THE SURROUNDING SOIL FROM MIGRATING INTO AND CLOGGING THE FILTER AND CLOGGING THE OUTLET. OVERLAP SEAMS MUST BE A MINIMUM OF 12 INCHES. DO NOT WRAP FABRIC OVER THE TOP OF THE PIPE BEDDING AS IT WILL CAUSE CLOGGING AND WILL PREVENT FLOWS OUT OF THE FILTER. THE GEOTEXTILE FABRIC SHALL BE MIRAF 170N OR EQUIVALENT.

2. CONSTRUCTION CRITERIA

- A. **Basin Excavation:** THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND CAN BE USED AS A SEDIMENT TRAP FOR THE SITE DURING CONSTRUCTION. AFTER EXCAVATION OF THE BASIN, THE OUTLET STRUCTURE AND PIPING SYSTEM MUST BE INSTALLED AT THE APPROPRIATE ELEVATION AND PROTECTED WITH A SEDIMENT BARRIER. IF THE BASIN IS TO BE USED AS A SEDIMENT TRAP, THE SIDES OF THE EMBANKMENTS MUST BE MULCHED AND MAINTAINED TO PREVENT EROSION.
- B. **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.
- C. **Construction Sequence:** EROSION AND SEDIMENTATION FROM UNSTABLE SUBCATCHMENTS IS THE MOST COMMON REASON FOR FILTER FAILURE. NOT HEEDING THE CONSTRUCTION SEQUENCING CRITERIA IS LIKELY TO RESULT IN THE NEED TO REPLACE THE SOIL FILTER. THE SOIL FILTER MEDIA AND VEGETATION MUST NOT BE INSTALLED OR OTHER STRUCTURES STABILIZED UNTIL THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURE, 90% VEGETATION COVER, OR OTHER PERMANENT STABILIZATION. OTHERWISE, THE RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA MUST BE DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED UNLESS THE DEPARTMENT HAS DETERMINED, ON A CASE-BY-CASE BASIS, THAT SUFFICIENT MEASURES ARE BEING TAKEN TO PREVENT EROSION OF MATERIAL FROM THE UNSTABLE CATCHMENT AREA AND DEPOSITION ON THE FILTER.
- D. **Remedial Loam Cover:** TO RAPIDLY ESTABLISH VEGETATION IN THE FILTER AREA, THE CONTRACTOR WILL INSTALL A 2-3 INCH LAYER OF SANDY LOAM TOPSOIL (WITH LESS THAN 2% CLAY AS TESTED VIA HYDROMETER TEST) ABOVE THE GRASS FILTER PRIOR TO SEEDING, MULCHING AND ANCHORING EROSION CONTROL MESH.
- E. **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 ASTM C136 (SAND) AND A SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES: 199#A) 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.

3. MAINTENANCE CRITERIA

DURING THE FIRST YEAR, THE BASIN WILL BE INSPECTED SEMI-ANNUALLY AND FOLLOWING MAJOR STORM EVENTS.

DEBRIS AND SEDIMENT BUILDUP SHALL BE REMOVED FROM THE FOREBAY AND BASIN AS NEEDED.

MOVING OF A GRASSED BASIN CAN OCCUR SEMIANNUALLY TO A HEIGHT NO LESS THAN 6 INCHES.

ANY BARE AREA OR EROSION RILLS SHALL BE REPAIRED WITH NEW FILTER MEDIA OR SANDY LOAM THEN SEEDED AND MULCHED.

MAINTAINING GOOD GRASS COVER WILL MINIMIZE CLOGGING WITH FINE SEDIMENTS AND IF PONDING EXCEEDS 48 HOURS, THE TOP OF THE FILTER BED MUST BE ROTTILLED TO REESTABLISH THE SOIL'S FILTRATION CAPACITY IF EXTENDED PONDING IS OBSERVED.

A. **MAINTENANCE AGREEMENT:** THE SCHOOL DEPT IS RESPONSIBLE FOR INSPECTING AND MAINTAINING ANY UNDERDRAINED FILTER.

B. **SOIL FILTER INSPECTION:** THE SOIL FILTER SHOULD BE INSPECTED AFTER EVERY MAJOR STORM IN THE FIRST YEAR TO BE SURE IT IS FUNCTIONING PROPERLY. THEREAFTER, THE FILTER SHOULD BE INSPECTED AT LEAST ONCE EVERY SIX MONTHS TO ENSURE THAT IT IS DRAINING WITHIN 48 HOURS FOLLOWING A ONE INCH STORM OR GREATER, AND THAT FOLLOWING STORMS THAT FILL THE SYSTEM TO OVERFLOW, IT DRAINS IN NO LESS THAN 36 TO 60 HOURS. IF THE SYSTEM DRAINS TOO FAST, AN ORIFICE MAY NEED TO BE ADDED ON THE UNDERDRAIN OUTLET OR, IF ALREADY PRESENT, MAY NEED TO BE MODIFIED.

C. **SOIL FILTER REPLACEMENT:** THE TOP SEVERAL INCHES OF THE UNDERDRAIN BED SHOULD BE REPLACED WITH FRESH MATERIAL WHEN WATER PONDING ON THE SURFACE OF THE BED FOR MORE THAN 72 HOURS. THE REMOVED SEDIMENTS SHOULD BE DISPOSED OF IN AN ACCEPTABLE MANNER.

D. **MOWING:** IF MOWING IS DESIRED, ONLY HANDHELD STRING TRIMMERS OR PUSH-MOWERS ARE ALLOWED ON THE FILTER (NO TRACTOR) AND THE GRASS BED SHOULD BE MOWED NO MORE THAN 2 TIMES PER GROWING SEASON TO MAINTAIN GRASS HEIGHTS OF NO LESS THAN 6 INCHES.

E. **FERTILIZATION:** FERTILIZATION OF THE UNDERDRAINED FILTER AREA SHOULD BE AVOIDED UNLESS ABSOLUTELY NECESSARY TO ESTABLISH VEGETATION.

F. **HARVESTING AND WEEDING:** HARVESTING AND PRUNING OF EXCESSIVE GROWTH WILL NEED TO BE DONE OCCASIONALLY. WEEDING TO CONTROL UNWANTED OR INVASIVE PLANTS MAY ALSO BE NECESSARY. ADD NEW MULCH ONLY AS NECESSARY FOR BIORETENTION CELL.

THE CONTRACTOR HAS SOLE RESPONSIBILITY FOR COMPLYING WITH THE EROSION/SEDIMENT CONTROL REPORT, INCLUDING CONTROL OF FUGITIVE DUST, AND SHALL BE RESPONSIBLE FOR ANY MONETARY PENALTIES RESULTING FROM FAILURE TO COMPLY WITH THESE STANDARDS.

PERMANENT SEEDING PLAN

PROJECT: GRAVEL LOT NORTHEAST OF FIELD #10

SITE LOCATION: WINDHAM, MAINE

___ X ___ PERMANENT SEEDING ___ TEMPORARY SEEDING

1. INSTRUCTIONS ON PREPARATION OF SOIL: PREPARE A GOOD SEED BED FOR PLANTING METHOD USED.

2. APPLY LIME AS FOLLOWS: ___ #/ACRES, OR ___ 115# /M SQ. FT. OR PER SOIL TEST

3. FERTILIZE WITH: ___ 1.0 POUND OF ACTIVE N#1000 S.F. OF 10-20-20 (N-P205-K20).

4. METHOD OF APPLYING LIME AND FERTILIZER: SPREAD AND WORK INTO THE SOIL BEFORE SEEDING.

5. SEED WITH THE FOLLOWING MIXTURE:

35% TALL FESCUE
30% CREEPING RED FESCUE
20% PERENNIAL RYEGRASS
15% ANNUAL RYEGRASS

6. MULCHING INSTRUCTIONS: APPLY AT THE RATE OF ___ 115 POUNDS PER M. SQ. FT.

7. APPLICATION:

TYPE/UNT #/LBS./APPLICATION RATE
TOTAL LIME 115#/1,000 S.F.
TOTAL FERTILIZER 1.0 LBS. ACTIVE N#1,000 S.F.
TOTAL SEED 5.0#/1,000 S.F.
TOTAL MULCH 115#/1,000 S.F.

PERMANENT SEEDING PLAN (UNDERDRAINED FILTER BEDS)

PROJECT: GRAVEL LOT NORTHEAST OF FIELD #10

SITE LOCATION: WINDHAM, MAINE

___ X ___ PERMANENT SEEDING ___ TEMPORARY SEEDING

1. AREA TO BE SEEDED: UNDERDRAINED FILTERED BEDS, APPROXIMATELY ___ 0.03 ACRES(S) OR ___ /M. SQ. FT.

2. INSTRUCTIONS ON PREPARATION OF SOIL: PREPARE A GOOD SEED BED FOR PLANTING METHOD USED.

3. APPLY LIME AS FOLLOWS: ___ #/ACRES OR ___ 115# /M SQ. FT. OR PER SOIL TEST

4. FERTILIZE: ___ POUNDS OF ___ N-P-K/AC.

@ POUNDS OF 10-0-20 N-P-K/M SQ. FT. OR PER SOIL TEST

5. METHOD OF APPLYING LIME AND FERTILIZER: SPREAD AND WORK INTO THE SOIL BEFORE SEEDING.

6. SEED WITH THE FOLLOWING MIXTURE:

NEW ENGLAND EROSION CONTROL RESTORATION MIX FOR MOIST SITES AS MANUFACTURED BY "NEW ENGLAND WETLAND PLANTS, INC. - AMHERST, MA"
CONSISTING OF THE FOLLOWING SPECIES:

SWITCHGRASS	N. ENGLAND ASTER
VA. WILD RYE	GRASS-LEAVED GOLDENROD
CREEPING RED FESCUE	NODDING BUR MARIGOLD
FOX SEDGE	GREEN BULRUSH
CREEPING BENTGRASS	JOE-PYE WEED
SOFT RUSH	BONASET
BLUE VERVAIN	

WHEN USING SMALL GRASS AS NURSE CROP, SEED IT AT ONE-HALF THE NORMAL SEEDING RATE.

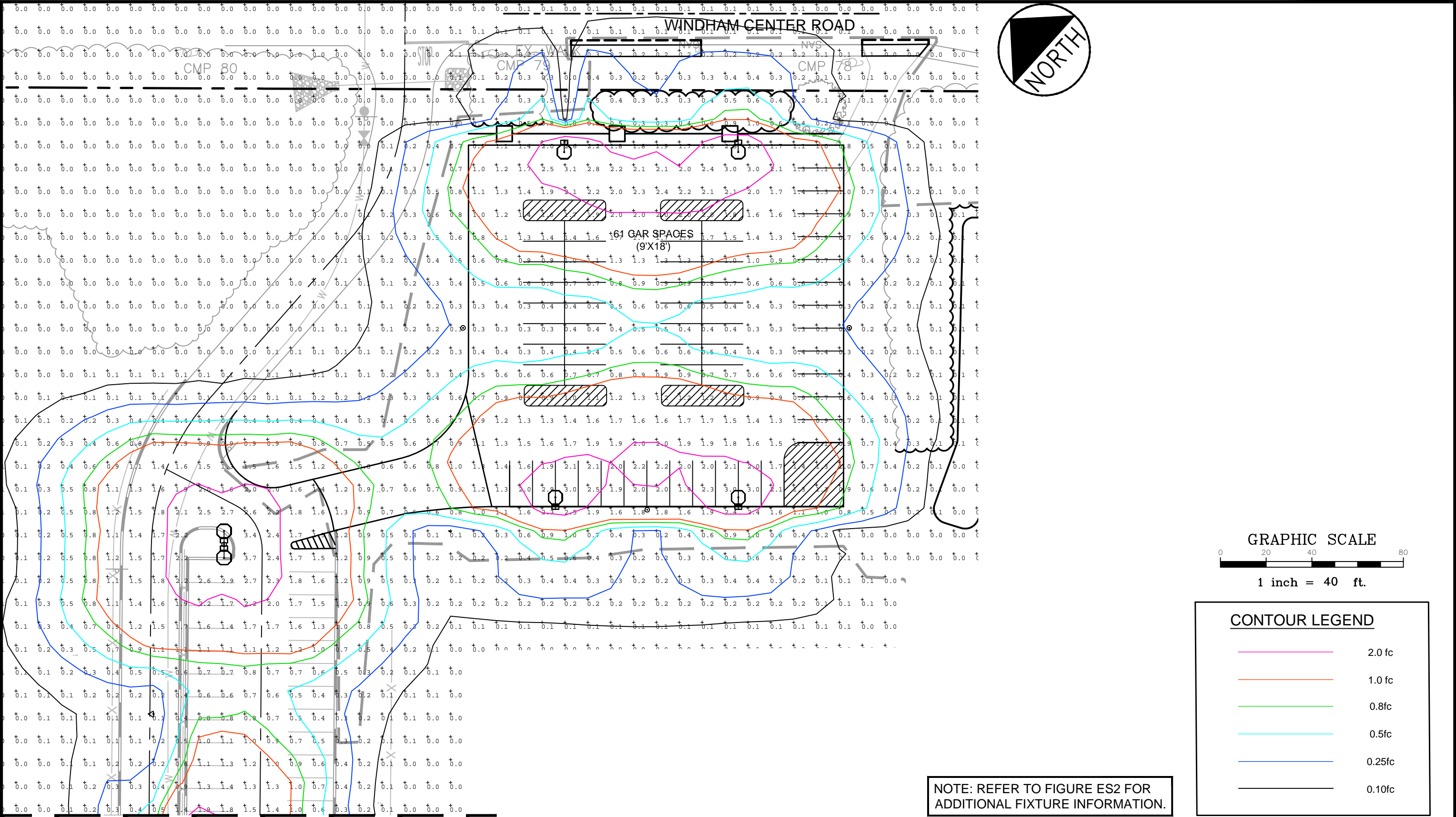
7. MULCHING INSTRUCTIONS: APPLY AT THE RATE OF ___ TONS PER ACRE OR ___ 180 POUNDS PER M. SQ. FT.

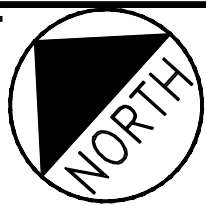
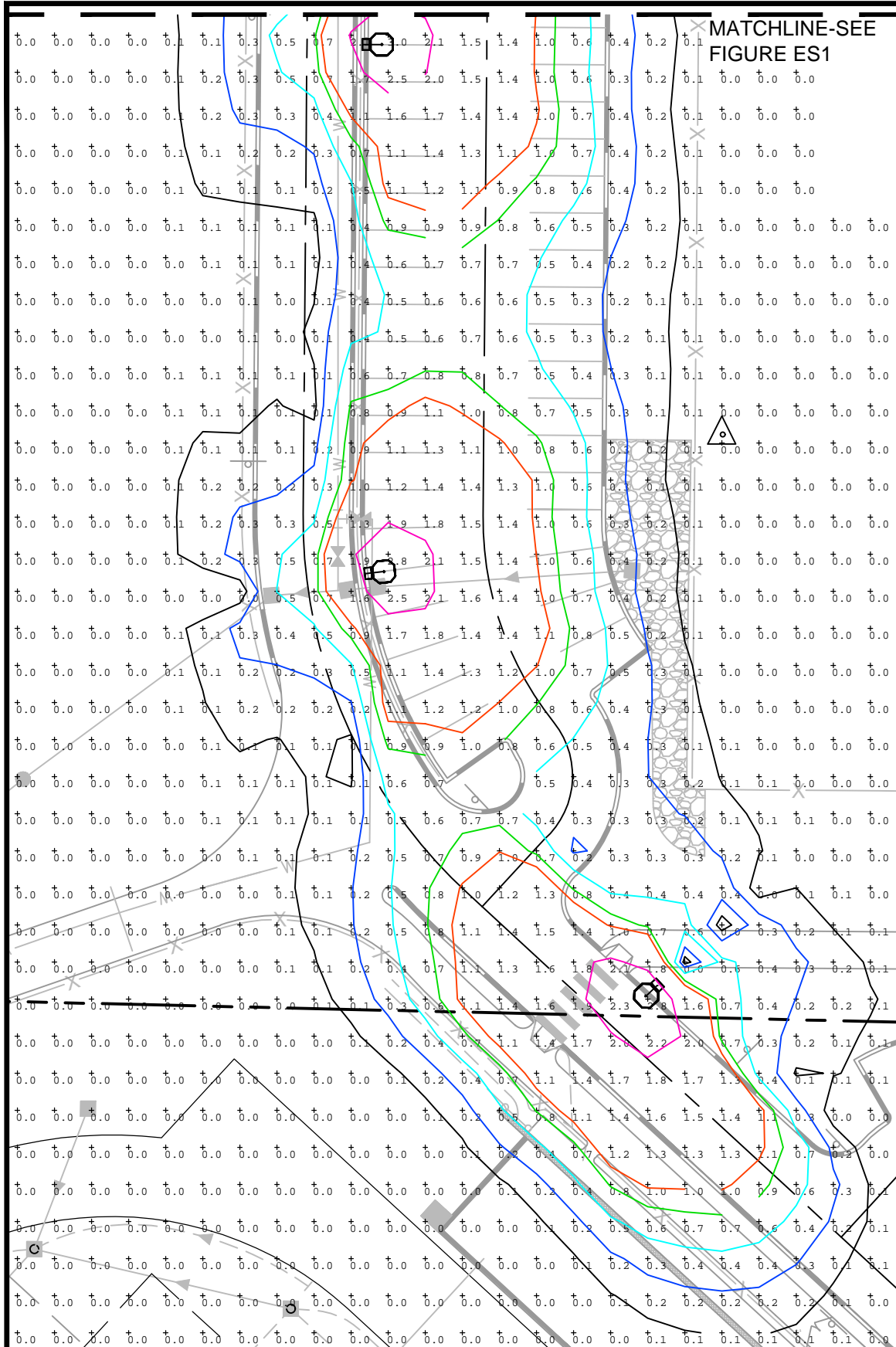
8. APPLICATION:

TYPE/UNT #/TONS, ETC.
TOTAL LIME 115 #/1,000 S.F.
TOTAL FERTILIZER NONE #/1,000 S.F.
TOTAL SEED 1.0 #/1,000 S.F.
TOTAL MULCH 180 #/1,000 S.F.
TOTAL OTHER

SEEDING REMARKS:

RECOMMENDED SEEDING

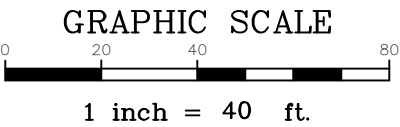




MATCHLINE-SEE
FIGURE ES1

ILLUMINANCE VALUES FOR COMPARISON	
FULL MOONLIGHT	.01 TO .1 FOOT-CANDLE
PREDAWN	.1 TO 1 FOOT-CANDLE
WINDOWED ROOM ON A CLOUDY DAY	6-8 FOOT-CANDLES
BEACH IN BRIGHT SUNLIGHT	30,000 FOOT-CANDLES

CONTOUR LEGEND	
	2.0 fc
	1.0 fc
	0.8fc
	0.5fc
	0.25fc
	0.10fc



LUMINAIRE SCHEDULE						
Scene: 25 ft_Southern Lot_1						
Symbol	Qty	Label	Arrangement	Lum. Lumens	Lum. Watts	Arr. Watts
	1	MR2_LED_60C_700_40K_T3M	SINGLE	15705	132	132
	6	MR2_LED_60C_700_40K_T4M	SINGLE	15605	132	132
	1	MR2_LED_60C_700_40K_T3M-2	BACK-BACK	15705	132	264

CALCULATION SUMMARY							
Scene: 25 ft_Southern Lot_1							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Parking Lot Entrance Access Road	Illuminance	Fc	1.43	3.6	0.5	2.86	7.20
Parking Lot Entrance Off Street	Illuminance	Fc	0.59	2.3	0.2	2.95	11.50
Parking Lot Gravel	Illuminance	Fc	1.25	3.3	0.3	4.17	11.00
ROW	Illuminance	Fc	0.00	0.0	0.0	N.A.	N.A.
South Parking Lot	Illuminance	Fc	1.10	3.7	0.3	3.67	12.33