

**SPECIAL PROVISIONS  
FOR  
SECTION 604-A: GEOGRID REINFORCEMENT**

The 2019 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

**604-A.1 DESCRIPTION**

This Work shall consist of furnishing and placement of Triaxial TX7 Type 3 Geogrid Reinforcement, unless otherwise specified. The Contractor shall place Geogrid Reinforcement to the lines, grades, dimensions, details and locations in the Contract, and as per manufacturers recommendations. The Project Manager will have final approval of the installation.

**604-A.2 MATERIALS**

**604-A.2.1 Geogrid Reinforcement**

The Geogrid Reinforcement shall be a Geogrid Reinforcement structure consisting of a continuous sheet of polypropylene Material that is “punched and stretched” to create an integrally formed Geogrid Reinforcement structure with a high tensile modulus, open apertures (triangular), and thick ribs and junctions to permit significant mechanical interlock with the Material being reinforced and with continuity of tensile strength through all ribs and junctions of the structure. The Geogrid Reinforcement shall maintain its reinforcement and interlock capabilities under repeated dynamic loads while in service and shall also be resistant to ultraviolet degradation, to damage under normal construction practices and to all forms of biological or chemical degradation normally encountered in the Material being reinforced.

The Geogrid Reinforcement Material shall conform in all respects to the property requirements listed in Table 604-A.2.1:1 “TriAx TX7 Type 3 Geogrid Reinforcement”.



**Table 604-A.2.1:3  
Tensor TriAx TX7 Geogrid Reinforcement**

<b>Tensor TriAx TX7 Geogrid Reinforcement<sup>6</sup></b>			
<b>Property</b>	<b>Test Method</b>	<b>Units</b>	<b>Geogrid Reinforcement Requirements<sup>1</sup></b>
Geogrid Reinforcement Type	Observed	n/a	Punched and Drawn Polypropylene
Rib Shape	Observed	n/a	Rectangular
UV Resistance @ 500 hours	ASTM D4355	%	70
Chemical Resistance	EPA 9090 Emersion Testing	%	100
Junction Efficiency <sup>2</sup>	ASTM D7737 Method A	%	93
Aperture Shape	Observed	n/a	Equilateral Triangular
Ribs Per Junction	Observed	n/a	6
Aperture Size (nominal) <sup>3</sup>	Calipered	in	1.6
Radial Stiffness @ 0.5% Strain <sup>4</sup>	ASTM D6637	lb/ft	20,580
Radial Stiffness Ratio <sup>5</sup>	ASTM D6637	unitless	>0.6

Notes:

1. Minimum Average Roll Values (MARVs) determined in accordance with ASTM 4759, unless indicated otherwise.
2. Load transfer capability expressed as a percentage of ultimate rib tensile strength in the same direction as the junction test (determined in accordance with ASTM D6637)
3. Determined by measuring the spacing between sets of parallel ribs (i.e. the “rib patch”) in any direction.
4. ASTM D6637 Method B with a 2 aperture gage length tested in all “rib” and “mid-rib” directions. The radial stiffness is computed as the minimum measured modulus at 0.5% strain for each of the aforementioned directions.
5. Minimum measured radial stiffness at 0.5% strain divided by the maximum measured radial stiffness at 0.5% strain.
6. Properties provided in this table are for quality assurance purposes only and not indicative of field performance. Alternate material submittals will not be allowed.

**604-A.2.2 Delivery, Storage and Handling**

The Contractor shall:

1. Check the Geogrid Reinforcement upon delivery to assure the proper Material has been received;
2. Prevent excessive mud, wet concrete, epoxy, or other deleterious Materials from coming in contact with and affixing to the Geogrid Reinforcement;
3. Store at temperatures above -20 degrees F;
4. Rolled Geogrid Reinforcement shall be laid flat or stood on end; and
5. Not expose Geogrid Reinforcement to direct sunlight for a period longer than recommended by the manufacturer.

## **604-A.3 CONSTRUCTION REQUIREMENTS**

### **604-A.3.1 Contractor Coordination with Geogrid Manufacturer**

The Contractor shall notify the Geogrid Manufacturer at least two (2) weeks in advance of the anticipated date of geogrid placement to arrange an onsite meeting. The onsite meeting shall be held immediately prior to geogrid placement in order to discuss and observe the preparation, placement and compaction of geogrid and Materials once finished lines and grades are met. The Contractor shall not place geogrid **on day one** unless the Geogrid Manufacturer, Installer, and Project Manager are present.

After satisfactory geogrid and Material placement and compaction methods are established, the Contractor shall ensure that the Geogrid Manufacturer is available to provide additional onsite inspections and/or guidance as warranted by site conditions.

#### **Geogrid Manufacturer Contact Information:**

Aaron Schlessinger  
480.215.3265  
[aschlessinger@tensarcorp.com](mailto:aschlessinger@tensarcorp.com)  
975 E. Riggs Rd. Ste 256  
Chandler, AZ 85249

### **604-A.3.2 Submittals**

The Contractor shall:

1. Submit Geogrid Reinforcement product sample approximately 4 inches by 7 inches or larger in accordance with ASTM D 4354;
2. Submit Geogrid Reinforcement product data sheet and certification from the manufacturer. Geogrid Reinforcement shall meet the type designated in the Plans; and
3. Submit manufacturer's installation instructions and recommendations.
4. Equipment to be used for placement and compaction of base course.
5. Alternate material submittals based on geosynthetic index properties are not allowed.

### **604-A.3.3 Weather Limitations**

The Contractor shall not place Geogrid Reinforcement when weather or surface conditions, in the opinion of the Project Manager, are not suitable for placement. Weather and surface limitations include very wet and snowy, heavy rainfall, extreme cold or frost conditions.

### **604-A.3.4 Surface Preparation.**

The Contractor shall place Geogrid Reinforcement directly on a prepared surface in accordance with manufacturer's recommendations.

### **604-A.3.5 Geogrid Placement.**

The Contractor shall place Geogrid Reinforcement as shown in the Plans. The Contractor shall roll Geogrid Reinforcement along the alignment in the direction of advancing construction. The Contractor shall remove all wrinkles and folds.

The Contractor shall provide a 12 inch minimum overlap with securing pins as required at all joints (both

the transverse and longitudinal) or in accordance with manufacturer's recommendations. At transverse joints, the preceding roll shall overlap the following roll in the direction that the base course will be placed. Securing pins shall be 3/16 inch steel bars, pointed at one end fabricated with a head to retain a steel washer having an outside diameter of not less than 1.5 inches. U-shaped pins shall be another option as approved by the Project Manager.

The Contractor shall use, as a minimum, securing pins of 8" in length. The Contractor shall tension, by hand, the Geogrid Reinforcement and shall anchor to the ground at the edges, including overlaps, and in the center of the roll at 30-foot intervals along the roll length, at the corners if applicable, or as directed by the Project Manager. The use of securing pins may be reduced or eliminated by the Project Manager if it can be shown that the Geogrid Reinforcement is adequately tensioned by hand and anchored by the placed base course in a progressive installation process as recommended by the manufacturer's representative.

The Contractor shall ensure that Geogrid Reinforcement sections do not separate at overlaps during construction. The Contractor shall place the Geogrid Reinforcement around corners will require cutting of Geogrid Reinforcement and diagonal overlapping of the same to make sure that excessive buckling of Geogrid Reinforcement does not occur.

### 604-A.3.6 Placing and Compacting Base Course

The Contractor shall back dump the base course and shall spread in a uniform lift maintaining the design thickness at all times. The Contractor shall blade the base course onto the Geogrid Reinforcement in such a manner that the aggregate rolls onto the Geogrid Reinforcement ahead, by gradually raising the machine blade while moving ahead.

If the Material underlying the Geogrid Reinforcement is stable and capable of supporting rubber tire end and belly dump trucks, the Contractor may drive over the Geogrid Reinforcement at very low speeds, less than 5 mph, and dump the base course while moving ahead. The Contractor shall avoid sudden stops and turning by trucks while on the Geogrid Reinforcement. Tracked vehicles shall not be allowed on the Geogrid Reinforcement until at least six (6) inches of base course has been placed over the Geogrid Reinforcement or as noted in Table IV below. To maintain design base course thickness, the Contractor shall fill ruts which may develop during spreading or compacting the base course with additional base course rather than bladed from surrounding areas.

The Contractor shall repair Geogrid Reinforcement damaged after or during construction in accordance with the manufacturer's recommendations.. The damaged Geogrid Reinforcement is to be replaced at no additional cost to the Department.

Base course shall be compacted per Table IV "Multi-Lift Geogrid Base Reinforcement Application" as indicated below. Base course material shall not be mixed or processed on the geogrid. The base course shall be premixed at the stockpile area or another location in a manner approved by the Project Manager. The base course will be sampled for gradation after premixing and prior to placement on the geogrid material. Contamination and segregation of the base course prior to or during placement shall be minimized.

Table IV "Multi-Lift Geogrid Base Reinforcement Application"

Geogrid Reinforced Base Course Layer	<u>Final Compacted Thickness*</u>	Percent Compaction, maximum density AASHTO T180 (Modified Proctor), Method D (TTCP Modified)
Top Layer	6 inches	96%
Middle Layer	12 inches	95%
Bottom Layer	12 inches – Placed in 1 Lift**	85%

\* A sufficient thickness of base course materials shall be placed to meet the required final compaction thickness as required above.

\*\* Static Compaction only permitted, unless indicated otherwise

For multi-lift geogrid base reinforcement applications or in areas of soft, saturated, pumping subgrades, low ground pressure equipment with static compaction may be necessary. The determination to require low ground pressure equipment with static compaction shall be determined by Project Manager or unless indicated otherwise.

### 604-A.3.7 Acceptance

The Department will reject Geogrid Reinforcement at installation if it does not meet the specified Type as

indicated on the Plans, has defects, rips, holes, flaws, deterioration, or damage incurred during manufacturing, transport, handling or storage.

#### **604-A.4 METHOD OF MEASUREMENT**

##### **604-A.4.1**

The Geogrid Reinforcement shall be measured by the number of square yards from the lines and notes shown in the Plans, or from lines and notes established in writing by the Project Manager. This excludes seam overlaps.

#### **604-A.5 BASIS OF PAYMENT**

##### **Pay Item**

Geogrid Reinforcement

##### **Pay Unit**

Square Yard

##### **604-A.5.1 Work Included in Payment**

The Department will consider the item(s) listed in this section as included in Geogrid Reinforcement and will not measure or pay for them separately:

1. Delivery, storage and handling;
2. Product sample, product data sheet and manufacturer's recommendations; and
3. Material waste and seam overlap.
4. Coordination as well as Site Meetings with Geogrid Manufacturer