



BIOFILTER SPECIFICATIONS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. TOPSOIL

B. BIOFILTER SOIL MIX

C. SAND FILTER LAYER

D. DRAINAGE AGGREGATE LAYER

E. UNDERDRAIN

1.02 QUALITY ASSURANCE

THESE TESTS SHALL BE PERFORMED ON MATERIAL PRIOR TO SHIPMENT TO THE SITE WITH A MINIMUM OF ONE TEST PER MATERIAL TYPE AND FOR EVERY GARDEN.

A. ASTM C 117 AND C 136 TESTS ON SAND USED FOR PLANTING SOIL MIX AND FOR SAND USED AS A FILTER BENEATH THE BIOFILTER SOIL MIX.

B. SOLUBLE NUTRIENT ANALYSIS ON BIOFILTER SOIL MIX.

C. SOLUBLE NUTRIENT ANALYSIS ON SAND USED FOR PLANTING SOIL MIX.

D. ASTM D2454 OR FALLING HEAD ASTM D5954 FOR HYDRAULIC CONDUCTIVITY OF THE BIOFILTER SOIL MIX.

E. LOSS ON IGNITION TEST FOR THE BIOFILTER SOIL MIX.

F. LOSS ON IGNITION TEST FOR THE SAND.

RESULTS OF LABORATORY TESTS PERFORMED ON REPRESENTATIVE MATERIALS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO DELIVERY TO THE SITE.

PART 2 - PRODUCTS

A. THE BIOFILTER SOIL MIX SHALL BE A MIXTURE OF SAND, TOPSOIL, AND MATRIE COMPOST THAT IS SUITABLE FOR INITIAL, AND LONG-TERM SUPPORT OF PLANT GROWTH, WHILE MAINTAINING MODERATE HYDRAULIC CONDUCTIVITY. IT SHALL BE IN ACCORDANCE WITH THE PROPORTIONS SUMMARIZED IN TABLE 1. IT SHALL HAVE A PH IN THE RANGE OF 6.0 TO 8.0, AND SHALL HAVE ADEQUATE NUTRIENT CONTENT TO MEET PLANT GROWTH REQUIREMENTS. IT SHALL NOT CONTAIN VISIBLE WEED OR NOXIOUS PLANT SEED OR MATERIALS. THE MIX SHALL HAVE A HYDRAULIC CONDUCTIVITY OF AT LEAST 0.01 CM/S AFTER BEING BRUSH, OR OTHER MATERIAL, OVER 1" DIAMETER.

TABLE 1 - BIOFILTER SOIL MIX

COMPONENT	PERCENT BY VOLUME	PERCENT PASSING (BY WT.)
SAND	APPROX. 40%	ADJUST AS NEEDED FOR PERFORMANCE
TOPSOIL	10 TO 15% IF LOAM TEXTURE	15 TO 20% IF SANDY LOAM TEXTURE
COMPOST	20 TO 25% IF LOAMY SAND TEXTURE	30 TO 45%

ADJUSTMENTS TO PROPORTIONS SHALL BE MADE TO MEET HYDRAULIC CONDUCTIVITY REQUIREMENTS. FIBRIC PEAT OPSILUM UNDRINENT FOR CONDITIONING AGENTS MAY BE ADDED AS NEEDED TO SUPPORT PLANT GROWTH AND/OR MAINTAIN HYDRAULIC CONDUCTIVITY. MAGNESIUM SHALL BE PRESENT AT 35 LB/ACRE, PHOSPHORUS (AS P2O5) AT 75 LB/ACRE, AND POTASSIUM (AS K2O) AT 85 LB/ACRE. SOLUBLE SALTS SHALL NOT EXCEED 500 PPM.

C. UNDERDRAIN PIPES SHALL BE 4" DIA. PERFORATED UNDERDRAIN PIPES LOCATED ADJACENT TO PARKING LOT.

D. TOPSOIL MAY BE A USDA CLASSIFICATION LOAM, SANDY LOAM, AND LOAMY SAND, AS VERIFIED BY LABORATORY ANALYSIS OR VISUAL/MANUAL CLASSIFICATION BY QUALIFIED PERSONNEL. TOPSOIL COMPONENT MAY ALSO CONSIST OF "PLANT STARTER MIX" OF PEAT AND MATRIE MANURE COMPOST. COMPOST SHALL MEET MORE SPECIFICATION 5100 - COMPOST. MATRIE BY DEKAR SELF-HEATING FLASK (3 TO 7 DAY) OR SOLVIA CARBON-DIOXIDE AND AMMONIA EVOLUTION TEST (PH, WATER HOLDING CAPACITY, ORGANIC MATTER, CARBON CONTENT, CATIONIC NITROGEN RATIO, SOLUBLE SALTS, AND SAMPLE OF BATCH) THAT WILL BE DELIVERED TO THE SITE. IF COMPOST INCLUDES INDUSTRIAL OR MUNICIPAL WASTEWATER SLUDGE, TESTING SHALL INCLUDE EPA 503 METALS ANALYSIS AND SCREENING FOR PATHOGENS (WQNR NR 204-07(9)(A)) ON SAME SOURCE AND PRODUCTION PROCESS WITHIN LAST 12 MONTHS.

TABLE 2 - BIOFILTER AND RAIN GARDEN SAND PARTICLE SIZE DISTRIBUTION

SEIVE SIZE	PERCENT PASSING (BY WT.)
#10	100
#20	100
#40	100
#60	100
#80	100
#100	100
#120	100
#140	100
#160	100
#180	100
#200	100
#250	100
#300	100
#350	100
#400	100
#450	100
#500	100
#562.5	100
#630	100
#700	100
#750	100
#800	100
#900	100
#1000	100

TABLE 3 - BEACH SAND PARTICLE SIZE DISTRIBUTION

SEIVE SIZE	PERCENT PASSING (BY WT.)	GRAIN SIZE DIAMETER (MILLIMETERS)
#10	100	2.00-2.50
#20	100	0.85-1.05
#40	100	0.425-0.60
#60	100	0.25-0.425
#80	100	0.175-0.25
#100	100	0.15-0.175
#120	100	0.125-0.15
#140	100	0.106-0.125
#160	100	0.09-0.106
#180	100	0.075-0.09
#200	100	0.075

BEACH NOURISHMENT SAND SPECIFICATIONS

1. ALL VEGETATION, TOPSOIL, AND EXISTING BEACH SAND ABOVE ELEVATION 581 SHOULD BE REMOVED FROM THE AREA OF THE PROPOSED BEACH NOURISHMENT PRIOR TO PLACING THE SAND.

2. BEACH NOURISHMENT SAND SHALL BE NATURAL WIND-DRIED, UNADDED, OR WIND-DRIED HIGHER PARTICLE SIZE SAND. SAND SHALL NOT EXCEED 5.0% #200 SEIVE SHALL NOT EXCEED 5.0%.

GENERAL NOTES

- DIMENSIONS TAKE PRECEDENCE OVER SCALE. CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD.
- PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS, THE CONTRACTOR MUST CALL DIGGERS HOTLINE SERVICE AND THE VILLAGE OF EPHRAIM FOR THE LOCATION AND STAKING OF ALL EXISTING UNDERGROUND UTILITIES.
- ALL CONSTRUCTION STAKING AND TRAFFIC CONTROL TO BE IN ACCORDANCE WITH TRANSPORTATION REQUIREMENTS.
- THE PROPOSED IMPROVEMENTS SHALL BE CONSTRUCTED ACCORDING TO THE ORDINANCES, REQUIREMENTS OF WISCONSIN DOT, DCRM, AND DNR REQUIREMENTS.
- THE PROPOSED IMPROVEMENTS MUST BE APPROVED BY THE VILLAGE FOLLOWS IN CONSTRUCTION THE IMPROVEMENTS INDICATED ON THE ENGINEERING PLANS.
- THE CONTRACTOR IS RESPONSIBLE FOR EXAMINING ALL SITE CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND IS TO COMPARE THE SITE CONDITIONS TO THOSE INDICATED ON THE ENGINEERING PLANS. THE CONTRACTOR SHALL NOTIFY THE VILLAGE OF EPHRAIM AND RESUBMIT PRIOR TO THE START OF CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY THE WINDCUT AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
- APPROPRIATE CONSTRUCTION INSPECTION.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER WITH AS-BUILT INFORMATION OF THE DESIGNED IMPROVEMENTS. ANY APPROVALS TO THE DESIGN OR ADDITIONAL ITEMS MUST HAVE PRIOR APPROVAL FROM THE MUNICIPALITY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, AND ALL OTHER FEES REQUIRED FOR THE PROPOSED WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, AND ALL OTHER FEES REQUIRED FOR THE PROPOSED WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR NOTING ALL OF THE UTILITIES PRIOR TO THE INSTALLATION OF ANY UNDERGROUND IMPROVEMENTS.
- ANY UTILITIES WHICH ARE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION AND AT THE CONTRACTOR'S EXPENSE.
- STH #42 (WATER STREET) SHALL BE THE CONSTRUCTION ACCESS MAINTAINING THE SURFACE OF THE ROAD FOR USE BY THE PUBLIC DURING CONSTRUCTION. STH #42 SHALL REMAIN IN SERVICE DURING AND AFTER CONSTRUCTION.

IMPLEMENTATION OF EROSION CONTROL METHODS

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. TECHNICAL STANDARDS, AND THE VILLAGE OF EPHRAIM REQUIREMENTS.
- MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE D.O.T. EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.
- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL AT A MINIMUM BE INSPECTED WEEKLY AND MAINTAINED 24 HOURS PER WEEK THROUGHOUT CONSTRUCTION. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION GIVEN TO THE CONDITIONS.
- ALL SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED TO MEET FIELD CONDITIONS AND THE NUMBER OF BARRIERS AND INSTALLED MATERIALS SHALL BE ADJUSTED TO PREVENT EROSION AND TO BE LONGER SUSCEPTIBLE TO EROSION.
- ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREAS ARE PERMANENTLY STABILIZED AND NO LONGER SUSCEPTIBLE TO EROSION.
- TRACKING PADS SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE. AT ALL CONSTRUCTION SITE EXITS TO PREVENT TRACKING OF SOIL OFF THE SITE. ALL OFF SITE TRACKING SHALL BE REMOVED AT THE END OF EACH WORK DAY.
- OVERLAND FLOW SHALL BE PREVENTED FROM LEAVING THE WORK SITE BY INSTALLING STRAW BALES OR SILT FENCE PARALLEL TO THE CONTOURS LOCATED DOWNHILL FROM THE WORK AREA.
- IF THERE ARE DISPARITIES BETWEEN THESE DETAILS AND THE DNR TECHNICAL STANDARDS FOR SEDIMENT AND EROSION CONTROL, THE MORE RESTRICTIVE REQUIREMENT SHALL BE FOLLOWED.