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**PART 1: GENERAL**

**1.01 DESCRIPTION**

- A. THE WORK TO BE PERFORMED INCLUDES SOURCING, PROVIDING AND INSTALLING CONCRETE RETAINING WALL BLOCKS TO THE LINES AND GRADES AS SPECIFIED ON THE PROJECT CONSTRUCTION DRAWINGS AND AS MAY BE FURTHER SPECIFIED HEREIN.
- B. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD, DRAINAGE AGGREGATE, AND BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.
- C. WORK INCLUDES FURNISHING AND INSTALLING ALL RELATED MATERIALS REQUIRED FOR CONSTRUCTION OF THE RETAINING WALL AS SHOWN ON THE CONSTRUCTION SHOP DRAWINGS.

**1.02 REFERENCE STANDARDS**

- A. ASTM D448 STANDARD CLASSIFICATION FOR SIZES OF AGGREGATE FOR ROAD AND BRIDGE CONSTRUCTION.
- B. ASTM D698 STANDARD TEST METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12 400 FT-LBF/FT<sup>3</sup>).

**1.03 QUALITY ASSURANCE**

- A. OWNER/STATE SHALL BE RESPONSIBLE FOR SOIL TESTING AND INSPECTION DURING EARTHWORK OPERATIONS. QUALITY CONTROL SHALL BE PER THE SPECIAL PROVISION.

**PART 2: MATERIALS**

**2.01 DEFINITIONS**

- A. RETAINING WALL UNIT - A PRECAST CONCRETE, SEGMENTAL FACING BLOCK PROVIDED BY AN AUTHORIZED MANUFACTURER.
- B. DRAINAGE AGGREGATE - CLEAN 1" CRUSHED ANGULAR ROCK LOCATED WITHIN AND IMMEDIATELY BEHIND THE RETAINING WALL UNITS TO FACILITATE DRAINAGE.
- C. FOUNDATION SOIL - SOIL ZONE IMMEDIATELY BENEATH THE RETAINING WALL FACING UNITS, THE WALL LEVELING PAD, AND THE REINFORCED SOIL ZONE.
- D. LEVELING PAD - COMPACTED CRUSHED STONE PAD WHICH SERVES AS A FLAT SURFACE FOR PLACING THE INITIAL COURSE OF PRECAST UNITS.
- E. RETAINED BACKFILL - SOIL IMMEDIATELY BEHIND THE RETAINING WALL DRAINAGE AGGREGATE.
- F. SUBSURFACE DRAINAGE SYSTEM - A SYSTEM FOR REMOVING WATER FROM BEHIND THE WALL AND CHANNELING IT TO A POINT OF POSITIVE DRAINAGE.

**2.02 RECON RETAINING WALL UNITS**

- A. RECON WALL UNITS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5,000 PSI. STANDARD WEIGHT CONCRETE SHALL HAVE A 7% (+/- 2%) AIR ENTRAINMENT BY VOLUME. WEIGHT OF CONCRETE SHALL BE 145 PCF.
- B. BLOCKS SHALL BE CONSISTENT AND FREE OF STAINS, DEFECTS, CRACKS, OR CHIPS. UNITS THAT CONTAIN VISIBLE DEFECTS SUCH AS, BUT NOT LIMITED TO, VERTICAL OR HORIZONTAL SEAMS, CONSPICUOUS STAINS, FORM MARKS, OR COLOR STREAKS SHALL BE REPAIRED TO THE SATISFACTION OF THE PROJECT ENGINEER OR REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
- C. TEXTURE AND COLOR ON THE FACE OF THE BLOCK SHALL BE THE NORTH SHORE GRANITE TEXTURE IN NATURAL CONCRETE GRAY COLOR.
- D. PRODUCTION: POUR BLOCKS INSIDE HEATED PLANT. PLACE INSULATED BLANKETS OVER BLOCKS AFTER POURING. STRIP BLOCKS THE FOLLOWING DAY AT MINIMUM 1,500 PSI. KEEP THE BLOCKS FROM PREVIOUS DAY INSIDE PLANT AND PLACE DAMP BURLAP/POLY OVER THE BLOCKS FOR A PERIOD OF 24 HOURS. PALLETIZE BLOCKS AND PLACE IN PRECAST YARD WHEN CONCRETE SURFACE TEMPERATURES SHALL NOT BE SUBJECT TO AN AMBIENT TEMPERATURE CHANGE GREATER THAN 40°F IN A 24-HOUR PERIOD. PRECAST BLOCKS SHALL NOT BE SUBJECT TO TEMPERATURES LESS THAN 36°F PRIOR TO MEETING DESIGN STRENGTHS. DUNNAGE IS NOT USED.

**2.03 LEVELING PAD MATERIAL**

- A. MATERIAL SHALL CONSIST OF COMPACTED CRUSHED STONE AS SHOWN ON THE CONSTRUCTION DRAWING.

**2.04 DRAINAGE AGGREGATE (PHI 40°)**

- A. DRAINAGE AGGREGATE SHALL HAVE AT LEAST TWO FRACTURED FACES AND SHALL NOT BE RIVER ROCK OR PEA GRAVEL.
- B. DRAINAGE AGGREGATE SHALL CONSIST OF CLEAN 1" CRUSHED STONE MEETING THE FOLLOWING GRADATION:

SIEVE SIZE	% PASSING
1"	100
3/4"	100 - 75
NO. 4	0 - 10
NO. 50	0 - 5

**2.05 BACKFILL**

- A. SELECT BACKFILL (704.08 GRANULAR BACKFILL FOR STRUCTURES MINIMUM PHI 34°) SHALL BE OBTAINED FROM APPROVED SOURCES. IT SHALL CONSIST OF SATISFACTORILY GRADED, FREE DRAINING GRANULAR MATERIAL REASONABLY FREE FROM LOAM, SILT, CLAY, AND ORGANIC MATERIAL. GRANULAR BACKFILL FOR STRUCTURES SHALL MEET THE GRADATION REQUIREMENTS MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH AASHTO T 27 AND AASHTO T 11:

SIEVE SIZE	% PASSING
3"	100
NO. 4	45 - 75
NO. 100	0 - 12
NO. 200	0 - 6

- B. THE MAXIMUM AGGREGATE SIZE SHALL BE LIMITED TO 3" UNLESS FIELD TESTS HAVE BEEN PERFORMED TO EVALUATE POTENTIAL STRENGTH REDUCTION TO INSTALLATION.
- C. MATERIAL CAN BE SITE EXCAVATED MATERIAL WHEN THE ABOVE REQUIREMENTS ARE MET. UNSUITABLE SOILS FOR BACKFILL (HIGH PLASTIC CLAYS OR ORGANIC MATERIALS) SHALL NOT BE USED IN THE REINFORCED SOIL MASS.
- D. CONTRACTOR SHALL SUBMIT REINFORCED FILL SAMPLE AND TEST RESULTS TO THE ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

**2.06 SUBSURFACE DRAINAGE SYSTEM**

- A. SUBSURFACE DRAINAGE SYSTEM SHALL CONSIST OF PERFORATED POLYETHYLENE (PE) PIPE. IF THE PIPE IS NOT PLACED WITHIN CLEAN CRUSHED STONE IT SHALL BE WRAPPED IN A GEOTEXTILE FABRIC OR NON-PERFORATED WHERE REQUIRED.
- B. NON-PERFORATED PIPE SHALL BE USED TO CONNECT DRAINS FROM THE WALL TO DRAINAGE STRUCTURES OR HEAD WALLS.
- C. FITTINGS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

**2.07 GEOTEXTILE FILTER FABRIC**

- A. GEOTEXTILE FABRIC SHALL BE AN 8-OZ. MINIMUM NON-WOVEN POLYPROPYLENE FABRIC SOURCED FROM A VENDOR LISTED ON THE VERMONT AGENCY OF TRANSPORTATION APPROVED PRODUCTS LIST.

Note that per subsection 540.08(a)(1), precast concrete structure components shall be cured until the design strength has been achieved.

**PART 3: EXECUTION**

**3.01 EXCAVATION**

- A. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. CONTRACTOR SHALL BE CAREFUL NOT TO DISTURB EMBANKMENT AND FOUNDATION MATERIALS BEYOND LINES SHOWN.

**3.02 FOUNDATION SOIL PREPARATION**

- A. FOUNDATION SOIL SHALL BE EXCAVATED AS REQUIRED FOR LEVELING PAD DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- B. UNSUITABLE SOILS SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIAL.
- C. OVER-EXCAVATED AREAS SHALL BE BACKFILLED WITH APPROVED COMPACTED BACKFILL MATERIAL.

**3.03 BASE LEVELING PAD**

- A. LEVELING PAD MATERIALS SHALL BE PLACED UPON APPROVED FOUNDATION AS SHOWN ON THE CONSTRUCTION DRAWINGS TO A MINIMUM THICKNESS OF 6".
- B. AGGREGATE MATERIAL SHALL BE COMPACTED TO PROVIDE A DENSE, LEVEL SURFACE ON WHICH TO PLACE THE FIRST COURSE OF MODULAR UNITS. COMPACTION SHALL BE TO 95% OF STANDARD PROCTOR DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D698.
- C. CRUSHED STONE SHALL BE PLACED IN MAXIMUM 6" LIFTS AND SHALL BE WELL COMPACTED WITH A VIBRATORY PLATE COMPACTOR OR OTHER SUITABLE EQUIPMENT.

**3.04 UNIT INSTALLATION**

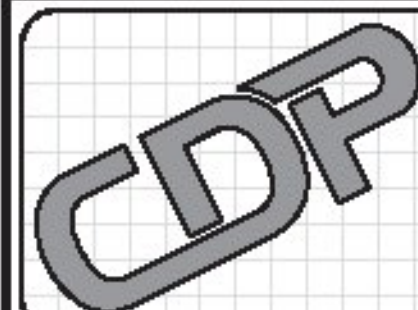
- A. THE FIRST COURSE OF CONCRETE MODULAR WALL UNITS SHALL BE CAREFULLY PLACED ON THE BASE LEVELING PAD. EACH UNIT SHALL BE CHECKED FOR LEVEL AND ALIGNMENT.
- B. UNITS ARE PLACED SIDE BY SIDE FOR FULL LENGTH OF WALL ALIGNMENT. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM A BASE LINE.
- C. SWEEP EXCESS MATERIAL FROM TOP OF UNITS AND INSTALL NEXT COURSE. ENSURE THAT EACH COURSE IS COMPLETELY UNIT FILLED, BACKFILLED AND COMPACTED PRIOR TO PROCEEDING TO NEXT COURSE.

**3.05 DRAINAGE SYSTEM PLACEMENT**

- A. A DRAINAGE SYSTEM SHALL BE PROVIDED AT THE BASE OF THE WALL SYSTEM BEHIND THE WALL UNITS.
- B. THE DRAINAGE SYSTEM SHALL CONSIST OF 4" PERFORATED POLYETHYLENE (PE) PIPE WRAPPED WITH GEOTEXTILE FABRIC.
- C. THE PIPE SHALL BE INSTALLED WITH POSITIVE DRAINAGE, 1% MINIMUM.

**3.06 FILL PLACEMENT**

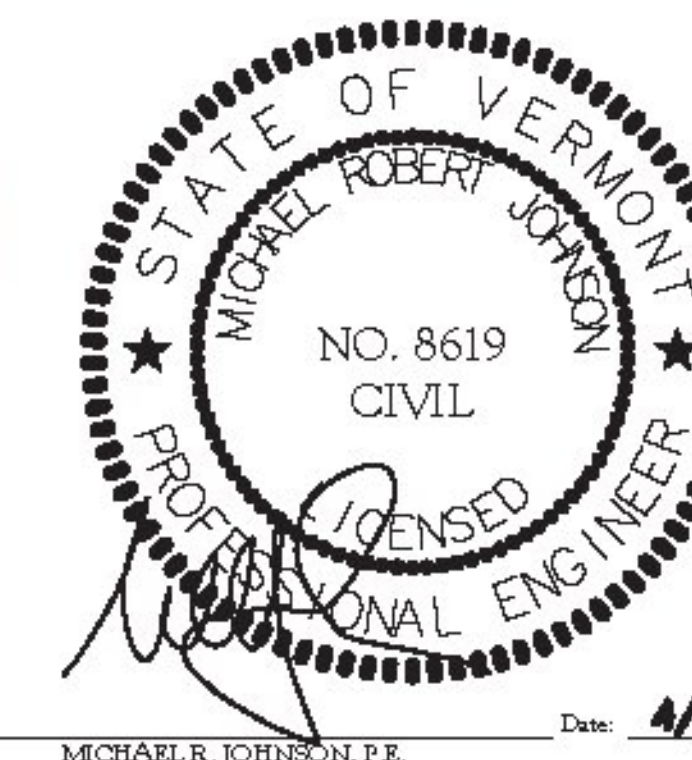
- A. BACKFILL MATERIAL SHALL BE PLACED WITH A MAXIMUM OF 8" LIFTS AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D698. THE IN PLACE MOISTURE CONTENT SHALL NOT EXCEED THE OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D698 AND BE NO LOWER THAN 2% BELOW OPTIMUM MOISTURE CONTENT.
- B. COMPACTION WITHIN 3 FEET OF BACK FACE OF WALL SHALL BE ACHIEVED BY MEANS OF A MINIMUM 3 PASSES WITH A LIGHTWEIGHT MECHANICAL TAMPER, ROLLER, OR VIBRATORY SYSTEM. MAXIMUM LIFT SIZE SHALL NOT EXCEED 8 INCHES LOOSE.



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