State of Utah

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Department of Administrative Services
KIMBERLY HOOD
Executive Director

Division of Facilities Construction and Management
F. KEITH STEPAN
Director

ADDENDUM

Date: 05-01-2007

Craig Wessman
Utility Tunnel Expansion
SLCC- Redwood Road Campus
4600 South Redwood Road, SLC

DFCM Project No. **06163660**

Subject: **Addendum No.2**

Pages:		
	Addendum Cover Page	1 Page
	Architects Clarifications	16 Pages
	Total	17 Pages

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

SCHEDULE HAS NOT BEEN CHANGED

2.1 Architect Clarifications.

End of Addendum

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Addendum No. 2

Project:	Utility Tunnel Expansion - Redwood Road Campus	**Date:**	02 May 2006
Address:	4600 South Redwood Road	**Project No.:**	0647.01
City, State:	Salt Lake City, Utah 84130-0808	**Owner No.:**	06163660
Owner:	DFCM	**Agency:**	Salt Lake Community College

To all Bidders of Record:

This addendum forms a part of the contract documents and modifies the original specifications and drawings as noted below. Items of general information are included without reference to the plans and specifications. Revisions to the specifications are referenced by page number and paragraph heading on that page. Revisions to the drawings are reference by the drawing number. Unless otherwise stated, any changes herein offset only the specific drawings, words, or paragraphs mentioned, and the balance of the drawings and specifications remain in full force. Acknowledge receipt of this addendum in the space provided on the Bid form. Failure to do so will subject the Bidder to disqualification.

ARCHITECTURAL ADDENDUM

Item No.	Section or Sheet No.	Description
General Items:		
2 -1	Clarification	There are four light poles shown on AD101 to be removed, see Keyed Notes 5 and 26.
2 -2	Clarification	There are four light poles shown on AE101 to be reinstalled, see Keyed Notes 4 and 20. Add the following to Keyed Notes 4 and 20: "The electrical contractor shall locate and protect the conduits feeding the light poles and the circuits shall be maintained during the duration of the project. The contractor shall provide all necessary material and labor.
Specification Items:		
2 -3	02200	Add the attached specification section.
2 -4	02836	Add the attached specification section.
Attachments:		
2 -5	Spec 02200	9 pages.
2 -6	Spec 02836	6 pages.

End of Addendum No. 2

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing and grading subgrades for slabs-on-grade, walks, and pavements.
2. Excavating and backfilling for buildings and structures.
3. Drainage and moisture-control fill course for slabs-on-grade.
4. Subbase course for walks and pavements.

B. Related Sections: The following Sections contain requirements that relate to this Section.

1. Division 2 Section “Site Clearing” for stripping, grubbing, topsoil removal, and tree protection.
2. Division 2 Section “Excavation, Trenching & Backfilling for Utilities System”
3. Division 2 Section “Landscaping” for finish grading, including placing and preparing topsoil for lawns and planting.
4. Division 3 Section "Cast-In-Place Concrete" for concrete encasings, cradles, and appurtenances for utility systems.

1.3 DEFINITIONS

A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.

B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.

D. Subbase Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.

E. Base Course: The layer placed between the subbase and surface pavement in a paving system.

F. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.

G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

I. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Test Reports: In addition to test reports required under field quality control, submit the following:

1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources.
2. One optimum moisture-maximum density curve for each soil material.
3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

C. Photographs of existing adjacent structures and site improvements.

1.5 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.

B. Testing and Inspection Service: Owner will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.

C. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted in writing by the Architect and then only after acceptable temporary utility services have been provided.

1. Provide a minimum 48-hours' notice to the Architect and receive written notice to proceed before interrupting any utility.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 4 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter. See also ‘Structural General’ notes.

C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

D. Backfill and Fill Materials: Satisfactory soil materials.

E. Subbase and Base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D 2940, with at least 95 percent passing a 1-1/2 inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Subbase or base materials.

G. Bedding Material: Subbase or base materials with 100 percent passing a 1 inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 8 sieve.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 DEWATERING

A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.3 EXCAVATION

A. Explosives: Do not use explosives.

B. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

3.4 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 feet. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.7 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. When Architect determines that unforeseen unsatisfactory soil is present, continue excavation and

replace with compacted backfill or fill material as directed.

1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect.

D. Contractor shall retain soil engineer to view and approve subgrade. Preparation prior to commencing with replacement fill. Prepare written report of findings.

3.8 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect.

1. Fill unauthorized excavations under other construction as directed by the Architect.

3.9 STORAGE OF SOIL MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for record documents.
3. Testing, inspecting, and approval of underground utilities.
4. Concrete formwork removal.
5. Removal of trash and debris from excavation.
6. Removal of temporary shoring and bracing, and sheeting.

3.11 FILL

A. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.

1. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.

B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.

C. Place fill material in layers to required elevations for each location listed below.

1. Under walks and pavements, use subbase or base material, or satisfactory excavated or borrow soil material.
2. Under building slabs, use drainage fill material.
3. Under footings and foundations, use engineered fill.

3.12 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.
   a. Stockpile or spread and dry removed wet satisfactory soil material.

3.13 COMPACTION

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.

C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557:

1. Under structures and building slabs, compact the top 12 inches below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
2. Under walkways, compact the top 6 inches below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
3. Under landscaped areas, compact the top 6 inches below subgrade and each layer of backfill or fill material at 90 percent maximum dry density.

3.14 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 0.10 foot.
2. Walks: Plus or minus 0.10 foot.
3. Pavements: Plus or minus ½ inch.

C. Grading Inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10 foot straightedge.

3.15 SUBBASE AND BASE COURSES

A. Under pavements and walks, place subbase course material on prepared subgrades. Place base course material over subbases to pavements.

1. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D 4254 relative density.
2. Shape subbase and base to required crown elevations and cross-slope grades.
3. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
4. When thickness of compacted subbase or base course exceeds 6 inches , place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

B. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders at least 12 inches wide of acceptable soil materials and compact simultaneously with each subbase and base layer.

3.16 DRAINAGE FILL

A. Under slabs-on-grade, place drainage fill course on prepared subgrade.

1. Compact drainage fill to required cross sections and thickness.
2. When compacted thickness of drainage fill is 6 inches or less, place materials in a single layer.
3. When compacted thickness of drainage fill exceeds 6 inches thick place materials in equal layers, with no layer more than 6 inches thick nor less than 3 inches thick when compacted.

3.17 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General: The Owner will employ a testing agency to perform tests and to submit test reports.

B. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
   a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
   b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.
2. Compaction:
   a. Continuous Footings - One test per lift per each 15 lin. ft.
   b. Spot Foundations - One test per lift per each foundation.
   c. Interior Flatwork - One test per lift per each 1000 SF.
   d. Curbs/Gutters - One test per lift per each 40 lin. ft.
   e. Exterior Walks/Ramps - One tet per lift per each 40 lin. ft.
   f. Exterior Flatwork- one test per lift per each 2000 SF.
3. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 50 feet or less of wall length, but no fewer than two tests along a wall face.
4. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 50 feet or less of trench, but no fewer than two tests.

C. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

3.18 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace material to depth directed by the Architect; reshape and recompact at optimum moisture content to the required density.

C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Transport surplus satisfactory soil to designated storage areas on the Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

SECTION 02836- MECHANICALLY STABILIZED EARTHEN RETAINING WALLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Mechanically stabilized earth (MSE) retaining wall system with high-density polyethylene or polypropylene geogrids positively connected to steel wire mesh facing units.

B. Face Fill and Backfill.

C. Geotextile, Turf Reinforcement Mat and Drainage Composite.

1.2 RELATED SECTIONS

A. Section 02200 - Earthwork

1.3 REFERENCES

A. AASHTO M288 - Standard Specification for Geotextiles.

B. AASHTO T289 - Determining pH of Soil for Use in Corrosion Testing.

C. AASHTO Standard Specification for Highway Bridges.

D. ASTM A 123 / A 123M - Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

E. ASTM A 641 / A 641M-03 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

F. ASTM D 698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.

G. ASTM D 1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.

H. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

I. ASTM D 2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

J. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

K. ASTM D 4355 - Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).

L. ASTM D 4716 - Standard Test Method for Constant Head Hydraulic Transmissivity (In-Plane Flow) of Geotextiles and Geotextile Related Products.

M. ASTM D 6637 - Determining Tensile Properties of Geogrids by the Single or Multi-Rib Test Method; 2001.

N. ASTM F 904 - Standard Test Method for Comparison of Bond Strength or Ply Adhesion of Similar

Laminates Made from Flexible Materials; 1991.

O. GG2 - Standard Test Method for Geogrid Junction Strength.

P. Tensar International Corporation "Design Guidelines for Tensar Geogrid Reinforced Soil Walls with SierraScape Facing Units," TTN: SierraScape-DG.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Engineering drawings, elevations, and large-scale details of elevations, typical sections, details, and connections.
1. Include design calculations sealed by a Registered Professional Engineer licensed in Utah.
2. Manufacturer's certifications that the ultimate tensile strength and junction strength of the geogrid are equal to or greater than those specified.

D. Samples: Two samples of each wall system component including:
1. Geogrids: 4 inch by 18 inch (102 mm by 457 mm) piece.
2. Facing unit: 12 inch wide section of welded wire facing with one diagonal strut and 12 inch (305 mm) section of connection rod.
3. Geotextile: 4 inches by 8 inches piece
4. Turf Reinforcement Mat: 4 inches by 8 inches piece.
5. Drainage Composite: 4 inches by 8 inches piece.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Design Requirements: Design retaining wall system in accordance with the local codes and regulations and the design guidelines of AASHTO, NCMA or Tensar International Corporation Design shall be by a professional engineer registered in the state where the project is located and who is employed by a firm that has designed at least five projects of similar construction and scope.

B. Manufacturer Qualifications: MSE wall system components manufactured by Tensar International Corporation and companies approved and authorized by Tensar International Corporation

C. Installer Qualifications: Firm with documented experience of at least five projects of similar construction and scope. Include brief description of each project and name and phone number of owner's representative knowledgeable in each listed project.

D. Pre-Construction Meeting: Prior to construction of retaining walls, conduct a meeting at the site with the retaining wall materials supplier, the retaining wall installer, and the Contractor to review the retaining wall requirements. Notify the Owner and the Architect at least 3 days in advance of the time of the meeting.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Prevent excessive mud, fluid concrete, epoxy, or other deleterious materials from coming in contact with and affixing to retaining wall materials.

C. Polymeric Materials: Store at temperatures above minus 20 degrees F (minus 29 degrees C); rolled materials may be laid flat or stood on end.

1.7 PROJECT CONDITIONS

A. Do not place backfill when subgrade is wet or frozen.

B. Do not place backfill during wet or freezing weather that prevents conformance with specified compaction requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
1. SierraScape Facing Unit, Diagonal Strut and Connection Rod Manufacturers approved by Tensar International Corporation 5883 Glenridge Dr., Suite 200, Atlanta, GA 30328. ASD. Tel: (404) 250-1290 (Intl.), Toll Free: (866) 472-7161. Fax: 404-250-9185. Web Site: www.tensarcorp.com/A. E-mail: info@tensarcorp.com.
2. Tensar Structural Geogrid: The Tensar Corporation, 1nc. 1210 Citizens Parkway, Morrow, GA 30309.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

A. SierraScape Facing System: Steel welded wire mesh facing unit, bent 90 degrees at long center line to form "L" shaped unit; vertical section as face to retain fill, and horizontal leg extending into fill, with structural geogrid mechanically connected to rear edge of horizontal leg and diagonal struts supporting top edge of vertical leg.
1. Wire Mesh Facing Unit: Galvanized, in accordance with ASTM A 82, ASTM A 185 and ASTM A 123 / A 123M.
2. Wire Strut Type: Galvanized, in accordance with ASTM A 641/641M.
3. Wire Mesh Spacing: 1.80 inches by 12.75 inches (vertical x horizontal wires) unless otherwise indicated on the Drawings.
4. Wire Mesh Minimum Diameters: 0.192 inch, vertical wires and 0.243 inches horizontal wire (before galvanizing).
5. Wire, Strut, Minimum Diameter: 0.243 inch.
6. Tie wire or cable ties to connect vertical wires of adjacent facing units.
7. Method of Connecting Geogrid to Facing Unit: Inverted U or V-shaped loops in wires of horizontal leg near rear edge fit through alternate apertures between geogrid ribs and bear against transverse direction bars of geogrid, forming mechanical connection to transfer load between facing unit and geogrid. Connection secured by 3/4 inch by 54 inch long SierraScape connection rod placed through loops and over geogrid ribs. Rods formulated with 25 percent glass filled high density polyethylene (HDPE).

B. Structural Geogrid: Tensar UX1100MSE: Polymeric grid formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth; functions primarily as reinforcement.
1. Ultimate Tensile Strength: 3970 pounds per linear foot, minimum average roll value, when tested in accordance with ASTM D 6637.

2. Junction Strength: 3,690 pounds per linear foot, minimum average roll value, when tested in accordance with GRI-GG2.

C. Structural Geogrid: Tensar UX1400MSE: Polymeric grid formed by regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock or earth and function primarily as reinforcement.
1. Ultimate Tensile Strength: 4800 pounds per linear foot (70 kN/M), minimum average roll value, when tested in accordance with ASTM D 6637.
2. Junction Strength: 4520 pounds per linear foot (66kN/m), minimum average roll value, when tested in accordance with GRI-GG2.

D. Reinforced Backfill: Granular fill with a pH range of 2 to 12, when tested in accordance with AASHTO T 289, and graded as follows:
1. 100 to 75 percent passing a 2-inch (51 mm) sieve.
2. 100 to 75 percent passing a 3/4-inch (19 mm) sieve.
3. 100 to 20 percent passing a No. 4 sieve.
4. 0 to 60 percent passing a No. 40 sieve.
5. 0 to 35 percent passing a No. 200 sieve.

E. Geotextile: Non-woven geotextile, AASHTO M288, Class 3.

PART 3 EXECUTION

3.1 PREPARATION

A. Do not begin installation until excavation to foundation elevation has been completed and the foundation for the reinforced fill and leveling pad has been properly prepared.

B. If subgrade preparation is the responsibility of others, notify Architect of unsatisfactory preparation. Do not begin work until unsatisfactory conditions have been rectified.

C. Excavation:
1. Excavate subgrade vertically to plan elevation and horizontally to designed geogrid lengths.
2. Remove soils not meeting required strength and replace with Geotechnical Engineer-approved materials.

D. Compaction: Compact foundation materials to a minimum of 95 percent Standard Proctor Dry Density in accordance with ASTM D 698.

3.2 CONSTRUCTION

A. Construct SierraScape wall system in accordance with approved shop drawings and manufacturer's instructions.

B. Facing Unit Installation:
1. Place the first course of wire mesh facing units with the connection loops on the horizontal legs resting on the foundation material.
2. Verify that the first row of facing units is level from end to end and from front-to-back.
3. Connect geogrids to facing units as specified below.
4. Overlap the horizontal wire extensions of front faces of adjacent facing units. Tie together vertical wires of adjacent facing units as required to maintain alignment and prevent escape of backfill material.
5. Use a string line or equivalent to align straight sections.
6. Place subsequent courses of facing units on previous courses, at a setback, if any, as shown

on shop drawings.

7. Align subsequent courses of facing units using a string line or other suitable method that is independent of the final position of the underlying course of facing units.

C. Geogrid-to-Facing Unit Connection and Connection Rod Installation:
1. Unroll geogrid and cut to length shown on plans, minus distance between front face and front of the connection loop of the facing unit, approximately 15 inches. Cut geogrid ribs at the front side of the transverse bar.
2. Place the geogrid ribs over the connection loops of the facing units such that the loops extend up through every other aperture of the geogrid. Pull the geogrid back such that the transverse bar is in contact with the connection loops. Use two full widths of geogrid per facing unit. The two ribs on outer edges of the geogrids should be positioned between the first two wires on the edges of the facing unit. The two ribs on the opposite edges of the geogrid should be positioned between the center wire and the wires adjacent to it. Two ribs of geogrid shall be positioned between each pair of wires.
3. Where the transverse bar cannot engage the wire connection loop due to misalignment of apertures and wire loops, cut the transverse bar midway between the wire loops to allow the geogrid to be spread or overlapped slightly to achieve correct alignment of grid apertures with connection loops. The transverse bar will usually have to be cut at the ends of the third, fifth and seventh apertures from both edges of the geogrid and occasionally at a few apertures in the center section of the geogrid to achieve the correct alignment with the wire connection loops.
4. Thread the SierraScape connection rods through the wire connection loops over the geogrid ribs.
5. After placement of geogrid and any required face wrap, place seven wire support struts on approximately 18-inch centers connecting the upper horizontal wire on the face of facing unit to back wire behind the connection loop. Place one of the support struts at each end of the facing unit between the outer two wires.

D. Fill:
1. Pull connection tight and secure by placing facing fill over the connection prior to placement of reinforced fill over rest of geogrid.
2. Soil Face Fill: Place geotextile inside facing unit and place reinforced backfill as shown on shop drawings. Compacted lift thickness: Maximum 9 inches.
3. Backfill:Place reinforced backfill material in compacted lifts, maximum 9 inches deep. Compact to minimum of 95 percent Standard Proctor Dry Density in accordance with ASTM D 698.
4. Use only hand-operated compaction equipment within 3 feet of front face. Use a minimum of 3 passes to compact this zone.
5. Do not perform soil density testing within 3 feet of front face.
6. Smooth and level backfill to ensure geogrid lays flat.

E. Geogrid placement:
1. Unroll the geogrid on the compacted backfill and cut to the length indicated.
2. Pull the geogrid taut to remove slack in the geogrid and at the facing unit connection.
3. Stake or pin the geogrid near the end to maintain alignment and tension during filling.
4. Place a minimum of 3 inches of fill between overlapping layers of geogrid where overlapping occurs behind curves and corners of a wall.
5. Rubber tired vehicles may travel on the geogrid at low speeds, less than 5 miles per hour. Turning of vehicles should be avoided to prevent dislocation or damage to the geogrid and the connected wall facing units.
6. Tracked vehicles shall not be operated directly on the geogrid. A minimum of 8 inches of fill cover over the geogrid is required for operation of tracked construction vehicles in the reinforced zone.
7. Place geogrid shims on the front flange of all facing units connected to geogrid as shown on the shop drawings or as shown in the Tensar International Corporation Construction and Quality Control Manual.

3.3 FIELD QUALITY CONTROL

A. Testing and Inspection will be provided by the Owner's Testing Agency as specified in Section 02200 Earthwork. Notify the Architect 72 hours in advance of testing.

B. Perform laboratory material tests in accordance with ASTM D 698.

C. Perform in place compaction tests in accordance with the following:
   1. Density Tests: ASTM D 1556, ASTM D 2167, or ASTM D 2922 as appropriate for material tested.
   2. Moisture Tests: ASTM D 3017.

D. Frequency of Tests:
   1. Subgrade Soil: A minimum of one test per 1000 SF (100 SM) of surface area.
   2. Reinforced Backfill: Provide one test for every 50 CY (40 CM) of fill placed.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION