STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLE
COMMISSIONER

June 15, 2009
Subject: **South Portland**
Federal Project No's: STP-1123(100)X & IM-A280(000)
State Pin No's: 011231.00 & 012800.00
Amendment No. 5

Dear Sir/Ms:

Make the following change to the Bid Document:

In the Bid Book, **REPLACE** "SPECIAL PROVISION, SECTION 606, HIGH-TENSION CABLE BARRIER, (State Supplied)" (6 pages dated June 5, 2009 and replaced in Amendment #4) with the attached new "SPECIAL PROVISION, SECTION 606, HIGH-TENSION CABLE BARRIER, (State Supplied)" 6 pages dated June 15, 2009.

The following question has been received:

Question: Regarding SP 606, High Tension Cable Barrier; is there gravel required under the 3 foot wide mow strip and if so, what is the type and depth?

Response: Please see the attached and amended Special Provision 606.

Consider this change and information prior to submitting your bid on **June 17**, 2009.

Sincerely,

Scott Bickford
Contracts & Specifications Engineer

SPECIAL PROVISION
SECTION 606
HIGH-TENSION CABLE BARRIER
(State-Supplied)

Description. This work shall consist of pick-up, delivery to the work site, and installation of State-Supplied high-tension cable barrier and end terminals as shown in the plans and according to manufacturer's details and specifications, and this special provision.

The Department plans to pre-order the Cable Barrier Guardrail and End Terminals in advance of awarding this Contract. The Department will deliver the guardrail and components to the Dunstan Camp maintenance lot in Scarborough for pick-up by the Contractor. This will enable the Contractor to meet the timely schedule for installation and completion of the cable guardrail system.

Materials. The following high-tension cable barrier system is specified for this project:

Cable Safety System (CASS™) TL4 manufactured by Trinity Highway Products of Dallas, TX

All cable barriers and end terminals shall be of the same type from the same manufacturer. The end terminals shall be compatible with the cable barrier system installed. Intermixing and/or overlapping different cable barrier types or cable barrier systems made by different manufacturers shall be prohibited. All cable barrier posts will be of the same type. Intermixing different types of cable barrier posts is prohibited.

The cable barrier shall meet National Cooperative Highway Research Program (NCHRP) 350 Test Level 4 (NCHRP 350, TL-4) when installed on slopes with an inclination of 6:1 or flatter. In addition, the cable barrier shall have Federal Highway Administration (FHWA) acceptance. The end terminals shall meet NCHRP 350 Test Level 3 and have FHWA acceptance. The Contractor shall furnish FHWA acceptance letters to the Resident indicating that the cable barrier and end terminals are NCHRP 350 compliant when installed on a 6:1 slope.

The cable barrier system shall have a minimum of three cables. Each cable shall be 3/4-inch (minimum) diameter, zinc-coated (galvanized) wire rope with 3 x 7 strands manufactured in accordance with AASHTO M 30, Type I, Class A coating. Each cable shall be pre-stretched during manufacture and have a minimum tensile strength of 39,000 pounds. The manufacturer shall furnish a certificate to the Resident that the cable was pre-stretched.

All fittings, including but not limited to turnbuckles and connections, shall have a minimum diameter of 3/4 inch and be zinc coated (galvanized) according to AASHTO M 232 after threading. All fittings shall develop a minimum tensile load (without yielding) of 36,800 pounds. All other components made of ferrous metal shall be zinc coated (galvanized) according to AASHTO M 111 after fabrication.

All materials used for high-tension cable barriers and end terminals shall conform to manufacturer's specifications. In addition, all posts shall be made of steel meeting AASHTO M 183 and zinc coated (galvanized) after fabrication to AASHTO M 111.

Retroreflective sheeting meeting AASHTO M 268, Type III shall be attached to all reflectors on posts. Reflectors shall meet manufacturer's specifications. Reflectors shall match color of edge line adjacent to approaching traffic. Each reflector shall have a minimum of 13 square inches of retroreflective sheeting material facing approaching traffic.

Class LP (5,075 psi) concrete meeting the requirements specified in Section 502 of the Standard Specifications shall be used for all anchorage foundations and line post foundations (sockets), unless otherwise specified by the Resident.

Steel reinforcement meeting the requirements specified in Section 503 of the Standard Specifications shall be used.

Excluder caps (a sleeve cover placed around each post to prevent debris from entering the socket) meeting the manufacturer's specifications shall be used at each post location.

Sound earth meeting the requirements specified in Section 203 of the Standard Specifications shall be used for grading and earthwork.

The Contractor shall provide written certification to the Resident that the materials used to construct the high-tension cable system and end terminals meet manufacturer's specifications and the requirements contained in this Special Provision.

Pre-Construction. At least 14 days prior to cable barrier installation, the Contractor shall submit three plan sets of the high-tension cable system selected for this project (CASS™). Plan sets must be prepared by the manufacturer of the high-tension cable system selected for the project. One set shall be sent to the MaineDOT Highway Program Project Manager, one set to the MaineDOT Safety Office, and one set to the MaineDOT Transportation Research Division.

Each set of plans shall contain detailed shop drawings of the cable system, design calculations and notes, and any construction specifications. The cable system shall be designed according to the manufacturer's recommendations and all of the requirements specified in this Special Provision. In addition, the following must be included in each plan set:

1. The height of each cable in the system.

2. The post length and height of each post with respect to ground level.

3. The post spacing along the entire length of each cable run.

4. Line post foundation design, including detailed drawing of steel reinforcement.

5. Reflector design.

6. End terminal design, including concrete anchor foundation(s).

7. Detailed drawings showing steel reinforcement in anchor foundation(s).

8. Geotechnical data used to design line post foundations and end terminal foundations.

9. Recommended post spacing as a function of roadway curvature:
   - Radius less than 650' consult a Trinity representative.
   - Radii 650' to 1300' use 10' post spacing or less if specified by the agency.
   - Radii 1301' to 2250' use 16.5' post spacing or less if specified by the agency.
   - Radii greater than 2250' use project post spacing or less if specified by the agency.

10. A table and/or graph showing impact deflection (under NCHRP 350, TL-3 and NCHRP 350, TL-4 conditions) as a function of post spacing.

11. A table showing the recommended cable tension as a function of cable temperature.

All concrete line post and end anchor foundations must contain steel reinforcement according to manufacturer's recommendations.

Individual cables must terminate at an end anchor foundation. Anchoring individual cables to other cables shall be prohibited.

Line post and end anchor foundations shall be designed by the manufacturer based on the project's soil conditions and frost considerations. The Contractor shall be responsible for furnishing all geotechnical information (including soil borings) required by the manufacturer for designing all line post concrete foundations and end anchor terminals.

Line post and end anchor depths must be determined by the manufacturer based on the project's soil conditions. However, the depth below ground level shall not be less than 27 inches.

End anchor foundations shall be designed such that movement due to the forces imparted by the attached cables is less than one inch.

The shop drawings detailing the line post foundations and end anchor foundations shall be signed and sealed by a Licensed Professional Engineer registered in the State of Maine.

Each plan set shall include FHWA acceptance indicating the cable barrier meets NCHRP 350, TL-4 and end terminals meet NCHRP 350, TL-3 when installed on 6:1 slopes. In addition, each plan set shall include a signed certification letter from the manufacturer indicating the cable system meets all of the requirements set forth in this Special Provision.

The manufacturer shall be available to provide formal training and/or consultation, free of charge, as requested by MaineDOT personnel and/or any of MaineDOT's invitees. The manufacturer must provide training with respect to the installation, operation, and maintenance of the cable barrier system. Training and/or consultation shall be held at a location immediate to the project location. The manufacturer/supplier shall issue a dated certificate to each individual that has undergone formal training.

Construction. Furnish and install high-tension cable barrier and end terminals at the location(s) specified on the plans. All cable barriers and end terminals shall be installed according to manufacturer's specifications, the plans, and this special provision.

Construct a concrete foundation for each line post per manufacturer's specifications. Each line post foundation shall have a sleeve/socket embedded in the concrete for placing the post in the sleeve/socket. Each line post foundation shall contain steel reinforcement according to manufacturer's specifications.

Construct end terminals, including end anchor foundations, according to manufacturer's specifications and the requirements in this special provision. Each end anchor foundation shall contain steel reinforcement according to manufacturer's specifications.

The bottom of all concrete foundations, including but not limited to line post foundations and end terminal foundations, shall be a minimum of 27 inches below ground level. The top of all concrete foundations shall be at ground level.

Post spacing will be based on manufacturer's specifications depending on the roadway curvature shown on the plans. However, the following conditions must be satisfied:

1. The post spacing shall not exceed 10 feet, 6 inches under any circumstance.

2. The impact deflection (under NCHRP 350, TL-3 and TL-4 conditions) of the cable system shall not exceed 8 feet under any circumstance.

3. When placing cable barrier near fixed objects (e.g., concrete bridge piers, trusses, barrier walls, guardrail, trees, etc.) or a traffic lane, the cable barrier posts shall be spaced such that the impact deflection (under NCHRP 350, TL-3 and TL-4 conditions) of the cable system is at least 4 feet less than the shortest distance between the fixed object(s)/edge of traffic lane and the cable system.

4. The Contractor shall use a shorter post spacing than the one specified by the manufacturer if directed by the Resident.

An individual run of cable barrier, not including the end terminals, shall not exceed 26,400 feet (5 miles) in length.

At locations where two cable runs overlap, lap cables according to manufacturer's specifications.

Attach reflectors to line posts according to manufacturer's specifications and this special provision. Reflectors shall not be installed on end terminal posts. Reflectors shall be spaced at the following intervals:

- 48 feet (maximum) on tangent sections and curves with a radius of 1,150 feet or more.
- 24 feet (maximum) on curves with a radius less than 1,150 feet.

Grade ground as necessary to maintain a consistent slope with smooth, gradual transitions, or grade as directed by the Resident. Slopes shall be graded to 6:1 or flatter, unless otherwise directed by the Resident. Grade slopes to within 1 inch +/- of average slopes shown on the plans. Concrete foundation tops shall be flush with the surrounding earth. Concrete foundations shall not protrude above ground level after grading. Remove all excess material and dispose of according to Section 203 of the Standard Specifications. This material may be spread thinly over the roadway slopes provided it does not kill vegetation or block drainage.

An employee trained by the manufacturer in the proper installation of the high-tension cable system and end terminals, as well as a manufacturer's representative, must be present during all phases of installation. The manufacturer's representative must be available to consult with and train personnel from MaineDOT and/or any of MaineDOT's invitees with regard to the installation, operation, and maintenance of the cable barrier system.

Upon complete assembly of the cable barrier, set each cable to the required tension specified by the manufacturer (between 2,800 to 8,800 pounds of force). Measure the temperature of each cable prior to tensioning and use this temperature to determine the required tension. The Contractor shall recheck the tension in each cable after two weeks and, if necessary, adjust the tension to the proper setting. The Contractor shall submit written certification to the Resident indicating the dates the cables were tensioned and rechecked, the ambient temperature and cable temperature on each of these dates, and the tension in each cable on each of these dates.

Any end anchor movement exceeding one inch within 12 months of completed installation that results in any tension reduction to the cable system will require repair and re-tensioning of the cable system by the Contractor at the Contractor's expense.

Both the Contractor and the manufacturer's representative shall provide written certifications to the Resident indicating that the high-tension cable system and end terminals were installed according to the plans, manufacturer's specifications and guidelines, and this Special Provision.

Measurement and Payment: High-Tension Cable Barrier and End Terminals – Install Only will be paid by the Lump Sum, complete in place and accepted. This price will include pick-up, delivery to the work site, installation, and any incidentals necessary to satisfactorily complete this item.

Payment will be made under:

Pay Item		Pay Unit
606.92	High Tension Cable Barrier and End Terminals – Install Only	LS