

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

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September 14, 2011

04-Son-101-7.3/8.3

04-264044

Project ID 0400020503

HPLUL-6204(101)

HPLUL-6204(102)

Addendum No. 1

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN SONOMA COUNTY IN PETALUMA ON ROUTE 101 FROM 0.4 km SOUTH TO 0.7 km NORTH OF EAST WASHINGTON STREET OVERCROSSING.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on Wednesday, October 5, 2011.

This addendum is being issued to revise the Project Plans and the Notice to Bidders and Special Provisions.

Project Plan Sheet 168 is revised. A copy of the revised sheet is attached for substitution for the like-numbered sheet.

In the Special Provisions, Section 8-2.02, "PRECAST CONCRETE QUALITY CONTROL," subsection "PRECAST CONCRETE QUALIFICATION AUDIT," the following paragraph is added after the first paragraph:

"Precast concrete qualification audit shall not apply to mechanically stabilized embankment members."

In the Special Provisions, Section 10-1.36, "EARTH RETAINING STRUCTURES," is revised as attached.

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04-Son-101-7.3/8.3
04-264044
Project ID 0400020503
HPLUL-6204(101)
HPLUL-6204(102)

To Bid book holders:

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the Notice to Bidders section of the Notice to Bidders and Special Provisions.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the Bid book.

Submit bids in the Bid book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

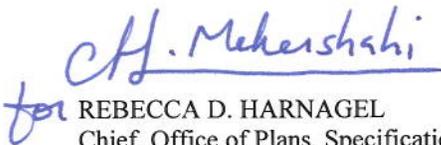
Inform subcontractors and suppliers as necessary.

This addendum and attachments are available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/04/04-264044

If you are not a Bid book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,



REBECCA D. HARNAGEL
Chief, Office of Plans, Specifications & Estimates
Office Engineer
Division of Engineering Services

Attachments

10-1.36 EARTH RETAINING STRUCTURES

Earth retaining structures, consisting of Mechanically Stabilized Embankment system, shall conform to the details shown on the plans and these special provisions.

Attention is directed to "Precast Concrete Quality Control" of these special provisions.

At the Contractor's option, the Mechanically Stabilized Embankment shown in the plans can be replaced with one of the following acceptable alternative earth retaining systems:

<u>Proprietary Earth Retaining System</u>	<u>Address and Phone Number</u>	<u>Web Site</u>
Reinforced Earth – 1.5 m cruciform (Steel strap soil reinforcement with 1.5 m cruciform concrete face panels)	The Reinforced Earth Company 1660 Hotel Circle North, Suite 304 San Diego, CA 92108 (619) 688-2400	http://www.reinforcedearth.com
Reinforced Earth –1.5 m square (Steel strap soil reinforcement with 1.5 m square concrete face panels)	The Reinforced Earth Company 1660 Hotel Circle North, Suite 304 San Diego, CA 92108 (619) 688-2400	http://www.reinforcedearth.com
Retained Earth (Steel mesh soil reinforcement with 1.5 m square concrete face panels)	The Reinforced Earth Company 1660 Hotel Circle North, Suite 304 San Diego, CA 92108 (619) 688-2400	http://www.reinforcedearth.com
MSE Plus - 1.5 m square (Steel mesh soil reinforcement with 1.5 m square concrete face panels)	SSL 4740 Scotts Valley Drive, Suite E 209 Scotts Valley, CA 95066 (831) 430-9300	http://www.mseplus.com
MSE Plus – 1.5 by 1.8 m (Steel mesh soil reinforcement with 1.5 m high by 1.8 m wide concrete face panels)	SSL 4740 Scotts Valley Drive, Suite E 209 Scotts Valley, CA 95066 (831) 430-9300	http://www.mseplus.com
Landmark Reinforced Soil Wall System (Geogrid soil reinforcement with modular concrete block facing at 4 degree batter)	Anchor Wall Systems, Inc. 5959 Baker Road, Suite 390 Minnetonka, MN 55345-5995 (877) 295-5415	http://www.anchorwall.com
KeySystem 1	Keystone Retaining Wall Systems 4444 West 78th Street Minneapolis, MN 55435 (952) 897-1040	http://www.keystonewalls.com
ARES – 2.75 by 1.5 m (Geogrid soil reinforcement with 2.75 m wide by 1.5 m high concrete face panels)	Tensar International Corporation 34892 Calle Fortuna Capistrano Beach, CA 92624 (949) 488-7054	http://www.tensarcorp.com

Only one type of earth retaining system shall be used at any one location.

The above list of acceptable alternative earth retaining systems has been selected from the Department's current list of prequalified earth retaining systems and is limited only to those systems determined to have characteristics suitable for this project. Among the alternatives shown, some systems may be proprietary.

The list of prequalified earth retaining systems has been developed from data previously furnished by suppliers or manufacturers of each system. Approval of additional earth retaining systems is contingent on the system meeting the full range of parameters for which prequalification is required. The prequalification requirements are available at:

<http://www.dot.ca.gov/hq/esc/Translab/NewProducts/index.htm>

WORKING DRAWINGS

If the Contractor elects to use a proprietary earth retaining system from the list of acceptable alternative systems, the Contractor shall submit complete working drawings for each installation of the system in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. For initial review, 5 sets of drawings shall be submitted. After review between 6 and 12 sets, as requested by the Engineer, shall be submitted for final approval and use during construction. Working drawings shall be submitted to the Offices of Structure Design, Documents Unit.

Working drawings shall be 279 mm x 432 mm in size, and each drawing and calculation sheet shall include the State assigned designations for the contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Kilometer Post. The design firm's name, address, and phone number shall be shown on the working drawings. Each sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

The Contractor shall verify the existing ground elevations at the site before preparing the working drawings. The working drawings shall contain all information required for the proper construction of the system at each location including existing ground line at face of wall as verified at the site and any required revisions or additions to drainage systems or other facilities. The working drawings shall include "General Notes" that contain design parameters, material notes, and wall construction procedures. The working drawings and calculations shall be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California. The Contractor shall allow the Engineer 30 days to review the drawings after a complete set has been received.

Unless otherwise specified, at the completion of each structure for which working drawings were submitted, and if the work detailed in these working drawings is permanent, the Contractor shall submit to the Engineer one set of corrected as-built prints 279 mm x 432 mm in size and on 75 g/m² (minimum) bond paper, showing as built conditions. As-built drawings that are common to more than one structure shall be submitted for each structure.

MATERIALS

Earthwork

Excavation and backfill shall conform to the details shown on the plans, the provisions in Section 19, "Earthwork," of the Standard Specifications, and these special provisions.

Structure backfill for earth retaining structures with soil reinforcement shall be free of organic material and substantially free of shale or other soft materials of poor durability. Structure backfill shall not contain slag aggregate or recycled materials such as glass, shredded tires, portland cement concrete rubble, asphaltic concrete rubble, or other unsuitable material as determined by the Engineer.

Structure backfill above the bottom elevation of the leveling pad for earth retaining structures with soil reinforcement shall conform to the following requirements:

Gradation Requirements		
Sieve Size	Percentage Passing	California Test
159 mm	100	202
75 mm	78 - 100	202
4.75 mm	----	202
600 μ m	0 - 60	202
75 μ m	0 - 15	202

Property Requirements		
Test	Requirement	California Test
Sand Equivalent	12 minimum	217
Plasticity Index	6 maximum	204
Minimum Resistivity	2000 ohm-cm	643
Chlorides	< 250 ppm	422
Sulfates	< 500 ppm	417
pH	5.5 to 10.0	643

If 12 percent or less passes the No. 75 μ m sieve and 50 percent or less passes the No. 4.75 mm sieve, the Sand Equivalent and Plasticity Index requirements shall not apply.

Gradation requirement for structure backfill below the bottom elevation of the leveling pad for earth retaining structures with soil reinforcement shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications

Structure backfill for earth retaining structures with geosynthetic soil reinforcement shall conform to the following requirements:

Gradation Requirements		
Sieve Size	Percentage Passing	California Test
50 mm	100	202
4.75 mm	50-80	202
425 µm	0-30	202
75 µm	0-15	202

Property Requirements		
Test	Requirement	California Test
Sand Equivalent	30 minimum	217
Plasticity Index	6 maximum	204
Durability Index	35 minimum	229
pH	4.5 to 9.0	643

Permeable material shall be used for the portion of the structure backfill for earth retaining structures with soil reinforcement within the limits shown on the plans. Permeable material shall be Class 1, Type B, conforming to the provisions in Section 68-1.025, "Permeable Material," of the Standard Specifications.

Permeable material for earth retaining structures with metallic soil reinforcement shall conform to the following requirements:

Property Requirements		
Test	Requirement	California Test
Minimum Resistivity	2000 ohm-cm	643
Chlorides	< 250 ppm	422
Sulfates	< 500 ppm	417
pH	5.5 to 10.0	643

Permeable material for earth retaining structures with geosynthetic soil reinforcement shall conform to the following requirements:

Property Requirements		
Test	Requirement	California Test
pH	4.5 to 9.0	643

Water used for earthwork or dust control within 150 meters of earth retaining structures with metallic soil reinforcement shall conform to the provisions for water in Section 90-2.03, "Water," of the Standard Specifications.

Concrete

Concrete used in precast and cast-in-place reinforced concrete members of earth retaining structures shall conform to the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions. If the Contractor chooses to construct the earth retaining structures with self-consolidating concrete, then concrete used in precast concrete members of earth retaining structures shall also conform to "Self-Consolidating Concrete For Precast Elements," of these special provisions.

The concrete leveling pads for the Mechanically Stabilized Embankment (MSE) system shall conform to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications.

Reinforcement

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

Galvanizing

Soil reinforcement, connecting elements, and other steel components that are in contact with the earth shall be galvanized in conformance with the provisions in Section 75-1.05, "Galvanizing," of the Standard Specifications.

Inspection Elements

If a proprietary alternative system is selected, inspection elements representative of the particular soil reinforcement shall be furnished in the same number and approximate location as shown on the plans for the MSE system.

When metallic soil reinforcement is used, the threaded end of the inspection wire may be formed before or after galvanizing. The end 100 mm of the wire shall be coated with two applications of an approved unthinned commercial quality zinc-rich primer (organic vehicle type). The threaded end of the wire shall be encapsulated with corrosion inhibiting, mastic filled, round vinyl enclosure secured with a nylon tie as shown on the plans. If the threaded end is galvanized after threading, the threads shall be cleaned before painting. There shall be no damage to the unthreaded portion of the galvanized inspection wire.

Drainage System

The drainage system shall conform to the details shown on the plans and these special provisions.

Corrugated steel pipe shall conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications.

Perforated steel pipe underdrains and underdrain outlets and risers shall conform to the provisions in Section 68-1, "Underdrains," of the Standard Specifications.

The class of rock used for rock slope protection at drain pipe outlets shall be No. 3 Backing and shall conform to the provisions in Section 72-2, "Rock Slope Protection," of the Standard Specifications.

Filter fabric shall be ultraviolet (UV) ray protected, and shall conform to the provisions for fabric for underdrains in Section 88-1.03, "Filter Fabric," of the Standard Specifications and these special provisions.

Adhesive for bonding filter fabric to concrete panels shall be commercial grade.

Soil Reinforcement

Soil reinforcement shall conform to the details shown on the contract plans, the approved working drawings, the preapproved proprietary system details, and these special provisions.

MW70, MW100 and MW130 steel wire shall conform to the requirements in ASTM Designation: A 82/A 82M. The welded wire mat shall conform to the requirements in ASTM Designation: A 185/A 185M. MD70, MW100 and MD130 deformed steel wire may be substituted for MW70, MW100 and MW130 steel wire, respectively. The welded wire mat utilizing deformed steel wire shall conform to the requirements in ASTM Designation: A 496/A 496M and ASTM Designation: A 497/A 497M.

The button on button-head wires shall conform to the provisions in Section 50-1.05, "Prestressing Steel," of the Standard Specifications.

The coupler at the wire mat connection shall be a seamless steel sleeve. The coupler shall be applied over the button-head wires and swaged by means of a hydraulic press. The coupler shall develop the minimum tensile strength of the wire without exceeding a total slip of the wires of 5.0 mm.

Sample button-head wire and coupler connectors shall develop the minimum tensile requirements for MW70, MW100 and MW130 steel wire in ASTM Designation: A 82/A 82M without exceeding a total slip of the wires of 5.0 mm when tested in conformance with the provisions for tension testing of round wire samples in ASTM Designation: A 370. When MD70, MW100 and MD130 deformed steel wire are substituted, samples shall develop the minimum tensile requirements contained in ASTM Designation: A 496/A 496M. An independent testing laboratory shall perform button-head wire and coupler connection testing. Samples shall consist of 2 button-head wires each 600 mm long connected by a swaged coupler.

Prior to the start of wall construction, the Contractor shall furnish test results to the Engineer from tension and slip tests conducted on 6 proposed button-head wire and coupler connections. Failure of any of the proposed button-head wire and coupler connector samples to meet the slip and tensile strength requirements herein shall require the connection be redesigned by the Contractor.

No installation of face panels shall be allowed until the Contractor has successfully completed tension and slip testing for proposed button-head wire and coupler connectors.

During wall construction, the Contractor shall furnish test results to the Engineer from tension and slip testing of 4 samples of production button-head wire and coupler connections for each lot of 500 individual mat wire connections incorporated into the work. Production testing shall consist of testing each of the 4 sample connections for both slip and tensile requirements herein. If 2 or more of the production samples fail to meet slip or tensile test requirements, the entire lot represented by these samples shall be rejected. If one of the production samples fails to meet slip or tensile test requirements, an additional 4 samples shall be tested. Should any of the additional samples fail to meet the slip or tensile requirements, the entire lot represented by these samples shall be rejected.

Splicing of the welded wire mat along its length shall be by mechanical coupler that shall develop the minimum tensile strength of the wire. The mechanical coupler shall be approved by the Engineer.

Geogrid soil reinforcement roll identification, storage, and handling shall be in accordance with ASTM Designation: D 4873, and as specified in the preapproved proprietary details. The geogrid shall be shipped and stored such that the material is not placed directly on the ground. The geogrid shall be covered and protected at all times during shipment and storage such that it is fully protected from UV radiation including sunlight, site construction damage, precipitation, chemicals, flames including welding sparks, temperatures less than -29°C or greater than 60°C, or other conditions that may damage the physical property values of the geogrid. The Contractor shall prevent foreign materials from coming into contact with or affixing to the geogrid.

Miscellaneous

Resin bonded cork for horizontal joints shall conform to the requirements in ASTM Designation: D 1752, Type II, with a compressive load of not less than 690 kPa.

Pipe for the pipe pin shall conform to the requirements in ASTM Designation: A 53/A 53M, Standard weight, except the amount of the zinc coating per square meter of actual surface shall average not less than 610 g and no individual specimen shall be less than 550 g.

CONSTRUCTION

Earth retaining structures shall be constructed to the lines, grades, and details shown on the plans, and shall conform to these special provisions.

Earthwork

The foundation for the structure shall be graded level for a width equal to the length of soil reinforcement elements plus 300 mm or as shown on the contract plans. The foundation material shall be compacted to a relative compaction of not less than 95 percent. The Engineer shall approve the compacted foundation area prior to commencement of wall construction.

The Contractor shall remove unsuitable material as determined and directed by the Engineer. This work shall be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Structure backfill material shall be placed and compacted simultaneously with the erection of the facing panels. Placement and compaction shall be accomplished without distortion of the soil reinforcement or displacement of facing panels. Structure backfill at the front of the wall shall be completed prior to backfilling more than 4 m above the bottom of the lowermost face element.

Vertical and horizontal alignment tolerances of panels shall not exceed 20 mm when measured along a 3 m straight edge. The maximum allowable offset in any panel joint shall not exceed 20 mm.

Structure backfill for earth retaining structures with soil reinforcement shall be compacted to a relative compaction of not less than 95 percent.

A relative compaction of not less than 95 percent shall be obtained for embankment under earth retaining structures with soil reinforcement within the limits established by inclined planes sloping 1:1.5 (vertical:horizontal) out and down from lines 0.3 m outside the bottom limits of the structure, including permeable material when required.

Soil reinforcement shall be tensioned in the direction perpendicular to the wall face with enough force to remove any slack in the connection or in the soil reinforcement itself. Soil reinforcement shall be secured in place to prevent movement during placement of additional soil reinforcement and structure backfill until the initial lift of structure backfill is compacted.

Geogrid soil reinforcement shall be placed in full-length sections.

Soil reinforcement shall be covered with structure backfill during the same work shift that it is placed.

Placement and compaction of structure backfill shall begin 300 mm from the back face of wall panels and progress towards the free end of the soil reinforcement. Compaction equipment shall be operated parallel to the wall facing. The remaining width of backfill behind the wall panels shall be placed and compacted after soil reinforcement has been covered to a depth of 150 mm.

Sheepsfoot or grid-type rollers shall not be used for compacting material within the limits of the soil reinforcement. Hand-held or hand-guided compacting equipment shall be used to compact structure backfill material within one meter of the facing panels.

Construction equipment shall not be operated directly on the soil reinforcement. A layer of structure backfill material not less than 150 mm in thickness shall be maintained between the soil reinforcement and construction equipment of any type.

Structure backfill material for earth retaining structures with geogrid soil reinforcement shall be placed in lifts not to exceed 150 mm where hand-operated compacting equipment is used and 200 mm where heavy compaction equipment is used.

At each level of the soil reinforcement the structure backfill shall be constructed to a plane 50 mm above the elevation of the soil reinforcement connection and shall start one meter from the back of the face panel and extend for at least the remaining length of soil reinforcement. This grading shall be complete before placing the next layer of soil reinforcement.

Permeable material and filter fabric shall be placed along with structure backfill as shown on the plans. Permeable material shall be placed in layers not exceeding 0.6 m in thickness. Compaction of the permeable material for the drainage system outside the limits of the soil reinforcement is not required, and equipment shall not be operated directly on the permeable material or filter fabric. If a sloped layer of permeable material is placed to facilitate the work or to satisfy safety considerations, the vertical limits of permeable material shall remain unchanged and the thickness of the layer of permeable material shall be measured normal to the slope.

The Contractor shall grade the reinforced backfill to rapidly drain away from the wall face at the end of each work shift. Berms or ditches shall be provided to direct runoff away from the wall site. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

Filter Fabric

Filter fabric shall be placed at the locations and in conformance with the details shown on the plans and these special provisions.

Filter fabric shall be ultraviolet (UV) ray protected, and shall conform to the provisions for fabric for underdrains in Section 88-1.03, "Filter Fabric," of the Standard Specifications and these special provisions.

Immediately prior to placing filter fabric, the subgrade to receive the filter fabric shall conform to the compaction and elevation tolerance specified for the material involved and shall be free of loose or extraneous material and sharp objects that may damage the filter fabric during installation.

Concrete panel surfaces to receive filter fabric shall be dry and thoroughly cleaned of dust and deleterious materials.

Filter fabric shall be handled and placed in conformance with the manufacturer's recommendations.

Filter fabric shall be stretched, aligned, and placed in a wrinkle-free manner.

Adjacent borders of filter fabric shall be stitched or overlapped from 300 mm to 450 mm. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When filter fabric is joined by stitching it shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the filter fabric manufacturer. The stitches shall number 2 to 3 per centimeter of seam.

If the filter fabric is damaged during installation, it shall be repaired by placing a piece of filter fabric that is large enough to cover the damaged area and that meets the overlap requirement.

During spreading of the permeable material, a minimum of 150 mm of the material shall be maintained between the filter fabric and the Contractor's equipment. Where structure backfill material is to be placed on filter fabric, a minimum of 450 mm of structure backfill material shall be maintained between the filter fabric and the Contractor's equipment. Equipment or vehicles shall not be operated or driven directly on filter fabric.

Concrete

Concrete for the leveling pads shall be placed at least 24 hours prior to erecting face panels.

After placement of an inspection element and placement of backfill to a level at least 0.6 m above the inspection element, the void in the face panel shall be dry packed with mortar as shown on the plans. Dry pack shall conform to the provisions in Section 51-1.135, "Mortar," of the Standard Specifications, except that the proportion of cementitious material to sand shall be that required to achieve a 28-day mortar compressive strength of 7 MPa to 10 MPa.

Architectural Texture

Precast panels of the Mechanically Stabilized Embankment systems shall be cast with fractured rib architectural texture.

Fractured rib architectural texture shall conform to the details shown on the plans and the provisions in section 51, "Concrete Structures," of the Standard Specifications.

The fractured rib texture shall be an architectural texture simulating the appearance of straight ribs of concrete with a fractured concrete texture imparted to the raised surface between the ribs. Grooves between ribs shall be continuous with no apparent curves or discontinuities. Variation of the groove from straightness shall not exceed 6 mm for each 3 m of groove. The architectural texture shall have random shadow patterns. Broken concrete at adjoining ribs and groups of ribs shall have a random pattern. The architectural texture shall not have secondary patterns imparted by shadows or repetitive fractured surfaces.

The architectural texture shall match the texture, color and pattern of the referee sample located at the Office of Landscape Architecture, Ninth Floor, 111 Grand Avenue, Oakland, California and is available for inspection by bidders. An appointment to inspect the referee sample can be arranged by calling (510) 622-8725.

A test panel at least 1.25 m x 1.25 m in size shall be successfully completed at a location approved by the Engineer before beginning work on architectural texture. The test panel shall be constructed and finished with the materials, tools, equipment and methods to be used in constructing the architectural texture. If ordered by the Engineer, additional test panels shall be constructed and finished until the specified finish, texture and color are obtained, as determined by the Engineer.

The test panel approved by the Engineer shall be used as the standard of comparison in determining acceptability of architectural texture for concrete surfaces.

Form liners shall be used for textured concrete surfaces and shall be installed in conformance with the manufacturer's recommendations, unless other methods of forming textured concrete surfaces are approved by the Engineer. Form liners shall be manufactured from an elastomeric material or a semi-elastomeric polyurethane material by a manufacturer of commercially available concrete form liners. No substitution of other types of formliner material will be allowed. Form liners shall leave crisp, sharp definition of the architectural surface. Recurring textural configurations exhibited by repeating, recognizable shadow patterns shall be prevented by proper casting of form liner patterns. Textured concrete surfaces with such recurring textural configurations shall be reworked to remove such patterns as approved by the Engineer or the concrete shall be replaced.

Form liners shall have the following properties:

Description	ASTM Designation:	Range
Elastomeric material		
Shore A hardness	D 2240	20 to 65
Tensile strength (MPa)	D 412	0.9 to 6.2
Semi-elastomeric polyurethane		
Shore D hardness	D 2240	55 to 65
Tensile strength (MPa)	D 2370	18 minimum

Cuts and tears in form liners shall be sealed and repaired in conformance with the manufacturer's recommendations. Form liners that are delaminated from the form shall not be used. Form liners with deformations to the manufactured surface caused by improper storage practices or any other reason shall not be used.

Products and application procedures for form release agents shall be approved by the form liner manufacturer. Release agents shall not cause swelling of the liner material or delamination from the forms. Release agents shall not stain the concrete or react with the liner material. For reliefs simulating fractured concrete or wood grain surfaces the application method shall include the scrubbing method using a natural bristle scrub brush in the direction of grooves or grain. The release agent shall coat the liner with a thin film. Following application of form release agent, the liner surfaces shall be cleaned of excess amounts of agent using compressed air. Buildup of form release agent caused by the reuse of a liner shall be removed at least every 5 uses.

Form liners shall release without leaving particles or pieces of liner material on the concrete and without pulling or breaking concrete from the textured surface. The concrete surfaces exposed by removing forms shall be protected from damage.

Proprietary Earth Retaining Systems

If the Contractor elects to construct one of the acceptable proprietary alternative earth retaining systems, the structure shall be constructed to the lines and grades shown on the plans. Vertical and horizontal alignment shall be checked at every course throughout the erection process. The construction shall include a drainage system where shown on the plans, and shall conform to the details shown on the approved working drawings, approved proprietary system details, and these special provisions.

The Contractor shall supply a Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications stating the supplied material meets the respective index criteria set forth when the proprietary alternative earth retaining system was prequalified by the Department, as measured in accordance with all test methods and standards specified in the Standard Specifications, these special provisions, and the approved working drawings.

A qualified representative of the proprietary earth retaining system manufacturer shall be present during erection and backfill of the first 3 meters of height of the entire length of the wall and shall be available during any remaining installations. The manufacturer's representative shall not be an employee of the Contractor.

Alternative earth retaining structures shall be constructed to accommodate the panels with utility openings, as shown on the plans.

The top of wall profile of alternative earth retaining systems shall conform to the profile shown on the plans. The bottom of face panels shall be at or below the elevations shown on the plans. The height and length to be used for any system shall be the minimums for that system that will effectively retain the earth behind the structure for the loading conditions and the contours, profile, or slope lines shown on the plans. The length of soil reinforcement for any system shall be not less than that shown on the plans. In addition, if the plans or special provisions indicate limiting parameters for alternative systems, the system shall conform to those parameters.

The top of face panels, assuming no leveling pad settlement, shall be covered by the coping lip or concrete barrier slab lip at a minimum of 170 mm.

The top level of soil reinforcement shall be placed parallel to the top of the concrete panel at a distance below the top of the wall as shown on the plans. The top level of soil reinforcement shall also be (1) placed a minimum of 75 mm below the bottom of the barrier slab lip or the bottom of the concrete gutter behind coping and (2) placed a minimum of 125 mm below the top edge of the concrete panel.

MEASUREMENT AND PAYMENT

Earth retaining structures will be measured and paid for by the square meter. Regardless of the type of earth retaining structure actually constructed, the square meter area for payment will be based on the length and vertical height of each section of Mechanically Stabilized Embankment system shown on the plans that was or would have been constructed. The vertical height of each section will be taken as the difference in elevation on the outer face from the bottom of the lowermost face element to the top of wall profile.

The contract price paid per square meter for earth retaining structure at each location shown on the plans shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the earth retaining structure and inspection elements, including architectural texture, test panels, earthwork shown to the limits on the plans, leveling pad, coping, bearing pads, and drainage systems, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for furnishing and testing sample mechanical connectors shall be considered as included in the contract price paid per square meter for earth retaining structure, and no separate payment will be made therefor.

Full compensation for revisions to the barrier support, drainage system, or other facilities made necessary by the use of an alternative earth retaining system shall be considered as included in the contract price paid per square meter for earth retaining structure, and no separate payment will be made therefor.