## CONSTRUCTION REQUIREMENTS FOR PLACEMENT OF TENSAR GEOGRIDS AND BACKFILL SOILS FOR TENSAR WELDED WIRE FORM REINFORCED RETAINING WALLS

- 1.0 <u>MATERIALS</u>
- 1.1 GEOGRID REINFORCEMENT SHALL BE TENSAR UNIAXIAL AND BIAXIAL GEOGRIDS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.
- 1.2 BODKIN BARS SHALL BE 4½" x ½" HDPE BARS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.
- 1.2.1 CONNECTION ROD SHALL BE 4'-6" x 3/8" ∅ (25% GLASS FILLED HDPE.)
- 1.3 GEOTEXTILE FABRIC SHALL BE 8 oz/SY (MIN.) NON-WOVEN, NEEDLE-PUNCHED POLYPROPYLENE WITH MIN. PERMITTIVITY OF 1.0 SEC-1.
- 1.4 BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 548 OF THE FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- 1.5 FACING SHALL BE PRE-FABRICATED BLACK STEEL WELDED WIRE FORMS TOGETHER WITH EITHER BIAXIAL GEOGRID WRAP OR OPTIONAL MECHANICAL CONNECTION SYSTEM. WIRE FORM GEOMETRY SHALL BE AS DETAILED IN THE CONSTRUCTION DRAWINGS.
- 1.6 TENSAR EARTH TECHNOLOGIES, INC. SHALL PROVIDE TO THE CONTRACTOR THE FOLLOWING MATERIALS ONLY:

WWF FACING FORMS AND STRUTS FILTER FABRIC GEOGRID GEOGRID CONNECTOR, AS APPLICABLE

- 2.0 TECHNICAL REQUIREMENTS
- 2.1 FILL MATERIALS SHALL BE PLACED FROM THE BACK OF THE WELDED WIRE FORMS TOWARDS THE ENDS OF THE GEOGRID TO ENSURE FURTHER TENSIONING.
- 2.2 WELDED WIRE FACING SHALL BE MONITORED FOR DEFORMATION AND COMPLIANCE TO FDOT STANDARD SPECIFICATIONS SECTION 548 DURING FILL PLACEMENT AND COMPACTION. COMPACTION EQUIPMENT AND OPERATION PROCEDURES MAY HAVE TO BE MODIFIED TO PREVENT EXCESSIVE DEFORMATION OF THE FLEXIBLE WELDED WIRE FACING.
- 2.3 TIE WIRES OR HOG RINGS MAY BE REQUIRED IF WWF FACING MOVES DURING BACKFILL OPERATIONS.
- 3.0 TENSAR GEOGRID PLACEMENT
- 3.1 TENSAR GEOGRID SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE SHOP DRAWINGS.
- 3.2 TENSAR GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTH(S). THE BODKIN CONNECTION SHALL NOT BE UTILIZED FOR SPLICING GEOGRID UNLESS PRE-APPROVED BY THE ENGINEER.
- 3.2.1 IF PRE-APPROVED, TENSAR UNIAXIAL GEOGRIDS MAY BE SPLICED UTILIZING THE BODKIN CONNECTION DETAIL. NO MORE THAN ONE SPLICE SHALL BE ALLOWED IN ANY ONE LENGTH OF REINFORCEMENT AND NO SPLICES SHALL BE ALLOWED FOR GEOGRIDS LESS THAN 6 FEET IN LENGTH (EACH). NO SPLICE SHALL BE PLACED HORIZONTALLY OR VERTICALLY ADJACENT TO ANOTHER SPLICE.

- 3.3 PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE PLACED TO LAY FLAT AND PULLED TAUT TO REMOVE SLACK IN THE GEOGRIDS.
- 3.4 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM BACKFILL THICKNESS OF 6 INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND/OR THE GEOGRID.
- 3.5 RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.
- 3.6 TENSAR UNIAXIAL GEOGRID SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WALL FACE. TENSAR BIAXIAL GEOGRID SHALL BE ROLLED OUT ALONG THE WALL FACE (MACHINE DIRECTION PARELLEL TO WALL FACE).
- 3.6.1 UNIAXIAL (UX) GEOGRIDS SHALL BE CUT NEXT TO THE CROSS-MACHINE DIRECTION (TRANSVERSE) BAR. BIAXIAL (BX) GEOGRIDS SHALL BE CUT NEXT TO THE MACHINE DIRECTION BAR (LONGITUDINAL RIB).
- 3.7 FOR THE BIAXIAL GEOGRID WRAP FACING OPTION, THE UNIAXIAL GEOGRIDS, SHALL BE CUT AND PLACED SO THAT A TRANSVERSE BAR IS EXTENDED TO THE VERTICAL LEG OF THE WELDED WIRE FORM.
- 3.8 A MINIMUM OF 3 INCHES OF FILL MATERIAL SHALL BE REQUIRED BETWEEN LAYERS OF BIAXIAL AND UNIAXIAL GEOGRIDS, UNLESS OTHERWISE SHOWN.
- 4.0 CHANGES TO GEOGRID LAYOUT OR PLACEMENT
- 4.1 NO CHANGES TO THE TENSAR GEOGRID LAYOUT, INCLUDING, BUT NOT LIMITED TO, LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT THE EXPRESS, WRITTEN CONSENT OF TENSAR EARTH TECHNOLOGIES, INC.
- 5.0 DRAINAGE
- 5.1 THE TENSAR REINFORCED WALL HAS BEEN DESIGNED ON THE ASSUMPTION THAT THE REINFORCED BACKFILL MATERIAL SHALL BE FREE OF SUBSURFACE SEEPAGE. PERMANENT SUBSURFACE WATER (SEEPAGE) COLLECTION AND DIVERSION SHALL BE THE RESPONSIBILITY OF OTHERS.
- 5.2 AT THE END OF EACH WORK DAY, THE BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE AT A MINIMUM OF 2 PERCENT SLOPE AND A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE WALL CREST TO PREVENT SURFACE WATER RUNOFF FROM OVERTOPPING THE WALL.
- 5.3 AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH WHEEL ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.
- 5.4 THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINAGE CONTROL AS NEEDED DURING CONSTRUCTION.

6.0 <u>DESIGN PARAMETERS</u>

6.1 <u>SOIL PARAMETERS</u>

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. IF SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL ARE PROVIDED IN THE WALL CONTROL DRAWINGS, THEN THE CONTRACTOR SHALL VERIFY THAT THE SOIL MATERIALS COMPLY WITH THOSE GIVEN PARAMETERS. IF SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL ARE NOT PROVIDED IN THE WALL CONTROL DRAWINGS, THEN THE CONTRACTOR SHALL PROVIDED SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL ARE NOT PROVIDED SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL TO BE UTILIZED IN THE CONSTRUCTION. THE VALUES OF FRICTION ANGLE, APPARENT COHESION AND UNIT WEIGHT SHALL BE SHOWN ON THE SHOP DRAWINGS.

6.2 DESIGN

THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, TENSAR EARTH TECHNOLOGIES, INC. IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR EXTERNAL STABILITY, GLOBAL STABILITY AND FOUNDATION.

- 6.2.1 FACTORS OF SAFETY:
- 6.2.1.1 INTERNAL STABILITY

MAXIMUM GEOGRID DESIGN STRENGTH MINIMUM FACTOR OF SAFETY FOR GEOGRID PULLOUT MINIMUM FACTOR OF SAFETY FOR SLIDING AT LOWEST GEOGRID	= 0.29 ULT = 1.5 = 1.5
GEOGRID-SOIL INTERACTION COEFFICIENT FOR: UXMSE GEOGRID	= 0.55 - 0.8
BX GEOGRID	= 0.8
PERCENT COVERAGE OF GEOGRID	= VARIES

6.2.1.2 SLIDING AND OVERTURNING:

MINIMUM FACTOR OF SAFETY FOR SLIDING = 1.5 MINIMUM FACTOR OF SAFETY FOR OVERTURNING = 2.0

SLIDING AND OVERTURNING ARE THE RESPONSIBILITY OF OTHERS. THE EVALUATION OF SLIDING AND OVERTURNING AND THEIR EFFECT ON THE TENSAR RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR SLIDING OR OVERTURNING.

6.2.1.3 GLOBAL STABILITY:

GLOBAL STABILITY INCLUDING SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS. THE EVALUATION OF GLOBAL STABILITY AND ITS EFFECT ON THE TENSAR RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR GLOBAL STABILITY.

6.2.1.4 FOUNDATION:

FOUNDATION, INCLUDING FOUNDATION PREPARATION AND THE EVALUATION OF BEARING CAPACITY, TOTAL AND DIFFERENTIAL SETTLEMENT ARE THE RESPONSIBILITY OF OTHERS. SETTLEMENT AND ITS EFFECT ON THE TENSAR RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILTY FOR FOUNDATION.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO <u>THE TENSAR CORPORATION</u> 1210 CITIZENS PARKWAY, MORROW GA, 30260, ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN, THIS DRAIMING IS BEING FURNISHED FOR USE ON THIS SPECIFIC PROJECT ONLY, ANY PARTY ACCEPTING THIS DOCUMENT DOES SO IN CONFIDENCE AND AGREES THAT IT SHALL NOT BE DUPICICATED WHOLE OR IN PART, NOR DISCLOSED TO OTHERS, WITHOUT THE CONSENT OF <u>TENSAR EARTH TECHNOLOGIES, INC</u>

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ensor Earth Technologies, Inc. 5883 Glenridge Drive, Ste 200 Atlanta, Georgia 30328 (404) 250-1290

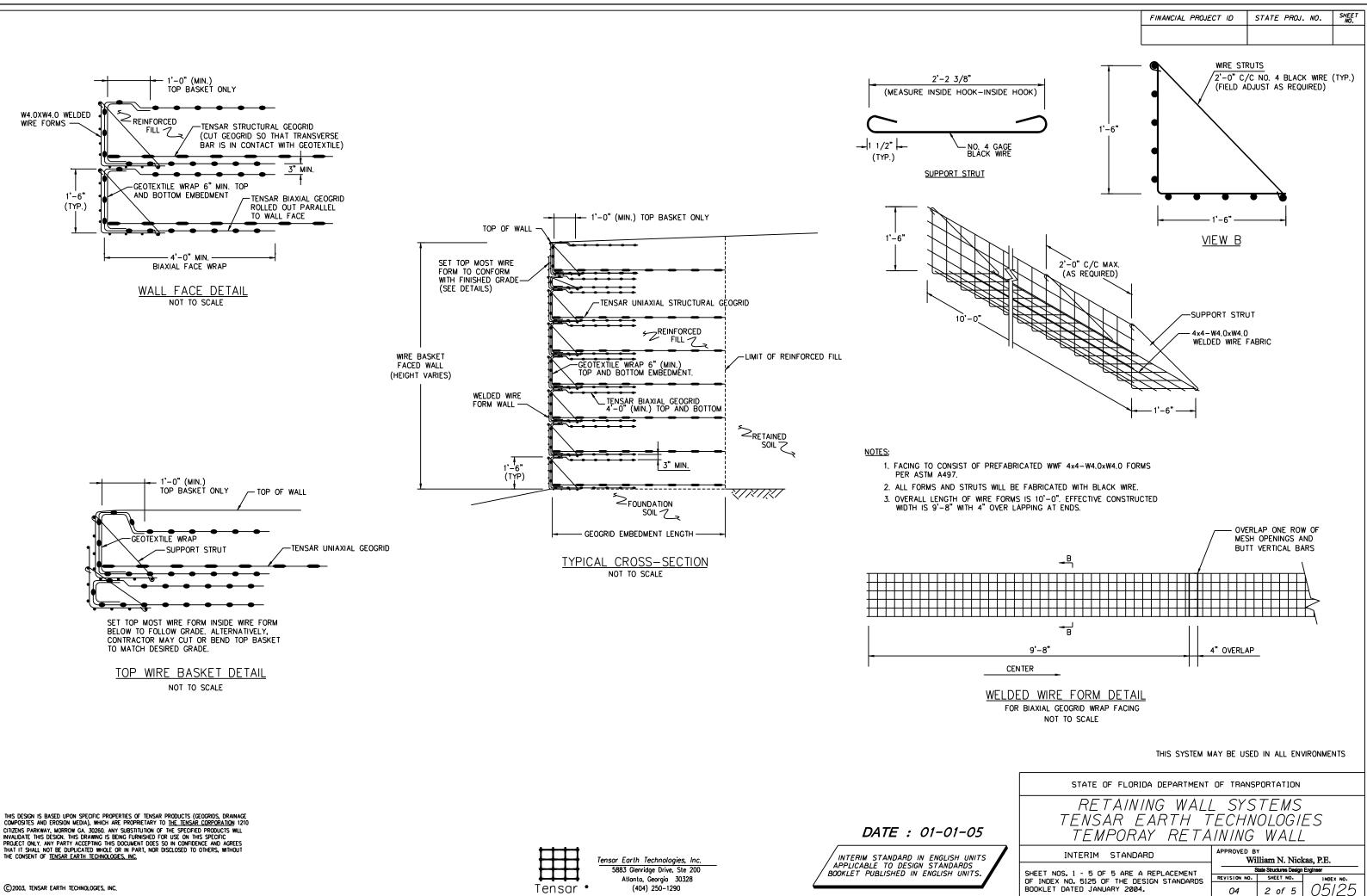
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7.0	SPECIAL PROVI	SIONS		
7.1	PROPOSED STR	N VIEWS AND LOCATIONS, AND ( LUCTURES MUST BE VERIFIED BY ION OF THE SHOP DRAWINGS.		
7.2	INTERPRETATIC SUITABILITY OF	TECHNOLOGIES, INC. ASSUMES DN OR VERIFICATION OF SUBSUR SOIL DESIGN PARAMETERS AND ROUNDWATER CONDITIONS.	FACE CONDITIONS,	
7.3	PARAMETERS C	TO STRUCTURE GEOMETRY OR IN THE WALL CONTROL DRAWIN( EDESIGN MODIFICATIONS PRIOR I.	GS OR SHOP DRAWINGS	
7.4	FOR REVIEWING SHOWN ON THE REPRESENTATI	DURING CONSTRUCTION, THE CO 3 AND VERIFYING THAT THE ACT 5 SHOP DRAWINGS. THE OWNER VE SHALL BE ONSITE TO ASSURE 1 NOTES ARE FOLLOWED.	UAL SITE CONDITIONS ARE OR OWNER'S	
7.5		N PARAMETERS SHOWN ON THE E CONTRACTOR PRIOR TO CONS		BE
7.6		DRAWINGS, FDOT STANDARD SPI SIONS FOR ADDITIONAL REQUIRI		ст
7.7	RETAINING WAL	TENSAR EARTH TECHNOLOGIES L SYSTEM INSTALLATION GUIDE NG WALL CONSTRUCTION.		Г

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION					
RETAINING WALL SYSTEMS TENSAR EARTH TECHNOLOGIES TEMPORAY RETAINING WALL					
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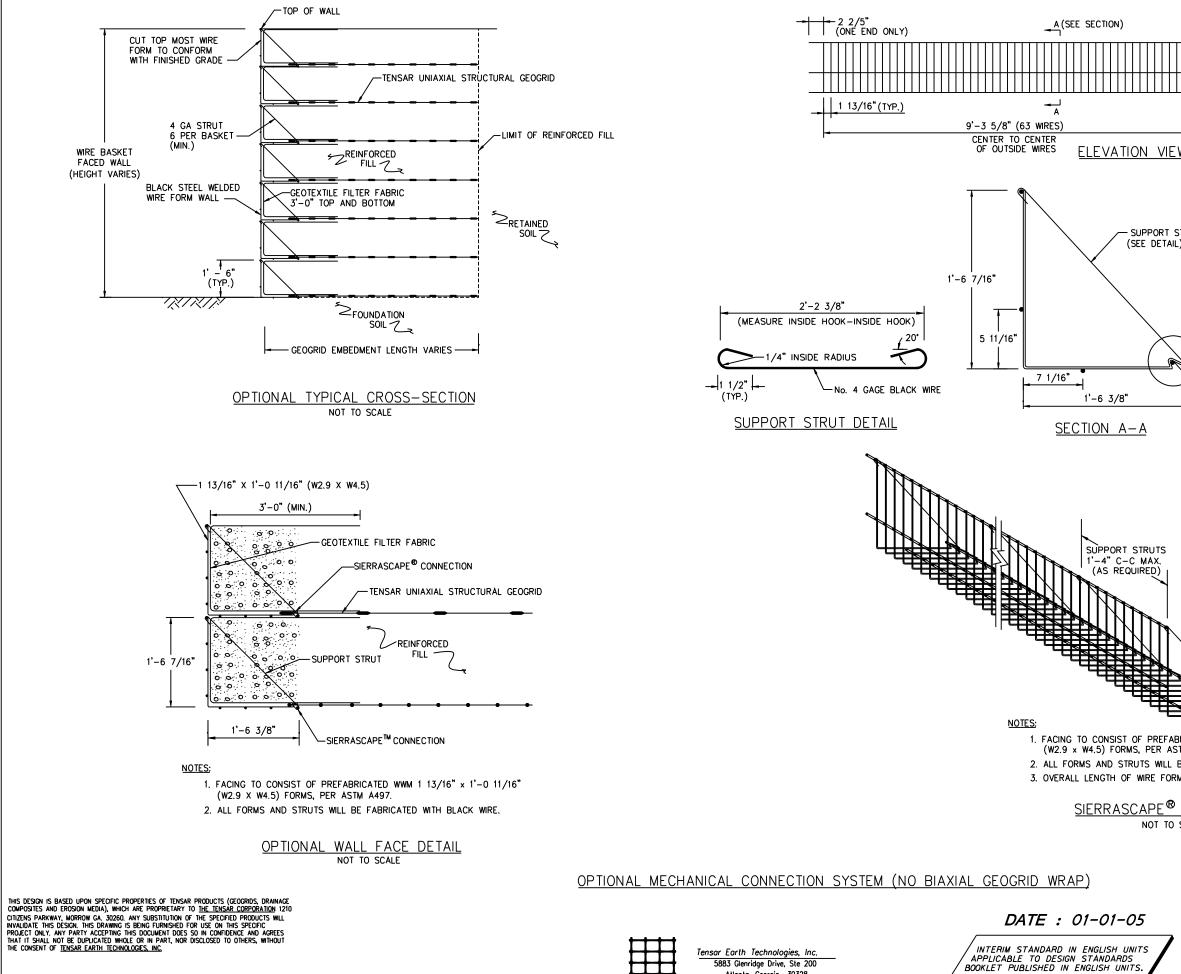


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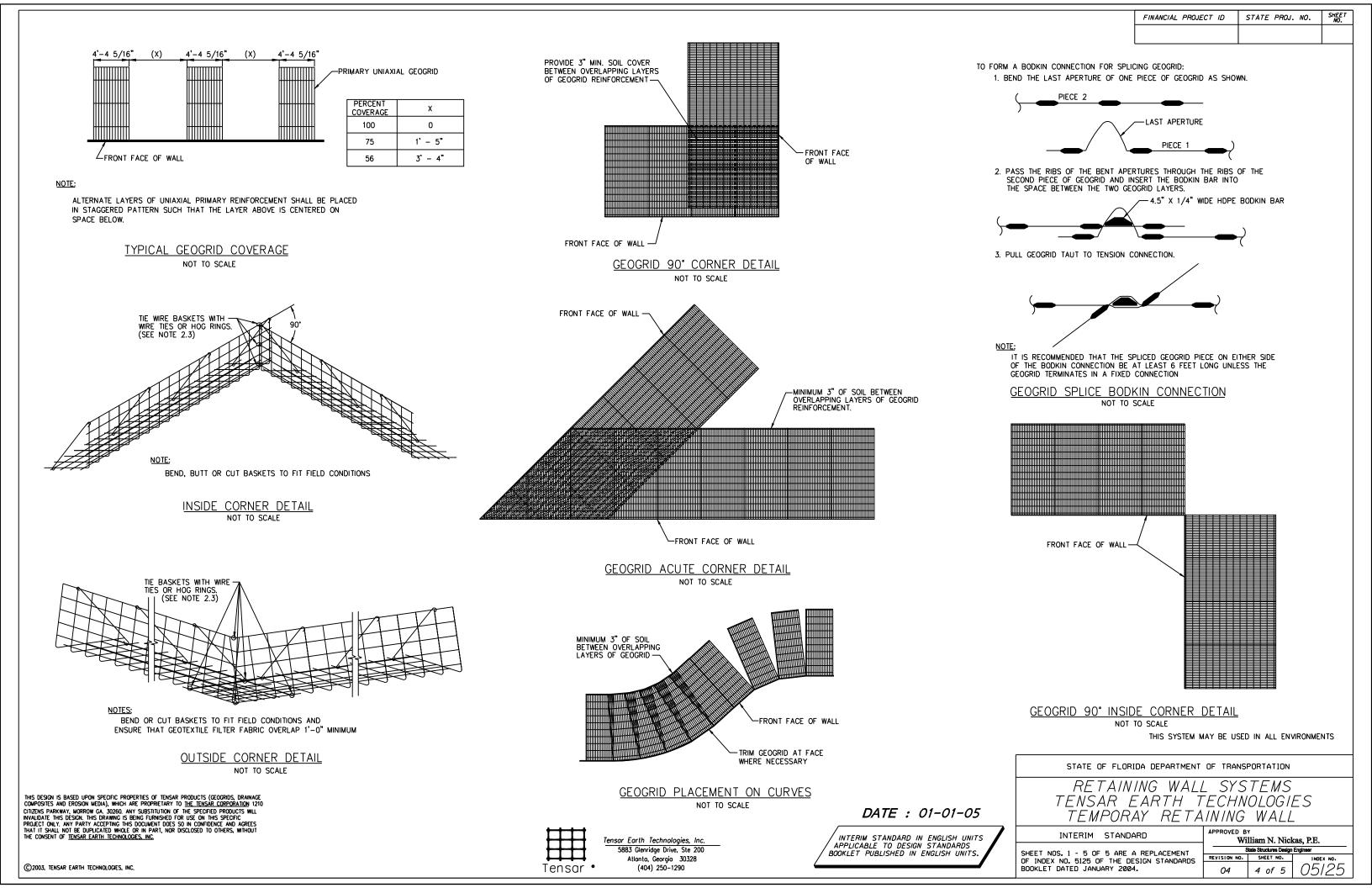
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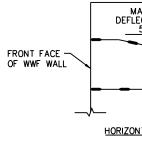


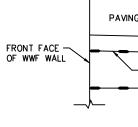
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## SUPER-ELEVATED

NOTE: CONTRACTOR IS RESPONS AVOID CONFLICT WITH THE MUST BE SEPARATED FRO

GEOGRID PLACEMENT AT

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA. 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN. THIS DRAWING IS BEING FURNISHED FOR USE ON THIS SPECIFIC PROJECT ONLY. ANY PARTY ACCEPTING THIS DOCUMENT DOES SO IN COMPIDENCE AND AGREES THAT IT SHALL NOT BE DUPLICATED WHOLE OR IN PART, NOR DISCLOSED TO OTHERS, WITHOUT THE CONSENT OF TENSAR EARTH TECHNOLOGIES, INC. 2'-0" (MIN.)

GEOTEXTILE WRAP 2'-0" MIN. TOP -AND BOTTOM EMBEDMENT

TOP OF WELDED-WIRE FORM-

-TRAFFIC BARRIER

- TOP OF PAVEMENT (TOP OF WALL)

1'-0" MAX. -

(BY OTHERS)

- TENSAR BIAXIAL GEOGRID

TYPICAL DETAIL FOR TOP OF

WALL WITH FLEXIBLE PAVEMENT

NOT TO SCALE

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