City of Duluth
DEPARTMENT OF PUBLIC WORKS/UTILITIES
Engineering Division
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September 9, 2015

City of Duluth Bid # 2015-0559
Job Description: Reconditioning/Reconstruction of Ridgeview Road
City Project No. 1055

Addendum #1

NOTICE TO ALL BIDDERS:

The addendum is issued to modify the bid for the above referenced project.

Bid Form and Advertisement to Bid:

N/A

Specifications:

SP -20.2 shall be DELETED and REPLACED with

SP-20.2 The material used shall be a biaxial geogrid or triaxial geogrid meeting the following properties:

Geogrid manufactured by Tensar, Tencate (Mirafi), or GSE Environmental (SynTec) or equal.

Biaxial Geogrid

Mechanical Properties	**Test Method**	**Units**	**Required Value**	
Reinforcement Properties			MD	CD
Tensile Strength @ 2% Strain	ASTM D6637	lbs/ft (kN/m)	411 (6.0)	617 (9.0)
Tensile Strength @ 5% Strain	ASTM D6637	lbs/ft (kN/m)	809 (11.8)	1343 (19.6)
Survivability Index Values			MD	CD
Ultimate Tensile Strength	ASTM D6637	lbs/ft (kN/m)	1316 (19.2)	1974 (28.8)
Ultraviolet Stability (after 500 hrs)	ASTM D4355	%	100	

Property	Unit	Typical Value
Rib Thickness	in (mm)	0.05 (1.27)
Grid Aperture Size (MD)	in (mm)	1.0 (25.4)
Grid Aperture Size (CMD)	in (mm)	1.3 (33.0)
Roll Dimension	ft (m)	13 x 164 (4 x 50)
Roll Area	yd^2 (m^2)	237 (200)

Triaxial Geogrid

Index Properties	Longitudinal	Diagonal	Transverse	General
Rib pitch, mm (in)	40 (1.60)	40 (1.60)	-	
Mid-rib depth, mm (in)	-	1.8 (0.07)	1.5 (0.06)	
Mid-rib width, mm (in)	-	1.1 (0.04)	1.3 (0.05)	
Nodal thickness, mm (in)				3.1 (0.12)
Rib shape				rectangular
Aperture shape				triangular
Rib Aspect Ratio (height: width)				> 1.0
Structural Integrity				
Junction efficiency,[1] %				93
Aperture stability,[2] kg-cm/deg @ 5.0kg-cm				3.6
Radial stiffness at low strain,[3] kN/m @ 0.5% strain				300
Radial stiffness at low strain,[3] (lb/ft @ 0.5% strain)				20,580
Durability				
Resistance to chemical degradation[4]				100%
Resistance to ultra-violet light and weathering[5]				100%

Notes for triaxial:

1. Load transfer capability determined in accordance with GRI-GG2-87 and GRI-GG1-87 and expressed as a percentage of ultimate tensile strength.
2. In-plane torsional rigidity measured by applying a moment to the central junction of a 225mm x 225mm specimen restrained at its perimeter in accordance with U.S. Army Corps of Engineers Methodology for Measurement of Torsional Rigidity, (Kinney, T.C. Aperture stability Modulus ref 3, 3-1-2000).
3. Radial stiffness is determined from tensile stiffness measured in any in-plane axis from testing in accordance with the scope of ISO 10319:1996.
4. Resistance to loss of load capacity when subjected to chemically aggressive environments in accordance with testing to ISO12960 as part of a durability assessment in accordance with ISO13434:1999 7.3

5. Resistance to loss of load capacity when subjected to ultra-violet light and weathering in accordance with testing to EN12224 as part of a durability assessment in accordance with ISO13434:1999 7.2

SP-20.2a All dimensions and values are typical unless otherwise stated.

Deliver a sample of the geogrid material to the engineer at least 10 days prior to its incorporation into the work. At the same time, furnish a manufacturer's Certified Report of Test or Analysis that verifies that the geogrid delivered for use on the work meets the above requirements. Samples of geogrid for test purposes will be obtained from the job site for each 10,000 square yards or portions thereof used on the contra: 0.03"

SP-20.2b **Install Requirements**
The installation operation shall not cause damage, distortion to, or impede the performance of the geogrid in any manner. The installation process shall be approved by the Project Engineer prior to the start of the placement operation. The contractor is instructed to follow the manufacturer's recommendations concerning trafficking equipment on the geogrid.

SP-20.2c **Designer to specify**
Geogrid will be placed in a longitudinal (parallel to centerline) direction between Station 100+00 Station 106+75 and between Station 106+75 and Station 120+50 .

Geogrid longitudinally applied shall have a minimum overlap of 1 foot.

SP-20.2d Measurement will be made by the area of geogrid placed (no compensation for overlaps) as specified. Payment will be made under item 2105.604 (Geogrid) at the contract bid price per square yard, which shall be compensation in full for the cost of furnishing and installing the required materials, including securing devices, complete and in place as shown on the Plans, or as directed by the Engineer.

Plan sheets:

N/A

All other items remain the same.

Sincerely,

Patrick Mlakar
Project Manager