

1.1 GENERAL

SEGMENTAL RETAINING WALL SYSTEMS ARE DESIGNED AS A GRAVITY RETAINING WALL UTILIZING A HIGH DENSITY POLYESTER GEOGRID TO REINFORCE THE SOIL ZONE BEHIND THE WALL. THE GEOGRID IS POSITIVELY CONNECTED TO THE MODULAR CONCRETE BLOCK CREATING A REINFORCED SOIL MASS CAPABLE OF RESISTING LATERAL EARTH PRESSURES AND SURCHARGED LOADS. ALL REFERENCES TO THE ENGINEER REFER TO TYNDALL ENGINEERING & DESIGN.

1.2 QUALITY ASSURANCE

WORK SHALL BE PERFORMED ONLY BY AN EXPERIENCED CONTRACTOR WHO HAS SUCCESSFULLY INSTALLED A MINIMUM OF ONE MILLION SQUARE FEET OF RETAINING WALLS AND WHO HAS SUCCESSFULLY COMPLETED AT LEAST FIVE RETAINING WALLS OF EQUAL OR GREATER SCOPE.

- A.) CONTRACTOR SHALL SUBMIT TO THE ENGINEER, PRIOR TO START OF WORK, EVIDENCE OF QUALIFICATIONS AND REFERENCES ON PROJECTS OF SIMILAR SCOPE. EVIDENCE SHALL BE SUBMITTED IN WRITING TO THE ENGINEER ON THE CONTRACTOR'S LETTERHEAD AND SHALL CONTAIN AT A MINIMUM: 1) A LIST OF FIVE REFERENCE PROJECTS OF EQUAL OR GREATER SCOPE WITH CONTACT INFORMATION, 2) A LIST OF EXPERIENCE COMMENSURATE WITH THE PROJECT SCOPE (WALL DIMENSIONS, ERECTION TOLERANCES, SOIL PARAMETERS, AND MATERIALS).
- B.) ENGINEER SHALL REVIEW QUALIFICATIONS AND REPORT TO THE CLIENT ON THE SAME. ENGINEER RESERVES THE RIGHT TO REJECT ANY AND ALL QUALIFICATION SUBMITTALS, WHEN IN THE ENGINEER'S OPINION SUCH QUALIFICATIONS ARE DEEMED UNSATISFACTORY. ENGINEER'S APPROVAL OF CONTRACTOR'S QUALIFICATIONS SHALL NOT RELIEVE THE CONTRACTOR OF ANY OR ALL CONTRACT RESPONSIBILITIES FOR QUANTITIES, PERFORMANCE, OR OTHER REQUIREMENTS OF THE CONTRACT DOCUMENTS. ENGINEER'S APPROVAL OF CONTRACTOR QUALIFICATIONS SHALL NOT BE CONSTRUED AS A WARRANTY OR GUARANTEE OF THE CONTRACTOR'S WORK.
- C.) THE OWNER AND/OR GENERAL CONTRACTOR SHOULD PROVIDE A SPECIAL INSPECTOR AS A FULL-TIME CONTINUOUS MONITOR OF WORK QUALITY. THE SPECIAL INSPECTOR WILL REPORT BACK TO THE BUILDING OFFICIAL AND ENGINEER ON QUALITY AND PROGRESS OF WORK. THE SPECIAL INSPECTOR WILL REQUIRE TESTING BE DONE BEFORE THE WORK PROCEEDS.

1.3 BACK FILL MATERIALS

THE SOIL MATERIAL ASSOCIATED WITH THE RETAINING WALL IN THE REINFORCED ZONE, THE RETAINED ZONE, OR THE FOUNDATION BEDDING SHALL HAVE THE FOLLOWING PROPERTIES:

- A.) FOUNDATION SOILS $\phi = 26$ DEGREES, COHESION = 0 PSF, UNIT WEIGHT = 120 LBS/CU.FT.
- B.) RETAINED SOILS $\phi = 26$ DEGREES, COHESION = 0 PSF, UNIT WEIGHT = 120 LBS/CU.FT.
- C.) REINFORCED SOILS $\phi = 26$ DEGREES, COHESION = 0 PSF, UNIT WEIGHT = 120 LBS/CU.FT.

THE SOILS CHARACTERISTICS ABOVE WERE ASSUMED BASED ON INFORMATION SUPPLIED TO THE ENGINEER. IF THIS INFORMATION DOES NOT REPRESENT THE ACTUAL SOIL TO BE USED, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY AND THE WALL SHALL BE REDESIGNED.

1.4 SEISMIC DESIGN CRITERIA

PEAK ACCELERATION = N/A VERTICAL ACCELERATION = N/A

1.5 FOUNDATION LOADS

THE MAXIMUM APPLIED FOUNDATION LOAD FOR THIS WALL IS 3.0 KIPS/SQ.FT.

1.6 CONCRETE MASONRY WALL UNITS

CONCRETE WALL UNITS SHALL BE SEGMENTAL UNITS MANUFACTURED IN ACCORDANCE WITH ASTM-C1372 AND ASTM C140 AND SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. UNITS SHALL BE INTERLOCKED IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.

1.7 GEOGRID REINFORCEMENT

GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF HIGH TENACITY GEOGRIDS OR GEOTEXTILES MANUFACTURED FOR SOIL REINFORCEMENT APPLICATIONS. THE TYPE, AND PLACEMENT LOCATION OF THE REINFORCING GEOSYNTHETIC SHALL BE AS SHOWN ON THE PLANS.

1.8 WALL BATTER

BATTER FOR THE ENTIRE WALL SHALL BE MAINTAINED AT 1" SETBACK.

2.0 FOUNDATION REQUIREMENTS

THE FOUNDATION BEARING CAPACITY THAT WAS ASSUMED FOR DESIGN SHALL BE VERIFIED IN THE FIELD, AND COPIES OF THE TEST DATA FILED WITH THE ENGINEER. THE FOOTING SHALL BE CLEARED OF LOOSE SOIL. A MINIMUM OF 12" OF WASHED STONE SHALL BE PLACED AT THE BACK OF EACH BLOCK AS INDICATED ON THE DETAILS.

2.1 LEVELING PAD

MATERIAL SHALL CONSIST OF COMPACTED SAND, GRAVEL, CRUSHED ROCK, WASHED STONE, OR UNREINFORCED CONCRETE. THE PAD SHALL BE 6" THICK (UNO). SAND OR GRAVEL MATERIAL SHALL BE COMPACTED TO 95% STANDARD PROCTOR. AGGREGATE MATERIAL SHALL RECEIVE A MINIMUM OF ONE PASS OF THE COMPACTION EQUIPMENT. THE TOP OF THE LEVELING PAD FOR THE WALL SECTIONS SHALL BE MAINTAINED AT A MINIMUM DEPTH OF 10% OF TOTAL WALL HEIGHT OR MORE (6" MIN.) (UNO).

2.2 UNIT FILL

THE VOID WITHIN EACH UNIT SHALL BE FILLED WITH A WASHED STONE (#57 STONE) HAVING 100 % OF THE AGGREGATE PASSING THE 2" SIEVE. A MINIMUM OF 3/8" WASHED STONE SIZE IS REQUIRED (NO MORE THAN 5 % PASSING THE #200 SIEVE). THIS SAME MATERIAL SHALL BE PLACED BEHIND EACH BLOCK PER SEC. 2.0. ALL EXCESS MATERIAL SHALL BE SWEEP CLEAN FROM THE TOP OF THE BLOCK PRIOR TO INSTALLING THE NEXT COURSE. EACH COURSE OF BLOCK SHALL BE COMPLETELY FILLED BEFORE PROCEEDING TO THE NEXT COURSE.

2.3 FIRST BLOCK COURSE

THE FIRST COURSE OF BLOCK SHALL BE PLACED ON TOP OF AND IN FULL CONTACT WITH THE LEVELING PAD. THE UNITS SHALL MAINTAIN A DISTANCE OF MINIMUM 6" FROM THE FRONT AND BACK OF THE LEVELING PAD. PROPER ALIGNMENT MAY BE ACHIEVED WITH THE AID OF A STRING LINE. PROCEED TO THE NEXT COURSE OF BLOCK. EACH UNIT SHALL CONTACT THE UNITS ON BOTH SIDES AS WELL AS ABOVE AND BELOW. SOME ADJUSTMENTS MAY BE REQUIRED FOR WALLS WITH CURVES AND A BATTER.

2.4 CAPS

APPLY A CONSTRUCTION ADHESIVE TO THE UNITS TO PREVENT THEIR REMOVAL.

3.0 GEOGRID INSTALLATION

THE GEOGRID REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED BACK FILL AND CONNECTED TO THE CONCRETE WALL UNITS, IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS. GEOGRID SHALL BE PULLED TAUT REMOVING ALL SLACK FROM THE MATERIAL AND ANCHORED BEFORE ADDING FILL. GEOGRID SHALL BE INSTALLED AT THE ELEVATIONS AND LENGTHS REQUIRED AS SHOWN ON THE PLANS (REFER TO DETAILS FOR THE APPROPRIATE ORIENTATION). SOIL SURFACE SHALL BE SMOOTH AND LEVEL AND HAVE BEEN COMPACTED TO 95% STANDARD PROCTOR BEFORE INSTALLING THE GRID.

3.1 FILL PLACEMENT

BACK FILL MATERIAL SHALL BE PLACED ON A MAXIMUM 8" COMPACTED LIFT, 95 % STANDARD PROCTOR WITH A MOISTURE CONTROL OF +/- 3% OF OPTIMUM. ONLY HAND OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET OF THE SEGMENTAL UNITS. BACK FILL SHALL BE PLACED FROM THE WALL REARWARD TO INSURE TAUTNESS OF THE GEOGRID. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID.

3.2 UNSUITABLE MATERIAL

SOILS CONTAINING ROOTS, BRUSH, SOD OR OTHER ORGANIC MATERIAL SHALL NOT BE PERMITTED AS BACKFILL. FROZEN SOILS, SNOW, ICE, HEAVY CLAYS, OR WET SOILS SHALL NOT BE PERMITTED AS BACKFILL. MATERIAL PASSING THE #40 SIEVE SHALL NOT HAVE A LIQUID LIMIT OF GREATER THAN 40 AND A PLASTICITY INDEX OF GREATER THAN 15, UNLESS WRITTEN CONSENT IS OBTAINED FROM THE ENGINEER PRIOR TO PLACEMENT.

3.3 SOIL PROPERTIES

MINIMUM INTERNAL ANGLE OF FRICTION SHALL EQUAL OR BE GREATER THAN REFERENCE IN SECTION 1.3. VERIFICATION SHALL BE FILED WITH THE ENGINEER THAT THE SOIL WILL MEET THIS CRITERIA.

4.0 SOIL TESTING

COMPACTION TESTING SHALL BE PERFORMED FOR EVERY LIFT ELEVATION REQUIRING GEOGRID OR EVERY 3RD LIFT AS A MINIMUM. TESTS SHALL BE FILED WITH THE ENGINEERS OFFICE.

5.0 HYDROSTATIC PRESSURE POTENTIAL

THE ENGINEER SHALL BE NOTIFIED IF ANY OF THE FOLLOWING SHOULD BECOME EVIDENT:

- WATER OR WETNESS FROM OR IN A CUT BANK
- LOCAL SPRINGS, LOCAL STORM DRAINS, SEWER, WATER LINES UNDER OR BEHIND THE WALL

6.0 ACCEPTABLE BLOCK

SEGMENTAL UNITS SHALL BE USED AND KEPT FREE OF DEFECTS THAT WOULD INTERFERE WITH THE PLACING OR POSITIONING OF THE UNIT OR IMPAIR ITS STRENGTH. MINOR CRACKS INCIDENTAL TO THE USUAL METHOD OF MANUFACTURING OR MINOR CHIPPING RESULTING FROM SHIPMENT AND DELIVERY ARE NOT GROUNDS FOR REJECTION.

7.0 ACCEPTABLE GEOGRID

GEOGRID SHALL BE REJECTED IF 20% OR MORE OF A STRUCTURAL RIB HAS BEEN CUT OR RIPPED. THE CONTRACTOR SHALL INSPECT ALL GEOGRID DELIVERED TO THE SITE AND REJECT MATERIALS THAT MEETS THIS CRITERIA. IF THE GEOGRID IS DAMAGED ON THE CONSTRUCTION SITE, IT SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

8.0 DRAINAGE COMPOSITE

(APPLIES TO CUT WALL APPLICATIONS ONLY), WHERE SITE CONDITIONS WARRANT DRAINAGE COMPOSITE SHALL BE INSTALLED TO COVER 30% OF THE CUT BEHIND THE GEOGRID LAYERS. STRATA-DRAIN (6FT. WIDE SECTIONS) PROVIDES 30% COVERAGE WHEN INSTALLED ON 15 FT CENTERS AND 2/3 THE WALL HEIGHT.

9.0 SPECIAL PROVISIONS

- A.) GENERAL CONTRACTOR SHALL COORDINATE UPPER GEOGRID LAYERS INSTALLATION WITH PAVING INSTALLATION.
- B.) MAINTAIN THE DIRECTION OF DRAINAGE AWAY FROM THE WALL FACE AT ALL TIMES DURING CONSTRUCTION OF THE WALL AND FINISH GRADING AS SHOWN ON PLANS.
- C.) PLACEMENT OF GEOGRID SHALL BE AS PER PLANS, WITH REGARDS TO PLAN SPECIFIED LENGTH AND ELEVATIONS.
- D.) THE ENGINEER SHALL BE NOTIFIED BY THE INSTALLING CONTRACTOR SHOULD THE EMBEDMENT DEPTH OF THE WALL BE LESS THAN 10% OF THE TOTAL WALL HEIGHT (6" MIN.) (UNO).
- E.) THE REINFORCED SOIL IS ASSUMED TO BE: ML, SC, SM, SP, SW, & ETC. (HIGH PLASTICITY SILTS AND CLAYS) ARE NOT ACCEPTABLE.
- F.) PER NORTH CAROLINA BUILDING CODE, A BUILDING PERMIT MUST BE OBTAINED PRIOR TO WALL CONSTRUCTION. CONTACT YOUR LOCAL CITY, COUNTY, MUNICIPALITY, OR TOWN CODE ENFORCEMENT TO OBTAIN BUILDING PERMIT.

10.0 QUALIFICATION OF DESIGN

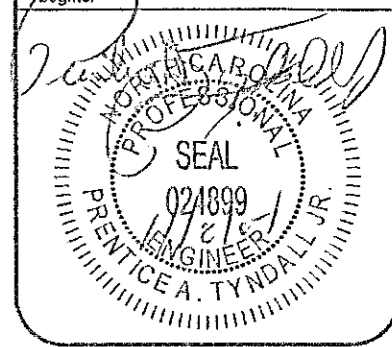
- A.) STABILITY OF ANY TEMPORARY SLOPES REQUIRED BY THE INSTALLATION OF A SEGMENTAL RETAINING WALL SHALL BE ADDRESSED BY A QUALIFIED GEOTECHNICAL ENGINEER. RESPONSIBILITY OF THESE TEMPORARY SLOPES RESTS WITH THE OWNER AND/ OR ARCHITECT OF THIS PROJECT AND THE SLOPES SHALL MEET ALL OSHA STANDARDS OF MAX. SLOPE STEEPNESS= 1.5H:1V.
- B.) HANDRAIL/ GUARDRAIL REQUIREMENTS SHALL BE DETERMINED BY THE ARCHITECT OR GENERAL CONTRACTOR.
- C.) NOTIFY THE DESIGN ENGINEER PRIOR TO MODIFYING WALL CONSTRUCTION IF EXISTING SITE CONDITIONS DEVIATE FROM CONDITIONS OUTLINED ON RETAINING WALL PROFILE.

04-SP-159
APPROVED

Town of Cary

Approved by _____ Date _____
Planning _____ Date _____
Engineering _____ Date _____

Engineers seal does not include construction means, methods, techniques, sequences, procedures or safety precaution. Any deviations or discrepancies on plans are to be brought to the immediate attention of Tyndall Engineering & Design. Failure to do so will void Tyndall Engineering & Design liability. Please review these documents carefully. Tyndall Engineering & Design will interpret that all dimensions, recommendations, etc. portrayed in these documents were printed acceptable once construction begins.



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REVISIONS		
No.	Date:	Remarks
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3		

Sheet Name:
Specifications
Sheet #:
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