Stan Redford, President
P.O. Box 1065
Raymore, MO 64083

Certified D/MBE

REDFORD CONSTRUCTION

Phone: 816-540-2030
www.redfordconstruction.com
Fax: 816-540-3071

MATERIAL SUBMITTAL

PROJECT: Manor at Stoney Creek 2nd Plat
Lee's Summit, MO

DATE: 11/13/2017

TO: City of Lee's Summit, MO
220 SE Green St.
Lee's Summit, MO 64063

RE: Street Subgrade
Base Rock / Geogrid

ATTN: Brice Lawson

PROJECT #: 37-43

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Samples	☐ Approval	☐ Approved as Noted
☐ Shop Drawings	■ **As Requested**	☐ Approved as Submitted
■ **Specifications**	☐ Review and Comment	☐ Resubmit
☐ Concrete Mix Designs	☐ Your Use	☐ Returned for Corrections
☐ Other: Product Data Sheets	☐ Other:	☐ Other:

SUBMITTAL #	SPECIFICATION SECTION	DESCRIPTION OF PRODUCT AND MANUFACTURER
		MODOT Type 5 Base Rock - Martin Marietta
13	City of Lee's Summit	Geogrid - Tensar

CC: Job File

Signed: Thomas Hudgens

Randy Spalding
Excavating, Inc.
P. O. Box 1421
Raymore, MO 64083
816-318-9500
816-318-8405 (fax)

To:	Thomas	**Fax:**	(816) 540-3017
From:	Marc Cook	**Date:**	11/13/17
Re:		**Pages:**	including this page 3
CC:			

☐ **Urgent** X **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Thomas,

Please find the attached submittal for the Type 5 basrock and the Geogrid

Thanks,
Marc

PROCTOR TEST REPORT

Curve No.: 1 of 1

Project No.: 16-143T **Date:** 12/15/2016

Project: MARTIN MARIETTA - GREENWOOD Quarry Testing

Client: MARTIN MARIETTA

Location: Greenwood Quarry -Winterset Ledge

Sample Number: Type 5 2005

Remarks:

MATERIAL DESCRIPTION

Description: Crushed limestone with fines (Type 5 2005)

Classifications - **USCS:** GP-GC **AASHTO:** A-1-a

Nat. Moist. =

Liquid Limit = 21

Sp.G. =

Plasticity Index = 5

% < No.200 = 10.3 %

ROCK CORRECTED TEST RESULTS	UNCORRECTED
Maximum dry density = 132.9 pcf	129.7 pcf
Optimum moisture = 7.8 %	8.9 %

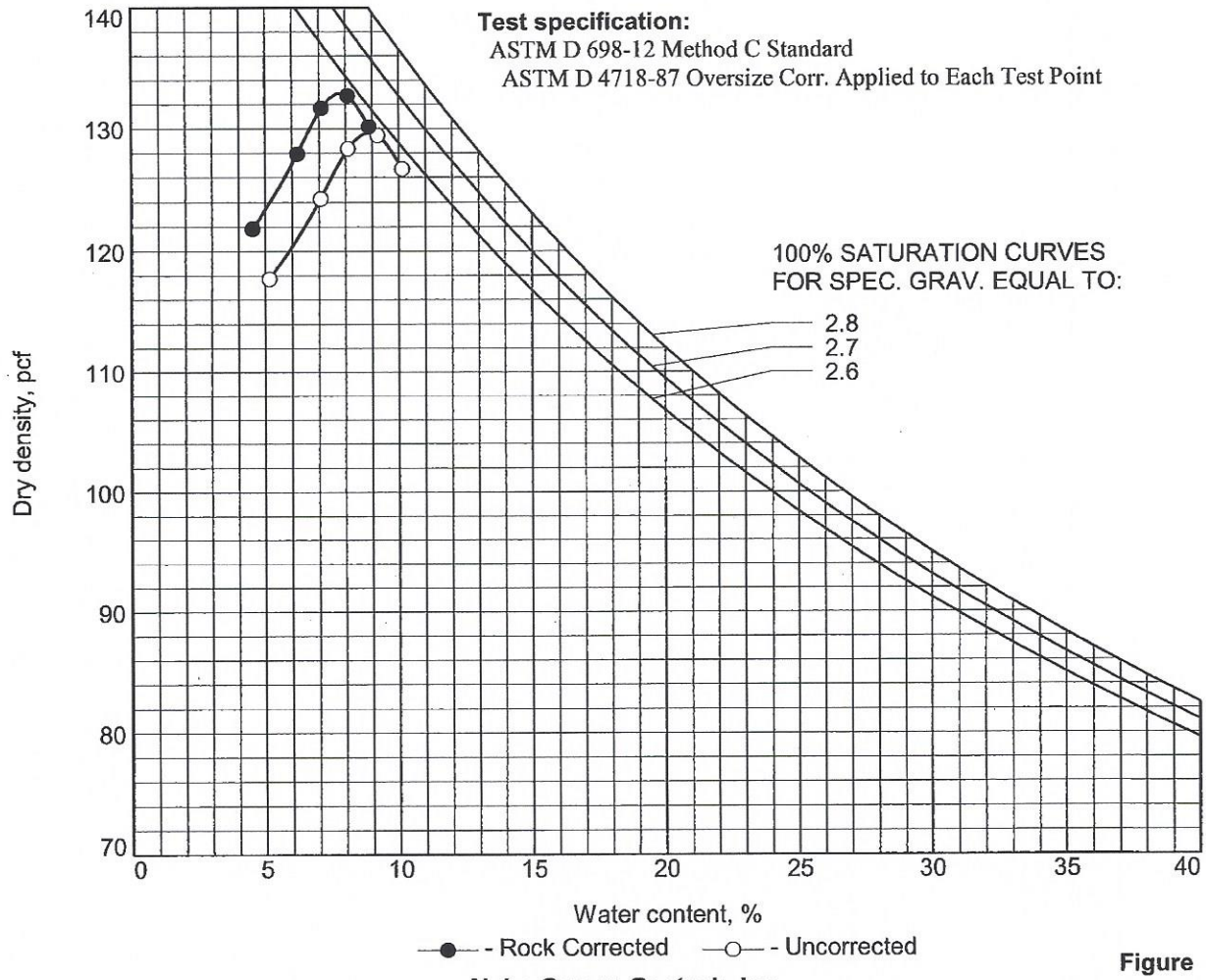
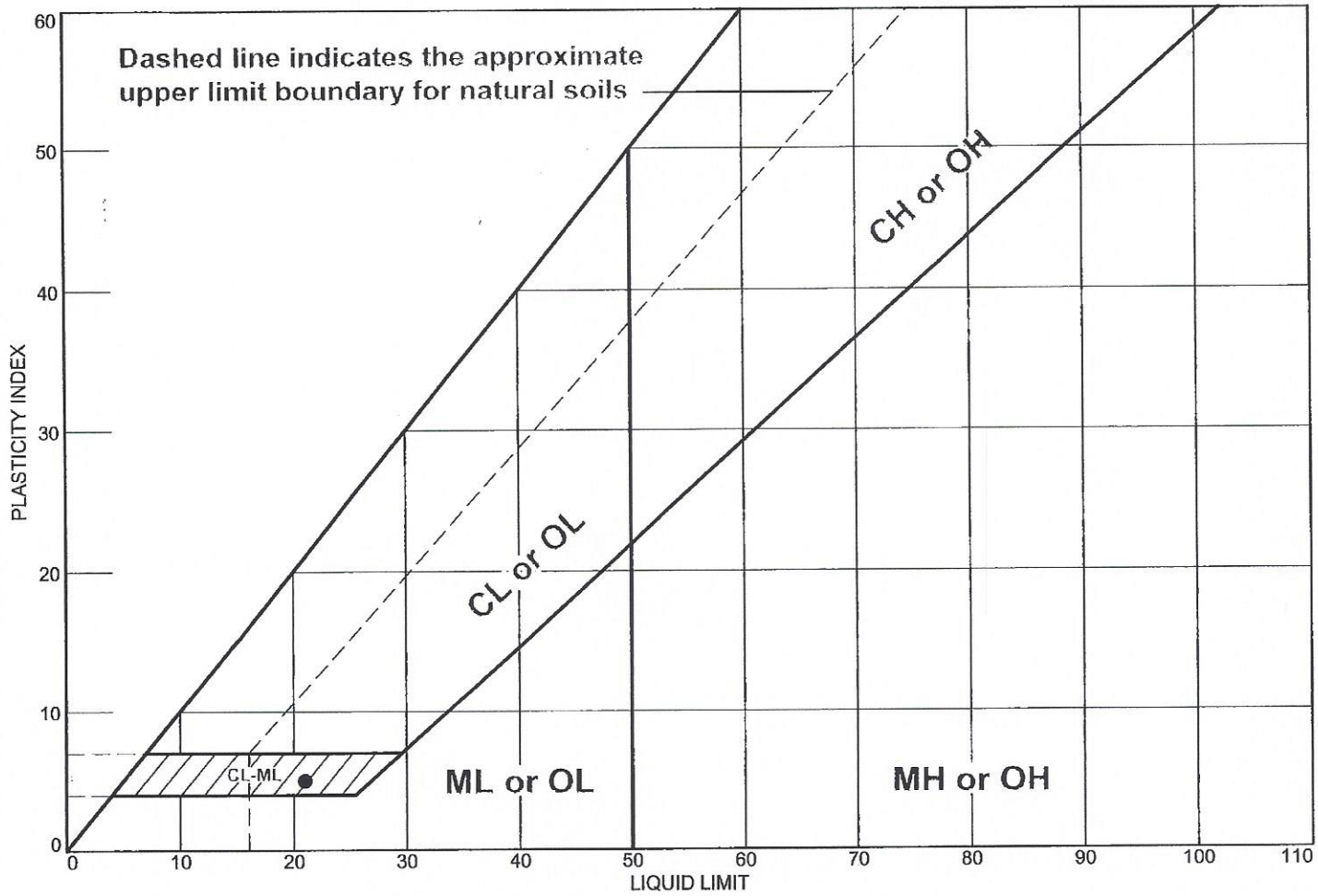


Figure 1 of 1

Alpha-Omega Geotech, Inc.

Tested By: D.B. **Checked By:** T.B.

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Crushed limestone with fines (Type 5 2005)	21	16	5	13.7	10.3	GP-GC

Project No. 16-143T **Client:** MARTIN MARIETTA

Project: MARTIN MARIETTA - GREENWOOD Quarry Testing

● **Location:** Greenwood Quarry -Winterset Ledge **Sample Number:** Type 5 2005

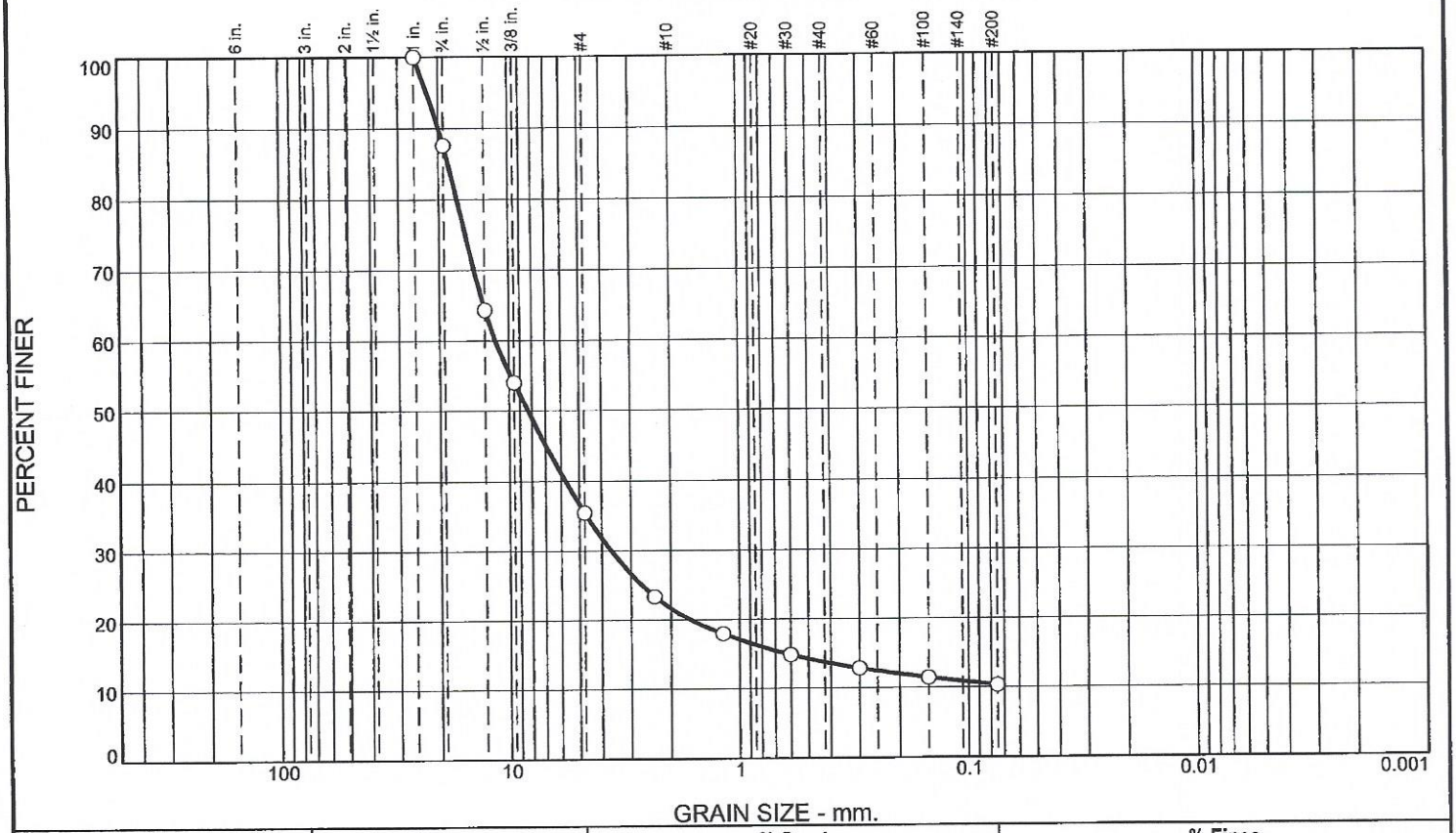
Remarks:

ALPHA-OMEGA GEOTECH

Figure 1 of 1

Tested By: D.B. **Checked By:** T.B.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	12	53	13	8	4	10	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100	100	
.75	88		
.5	64	60 - 90	
.375	54		
#4	35	35 - 60	
#8	23		
#16	18		
#30	15	10 - 35	
#50	13		
#100	11		
#200	10	0.0 - 15	

* MODOT Type 5 Aggregate for Base

Material Description

Crushed limestone with fines (Type 5 2005)

Atterberg Limits

PL= 16 LL= 21 PI= 5

Coefficients

D_{90}= 19.9693 D_{85}= 18.1514 D_{60}= 11.4704
D_{50}= 8.3234 D_{30}= 3.6379 D_{15}= 0.6297
D_{10}= C_u= C_c=

Classification

USCS= GP-GC AASHTO= A-1-a

Remarks

Total Deleterious % (MoDOT TM-71) = 0.9
Shale % (MoDOT TM-71) = 0.9
F.M.=5.43

Location: Greenwood Quarry -Winterset Ledge
Sample Number: Type 5 2005

Date: 11/22/2016

ALPHA-OMEGA GEOTECH

Client: MARTIN MARIETTA
Project: MARTIN MARIETTA - GREENWOOD Quarry Testing

Project No: 16-143T **Figure** 1 of 1

Tested By: D.B. **Checked By:** T.B.

Tensar International Corporation
2500 Northwinds Pkwy, Suite 500
Alpharetta, Georgia 30009
Phone: 800-TENSAR-1
www.tensarcorp.com

Product Specification - Biaxial Geogrid BXTYPE1F

Tensar International Corporation reserves the right to change its product specifications at any time. It is the responsibility of the specifier and purchaser to ensure that product specifications used for design and procurement purposes are current and consistent with the products used in each instance.

Product Type: **Integrally Formed Biaxial Geogrid**
Polymer: **Polypropylene**

Product Properties

Index Properties	Units	MD Values[1]	XMD Values[1]
▪ Aperture Dimensions[2]	mm (in)	26 (1.0)	33 (1.3)
▪ Minimum Rib Thickness[2]	mm (in)	0.76 (0.03)	0.76 (0.03)
▪ Tensile Strength @ 2% Strain[3]	kN/m (lb/ft)	4.1 (280)	6.6 (450)
▪ Tensile Strength @ 5% Strain[3]	kN/m (lb/ft)	8.5 (580)	13.4 (920)
▪ Ultimate Tensile Strength[3]	kN/m (lb/ft)	12.4 (850)	19.0 (1,300)
Structural Integrity			
▪ Junction Efficiency[4]	%	93	
▪ Overall Flexural Rigidity[5]	mg-cm	250,000	
▪ Aperture Stability[6]	m-N/deg	0.32	
Durability			
▪ Resistance to Installation Damage[7]	%SC / %SW / %GP	95 / 93 / 90	
▪ Resistance to Long Term Degradation[8]	%	100	
▪ Resistance to UV Degradation[9]	%	100	

Dimensions and Delivery

The biaxial geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 4.0 meters (13.1 feet) in width and 75.0 meters (246 feet) in length.

Notes

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02. Brief descriptions of test procedures are given in the following notes.
2. Nominal dimensions.
3. Determined in accordance with ASTM D6637-10 Method A.
4. Load transfer capability determined in accordance with ASTM D7737-11.
5. Resistance to bending force determined in accordance with ASTM D7748/D7748M-14.
6. Resistance to in-plane rotational movement measured in accordance with ASTM D7864/D7864M-15.
7. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress in clayey sand (SC), well-graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The geogrid shall be sampled in accordance with ASTM D5818 and load capacity shall be determined in accordance with ASTM D6637.
8. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
9. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355-05.

The geogrid specified herein has not been tested, calibrated, or validated in relation to any design methodology for either unpaved roads or flexible pavements.

This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to January 1, 2015.