

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

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April 21, 2011

07-LA-5-2.9/4.9

07-2159C4

Project ID 0700000339

IM-005-2(949)N

Addendum No. 1

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN LOS ANGELES COUNTY IN SANTA FE SPRINGS AND NORWALK FROM ALONDRA BOULEVARD OVERCROSSING TO SHOEMAKER AVENUE 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 Thursday, May 12, 2011.

This addendum is being issued to revise the Project Plans, the Notice to Bidders and Special Provisions, the Bid book, the Federal Minimum Wages with Modification Number 20 dated 4/15/11, and the Information Handout.

Project Plan Sheets 20, 21, 26, 27, 28, 29, 30, 60, 61, 62, 63, 67, 80, 84, 105, 106, 107, 108, 110, 163, 164, 192, 228, 235, 306, 318, 340, 387, 388, 390, 392, 393, 394, 395, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 495, 496, 497, 503, 536, 537, 549, 552, 566, 602, 603, 634, 635, 637, 638, 642, 643, 644, 645, 646, 647, 648, 649, 1070, 1071, 1072 and 1073 are revised. Copies of the revised sheets are attached for substitution for the like-numbered sheets.

Project Plan Sheet 769A is added. A copy of the added sheet is attached for addition to the project plans.

In the Notice to Bidders and Special Provisions, in the "STANDARD PLANS LIST," the following Standard Plan is added:

"RSP A90A."

In the Special Provisions, Section 5-1.11, "PAYMENTS," the following item is added :

"SS. Wrought Iron Fence."

In the Special Provisions, Section 5-1.12, "SUPPLEMENTAL PROJECT INFORMATION," is revised as attached.

In the Special Provisions, Section 5-1.17, "NONHIGHWAY FACILITIES (INCLUDING UTILITIES)," is revised as attached.

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In the Special Provisions, Section 9, "DESCRIPTION OF BRIDGE WORK," under "Retaining Wall 13," the first paragraph is revised as follows:

"A geosynthetic reinforced embankment wall with shotcrete and cast-in-placed concrete facings."

In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the following paragraphs are added after the second paragraph:

"The first order of work shall be furnished preconstruction shotcrete test panels as specified in "Shotcrete " of these special provisions.

The first order of work shall be furnished test panels and mock-up panels for concrete textures as specified in "Architectural Treatment," of these special provisions."

In the Special Provisions, Section 10-1.19, "COOPERATION," is revised as attached.

In the Special Provisions, Section 10-1.22, "RIGHT OF WAY OBSTRUCTIONS," is revised as attached.

In the Special Provisions, Section 10-1.38, "EXISTING HIGHWAY FACILITIES," subsections "REMOVE UTILITY PIPE" "REMOVE WROUGHT IRON FENCE," AND "ABANDON UTILITY PIPE," are added after the subsection "REMOVE CONCRETE" as attached.

In the Special Provisions, Section 10-1.395, "REMOVE ASBESTOS CEMENT PIPE," is added as attached.

In the Special Provisions, Section 10-1.425, "GEOSYNTHETIC REINFORCED EMBANKMENT WALL," is added as attached.

In the Special Provisions, Section 10-1.45, "HANDLING OF SOIL AND WATER CONTAMINATED WITH POTENTIALLY HAZARDOUS SUBSTANCES," is revised as attached.

In the Special Provisions, Section 10-1.57, "JOINTED PLAIN CONCRETE PAVEMENT," is revised as attached.

In the Special Provisions, Section 10-1.715, "SHOTCRETE," is added as attached.

In the Special Provisions, Section 10-1.935, "WROUGHT IRON FENCE," is added as attached.

In the Special Provisions, Section 13, "RAILROAD RELATIONS AND INSURANCE REQUIREMENTS," is revised as attached.

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In the Bid book, in the "Bid Item List," Items 27, 96, 98, 102, 128, 129, 135, 145, 155, 228, and 244 are revised, Items 281, 282, 283, 284, 285, 286 and 287 are added and Item 280 is deleted as attached.

To Bid book holders:

Replace pages 4, 5, 7, 8, 9, 10, 14, 15, and 16 of the "Bid Item List" in the Bid book with the attached revised pages 4, 5, 7, 8, 9, 10, 14, 15, 16 and 16A of the Bid Item List. The revised Bid Item List is to be used in the bid.

Attached is a copy of the Information Handout for Foundation Report on Retaining Wall No. 13 and Right of Entry Agreement with Union Pacific Railroad Company

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, attachments and the modified wage rates are available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/07/07-2159C4

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

5-1.12 SUPPLEMENTAL PROJECT INFORMATION

The Department makes the following supplemental project information available:

Supplemental Project Information

Means	Description
Included in the Information Handout	<ul style="list-style-type: none"> • Foundation Report for Carmenita Rd/I-5 Interchange, dated May 12, 2010. • Foundation Report for Retaining Wall No. 13, dated March 14, 2011. • Geotechnical Design Recommendation for Type 1 retaining walls at Carmenita Rd/I-5 Interchange, dated May 24, 2010. • Standard Specifications for Public Works Construction, 2006 Edition. • 2007 Supplement to Standard Specifications for Public Works Construction, 2006 Edition. • Los Angeles County Sanitary District Amendments to Standard Specifications for Public Works Construction, 2006 Edition and Standard Drawings for Construction. • Installation detail for Battery Backup System. • Portions of Lead Site Investigation Report. • Right of Way Entry Agreement with Union Pacific Railroad Company.
Available as specified in the Standard Specifications	Bridge as-built drawings
Available at: http://www.dot.ca.gov/hq/esc/oe/weekly_ads/index.php	Cross sections

5-1.17 NONHIGHWAY FACILITIES (INCLUDING UTILITIES)

The utility owner will relocate a utility shown in the following table before the corresponding date shown:

Utility Relocation and Date of the Relocation

Utility	Location	Date
Chevron 1-250mm CPL Crude in 400mm Casing	From Sta 11+60 (Freeway Dr.) going along Freeway Dr. then crossing Rte 5 at Sta 12+05	March 5, 2012 (Finish)
Chevron 1-150mm CPL Natural Gas in 300mm Casing	From Sta 11+60 (Freeway Dr.) going along Freeway Dr. then crossing Rte 5 at Sta 12+05	March 5, 2012 (Finish)
Chevron 1-200mm CPL Waste Water in 350mm Casing	From Sta 11+60 (Freeway Dr.) going along Freeway Dr. then crossing Rte 5 at Sta 12+05	March 5, 2012 (Finish)
Chevron 1-200mm CPL Crude in 350mm Casing	From Sta 11+60 (Freeway Dr.) going along Freeway Dr. then crossing Rte 5 at Sta 12+05	March 5, 2012 (Finish)
Chevron 1-300mm CPL Dry Gas in 350mm Casing	From Sta 11+60 (Freeway Dr.) going along Freeway Dr. then crossing Rte 5 at Sta 12+05	March 5, 2012 (Finish)
Chevron 1-200mm CPL Spare in 350mm Casing	From Sta 11+60 (Freeway Dr.) going along Freeway Dr. then crossing Rte 5 at Sta 12+05	March 5, 2012 (Finish)
City of Santa Fe Springs Water 1-300mm DIP Water System	Freeway Drive Alignment 0.61m SN Sta 11+60 to Sta 15+00	February 30, 2012 (Finish)
City of Santa Fe Springs Water 1-300mm DIP Water System	Freeway Drive Alignment 0.61m SN Sta 15+00 to Sta 24+20	February 30, 2011 (Finish)
Southern California Gas Company 1-100mm Main	Freeway Drive Alignment 1.22m Rt. Sta 11+40 to Sta 14+00	August 30, 2011 (Finish)
Southern California Gas Company 1-250mm HP	Freeway Drive Alignment 2.29m Lt. Sta 11+80 to Sta 14+00	August 30, 2011 (Finish)
Southern California Gas Company 1-100mm Main	Freeway Drive Alignment Sta 14+00 to Sta 24+20	July 31, 2011 (Finish)
Southern California Gas Company 1-100mm in 200mm Casing	Crossing Rte 5 at Sta 28+85	July 31, 2011 (Finish)
Southern California Gas Company 1-80mm Main	Firestone Blvd(south) Alignment Sta 11+00 to Sta 19+30	July 31, 2011 (Finish)
Southern California Gas Company 1-80mm Main	Firestone Blvd(south) Alignment Sta 19+30 to Sta 27+15	October 3, 2011 (Finish)
Verizon Overhead Line	Freeway Drive Alignment Sta 11+00 to 14+45	September 15, 2011 (Finish)
Southern California Edison 5- Poles	Freeway Drive Alignment Sta 11+00 to 14+45	July 31, 2011 (Finish)
Time Warner Overhead Line	Freeway Drive Alignment Sta 11+00 to 14+45	September 15, 2011 (Finish)
Verizon Overhead and underground	From PP4666542E to Sta 14+60 on Freeway Dr, then crossing Rte 5 at Sta 29+45	March 30, 2012 (Finish)
Southern California Edison 15- Poles	Freeway Dr. Alignment Sta 11+90 to 24+20	March 30, 2012 (Finish)
City of Santa Fe Springs Water 1-400mm DIP Water Main	Crossing Rte 5 at Sta 29+55	January 31, 2012 (Finish)

City of Santa Fe Springs Water 1-400mm DIP Water Main	Firestone Blvd Alignment Sta 11+20 to 19+80	January 31, 2011 (Finish)
City of Santa Fe Springs Water 1-400mm DIP Water Main	Carmenita Place Alignment Sta 00+00 to 2+40	December 31, 2011 (Finish)
City of Santa Fe Springs Water 1-300mm DIP Water Main	Artic Circle Alignment Sta 00+00 to 00+90	December 15, 2011 (Finish)
City of Santa Fe Springs Water 1-300mm DIP Water Main	Molette Ave Alignment Sta 00+00 to 00+05 to 00+80	December 15, 2011 (finish)
Southern California Edison Transmission 4- Poles	Crossing Rte 5 at Marquart Ave From Freeway Dr. to Firestone Blvd	March 30, 2012 (Finish)
Southern California Edison 14- Poles	Firestone Blvd Alignment Sta 11+40 to 17+80	February 15, 2012 (Finish)
Verizon Overhead Lines	Firestone Blvd Alignment Sta 11+40 to 17+80	March 15, 2012 (Finish)
Verizon 20-100mm PVC (underground)	Carmenita Rd Alignment Sta 10+50 (PB 24L) to MH 532L	September 30, 2011 Finish)
Verizon 12-100mm PVC in 560mm Casing (Underground facility)	Crossing Rte 5 From MH 532L to MH 533L	August 30, 2011 (Finish)
Verizon 12-100mm PVC (Underground facility)	Excelsior Dr. Alignment From MH 536L to MH 29L	November 30, 2011 (Finish)
Verizon 12-100mm PVC (Underground facility)	Freeway Drive Alignment From. MH 533L to MH 536L	October 30, 2011 (Finish)
Verizon 1-100mm PVC (Underground facility)	From. Lowe's parking lot to PP 4666513.	November 1, 2011 (Finish)
Verizon Overhead Line	Firestone Blvd (North) Alignment From PP 4666513 to PP 816284	November 1, 2011 (Finish)
City of Santa Fe Springs Water 1-300mm DIP Water Main	Excelsior Dr. Alignment From Sta 14+80 Rt. to Carmenita	February 30, 2012 (Finish)
City of Santa Fe Springs Water 1-300mm DIP Water Main	Carmenita Rd Alignment From Excelsior Dr. to 18+00	February 30, 2012 (Finish)
Central Basin Municipal Water District 1-400mm Recycled Water Main	Carmenita Rd. Alignment From Sta 16+90 to Sta 19+00	May 30, 2011 (Finish)
Park Water 1-200mm DIP Main	Firestone Blvd Alignment From Sta 10+00 to Sta 15+00	May 30, 2011 (Finish)
Central Basin Municipal Water District 1-400mm Recycled Water Main	Firestone Blvd(north) Alignment From Sta 12+60 to Sta 14+40	May 1, 2011 (Finish)
City of Santa Fe Springs Water 1-300mm DIP	Firestone Blvd Alignment From Sta 19+80 to Sta 25+40	January 15, 2012 (Finish)
Verizon 3-100mm PVC (Underground facility)	Firestone Blvd Alignment From MH 531L to MH 423L	December 30, 2011 (Finish)
Southern California Edison 8- Poles	Firestone Blvd Alignment From Sta 19+80 to 25+40	January 30, 2012 (Finish)
Southern California Edison Transmission-11-Poles	Carmenita Rd., Alignment From Sta 10+60 to 17+60	March 15, 2012 (Finish)

Southern California Edison 9- Poles	Carmenita Rd., Alignment From Sta 12+00 to 16+80	April 15, 2012 (Finish)
Southern California Edison 8- Poles	Excelsior Dr. Alignment	March 20, 2012 (Finish)
Sothern California Gas Extend Pipe & Casing of 150 mm	Crossint Rte 5 at 48+00	November 30, 2011 (Finish)

During the progress of the work under this Contract, the utility owner will relocate a utility shown in the following table within the corresponding number of days shown. Notify the Engineer in writing 30 days before you work within the approximate location of a utility shown. The days start on the notification date.

Utility Relocation and Department-Arranged Time for the Relocation

Utility	Location	Days
Southern California Edison 10- Poles, 7-Electroliers	Firestone Blvd(north) Alignment From Sta 10+00 to Sta 15+00	45-days

10-1.19 COOPERATION

It is anticipated that work by another Contractor may be in progress adjacent to or within the limits of this project during progress of the work on this contract. The following table lists contracts anticipated to be in progress during this contract.

Contract No.	Co-Rte-KP	Location	Type of Work
07-3Y7504	LA-5, 60, 605-Var	In Los Angeles County at Various Locations	Coldplane and place Rubberized Hot Mix Asphalt (Gap Graded)
07-226534	LA-5-1.9/26.6	In Los Angeles County fromr Santa Fe Springs To Los Angeles from Valley View Avenue to Soto Street and Various Locations	Install Vertical Clearance Signs
07-258604	LA-5, 60, 101, 605-Var	In Los Angeles County at Various Locations	Stabilize and pave slope areas
ConocoPhilips Company		Parcel No. 78268	Hazardous Waste Remediation and Install Monitoring Wells

Comply with Section 7-1.14, "Cooperation," of the Standard Specifications.

10-1.22 RIGHT OF WAY OBSTRUCTIONS

Attention is directed to the occupied improvements located within the right of way at:

Parcel No.	Description	Date
77074	Work around Parcel	02/28/2012
78269	Work around Parcel	09/01/2013
78327	Work around Parcel	04/30/2012
77070, 77071	Work around Parcel	03/31/2012
77072	Work around Parcel	09/01/2011
78254	Work around Parcel	08/01/2011
78255	Work around Parcel	05/01/2012
78265	Work around Parcel	08/01/2011
78268	Work around Parcel	10/01/2011
78325	Work around Parcel	06/30/2012
79394	Work around Parcel	09/30/2011
79476	Work around Parcel	01/31/2012
79679	Work around Parcel	02/01/2012
79684	Work around Parcel	09/30/2011
77069, 78250, 78251, 78252, 78253, 78324	Work around Parcel	06/30/2012

The Contractor shall take no action that will result in unnecessary inconvenience, disproportionate injury or any action coercive in nature to the occupants of these improvements who have not yet moved from the improvements.

In the event that the improvements in the right of way secured for the project mentioned on the parcels above are not removed by the date specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the improvements not being removed by the date specified, the State will compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

REMOVE UTILITY PIPE

Existing utility pipes, where any portion of utility pipes is within one meter of the grading plane in excavation areas, or within 0.3-m of original ground in embankment areas, or where shown on the plans to be removed, shall be completely removed and disposed of. You must notify the Engineer prior to removing utility pipes.

Attention is directed to Section "Handling of Soil and Water Contaminated with Potentially Hazardous Substances" of these special provisions prior to removing utility pipes shown on the plans.

The contract price paid per meter for remove utility pipe shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in removing utility pipe, including structure excavation and structure backfill, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

REMOVE WROUGHT IRON FENCE

Existing wrought iron fence, including gates and post footings, where shown on the plans, shall be removed and disposed of.

Notify the Engineer 5 working days before removing wrought iron fences and gates.

Full compensation for removing gates and backfilling and compacting post holes shall be considered as included in the contract price paid per meter for remove wrought iron fence and no additional compensation will be allowed therefor.

ABANDON UTILITY PIPE

Existing utility pipelines, where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the culverts and pipelines shall be removed and disposed of. Resulting openings into existing structures that are to remain in place shall be plugged with concrete conforming to the provisions in Section 90-10 "Minor Concrete," of the Standard Specifications. The concrete shall contain not less than 300 kg of cementitious material per cubic meter.

Abandoning utility pipelines in place shall conform to the following:

1. Pipelines that intersect the side slopes shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.
2. Pipelines 300 mm in diameter and larger, shall, at the Contractor's option, be backfilled with either sand, controlled low strength material or slurry cement backfill conforming to the provisions in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications by any method acceptable to the Engineer that completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.
3. The ends of pipelines shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

The contract price paid per meter for abandoning utility pipes shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in abandoning utility pipes, including concrete plugs, pipe removal, structure excavation, and structure backfill, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.395 REMOVE ASBESTOS CEMENT PIPE

Asbestos containing materials (ACM), as defined in section 1529, "Asbestos," of the Construction Safety Orders, Title 8, of the California Code of Regulations are present in the abandoned Santa Fe Springs water pipes to be removed.

In compliance with Standard Specifications Section 14-9.01, the Contractor must notify the South Coast Air Quality Management District (AQMD) as required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61, Subpart M, California Health and Safety Code section 39658(b)(1), and the California Air Resources Board regulations. Provide a copy of the notification form and attachments to the Engineer prior to submittal. Notification must take place a minimum of 10 days prior to removing the water pipes. The Contractor must contact the AQMD for confirmation.

Friable ACM is defined under the Asbestos Hazard Emergency Response Act (AHERA) as "any material containing more than 1 percent asbestos by area that hand pressure can crumble, pulverize or reduce to powder when dry". The term non- friable implies that the asbestos fibers are tightly bound into the matrix of the material and should not become an airborne hazard as long as the material remains intact and undamaged, and is not sawed, sanded, drilled or otherwise abraded during removal.

Codes, which govern removal and disposal of materials containing asbestos include, but are not limited to, the following:

1. California Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control.
2. California Code of Regulations, Title 8, General Industry Safety Order 5208 Asbestos.
3. California Code of Regulations, Title 8, Sections 1529 and 341
4. California Code of Regulations, Title 22, Division 4.5
5. Occupational Safety and Health Administration, Part 26 (amended), of Title 29 of the Code of Federal Regulations.
6. Code of Federal Regulations (CFR), Title 40, Part 61, subpart M.

ASBESTOS SAMPLING AND ANALYSIS WORKPLAN

At least 15 days prior to beginning any sampling for suspected ACM, submit a written, project specific Asbestos Sampling and Analysis Workplan that establishes the procedures used to comply with requirements for asbestos abatement, including sampling and testing of suspected ACM, containment, transportation and disposal of ACM. No sampling and analysis work will proceed until the plan is authorized by the Engineer. If the plan is unacceptable, it will be returned within 10 days of the submittal to the Contractor for revision. The Engineer must have 5 days to review and authorize or reject the revised plan from the date the revised plan is received from the Contractor. The Contractor must be a Certified Asbestos Consultant (CAC) and AHERA (Asbestos Hazard Emergency Response Act) -trained to perform an asbestos survey prior to any removal activity. The plan must be prepared, signed, and stamped by a CAC.

ACM sampling methods must meet USEPA, SW-846, "Test Methods for Evaluating Solid Waste," Volume II: Field Manual, Physical/Chemical, Chapter Nine Section 9.1. Use a laboratory certified by the California Department of Public Health, Environmental Laboratory Accreditation Program for analysis of ACM samples. Samples must be analyzed for asbestos according to Analytical Method 600/R-93-116 specified in 40 Code of Federal Regulations (CFR) Part 763 Subpart F, Appendix A (Polarized Light Microscopy).

A minimum of one sample must be taken per suspected ACM location. For pipes and other linear components of suspected ACM, collect one sample per 1.5 meters of exposed material. Sample any exposed ACM on the existing structure. ACM encased in concrete will be sampled when exposed during demolition.

Transport samples under the chain of custody to the laboratory within 24 hours of collection. Run analytical laboratory tests on a 48-hour turn-around. Send by facsimile, or hand deliver to the Engineer, laboratory results as soon as they are available. Supply a summary report of sampling protocols, photographs of the structures and of the locations where samples were taken, chain of custody, analysis and laboratory data sheets, to the Engineer within 15 days of completion of sampling.

SUBMITTALS

Submit a draft sampling and analysis report to the Engineer within 15 days of completion of sampling and analysis. The Engineer will review the survey report and provide comments to the Contractor within 7 days. If, in the opinion of the Engineer, completion of work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted in accordance with Section 8-1.07, "Right of Ways Delays" of the Standard Specifications. Make any requested edits and submit four copies of the final report to the Engineer within 5 days.

Submit an Asbestos Compliance Plan (ACP). ACP must comply with section 7-1.01A, "Labor Code Requirements" of the Standard Specifications.

ASBESTOS COMPLIANCE PLAN

Prepare an Asbestos Compliance Plan (ACP) to prevent or minimize exposure to asbestos. Attention is directed to Title 8, California Code of Regulations, Construction Safety Orders, section 5192 (b) and section 1529, "Asbestos", Occupational Safety and Health Guidance Manual published by the National Institute of Occupational Safety and Health (NIOSH) and the USEPA for elements of the ACP. The ACP must contain as a minimum but not be limited to: identification of key personnel for the project, job hazard analysis for work assignments, summary of risk assessment, personal protective equipment, delineation of work zones on-site, decontamination procedures, general safe work practices, security measures, emergency response plans and worker training. The ACP must be authorized in writing by an industrial hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene before submission to the Engineer for review and acceptance. Submit the ACP to the Engineer at least 15 days prior to beginning work in areas containing or suspected to contain asbestos.

TRAINING

Prior to performing work in areas containing or suspected to contain asbestos, personnel who have no prior training or are not current in their training status, including State personnel, must complete a safety training program provided by the Contractor, which meets the requirement of Title 8, California Code of Regulations, Section 1529. Provide a written certification of completion of safety training to the Engineer for trained personnel prior to performing work in areas containing or suspected to contain asbestos.

EQUIPMENT AND MEDICAL SURVEILLANCE

Provide personnel protective equipment, training, and medical surveillance required by the Contractor's Asbestos Compliance Plan to State personnel. The number of State personnel will be 2.

REMOVAL

Prepare a work plan for the removal, storage, transportation and disposal of ACM. Removal and management of ACM will be performed by a contractor registered pursuant to Section 6501.5 of the Labor Code and certified pursuant to Section 7058.6 of the Business and Professions Code. Asbestos removal must conform to Cal/OSHA requirements in Title 8 Sections 1529 and 341. For bridges built before 1980, where ACM is suspected, but cannot be sampled before demolition, a CAC must be present during demolition in case unforeseen ACM is encountered. Remove all friable material in a manner that conforms to OSHA work practice requirements. Remove and handle all non-friable ACM to prevent breakage. Non-friable ACM such as asbestos cement pipe must be disposed of to a landfill facility permitted to take ACM. The removal of ACM encased in concrete or other similar structural material is not required prior to demolition, but such material must be adequately wetted whenever exposed during demolition. Packaging, storage, transporting, and disposing of ACM, must conform to Title 22, Division 4.5, Chapters 11, 12 and 13 of the California Code of Regulations. No visible dust must be generated when handling, removing, transporting, and disposing of ACM.

Asbestos removal procedures include, but are not limited to:

1. Installing asbestos warning signs at perimeters of abatement work areas.
2. Wetting asbestos materials with sprayers.
3. Containing large volumes of asbestos materials in disposal bins for temporary storage until removed from the site.
4. Providing manifests for the Engineer to sign for disposal of friable ACM waste or a waste shipment record for disposal of non-friable ACM waste.
5. Providing transporters registered to transport hazardous waste in the State of California in accordance with the provisions of Chapter 6.5, Division 20 of the Health and Safety Code and Title 22 of the California Code of Regulations, Division 4.5.
6. Disposing of asbestos materials at a permitted disposal facility, which accepts such materials.
7. Working in accordance with Federal, State, and Local requirements for asbestos work.

Mark all vehicles used to transport ACM as specified below, or an equivalent warning:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY**

Handling

Comply with CCR Title 22, Division 4.5, Chapter 12, Article 3 requirements for the packaging and labeling of removed ACM, and place such removed material in approved plastic containers (double ply plastic bags) with caution labels affixed to bags. Such caution labels must have conspicuous, legible lettering, which spells out the following, or equivalent warning:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD**

At the option of the Contractor, the removed materials containing asbestos may be placed directly into a covered roll off or drop box, which must have the same caution label, affixed on all sides.

Transporting

Haulers of friable asbestos containing material will have current registration with the State Department of Toxic Substances Control (DTSC), and must have a U.S. Environmental Protection Agency Identification Number (U.S. EPA I.D. Number). A valid registration issued by DTSC is required for all vehicles used to transport hazardous waste material. Non-friable ACM is not hazardous waste and can be transported with a waste shipment record (WSR) or comparable shipping document.

Disposal

The Engineer will obtain the required EPA generator identification numbers, and will sign the hazardous waste manifests for disposal of friable asbestos containing material. The Contractor must dispose of friable and non-friable waste containing asbestos at a disposal facility permitted to accept such material and that meets all the requirements specified by Federal, State, and Local regulations. Notify the proper authorities at the disposal site in advance of delivery of asbestos containing material to the disposal site. Conduct additional sampling deemed necessary by the owner of the disposal facility for acceptance of the material at your expense.

MEASUREMENT AND PAYMENT

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing the Asbestos Compliance Plan, including paying the Certified Industrial Hygienist, and for providing personal protective equipment, training, medical surveillance, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer will be considered as included in the contract prices paid per meter for remove asbestos cement pipe and no additional compensation will be allowed therefor.

Full compensation for preparation of a Removal Work Plan, Sampling and Analysis Work Plan, performing sampling and analysis and for the removal, transportation, and disposal of asbestos cement pipes are included in the contract price paid per meter for remove asbestos cement pipe and no additional compensation will be allowed therefor.

10-1.425 GEOSYNTHETIC REINFORCED EMBANKMENT WALL

This work includes constructing geosynthetic reinforced embankment, concrete anchor blocks, wall footing, shotcrete facings, and cast-in-placed concrete facings as shown on the plans and in conformance with these special provisions.

Comply with Section 19, "Earthwork," Section 51, "Concrete Structures," Section 52, "Reinforcement," Section 53 "Shotcrete," Section 75, "Miscellaneous Metal," and Section 88, "Engineering Fabrics," of the Standard Specifications.

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 geosynthetic reinforced embankment wall 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 for geosynthetic reinforced embankment wall 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.

Geosynthetic Reinforcement

Geosynthetic reinforcement used for geotechnical subsurface reinforcement shall be either geotextile or geogrid.

When tested under ASTM D 4491, geotextile permittivity shall be at least 0.05 sec^{-1} .

Geogrid shall have a regular and defined open area. The open area shall be from 50 to 90 percent of the total grid area.

Determine the Long Term Design Strength (LTDS) of geosynthetic reinforcement from the ultimate tensile strength in the primary strength direction divided by reduction factors. Calculate LTDS from the guidelines in Geosynthetic Research Institute Standard Practice GG4a, GRI GG4b, or GRI GT7.

The product of the reduction factors shall be at least 1.30. Determine the reduction factor for creep using a 75 year design life for permanent applications. Determine the installation damage reduction factor from the characteristics of backfill materials used.

If test data is not available, use default values of reduction factors in the Geosynthetic Research Institute Standard Practice to determine LTDS.

Submit the LTDS and its supporting calculations at least 15 days before placing geosynthetic reinforcement. The calculations shall be signed by an engineer who is registered as a civil engineer in the State. Geosynthetic reinforcement shall not be installed before the submittal has been approved by the Engineer.

LTDS values of geosynthetic reinforcement shall conform with the following:

Geosynthetic Reinforcement Type	LTDS (kg/m)
Type I	4260

Each roll must be labeled with:

1. Manufacturer's name.
2. Production identification.
3. Roll dimensions.
4. Lot number.
5. Date of manufacture.

Concrete

Concrete used for cast-in-place reinforced concrete facing of geosynthetic reinforced embankment wall shall conform to the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications, and these special provisions.

The concrete pads and anchor blocks for geosynthetic reinforced embankment wall 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.

Tie rods and connecting elements that are in contact with soil shall be galvanized in conformance with the provisions in Section 75-1.05, "Galvanizing," of the Standard Specifications.

Nuts, washers, and bearing plates to be fully encased in concrete or shotcrete need not be galvanized.

Stud heads on bearing plates shall conform to the provisions for stud connectors in Section 55-2, "Materials," of the Standard Specifications.

Shotcrete

Shotcrete used in geosynthetic reinforced embankment wall shall conform to the details shown on the plans, the provisions in Section 53, "Shotcrete," of the Standard Specifications, and these special provisions.

Geocomposite Drain

Geocomposite drain shall conform to the details shown on the plans and the following:

- A. Attention is directed to "Engineering Fabrics" under "Materials" of these special provisions.
- B. Geocomposite drain shall consist of a manufactured core not less than 6.35 mm thick nor more than 50 mm thick with one or both sides covered with a layer of filter fabric that will provide a drainage void. The drain shall produce a flow rate, through the drainage void, of at least 25 liters per minute per meter of width at a hydraulic gradient of 1.0 and a minimum externally applied pressure of 168 kPa.

- C. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for the geocomposite drain certifying that the drain produces the required flow rate and complies with these special provisions. The Certificate of Compliance shall be accompanied by a flow capability graph for the geocomposite drain showing flow rates for externally applied pressures and hydraulic gradients. The flow capability graph shall be stamped with the verification of an independent testing laboratory.
- D. Filter fabric for the geocomposite drain shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.
- E. The manufactured core shall be either a preformed grid of embossed plastic, a mat of random shapes of plastic fibers, a drainage net consisting of a uniform pattern of polymeric strands forming 2 sets of continuous flow channels, or a system of plastic pillars and interconnections forming a semirigid mat.
- F. The core material and filter fabric shall be capable of maintaining the drainage void for the entire height of geocomposite drain. Filter fabric shall be integrally bonded to the side of the core material with the drainage void. Core material manufactured from impermeable plastic sheeting having nonconnecting corrugations shall be placed with the corrugations approximately perpendicular to the drainage collection system.
- G. The geocomposite drain shall be installed with the drainage void and the filter fabric facing the embankment. The fabric facing the embankment side shall overlap a minimum of 75 mm at all joints and wrap around the exterior edges a minimum of 75 mm beyond the exterior edge. If additional fabric is needed to provide overlap at joints and wrap-around at edges, the added fabric shall overlap the fabric on the geocomposite drain at least 150 mm and be attached thereto.
- H. Should the fabric on the geocomposite drain be torn or punctured, the damaged section shall be replaced completely or repaired by placing a piece of fabric that is large enough to cover the damaged area and provide a minimum 150-mm overlap.
- I. Plastic pipe shall conform to the provisions for edge drain pipe and edge drain outlets in Section 68-3, "Edge Drains," of the Standard Specifications.

CONSTRUCTION

Geosynthetic reinforced embankment wall shall be constructed to the lines, grades, and details shown on the plans, and shall conform to these special provisions.

Foundation Preparation

Remove loose or extraneous material and sharp objects that may come in contact with the geosynthetic reinforcement. Compact foundation under Section 19-5.03, "Relative Compaction (95 Percent)," of the Standard Specifications.

Geosynthetic Reinforcement Placement

Unless otherwise shown, at least 75 mm of compacted backfill is required between layers of geosynthetic reinforcement. Geosynthetic reinforcement shall be:

1. Secured with staples, pins, or small piles of backfill.
2. Placed without wrinkles.
3. Aligned with the primary strength direction perpendicular to slope contours.
4. Spliced under manufacturer's recommendations.
5. Butted edge-to-edge for straight slope contours.
6. Butted edge-to-edge at the slope face and fanned out or overlapped into the backfill for curved slope contours.

Cover geosynthetic reinforcement with backfill within the same work shift.

Backfill Placement and Compaction

Grade and compact backfill to ensure the reinforcement remains taut.

Compact backfill under Section 19-5.3, "Relative Compaction (95 Percent)," of the Standard Specifications. If hand-operated equipment is used to compact backfill, do not place more than 150 mm of backfill before compacting.

Construct embankment slope under Section 19-2.05, "Slopes," of the Standard Specifications.

Use hand-operated equipment to compact backfill areas within 0.6 m of tie rods and underground structures.

Disking and plowing is not allowed in the reinforced area.

Place at least 150 mm of backfill on the geosynthetic reinforcement before operating or driving equipment or vehicles over it, except for equipment or vehicles used under the conditions specified below for spreading backfill.

Equipment or vehicles for spreading backfill may be driven directly on the geosynthetic reinforcement if:

1. Comply with manufacturer's recommendations.
2. Vehicles have rubber tires.
3. Traffic repetitions are minimized.
4. Speed of less than 5 miles per hour is maintained.
5. Sudden braking and sharp turning is avoided.

Do not extend geosynthetic reinforcement into pavement structural section.

If the geogrid reinforcement is damaged during construction, replace it or repair it. Repair by placing additional reinforcement to cover the damaged area and:

1. For reinforcement placed parallel to slope contours, overlapping 5 aperture openings or 200 mm whichever is greater.
2. For reinforcement placed perpendicular to slope contours, splicing the edges as recommended by the manufacturer.

If the geotextile reinforcement is damaged during construction, replace it.

The top of the geosynthetic reinforced embankment shall be within 75 mm of the bottom of the barrier slab.

Tie rods shall be level, tensioned in the direction perpendicular to the wall face with enough force to remove any slack in the connection or the tie rod itself, and shall be secured at the face of the steel bearing plate. The steel bearing plate shall be seated with full bearing on the shotcrete.

Structure backfill for concrete anchor blocks shall be compacted to a relative compaction of not less than 95 percent.

Concrete and Shotcrete placement

Shotcrete shall be constructed after geosynthetic reinforced embankment is complete.

Concrete for wall footing shall be placed at least 24 hours prior to placing shotcrete facing.

Exposed surfaces of cast-in-place concrete shall conform the provisions in "Architectural Treatment," of these special provisions.

Geocomposite Drain

Geocomposite drain and plastic pipes shall be placed at the locations and in conformance with the details shown on the plans and the manufacturer's recommendations.

MEASUREMENT AND PAYMENT

Geosynthetic reinforcement embankment is measured and paid for by the square meter.

The square meter area for payment will be based on the length and vertical height as shown on the plans.

The contract price paid per square meter for geosynthetic reinforced embankment includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing geosynthetic reinforcement embankment complete in place, including backfill, concrete anchor blocks, tie rods and anchoring system, wall footings, and geocomposite drain, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per cubic meter for structural concrete, barrier slab shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the barrier slab, complete in place, including earthwork and bar reinforcement, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.45 HANDLING OF SOIL, WATER, AND LIQUIDS CONTAMINATED WITH POTENTIALLY HAZARDOUS SUBSTANCES AND PETROLEUM HYDROCARBONS

GENERAL

Soil, perched groundwater and liquids inside the Plains All American Pipeline utility pipeline within the project limits are contaminated with heavy metals, volatile organic compounds, petroleum hydrocarbons, semi-volatile organic compounds, agricultural chemicals and other constituents that are potentially hazardous to human health and the environment.

Limited Site Investigations (SI) were performed at industrial properties within the project limits to determine if the soil, soil vapor, and perched groundwater were impacted by hazardous substances and petroleum hydrocarbons, and if the detected concentrations of contaminants pose a risk to human health and the environment. The Plains All American Pipeline utility pipeline was reported by the owner to contain liquids consisting of petroleum hydrocarbons and water (herein referred to as "material"). Concentrations in excess of a regulatory standard or screening level, such as, California Human Health Screening Levels (CHHSLs), U.S. EPA Preliminary Remediation Goals (PRGs), Los Angeles Regional Water Quality Control Board maximum soil screening levels (MSSLs), and Maximum Contaminant Levels (MCLs), were determined to pose a risk and require remediation. Remediation will consist of excavation of the contaminated soil within the constructed roadway footprint and removal of material inside the Plain All American Pipeline utility pipeline. Sites within the constructed roadway footprint with elevated soil gas concentrations but no detected soil matrix contamination are not included in the list of sites with contaminated soil. Refer to the Information Handout attachment in the bid package for sites with detection of volatile organic compounds in soil gas. The contractor is responsible for addressing exposure to workers from soil gas in the health and safety plan.

The estimated soil contamination within the constructed footprint for the roadway at each industrial property and the material inside the Plain All American Pipeline utility pipeline is delineated and shown on the plans. The SI reports for each industrial property are available for inspection at the California Department of Transportation, District 7, Division of Construction, CCO Unit located at 100 South Main Street, Los Angeles, California 90012. For gasoline station properties, numbers 13, 14, 15, and 16 listed below, under the Los Angeles Regional Water Quality Control Board jurisdiction, refer to the GEOTRACKER data base for reports documenting soil contamination.

Contaminated soil exists at:

1. Centerline Wheel (13521 Freeway Drive & 15105 Radius Place, Santa Fe Springs, CA)
2. LeFiell/ Budget Rental (13700, 13750, 13770 Firestone Blvd., Santa Fe Springs, CA)
3. Unoccupied Warehouse (13500 Excelsior Drive, Santa Fe Springs, CA)
4. UPRR Right of Way
5. Choice Lithographics (13362 & 13363 Molette St., Santa Fe Springs, CA)
6. Jack in the Box Restaurant (13369 Firestone Blvd., Norwalk, CA)
7. Innovation Quality Center (Smurfit Stone Container Corp., 13833 Freeway Dr., Santa Fe Springs, CA)
8. Carmenita Ford Truck Sales, Inc. (13407 Freeway Dr., Santa Fe Springs, CA)
9. City of Santa Fe Springs Property (13443 Freeway Dr., Santa Fe Springs, CA)
10. Budget Inn (13420 Firestone Blvd., Santa Fe Springs, CA)
11. Carmenita Business Center (15401 & 15421 Carmenita Road, Santa Fe Springs, CA)
12. Carmenita Commerce Center (13230-13380 Firestone Blvd., Santa Fe Springs, CA)
13. ARCO (13460 Firestone Boulevard, Santa Fe Springs, CA)
14. Union 76 (114960 Firestone Boulevard, Santa Fe Springs, CA)
15. John Veyna's Property (13363 Excelsior Drive, Norwalk, CA)
16. Mobile (13440 Firestone Boulevard, Santa Fe Springs, CA)

Contaminated material contained inside of the pipeline exists at Plain All American Pipeline utility pipeline (Santa Fe Springs, CA, location shown on the plans).

The perched groundwater is contaminated. Pile construction for abutments and bents will generate contaminated soil and water that must be removed, containerized, characterized, and transported to a disposal facility.

Handling of contaminated material must consist of the following:

1. Prepare a project-specific Health and Safety Plan (HSP), a Sampling and Analysis Plan (SAP), and a Quality Assurance/Quality Control Plan for approval by the Engineer.
2. Health and Safety Training and annual refresher training for workers.
3. Excavate contaminated soil.
4. Remove contaminated soil and water generated during construction of piles at each abutment, and bent location, and liquids from the All American utility pipeline.
5. Placement of excavated contaminated soil in a United States Department of Transportation (USDOT) approved container or stockpile separate from uncontaminated soil. Each container and stockpile shall contain contaminated soil from one property. The label on each container must identify the industrial property by name, address and Caltrans parcel number. The stockpiles must be identified and recorded by name, address and Caltrans parcel number. Prior to excavation, the contaminated soil staging area designated for stockpiles must be delineated. A maximum volume for each stockpile is 100 m³ of soil. Soil stockpiles and containers must be maintained in a securely fenced area not accessible to the public.
6. Placement of contaminated water and soil generated during construction of piles and material removed from All American utility pipeline in temporary waste storage tanks or U.S. DOT approved containers that will not allow release of liquids.
7. Collection of soil, water, and liquid samples. Collect soil samples at the bottom and the side walls of the excavation at each property and from stockpiled and containerized soil placed in designated contaminated soil staging areas in accordance with the approved SAP and these special provisions. Collect water and liquid samples from the temporary waste storage tanks and USDOT approved containers in accordance with the approved SAP and these special provisions.
8. Decontamination of reusable equipment.
9. Transport samples to an approved analytical laboratory under proper chain-of-custody.
10. Evaluate laboratory analytical results, including performance of statistical analysis of the data in accordance with the approved SAP and USEPA, SW 846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" Volume II: Field Manual, Chapter Nine, Section 9.1.
11. Prepare a draft and final Soil and Water Sampling Report (SWSR) to be submitted for review and concurrence by the Engineer.
12. Prepare an Excavation and Transportation Plan (ETP) based on the final SWSR for the review and concurrence of the Engineer.
13. Transport and dispose the contaminated soil and water in accordance with the final ETP.

APPLICABLE RULES AND REGULATIONS

Excavation, collection, storage, transportation, and disposal of contaminated soil, water and liquids must be in accordance with the laws, regulations, rules, and ordinances, as applicable, of the following agencies:

1. United States Department of Transportation (USDOT)
2. United States Environmental Protection Agency (USEPA)
3. California Environmental Protection Agency (Cal-EPA)
4. California Department of Toxic Substances Control (DTSC), Southern Region 3
5. California Department of Public Health
6. California Integrated Waste Management Board
7. Regional Water Quality Control Board (RWQCB), Region 4
8. California Air Resources Board
9. South Coast Air Quality Management District (SCAQMD)
10. California Division of Occupational Safety and Health Administration (Cal-OSHA)
11. Los Angeles County and the local Cities

Laws and regulations that govern work related to contaminated material, and to which reports and plans must conform, include, but are not limited to:

1. Health and Safety Code, Division 20, Chapter 6.5 (California Hazardous Waste Control Act).
2. Title 22, California Code of Regulations, Division 4.5 (Environmental Health Standards for the Management of Hazardous Waste).
3. Title 8, California Code of Regulations.
4. Rule 1166 - Volatile Organic Compound Emissions from Decontamination of Soil and Rule 403 - Fugitive Dust, South Coast Air Quality Management District.

PERMITS AND LICENSES

The Engineer obtains the Cal-EPA or USEPA Generator Identification Number and signs the Uniform Hazardous Waste Manifests as Generator for contaminated soil, water, and liquids characterized as hazardous waste.

HAZARDOUS MATERIALS MITIGATION PLANS

Hazardous Materials Mitigation plans must consist of a Health and Safety Plan (HSP), Health and Safety Training, Sampling and Analysis Plan (SAP), soil, water, and liquids sampling and preparation of Soil, Water, and liquids Sampling Report (SWSR), Excavation and Transportation Plan (ETP), and air monitoring as required by HSP conforming to the requirements of these special provisions.

If the Engineer fails to complete the review of your submittals, including the HSP, SAP, SWSR, and ETP, within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, you are compensated for resulting losses, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

If you fail to prepare and submit complete plans or reports, including HSP, SAP, SWSR, and ETP and other deliverables, that the Engineer deems as unacceptable, and if, in the opinion of the Engineer, completion of the work is impeded by delay in submittal of acceptable reports or plans or other deliverables by you, the State will not be liable to you for loss of work days due to such failure or delay.

HEALTH AND SAFETY PLAN

You must prepare a project-specific Health and Safety Plan (HSP) for site personnel, including State personnel, to prevent or minimize worker exposure to chemical, physical, biological, and environmental hazards while handling contaminated material. The HSP must be approved and signed by a Certified Industrial Hygienist (CIH) certified in comprehensive practice by the American Board of Industrial Hygiene, and submitted within 20 days after contract approval for review and acceptance by the Engineer.

The HSP must identify potential health and safety hazards associated with construction operations and activities in areas containing hazardous substances and petroleum hydrocarbons during, construction operations and activities, including excavation, drilling, soil and water removal from conductor casing installation during pile construction, removal of material from the All American utility pipeline collection of soil and water samples, decontamination of reusable equipment, transport of samples to the analytical laboratory, containerizing, stockpiling, storage, transportation, and disposal of contaminated soil and water. The HSP must be designed to protect workers from hazards in conformance with Cal-OSHA regulations and requirements of 29CFR1910.120. The HSP must include the following, but not be limited to:

1. Identification of key site safety personnel and their roles;
2. Description of the activities to be performed and risks associated with exposure to hazardous waste and substances (including soil gas) specific to onsite activities that will be performed;
3. Training requirements; safe work practices; administrative and engineering controls;

4. Hand and eye wash facilities; appropriate personal protective equipment (PPE) and conditions under which upgrade of PPE will be required;
5. Site-specific medical surveillance requirements; perimeter air monitoring requirements;
6. Decontamination requirements; identification of appropriate site work zones; and a contingency and emergency plan.

You are responsible for the health and safety of employees, subcontractors, and personnel (including state personnel). Daily pre-entry safety meetings, required health and safety training, administrative and engineering controls, use of appropriate personal protective equipment, monitoring, and appropriate site work zones must be utilized.

The HSP must include perimeter air monitoring for airborne contaminants such as Volatile Organic Compounds (VOCs) and particulate matter during handling of contaminated soil. A photoionization detector (PID) must be used to monitor worker's breathing zone for VOCs and a particulate air monitor used for dust and particulate matter. Monitoring must be done under the direction of and data reviewed, signed, and stamped by a Certified Industrial Hygienist (CIH). The Engineer will notify you of acceptance or rejection of submitted or revised HSP not more than 20 days after submittal.

HEALTH AND SAFETY TRAINING

Prior to the start of work, you must provide field personnel with Health and Safety training, including the required initial and subsequent training and certification of completion, until project completion. The Health and Safety training program must communicate the potential health and safety hazards associated with work on the site, instruct personnel on procedures for conducting the work safely, hazard recognition, and minimization of hazards. The level of training must conform to Cal-OSHA regulations and be consistent with the personnel's job function, the proposed work, and potential hazards.

A Health and Safety training program, personal protective equipment, and medical surveillance required by your HSP for personnel working within exclusion zones must be supplied to State personnel by you. The number of State personnel requiring the Health and Safety training program, personal protective equipment, and medical surveillance is 7.

SAMPLING AND ANALYSIS PLAN

Within 30 days after contract approval, you must prepare and submit a draft Sampling and Analysis Plan (SAP) for review by the Engineer for each of the identified industrial properties, pile construction locations and utility pipe removal and abandonment locations. The SAP must provide information on the area (lateral and vertical extent) of excavation, the number, depth, and location of samples, describe the sampling methodology, analytical parameters and methods, detection limits, field screening methods, and management of soil cuttings, water, and decontamination water. The SAP must list criteria for characterization of the excavated material, material removed from inside the All American utility pipeline, and water and soil generated from pile construction from each property for use in determining whether the waste is unregulated, waste with land use restrictions, non-RCRA (California) hazardous waste, or RCRA hazardous waste and the disposal options (e.g., Class 3, Class 2, or Class 1 or recycler). The Engineer has 20 days to review the SAP. If revisions are required, as determined by the Engineer, you must revise and resubmit the Sampling and Analysis Plan within 15 days of receipt of the Engineer's comments. The Engineer will have 15 days to review the revisions. The final SAP must address and incorporate comments by the Engineer. The final SAP must be signed and stamped by a California Professional Geologist, Certified Engineering Geologist, or Registered Civil Engineer who has supervised the preparation of the plan, and be submitted for review and approval in 5 days after incorporation of the comments by the Engineer.

The SAP must include the following:

1. Data quality objectives.
2. Description of activities to be performed.

3. Rationale for proposed number of samples, locations, and analytical tests, including but not limited to:
 - 3.1 Sample each excavated property in a grid pattern using simple random sampling.
 - 3.2 Soil sample collection at the bottom and side walls of the excavation.
 - 3.3 Collect and analyze a sample of the perched groundwater for the contaminants of concern at each property to determine water quality in areas where excavation intersects perched groundwater.
 - 3.4 Collect and analyze samples of the liquids removed from the All American utility pipeline.
 - 3.5 Collect and analyze samples from each stockpile and container. Samples must be collected a minimum of 300 mm below the soil surface. The samples must be distributed laterally and vertically across the stockpile and container to provide a representative cross section of soil quality.
 - 3.6 EPA analytical methods and detection limits for each contaminant and matrix shall be specified.
4. Excavation, soil segregation methodology, and storage locations.
5. Soil, water, and liquids sampling methodology:
 - 5.1. Step-by-step standard sampling protocol (with appropriate equipment) for samples.
 - 5.2. Special collection and analytical methods to prevent the loss of volatile and unstable compounds.
 - 5.3. Sample containers and the method of preservation for each matrix and analysis.
 - 5.4. Packaging, labeling, marking, and shipping methods.
Discussion of field documentation such as sample identification, labeling, field logs, boring logs, and chain of custody.
6. Sample handling procedures. The samples must be collected and transferred in a container under proper chain of custody to an approved laboratory within 24 hours after collection. Samples must be analyzed within the holding times specified in SW-846 Test Methods for Evaluating Solid Waste.
7. Decontamination of reusable equipment.
8. Methodology for disposing of investigation derived wastes.
9. Laboratory and field Quality Assurance/Quality Control (QA/QC) procedures. The Quality Assurance Samples (i.e., duplicates, travel blanks, equipment blanks, field blanks) must be collected and analyzed for the same constituents as the associated property samples. These samples must be labeled in a similar fashion as the property samples. Do not identify these samples as QA/QC samples to the analytical laboratory.
10. Statistical Analysis of the sample data in accordance with EPA SW-846 Test Methods for Evaluating Solid Waste.
11. Drilling equipment (drill bit, augers, etc.) must be steam-cleaned prior to use, and steam-cleaned or decontaminated between boring locations and at the end of the each work day. Statements regarding prevention of cross contamination must be included.
12. Schedule for field work and draft and final Soil, Water, and liquids Sampling Report (SWSR) submittal.
13. A discussion on the management of investigation derived waste (IDW), including a recommendation for disposal of excavated soil and water when characterized as contaminated. The generated rinseate, water, and drill cuttings must be containerized in DOT approved 210 liter drums or other DOT approved containers, sealed, labeled, and stored onsite while awaiting analytical results to determine appropriate disposition.
14. The SAP must be prepared under the direction of a California Registered Geologist, Certified Engineering Geologist, or Registered Civil Engineer with 3 or more years of experience in the field of hazardous waste investigation and remediation and must bear the signature and stamp of the registered or certified professional.

Soil and water samples must be collected and analyzed for contaminants of concern using EPA methods to characterize the excavated area, excavated stockpiled and containerized soil, extracted water, and satisfy requirements of the disposal facility. The EPA analytical methods include:

- A. Metals by EPA Method 6010.
- B. Soluble metals by California Waste Extraction Test (Ca WET) (if total metal greater than 10 times the Soluble Threshold Limit Concentration (STLC).
- C. Soluble lead by DI WET (only for soil that will be reused within the right of way).
- D. Soluble lead by Toxicity Characteristic Leaching Procedure (TCLP).
- E. pH by EPA Method 9045.
- F. Total Petroleum Hydrocarbons (TPH) (gasoline (sample collection and preparation by EPA Method 5035), diesel, and oil & grease) by EPA Method 8015 Modified.
- G. VOCs including oxygenates by EPA Method 8260 (sample collection and preparation by EPA Method 5035).
- H. Semi-volatile organic compounds (SVOCs) by EPA method 8270.
- I. Pesticides by EPA Method 8081.
- J. Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8310.
- K. Polychlorinated biphenyls (PCB) by EPA Method 8082.
- L. Other analytical methods specific to the constituent as contained in USEPA, "Test Methods for Evaluating Solid Waste" (SW-846) and approved by the Engineer.

STAGING AREA FOR CONTAMINATED SOIL, WATER, AND LIQUID STORAGE

Material removed from inside the Plains All American Pipeline utility pipeline and excavated soil from the contaminated area as shown on the plans must be containerized and stockpiled in a designated storage staging area as approved by the Engineer. Water and liquids generated during construction must be containerized and stored in designated storage staging areas as approved by the Engineer. The storage staging areas are located within the project limits and approved by the Engineer prior to excavation, generation of waste, sampling, and transport off-site for disposal. Excavated contaminated soils and waste water and liquids must be placed in separate containers or stockpiles and segregated by property. The staging areas must have a designated area away from the stockpiled soil where trucks can be decontaminated, including tire washing, prior to leaving the site. Within 20 days after contract approval, you must propose to the Engineer in writing and submit plans identifying specific locations of the designated contaminated material staging area.

Temporary stockpiles of contaminated soil stored at the designated storage staging areas must consist of an impermeable liner over the ground surface, bermed to prevent migration of free liquids or soil away from the stockpile, wetting and covering the contaminated soil with sheets of polyethylene at a designated area or placement in covered storage containers. Stockpiled material containing contaminated soil must not be placed in locations where it may come in contact with surface water run-on or run-off. Stockpiled material must be stored on undamaged 1.52-mm high-density polyethylene or an equivalent impermeable barrier. If the location is on a paved surface the thickness of the barrier can be reduced to 0.51-mm high-density polyethylene or equivalent. The dimensions of the barrier must exceed the dimensions of the stockpile to allow for construction of the berms. Seams in the barrier must be sealed to prevent leakage. Dust suppression methods using water must be used. Stockpiles must be covered with plastic sheeting 0.33 mm minimum thickness secured in place with sandbags. If containers are used, they must be a type approved by the United States Department of Transportation (USDOT) for the transportation and temporary storage of hazardous waste, labeled, covered, and leak tight so not to allow escape of liquids. The containers must be handled not to spill the contents. Stockpiled and containerized material must not be placed in, upslope of, or allowed to enter storm drains, inlets, or waters of the State, or become airborne.

CONTAMINATED SOIL, WATER, AND LIQUID SAMPLING

You must ensure that necessary equipment and materials are present at the site and in good operating condition at the beginning of each work day and must supply backup equipment when needed. Field instruments must be calibrated at the beginning and end of each work day or as required by the manufacturer if more frequent.

Soil, water, and liquids sampling must be conducted under the responsible charge of a Certified Engineering Geologist or a Professional Geologist certified in the State of California. You must notify the Engineer at least 5 days before the commencement of soil, water, and liquids sampling.

Reusable equipment must be decontaminated after each use and consist of washing with a non-phosphate detergent and triple rinsed and in conformance with the approved final SAP. Water from decontamination procedures must be collected, tested, and disposed of at an appropriate disposal site. Disposable equipment and personal protective equipment that are not reused must be collected and disposed of at an appropriate disposal site.

Analytical Laboratory

Laboratories performing chemical analyses must be certified by the California Department of Public Health, Environmental Laboratory Accreditation Program (DPH-ELAP) for the specific laboratory test methods listed in the SAP.

You are responsible for sample transportation from the project site to the laboratory, providing decontaminated (certified clean) or new sample containers, labels, appropriate preservation, and chain of custody records.

You and the laboratory must provide clear and accurate explanation of analytical results including graphical presentations and summaries of the laboratory data in reports. Based upon test results and professional judgment, you must make recommendations of the options for disposal and recycling of IDW.

Quality Assurance/Quality Control (QA/QC) for Field and Laboratory

Laboratory Quality Assurance/Quality Control (Laboratory QA/QC)

Laboratory QA/QC is used to evaluate the accuracy and precision of analytical data to establish the quality of data, providing an indication of the need for corrective actions, and determines the effect of corrective action. QA/QC must be performed for each method of analysis listed in the test methods. The QA/QC data collected must be reported in summary form for samples or groups of samples submitted for analyses. The QA/QC summary reports must include:

1. Temperature of incoming samples.
2. Constituent/analyte.
3. Specific EPA test method.
4. Date of sample receipt and analysis (include holding time table for more than 50 samples).
5. Detection limit and units of measure of the specific test method (mg/kg, µg/kg, mg/liter, or µg/liter).
6. Percent accuracy.
7. Percent precision.
8. Signature of laboratory manager or director.

Laboratory QA/QC procedures specified by each test method must include analysis of the following types of samples:

1. One method blank for every 10 samples, batch of samples or type of matrix, whichever is more frequent.
2. One spiked sample for every 10 samples, batch of samples or type of matrix, whichever is more frequent, with spikes made at 10 times the detection limit or at the analyte level.
3. One sample analyzed in duplicate for every 10 samples, batch of samples or type of matrix analyzed in the laboratory, whichever is more frequent.
4. Samples spiked with surrogates.

Field Quality Assurance/ Quality Control (Field QA/QC)

Documentation of pre-field activities, field activities as specified in the SAP, post-field activities, and deviations from the SAP include:

1. Collection of one duplicate sample per 20 samples or one per batch of samples collected in the field.
2. One equipment blank for every chain of custody by pouring de-ionized water onto the decontaminated sampling device and collecting the water in a laboratory container.
3. One trip blank for every ice chest or sample shipment container used to store samples for analysis of VOCs. One laboratory prepared trip blank must accompany each individual group of samples transported to the laboratory. The contents of each ice chest or refrigerated container constitutes an individual group of samples.
4. Collection of field blanks. The field blank is a clean water sample that is prepared at the site in the same location as field sampling and handled in the same manner as the site samples.
5. Calibration must be maintained for field test instruments and measuring gauges, including handheld equipment, according to the manufacturer's recommended calibration schedule. Records of calibration must be kept intact in file and ready for inspection if requested by the Engineer.
6. Samples must be placed in new or sterilized containers that have been certified clean, preserved immediately at 4° C, and delivered to the laboratory within 24 hours of sampling. When chemical preservation of a sample is necessary at the time of collection, containers with the added preservative must be supplied by the laboratory.

Where the test method does not specify QA/QC procedures, the above applies.

You must obtain new samples at your expense if QA/QC data shows any of the following:

- A. Cross contamination.
- B. Samples were analyzed beyond their holding time.
- C. Samples were compromised while in your custody prior to delivery for analysis.
- D. Chain of custody was broken.
- E. Sample collection methodology was not followed.
- F. Incorrect analysis was performed.
- G. Samples were not preserved properly (i.e., a temperature of 4° C was not maintained during transport of samples to the laboratory or required chemical preservation was not used).

REPORT SUBMITTAL

General Requirements

You must submit written progress reports once a month.

Four copies of the Health and Safety Plan (HSP) and the Sampling Analysis Plan (SAP) must be submitted to the Engineer.

Three copies of the Soil, Water, and liquids Sampling Report (SWSR) must be submitted to the Engineer for review and comment. The SWSR must be complete and include all figures and tables, and must pass your Quality Assurance/Quality Control (QA/QC) procedures. The SWSR must be prepared, signed and stamped by a project Certified Engineering Geologist, Professional Geologist, or Professional Engineer. Five copies of the final SWSR must be submitted to the Engineer.

You must submit the SWSR for review and approval by the Engineer within 20 days of completion of soil and water sampling activities. The Engineer has 20 days to review the SWSR. If revisions are required, as determined by the Engineer, you must revise and resubmit the final SWSR within 15 days of receipt of the Engineer's comments. The Engineer has 15 days to review the revisions. You must prepare and submit a final SWSR 5 days after the Engineer's comments are incorporated.

Soil, Water, and liquids Sampling Report (SWSR)

The SWSR must include the items described below:

1. Title sheet identifying project name and project location, Contract number, your name, name of author and date prepared.
2. Signature page with signature, title, stamp and professional registration of the project geologist, engineering geologist, or professional engineer, licensed in the State of California.
3. Table of Contents.
4. Investigative summary: This section must present and summarize the findings of the investigation and waste characterization.
5. Project description: This section must provide a brief description of the project for which the work was undertaken.
6. Introduction: This section must include the general objectives of the fieldwork, a brief chronology of site activities, previous site work, and items of work completed.
7. Investigative or Field Methods: This section must describe the activities performed, field methods used for the investigation or other field activity, sampling methodology employed, identification of the property and areas within the excavation sampled, source of containerized water and liquids sampled, stockpile sampling locations, QA/QC, decontamination, management of IDW, and deviations from the approved SAP.
8. Investigative results and field observations: This section must include a discussion of the site geology observed during the investigation, chemical test results, and laboratory QA/QC (as described in Laboratory Test Reports). The data must be presented in clear and concise form and be summarized in table form, including previous work or results.
9. Description of regulatory contacts.
10. Data Evaluation and Discussion: Site investigation or field activity results must be evaluated by property and/or utility location. Data evaluation must include maps showing the site, feature locations, boring and well locations, vertical and horizontal extent of contamination, contour maps of contaminant concentrations, hydraulic gradient. Maps must have title blocks, scale and north arrow. Map scale will be approved by the Engineer. Maps must contain the following information:
 - 10.1. Cross sections showing subsurface geologic conditions, sample results and estimated extent of contamination. An estimate of contaminated soil volume must be presented with assumptions and calculations.
 - 10.2. Charts showing contamination levels of soil in specific, identifiable locations.
 - 10.3. Color photographs that document the site surroundings, the investigation area with flagged boring locations, and significant geological features. Additional photographs that document the progress of the investigation, or significant areas or activities, may be requested by the Engineer or specified in the Work Plan.
 - 10.4. Statistical analysis of sample results, estimating trends, contaminant distribution and average concentration including the following statistical analysis for samples tested:
 - 10.4.1. The mean, median, standard deviation, 90% and 95% Upper Confidence Limits (UCL) must be calculated and histograms of the original data and transformations (arcsine or square root) must be supplied in accordance with USEPA, SW 846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods " Volume II: Field Manual.
 - 10.4.2. Arcsine data transformation must be used to determine the confidence interval and must be referenced or reproduced.
 - 10.5. Maps, cross sections, and graphs must be supported by data and must be included in the reports.
 - 10.6. Summary of laboratory results by property.

11. Conclusions: Recommendations for waste classification of the containerized and stockpiled soil, water, and liquids, disposal or relinquishment options based on data and applicable State and Federal laws and regulations, lateral extent of contamination at the constructed footprint for each property.
12. Appendices containing data used to support the report discussion, calculations, estimates, and recommendations such as:
 - 12.1. Complete laboratory analysis reports, including QA/QC summary reports. Chromatographs must be provided with the laboratory reports. You must keep the chromatographs on file and provide to the Engineer upon request. Laboratory test reports must contain the following information.
 - 12.2. Name of analytical laboratory.
 - 12.3. Address of laboratory.
 - 12.4. Telephone number of laboratory
 - 12.5. Laboratory number for each sample reported.
 - 12.6. Contractor's number for each sample reported, if applicable
 - 12.7. Date samples collected.
 - 12.8. Date samples received by laboratory.
 - 12.9. Date of laboratory testing.
 - 12.10. Brief sample description.
 - 12.11. Specific test method.
 - 12.12. Extraction method utilized (if not unique to test method).
 - 12.13. Test result for each sample and method (reported in mg/kg or mg/liter as appropriate).
 - 12.14. Limit of detection for each test method (reported in mg/kg or mg/liter as appropriate).
 - 12.15. Explanation of higher detection limits, laboratory contaminants, or other unusual results.
 - 12.16. Samples which failed QA/QC procedures and why.
 - 12.17. Date of test report.
 - 12.18. Signature and title of the director of the laboratory.
 - 12.19. Approved Health and Safety Plan
 - 12.20. Chain-of-custody documents.
 - 12.21. Boring and trench logs (when applicable).
 - 12.22. Excavation map/plan showing the excavated footprint at each property.

EXCAVATION AND TRANSPORTATION PLAN (ETP)

You must submit an Excavation and Transportation Plan (ETP) that incorporates and addresses soil, water, and liquids characterized as contaminated. Characterization of soil and water must be determined by the analytical results and as categorized in the conclusions and recommendations of the approved final SWSR.

Within 20 days after approval of the final SWSR, you must submit 2 copies of the ETP to the Engineer. The Engineer has 15 days to review the ETP. If revisions are required, as determined by the Engineer, you must revise and resubmit the ETP within 10 days of receipt of the Engineer's comments. The Engineer has 10 days to review the revisions. Upon the Engineer's approval of the ETP, 2 copies of the final ETP incorporating the required changes must be submitted to the Engineer.

The ETP must conform to the regulations of the Department of Toxic Substance Control (DTSC) and the California Division of Occupational Safety and Health Administration (Cal-OSHA). The plan must describe the procedures that will be followed to minimize potential health, safety, and environmental risks resulting from movement of material and equipment during on-site and off-site transport. The plan must contain, but not be limited to the following elements:

1. Transportation, safety, and waste disposal schedule.
2. Locations with soil characterized as contaminated.
3. Results of sampling and analysis for the excavated soil, water, and liquids.
4. Characteristics of Waste and Material to be transported with description of appearance, source, approximate quantity, nature of the contaminants and their associated hazards.
5. Dust control measures.

6. Air monitoring.
7. Identity of transporters and proof of valid hauler registration.
8. Location, type, number, and capacity of equipment, containers, and transport vehicles.
9. Sampling frequency and methodology for material not previously characterized.
10. Analytical laboratory certified by ELAP.
11. Truck loading and staging areas.
12. Transportation equipment and routes of transport on-site and off-site to disposal facility, including alternate routes, map, the preferred routes to avoid residential areas, peak traffic hours, hazardous road conditions, etc., estimated round trip time, and maximum and average round trips per day.
13. Traffic Control and Loading Procedures for entering and leaving the site to address local traffic problems, rush hour traffic, school children, etc. Identify city or county requirements, the need for lane closures, traffic signs, flagmen, and other traffic control measures.
14. Decontamination of trucks prior to leaving the loading area. Include how and where decontamination will occur.
15. Inspection of vehicles prior to leaving site to ensure proper loading, covering, decontamination, placarding, and manifesting.
16. Method for preventing spills and tracking soil onto public roads.
17. Destination and disposition of non-hazardous waste and hazardous waste.
18. Record Keeping – Date, time, weight/volume, waste and material, trucking company, driver, and vehicles used for each trip, maintaining of records, identify documents carried with the load as required by law.
19. Health and Safety Plan.
20. Spill Contingency Plan for accidental off-site releases of contaminated soil and water.
21. Identification of the permitted disposal or recycling facility in California that will accept the contaminated soil and water.

Contaminated soil and water must be transferred directly from staging areas to registered transport vehicles or storage containers approved for transportation of contaminated waste by the United States Department of Transportation.

Prior to leaving the staging area, loose and extraneous soil must be removed from surfaces outside the cargo areas of the transporting vehicles and placed in the cargo area or back in the stockpile, and the cargo must be covered with tarpaulins, or other cover, as outlined in the approved Transportation and Disposal Plan. Truck tires are to be brushed to remove extraneous soil and washed before leaving the site. Contaminated soil must not be deposited on public roads. Wastewater from tire washing must be collected and stored in U.S. DOT approved containers and characterized for disposal.

You must transport and dispose of soil and water characterized as hazardous waste at a permitted facility in California in conformance with Division 4.5 of Title 22 of the California Code of Regulations, Section 2521 of Title 23 of the California Code of Regulations, and Section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the Standard Specifications, and these special provisions.

Disposal of additional soil resulting from slope excavations in lieu of shoring or excavation operations outside the pay limits as shown on the plans is at your expense. You must verify the condition of excess soils and must handle excess soil in accordance with local, state, and federal regulations.

DUST CONTROL

Excavation, transportation, placement, handling, storage, and stockpiling of excavated soils must result in no visible dust or fugitive dust emissions. Work must be in compliance with the South Coast Air Quality Management District Rule 403-Fugitive Dust. Best available control measures must be taken to minimize fugitive dust emissions during soil disturbance activities, containerizing, and storage of stockpiled soil. A water truck or tank must be on the job site at all times for dust suppression while earthwork operations are performed at the site.

EARTHWORK

Earthwork must conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

MEASUREMENT AND PAYMENT

The contract lump sum price paid for hazardous materials mitigation plans shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in preparing, updating, submitting, and implementing the Health and Safety Plan (HSP), Health and Safety Training, Sampling and Analysis Plan (SAP), Soil and Water Sampling Report (SWSR) submittal, Excavation and Transportation Plan (ETP), and air monitoring as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per cubic meter for roadway excavation (contaminated soil) and structure excavation (contaminated soil) shall include full compensation for doing all the work involved in excavating, removing, stockpiling, containerizing of, transporting, and disposing of the contaminated soil.

The contract price paid per cubic meter for contaminated soil disposal shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in contaminated soil disposal, complete in place, including excavated soil from storm drain and sewer systems in the designated areas, as shown on the plans and as specified in these special provisions, and as directed by the Engineer.

The contract price paid per cubic meter for disposal of hazardous material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in disposal of hazardous material, complete in place, including removing the material from inside the utility pipes as shown on the plans and as specified in these special provisions, and as directed by the Engineer.

If analytical laboratory test results indicate water from construction of the piles is contaminated and required to be disposed of at a site regulated for hazardous material, the cost for transportation and disposal of the contaminated water will be paid for as extra work in accordance with section 4-1.03D of the Standard Specifications.

10-1.57 JOINTED PLAIN CONCRETE PAVEMENT

GENERAL

Jointed plain concrete pavement shall be constructed in conformance with the provisions in Section 40, "Portland Cement Concrete Pavement," of the Standard Specifications and these special provisions, and as shown on the plans.

Insert method for forming joints in pavement shall not be used.

PREPAVING CONFERENCE

Supervisory personnel of the Contractor and subContractors who are to be involved in the concrete paving work shall meet with the Engineer at a prepaaving conference, at a mutually agreed time, to discuss methods of accomplishing the paving work.

The Contractor shall provide a facility for the prepaaving conference within 5 km of the construction site or at a nearby location agreed to by the Engineer. Attendance at the prepaaving conference is mandatory for the Contractor's project superintendent, paving construction foreman, subContractor's workers, including foremen and personnel performing saw cutting, joint sealing, concrete plant manager, and concrete plant operator. Conference attendees shall sign an attendance sheet provided by the Engineer. Production and placement shall not begin nor proceed unless the above-mentioned personnel have attended the mandatory prepaaving conference.

JUST-IN-TIME TRAINING

Attending a 4-hour Just-In-Time Training (JITT) shall be mandatory, and consist of a formal joint training class on portland cement concrete and paving techniques. Construction operations for portland cement concrete paving shall not begin until the Contractor's and the Engineer's personnel have completed the mandatory JITT. The Contractor's personnel included in the list of participants for the prepaaving conference as well as the Engineer's representatives shall attend JITT. JITT shall be in addition to the prepaaving conference.

The JITT class will be conducted for not less than 4 hours on portland cement concrete pavement and paving techniques. The training class may be an extension of the prepaaving conference and shall be conducted at a project field location convenient for both the Contractor and the Engineer. The JITT class shall be completed at least 15 days, not including Saturdays or holidays, prior to the start of portland cement concrete paving operations. The class shall be held during normal working hours.

The JITT instructor shall be experienced in the construction methods, materials, and test methods associated with construction of portland cement concrete pavement and paving techniques. The instructor shall not be an employee of the Contractor or a member of the Engineer's field staff. A copy of the course syllabus, handouts, and presentation material shall be submitted to the Engineer at least 7 days before the day of the training. The Contractor and the Engineer shall mutually agree to course instructor, the course content, and training site. The instructor shall issue a certificate of completion to the participants upon completion of the class. The certificate of completion shall include the course title, date and location of the class, the name of the participant, instructor's name, location and telephone number.

The Contractor's or Engineer's personnel involved with portland cement concrete paving operations will not be required to attend JITT if they have completed equivalent training within the previous 12 months of the date of the JITT for this project. The Contractor shall provide a certificate of class completion as described above for each staff member to be excluded from the JITT class. The Engineer will provide the final determination for exclusion of staff member's participation. Attendees of the JITT shall complete, and submit to the Engineer, an evaluation of the training. The Engineer will provide the course evaluation form.

Just-In-Time Training shall not relieve the Contractor of responsibility under the contract for the successful completion of the work in conformance with the requirements of the plans and specifications.

TEST STRIP

At the beginning of paving operations, the Contractor shall construct a test strip of concrete pavement from 200 m to 300 m in length. The paving width for the test strip shall be the same as that intended by the Contractor for production work. The Contractor shall use the same equipment to construct the test strip for the remainder of the paving operations, except as specified in this section. The Contractor shall not begin paving operations until the test strip has been evaluated in conformance with the provisions in Section 40-1.10, "Final Finishing," of the Standard Specifications regarding surface straight edge requirements, and "Profile Index" in this section; for dowel and tie bar alignment verification; concrete quality (except modulus of rupture); and pavement thickness. Additional test strips will be required when:

1. A portion of a test strip fails to conform to the provisions in Section 40-1.10, "Final Finishing," of the Standard Specifications for straight edge requirements;
2. A portion of the test strip fails to conform to profile requirements;
3. The Contractor proposes different paving equipment, including a batch plant, paver, dowel bar inserter, tie bar inserter, tining, or curing equipment;
4. The dowel bar tolerances are not met;
5. The pavement thickness deficiency is greater than 15 mm after grinding; or
6. A change in concrete mix proportions has occurred.

The Contractor shall perform coring of the test strips as part of the dowel and tie bar placement tolerance verification, and pavement thickness verification. The Engineer will select a minimum of six dowel bars that will be cored for each test strip. The Engineer will have the option of selecting up to 6 tie bars that will be cored for each test strip. After removal of cores, voids in concrete pavement shall be cleaned and filled with hydraulic cement grout conforming to the provisions in "Core Drilling for Dowel Placement Alignment Assurance Testing" in this section.

Before mechanical dowel bar inserters are used, the Contractor shall demonstrate that the insertion equipment will not leave surface irregularities such as depressions, dips, or high areas adjacent to the dowel bar insertion point, or voids or segregation around dowel bars.

Before placement of the test strip, the Contractor shall submit a written procedure to locate transverse weakened plane joints that will coincide with the center of the dowel bars being placed and locating the tie bars along the longitudinal joints. This procedure shall be submitted prior to the prepaving conference, and shall describe the control of inadvertent covering of paint markings after applying curing compound, excessive paint spray producing too large a paint dot marking for the accuracy required, misalignment by transferring marking spots, and inadequate staking of joints.

Construction of concrete pavement shall not proceed until the Engineer has completed an evaluation of the test strip. The Engineer shall be allowed 3 business days to evaluate the test strip. If, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the Engineer not completing the evaluation of the test strip within the time specified, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications. Test strips failing to conform to the specifications for concrete pavement shall be removed. Additional test strips shall be constructed until the Contractor constructs a test strip that conforms to the specifications for concrete pavement. Additional test strips shall conform to the requirements in this section, except the test strip shall be 200 m in length.

Prior to constructing additional test strips, the Contractor shall change methods or equipment to construct a test strip that conforms to the provisions in Section 40-1.10, "Final Finishing," of the Standard Specifications, "Profile Index" of this section, and dowel bar alignment verification, without grinding or other corrective work.

The Engineer may waive the initial test strip if the Contractor proposes to use a batch plant mixer and paving equipment with the same personnel that were satisfactorily used on a Department project within the preceding 12 months. The personnel shall be individuals listed in the prepaving conference used on a preceding Department project.

Materials resulting from the construction and removal of rejected test strips shall become the property of the Contractor and shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

MATERIALS

Concrete

Attention is directed to Section 90, "Portland Cement Concrete," of the Standard Specifications, regarding mix proportions for concrete being determined by the Contractor.

Primary aggregate gradings shall conform to the gradation requirements of Section 90-3, "Aggregate Gradings," of the Standard Specifications. When combined in the proportions determined by the Contractor, the percent passing the 9.5 mm sieve and retained on the 2.36 mm sieve shall not be less than 16 percent of the total aggregate.

The cementitious material content shall not exceed 400 kg/m³.

Tie Bars

Tie bars shall be deformed reinforcing steel bars conforming to the requirements of ASTM Designation: A 615/A 615M, Grade 280 or 420; ASTM Designation: A 615/A 615M (Grade 280 or 420), A996/A996M or A706/A706M. Tie bars shall be epoxy-coated in conformance with the requirements in ASTM Designation: A 934/A 934M or A 775/A 775M and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except the epoxy-coating thickness after curing shall be between 175 micrometers to 400 micrometers (7 mils to 16 mils). Fabrication, sampling and jobsite handling shall conform to the requirements in ASTM Designation: D 3963 and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except the 2 samples shall be 750 mm long. Epoxy-coated tie bars shall not be bent.

Epoxy (Drill and Bond)

Epoxy for bonding tie bars and dowel bars to portland cement concrete shall be a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C 881, Type V, Grade 3 (Non-Sagging), Class A, B or C. The class used shall be dependent on the internal temperature of the hardened concrete at the time the epoxy is to be applied. Class A shall be used when the internal temperature is below 4°C, but not lower than recommended by the manufacturer. Class B shall be used when the internal temperature is from 4°C to 15°C. Class C shall be used when the internal temperature is above 15°C, but not higher than recommended by the manufacturer. A Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished with the epoxy. A copy of the manufacturer's recommended installation procedure shall be provided to the Engineer at least 7 days prior to the start of work. Epoxy shall be applied in conformance with the manufacturer's recommendations.

Dowel Bars

Dowel bars shall be plain round smooth, epoxy-coated steel conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 280 or 420, the details shown on the plans and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that the two samples required in ASTM Designation D 3963/D 3963M shall be 460 mm long. Epoxy coating of dowel bars shall conform to the provisions in ASTM Designation: A 884/A 884M, Class A, Type 1 or Type 2, except that the bend test shall not apply.

Dowel bars shall be free from burrs or other deformations detrimental to free movement of the bars in the concrete.

Bond Breaker

Dowel bars shall be lubricated with a bond breaker over the entire bar. A bond breaker application of petroleum paraffin based lubricant or white-pigmented curing compound shall be used to coat the dowel bars completely prior to placement. Oil and asphalt based bond breakers shall not be used. Paraffin based lubricant shall be Dayton Superior DSC BB-Coat or Valvoline Tectyl 506 or an approved equal. Paraffin based lubricant shall be factory applied. White pigmented curing compound shall conform to the requirements of ASTM Designation: C 309, Type 2, Class A, and shall contain 22 percent minimum nonvolatile vehicles consisting of at least 50 percent paraffin wax. Curing compound shall be applied in 2 separate applications, the last application not more than 8 hours prior to placement of the dowel bars. Each application of curing compound shall be applied at the approximate rate of one liter per 3.7 m².

Dowel Bar Baskets

Dowel bar baskets shall be manufactured with a minimum welded wire gage number of MW 65. Baskets shall be either U-frame or A-frame shape. J-frame shapes shall not be used. Baskets shall be fabricated in conformance with the requirements in ASTM Designation: A 82. Welding of baskets shall conform to the requirements in AASHTO Designation: M 254. A broken weld will be a cause for rejection of the basket. Baskets shall be Class A, Type 1 epoxy-coated in conformance with the requirements in ASTM Designation: A 884/A 884M. Fabrication and job-site handling shall conform to the requirements in ASTM Designation: D 3963 and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that sampling of epoxy-coated wire reinforcement will not be required. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished for each shipment of epoxy-coated wire reinforcement certifying that the coated bars conform to the requirements in ASTM Designation: A 884/A 884M and the provisions in Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include the certifications specified in ASTM Designation: A 884/A 884M and a statement that the coating material has been pre-qualified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

Concrete fasteners shall be used for anchoring dowel bar baskets to lean concrete base, hot mix asphalt used as base, asphalt treated permeable base, or cement treated permeable base. Concrete fasteners shall be driven fasteners such as concrete nails, used specifically for fastening to hardened concrete, or hot mix asphalt used as base. Concrete fasteners shall conform to the requirements of ASTM Designation: F 1667. Concrete nails used as fasteners on lean concrete base or hot mix asphalt used as base shall have a minimum shank diameter of 4 mm with a minimum shank length of 64 mm. Concrete nails used as fasteners on asphalt treated or cement treated permeable base shall have a minimum shank diameter of 4 mm with a minimum shank length of 120 mm. Shank length shall be the distance from the point to the bottom of the nail head. Clips and washers shall be commercial quality manufactured for use with dowel bar baskets. The surface of concrete fasteners, clips, and washers shall be either zinc electroplated or galvanized with a minimum coating thickness of 0.005-mm.

Tie Bar Baskets

Tie bar baskets shall be manufactured with a minimum welded wire gage number of MW 65. Baskets shall be either U-frame or A-frame shape. J-frame shapes shall not be used. Tie bar baskets shall be fabricated in conformance with the requirements in ASTM Designation: A 82. Welding of baskets shall conform to the requirements in AASHTO Designation: M 254. A broken weld will be a cause for rejection of the basket. Baskets shall be Class A, Type 1 epoxy-coated in conformance with the requirements in ASTM Designation: A 884/A 884M. Fabrication and job-site handling shall conform to the requirements in ASTM Designation: D 3963 and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that sampling of epoxy-coated wire reinforcement will not be required. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished for each shipment of epoxy-coated wire reinforcement certifying that the coated bars conform to the requirements in ASTM Designation: A 884/A 884M and the provisions in Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include the certifications specified in ASTM Designation: A 884/A 884M and a statement that the coating material has been pre-qualified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

Concrete fasteners shall be used for anchoring tie bar baskets to lean concrete base, hot mix asphalt used as base, asphalt treated permeable base, or cement treated permeable base. Concrete fasteners shall be driven fasteners such as concrete nails, used specifically for fastening to hardened concrete, or hot mix asphalt used as base. Concrete fasteners shall conform to the requirements of ASTM Designation: F 1667. Concrete nails used as fasteners on lean concrete base or hot mix asphalt used as base shall have a minimum shank diameter of 4 mm with a minimum shank length of 64 mm. Concrete nails used as fasteners on asphalt treated or cement treated permeable base shall have a minimum shank diameter of 4 mm with a minimum shank length of 120 mm. Shank length shall be the distance from the point to the bottom of the nail head. Clips and washers shall be commercial quality manufactured for use with tie bar baskets. The surface of concrete fasteners, clips, and washers shall be either zinc electroplated or galvanized with a minimum coating thickness of 0.005-mm.

Reinforcement

Reinforcement shall be epoxy coated and shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications.

Preformed Compression Joint Sealant

Preformed compression seals shall conform to the requirements of ASTM Designation: D 2628. Preformed compression seals shall have 5 or 6 cells. Preformed compression seals for Types A2 and B joints shall have 4 or more cells. Lubricant adhesive used with preformed compression seals shall conform to the requirements of ASTM Designation: D 2835. Compression seals and lubricant adhesive shall be installed in conformance with the manufacturer's recommendations and these special provisions. The manufacturer's recommendations shall be submitted to the Engineer at the prepping conference.

Each lot of compression seal and lubricant adhesive shall be accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, and shall be accompanied with storage instructions and precautionary instructions for use. The Certificate shall also be accompanied with a certified test report of the results of the required tests performed on the preformed compression joint sealant material within the previous 12 months prior to proposed use. The Certificate and accompanying test report shall be provided for each lot of joint seal prior to use on the project. The Contractor shall submit the manufacturer's data sheet with installation instructions and recommended type of preformed compression seal for the joint size and depth as shown on the plans. The manufacturer's selected compression seal shall show evidence that the seal is being compressed at level between 40 percent and 50 percent for the joint width and depth shown on the plans.

Joint Filler Material

Joint filler material shall be preformed expansion joint filler for concrete (bituminous type), conforming to the requirements of ASTM Designation: D 994.

Joint filler material shall be Type 1 preformed expansion joint filler for concrete conforming to the requirements of ASTM Designation: D 1752.

A Certificate of Compliance for the joint filler material shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall be accompanied with a certified test report of the results of the required tests performed on the joint filler material within the previous 12 months prior to proposed use. The certificate and accompanying test report shall be provided for each lot of joint filler material prior to use on the project.

Hydraulic Cement Grout (non-shrink)

Hydraulic cement grout (non-shrink) shall conform to the requirements in ASTM Designation: C 1107. At the Contractor's option, clean, uniformly rounded aggregate filler may be used to extend the grout. The extension of grout shall not exceed 60 percent of the mass of the grout or the maximum amount of grout extension recommended by the manufacturer, whichever is less. The moisture content of the aggregate filler shall not exceed 0.5-percent. Grading of the aggregate filler shall conform to the following:

Sieve Size	Percentage Passing
12.5 mm	100
9.5 mm	85-100
4.75 mm	10-30
2.36 mm	0-10
1.10 mm	0-5

PAVEMENT CONCRETE MIX PROPORTIONS

The Contractor shall determine the mix proportions for pavement concrete. The laboratory used to develop the mix proportions shall meet the requirements of ASTM Designation: C 1077, and shall have current AASHTO accreditation for test methods AASHTO Designation: T 97 or ASTM Designation: C 78, and AASHTO Designation: T 126 or ASTM Designation: C 192.

The minimum cementitious materials content or the maximum water to cementitious materials ratio shall be determined in conformance with the requirements in California Test 559. Trial mixtures shall be made no more than 24 months before field qualification. The minimum cementitious materials content or the maximum water to cementitious materials ratio shall be that determined from the trial mixtures curve to produce a minimum modulus of rupture of 3.9 MPa at 28 days age and 4.5 MPa at 42 days age. To account for variances in materials, production of concrete, and modulus of rupture testing, the Contractor shall include as part of the proposed mix proportions an increase to the cementitious material content or a decrease to the water to cementitious materials ratio, determined from trial mixtures, to ensure that portland cement concrete produced during paving operations conforms to the requirements in "Modulus of Rupture," in this section.

At least 15 days prior to field qualification, the Contractor shall submit the proposed pavement concrete mix proportions with laboratory test reports. Laboratory test reports shall include modulus of rupture determined for each trial mixture at ages of 10, 21, 28 and 42 days in conformance with the applicable portions of California Test 559.

Field Qualification

Field qualification of proposed mix proportions will be required prior to placement of pavement concrete. The Contractor shall perform field qualification and submit certified test data to the Engineer. Field qualification data shall be based upon the proposed use of materials, mix proportions, mixing equipment, procedures and size of batch.

Proposed concrete mix proportions will be field qualified when the test results of five beams from a single batch of concrete indicate the average modulus of rupture is at least 3.9 MPa with no single beam lower than 3.8 MPa at an age of the Contractor's choice but not later than 28 days. Beams shall be tested for modulus of rupture at a minimum of 10, 21, and 28 days of age. Test specimens shall be made and tested in conformance with the requirements in California Test 523.

The certified field qualification test data reports shall include the following:

1. Date of mixing,
2. Mixing equipment and procedures used,
3. Volume of batch in cubic meters and the mass or volume,
4. Type and source of ingredients used,

5. Penetration and slump of the concrete,
6. The air content of the concrete, and
7. The age at time of testing and strength of concrete specimens tested.

Field qualification test data reports shall be signed by a certified representative in charge of the laboratory that performed the tests.

If the Contractor changes a source of supply or proportions, the Contractor shall submit a new proposed mix design and furnish samples from the new source, or sources, at least 60 days prior to their intended use. The new mix proportions shall be trial batched and field qualified, unless, the Engineer determines the change is not substantive. No extension of contract time will be allowed for the time required to perform the sampling, testing, preparing and qualifying new mix proportions for new aggregate sources proposed by the Contractor.

MODULUS OF RUPTURE

The Engineer will test portland cement concrete pavement for modulus of rupture in conformance with the requirements in California Test 523. Acceptance will be on a lot basis. Each lot shall not exceed 750 m³ of concrete pavement. The Engineer will determine sample locations. A minimum of six beam specimens shall be made from each sample. Beam specimens will be tested for modulus of rupture at 10, 21, and 28 days. The modulus of rupture for each lot will be calculated by averaging the results of two beams representing that lot tested at 28 days of age. The difference in modulus of rupture between each individual beam result shall not exceed 0.44-MPa.

The Contractor shall perform sampling and testing of beam specimens to determine if concrete pavement has achieved a modulus of rupture of 2.4 MPa when requesting early use of concrete pavement in conformance with the provisions in Section 90-8.03, "Protecting Concrete Pavement," of the Standard Specifications. Beam specimens shall be made and tested in conformance with the requirements in California Test 523.

INSTALLING TIE BARS

Tie bars shall be installed at longitudinal contact joints and longitudinal weakened plane joints as shown on the plans. Contiguous width of new portland cement concrete pavement tied together with tie bars shall not exceed 15 m. Tie bars shall not be installed at joints between portland cement concrete and hot mix asphalt pavements.

Tie bars shall be installed at longitudinal joints by one of the following methods:

1. Drilling and bonding tie bars with two-component, epoxy-resin that conforms to this section. Drilled holes shall be cleaned in conformance with the epoxy manufacturer's instructions and shall be dry at the time of placing the epoxy and tie bars. Tie bars will be rotated 180° while being inserted into the epoxy filled holes. Immediately after inserting the tie bars into the epoxy, the tie bars shall be supported as necessary to prevent movement during curing and shall remain undisturbed until the epoxy has cured as specified by the manufacturer instructions. Tie bars that are improperly placed or bonded, as determined by the Engineer, will be rejected. If rejected, new holes shall be drilled and new tie bars shall be placed and securely bonded to the concrete. Rejected tie bars shall be cut flush with the joint face. Exposed ends of tie bars shall be epoxy coated. The center of the new holes shall be offset 75 mm horizontally from the center of the rejected hole to maintain the minimum clearance to the dowel bar. Work necessary to correct improperly bonded tie bars shall be performed at the Contractor's expense.
2. Inserting tie bars into the plastic slipformed concrete before finishing the concrete. Inserted tie bars shall have full contact between the bar and the concrete. When tie bars are inserted through the pavement surface, the concrete over the tie bars shall be reworked and refinished so that there is no evidence on the surface of the completed pavement that there has been an insertion performed. Loose tie bars shall be replaced by drilling and bonding as described in A above, at the Contractor's expense.

3. Using threaded dowel splice couplers fabricated from deformed bar reinforcement material, free of external welding or machining. Threaded dowel splice couplers shall be accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, and shall be accompanied with installation instructions. Installation of threaded dowel splice couplers shall conform to the requirements of the manufacturer's recommendations.
4. Using tie bar baskets that conform to these special provisions

Tie bars shall be oriented perpendicular to the pavement joint and parallel with the surface of the pavement at mid-slab depth. Tie bar alignment tolerances shall conform to the requirements for dowel bars except embedment length tolerance shall be ± 50 mm.

If tie bar baskets are used, they shall be anchored to the base to hold the tie bars at the specified depth and alignment during concrete placement without displacement. A minimum of 8 alternating, equally spaced, concrete fasteners with clips shall be used to anchor each basket (4 per lower runner wire). Temporary spacer wires shall be cut or removed after the baskets are anchored into position before concrete placement. Concrete pavement shall not be placed if the baskets are not in place at least 60 m in advance of the concrete placement operation. The Engineer may waive this requirement upon written request by the Contractor in areas where access is restricted or other construction limitations are encountered. The Contractor shall demonstrate that the baskets are anchored and shall not shift during concrete placement. The Contractor shall provide longer concrete nails than the minimum lengths for the varying bases beneath the portland cement concrete when baskets demonstrate movement.

Full compensation for providing longer concrete nails shall be considered as included in the contract unit price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

DOWEL PLACEMENT

Dowel bars shall be centered on the joint within a tolerance of ± 50 mm in the longitudinal direction directly over the contact joint or sawcut for the transverse weakened plane joints, as shown on the plans. Prior to placement of dowel bars, the Contractor shall submit to the Engineer a written procedure to identify the transverse weakened plane joint locations relative to the middle of the dowel bars and the procedure for consolidating concrete around the dowel bars.

Dowel bars shall be placed at transverse weakened plane joints within shoulder areas except at drainage inlets.

Dowel bars shall be placed at longitudinal joints as shown on the plans.

Dowel bars shall be placed as shown on the plans by using dowel bar baskets or by mechanical insertion.

When dowel bars are placed by mechanical insertion, the concrete over the dowel bars shall be reworked and refinished so that there is no evidence on the surface of the completed pavement that there has been any insertion performed. When drill and bonding of dowel bars is performed at contact joints, a grout retention ring shall be used.

When dowel bar baskets are used, they shall be anchored to the base to hold the dowel bars at the specified depth and alignment during concrete placement without displacement. A minimum of 8 alternating, equally spaced, concrete fasteners with clips shall be used to anchor each 3.6 m dowel bar basket (4 per lower runner wire). At least 10 concrete fasteners shall be used for basket sections greater than 3.6 m and less than or equal to 4.9 m. Temporary spacer wires connecting dowel bar baskets shall be cut or removed after the dowel bar baskets are anchored into position prior to concrete placement. Paving shall be suspended when dowel bar baskets are not in place at least 60 m in advance of the concrete placement operation. The Engineer may waive this requirement upon written request by the Contractor, in areas, where access is restricted, or other construction limitations are encountered. The Contractor shall demonstrate to the Engineer's satisfaction that dowel bar baskets are adequately anchored and not shift during concrete placement. The Contractor shall provide longer concrete nails than the minimum lengths for the varying bases beneath the portland cement concrete when anchored dowel bar baskets demonstrate movement.

Full compensation for providing longer concrete nails shall be considered as included in the contract unit price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

Dowel bar placement at transverse and longitudinal weakened plane joints	
Horizontal offset	±25 mm
Longitudinal translation	±50 mm
Horizontal skew	9 mm
Vertical skew	9 mm
Vertical depth	(d/3 + 12 mm) from pavement surface to top of dowel bar or -15 mm below planned placement

Note: d = pavement thickness in mm

CORE DRILLING FOR DOWEL BAR AND TIE BAR PLACEMENT ALIGNMENT ASSURANCE TESTING

Coring to confirm dowel bar and tie bar placement, alignment, and concrete consolidation shall be provided by the Contractor throughout the project, at locations determined by the Engineer. Each day's paving shall be cored within 2 days by performing a minimum of 2 and a maximum of 4 tests for dowel bar placement and position for every 1670 m² of doweled pavement or fraction thereof and one test for tie bar placement and position for every 3340 m² of pavement with tie bars. One test shall consist of drilling two cores, one on each end of a dowel bar to expose both ends and allow measurement for proper alignment. The minimum core hole diameter shall be 127 mm. If the cores indicate that dowel bars or tie bars are not within the allowable tolerances or if air voids exist surrounding the dowel bars or tie bars, additional cores will be required to determine the limits and severity of unacceptable work.

The holes shall be cored by methods that will not damage the concrete adjacent to the holes. Immediately after coring, the concrete cores shall be submitted to the Engineer for inspection, and the cores shall be identified by the Contractor with a location description.

After removal of cores, core hole voids in concrete pavement shall be cleaned and filled with hydraulic cement grout (non-shrink). After placement of hydraulic cement grout, the material while still plastic shall be finished and textured to match the adjacent pavement surface. The backfill material shall be the same level as the pavement surface.

Water for core drilling operations shall be from a local domestic water supply, and shall contain not more than 1000 parts per million of chlorides as CL, nor more than 1300 parts per million of sulfates as SO₄, nor shall it contain impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Water from core drilling operations shall not be permitted to fall on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

Dowel bar and tie bar alignment shall be within the specified tolerances. If dowel bars or tie bars are found to be installed improperly, the paving operations shall not continue until the Contractor has demonstrated to the Engineer that the problem which caused the improper dowel bar or tie bar positioning has been corrected.

Dowel bars in rejected joints shall be replaced by the Contractor by saw cutting on each side of the rejected joint a minimum of 0.9-m, lifting out concrete to be removed, installing new dowel bars at the new transverse joints, installing dowel bars and preformed sponge rubber expansion joint filler along the longitudinal joints, placing concrete, and installing new joints. Preformed sponge rubber expansion joint filler shall conform to the requirements in ASTM Designation: D 1752. New dowel bar holes shall be drilled, not more than 3 mm greater than the dowel bar diameter, by the use of an automatic dowel-drilling rig for the dowels to be installed at the contact joints. Dowel bars shall be placed, as shown on the plans, for the 2 new transverse contact joints. Original exposed tie bars, located within the slab replacement area, shall be cut flush with the lane or pavement edge and dowel bars shall be installed to replace the tie bars at an offset of 75 mm, horizontally from the tie bar location. Holes for dowel bars to be placed along the longitudinal joint shall be drilled, not more than 3 mm greater than the dowel bar diameter, by the use of an automatic dowel-drilling rig for the dowel bars to be installed at the contact joints.

When requested by the Contractor and approved by the Engineer, dowel bars which are more than ± 50 mm but less than ± 75 mm from being centered directly over the sawcut for the transverse weakened plane joint, may remain in place, and the Contractor shall pay to the State the amount of \$32.30 per square meter for the quantity of concrete pavement panels represented by the cores indicating incorrect dowel bar alignment or improper concrete consolidation around dowels. The quantity of concrete pavement area used to determine the amount of payment to the State will be calculated using the panel dimensions for panels adjacent to and inclusive of the joints with incorrect dowel bar alignment or improper concrete consolidation around dowel bars. The Department will reduce compensation from moneys due, or that may become due to the Contractor under the contract. This reduced compensation shall be in addition to other adjustments for incorrect tie bar alignment or improper concrete consolidation around tie bars as specified in these special provisions and for pavement thickness deficiency in conformance with the provisions in Section 40-1.135, "Pavement Thickness," of the Standard Specifications and in addition to other adjustments for deficient Cleanness Value and coarse aggregate grading; and for deficient Sand Equivalent and fine aggregate grading in conformance with the provisions in Section 90-2.02, "Aggregate," of the Standard Specifications.

Tie bars which are not within the specified tolerance for placement and position, as determined from inspection and measurements of cores, may remain in place when requested by the Contractor and approved by the Engineer. The Contractor shall pay to the State the amount of \$16.15 per square meter for the quantity of concrete pavement panels represented by the cores indicating incorrect tie bar alignment or improper concrete consolidation around tie bars. The quantity of concrete pavement area used to determine the amount of payment to the State will be calculated using the panel dimensions for panels adjacent to and inclusive of the joints with incorrect tie bar alignment or improper concrete consolidation around tie bars. The Department will reduce compensation from moneys due, or that may become due to the Contractor under the contract. This reduced compensation will be in addition to other adjustments for incorrect dowel bar alignment or improper concrete consolidation around dowel bars as specified in these special provisions and for pavement thickness deficiency in conformance with the provisions in Section 40-1.135, "Pavement Thickness," of the Standard Specifications and in addition to other adjustments for deficient Cleanness Value and coarse aggregate grading; and for deficient Sand Equivalent and fine aggregate grading in conformance with the provisions in Section 90-2.02, "Aggregate," of the Standard Specifications.

PREFORMED COMPRESSION JOINT SEAL INSTALLATION

The compression seal alternative joint detail for transverse and longitudinal joints, as shown on the plans, shall apply only to weakened plane joints. Weakened plane joints shall be constructed by the sawing method. Should grinding or grooving be required over or adjacent to any joint after the compression seal has been placed, the joint materials shall be removed and disposed of, and replaced at the Contractor's expense. Compression seals shall be recessed below the final finished surface as shown on the plans.

Transverse weakened plane joints shall be Type B as shown on the plans. Longitudinal weakened plane joints shall be Type B as shown on the plans.

Seven days after the concrete pavement placement and not more than 4 hours before placing preformed compression joint seals, the joint walls shall be cleaned by the dry sand blast method and other means as necessary to remove from the joint objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, traces of sand, dust and loose material shall be removed from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Surface moisture or dampness shall be removed at the joints by means of compressed air or moderate hot compressed air or other means approved by the Engineer. Drying procedures that leave a residue or film on the joint wall shall not be used. Sandblasting equipment shall have a maximum nozzle diameter size of 6 ± 1 mm and a minimum pressure of 0.62-MPa.

Longitudinal seals shall be installed before installing transverse seals. Longitudinal seals shall be continuous except at intersections with transverse seals. Transverse seals shall be installed in one continuous piece throughout each transverse joint. After the longitudinal seal is completed and the transverse seal is ready to be installed, a single cut with a sharp instrument or saw shall be made across the longitudinal seal at the middle of the intersection with the transverse seal. After the initial cut of the longitudinal seal, if the longitudinal joint material does not relax enough to allow proper installation of the transverse seal, the longitudinal joint material shall be trimmed precisely to accommodate the transverse seal and form a tight seal between the 2 joints.

An installation machine specifically designed for the installation of preformed compression joint seals shall be used to install the seal at the specified depth without cutting, nicking, or twisting the seal. The installation machine shall install the seal with no more than 4 percent stretch in the installed seal. Hand installation methods of installing seals will not be permitted.

The percentage of stretch shall be determined by laying a length of the preformed compression joint seal material cut to the exact length of the pavement joint to be sealed. The length shall then be measured. The cut length of preformed compression joint seal material shall then be installed in the joint. Excess amount of seal material remaining at the end of the joint shall be measured as the amount of stretch. The measured amount of stretch shall be divided by the original measured length to determine the percentage of stretch.

The completed seal shall not be twisted or have deformities that prevent the seal from making complete continuous contact with the joint walls. Seals installed that are twisted or deformed, or do not make continuous contact with joint walls or with greater than 4 percent stretch of the joint material will be rejected and removed.

CONSTRUCTING TRANSVERSE CONTACT JOINTS

A transverse contact (construction) joint shall be constructed, including dowel bars, at the end of each day's work or where concrete placement is interrupted for more than 30 minutes, to coincide with the next weakened plane joint location.

If sufficient concrete has not been mixed to form a slab to match the next weakened plane joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of excess concrete shall be at the Contractor's expense. Excess material shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of dowel bars.

CONSTRUCTING TRANSVERSE JOINT CONNECTIONS AND ANCHORS

Concrete pavement joints at transitions to hot mix asphalt pavement, pavement end anchors and bridge approach slabs shall conform to the details as shown on the plans. Paint binder shall be applied to the concrete surface that hot mix asphalt pavement will contact. Paint binder shall be applied in conformance with the provisions in Section 39, "Hot Mix Asphalt," of the Standard Specifications.

PROFILE INDEX

The pavement surface shall be profiled, by the Contractor not more than 10 days following concrete placement, in the presence of the Engineer, using a California Profilograph or equivalent in conformance with the requirements in California Test 526, except a blanking band of zero (null) shall be used to determine the Profile Index. Two profiles shall be made within each traffic lane, one meter from and parallel with each lane line.

Profiled pavement shall conform to the following Profile Index requirements:

1. Pavement on tangent alignment and pavement on horizontal curves having a centerline radius of curve 600 m or more shall have a Profile Index of 64 mm or less for each 0.1-km.
2. Pavement on horizontal curves having a centerline radius of curve 300 m or more but less than 600 m and pavement within the superelevation transition of those curves shall have a Profile Index of 128 mm or less for each 0.1-km.

Individual high points in excess of 7.5 mm, as determined by measurements of the profilogram in conformance with the requirements in California Test 526, except using a blanking band of zero (null), shall be reduced by grinding in conformance with the requirements in Section 40-1.10, "Final Finishing," of the Standard Specifications until the high points as indicated by reruns of the profilograph do not exceed 7.5 mm.

Pavement grinding shall not be performed before 10 days have elapsed after concrete placement, nor before the concrete has developed a modulus of rupture of at least 3.8 MPa.

CONSTRUCTING WEAKENED PLANE JOINTS (EARLY ENTRY SAW METHOD)

The Contractor may construct weakened plane joints using lighter weight concrete saws (early entry saws) specifically designed for sawing fresh concrete without the use of water. The early entry saws shall be capable of sawing joints within 2 hours of cure time after placement of the concrete pavement without raveling or tearing, as defined in Section 40-1.08B(1), "Sawing Method," of the Standard Specifications. Joints sawed with early entry saws that develop random cracking shall be removed to the nearest controlled joint and replaced with concrete pavement containing dowel bars and tie bars in conformance with these special provisions and as shown on the plans. The removal and replacement work shall be at the Contractor's expense. Weakened plane joints not sawed within 2 hours of placing concrete pavement shall be sawed by conventional power driven wet-type concrete saws in conformance with the requirements of Section 40-1.08B(1), "Sawing Method," of the Standard Specifications.

Sawed grooves shall be cut to a maximum of 3 mm in width for longitudinal and transverse weakened plane joints made with early entry saws. The minimum depth of cut shall be calculated utilizing the formula in Section 40-1.08B(1), "Sawing Method," of the Standard Specifications except $d = t/4$.

TIE BARS ALONG LONGITUDINAL JOINT FOR SHORT RADIUS CURVES

When paving along short radius curves, the transverse joints shall be maintained in a single continuous straight line across lanes, through the radius point. Tie bars shall maintain minimum clearance from the transverse joint as shown on the plans. If the inside or outside curve of the panel does not allow equal uniform spacing of tie bars at 710 mm between tie bars, then the tie bars shall be equally spaced so that a minimum spacing of 375 mm to a maximum spacing of 710 mm is maintained between tie bars. Additional tie bars shall be considered as included in the contract price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

If dowel bars are specified along longitudinal joint for short radius curves, then dowel bars shall conform to the requirements of this special provision for tie bars spacing and tolerance.

MEASUREMENT AND PAYMENT

Sealing longitudinal and transverse weakened plane joints, and longitudinal isolation joints in portland cement concrete pavement will be measured by the meter. When a test strip conforms to the specifications for concrete pavement and remains a part of the project paving surface, the sealed pavement joints will be measured and paid for as seal pavement joint.

The contract price paid per meter for seal pavement joint shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in sealing pavement joints complete in place, including sawing, cleaning and preparing the joints in the concrete pavement, furnishing and installing compression seals, repairing and patching spalled or raveled sawed joints, and replacing or repairing rejected joints, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Concrete pavement will be measured by the cubic meter in conformance with the provisions in Section 40-1.13, "Measurement," of the Standard Specifications. No deduction will be made for the volume of epoxy-coated dowel bars, epoxy-coated tie bars and, when used, tie bar baskets with fasteners and dowel bar baskets with fasteners, in the concrete pavement. When a test strip conforms to the specifications for concrete pavement and remains a part of the project paving surface, the concrete will be measured and paid for as concrete pavement.

The contract price paid per cubic meter for concrete pavement shall include full compensation for furnishing all labor, materials (including cementitious material in the amount determined by the Contractor), tools, equipment, and incidentals, and for doing all the work involved in constructing the portland cement concrete pavement complete in place, including furnishing and placing epoxy-coated dowel bars, epoxy-coated tie bars and, when used, any tie bar baskets and dowel bar baskets with fasteners, submittal to the Engineer all test data for determination of mix proportions of concrete for concrete pavement and for providing the facility, Contractor personnel and all the work involved in arranging and holding the pre-paving conference, for constructing and repairing all joints; for performing all profile checks for Profile Index and furnishing final profilograms to the Engineer; for grooving and grinding required for final finishing; and for removing, and replacing pavement for deficient thickness, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for drilling holes and bonding tie bars with epoxy resin shall be considered as included in the contract price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

Full compensation for coring test strips for evaluation by the Engineer and for backfilling core holes with hydraulic cement grout when the test strip remains in place as part of the concrete pavement; and for constructing, coring and removing and disposing of test strips that are rejected shall be considered as included in the contract price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

Full compensation for sealing longitudinal isolation joint including sawing, cleaning and preparing the joints in the concrete pavement, furnishing and installing joint filler material, repairing and patching spalled or raveled sawed joints, and replacing or repairing rejected joints as shown on the plans and the Standard Specifications, shall be considered as included in the contract price per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

Full compensation for sealing isolation joints between drainage inlets including furnishing and installing reinforcing bars, joint filler material, and joint sealant as shown on the plans, shall be considered as included in the contract price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

Costs for providing JITT will be determined in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications, except no markups shall be added, and the Contractor will be paid for one half of the JITT cost. Costs for providing JITT shall include training materials, class site, and the JITT instructor including the JITT instructor's travel, lodging, meals and presentation materials. All costs incurred by the Contractor or Engineer for attending JITT shall be borne by the party incurring the costs.

Full compensation for core drilling for dowel bar or tie bar alignment and backfilling with hydraulic cement grout shall be considered as included in the contract price per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

If the initial cores show that dowel bars or tie bars are out of alignment tolerances and the Engineer orders additional dowel bar or tie bar coring, full compensation for drilling the additional cores shall be considered as included in the contract price per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

If the initial cores show that dowel bars or tie bars are within alignment tolerances and the Engineer orders more dowel bar coring the additional cores will be paid for as extra work in conformance with the provisions in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Full compensation for furnishing and placing epoxy coated reinforcement for transition end panel shall be considered as included in the contract price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

Full compensation for furnishing and placing paint binder (tack coat) for transition end panel shall be considered as included in the contract price paid per cubic meter for concrete pavement and no additional compensation will be allowed therefor.

10-1.715 SHOTCRETE

Shotcrete shall conform to the specifications in Section 51, "Concrete Structures," and Section 53, "Shotcrete," of the Standard Specifications and these special provisions.

Shotcrete shall completely encase reinforcement and other obstructions shown on the plans.

Attention is directed to the section, "Order of Work," in these special provisions regarding furnishing preconstruction shotcrete test panels.

Shotcrete shall have a minimum compressive strength of 22.5 MPa at 28 days. No shotcrete work shall be performed before verification by the Engineer of the required compressive strength.

The Contractor shall be responsible for obtaining and testing all required preconstruction and production test cores. Coring and testing shall be performed in the presence of the Engineer. The Engineer shall be notified a minimum of 24 hours before the Contractor performs any coring or testing.

All cores shall be obtained and tested for compressive strength in conformance with the specifications in ASTM Designation: C 42/C 42M. Cores used for determining compressive strength shall be free of bar reinforcement or other obstructions. The testing shall be performed at an independent testing facility approved by the Engineer. A copy of the test results shall be furnished to the Engineer within 5 days following completion of testing. Test cylinders specified in Section 90-9 "Compressive Strength" of the Standard Specifications will not be required for shotcrete.

All test panels shall become the property of the Contractor and shall be disposed of in conformance with the specifications in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

PRECONSTRUCTION REQUIREMENTS

Before performing shotcrete work, the Contractor shall construct at least 2 preconstruction shotcrete test panels for each mixture being considered.

The nozzleperson shall have a minimum of 3000 hours experience as a nozzleperson on projects with a similar application.

At least 15 days before constructing any shotcrete test panels, the Contractor shall submit, in conformance with specifications in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, a Quality Control Plan (QCP) for the proposed method of shotcrete placement. The plan shall include:

1. The number and qualifications of nozzlepersons available to place shotcrete, the number of nozzlepersons on-the project site at any time during the shotcrete placement, description of their work schedule, and the procedures for avoiding fatigue of any nozzleperson.
2. The proposed method of placing shotcrete, including, but not limited to, application rates, details of any proposed construction joints and their locations, and methods for achieving the required thickness and surface finish.
3. The procedure for curing shotcrete surfaces.
4. The description of a debris containment system, to be used during the cleaning of bar reinforcing steel and concrete and placing of shotcrete, as required to provide for public safety.

The Engineer shall have 15 days to review and approve the QCP submittal after a complete plan has been received. No construction of shotcrete test panels shall be performed until the QCP is approved by the Engineer. Should the Engineer fail to complete the review within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in approving the QCP, the delay will be considered a right of way delay in conformance with the specifications in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Preconstruction shotcrete test panels shall be constructed by the nozzlepersons and application crew scheduled to do the work, using equipment, materials, mixing proportions, ambient temperatures and procedures proposed for the work. The preconstruction shotcrete test panels shall conform to the following:

1. One shotcrete test panel, of the size determined by the Contractor, shall be unreinforced and shall have 3 cores taken from it and tested for compressive strength. The compressive strength shall be the average strength of the 3 cores, except that, if any core should show evidence of improper coring, the core shall be discarded and the compressive strength shall be the average strength of the remaining cores. The test panel shall be identified and submitted to the Engineer with the test results including a description of the mixture, proportions, and ambient temperature.
2. One shotcrete test panel shall have the same (1) thickness, (2) bar size and quantity of bar reinforcement or other obstructions, and (3) positioning of bar reinforcement or obstructions as the most heavily reinforced section of shotcrete to be placed. The test panel shall be square with the length of the sides equal to at least 3 times the thickness of the most heavily reinforced section of shotcrete to be placed, but not less than 750 mm. After a minimum 7 days of cure, the test panel shall be broken by the Contractor, in the presence of the Engineer, into pieces no larger than 250 mm in greatest dimension. The surfaces of the broken pieces shall be dense and free of laminations and sand pockets, and shall verify the bar reinforcement or other obstructions are completely encased.
3. Both test panels shall be cured under conditions similar to the actual work.
4. At the option of the Contractor, cores to be used for determining the compressive strength may be taken from the reinforced test panel described above instead of making a separate unreinforced test panel as described above. The compressive strength shall be the average strength of the 3 cores, except that, if any core should show evidence of improper coring or contains bar reinforcement or other obstructions, the core shall be discarded and the compressive strength shall be the average strength of the remaining cores. If cores are taken from the reinforced test panel, the panel shall not be broken into pieces, as described above, until it has cured for a minimum of 14 days.

The requirements for constructing preconstruction shotcrete test panels may be eliminated, when approved by the Engineer, if a test panel report and certified compressive strength test data are furnished from a State highway project with a similar application of approximately equal thickness, including similar quantities and placement of reinforcement or other obstructions. The proposed nozzleperson shall have constructed the test panel described in the test panel report. The test panel report shall list the names of the application crew, equipment used, materials, mixing proportions, ambient temperatures and procedures used to make the test panels. The certified compressive strength test data shall be for cores taken from the same test panels.

PLACING

An air blowpipe shall be used during shotcrete placement to remove rebound, overspray, and other debris from the areas to receive shotcrete.

Construction joints shall be tapered and shall conform to the specifications in Sections 51-1.13, "Bonding," of the Standard Specifications.

All overspray and rebound shall be removed before final set and before placement of shotcrete on adjacent surfaces.

Rebound or any other material which has already exited the nozzle shall not be reused.

Shotcrete shall be cured in conformance with the specifications in Section 90-7.03, "Curing Structures," of the Standard Specifications.

When a finish coat is to be used, all loose, uneven or excess material, glaze, and rebound shall be removed by brooming, scraping, or other means and the surface left scarified. Surface deposits which take a final set shall be removed by abrasive blasting. Before placing the finish coat, the receiving surface shall be washed down with an air-water blast.

Shotcrete extending into the space shown on the plans for cast-in-place concrete shall be removed.

TESTING AND ACCEPTANCE

At least 3 production shotcrete test cores shall be taken from each 30 square meters or portion thereof of shotcrete placed each day. The cores shall be 76 mm in diameter. The location where cores are to be taken will be designated by the Engineer. Test cores shall be identified by the Contractor, and a description of the core location and mixture, including proportions, shall be submitted to the Engineer with the test cores, immediately after coring. Cored holes shall be filled with mortar in conformance with the specifications in Section 51-1.135, "Mortar," of the Standard Specifications.

Upon receipt of the cores, the Engineer will perform a visual examination to determine acceptance, as described below. Within 48 hours after receipt, the Engineer will return the cores to the Contractor for compressive strength testing.

The compressive strength test shall be performed using the shotcrete production test cores described above. The compressive strength shall be the average strength of the 3 cores, except that, if any core should show evidence of improper coring, the core shall be discarded, and the compressive strength shall be the average strength of the remaining cores.

The basis of acceptance for production shotcrete test cores shall be (1) that the core is dense and free of laminations and sand pockets, and shows the reinforcement or other obstructions are completely encased and (2) the same as specified for test cylinders in the 4th and 5th paragraphs of Section 90-9.01, "General," of the Standard Specifications.

If any production test core shows signs of defective shotcrete as described in (1) above, the shotcrete represented by that test core will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the shotcrete placed in the work are acceptable.

The surface finish of the shotcrete shall conform to the specifications in Section 51-1.18, "Surface Finishes," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Full compensation for the Quality Control Plan, constructing and breaking test panels, furnishing and testing cores and patching cored holes shall be considered as included in the contract price paid per cubic meter for shotcrete, and no additional compensation will be allowed therefor.

10-1.935 WROUGHT IRON FENCE

Wrought iron fence work shall consist of fabrication, installation, and finishing of wrought iron fencing and components including fence panels, posts, gates, and accessories in accordance with the locations shown on the plans and in conformance with the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions or as directed by the Engineer.

MATERIALS

The material for the fence posts, pickets, rails, and gates shall be manufactured from electric resistance-welded carbon and alloy steel tubing conforming to the requirements of ASTM designation: A513. The tubing shall be manufactured from coil steel having a minimum yield strength 310 MPa and a tensile strength of 345 MPa.

Pickets shall be a maximum of 25 mm square tubing with a wall thickness of 1.65 mm. Upper and lower rails shall be a minimum of 38 mm square tubing with a wall thickness of 1.65 mm. Posts shall be a minimum of 76 mm square tubing with a wall thickness of 2.413 mm. Post caps shall be shop welded to the posts and have a minimum thickness of 1.65 mm. Hinges shall be a maximum of 75 mm by 75 mm of commercial grade stainless steel with non-removable pins. Latches shall be lockable commercial grade stainless steel heavy duty gravity gate latches. Padlocks shall be commercial grade and keyed with chrome plated solid body with hardened steel shackle that resists corrosion and rust.

All welds shall be full perimeter welds completely sealing and tightly connection two metal pieces. All overlapping, butting, or touching points of the picket-and-rail pane shall be welded. All surfaces shall be free of burrs and sharp edges prior to coating.

INSTALLATION

Field assembly shall be via mechanical connectors or field welds. Field assembly via mechanical connections shall only occur within the limits of the rails via male-to-female slip joints. Field assembly via welded connections shall be done in such a manner to minimize damage to the powder coating.

All slip joints shall have overlapping portions of not less than 75 mm. Slip joints shall provide a rigid system when fully erected. Each rail and picket assembly shall be welded to at least one post. Slip joints shall occur within 150 mm of a post and shall provide for smooth, continuous rail elements that provide no more than 10 mm of gap. All portions of panelized systems shall be powder coated including drilled holes. Rivets shall not be permitted. Connection bolts shall be one-way pan head, screw-to-screw or male-to-female type connections, or approved alternates, painted to match the finished coat.

All posts and pickets shall be plumb. Panels, post-panel or post-panel-post assemblies and gates shall be shop assembled in sections as shown on the plans.

Avoid unnecessary cutting, drilling, and welding of prefinished fence and components. Touch-up any areas where powder coating is damaged by applying a zinc-rich cold galvanizing primer in accordance with Section 75-1.05 paragraph 10 and Section 91.1.04, paragraph 3 of the Standard Specifications. The primer shall be followed by a high quality acrylic paint to match the finish. A minimum of three finish color coats shall be applied to all touch-up areas.

The Contractor shall verify final graded, elevations, and materials prior to fabrication and installation. Shop drawings of the fence shall be provided. The Contractor shall remove unused materials, level uneven areas due to excavation, and remove all related debris. Ground cover, mulch, and plants shall be returned to pre-construction condition or better.

COATING

All oxidization, dust, dirt, oil, grease, mill scale, any foreign matter, or contaminants shall be removed from surfaces subject to coating. All exposed surfaces shall be powder coated including the embedded portion of the posts. All welds shall be neutralized with a suitable solvent compatible with the specified Coating System Materials. Slag and weld metal accumulation and spatters shall be removed by shipping or grinding. All sharp edges shall be peened, ground, filed, or otherwise blunted.

An application of a minimum 64-microns (2.5-mil) thick zinc rich epoxy primer shall immediately follow cleaning and preparation of the steel surfaces. The primer shall be provided by and specific for the powder coat. A minimum of 90 microns (3.5-mil) thick of high quality TGIC polyester resin shall be applied by the electrostatic spray process. Cure cycle(s) shall immediately follow the application of the primer and topcoat. The cure cycle(s) shall be in accordance with the powder manufacture's cure curves and procedures for primer and topcoat systems.

Color shall be gloss black.

Powder coat materials shall be specifically intended for exterior, landscape environment subject to irrigation water and adverse climate conditions. The material shall provide superior color and gloss retention, resistance to severe weathering. The intended maintenance-free service life is not less than 15 years. The powder coating and primer must be shown to satisfy or exceed the requirements listed herein.

The Contractor shall provide powder coating color chips or samples, powder coating, and primer material specification sheets along with the dated of manufacturing and shipping date. All materials stored at the fabrication yard shall be stored so as not to degrade the material.

MEASUREMENT AND PAYMENT

Quantities of wrought iron fence to be paid for will be determined by the meter from actual measurements, the measurements to be made parallel to the ground slope along the line of the completed fence, including the widths of gate openings.

Full compensation for clearing the line of the fence and disposing of the resulting material, excavating high points in the existing ground between posts, excavating and backfilling holes, disposing of surplus materials, and furnishing and placing portland cement concrete footings, hinges, latches, padlocks and the furnishing and placing of gates shall be considered as included in the contract price paid per meter for wrought iron fence and no additional compensation will be allowed therefore.

The contract price paid per meter for wrought iron fence shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in fabrication, finishing, and installation of wrought iron fence and gate, complete in place, as shown on the plans and as specified in the Standard Specifications, and these special provisions, and as directed by the Engineer.

SECTION 13: RAILROAD RELATIONS AND INSURANCE REQUIREMENTS.

13-1.01 GENERAL

The term "Railroad" must mean the Union Pacific Railroad Company.

It is expected that the Railroad will cooperate with the Contractor to the end that the work may be handled in an efficient manner. However, except for the additional compensation provided for hereinafter for delays in completion of specific unit of work to be performed by the Railroad, and except as provided in Public Contracts Code Section 7102, the Contractor must have no claim for damages, extension of time, or extra compensation in the event his work is held up by railroad train operations or other work performed by the Railroad.

The Contractor must understand the Contractor's right to enter the Railroad's property is subject to the absolute right of the Railroad to cause the Contractor's work on the Railroad's property to cease if, in the opinion of the Railroad, the Contractor's activities create a hazard to the Railroad's property, employees, and operations.

The Contractor must abide by the State's Right of Entry Agreement with the Railroad. The Contractor must agree to execute and deliver to the Railroad the Contractor's Endorsement that is attached hereto as Appendix 1 and to provide to the State and/or the Railroad all insurance policies, binders, certificates or endorsements that are set forth in Exhibit B of the State's Right of Entry Agreement.

13-1.02 RAILROAD REQUIREMENTS

The Contractor must provide to Railroad's Senior Manager, Industry and Public Projects, at 2015 South Willow Avenue, Bloomington, California 92316, and the Engineer, in writing, at least ten (10) working days in advance of performing any work on, or adjacent to the property or tracks of the Railroad.

The Contractor must cooperate with the Railroad where work is over or under the tracks, or within the limits of the Railroad property to expedite the work and avoid interference with the operation of railroad equipment.

The Contractor must comply with the rules and regulations of the Railroad or the instructions of its representatives in relation to protecting the tracks and property of the Railroad and the traffic moving on such tracks, as well as the wires, signals and other property of the Railroad, its tenants or licensees, at and in the vicinity of the work during the period of construction. The responsibility of the Contractor for safe conduct and adequate policing and supervision of its work at the job site must not be lessened or otherwise affected by the presence at the work site of the Railroad representatives, or by the Contractor's compliance with any requests or recommendations made by the Railroad representatives.

The Contractor must perform work so as not to endanger or interfere with the safe operation of the tracks and property of the Railroad and traffic moving on such tracks, as well as wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the work.

The Contractor must take protective measures to keep the Railroad facilities, including track ballast, free of sand or debris resulting from his operations. Damage to the Railroad facilities resulting from the Contractor's operations will be repaired or replaced by the Railroad and the cost of such repairs or replacement must be deducted from the Contractor's progress and final pay estimates.

The Contractor must contact the Railroad's "Call Before You Dig" at least forty-eight (48) hours prior to commencing work, at 1-800-336-9193 during normal business hours (7:00 a.m. to 9:00 p.m. Central Time, Monday through Friday, except holidays – also a 24-hour, 7-day number for emergency calls) to determine location of fiber optics. If a telecommunications system is buried anywhere on or near the Railroad property, the Contractor will coordinate with the Railroad and the Telecommunication Company(ies) to arrange for relocation or other protection of the system prior to beginning any work on or near Railroad property.

The Contractor must not pile or store any materials nor park any equipment closer than 7.62 meters to the centerline of the nearest track, unless directed by the Railroad's representative.

The Contractor must also abide by the following temporary clearances during the course of construction:

- A. 3.66 meter horizontally from centerline of track
- B. 6.40 meter vertically above top of rail

The temporary vertical construction clearance above provided will not be permitted until authorized by the Public Utilities Commission. It is anticipated that authorization will be received not later than fifteen (15) days after the approval of the contract. In the event authorization is not received by the time specified, and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of authorization not being received by the said time, the State will compensate the Contractor for such delay to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications and not otherwise.

Walkways with railing must be constructed by the Contractor over open excavation areas when in close proximity of tracks, and railings must not be closer than 2.60-meter horizontally from centerline of the nearest track, if tangent, or 2.90-meter if curved.

Infringement on the above temporary construction clearances by the Contractor's operations must be submitted to the Railroad by the Engineer, and must not be undertaken until approved by the Railroad, and until the Engineer has obtained any necessary authorization from any governmental body or bodies having jurisdiction thereover. No extension of time or extra compensation will be allowed in the event the Contractor's work is delayed pending Railroad approval and governmental authorization.

When the temporary vertical clearance is less than 6.86-meter above top of rail, the Railroad must have the option of installing tell-tales or other protective devices the Railroad deems necessary for protection of the Railroad trainmen or rail traffic.

Four (4) sets of plans, in 279 mm x 432 mm format, and two (2) sets of calculations showing details of construction affecting the Railroad's tracks and property not included in the contract plans, including but not limited to shoring and falsework, must be submitted to the Engineer for review prior to submittal to the Railroad for final approval. Falsework must comply with the Railroad guidelines. Demolition of existing structures must comply with the Railroad guidelines. Shoring must be designed in accordance with the Railroad's shoring requirement of Drawing No. 106613 and guidelines for shoring and falsework, latest edition, issued by the Railroad's Office of Chief Engineer. Shoring and falsework plans and calculations must be prepared and signed by a professional engineer registered in California. This work must not be undertaken until such time as the Railroad has given such approval, review by the Railroad may take up to six (6) weeks after receipt of necessary information.

The Contractor must notify the Engineer in writing, at least twenty-five (25) calendar days but not more than forty (40) days in advance of the starting date of installing temporary work with less than permanent clearance at each structure site. The Contractor must not be permitted to proceed with work across railroad tracks until this requirement has been met. No extension of time or extra compensation will be allowed if the Contractor's work is delayed due to failure to comply with the requirements in this paragraph.

Blasting will be permitted only when approved by the Railroad.

The Contractor shall, upon completion of the work covered by this Contract to be performed by the Contractor upon the premises or over or beneath the tracks of the Railroad, promptly remove from the premises of the Railroad, the Contractor's tools, implements and other materials, whether brought upon said premises and cause said premises to be left in a clean and presentable condition.

Under track pipeline installations must be constructed in accordance with the Railroad's current standards which may be obtained from the Railroad. The general guidelines are as follows:

- A. Edges of jacking or boring pit excavations must be a minimum of 6.10-meter from the centerline of the nearest track.
- B. If the pipe to be installed under the track is 100 mm in diameter or less, the top of the pipe must be at least 1.07-meter below base of rail.
- C. If the pipe diameter is greater than 100-meter in diameter, it must be encased and the top of the steel pipe casing must be at least 1.60-meter below base of rail.
- D. Installation of pipe or conduit under the Railroad's tracks must be done by dry bore and jack method.
- E. Hydraulic jacking or boring will not be permitted.

Safety of personnel, property, rail operations and the public is of paramount importance. As reinforcement and in furtherance of overall safety measures to be observed by the Contractor (and not by way of limitation), the following special safety rules must be followed:

- A. The Contractor must keep the job site free from safety and health hazards and ensure that its employees are competent and adequately trained in all safety and health aspects of the job. The Contractor must have proper first aid supplies available on the job site so that prompt first aid services can be provided to any person that may be injured on the job site. The Contractor must promptly notify the Railroad of any U.S. Occupational Safety and Health Administration reportable injuries occurring to any person that may arise during the work performed on the job site. The Contractor must have a non-delegable duty to control its employees while they are on the job site or any other property of the Railroad to be certain they do not use, be under the influence of, or have in their possession any alcoholic beverage, drug, narcotic or other substance that may inhibit the safe performance of work by the employee.
- B. The employees of the Contractor must be suitably dressed to perform their duties safely and in a manner that will not interfere with their vision, hearing or free use of their hands or feet. Only waist length shirts with sleeves and trousers that cover the entire leg are to be worn. If flare-legged trousers are worn, the trouser bottoms must be tied to prevent catching. The employees should wear sturdy and protective work boots and at least the following protective equipment:
 - B.1 Protective head gear that meets American National Standard-Z89.1-latest revision. It is suggested that all hardhats be affixed with the Contractor's or the subcontractor's company logo or name.
 - B.2 Eye protection that meets American National Standard for occupational and educational eye and face protection, Z87.1-latest revision. Additional eye protection must be provided to meet specific job situations such as welding, grinding, burning, etc.
 - B.3 Hearing protection which affords enough attenuation to give protection from noise levels that will be occurring on the job site.
- C. All heavy equipment provided or leased by the Contractor must be equipped with audible back-up warning devices. If in the opinion of the Railroad Representative any of the Contractor's or the subcontractor's equipment is unsafe for use on the Railroad's right-of-way, the Contractor, at the request of the Railroad representative, must remove such equipment from the Railroad's right-of-way.

13-1.03 PROTECTION OF RAILROAD FACILITIES

Upon the advance notification of not less than ten (10) working days, the Railroad representatives, conductors, flagmen or watchmen will be provided by the Railroad to protect its facilities, property and movements of its trains or engines. Notice must be made to the Railroad's Manager of Track Maintenance at 200 South Adams Street, Anaheim, CA 92802, (714) 772-6579. At the time of notification, the Contractor must provide the Railroad with a schedule of dates that flagging services will be needed, as well as times, if outside normal working hours. Subsequent deviation from the schedule must require ten (10) working days' advance notice from the first affected date. The Railroad will furnish such personnel or other protective devices:

- A. When equipment is standing or being operated within 7.63 meters, measured horizontally, from centerline of any track on which trains may operate, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
- B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad's representative, track or other Railroad facilities may be subject to settlement or movement.

- C. During any clearing, grubbing, grading or blasting in proximity to the Railroad which, in the opinion of the Railroad's representative, may endanger the Railroad facilities or operations.
- D. During any of the Contractor's operations when, in the opinion of the Railroad's representatives, the Railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines or pipe lines, may be endangered.

The cost of flagging and inspection provided by the Railroad during the period of constructing that portion of the project located on or near the Railroad property, as deemed necessary for the protection of the Railroad's facilities and trains, will be borne by the State. The Railroad has indicated that its estimated flagging rate will be around One Thousand Dollars (\$1,000.00) per day. The State must pay the Railroad for all actual flagging costs incurred by the Railroad under this Project.

13-1.04 WORK BY RAILROAD

The following work by the Railroad will be performed by Railroad forces and is not a part of the work under this Contract:

- A. The Railroad will perform preliminary engineering and inspection (if any) and flagging as specified in Section 13-1.03 "Protection of Railroad Facilities," of these special provisions.
- B. Temporary crossings at grade over tracks of Railroad for the purpose of hauling earth, rock, paving or other materials will not be permitted. If the Contractor, for the purpose of constructing highway-railway grade separation structures, including construction ramps thereto, desires to move equipment or materials across Railroad's tracks, the Contractor must first obtain permission from Railroad via the State Engineer. Should Railroad approve the temporary crossing, State must execute a Service Contract with Railroad for Railroad to construct the temporary crossing. Under the Service Contract, State must bear the cost of the crossing surface, warning devices and other components that might be required. Notwithstanding State's Service Contract with Railroad, the Contractor is required to execute Railroad's form of Contractor's Haul Road Crossing Agreement. Railroad, at State's expense, must provide flagmen to control movements of vehicles across the temporary crossing. State and its Contractor must prevent the use of such temporary crossing by unauthorized persons and vehicles.
- C. The Railroad will remove existing railroad gate and signal, and installed new railroad gate and signal for the Carmenita Place and Arctic Circle at grade crossing. Contractor must coordinate the staging of the project work and the gate and signal work with the Railroad.

13-1.05 DELAYS DUE TO WORK BY RAILROAD.

If delays due to work by the Railroad occur, and the Contractor sustains loss which, in the opinion of the Engineer, could not have been avoided by the judicious handling of forces, equipment and plant, the amount of said loss must be determined as provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

If a delay due to work by the Railroad occurs, an extension of time determined pursuant to the provisions in Section 8-1.07, "Liquidated Damages," of the Standard Specifications will be granted.

13-1.06 LEGAL RELATIONS

The provisions of Section 13-1, "Relations with Railroad Company," and the provisions of Section 13-2, "Railroad Protective Insurance," of these special provisions must inure directly to the benefit of the Railroad.

13-1.07 RAILROAD PROTECTIVE INSURANCE

In addition to any other form of insurance or bonds required under the terms of the contract and specifications, the Contractor will be required to carry insurance of the kinds and in the amounts hereinafter specified.

Such insurance must be approved by the Railroad before any work is performed on the Railroad's property and must be carried until all work required to be performed on or adjacent to the Railroad's property under the terms of the contract is satisfactorily completed as determined by the Engineer, and thereafter until all tools, equipment and materials have been removed from the Railroad's property and such property is left in a clean and presentable condition.

Full compensation for all premiums which the Contractor is required to pay on all the insurance described hereinafter must be considered as included in the prices paid for the various items of work to be performed under the contract, and no additional allowance will be made thereof or for additional premiums which may be required by extensions of the policies of insurance.

The following insurance coverage will be required:

- A. Commercial General Liability insurance. Commercial general liability (CGL) with a limit of not less than \$5,000,000 each occurrence and an aggregate limit of not less than \$10,000,000. CGL insurance must be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).

The policy must also contain the following endorsement, which must be stated on the certificate of insurance:

- Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Railroad Company Property" as the Designated Job Site.

- B. Business Automobile Coverage insurance. Business auto coverage written on ISO form CA 00 01 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less \$5,000,000 for each accident.

The policy must contain the following endorsements, which must be stated on the certificate of insurance:

- Coverage For Certain Operations In Connection With Railroads ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "Union Pacific Property" as the Designated Job Site.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) if required by law.

- C. Workers' Compensation and Employers' Liability insurance. Coverage must include but not be limited to:

- Contractor's statutory liability under the workers' compensation laws of the State of California.
- Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 disease policy limit \$500,000 each employee.

If Contractor is self-insured, evidence of state approval and excess workers compensation coverage must be provided. Coverage must include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

The policy must contain the following endorsement, which must be stated on the certificate of insurance:

- Alternate Employer endorsement ISO form WC 00 03 01 A (or a substitute form providing equivalent coverage) showing Railroad in the schedule as the alternate employer (or a substitute form providing equivalent coverage).

- D. Railroad Protective Liability insurance. Contractor must maintain Railroad Protective Liability insurance written on ISO occurrence form CG 00 35 12 04 (or a substitute form providing equivalent coverage) on behalf of Railroad as named insured, with a limit of not less than \$2,000,000 per occurrence and an aggregate of \$6,000,000. A binder stating the policy is in place must be submitted to Railroad before the work may be commenced and until the original policy is forwarded to Railroad.
- E. Umbrella or Excess insurance. If Contractor utilizes umbrella or excess policies, these policies must "follow form" and afford no less coverage than the primary policy.
- F. Pollution Liability insurance. Pollution liability coverage must be written on ISO form Pollution Liability Coverage Form Designated Sites CG 00 39 12 04 (or a substitute form providing equivalent liability coverage), with limits of at least \$5,000,000 per occurrence and an aggregate limit of \$10,000,000.

If the scope of work as defined in this Agreement includes the disposal of any hazardous or non-hazardous materials from the job site, Contractor must furnish to Railroad evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of \$1,000,000 per loss, and an annual aggregate of \$2,000,000.

OTHER REQUIREMENTS

The following are the list of requirements that must be included in the railroad protective insurance:

- A. All policy(ies) required above (except worker's compensation and employers liability) must include Railroad as "Additional Insured" using ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage). The coverage provided to Railroad as additional insured shall, to the extent provided under ISO Additional Insured Endorsement CG 20 26, and CA 20 48 provide coverage for Railroad's negligence whether sole or partial, active or passive, and must not be limited by Contractor's liability under the indemnity provisions of this Agreement.
- B. Punitive damages exclusion, if any, must be deleted (and the deletion indicated on the certificate of insurance), unless the law governing this Agreement prohibits all punitive damages that might arise under this Agreement.
- C. Contractor waives all rights of recovery, and its insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors and employees. This waiver must be stated on the certificate of insurance.
- D. Prior to commencing the work, Contractor must furnish Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this Agreement.
- E. All insurance policies must be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the State of California.
- F. The fact that insurance is obtained by Contractor or by Railroad on behalf of Contractor will not be deemed to release or diminish the liability of Contractor, including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railroad from Contractor or any third party will not be limited by the amount of the required insurance coverage.

CONTRACTOR'S ENDORSEMENT

A. As a condition to entering upon the Railroad's right-of-way to perform Work pursuant to this agreement, State's contractor, _____

(Name of Contractor)

whose address is _____

(Contractor's Mailing Address)

(hereinafter "Contractor"), agrees to comply with and be bound by all the terms and provisions of the attached Caltrans Right of Entry Agreement that was signed by Union Pacific Railroad Company ("Railroad") and the State of California, Department of Transportation ("State") relating to the Work to be performed and the insurance requirements set forth in Exhibit B of the Right of Entry Agreement. The Contractor further acknowledges and agrees that the reference to Cal. Gov. Code §14662.5 in Sections 5.b) and 8.b) of Exhibit A to the Right of Entry Agreement does not apply to the Contractor and in no way limits the indemnities set forth in those provisions, to which the Contractor agrees to be bound.

B. Before the Contractor commences any Work, the Contractor will provide the Railroad with (i) a binder of insurance for the Railroad Protective Liability Insurance described in Section 13-2 of the Contract Special Provisions, hereto attached, and the original policy, or a certified duplicate original policy when available, and (ii) a certificate issued by its insurance carrier providing the other insurance coverage and endorsements required pursuant to Section 13-2 of the Contract Special Provisions.

C. All insurance correspondence, binders or originals must be directed to:

Union Pacific Railroad Company
Attn: Real Estate Department
1400 Douglas Street, MS 1690
Omaha, Nebraska 68179-1690
Attn.: Senior Manager - Contracts
Folder No. _____

D. Please note that fiber optic cable may be buried on the Railroad's property. Prior to commencing any work, the Contractor agrees to contact the Railroad's Telecommunications Operation Center as provided in Section 5 of Exhibit A of the Right of Entry Agreement to determine if any fiber optic cable is located on the Railroad's property on or near the location where the work is to be performed. If there is, the Contractor must comply with the terms and conditions of Section 5 of Exhibit A before commencing any work on the Railroad's property.

E. The Contractor agrees to also provide to the Railroad's Manager-Track Maintenance at 200 South Adams Street, Anaheim, CA 92802 the advance notice required in Section 1 of Exhibit A of the Right of Entry Agreement prior to working on the Railroad's property in order for the Railroad to coordinate the Contractor's work with the Railroad's operations and to make arrangements for flagging protection (if applicable).

This endorsement must be completed and sent to the person named in Paragraph C above.

(Name of Contractor)

By _____

Title: _____

BID ITEM LIST
07-2159C4

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	074034	TEMPORARY COVER	M2	2560		
22	074037	MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL)	EA	6		
23	074038	TEMPORARY DRAINAGE INLET PROTECTION	EA	200		
24	074041	STREET SWEEPING	LS	LUMP SUM	LUMP SUM	
25	019090	TEMPORARY PUMP	LS	LUMP SUM	LUMP SUM	
26	074051	TEMPORARY HYDRAULIC MULCH	M2	2560		
27	074057	STORM WATER ANNUAL REPORT	EA	6	\$2,000.00	\$12,000.00
28	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
29	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
30	120116	TYPE II BARRICADE	EA	58		
31	120119	TRAFFIC CONE	EA	110		
32	120120	TYPE III BARRICADE	EA	130		
33	120149	TEMPORARY PAVEMENT MARKING (PAINT)	M2	390		
34	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	M	60 300		
35	120165	CHANNELIZER (SURFACE MOUNTED)	EA	650		
36	120300	TEMPORARY PAVEMENT MARKER	EA	8170		
37	129000	TEMPORARY RAILING (TYPE K)	M	11 600		
38	129100	TEMPORARY CRASH CUSHION MODULE	EA	580		
39	019091	TEMPORARY CRASH CUSHION (TYPE ADIEM)	EA	1		
40	141101	REMOVE YELLOW PAINTED TRAFFIC STRIPE (HAZARDOUS WASTE)	M	10 200		

**BID ITEM LIST
07-2159C4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	141103	REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE)	M	8300		
42	020472	ABANDON UTILITY PIPE	M	400		
43	150241	ABANDON SEWER	M	2650		
44	019092	ABANDON SEWER MANHOLE	EA	30		
45	150608	REMOVE CHAIN LINK FENCE	M	3590		
46	150662	REMOVE METAL BEAM GUARD RAILING	M	490		
47	150667	REMOVE DOUBLE METAL BEAM BARRIER	M	1910		
48	150711	REMOVE PAINTED TRAFFIC STRIPE	M	18 900		
49	150712	REMOVE PAINTED PAVEMENT MARKING	M2	210		
50	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	M	12 900		
51	150722	REMOVE PAVEMENT MARKER	EA	7610		
52	150742	REMOVE ROADSIDE SIGN	EA	5		
53	150744	REMOVE ROADSIDE SIGN (WOOD POST)	EA	37		
54	150745	REMOVE ROADSIDE SIGN (METAL POST)	EA	145		
55	150747	REMOVE ROADSIDE SIGN (STRAP AND SADDLE BRACKET METHOD)	EA	39		
56	150760	REMOVE SIGN STRUCTURE	EA	4		
57	150767	REMOVE BRIDGE MOUNTED SIGN	EA	2		
58	150771	REMOVE ASPHALT CONCRETE DIKE	M	220		
59	150806	REMOVE PIPE	M	1800		
60	020473	REMOVE UTILITY PIPE	M	140		

**BID ITEM LIST
07-2159C4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
81	153250	REMOVE SOUND WALL	M	440		
82	155007	CAP MANHOLE	EA	3		
83	019097	REMOVE GUARD POST	EA	7		
84	157550	BRIDGE REMOVAL	LS	LUMP SUM	LUMP SUM	
85	160101	CLEARING AND GRUBBING	LS	LUMP SUM	LUMP SUM	
86	190101	ROADWAY EXCAVATION	M3	98 800		
87	019098	ROADWAY EXCAVATION (CONTAMINATED SOIL)	M3	8700		
88	190108	ROADWAY EXCAVATION (TYPE Y-2) (AERIALY DEPOSITED LEAD)	M3	9100		
89	190110	LEAD COMPLIANCE PLAN	LS	LUMP SUM	LUMP SUM	
90	190111	ADL BURIAL LOCATION REPORT	LS	LUMP SUM	LUMP SUM	
91	019099	HAZARDOUS MATERIALS MITIGATION PLANS	LS	LUMP SUM	LUMP SUM	
92	019100	CONTAMINATED SOIL DISPOSAL	M3	1310		
93	019101	SOIL BORING	LS	LUMP SUM	LUMP SUM	
94	020479	DISPOSAL OF HAZARDOUS MATERIAL	M3	1710		
95 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	M3	9843		
96 (F)	042803	STRUCTURE EXCAVATION (CONTAMINATED)	M3	796		
97 (F)	019102	STRUCTURE EXCAVATION (AUSTIN VAULT)	M3	260		
98 (F)	192037	STRUCTURE EXCAVATION (RETAINING WALL)	M3	7918		
99	019103	SAND BEDDING (AUSTIN VAULT)	M3	34		
100 (F)	019104	STRUCTURE BACKFILL (AUSTIN VAULT)	M3	75		

**BID ITEM LIST
07-2159C4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
101 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	M3	6601		
102 (F)	193013	STRUCTURE BACKFILL (RETAINING WALL)	M3	9476		
103 (F)	193031	PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	M3	10		
104	194001	DITCH EXCAVATION	M3	370		
105	019105	DITCH EXCAVATION (BIOSWALE)	M3	1260		
106	198001	IMPORTED BORROW	M3	10 100		
107	200001	HIGHWAY PLANTING	LS	LUMP SUM	LUMP SUM	
108	200114	ROCK BLANKET	M2	11 500		
109	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM	LUMP SUM	
110	208000	IRRIGATION SYSTEM	LS	LUMP SUM	LUMP SUM	
111	208304	WATER METER	EA	4		
112	208731	200 MM CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONDUIT	M	12		
113	208732	250 MM CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONDUIT	M	170		
114	250401	CLASS 4 AGGREGATE SUBBASE	M3	21 400		
115	260201	CLASS 2 AGGREGATE BASE	M3	18 300		
116	260301	CLASS 3 AGGREGATE BASE	M3	28 700		
117	280000	LEAN CONCRETE BASE	M3	17 000		
118	390131	HOT MIX ASPHALT	TONN	50 000		
119	394060	DATA CORE	LS	LUMP SUM	LUMP SUM	
120	394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	M	620		

**BID ITEM LIST
07-2159C4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
121	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	M	21		
122	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	M2	2630		
123	397005	TACK COAT	TONN	6		
124	401000	CONCRETE PAVEMENT	M3	34 400		
125	404092	SEAL PAVEMENT JOINT	M	37 500		
126	490584	FURNISH STEEL PIPE PILING (610 MM)	M	28 973		
127	490585	DRIVE STEEL PIPE PILE (610 MM)	EA	1489		
128	491009	FURNISH PILING (CLASS 400) (ALTERNATIVE V)	M	12 331		
129	491010	DRIVE PILE (CLASS 400) (ALTERNATIVE V)	EA	846		
130	498027	400 MM CAST-IN-DRILLED-HOLE CONCRETE PILING (SOUND WALL)	M	1810		
131	042804	760 MM PILE CASING	M	21 487		
132	500001	PRESTRESSING CAST-IN-PLACE CONCRETE	LS	LUMP SUM	LUMP SUM	
133 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	M3	4101		
134 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	M3	15 394		
135 (F)	510060	STRUCTURAL CONCRETE, RETAINING WALL	M3	3143		
136 (F)	510086	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)	M3	414		
137 (F)	019106	STRUCTURAL CONCRETE (AUSTIN VAULT)	M3	92		
138	019107	CLASS 3 CONCRETE	M3	4		
139	019108	CLASS 1 CONCRETE (BOX CULVERT)	M3	1060		
140 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	300		

BID ITEM LIST
07-2159C4

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
141	020478	MINOR CONCRETE (PIPE ENCASEMENT)	M3	190		
142 (F)	042805	MINOR CONCRETE (MEDIAN)	M3	32		
143 (F)	510526	MINOR CONCRETE (BACKFILL)	M3	350		
144	510705	PILASTER, SOUND WALL	M3	43		
145 (F)	511035	ARCHITECTURAL TREATMENT	M2	4454		
146 (F)	518002	SOUND WALL (MASONRY BLOCK)	M2	1790		
147	518051	PTFE SPHERICAL BEARING	EA	32		
148	042806	JOINT SEAL (MR 25 MM)	M	39		
149	042807	JOINT SEAL ASSEMBLY (MR 75 MM)	M	23		
150	519124	JOINT SEAL ASSEMBLY (MR 60 MM)	M	27		
151	519126	JOINT SEAL ASSEMBLY (MR 80 MM)	M	91		
152	519129	JOINT SEAL ASSEMBLY (MR 101 MM - 160 MM)	M	44		
153	519142	JOINT SEAL (MR 40 MM)	M	13		
154 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	KG	3 330 409		
155 (F)	520103	BAR REINFORCING STEEL (RETAINING WALL)	KG	242 648		
156 (F)	042808	BAR REINFORCING STEEL (AUSTIN VAULT)	KG	12 484		
157 (F)	520107	BAR REINFORCING STEEL (BOX CULVERT)	KG	169 938		
158 (F)	520120	HEADED BAR REINFORCEMENT	EA	4992		
159 (F)	560213	FURNISH SIGN STRUCTURE (LIGHTWEIGHT)	KG	9022		
160 (F)	560214	INSTALL SIGN STRUCTURE (LIGHTWEIGHT)	KG	9022		

**BID ITEM LIST
07-2159C4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
221	820180	INSTALL MEDIAN MILEAGE PANEL	EA	14		
222	832001	METAL BEAM GUARD RAILING	M	96		
223 (F)	019127	METAL HANDRAILING	M	65		
224 (F)	833033	CHAIN LINK RAILING (TYPE 7 MODIFIED)	M	692		
225	019128	CHAIN LINK RAILING (TYPE 6 MODIFIED)	M	1780		
226	833080	CONCRETE BARRIER (TYPE K)	M	850		
227 (F)	833088	TUBULAR HANDRAILING	M	461		
228 (F)	833142	CONCRETE BARRIER (TYPE 26 MODIFIED)	M	814		
229 (F)	839521	CABLE RAILING	M	87		
230	839541	TRANSITION RAILING (TYPE WB)	EA	4		
231	019129	END CAP (TYPE B)	EA	3		
232	839577	END CAP (TYPE TA)	EA	3		
233	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	3		
234	839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	2		
235	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	4		
236	839603	CRASH CUSHION (ADIEM)	EA	1		
237	839631	CRASH CUSHION MODULE, SAND FILLED	EA	39		
238	839706	CONCRETE BARRIER (TYPE 60G)	M	730		
239	839709	CONCRETE BARRIER (TYPE 60GE)	M	95		
240	019130	PORTABLE CONCRETE BARRIER (TYPE 60K)	M	1110		

BID ITEM LIST
07-2159C4

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
241 (F)	839727	CONCRETE BARRIER (TYPE 736 MODIFIED)	M	802		
242	019131	CONCRETE BARRIER (TYPE 736B MODIFIED)	M	1890		
243	839734	CONCRETE BARRIER (TYPE 736SV)	M	450		
244 (F)	042809	CONCRETE BARRIER (TYPE 742A MOD)	M	339		
245 (F)	042810	CONCRETE BARRIER (TYPE 736A MODIFIED)	M	641		
246	840515	THERMOPLASTIC PAVEMENT MARKING	M2	1380		
247	840561	100 MM THERMOPLASTIC TRAFFIC STRIPE	M	19 200		
248	840563	200 MM THERMOPLASTIC TRAFFIC STRIPE	M	2650		
249	840564	200 MM THERMOPLASTIC TRAFFIC STRIPE (BROKEN 3.66 M - 0.92 M)	M	540		
250	840567	100 MM THERMOPLASTIC TRAFFIC STRIPE (BROKEN 1.83 M - 0.30 M)	M	460		
251	840570	100 MM THERMOPLASTIC TRAFFIC STRIPE (BROKEN 10.98 M - 3.66 M)	M	7430		
252	840571	100 MM THERMOPLASTIC TRAFFIC STRIPE (BROKEN 5.18 M - 2.14 M)	M	5050		
253	842000	PARKING BUMPER (PRECAST CONCRETE)	EA	26		
254	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	1950		
255	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	2130		
256	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM	LUMP SUM	
257	019132	SIGNAL AND LIGHTING (CITY STREET TEMPORARY LOCATION 3)	LS	LUMP SUM	LUMP SUM	
258	019133	SIGNAL AND LIGHTING (CITY STREET TEMPORARY LOCATION 6)	LS	LUMP SUM	LUMP SUM	
259	019134	SIGNAL AND LIGHTING (CITY STREET TEMPORARY LOCATION 7)	LS	LUMP SUM	LUMP SUM	
260	019135	SIGNAL AND LIGHTING (CITY STREET TEMPORARY LOCATION 8)	LS	LUMP SUM	LUMP SUM	

BID ITEM LIST
07-2159C4

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
261	860254	SIGNAL AND LIGHTING (LOCATION 4)	LS	LUMP SUM	LUMP SUM	
262	860255	SIGNAL AND LIGHTING (LOCATION 5)	LS	LUMP SUM	LUMP SUM	
263	860300	SIGNAL AND LIGHTING (CITY STREET LOCATION 1)	LS	LUMP SUM	LUMP SUM	
264	860302	SIGNAL AND LIGHTING (CITY STREET LOCATION 2)	LS	LUMP SUM	LUMP SUM	
265	860306	SIGNAL AND LIGHTING (CITY STREET LOCATION 6)	LS	LUMP SUM	LUMP SUM	
266	019136	SIGNAL AND LIGHTING (CITY STREET LOCATION 7)	LS	LUMP SUM	LUMP SUM	
267	860400	LIGHTING (TEMPORARY)	LS	LUMP SUM	LUMP SUM	
268	860402	LIGHTING (CITY STREET)	LS	LUMP SUM	LUMP SUM	
269	019137	REMOVE LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
270	860460	LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
271	860701	INTERCONNECTION CONDUIT AND CONDUCTOR	LS	LUMP SUM	LUMP SUM	
272	860797	ELECTRIC SERVICE (IRRIGATION)	LS	LUMP SUM	LUMP SUM	
273	860889	MODIFY TRAFFIC MONITORING STATION	LS	LUMP SUM	LUMP SUM	
274	019138	TEMPORARY COMMUNICATION SYSTEM	LS	LUMP SUM	LUMP SUM	
275	019139	MODIFY COMMUNICATION SYSTEM	LS	LUMP SUM	LUMP SUM	
276	019140	REMOVE RAMP METERING SYSTEM	LS	LUMP SUM	LUMP SUM	
277	861100	RAMP METERING SYSTEM	LS	LUMP SUM	LUMP SUM	
278	019141	MODIFY LIGHTING (CITY STREET)	LS	LUMP SUM	LUMP SUM	
279	869050	GUARD POST	EA	5		
280	BLANK					

BID ITEM LIST
07-2159C4

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
281	020753	REMOVE ASBESTOS CEMENT PIPE	M	1140		
282	020754	REMOVE WROUGHT IRON PIPE	M	530		
283	020755	GEOSYNTHETIC REINFORCED EMANKMENT	M2	559		
284	510072	STRUCTURAL CONCRETE, BARRIER SLAB	M3	171		
285	530100	SHOTCRETE	M3	94		
286	020756	WROUGHT IRON FENCE	M	35		
287	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

TOTAL BID:

\$ _____