

PART 1: GENERAL

- 1.01 DESCRIPTION
- A. WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A VERDURA SEGMENTAL RETAINING WALL SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THESE PLANS AS SUPPLIED BY THE CIVIL ENGINEER OF RECORD AND AS STAKED BY THE SURVEYOR.
 - B. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD (IF REQUIRED), PLANTABLE SOIL UNIT FILL, AND BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.
 - C. WORK INCLUDES FURNISHING AND INSTALLING GEOSYNTHETIC SOIL REINFORCEMENT OF THE TYPE, SIZE, LOCATION, STRENGTH AND LENGTHS DESIGNATED ON THESE PLANS.
 - D. WORK INCLUDES FURNISHING AND INSTALLING SUBDRAIN AND OTHER WALL-RELATED DRAINAGE SYSTEMS SHOWN AND SPECIFIED ON THESE PLANS.
- 1.02 REFERENCE STANDARDS
- A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
 - 1) ASTM C-90-SRD. SPEC. FOR LOAD BEARING CONCRETE MASONRY UNITS
 - 2) ASTM C-140-STD. SPEC. FOR SAMPLING AND TESTING CONCRETE MASONRY UNITS
 - 3) ASTM C-1372-SPECIFICATION FOR SEGMENTAL RETAINING WALL UNITS
 - 4) ASTM D-1557-LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING MODIFIED EFFORT
 - 5) ASTM D-1785-STANDARD SPECIFICATION FOR PVC PLASTIC PIPE
 - 6) ASTM D-4595-TENSILE PRIORITIES OF GEOTEXTILES - WIDE WIDTH STRIP
 - 7) ASTM D-5262-UNCONFINED TENSION CREEP BEHAVIOR OF GEOSYNTHETICS
 - 8) ASTM D-6638-CONNECTION STRENGTH BETWEEN REINFORCEMENT AND SEGMENTAL CONCRETE UNITS
 - 9) ASTM D-6916-SHEAR STRENGTH BETWEEN SEGMENTAL CONCRETE UNITS
 - B. GEOSYNTHETIC RESEARCH INSTITUTE (GRI)
 - 1) GRI-GG4-DETERMINATION OF LONG TERM DESIGN STRENGTH OF GEOGRIDS
 - C. ICC EVALUATION SERVICES, INC.
 - 1) ICC-ES EVALUATION REPORT, ESR-3073, VERDURA RETAINING WALL SYSTEM.
 - D. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
 - 1) "DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS, 3RD EDITION" (2010)
 - E. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
 - 1) "DESIGN AND CONSTRUCTION OF MECHANICALLY STABILIZED EARTH WALLS AND REINFORCED SOIL SLOPES" (2000)
- 1.03 SUBMITTALS/CERTIFICATION
- A. AS DETERMINED NECESSARY BY OWNER.
 - B. WALL MATERIALS SHALL CONSIST OF THOSE SPECIFIED WITHIN THESE PLANS. SUBSTITUTIONS ARE NOT PERMITTED WITHOUT APPROVAL BY THE WALL DESIGNER AND/OR ENGINEER OF RECORD PRIOR TO CONSTRUCTION.
- 1.04 DELIVERY, STORAGE AND HANDLING
- A. CONTRACTOR SHALL CHECK ALL MATERIALS UPON DELIVERY TO ASSURE THAT THE PROPER TYPE, GRADE, AND CERTIFICATION HAVE BEEN RECEIVED.
 - B. CONTRACTOR SHALL PROTECT ALL MATERIALS FROM DAMAGE DUE TO JOBSITE CONDITIONS AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DAMAGED MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK.
- PART 2: PRODUCTS**
- 2.01 MODULAR CONCRETE RETAINING WALL UNITS
- A. MODULAR CONCRETE UNITS SHALL BE VERDURA BLOCK, AS INDICATED IN TABLE 2.
 - B. MODULAR CONCRETE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-1372 - STANDARD SPECIFICATIONS FOR SRW UNITS.
 - C. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING STRUCTURAL AND GEOMETRIC REQUIREMENTS MEASURED IN ACCORDANCE WITH SECTION 1.02 AND OTHER APPROPRIATE REFERENCES:
 - * COMPRESSIBLE STRENGTH = 5000 PSI MINIMUM AT 28 DAYS;
 - * MOISTURE ABSORPTION ≤ 8 LBS PER CUBIC FEET FOR STANDARD WEIGHT AGGREGATES;
 - * BATTER = AS INDICATED PER NOTE 3.10;
 - * DIMENSIONAL TOLERANCES = ±1/4" FROM NOMINAL UNIT DIMENSIONS (NOT INCLUDING EXPOSED AGGREGATE FACE TEXTURE), ±1/4" UNIT HEIGHT - TOP AND BOTTOM PLANES.
- 2.02 GEOSYNTHETIC REINFORCEMENTS
- A. GEOSYNTHETIC REINFORCEMENTS SHALL CONSIST OF PET-TYPE GEOGRID MATERIAL, WHICH CONSISTS OF A POLYMER COATED WOVEN POLYESTER FABRICATED FOR EARTH REINFORCEMENT.
 - B. GEOGRID MATERIALS SHALL BE MIRAGRID XT SERIES AS INDICATED IN TABLE 4.
 - C. SUBSTITUTE GEOGRID PRODUCTS ARE NOT PERMITTED WITHOUT APPROVAL BY THE WALL DESIGNER AND/OR ENGINEER OF RECORD.
 - D. ANY HIGHER STRENGTH GEOGRID INCLUDED IN TABLE 4 MAY BE SUBSTITUTED FOR LOWER STRENGTH GEOGRIDS SHOWN IN THE DESIGN WITHOUT QUESTION.
- 2.03 GEOSYNTHETIC REINFORCEMENT TO VERDURA BLOCK CONNECTORS
- A. CONNECTORS SHALL BE 1 INCH DIAMETER SCHEDULE 80 PVC PIPE AND MUST BE CAPABLE OF PROVIDING POSITIVE MECHANICAL INTERLOCK BETWEEN GEOSYNTHETIC SOIL REINFORCEMENT MATERIAL (GEOTEXTILE OR GEOGRID) AND BLOCK.
- 2.04 UNIT FILL
- A. UNIT FILL SHALL CONSIST OF SOILS USED FOR WALL BACKFILL OR AS SPECIFIED BY THE PROJECT LANDSCAPE ARCHITECT FOR ENHANCED WALL PLANTABILITY.
- 2.05 SOIL FILL
- A. ENGINEERED FILL FOR THE REINFORCED/INFILL SOIL AND RETAINED/BACKFILL SOIL ZONES SHALL BE ON-SITE OR IMPORTED SOILS ACCEPTED BY THE GEOTECHNICAL ENGINEER OF RECORD AND HAVING THE SOIL STRENGTH PROPERTIES AS NOTED IN TABLE 3 WHEN COMPACTED TO 90% RELATIVE COMPACTION PER ASTM D-1557.
 - B. REINFORCED/INFILL SOIL MATERIALS SHALL BE FREE OF DEBRIS AND MEET THE FOLLOWING RECOMMENDATIONS;
- GRADATION TESTED IN ACCORDANCE WITH ASTM D-6913:
- | SIEVE SIZE | PERCENT PASSING |
|------------------|-----------------|
| 2 INCH (50 MM) | 100 |
| 3/4 INCH (20 MM) | 100-75 |
| NO. 4 | 100-40 |
| NO. 40 | 0-60 |
| NO. 200 | 0-35 |
- EXPANSION INDEX (EI) ≤ 50 PER ASTM D4829
- PLASTICITY INDEX (PI) < 20 AND LIQUID LIMIT < 40 PER ASTM D4318
- C. OCCASIONAL NON-ANGULAR, ROUNDED ROCKS UP TO 4 INCHES IN DIAMETER MAY BE ALLOWED FOR NO MORE THAN 15% OF THE REINFORCED/INFILL SOIL.
 - D. ENGINEERED FILL MATERIALS FOR THE UPPER ONE (1) FOOT IMMEDIATELY BEHIND THE TOPMOST BLOCK AND ABOVE THE ZONE OF REINFORCED/INFILL SOIL SHALL BE COMPROMISED OF MORE IMPERVIOUS (NO. 200>35%) SOILS.
 - E. REINFORCED/INFILL SOIL CAN BE SITE-EXCAVATED SOILS WHERE THE ABOVE REQUIREMENTS CAN BE MET.
 - F. GEOTECHNICAL ENGINEER OF RECORD SHALL PERFORM LABORATORY TESTS ON THE SOIL MATERIAL PROPOSED FOR USE TO ENSURE COMPLIANCE WITH REQUIREMENTS STATED ABOVE PRIOR TO THE PLACEMENT OF THE MATERIALS.
- 2.06 DRAIN ROCK
- A. CLEAN 3/4" CRUSHED AGGREGATE
- 2.07 DRAINAGE PIPE
- A. PROVIDE A PERFORATED AND SOLID PIPING SYSTEM CONSISTING OF 4-INCH-DIAMETER SCHEDULE 40 PVC PIPE AS SHOWN ON THESE PLANS.
- 2.08 FILTER FABRIC
- A. PROVIDE FILTER FABRIC CONSISTING OF MIRAFI 140N OR EQUIVALENT AS SPECIFIED BY THE GEOTECHNICAL ENGINEER OF RECORD.

VERDURA® RETAINING WALL PLANS

PART 3: EXECUTION

- 3.01 SURFACE CONDITIONS
- A. PRIOR TO WORK, CAREFULLY INSPECT PREVIOUS GRADING WORK. VERIFY THAT ALL SUCH WORK IS COMPLETE TO THE POINT WHERE THIS INSTALLATION MAY PROPERLY COMMENCE.
 - B. VERIFY THAT WORK OF THIS SECTION MAY BE INSTALLED IN STRICT ACCORDANCE WITH THE ORIGINAL DESIGN, ALL PERTINENT CODES AND REGULATIONS.
 - C. VERIFY WALL DRAINAGE SYSTEM IS COORDINATED WITH POINTS OF CONNECTION TO STORM DRAINAGE SYSTEM OR OTHER APPROVED OUTLET LOCATION.
 - D. IN THE EVENT OF DISCREPANCY, IMMEDIATELY NOTIFY THE PROJECT CIVIL ENGINEER. DO NOT PROCEED WITH INSTALLATION UNTIL ALL SUCH DISCREPANCIES HAVE BEEN RESOLVED.
- 3.02 FIELD STAKING
- A. SEE THE STAKING REQUEST DOCUMENT FROM SOIL RETENTION PRODUCTS, INC.
 - B. CIVIL ENGINEER HAS DEFINED THE RETAINING WALL ALIGNMENT. SURVEYOR IS RESPONSIBLE TO STAKE THE BOTTOM OF WALL BY PROJECTING FROM THIS DEFINED ALIGNMENT OUT TO A BOTTOM OF WALL ALIGNMENT BASED ON THE PROFILE ON THIS SET OF PLANS AND A 1:4 BATTER.
 - C. ALL QUESTIONS ON THE HORIZONTAL CONTROL OF THE RETAINING WALL SHOULD BE DIRECTED TO THE CIVIL ENGINEER OF RECORD AND NOT THE WALL DESIGNER. THIS SET OF PLANS IS FOR THE STRUCTURAL DESIGN OF THE VERDURA RETAINING WALL ONLY.
 - D. SURVEYOR SHALL PROVIDE AN EXHIBIT THAT SHOWS THE POINTS OF THE PROPOSED BOTTOM OF WALL ALIGNMENT TO ALLOW THE CONTRACTOR THE ABILITY TO CONFIRM THE BOTTOM OF WALL HAS BEEN CORRECTLY LOCATED.
- 3.03 LAYOUT
- A. VERIFY ALL STAKING AND FIELD ENGINEERING REQUIRED TO IMPLEMENT THE WORK AS SHOWN ON THE DRAWINGS.
 - B. PROTECT ALL STAKES AND BENCHMARKS. REPLACE ALL STAKES AND BENCHMARKS DAMAGED DURING THE COURSE OF CONSTRUCTION.
 - C. SET GRADE STAKES USING INSTRUMENT TECHNOLOGY, AT HORIZONTAL AND VERTICAL GRADE BREAKS, CORNERS, CURVES AND EVERY 25 FEET.
 - D. HAND TRIM EXCAVATIONS TO REQUIRED ELEVATIONS. CORRECT OVER-EXCAVATION WITH FILL MATERIALS APPROVED BY THE GEOTECHNICAL ENGINEER OF RECORD.
 - E. REMOVE LARGE STONES OR OTHER HARD MATTER WHICH WOULD DAMAGE PIPES OR IMPEDE CONSISTENT BACKFILLING OR COMPACTION.
 - F. PROVIDE ALL EQUIPMENT OF SUCH TYPE, FUNCTION, AND DESIGN AS REQUIRED TO ACHIEVE SPECIFIC VALUES. WHERE NECESSARY, PROVIDE RUBBER-TIRED AND VIBRATORY SHEEPSFOOT COMPACTION EQUIPMENT.
- 3.04 SUBSURFACE DRAINAGE SYSTEM INSTALLATION
- A. EXCAVATE TRENCHES FOR SUBSURFACE DRAINAGE SHOWN ON DRAWINGS OR AT LOWEST POINT POSSIBLE THAT CAN BE OUTLET.
 - B. LAY FILTER FABRIC IN BOTTOM OF EXCAVATION PRIOR TO PLACING DRAIN ROCK. PLACE MINIMUM 4-INCH-THICK BED OF DRAIN ROCK OVER FABRIC.
 - C. INSTALL AND JOIN PERFORATED 4" PVC PIPE AND PIPE FITTINGS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. INSTALL DRAINAGE PIPING WITH PERFORATIONS DOWN. JOIN PIPE ENDS AND CAP ANY FREE ENDS OF PERFORATED PIPE WITH SOLVENT CEMENT.
 - D. LAY PERFORATED 4" PVC PIPE TO SLOPE GRADIENTS OF THE WALL FOUNDATION.
 - E. SURROUND PERFORATED PIPE WITH DRAIN ROCK.
 - F. WRAP FILTER FABRIC AROUND DRAIN ROCK. COVER AND TUCK LOOSE EDGE BETWEEN AGGREGATE AND SOIL WITH 12" MINIMUM OVERLAP OF THE FABRIC.
 - G. EXTEND NON-PERFORATED 4" PVC DISCHARGE PIPES TO APPROVED OUTLET LOCATION AT LOCATIONS AS SHOWN ON DRAWINGS OR AT LOWEST POINT POSSIBLE WITH A MINIMUM 2% FALL TOWARDS OUTLET LOCATION.
 - H. PROVIDE TRENCHING, BEDDING, AND BACKFILL AS REQUIRED FOR OUTLET DRAINAGE PIPING. DO NOT DISPLACE OR DAMAGE PIPE WHEN COMPACTING.
- 3.05 EXCAVATION
- A. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. OWNER'S REPRESENTATIVE SHALL INSPECT THE EXCAVATION AND APPROVE PRIOR TO PLACEMENT OF LEVELING MATERIAL OR FILL SOILS. PROOF ROLL FOUNDATION AREA AS DIRECTED BY THE GEOTECHNICAL ENGINEER OF RECORD TO DETERMINE IF REMEDIAL WORK IS REQUIRED.
 - B. OVER-EXCAVATION AND REPLACEMENT OF UNSUITABLE FOUNDATION SOILS WITH APPROVED COMPACTED FILL SHALL BE DIRECTED BY THE GEOTECHNICAL ENGINEER OF RECORD.
- 3.06 MODULAR UNIT INSTALLATION
- A. FIRST COURSE OF UNITS SHALL BE PLACED ON APPROVED FOUNDATION SOILS OR LEVELING MATERIALS, AS DIRECTED BY THE GEOTECHNICAL ENGINEER OF RECORD, AT THE APPROPRIATE LINES AND GRADES. MODULAR UNITS SHALL BE USED FOR ALIGNMENT. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS AND ENSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE FOUNDATION SOILS AND PROPERLY SEATED.
 - B. UNITS SHALL BE PLACED ON THE FOUNDATION SOILS WITH A MAXIMUM DISTANCE OF 9 INCHES BETWEEN ADJACENT UNITS. THE SPACING BETWEEN UNITS INSTALLED IN CURVED REGIONS (CONCAVE OR CONVEX) MUST BE ADJUSTED ACCORDINGLY SUCH THAT THE RUNNING BOND LAYOUT IS MAINTAINED. VERTICALLY ADJACENT UNITS SHALL BE CENTERED ON UNITS ABOVE AND BELOW. ALL BLOCK LAYOUT AND PLACEMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 - C. MODULAR UNITS MAY BE INSTALLED HORIZONTALLY WITH RESPECT TO THE PROFILE WALL ALIGNMENT OR MAY BE MADE TO FOLLOW THE BOTTOM OF WALL CONTOURS ("RUN WITH THE GRADE"). WHERE BOTTOM OF WALL CONTOURS ARE USED TO SET THE FIRST ROW OF MODULAR BLOCKS, GRADES MAY NOT SLOPE MORE THAN 15% WITH RESPECT TO THE WALL PROFILE BASE.
 - D. PLACE UNIT FILL WITHIN THE BLOCK CELL AND LIGHTLY CONSOLIDATE VIA FOOT PRESSURE.
 - E. PLACE AND COMPACT REINFORCED AND RETAINED FILL BEHIND WALL UNITS.
 - F. SCREED EXCESS UNIT FILL (ROD-BOARD) OFF TO DEVELOP A FLAT BASE UPON WHICH SUBSEQUENT UNITS CAN BE POSITIONED. CLEAR NOTCH IN RAIL IF GEOSYNTHETIC IS REQUIRED.
 - G. FOLLOW WALL ERECTION AND UNIT FILL CLOSELY WITH REINFORCED FILL. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS PRIOR TO UNIT FILL AND REINFORCED/RETAINED FILL PLACEMENT AND COMPACTION SHALL NOT EXCEED ONE COURSE.
- 3.07 GEOSYNTHETIC SOIL REINFORCEMENT INSTALLATION
- A. GEOSYNTHETIC SOIL REINFORCEMENT SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.
 - B. GEOSYNTHETIC SOIL REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS, AND ELEVATIONS SHOWN ON THESE DRAWINGS. WHERE GEOSYNTHETIC PLACEMENT ELEVATIONS VARY FROM FACING UNIT INCREMENTS, GEOSYNTHETIC ELEVATIONS MAY BE ADJUSTED UP OR DOWN BY 4 INCHES MAXIMUM.
 - C. THE GEOSYNTHETIC SOIL REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS IN ACCORDANCE WITH THE DETAILS OF THESE PLANS AND SPECIFICATIONS. A TOLERANCE FROM FACE TO TAIL OF REINFORCEMENT OF 6" IN 10' IS ACCEPTABLE RELATIVE TO HORIZONTAL GEOSYNTHETIC ORIENTATION. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOSYNTHETIC SOIL REINFORCEMENT. THE GEOSYNTHETIC SOIL REINFORCEMENT SHALL BE LAID FLAT PRIOR TO BACKFILL PLACEMENT ON THE GEOSYNTHETIC SOIL REINFORCEMENT.
 - D. GEOSYNTHETIC SOIL REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF EMBEDMENT. SPLICED CONNECTIONS BETWEEN SHORTER PIECES OF GEOSYNTHETIC SOIL REINFORCEMENT WILL NOT BE PERMITTED.

- 3.08 REINFORCED BACKFILL PLACEMENT
- A. REINFORCED BACKFILL SHALL BE PLACED, SPREAD AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOSYNTHETIC SOIL REINFORCEMENT AND INSTALLATION DAMAGE.
 - B. REINFORCED SOIL BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED THE "RAIL HEIGHT" OF THE UNITS BEING PLACED. LIFT THICKNESSES SHALL BE DECREASED TO ACHIEVE THE REQUIRED DENSITY AS REQUIRED.
 - C. REINFORCED BACKFILL SHALL BE COMPACTED TO 90% RELATIVE COMPACTION AS DETERMINED BY ASTM D-1557. THE MOISTURE CONTENT OF THE BACKFILL MATERIAL PRIOR TO AND DURING COMPACTION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER.
 - D. ONLY LIGHTWEIGHT HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 1 FOOT FROM THE BACK OF THE MODULAR CONCRETE UNIT.
 - E. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY UPON THE GEOSYNTHETIC SOIL REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOSYNTHETIC SOIL REINFORCEMENT. TRACKED VEHICLE TURNING SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOSYNTHETIC SOIL REINFORCEMENT.
 - F. RUBBER TIRED EQUIPMENT SHALL PASS OVER GEOSYNTHETIC SOIL REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.
 - G. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM THE WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUN-OFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.
 - H. CARE SHOULD BE TAKEN DURING EXCAVATION FOR AND CONSTRUCTION OF THE V-DITCH AND ALL OTHER SURFACE IMPROVEMENTS ADJACENT TO THE WALL STRUCTURE TO PREVENT DAMAGE TO THE UPPER GEOGRID LAYER. IF THE GEOGRID LAYERS ARE DAMAGED, THEY NEED TO BE PROPERLY REPLACED.
- 3.09 EROSION CONTROL
- A. PROVIDE DUST AND EROSION CONTROL PER CIVIL PLANS.
- 3.10 AS-BUILT CONSTRUCTION TOLERANCES
- A. VERTICAL ALIGNMENT: ±1.5 INCHES OVER ANY 10 FT DISTANCE.
 - B. WALL BATTER: WITHIN 2 DEGREES OF DESIGN BATTER.
 - C. HORIZONTAL ALIGNMENT: ±1.5 INCHES OVER ANY 10 FT DISTANCE.
 - D. CORNERS, BENDS, CURVES: ±1 FT TO DESIGN LOCATIONS.
 - E. MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE 9 INCHES.
- 3.11 FIELD QUALITY CONTROL
- A. THE OWNER SHALL ENGAGE INSPECTION AND TESTING SERVICES, INCLUDING INDEPENDENT LABORATORIES, TO PROVIDE QUALITY ASSURANCE AND TESTING SERVICES DURING CONSTRUCTION. THIS DOES NOT RELIEVE THE CONTRACTOR FROM SECURING THE NECESSARY CONSTRUCTION CONTROL TESTING DURING CONSTRUCTION.
 - B. QUALIFIED AND EXPERIENCED TECHNICIANS AND ENGINEERS SHALL PERFORM TESTING AND INSPECTION SERVICES.
 - C. AS A MINIMUM, QUALITY CONTROL TESTING SHOULD INCLUDE FOUNDATION SOIL INSPECTION, SOIL AND BACKFILL TESTING, VERIFICATION OF DESIGN PARAMETERS, AND OBSERVATION OF CONSTRUCTION FOR GENERAL COMPLIANCE WITH DESIGN DRAWINGS AND SPECIFICATIONS.
 - D. FIELD QUALITY CONTROL SHALL BE PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD.
- 3.12 SPECIAL INSPECTION
- A. PER ICC-ES EVALUATION REPORT ESR-3073, SPECIAL INSPECTION DURING INSTALLATION MUST BE PROVIDED IN ACCORDANCE WITH THE 2019 CALIFORNIA BUILDING CODE (CBC) SECTIONS 1705.1.1, 1705.4 AND 1705.6. INSPECTION RESPONSIBILITIES INCLUDE VERIFYING THE FOLLOWING:
 - 1. BLOCK TYPE AND UNIT DIMENSIONS.
 - 2. VERIFICATION OF BLOCK UNIT FOR COMPLIANCE WITH ASTM C1372, INCLUDING COMPRESSIVE STRENGTH AND WATER ABSORPTION, AS DESCRIBED IN SECTION 3.2.1 OF ESR-3073.
 - 3. PRODUCT IDENTIFICATION, INCLUDING EVALUATION REPORT NUMBER (ESR-3073).
 - 4. FOUNDATION PREPARATION.
 - 5. VERDURA BLOCK UNIT PLACEMENT, INCLUDING PROPER ALIGNMENT AND INCLINATION WITHIN DESIGN TOLERANCES.
 - 6. PVC PIPE CONNECTIONS, INCLUDING INSTALLATION LOCATIONS, PROPER FIT WITHIN THE BLOCKS, AND INSTALLATION SEQUENCE WITH RESPECT TO THE GEOGRID PLACEMENT.
 - 7. GEOGRID REINFORCEMENT TYPE (SEE TABLES 2 AND 3 IN ESR-3073), LOCATION AND PLACEMENT.
 - 8. PLACEMENT OF APPROVED BACKFILL AND COMPACTION.
 - 9. DRAINAGE PROVISIONS.
 - B. SPECIAL INSPECTIONS MAY BE COMPLETED BY THE PROJECT ENGINEERS OR AN INDEPENDENT INSPECTION SERVICE.

TABLE 1 -- REFERENCED DOCUMENTATION:

- 1. ROUGH GRADING PLANS, PROJECT NAME, PREPARED BY COMPANY, DATED XX/XX/2022.
- 2. VERDURA WALL DESIGN PARAMETERS, PROJECT NAME, PREPARED BY COMPANY, DATED XX/XX/2022.
- 3. VERDURA RETAINING WALL DESIGN, PROJECT NAME, PREPARED BY COMPANY, DATED XX/XX/2022.

TABLE 2 -- VERDURA BLOCK PROPERTIES

UNIT TYPE, VERDURA	V40
UNIT SIZE, RAIL HEIGHT, IN.	8
UNIT SIZE, CROWN HEIGHT, IN.	10.75
UNIT SIZE, WIDTH, IN.	18.25
UNIT SIZE, DEPTH, IN.	12.25
WEIGHT, LBS.	89
BATTER = (DEGREES FROM VERTICAL)	14

TABLE 3 -- SOIL STRENGTH REQUIREMENTS

MATERIAL	SHEAR STRENGTH		UNIT WEIGHT (pcf)
	FRICTION ANGLE	COHESION (psf)	
REINFORCED/INFILL SOIL*	0	0	0
RETAINED/BACKFILL SOIL	0	0	0
FOUNDATION SOIL	0	0	0
SEISMICITY (%PGA)	.0g		

* REINFORCED/INFILL SOIL PER NOTE 2.05

TABLE 4 -- GEOSYNTHETIC REINFORCEMENT PROPERTIES

TENSILE STRENGTH (AT ULTIMATE)	MIRAGRID					
	TEST METHOD	UNIT	TEST			
			5XT	8XT	10XT	20XT
ASTM D6637	lbs/ft	4700	7400	9500	13705	20559
LONG TERM ALLOWABLE DESIGN LOAD	lbs/ft	2826	4449	5712	8240	12361



OWNER / DEVELOPER:

COMPANY
STREET
CITY, CA ZIP
TEL: (XXX) XXX-XXXX
CONTACT PERSON: NAME

GEOTECHNICAL ENGINEER:

COMPANY
STREET
CITY, CA ZIP
TEL: (XXX) XXX-XXXX
CONTACT PERSON: NAME

CIVIL ENGINEER:

COMPANY
STREET
CITY, CA ZIP
TEL: (XXX) XXX-XXXX
CONTACT PERSON: NAME