

CONSTRUCTION NOTES

1.0 MATERIALS

1.1 BACKFILL SOILS / DRAINAGE STONE

1.1.1 REINFORCED BACKFILL MATERIAL SPECIFIED BELOW SHALL BE FREE DRAINING, REINFORCED BACKFILL MATERIALS SHALL BE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE AND SHALL MEET THE PHYSICAL PROPERTY REQUIREMENTS DEFINED IN SECTION 6.0. THE REINFORCED BACKFILL MATERIAL SHALL BE CRUSHED ANGULAR STONE MEETING THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING
2 inch	100
1 inch	30-100
3/4 inch	10-70
1/2 inch	0-40
No. 4	0-10

1.1.2 ON-SITE FILL

ON-SITE FILL MATERIAL SHALL BE ON-SITE OR IMPORTED COMPRESSIBLE SOIL CLASSIFIED PER THE UNIFIED SOIL CLASSIFICATION SYSTEM AS LOW PLASTICITY (MAX PI=25), COMPACTED TO 95% STD. PROCTOR DENSITY.

1.2 THE PORTION OF THE REINFORCED BACKFILL MATERIAL PASSING THE No. 40 SIEVE SHALL HAVE A LIQUID LIMIT OF LESS THAN 40 AND A PLASTICITY INDEX OF LESS THAN 20. REINFORCED BACKFILL MATERIAL SHALL BE CLASSIFIED PER THE UNIFIED SOIL CLASSIFICATION SYSTEM AS LOW PLASTICITY OR NON-PLASTIC SOILS.

1.3 GEOTEXTILE REINFORCING SHALL BE TENSAR UX1400 UNIAXIAL GEOTEXTILE AS MANUFACTURED BY THE TENSAR CORPORATION. DESIGNS PRESENTED HEREIN ARE VALID FOR TENSAR GEOTEXTILES OR ENGINEER APPROVED EQUAL.

1.4 WALL FACING SHALL BE CHOPPED LIMESTONE BLOCK.

1.5 GEOTEXTILE FABRIC SHALL BE MIRAFI 140N OR APPROVED EQUAL.

1.6 REINFORCING BARS SHALL BE ASTM A615, GRADE 60.

1.7 MORTAR SHALL BE IN ACCORDANCE WITH THE CITY OF AUSTIN SPEC. 403S.

1.8 CONSTRUCTION ADHESIVE SHALL BE SHEP POXY AS MANUFACTURED BY SHEPLER'S PERFORMANCE PRODUCTS OR APPROVED EQUAL.

2.0 TECHNICAL REQUIREMENTS

2.1 PRIOR TO CONSTRUCTION OF THE GEOTEXTILE REINFORCED WALL, THE CONTRACTOR SHALL CLEAR AND GRUB THE REINFORCED BACKFILL ZONE, REMOVING TOPSOILS, BRUSH, SOD OR OTHER ORGANIC OR DELETERIOUS MATERIALS. ANY UNSUITABLE SOILS SHALL BE OVER-EXCAVATED, REPLACED AND COMPACTED WITH REINFORCED BACKFILL MATERIAL TO PROJECT SPECIFICATIONS OR AS OTHERWISE DIRECTED BY THE OWNER'S GEOTECHNICAL ENGINEER.

2.2 BACKFILL MATERIALS SHALL BE PLACED FROM THE BACK OF THE BLOCK FACING UNITS TOWARDS THE TAIL OF THE GEOTEXTILE TO ENSURE FURTHER TENSIONING.

2.3 REINFORCED BACKFILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 8 INCHES IN UNCOMPACTED THICKNESS.

2.4 ONLY HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN THREE FEET OF THE BACK FACE OF WALL. COMPACTION SHALL BE ACHIEVED BY A LIGHTWEIGHT MECHANICAL TAMPER, ROLLER OR VIBRATORY SYSTEM. CARE SHALL BE EXERCISED DURING THE COMPACTION PROCESS TO AVOID MISALIGNMENT OF THE BLOCK UNITS.

2.5 REINFORCED BACKFILL MATERIAL DOES NOT REQUIRE DENSITY TESTING. COMPACTION FOR THIS TYPE OF MATERIAL SHALL CONTINUE UNTIL THERE IS NO EVIDENCE OF FURTHER COMPACTION, OR AS DIRECTED BY THE OWNER'S GEOTECHNICAL ENGINEER. SHOULD THE SUBGRADE, FOR ANY REASON OR CAUSE, LOSE THE REQUIRED STABILITY OR FINISH, IT SHALL BE RECOMPACTED AND REFINISHED AT THE CONTRACTOR'S EXPENSE.

2.6 THE CONTRACTOR SHALL HAVE AN APPROVED SET OF CONSTRUCTION DRAWINGS AND CONTRACT SPECIFICATIONS ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE RETAINING WALL.

3.0 GEOGRID PLACEMENT

3.1 GEOGRID SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS.

3.2 GEOGRID EMBEDMENT LENGTH (EL) SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS. REINFORCED BACKFILL ZONE LENGTH IS MEASURED FROM THE FRONT FACE OF THE WALL EXTENDING TO THE TAIL OF THE GEOGRIDS.

3.3 GEOGRID REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THE DESIGNATED EMBEDMENT LENGTH(S).

3.4 THE CONNECTION OF THE GEOGRID TO THE BLOCK SHALL BE A POSITIVE-MECHANICAL CONNECTION.

3.5 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF SIX 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.

3.6 RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

3.7 UNIAXIAL GEOGRID SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WALL FACE.

3.8 UNIAXIAL GEOGRIDS SHALL BE CUT NEXT TO THE CROSS-MACHINE DIRECTION BAR. THE CROSS-MACHINE DIRECTION BAR SHALL BE PLACED AND PULLED TAUT PRIOR TO FILL PLACEMENT.

3.9 A MINIMUM OF 3 INCHES OF FILL MATERIAL SHALL BE REQUIRED BETWEEN LAYERS OF UNIAXIAL GEOGRID AND FILTER FABRIC UNLESS OTHERWISE SHOWN.

3.10 NO CHANGES TO THE GEOGRID LAYOUT INCLUDING, BUT NOT LIMITED TO LENGTH, GEOGRID TYPE OR ELEVATION SHALL BE MADE WITHOUT THE EXPRESSED PRIOR WRITTEN CONSENT OF GEOSOLUTIONS INC.

4.0 BLOCK PLACEMENT

4.1 THE ALLOWABLE HORIZONTAL AND VERTICAL TOLERANCE FOR THE ERECTION OF THE WALLS SHALL BE LIMITED TO 1.5 INCH IN 10.0 FEET OF LENGTH OR HEIGHT.

5.0 DRAINAGE

5.1 FOR WALLS NOT INCORPORATING FREE-DRAINING CRUSHED STONE BACKFILL, THE BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE 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. GRADING SHALL BE PERFORMED AT THE END OF EACH WORK DAY.

5.2 AT THE END OF EACH WORKDAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH WHEEL ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.

5.3 PERMANENT SURFACE WATER DIVERSION AND/OR COLLECTION SHALL BE AS REQUIRED AND PROVIDED BY THE OWNER OR OWNER'S REPRESENTATIVE.

5.4 THE RETAINING WALL HAS BEEN DESIGNED ON THE ASSUMPTION THAT THE REINFORCED BACKFILL MATERIAL SHALL BE FREE OF SUBSURFACE DRAINAGE OF WATER (SEEPAGE). IF GROUND WATER IS ENCOUNTERED, GEOSOLUTIONS INC. SHALL BE CONTACTED IMMEDIATELY.

5.5 CARE SHALL BE TAKEN NOT TO CONTAMINATE THE GEOTEXTILE FABRIC AND/OR DRAINAGE STONE WITH FINE-GRAINED SOILS OR OTHER DELETERIOUS MATERIALS.

6.0 DESIGN PARAMETERS

6.1 DESIGN OF THE RETAINING WALLS IS BASED ON THE FOLLOWING PARAMETERS:

	EFFECTIVE FRICTION ANGLE	EFFECTIVE COHESION	MOIST UNIT WT
REINFORCED BACKFILL	34°	0 pcf	125 pcf
RETAINED SOILS	28°	0 pcf	125 pcf
FOUNDATION SOILS	28°	0 pcf	125 pcf

6.2 FACTORS OF SAFETY:

6.2.1 INTERNAL STABILITY:	DESIGN	FHWA
MINIMUM FACTOR OF SAFETY FOR UNCERTAINTIES	= 1.5	= 1.5
MINIMUM FACTOR OF SAFETY FOR GEOGRID PULLOUT	= 1.5	= 1.5
MINIMUM FACTOR OF SAFETY FOR SLIDING AT LOWEST GEOGRID	= 1.5	= 1.5
SOIL-GEOGRID INTERACTION COEFFICIENT	= 0.7	
PERCENT COVERAGE OF GEOGRID	= 100	
6.2.2 EXTERNAL STABILITY:		
MINIMUM FACTOR OF SAFETY FOR SLIDING AT BASE	= 1.5	= 1.5
MINIMUM FACTOR OF SAFETY FOR OVERTURNING	= 2.0	= 2.0
SURCHARGE LOADING	= 250 psf	

7.0 SPECIAL PROVISIONS

7.1 THE DESIGN PRESENTED HEREIN IS BASED ON SOIL PARAMETERS, FOUNDATION CONDITIONS, GROUNDWATER CONDITIONS, AND LOADINGS STATED IN SECTION 6.0.

7.2 LOCATIONS AND GEOMETRY OF EXISTING STRUCTURES AND GRADE ABOVE AND BELOW THE WALLS MUST BE VERIFIED BY THE OWNER OR OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.

7.3 THE OWNER OR OWNER'S REPRESENTATIVE IS RESPONSIBLE FOR REVIEWING AND VERIFYING THAT THE ACTUAL SITE CONDITIONS ARE AS DESCRIBED IN SECTION 6.0 PRIOR TO AND DURING CONSTRUCTION. THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE ON-SITE TO ASSURE THE PROVISIONS IN THE CONSTRUCTION NOTES ARE FOLLOWED.

7.4 THE SOIL DESIGN PARAMETERS STATED IN SECTION 6.0 ARE THE RESPONSIBILITY OF GEOSOLUTIONS, INC. THE OWNER OR OWNER'S REPRESENTATIVE SHALL CONTACT GEOSOLUTIONS INC. IF THE SOILS ENCOUNTERED APPEAR TO VARY FROM THOSE ENCOUNTERED AT THE BEGINNING OF CONSTRUCTION.

7.5 IF ANY ROCK FORMATIONS AND/OR GROUNDWATER ARE ENCOUNTERED DURING THE CONSTRUCTION OF THIS WALL, IMMEDIATELY CONTACT THE OWNER OR OWNER'S REPRESENTATIVE.

7.6 ANY REVISIONS TO DESIGN PARAMETERS STATED IN SECTION 6.0 OR STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

7.7 THIS DESIGN IS VALID ONLY FOR THE SONGHAI AT WESTGATE PROJECT, AUSTIN, TEXAS.

8.0 OWNER'S RESPONSIBILITIES

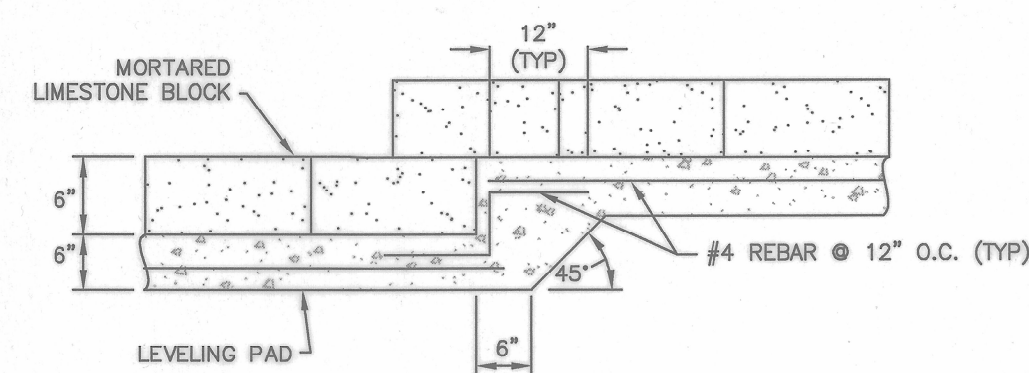
8.1 OWNER SHALL BE RESPONSIBLE FOR CONFIRMING THAT ALL REQUIREMENTS SET FORTH ON THESE DRAWINGS ARE MET. ASSIGNMENT OR DELEGATION OF RESPONSIBILITIES BY OWNER TO OWNER'S REPRESENTATIVE SHALL NOT RELIEVE OWNER OF RESPONSIBILITY OF CONFIRMING THAT ALL REQUIREMENTS SET FORTH HEREIN ARE MET.

8.2 OWNER (OR OWNER-DESIGNATED REPRESENTATIVES) RESPONSIBILITIES, AS DESCRIBED IN PREVIOUS SECTIONS OF THESE NOTES, SHALL INCLUDE:

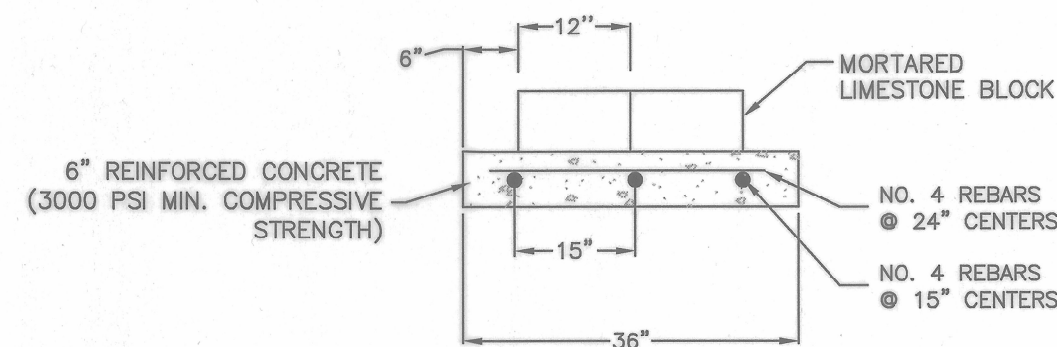
8.2.1 PERMANENT SURFACE WATER DIVERSION (SECTION 5.0).

8.2.2 CONFIRMATION OF GEOMETRY AND LOADING CONDITIONS FOR AREAS ADJACENT TO WALL (SECTION 7.0).

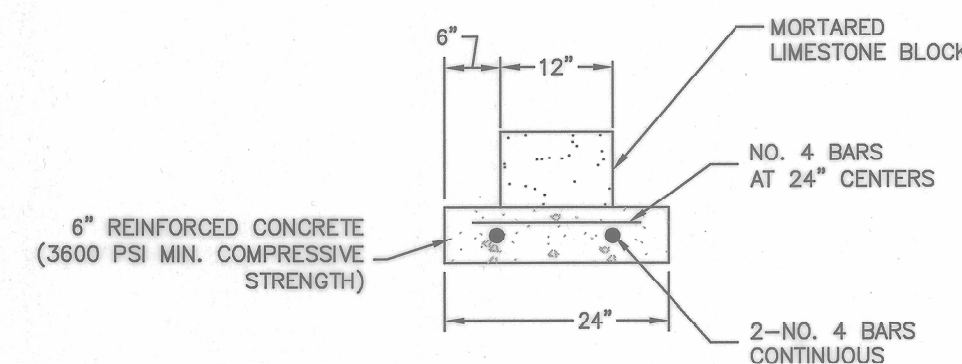
8.2.3 ASSURING CONFORMITY WITH CONSTRUCTION DRAWINGS AND NOTES DURING CONSTRUCTION BY ON-SITE INSPECTION (SECTION 7.0).



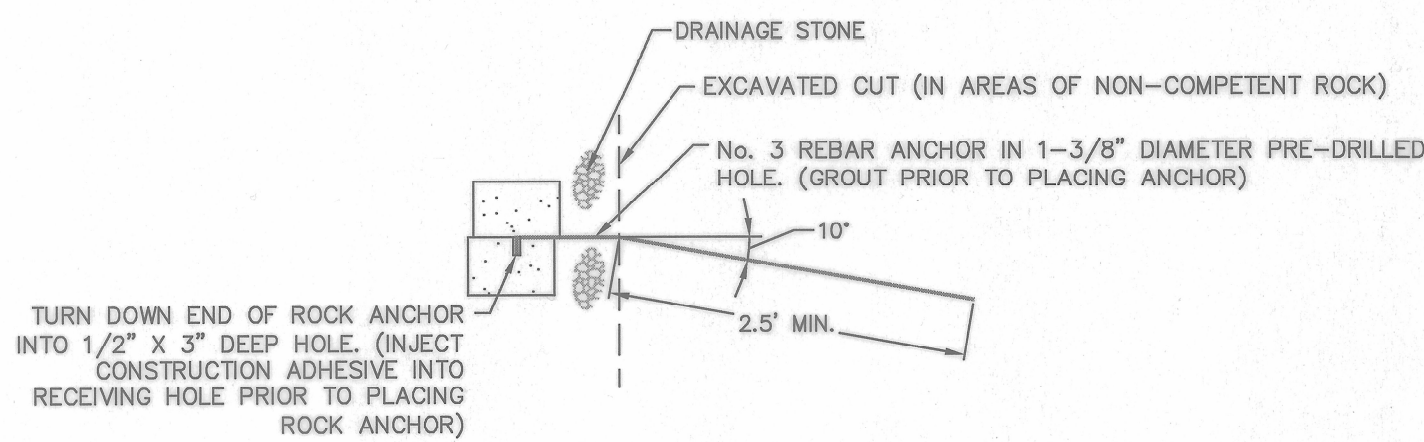
TYPICAL SMALL LIMESTONE BLOCK MSE WALL
LEVELING PAD STEP DETAIL
N.T.S.



GRAVITY WALL LEVELING PAD DETAIL - 2 BLOCKS
N.T.S.



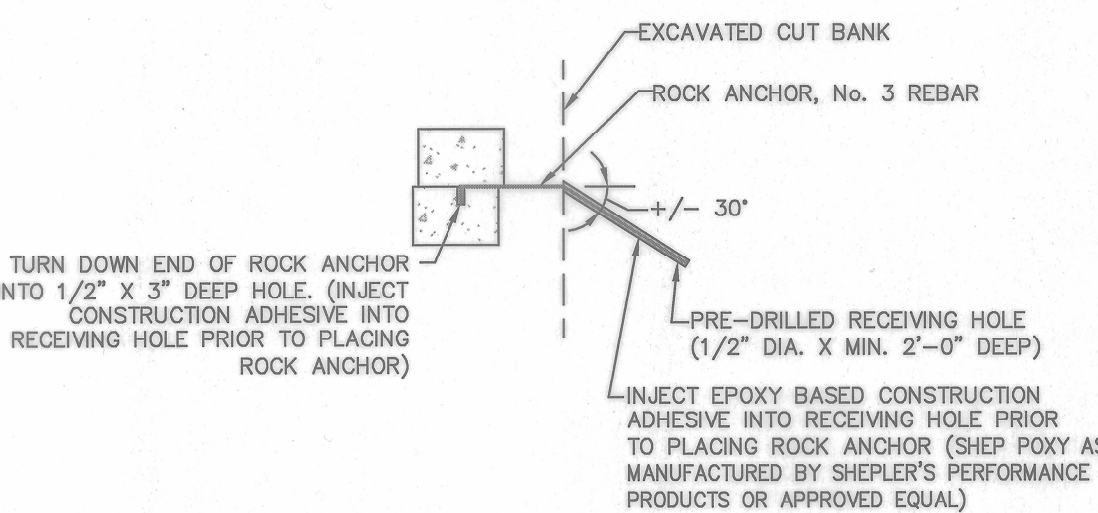
TYPICAL SMALL LIMESTONE BLOCK MSE WALL
LEVELING PAD DETAIL
N.T.S.



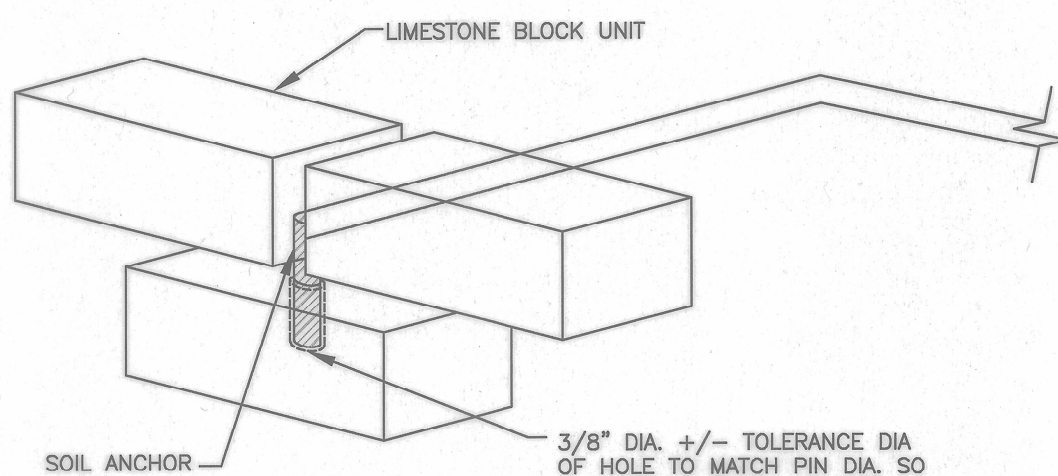
NOTE: GROUT SHALL CONSIST OF A PUMPABLE MIXTURE OF TYPE I, II OR III PORTLAND CEMENT, SAND, WATER AND ADMIXTURES. GROUT SHALL MEET ASTM C-150 WITH 3500 PSI, 7 DAY COMPRESSIVE STRENGTH.

LIMESTONE BLOCK TO NON-COMPETENT ROCK CUT
CONNECTION DETAIL
N.T.S.

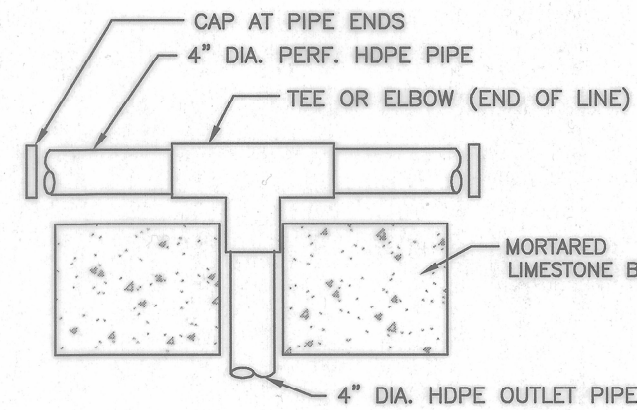
THIS DETAIL TO BE USED IN AREAS OF NON-COMPETENT ROCK, ONLY WITH PRIOR APPROVAL OF DESIGN ENGINEER AFTER VISUAL INSPECTION OF AREA IN QUESTION.



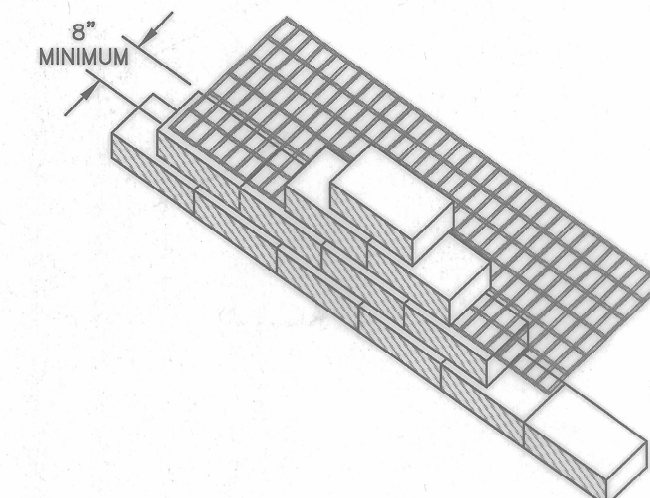
LIMESTONE BLOCK TO CUT BANK
CONNECTION DETAIL (ROCK ANCHOR)
N.T.S.



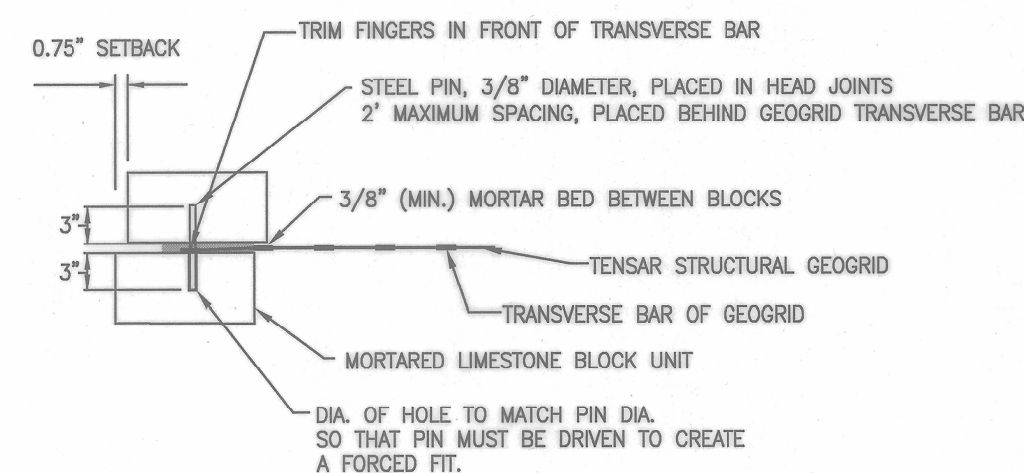
ISOMETRIC VIEW
N.T.S.



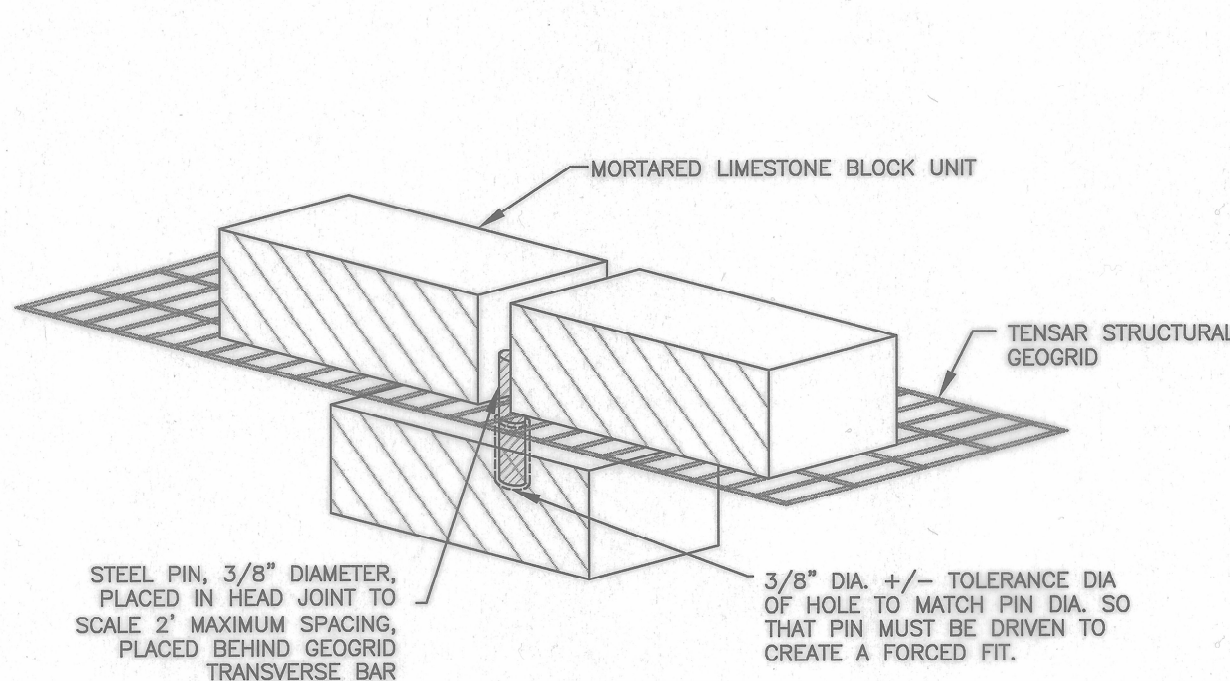
SUBDRAIN PIPE OUTLET DETAIL
N.T.S.



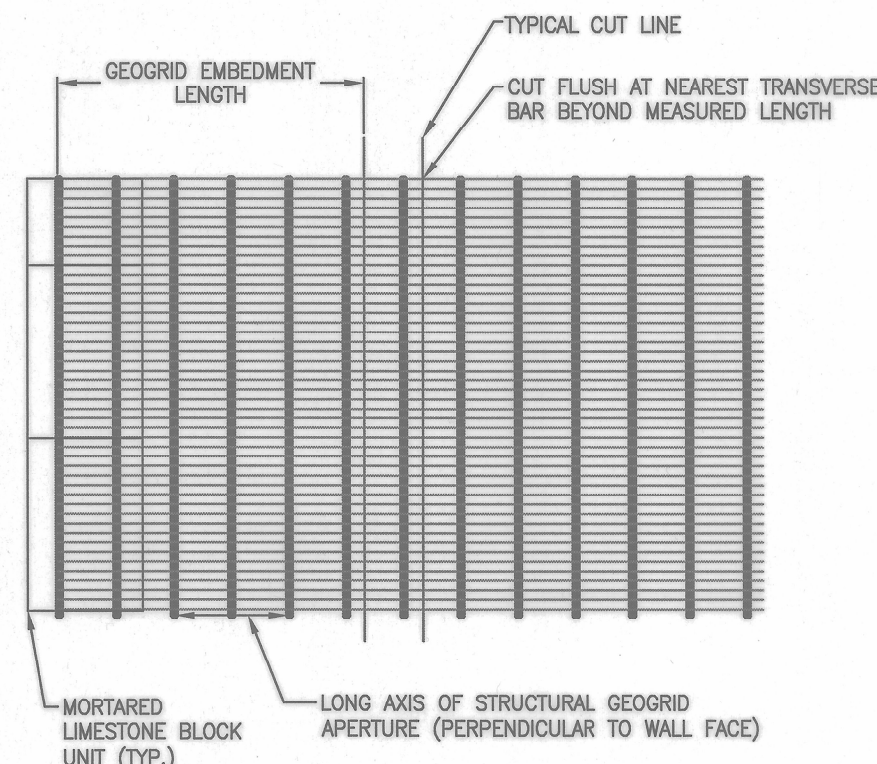
LIMESTONE BLOCK UNIT AND
GEOGRID CONNECTION DETAIL
N.T.S.



NATURAL LIMESTONE BLOCK TO
GEOGRID CONNECTION DETAIL
N.T.S.



ISOMETRIC VIEW
N.T.S.



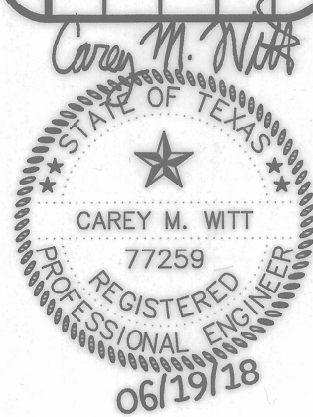
GEOGRID ORIENTATION DETAIL
N.T.S.

FOR CITY USE ONLY:

SITE PLAN APPROVAL Sheet _____ of _____
FILE NUMBER: SP-2017-0503C.SH APPLICATION DATE: DECEMBER 11, 2017
APPROVED BY COMMISSION ON: FINAL UNDER SECTION 118 OF
CHAPTER 26-6 OF THE CITY OF AUSTIN CODE.
EXPIRATION DATE (26-6-81.LDO) 12/11/22 CASE MANAGER: S. BAYE
PROJECT EXPIRATION DATE (ORD.#070908-A) _____ DWPZ _____ DDZ _____
Director, Development Services Department
RELEASED FOR GENERAL COMPLIANCE: _____ ZONING: MF-3
Rev. 1 _____ Correction 1 _____
Rev. 2 _____ Correction 2 _____
Rev. 3 _____ Correction 3 _____
FINAL PLAN MUST BE RECORDED BY THE PROJECT EXPIRATION DATE, IF APPLICABLE. SUBSEQUENT SITE PLANS WHICH DO NOT COMPLY WITH THE CODE CURRENTLY AT THE TIME OF FILING, AND ALL REQUIRED BUILDING PERMITS AND/OR A NOTICE OF CONSTRUCTION (IF A BUILDING PERMIT IS NOT REQUIRED), MUST ALSO BE APPROVED PRIOR TO THE PROJECT EXPIRATION DATE.

SP-2017-0503C.SH

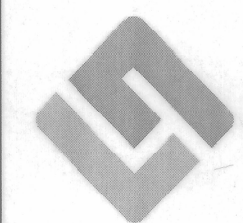
REVISIONS



PATHWAYS AT GOODRICH PLACE
RETAINING WALLS
AUSTIN, TEXAS

TYPICAL CROSS-SECTIONS, DETAILS & NOTES

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GEOSOLUTIONS

Scale: NOT TO SCALE

Date: 06/19/18

Drawn by: JY

Project No.: GS18053

SHEET

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OF 57