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DIVISION OF ENGINEERING SERVICES
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Flex your power!
Be energy efficient!

October 15, 2012

06-Mad-99-R6.9/R8.2
06-471004
Project ID 0600000463

Addendum No. 3

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN MADERA COUNTY NEAR MADERA FROM 0.6 MILE SOUTH OF AVENUE 12 OVERCROSSING TO 0.7 MILE NORTH OF AVENUE 12 OVERCROSSING.

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

Bids for this work will be opened on Wednesday, October 24, 2012.

This addendum is being issued to revise the Project Plans, the Notice to Bidders and Special Provisions, the Bid book, and provide additional Supplemental Project Information.

Project Plan Sheets 23, 24, 141, 161, 162, 165, 167, 168, 169, 173, 280, 281, 297, 444, 449, 462, 498, 510, and 514 are revised. Copies of the revised sheets are attached for substitution for the like-numbered sheets.

Project Plan Sheet 69A is added. A copy of the added sheet is attached for addition to the project plans.

In the Special Provisions, Section 4, "BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES," the first paragraph is revised as follows:

"The 1st working day is the earlier of (1) the 55th day after contract approval or (2) the day you start work other than the measurement of controlling field dimensions or the location of utilities."

In the Special Provisions, Section 4, "BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES," the fourth paragraph is revised as follows:

"You may start work at the job site before the 55th day after contract approval if:

1. You obtain required approval for each submittal before the 55th day.
2. The Engineer authorizes it in writing."

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In the Special Provisions, Section 5-1.11, "SUPPLEMENTAL PROJECT INFORMATION," second row of the table is revised as follows:

"Available as specified in the Standard Specifications	1. Cross sections a. Cross sections in PDF format b. Revised Cross sections in PDF format c. Cross Sections in DGN file format d. Original ground data in 2D DGN file format e. Horizontal geometric alignment files in KCM format f. Vertical geometric alignment files in KCM format g. Cross Sections Existing Rd 29 N in PDF format h. Cross Sections Existing Rd 29 N in DGN file format i. Horizontal Geometric Align. Rd 29 N in KCM format 2. Bridge as-built drawings"

In the Special Provisions, Section 5-1.18, "NONHIGHWAY FACILITIES (INCLUDING UTILITIES)," the first paragraph is revised as follows:

"During the progress of the work under this Contract, the utility owner will relocate or install a utility shown in the following table within the corresponding number of days shown. Notify the Engineer within the notification period as shown in the table below before you work within the approximate location of a utility shown.

Utility Relocation and Department-Arranged Time for the Relocation

Utility/Contact Information	Location	Notification Period in Days	Days
Pacific Gas and Electric, Land Agent (559) 263-7374	As shown on the plans, overhead electric lines.	21	130
Pacific Gas and Electric, Land Agent (559) 263-7374	As shown on the plans, underground gas lines.	21	90
AT&T, OSP Engineer (661) 631-3407	As shown on the plans, underground fiber optic lines."	21	90

In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the following paragraph is added after the third paragraph:

"Madera Irrigation Drainage Systems 55, 56, 68, 69, and 70 shall also be done between the estimated time of November 1 and February 28."

In the Special Provisions, Section 10-1.195, "RIGHT OF WAY OBSTRUCTIONS," is added as attached.

In the Special Provisions, Section 10-1.33, "EXISTING HIGHWAY FACILITIES," subsection "PIPELINER," is added as attached.

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In the Special Provisions, Section 10-1.33, "EXISTING HIGHWAY FACILITIES," subsection "CLEANING, INSPECTING AND PREPARING HOST PIPE," is added as attached.

In the Special Provisions, Section 10-1.33, "EXISTING HIGHWAY FACILITIES," subsection "CURED-IN-PLACE PIPELINER," is added as attached.

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

In the Bid book, in the "Bid Item List," Items 53, 64, 82, 84, 85, 86, 95, 119, and 206 are revised as attached.

To Bid book holders:

Replace pages 5, 6, 7, 8, and 13 of the "Bid Item List" in the Bid book with the attached revised pages 5, 6, 7, 8, and 13 of the Bid Item List. The revised Bid Item List is to be used in the bid.

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

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

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

Inform subcontractors and suppliers as necessary.

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

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/06/06-471004

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

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

Attachments

10-1.195 RIGHT OF WAY OBSTRUCTIONS

Attention is directed to the following parcels located within the right of way as shown on the plans at:

Parcel Number	Estimated Date Available to Contractor
86522-1	February 28, 2013
86524-1, 86524-2	February 28, 2013
86528-1	January 14, 2013
86531-1	January 14, 2013
86534-1	January 15, 2013
86537-1	January 11, 2013
86535-1	December 20, 2012
86525-1	February 20, 2013
86545-1	December 3, 2012

It is anticipated that the State will have legal possession and control of these parcels or the occupied improvements will be vacated and removed by the date shown in the above table.

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.

PIPELINER

General

Summary

This section includes general specifications for installing various types of pipeliners used in rehabilitating host pipes.

At a location where the plans allow more than one type of pipeliner for installation, choose which type of alternative pipeliner to install. At a location where the plans show only one type of pipeliner for installation, install only the type of pipeliner shown.

Host pipes of the same nominal size shown with different combinations of allowable pipeliners are shown on the plans and in the Verified Bid Item List as alternative pipeliner Type A, Type B, or as other types for each combination of allowable pipeliners.

Related Sections

Comply with these related sections:

1. Specifications for the following pipeliners under these special provisions:

    1.1. Cured-In-Place Pipeliner (CIPP)

2. Specifications for "Cleaning, Inspecting and Preparing Host Pipe" under these special provisions, including host pipe restoration plan and inspection and evaluation report
3. Specifications for protection of waterways from work activity related pollution under Section 7-1.01G, "Water Pollution," of the Standard Specifications and "Water Pollution Control" of these special provisions

Definitions

alternative pipeliner: Type of pipeliner you choose for installation at a location where the plans allow more than one type of pipeliner for installation.

annular space: Space or void between the outside wall of the pipeliner and the inside wall of a host pipe.

host pipe: Existing culvert pipe, storm drain, pipe or conduit, including risers, downdrains, median drainage inlets, and underdrains, where shown on the plans for installation or construction of a pipeliner.

lateral pipe opening: Opening in a host pipe for a connecting pipe or drain of any kind.

service opening: Opening in a host pipe for maintenance, repair, inspection or cleaning of a pipe.

wastewater: Water and contaminants generated by the work.

waterway: Existing drainage system including surface water, tributaries, and groundwater.

Submittals

Unless specified otherwise in these special provisions, upon receipt of a submittal, the Engineer reviews the submittal within 5 business days. Upon notification the submittal is incomplete, re-submit a completed submittal within 3 business days. The Engineer reviews re-submittals within 5 business days.

Upon completion of a pipeliner installation, submit:

1. Written Inspection Report: Describe the condition of completed pipeliner, including video recording and still photos of spot locations. Before accepting work, the Engineer reviews the written inspection report within 10 days.
2. Written Repair Proposal: Describe proposed repair methods, materials and procedures for correcting deficiencies discovered in completed pipeliner. Do not make any repairs until the Engineer accepts your proposal for repairs.
3. Documentation of Repairs: Provide documentation of repaired sections, including logs, records, reports, and photographs.

Quality Control and Assurance

Testing Agency Qualifications: An independent testing agency is a laboratory with the experience and capability to conduct the testing indicated, as determined under ASTM E 548. Laboratory must be independent of you and the installer, and must have no employee or employee relationship which constitutes a conflict of interest.

Preinstallation Meeting: Before starting any work, you must attend a preinstallation meeting with the Engineer, including any subcontractors, manufacturers and other parties involved in the work. Schedule a time and date with all participants for the preinstallation meeting that is acceptable to the Engineer. Furnish a facility for the preinstallation meeting within 5 miles of the job site or at another location if the Engineer accepts.

Materials

Furnish products and materials of the type indicated which comply with specifications in other sections of these special provisions.

Equipment must comply with Section 5-1.10, "Equipment and Plants," and Section 7-1.01, "Laws to be Observed," of the Standard Specifications.

Construction

Site Preparation

Before starting any pipe lining work on a host pipe, comply with "Cleaning, Inspecting and Preparing Host Pipe," of these special provisions.

Notify the Engineer's before you:

1. Start any repair work on a host pipe
2. Install a pipeliner
3. Restore any lateral pipe connection or service opening

Restoration of Openings

Restore lateral pipe and service openings, including risers, downdrains, median drainage inlets, and underdrains, within 72 hours of pipeliner installation and before lining any additional host pipes. Conform openings to match invert of connecting pipes.

Do not excavate unless the Engineer approves your request to excavate.

Restoration work must be performed from the interior of the pipe by either a CCTV and a remote control cutting device or by human entry.

Area of restored openings must be at least 95 percent of the original area. Openings must have a smooth crack-free edge free from burrs or other projections.

Where human-entry is possible, grout restored opening in a way to produce a watertight seal. If the Engineer approves your request, grout must be one of these:

1. Quick-set epoxy mortar
2. High viscosity epoxy
3. Hydrophilic vulcanized expansive rubber strip
4. Manufacturer's recommended method

Inspecting Completed Pipeliner

Inspect the entire length of completed pipeliner in the same way specified elsewhere in these special provisions for "Cleaning, Inspecting and Preparing Host Pipe."

Video recording and digital photos of spot locations must document the exact location, position and size of any deficiencies including:

1. Defects
2. Discoloration
3. Irregularities
4. Surface discontinuities
5. Anomalies
6. Constrictions
7. Deformities

If the Engineer determines that the video recording furnished does not adequately depict work inside the pipeliner including camera head position, focus, illumination, rate of progression, inadequate time documenting deficiencies, or if the Engineer orders re-cleaning, you must re-inspect and re-clean at your expense.

If human-entry is possible, and inspection reveals areas that require further inspection due to suspected deficiencies in the pipeliner, you must perform a more detailed human-entry inspection of the pipeliner concentrating on the suspected areas.

Site Cleanup

Upon completion of work, comply with Section 4-1.02, "Final Cleaning Up," of the Standard Specifications. Dispose of all excess material outside of the highway right of way under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, including material not incorporated in the work, waste material, wastewater, and debris.

Measurement and Payment

Repairs are paid for under Section 5-1.09 "Removal of Rejected and Unauthorized Work," of the standard specifications.

CLEANING, INSPECTING AND PREPARING HOST PIPE

General

Summary

This work includes removing sediments, debris and other accumulated materials, inspecting and preparing host pipe for pipelining or invert paving.

Submittals

Submit the following:

1. Host Pipe Restoration Plan: At the preinstallation meeting, submit a written plan for each host pipe in a 3-ring binder subdivided into categories listed below. The Engineer reviews the plan including submitted sample video recordings and inspection logs to determine if the quality of the video and still images are acceptable and defects were properly identified and documented. Do not start work until the Engineer accepts your host pipe restoration plan. Plan must include:

    1.1. Proposed cleaning methods.
    1.2. Plan for control of sediments dislodged during cleaning.
    1.3. Plan for control and diversion of existing stream or groundwater flows. Bypass system must be of adequate capacity and size to handle the flow, including:

        1.3.1. Calculations supporting system capacity
        1.3.2. Schedule indicating duration of flow diversion

    1.4. Sample CCTV inspection including:

        1.4.1. Sample of a printed CCTV preinstallation inspection log with digital photographs of material not dislodged during cleaning operations, locations where invert repairs were necessary, host pipe joints, lateral connection joints, protrusions, etc.

        1.4.2. Sample video recording of previous host pipe inspection work with audio commentary showing operational and structural defects in pipes that are the same size as those for this work. Sample video recording must be taken with the same camera and lighting equipment proposed for this work. Specify camera type and model and identify transporter to be used.

    1.5. Sample digital media for human entry inspection:

        1.5.1. Sample video camera preinstallation inspection log, including a printed log with digital photos covering same items under 1.4.1
        1.5.2. Sample digital photo log

2. Inspection and Evaluation Report: After completing host pipe cleaning and inspection, submit a written inspection and evaluation report within 7 days. Include 2 copies of the video recording and one set of digital photographs. Comply with these requirements:

    2.1. Document the location of conditions that might prevent pipeliner installation. Describe proposed repairs of host pipe, or a statement that no repairs are required before lining. Include a description of conditions you found that might prevent proper installation of pipeliner, including any sharp or protruding appurtenances that might snag or tear the pipeliner. Include proposed methods to correct those conditions and to re-establish lateral pipe and service openings.

2.2. The Engineer reviews video recordings and digital photographs and inspection and evaluation report within 7 days. If you submit more than one video recording and inspection and evaluation report simultaneously, or additional materials or documentation before completion of a previous submittal, designate the sequence for reviewing each submittal. The Engineer reviews each additional submittal in 7 days. The Engineer may add an additional 3 business days to the remaining time on each submittal which was under review and delayed by higher priority submittals in the sequence.

Quality Control and Assurance

Qualifications: Experienced personnel trained in locating defects, breaks and obstacles must perform host pipe inspection.

Preinstallation Meeting: Before starting work and within 75 days after contract approval, supervisory personnel involved in cleaning, inspection and preparation of host pipe and pipeliner or invert paving work must attend a preinstallation meeting with the Engineer to discuss methods of accomplishing the work. Schedule a time and provide a facility for the preinstallation meeting acceptable to the Engineer.

Materials

Slurry Cement Backfill

Slurry cement backfill for filling voids in backfill below host pipe invert must comply with Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications.

Grout

If sand is used in the grout mix, sand must comply with Section 90-2.02B, "Fine Aggregate," of the Standard Specifications and these grading requirements:

Sieve Size	Percentage Passing
No. 8	100
No. 16	95-100
No. 30	60-85
No. 50	20-50
No. 100	10-30
No. 200	0-20

CCTV Inspection Equipment

CCTV equipment must include:

1. CCTV camera with articulating head
2. Transporter adapted for conditions of host pipe
3. Television monitor
4. Lighting
5. Cables and power sources

CCTV equipment must:

1. Be specifically designed and constructed for pipe inspection
2. Have camera lighting for minimizing reflective glare
3. Have adjustable focal distance range from 6 inches to infinity
4. Produce minimum 356 lines per inch resolution for camera and monitor
5. Have remote reading meter counter accurate to 1 percent over the length of the particular section being inspected

Calibration

Verify the accuracy of the distance meter used in CCTV inspection with a walking meter, roll-a-tape or other suitable device approved by the Engineer.

Electronic Media

CCTV recording must be made in high quality electronic media such as VHS, CD or DVD.

Construction

General

Clean, inspect, and repair host pipe as described in host pipe restoration plan.

Site Preparation

Before host pipe inspection, clean host pipe, remove debris and sediment accumulated in host pipe invert, and restore flow area to original flow area or diameter as shown on the plans.

Do not let wastewater resulting from work to enter the waterway.

Before cleaning activities start, inspect host pipe to determine which cleaning method to use and develop a plan for controlling sediments, debris and other accumulated materials.

Use high-velocity hydraulic cleaning equipment and industrial air mover, or mechanically powered equipment to clean host pipe. For large diameter pipes where human entry is possible, you may use non-mechanically powered cleaning equipment.

Completely remove all sediments, debris and other accumulated material from host pipe.

Dispose of wastewater, sediments, debris and other accumulated material under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

At your expense, repair damage to host pipe resulting from your activity.

Inspecting Host Pipe

After cleaning, inspect cleaned host pipe either by human entry or CCTV equipment.

During inspection, review, log and comment on conditions that require attention before and after installation of pipeliner or invert paving. Inspect entire length of host pipe and document the condition and location of:

1. Any condition that might prevent proper installation of pipeliner or invert paving
2. Protrusions
3. Collapsed or crushed areas
4. Reduced cross sectional areas
5. Each lateral pipe opening including:

    5.1. Drainage system identification
    5.2. Distance into host pipe
    5.3. Exact position and orientation within host pipe wall
    5.4. Size or dimensions of opening
    5.5. Connecting joint
    5.6. Flow direction

6. Each host pipe joint

During inspection, perform additional cleaning as required to obtain acceptable quality of video scans and digital photographs and the required level of cleaning under manufacturer's recommendations for the type of pipeliner to be installed. The Engineer may stop inspection and require additional cleaning before allowing you to proceed with further inspection. The Department does not pay for additional cleaning.

Scan each host pipe joint and lateral pipe joint 360 degrees. If camera does not pass through entire host pipe, reset equipment and inspect host pipe from the opposite direction.

When using human entry inspection, use hand held video camera and lighting and digital photo camera to record inspection of host pipe. Lighting and picture quality must be suitable to provide a clear, in focus, picture of entire periphery of host pipe under all conditions. Do not exceed CCTV inspection rate of 30 feet per minute.

Record and label all audio and video media for incorporation into inspection and evaluation report. Video media must include this information:

1. Video:

    1.1. Recording number
    1.2. Inspection date
    1.3. Current distance along host pipe (counter meter)
    1.4. Encoded text description of location, host pipe size, type and length
    1.5. Printed labels on video recording hard copy with location and date

2. Audio:

    2.1. Inspection date
    2.2. Confirmation of tape counter meter orientation and origin
    2.3. Description of host pipe size, type and length
    2.4. Description and location of each defect
    2.5. Description and location of each lateral pipe opening
    2.6. Description of flow direction

Retain a copy of all inspection documentation (cassettes, compact disks, memory sticks, databases, and logs) for duration of work.

Filling Host Pipe Voids

Voids greater than 3 inches deep discovered in the backfill below host pipe invert must be filled with slurry cement backfill, as ordered by the Engineer. Perform slurry grouting of voids below host pipe invert before installing pipeliner.

Repairing Host Pipe

Uncover, remove, and repair surface obstructions greater than 1/2 inch that cannot be removed by host pipe cleaning activities. Repair all host pipe surface defects identified in the inspection and evaluation report. Do not make any repairs until the Engineer accepts your proposed materials and methods for repairing surface defects and obstructions.

If the Engineer accepts your proposal for repairs, make all proposed repairs to prepare host pipe for lining and re-establish lateral pipe and service openings.

Measurement and Payment

Full compensation for cleaning, inspecting and preparing host pipe, including preinstallation meeting, preparing submittals, restoring host pipe flow area, control and diversion of flows, host pipe restoration plan, inspection and evaluation report, disconnecting and reconnecting downdrains, is included in the contract price paid per linear foot for the size of pipeliner installed, and no separate payment will be made therefor.

The Department does not pay for additional cleaning that may be necessary before host pipe lining or invert paving.

The Department pays for the following work as extra work under Section 4-1.03D, "Extra Work," of the Standard Specifications:

1. Any necessary work not shown on the plans, as determined by the Engineer, including host pipe repair, and disconnecting and reconnecting downdrains not shown on the plans
2. When ordered by the Engineer, any cleaning not required by these special provisions or the Standard Specifications
3. Slurry cement backfill, grout injection, hammer soundings and additional probing or other means of void detection ordered by the Engineer

CURED-IN-PLACE PIPELINER

General

Summary

This work includes rehabilitating the interior of host pipes with cured-in-place pipeliner (CIPP.)

Cured-in-place pipeliner consists of lining host pipe with thermosetting resin-impregnated flexible fabric tube. Use one of these methods:

1. Inversion installation as specified in ASTM F 1216
2. Pulled-in-place installation as specified in ASTM F 1743

For all types of resin and installation methods, capture any process water and waste water resulting from the installation or flushing of the CIPP. Dispose of water and waste water under Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way," of the Standard Specifications.

Standards

Cured-in-place pipeliner must comply with these special provisions and the following standards:

1. ASTM D 2990 - Test Method for Tensile, Compressive and Flexural Creep and Creep-Rupture of Plastics
2. ASTM D 790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
3. ASTM D 883 - Definitions and Terms Relating to Plastics
4. ASTM D 1600 - Abbreviations, Acronyms, and Codes for Terms Relating to Plastics
5. ASTM F 412 - Definitions of Terms Relating to Plastic Piping Systems
6. ASTM F 1216 (including Appendix XI) - Rehabilitation of Existing Pipelines and Conduits by Inversion and Curing of a Resin Impregnated Tube
7. ASTM F 1743 - Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)
8. ASTM D 5813 Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe

Related Sections

Cured-in-place pipeliner must comply with general specifications under "Pipeliner" of these special provisions.

Definitions

segment: Continuous run of CIPP from end to end of a host pipe.

Submittals

Submit the following:

1. Pre-installation Information: Submit pre-installation information. Upon receipt of a submittal, the Engineer reviews the submittal within 15 days. Upon notification a submittal is incomplete, re-submit a completed submittal within 5 business days. The Engineer reviews re-submittals within 7 days or within the number of days remaining from the original submittal, whichever is greater. Do not start work until the Engineer accepts your submittals for:

    1.1. Resin Sample: Submit 1 liquid resin sample (4 oz. minimum of unreacted resin). Send sample to:

    Transportation Laboratory
    METS
    (Attention: Chemical Laboratory)
    5900 Folsom Blvd
    Sacramento, CA 95819

1.2. Summary Sheet: Identify each drainage system by number shown on the plans and include:

1.2.1. Calculated minimum thickness of liner
1.2.2. Manufacturer's recommended post-cure temperatures
1.2.3. Manufacturer's recommended pressures (including recommended minimum cold, maximum heated, and maximum cold)
1.2.4. Manufacturer's recommended cure time (including effects of anticipated heat sink conditions and variations in host pipe length)
1.2.5. Specific resin to be used (by trade name)
1.2.6. Expected maximum exotherm temperature
1.2.7. Method of liner insertion (e.g., air inversion, water inversion, pulled-in-place, etc.)
1.2.8. Proposed cure method (water or steam, etc.)
1.2.9. Proposed length, access and termination points for each segment

1.3. Manufacturer's information: Submit manufacturer's information in the following order:

1.3.1. Resin, resin enhancer, and bond enhancer identification and typical properties including: Identification of supplier; resin data test results; pipeliner and resin manufacturer's certification that resin and catalyst system meets requirements of each site where CIPP will be placed and is compatible with intended installation method, service conditions (as described in "CIPP Design Calculations" below), and host pipe material including bituminous coatings; certificates of compliance for CIPP under ASTM D 5813, F 1216, or F 1743
1.3.2. For resin enhancer include: Size range (in microns); amount used in the formulated resin; bond enhancing coating material; certification from resin manufacturer or formulator that bond enhancer is compatible with the resin system; certification from the bond enhancer manufacturer that the material is suitable for use in aqueous environments
1.3.3. Fabric tube description including: Identification of supplier; types of impermeable membranes and relative juxtaposition (e.g., inner layer, outer layer or both); maximum pulling force that will not damage fabric tube for pulled-in-place installations
1.3.4. Installation procedure guidelines for both insertion and resin curing
1.3.5. Sealing materials (quick-set epoxy mortar or high viscosity epoxy or a hydrophilic vulcanized expansive rubber strip)
1.3.6. Preliner description, preliner splicing recommendations, and identification of supplier
1.3.7. Description of non-toxic lubricant for inversion installation. Non-toxic lubricant must: Not have any detrimental effects on the fabric tube, resin or boiler and pump system; not support the growth of bacteria; not adversely affect the fluid to be transported

1.4. Record of annual calibration for pressure and temperature equipment performed by an independent third party including:

1.4.1. Standards traceable to National Institute of Standards and Technology.
1.4.2. Formal reporting procedure, including published test forms.
1.4.3. Sample of a temperature and pressure log to be used for monitoring the resin curing process. Log must have temperatures (resin and water or steam) and pressures noted at 5-minute intervals. Log must identify the drainage system number as indicated on the plans, host pipe diameter, date and fabric tube thickness.

1.5. Third party, 10,000-hour, 50-year Flexural Creep Modulus test data as specified in ASTM D 2990. If approved 10,000 hour tests are not available, use a minimum 75 percent reduction (25 percent retention) of Flexural Modulus of Elasticity (as specified in ASTM F 1216) for all formula calculations.

1.6. Certification on manufacturer's letterhead indicating you are approved by the fabric tube and resin manufacturer to perform CIPP installation work.

1.7. Material safety data sheets for all hazardous chemicals used or expected to be on the job site including resin, catalyst, cleaners, and repair agents. Identify proposed use for each hazardous chemical and where it will be used in the work.

1.8. CIPP Design Calculations: Include proposed CIPP liner thickness at each location using drainage system nomenclature and stationing shown on the plans. Design parameters include:

1.8.1. Classification of CIPP unless otherwise specified on the plans must be Type II (partially deteriorated) as specified in ASTM D 5813 and in Appendix X1.1.1 of ASTM F 1216
1.8.2. CIPP liner must be designed as specified in Appendix X1.2.1 of ASTM F 1216
1.8.3. Ovality must be assumed at 5 percent
1.8.4. If not specified in the contract document, assume the groundwater level is at 1/2 host pipe depth
1.8.5. Assume no bonding to host pipe wall

2. Independent Testing Agency Report: Submit independent testing agency's test report within 21 days after completing resin curing process. Obtain samples from each CIPP installation as specified in these special provisions and submit samples to an independent testing agency for testing. You pay for obtaining samples and testing. The Department withholds payment for CIPP installation until it receives test results. Test report must be signed by an engineer who represents the independent testing agency and is registered as a Civil Engineer in the State. Upon receipt of the test report, the Engineer reviews the test report within 3 business days. Upon notification the test report is incomplete, re-submit a completed test report within 5 business days. The Engineer reviews a re-submittal within 3 business days. Test report must include:

2.1. Infrared Spectrographic Chemical Fingerprint: Run and compare infrared spectrographic chemical fingerprint of field sample with accepted fingerprint from pre-installation information submittal. Verify field sample resin system is same as resin system accepted for use on the project.
2.2. Flexural Strength and Flexural Modulus: Test physical properties of field samples as specified in these special provisions and under ASTM F 1216, ASTM F 1743, and ASTM D 5813. Verify that physical properties of field samples comply with minimum initial test values as specified in Table 1 of ASTM F 1216 and as supplemented in Table 1 for polyester, vinylester, and epoxy resins:

Table 1

Test Description	Test Designation	Minimum Test Value
Flexural Strength	ASTM D 790	4,500 psi
Flexural Modulus	ASTM D 790	250,000 psi

2.3. Notable Defects: Describe any defects in samples tested. Describe how defects affect CIPP performance.

Quality Control and Assurance

Independent testing agency must:

1. Comply with testing agency qualifications under "Pipeliner" of these special provisions and:

1.1. Have testing equipment capable of performing tests specified in ASTM D 790 and infrared spectrographic chemical fingerprint
1.2. Have trained technicians for performing tests

Materials

General

Fabric tube must consist of one or more layers of flexible needled polyester-fiber felt or an equivalent non-woven material, or a combination of non-woven and woven materials including reinforcing fibers and fabrics capable of carrying the resin, and withstanding installation pressures and curing temperatures. Fabric tube must:

1. Be compatible with the resin system used and be capable of stretching to fit irregular pipe sections and negotiate bends
2. Have staggered longitudinal and circumferential joints between multiple layers of fabric so as not to overlap
3. Be fabricated to a size that, when installed, tightly fits internal circumference and length of host pipe
4. Have an impermeable plastic inner liner or outer liner film for resin control, which remains a permanent part of the system and an integral part of the fabric tube, by bonding or fusing to the fabric tube
5. Have plastic coating with opacity that does not interfere with visual inspection

Inversion Fabric Tube and Preliner Tube

Upon delivery, the outside layer of fabric tube must be plastic coated with a material that is compatible with the resin system. Make allowance for circumferential stretching during inversion. Use a preliner tube sized to fit host pipe. Preliner tube must be composed of 3-ply laminate sheet combining two layers of polyethylene film and high strength nylon cord grid formed into a tube sized to fit host pipe and must be continuous for the entire length of host pipe.

Pulled-In-Place Fabric Tube

Outside layer of fabric tube must have an impermeable plastic coating to contain the resin during and after fabric tube impregnation. Make allowance for circumferential and longitudinal stretching during installation. Minimum tensile strength of fabric tube or reinforced fiber material in the longitudinal and transverse directions must be 750 psi under ASTM D 5034 and ASTM D 5035 test methods.

Resin System

Resin must be compatible with the installation process. Resin must be capable of curing in the presence and absence of water. Initiation temperature for curing must be less than 180 °F. Resin must be one of these kinds:

1. Chemically resistant isophthalic based polyester resin
2 Vinyl ester thermosetting resin and catalyst system
3. Epoxy resin and hardener

Thixotropic agents that do not interfere with visual inspection may be added for viscosity control. Resins may contain pigments, dyes, or colors that do not interfere with visual inspection of the resin-impregnated liner or its required properties. Resin must not contain fillers, except those required for viscosity control, fire retardance, air release, and extension of pot life.

Resin system must be manufactured by a company selected by the fabric tube manufacturer. Resin must be one of these types of corrosion resistant resin systems:

1. Polyester Resin:

    1.1. Resin created by condensation reactions between isophthalic/terathalic acid, maleic anhydride and a glycol. Polymeric product is characterized by reactive unsaturation located along the molecular chain. This resin is compounded with a reactive styrene monomer and reacted together with initiators/promoters to produce cross-linked copolymer matrices.

    1.2. Polyester resin may contain only branched glycols, including but not limited to propylene glycol and neopentyle glycol. No PET/Isophthalic polyester is allowed. Polyesters may be either virgin isophthalic acid or virgin teraphthalic acid, but not combinations of both.

2. Vinyl Ester Resin:

    2.1. Resin created by reaction products of epoxy resins with methacrylic acid and characterized by reactive unsaturation located in the terminal position of the molecular chain. This resin is compounded with a reactive styrene monomer and reacted together with initiators or promoters to produce cross-linked copolymer matrices.

3. Epoxy Resin:

    3.1. Resin created by the reaction of epichlorohydrin and Bisphenol-A, Bispehnol-F, (or Novalac in some cases) to yield a diglycidyl ether (triglycidyl ether in the case of Novalacs) having terminal epoxy rings as the reactive sites.

    3.2. Epoxy resin system must be composed of a diglycidyl ether of Bisphen-A (DGEBPA) or Bisphenol-F (DGEBPF) resin solution, or a mixture of both, and a curing agent compatible with the saturation and cure methods for cured-in-place pipeliner. Curing agent may be catalytic type, an addition curing agent type, or a mixture of both, as specified and proportioned under manufacturer's formulation. Epoxy resin system must be free of volatile organic compounds (VOC's), be insensitive to ultra-violet light rays, low odor and comply with California Code of Regulations Title 8, Subchapter 7, "General Industry Safety Orders" with a flash point classification as combustible liquid, or higher (100 °F or higher). Sampling and testing must comply with Section 95-1.02, "Sampling and Testing," of the Standard Specifications and these special provisions.

4. Resin Enhancer:

    4.1. Resin enhancer may be used. Maximum amount of enhancer allowed is 30 pounds enhancer per 100 pounds resin. Submit data to certify resin enhancer does not exceed maximum amount.

    4.2.. Enhancer material must be made in a "batch method" procedure and attested to by the manufacturer.

5. Bond Enhancer:

    5.1. If using resin enhancer (i.e., aluminum trihydride) or fiberglass reinforced felt, use a suitable bond-enhancing compound (i.e., Silane or equal) to increase the bond between resin and other material

Construction

General

At each location and for each drainage system, notify the Engineer in writing 2 days before starting resin impregnation process.

Do not start work on any pipeliner segment unless the Engineer approves. The Engineer may require test results on the previous segment before allowing successive or simultaneous installation of another pipeliner segment.

Before starting resin impregnation, inspect the entire fabric tube for defects. Fabric tube must be either vacuum-impregnated with resin (wet-out) under controlled conditions, or impregnated with resin and run through a set of rollers separated by a space, calibrated under controlled conditions to ensure proper distribution of resin. Volume of resin used must be enough to fully saturate voids in fabric tube material (including all resin-absorbing material of the calibration hose if applicable). Certification documentation concerning date, type of resin (manufacturer, trade name and lot number) resin calculation and volume of resin used must be attached to the impregnated fabric tube. Impregnated fabric tube must be stored in an area where temperature is controlled to 70 ^{o}F or less.

Installation Involving Styrene

If the CIPP contains styrene comply with the following:

1. Before installing the liner, place an impermeable plastic sheet 20 linear feet immediately up stream and downstream of the host pipe. The impermeable plastic sheet must be either (1) at least 10 mil thick or (2) the same material as required for the preliner tube.
2. Capture any raw resin spillage during installation.
3. If using pulled-in-place installation, install a semi-rigid plastic slip sheet over interior portions of the host pipe that (1) could tear the outer film or (2) have a significant void
4. Promptly repair all pinholes and tears in the plastic film or preliner. If such defective areas cannot be repaired, promptly replace the impermeable plastic film or preliner before proceeding with liner installation.
5. Remove and dispose of water, waste water, and waste material under Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way," of the Standard Specifications.

Inversion Installation

The Engineer must witness the installation of each preliner tube. A preliner tube complying with these special provisions must be used to control resin loss, liner thickness, and prevent blocked laterals. For long segments, several sections of preliner tube may be spliced together under preliner manufacturer's recommendations to form a tube of adequate length.

If you fail to install the required preliner tube over the entire segment (regardless of physical tests and thickness test results), you must remove the CIPP from the host pipe and dispose of it under Section 5-1.09, "Removal of Rejected and Unauthorized Work," and Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Before starting inversion, the fabric tube manufacturer must furnish minimum pressure required to hold the tube tight against host pipe, and maximum allowable pressure to prevent fabric tube damage.

Initially turn fabric tube end inside out and attach to a platform ring, standpipe, or as ordered by the Engineer. Adjust pressure of water or steam to cause impregnated fabric tube to invert end to end and hold tight against host pipe wall.

During inversion, maintain a pressure between the required minimum and maximum pressures. If at any time during the installation you violate the manufacturer's required minimum and maximum pressures, you must remove the tube from the host pipe and dispose of it under Section 5-1.09, "Removal of Rejected and Unauthorized Work," and Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Use a lubricant during inversion to reduce friction. Lubricant must be poured into the inversion water in the down tube or applied directly to the tube. Lubricant must:

1. Be non-toxic
2. Not have any detrimental effect on tube, resin, and boiler and pump system
3. Not support the growth of bacteria
4. Not adversely affect the fluid to be transported

Pulled-in-Place Installation

Winch fabric tube into position under fabric tube manufacturer's recommendations. Adjust pressure of water or steam to cause calibration hose to invert end to end and hold fabric tube tight against host pipe wall.

Resin Curing Process

Comply with these requirements for resin curing:

1. Heat Source: After installing CIPP, regardless of installation method, use a suitable heat source (hot water or steam) and delivery system capable of providing the required amount of heat uniformly throughout the section to completely cure resin. Monitor temperature throughout curing process using these procedures:

    1.1. Install gauges to measure temperature of incoming and outgoing heat source.
    1.2. Place remote sensing devices at both ends between impregnated tube and invert of host pipe to monitor outside CIPP temperature.

1.3. Record temperature from each remote sensing device on a continuous tape from a strip-chart recorder. Readings on tape must represent temperature from start to completion of resin curing process and CIPP draining.
1.4 Record temperature every 5 minutes and submit tape and log of recorded temperatures within 48 hours after completing resin curing process.
1.5. Initial curing is complete when remote sensing devices achieve manufacturer's recommended curing temperatures for resin or catalyst, or both. Curing temperature and schedule must comply with submitted data and cool-down period.

2. Pressure: Start resin curing process after you complete dimpling for openings in host pipe. Maintain required pressure until resin curing process is complete. Monitor pressure throughout curing process using these procedures:

2.1. Record pressure every 5 minutes during resin curing process
2.2. Submit recorded pressure within 48 hours after completing resin curing process

3. Cool-Down:

3.1. Cool hardened CIPP to below 100 ^{o}F under manufacturer's recommendations for minimum cool-down period equivalent to starting boiler time to end of high temperature cure not exceeding cool-down rate of 15-20 ^{o}F/hour before relieving water column or pressure.
3.2. You may add cool water to the water column while maintaining circulation as water is drained from a small hole at the opposite end of CIPP within the requirements of Water Pollution Control conditions of these special provisions, so that a constant water column height is maintained until cool-down is completed. Do not let a vacuum develop during release of the water column, which could damage CIPP.

4. Rejected CIPP: Remove rejected CIPP from host pipe (regardless of physical tests and thickness test results) and dispose of it under Section 5-1.09, "Removal of Rejected and Unauthorized Work," and Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. The Engineer rejects CIPP if:

4.1. You fail to comply with submitted data for curing temperature and schedule
4.2. Pressure deviates more than 1 psi from required pressure
4.3. At any time during installation you violate manufacturer's required minimum cool-down time period or cool down rate

Field Quality Control

For each CIPP segment:

1. Obtain 1 liquid resin sample (4 oz. minimum of catalyzed resin): Submit to independent testing agency for analysis under these special provisions.

2. Obtain additional liquid resin samples (4 oz. minimum of catalyzed resin each) for:

2.1. First test performed.
2.2. One test randomly selected by the Engineer from the next 5 tests or, if less than 5 tests remain, from the portion thereof.
2.3. Mark each additional resin sample with the contract number and drainage system number and location where the sample was taken. Submit additional resin samples for quality assurance testing to:

Transportation Laboratory
METS
(Attention: Chemical Laboratory)
5900 Folsom Blvd
Sacramento, CA 95819

3. Obtain 3 cured flat plate samples; each 6" x 16" in size: Submit to independent testing agency for analysis under these special provisions. Comply with these sampling procedures:

    3.1. Place 3 aluminum plate clamped molds, each containing a flat plate sample, inside the downtube when heated circulated water is used, and in the silencer when steam is used during resin curing period.
    3.2. Seal each flat plate sample in heavy-duty plastic envelope inside mold.
    3.3. Samples must be identical to materials (tube, resin and catalyst) used for CIPP installation.
    3.4. Remove the 3 cured flat plates samples after draining all the moisture from cured CIPP. Identify each sample by date, project name, location, size, thickness, and resin and catalyst.

4. Obtain core samples of CIPP from each end of host pipe (i.e., 1 sample upstream and 1 sample downstream) in the presence of the Engineer. Comply with these sampling procedures:

    4.1. Take sample at least 10 feet from each end of host pipe or termination point. Take sample at least 2 inches in diameter from top of CIPP at each location.
    4.2. If using human entry method, samples may be cored internally. Repair cored holes in CIPP as specified in "Repairs" of these special provisions. Patch cored holes in host pipe with cement mortar as specified in Section 65-1.06, "Joints," of the Standard Specifications.
    4.3. As an alternative, you may core samples from the top section of a CIPP that has been inverted through a like diameter pipe (and material including preliner) of at least 10 feet in length which has been placed at the end of the host pipe and held in place by a suitable heat sink, such as sandbags or earth with a minimum cover of 6 inches. Take cores 12 inches from temporary joint with host pipe.
    4.4. Remove CIPP material from host pipe core samples. Remove inner liner film or preliner and measure the liner thickness at 3 spots on each sample. Average 6 measurements. Average thickness must be equal to or greater than the calculated minimum thickness submitted in pre-installation information summary sheet. The Department does not permit undersize allowance.
    4.5. If host pipe material is corrugated metal, take samples at corrugation crests.

Acceptance Criteria

The Engineer accepts CIPP under these conditions:

1. Verification from independent testing agency that resin samples comply with resin system accepted for the work. The Department rejects CIPP installed with unaccepted resin system.
2. Verification from independent testing agency that flat plate samples comply with physical requirements for flexural strength and flexural modulus of these special provisions. The Department rejects CIPP if any of the these occur:

    2.1. Two of the 3 flat plate samples fail modulus of elasticity test
    2.2. Two of the 3 flat plate samples fail flexural strength test
    2.3. Two of the 3 flat plate samples fail either:

        2.3.1. Modulus of elasticity test
        2.3.2. Flexural strength test

3. If the final thickness of CIPP is less than the calculated minimum thickness in your submittal, perform one of these remediation procedures at your expense:

    3.1. Remove and replace undersized CIPP
    3.2. Add a second thin liner designed (at least) to support hydrostatic loads due to groundwater, after acceptable preparation of the undersized CIPP interior
    3.3. Propose a repair method and if the Engineer accepts, repair the undersized CIPP using the accepted repair method

4. CIPP must comply with manufacturer's required temperature, pressure, and cure time.
5. CIPP must not have excessive defects or unrepairable defects, or both.
6. CIPP must comply with these special provisions.
7. CIPP must be:

    7.1. Continuous and fit tightly over entire length of host pipe
    7.2. Free of:

        7.2.1. Concentrated ridges, including folds and wrinkles exceeding 2 to 5 percent of CIPP diameter
        7.2.2. Dry spots
        7.2.3. Lifts
        7.2.4. Holes
        7.2.5. Tears
        7.2.6. Soft spots
        7.2.7. Blistering or bubbling
        7.2.8. Delamination or defects that would, in the opinion of the Engineer, affect CIPP performance

Repair Procedures

The Engineer must accept your repair plan before you make any repair. Repair plan must include information adequate to describe repair methods in the same way as described in pre-installation information submittal. You must use these repair methods:

1. If concentrated ridges fall outside the 120-degree invert arc and you demonstrate that grinding does not compromise CIPP structural integrity or reduce CIPP thickness below submitted calculated minimum thickness, you may grind concentrated ridges to required tolerance. After grinding to required tolerance, coat the ground area with manufacturer's approved resin. At the end of each work day dispose of any residue generated from grinding under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.
2. If the Engineer approves, you may make internal spot repairs to CIPP. Internal spot repairs may be made using the approved fabric and resins compatible with CIPP to restore strength and integrity.
3. If CIPP does not fit tightly against host pipe at termination point, fill space between CIPP and host pipe with any of these:

    3.1. Quick-set epoxy mortar
    3.2. High viscosity epoxy
    3.3. Hydrophilic vulcanized expansive rubber strip

4. If the Engineer orders, you must use repair methods in Table 2:

Table 2

Defect	Repair Method
Wrinkles or ridges exceeding 5% and up to 8% of pipe diameter outside of 120 degree invert arc. Wrinkles or ridges exceeding 2% and up to 8% of pipe diameter inside of 120 degree invert arc (except corrugations in CMP).	Grind to required tolerance. Grind to required tolerance within the lower 120 degrees of pipe to remove and point repair where needed to maintain minimum thickness, or else use procedure in accepted repair plan. If wrinkles or ridges exceed 8% of pipe diameter, you must remove CIPP.
Holes, tears, soft spots, and lifts up to 6 inches in major dimension. Delaminated areas up to 12 inches in major dimension; blistering or bubbling of the coating on CIPP surface present over a maximum of 5% of surface area.	Make point repair under manufacturer's recommendations. If defect covers a larger area, you must remove CIPP.
CIPP thickness less than calculated minimum thickness.	You must remove CIPP. If groundwater conditions allow, you may install a second CIPP within the first CIPP that produces a similar dimension ratio to the first CIPP, or else use procedure in accepted repair plan.
Annular space at lateral connection or at end of CIPP or infiltration at lateral opening.	Seal with quick-set epoxy mortar, high viscosity epoxy or a hydrophilic vulcanized expansive rubber strip.

Remove rejected CIPP from host pipe and dispose of it under Section 5-1.09 "Removal of Rejected and Unauthorized Work" and Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Measurement and Payment

The length of cured-in-place pipeliner is measured in linear feet along the flow line of the host pipe. The Department does not pay for cured-in-place pipeliner placed in excess of the measured length.

The contract unit price paid per linear foot for cured-in-place pipeliner includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing cured-in-place pipeliner, complete in place, including installing temperature and pressure gauges, sampling, testing, inspecting, and repairing as shown on the plans, as specified in the Standard Specifications, these special provisions, ASTM specifications, and as directed by the Engineer.

SECTION 13. RAILROAD RELATIONS AND INSURANCE

13-1.01 GENERAL

The term "Railroad" shall 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 shall 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, tenants, and operations or employees, and operations.

The Contractor acknowledges its receipt from the State of a copy of Caltrans Right of Entry Agreement that has been executed by the Railroad and the State. The Contractor agrees 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 and C of the Caltrans Right of Entry Agreement, which requirements are all contained in these special railroad provisions.

13-1.02 RAILROAD REQUIREMENTS

The Contractor shall provide to Mr. James Smith, Railroad's Manager, Industry and Public Projects, 9451 Atkinson Street, Roseville CA, 95747, and the State's Resident Engineer in writing, ten (10) days minimum advance notice before performing any work on, or adjacent to the property or tracks of the Railroad.

The Contractor shall 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 shall 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 tenant 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 shall not be lessened or otherwise affected by the presence at the work site of UPRR representatives, or by the Contractor's compliance with any requests or recommendations made by UPRR representatives.

The Contractor shall 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 tenant or licensees, at or in the vicinity of the work.

The Contractor shall 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 shall be deducted from the Contractor's progress and final pay estimates.

The Contractor shall 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 shall not pile or store any materials nor park any equipment closer than 25'-0" to the centerline of the nearest track, unless directed by the Railroad's representative.

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

3.66 meter (12'-0") horizontally from centerline of track
6.40 meter (21'-0") 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 by the Attorney General. 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 Licensee 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 shall be constructed by the Contractor over open excavation areas when in close proximity of tracks, and railings shall not be closer than 2.60-meter (8'-6") horizontally from centerline of the nearest track, if tangent, or 2.90-meter (9'-6") if curved.

Infringement on the above temporary construction clearances by the Contractor's operations shall be submitted to the Railroad by the Engineer, and shall 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 there over. 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 (22'-6") above top of rail, the Railroad shall 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 279mm x 432mm (11" x 17") 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 false work, shall be submitted to the Engineer for review prior to submittal to the Railroad for final approval. False work shall comply with the Railroad guidelines. Demolition of existing structures shall comply with the Railroad guidelines. Shoring shall be designed in accordance with the Railroad's shoring requirement of Drawing No. 106613 and guidelines for shoring and false work, latest edition, issued by the Railroad's Office of Chief Engineer. Shoring and false work plans and calculations shall be prepared and signed by a professional engineer registered in California. This work shall 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 shall 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 shall 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 shall 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 shall be a minimum of 6.10-meter (20 feet) from the centerline of the nearest track.

(b) If the pipe to be installed under the track is 100mm (4 inches) in diameter or less, the top of the pipe shall be at least 42 inches below base of rail.

(c) If the pipe diameter is greater than 100-meter (4 inches) in diameter, it shall be encased and the top of the steel pipe casing shall be at least1.60-meter (66 inches) below base of rail.

(d) Installation of pipe or conduit under the Railroad's tracks shall 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 shall be followed:

(a) The Contractor shall 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 shall 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 shall 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 shall 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 shall 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:

(1) Protective head gear that meets American National Standard-Z89.l-latest revision. It is suggested that all hardhats be affixed with the Contractor's or the subcontractor's company logo or name.

(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.; and

(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 shall 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, shall remove such equipment from the Railroad's right-of-way.

13-1.03 PROTECTION OF RAILROAD FACILITIES

Upon the 10-day minimum advance notification provided to the Railroad as set forth in Section 1 of Exhibit B of the Contractor’s Right of Entry Agreement, which requirements are contained in this Section, Railroad representatives, conductors, flagmen or watchmen will be provided by Railroad to protect its facilities, property and movements of its trains or engines. Notice shall be made to the Railroad’s Roadmaster at Roseville, California. At the time of notification, the Contractor shall 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 shall 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 25 feet, 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 any 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 and zero cents per day ($1,100.00/day) and that the Railroad has estimated a total of 34 days of flagging. The State shall pay the Railroad for all actual flagging costs incurred by the Railroad under this Project through a separate service contract that is not part of this Agreement.

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) Underground railroad communication line in vicinity of proposed Structure.

(c) Remove advertising signboards and signboard appurtenances.

(d) 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 shall first obtain permission from Railroad concurrence via the State Engineer. Should Railroad approve the temporary crossing, State shall execute a Service Contract with Railroad for Railroad to construct the temporary crossing. Under the Service Contract, State shall 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, shall provide flagmen to control movements of vehicles across the temporary crossing. State and its Contractor shall prevent the use of such temporary crossing by unauthorized persons and vehicles.

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 State’s Resident Engineer, could not have been avoided by the judicious handling of forces, equipment and plant, the amount of said loss shall 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 shall inure directly to the benefit of the Railroad.

13-2 INSURANCE AND ENDORSEMENTS

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 shall be approved by the Railroad before any work is performed on the Railroad's property and shall 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 shall 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.
- Designated Construction Project(s) General Aggregate Limit ISO Form CG 25 03 03 97 (or a substitute form providing equivalent coverage) showing the project on the form schedule.

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.

G. 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

H. 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 shall not be limited by Contractor's liability under the indemnity provisions of this Agreement.

I. Before Contractor commences any work, the Contractor shall, except to the extent prohibited by law; (1) require each of its subcontractors to include the Contractor as "Additional Insured" in the subcontractor's Commercial Liability policy and Business Automobile policies with respect to all liabilities arising out of the subcontractor's performance of work on behalf of the Contractor by endorsing these policies with ISO Additional Insured Endorsements CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage; (2) require each of its subcontractors to endorse their Commercial General Liability Policy with "Contractual Liability Railroads" ISO Form CG 24 17 10 01 (or a substitute form providing equivalent coverage) for the job site; and (3) require each of its subcontractors to endorse their Business Automobile Policy with "Coverage for Certain Operations In Connection With Railroads" ISO Form CA 20 70 10 01 (or a substitute form providing equivalent coverage) for the job site.

J. 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.

K. 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.

L. Prior to commencing the work, Contractor shall 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.

M. 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.

N. 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.

APPENDIX 1

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 _____,

(C*ontractor'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 C 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 B 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 shall 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. 2487-43

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 B of the Right of Entry Agreement, which are also contained in the project special railroad provisions, specifically Section13-1.02, 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 B before commencing any work on the Railroad's property.

E. The Contractor agrees to also provide to the Roadmaster in Bloomington California, the advance notice required in Section 1 of Exhibit B of the Right of Entry Agreement, 10 days minimum, 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 shall be completed and sent to the person named in Paragraph C above.

_____
(Name of Contractor)

By_____

Title:_____

EXHIBIT F

UNION PACIFIC RAILROAD
MINIMUM REQUIREMENTS

PART 1 – GENERAL

DESCRIPTION

This project includes construction work within the Right-of-Way and/or properties of the Union Pacific Railroad Company "UPRR" and adjacent to tracks, wire lines and other facilities. This section describes the special requirements for coordination with UPRR when work by the Contractor will be performed upon, over or under the UPRR Right-of-Way or may impact current or future UPRR's operations. The Contractor will coordinate, while performing the work outlined in this Contract, and shall afford the same cooperation with UPRR as it does with the Agency. All submittals and work shall be completed in accordance with UPRR Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the UPRR Designated Representative.

For purposes of this project, the UPRR Designated Representative shall be the person or persons designated by the UPRR Manager of Industry and Public Projects to handle specific tasks related to the project.

DEFINITION OF AGENCY AND CONTRACTOR

As used in these UPRR requirements, the term "Agency" shall mean the State of California, acting by and through its Department of Transportation.

As used in these UPRR requirements, the term "Contractor" shall mean the contractor or contractor's hired by the Agency to perform any project work on any portion of UPRR's property and shall also include the contractor's subcontractors and the contractor's and subcontractor's respective officer, agents and employees, and others acting under its or their authority.

UPRR CONTACTS

The primary UPRR point of contact for this project is:

James Smith
Manager Industry and Public Projects
Union Pacific Railroad Company
9451 Atkinson Street
Roseville, California 95747
Phone: (916) 789-5152

For UPRR flagging services and track work, contact:

Dewey Clark III
Manager Track Maintenance
Union Pacific Railroad Company
3135 N Weber Avenue
Fresno, CA 93705
Phone: (559) 443-2328

REQUEST FOR INFORMATION / CLARIFICATION

All Requests for Information ("RFI") involving work within any UPRR Right-Of-Way shall be in accordance with the procedures listed elsewhere in these bid documents. All RFI's shall be submitted to the Engineer of Record. The Engineer of Record will submit the RFI to the UPRR Designated Representative for review and approval for corresponding to work within the UPRR Right-Of-Way. The Contractor shall allow four (4) weeks for the review and approval process by UPRR.

PLANS / SPECIFICATIONS

The plans and specifications for this project, affecting the UPRR, are subject to the written approval by the UPRR and changes in the plans may be required after award of the Contract. Such changes are subject to the approval of the Agency and the UPRR.

PART 2 – UTILITIES AND FIBER OPTIC

All installations shall be constructed in accordance with current AREMA recommendations and UPRR specifications and requirements. UPRR general guidelines and the required application forms for utility installations can be found on the UPRR website at www.UPRR.com.

GENERAL

Contractor shall perform all work in compliance with all applicable UPRR and FRA rules and regulations. Contractor shall arrange and conduct all work in such manner and at such times as shall not endanger or interfere with the safe operation of the tracks and property of UPRR and the traffic moving on such tracks, or the wires, signals and other property of UPRR, its tenant or licensees, at or in the vicinity of the work. UPRR shall be reimbursed by Contractor or Agency for train delay costs and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction work or other activities.

Construction activities will be permitted within 12 feet of the centerline of operational tracks only if absolutely necessary and UPRR's Designated Representative grants approval. Construction activities within 12 feet of the operational track(s) must allow the tracks to stay operational.

Track protection is required for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail.

The Contractor is also advised that new railroad facilities within the project may be built by UPRR and that certain Contractor's activities cannot proceed until that work is completed. The Contractor shall be aware of the limits of responsibilities and allow sufficient time in the schedule for that work to be accomplished and shall coordinate its efforts with the UPRR.

RAILROAD OPERATIONS

The Contractor shall be advised that trains and/or equipment are expected on any track, at any time, in either direction. Contractor shall become familiar with the train schedules in this location and structure its bid assuming intermittent track windows in this period, as defined in Paragraph B below.

All railroad tracks within and adjacent to the Contract Site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. The Contractor shall coordinate and schedule the work so that construction activities do not interfere with railroad operations.

Work windows for this Contract shall be coordinated with the Agency's and the UPRR's Designated Representatives. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and adjacent to the railroad tracks within 25 feet of the nearest track, a UPRR flag person will be required. At the direction of the UPRR flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the UPRR Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window the railroad tracks and/or signals must be completely operational for train operations and all UPRR, Public Utilities Commission (PUC) and Federal Railroad Administration (FRA) requirements, codes and regulations for operational tracks must be complied with. In the situation where the operating tracks and/or signals have been affected, the UPRR will perform inspections of the work prior to placing that track back into service. UPRR flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for UPRR review.

RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Prior to beginning any work on or over the property of, or affecting the facilities of, the UPRR, the Contractor shall execute the Contractor's Endorsement that is a part of the Right of Entry Agreements to be signed by UPRR and Agency. There is a fee for processing of the agreement. This cost shall be borne by the Contractor. Contractor shall submit a copy of the executed agreement and the insurance policies, binders, certificates and endorsements set forth therein to the Agency prior to commencing work on UPRR property. The right of entry agreement shall specify working time frames, flagging and inspection requirements, and any other items specified by the UPRR.

B. The Contractor shall give the advance notice to the UPRR as required in the Right of Entry Agreement before commencing work in connection with construction upon or over UPRR's Right-of-Way and shall observe UPRR's rules and regulations with respect thereto.

C. All work upon UPRR's Right-of-Way shall be done at such times and in such manner so as not to interfere with or endanger the operations of UPRR. Whenever work may affect the operations or safety of trains, the method of doing such work shall first be submitted to UPRR's Designated Representative for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor, which requires flagging and/or inspection service, shall be deferred until the flagging protection required by UPRR is available at the job site. See Section 3.18 for railroad flagging requirements.

D. The Contractor shall make requests in writing for both Absolute and Conditional Work Windows, at least two weeks in advance of any work. The written request must include:

1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

The Contractor shall provide a written confirmation notice to the UPRR at least 48 hours before commencing work in connection with approved work windows when work will be performed within 25 feet of any track center line. All work shall be performed in accordance with previously approved work plans.

E. Should a condition arising from, or in connection with the work, require that immediate and unusual provisions be made to protect the operations and the property of UPRR, the Contractor shall make such provisions. If in the judgment of UPRR's Designated Representatives such provisions are insufficient, the UPRR's Designated Representatives may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the UPRR and its tenant. UPRR shall have the right to order Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the UPRR's Designated Representatives, the Contractor's operations could endanger their rail operations. In the event such an order is given, Contractor shall immediately notify the Agency of the order.

INSURANCE

Contractor shall not begin work upon or over UPRR's Right-of-Way until UPRR has been furnished the insurance policies, binders, certificates and endorsements required by the Right-of-Entry Agreement and UPRR's Designated Representative has advised the Agency that such insurance is in accordance with the Agreement. The required insurance shall be kept in full force and effect during the performance of work and thereafter until Contractor removes all tools, equipment, and material from UPRR's property and cleans the premises in a manner reasonably satisfactory to UPRR.

RAILROAD SAFETY ORIENTATION

All personnel employed by the Contractor and all subcontractors must complete the UPRR course "Orientation for Contractor's Safety," and be registered prior to working on UPRR property. This orientation is available at www.contractororientation.com. This course is required to be completed annually.

COOPERATION

UPRR will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of UPRR's right-of-way in performing the work.

MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

The Contractor shall abide by the following minimum temporary clearances during the course of construction:

A. 12' – 0" horizontal from centerline of track
B. 21' – 0" vertically above top of rail.

For construction clearance less than listed above, local Operating Unit review and approval is required.

APPROVAL OF REDUCED CLEARANCES

The minimum track clearances to be maintained by the Contractor during construction are specified in Section 3.07 herein.

Any proposed infringement on the specified minimum clearances due to the Contractor's operations shall be submitted to UPRR's Designated Representative through the Agency at least 30 days in advance of the work and shall not be undertaken until approved in writing by the UPRR's Designated Representative.

No work shall commence until the Contractor receives in writing assurance from UPRR's Designated Representative that arrangements have been made for flagging service, as may be necessary and receives permission from UPRR's Designated Representative to proceed with the work.

CONSTRUCTION AND AS-BUILT SUBMITTALS

A. Submittals are required for construction materials and procedures as outlined below. The submittals shall include all review comments from the Agency and the Engineer of Record. All design submittals shall be stamped and signed by a Professional Engineer registered in the State of California.

B. The tables below provide UPRR's minimum submittal requirements for the construction items noted. Submittal requirements are in addition to those specified elsewhere in these bid documents. The minimum review times indicated below represent UPRR's requirements only. The Contractor shall allow additional time for the Agency's review time as stated elsewhere in these bid documents.

C. Submittals shall be made by the Agency to the UPRR Manager of Industry and Public Projects unless otherwise directed by the Railroad. Items in Table 1 shall be submitted for both railroad overpass and underpass projects, as applicable. Items in Table 2 shall be submitted for railroad underpass projects only.

TABLE 1

	DESCRIPTION	SETS REQD.	UPRR's Minimum Review Time
1	Shoring design and details	4	4 weeks
2	**Falsework design and details**	4	4 weeks
3	Drainage design provisions	4	4 weeks
4	Erection diagrams and sequence	4	4 weeks
5	Demolition diagram and sequence	4	4 weeks

Prior to or during construction of railroad underpass structures, the UPRR requires the review of drawings, reports, test data and material data sheets to determine compliance with the specifications. Product information for items noted in Table 2 is submitted to UPRR's Designated Representative through the Agency for their own review and approval of the material. The signed submittal and the Agency's review comments will be reviewed by UPRR or their consultant. If a consultant performs the reviews, the consultant may reply directly to the Agency or its Designated Representative after consultation with UPRR. Review of the submittals will not be conducted until after review by the Agency or its Designated Representative. Review of the submittal items will require a minimum of four (4) weeks after receipt from the Agency.

TABLE 2

ITEM	DESCRIPTION	SETS REQD.	NOTES
1	Shop drawings	4	Steel and Concrete members
2	Bearings	4	For entire structures
3	Concrete Mix Designs	4	For entire structures
4	Rebar & Strand certifications	4	For superstructure only
5	28 day concrete strength	4	For superstructure only
6	Waterproofing material certifications and installation procedure	4	Waterproofing & protective boards
7	Structural steel certifications	4	All fracture critical members & other members requiring improved notch toughness
8	Fabrication and Test reports	4	All fracture critical members & other members requiring improved notch toughness
9	Welding Procedures and Welder Certification	4	AWS requirements
10	Foundation Construction Reports	4	Pile driving, drilled shaft construction, bearing pressure test reports for spread footings
11	Compaction testing reports for backfill at abutments	4	Must meet 95% maximum dry density, Modified Proctor ASTM D1557

As-Built Records shall be submitted to the UPRR within 60 days of completion of the structures. These records shall consist of the following items:

Overpass Projects

1. Electronic files of all structure design drawings with as-constructed modifications shown, in Microstation J or Acrobat .PDF format.
2. Hard copies of all structure design drawings with as-constructed modifications shown.

Underpass Projects

Electronic files of all structure design drawings with as-constructed modifications shown, in Microstation J or Acrobat .PDF format.
Hard copies of all structure design drawings with as-constructed modifications shown.
Final approved copies of shop drawings for concrete and steel members.
Foundation Construction Reports
Compaction testing reports for backfill at abutments

APPROVAL OF DETAILS

The details of the construction affecting the UPRR tracks and property not already included in the Contract Plans shall be submitted to UPRR's Designated Representative through the Agency for UPRR's review and written approval before such work is undertaken. Review and approval of these submittals will require a minimum of four (4) weeks in addition to the Agency's review time as stated elsewhere in these bid documents.

MAINTENANCE OF RAILROAD FACILITIES

A. The Contractor shall be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from Contractor's operations; to promptly repair eroded areas within UPRR's right of way and to repair any other damage to the property of UPRR.

B. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

C. The Contractor must submit a proposed method of erosion control and have the method reviewed by the UPRR prior to beginning any grading on the Project Site. Erosion control methods must comply with all applicable local, state and federal regulations.

SITE INSPECTIONS BY UPRR's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by UPRR's Designated Representative at significant points during construction, including but not limited to the following:

1. Preconstruction meetings.
2. Pile driving, drilling of caissons or drilled shafts.
3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
4. Erection of precast concrete or steel bridge superstructure.
5. Placement of waterproofing (prior to placing ballast on bridge deck).
6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by UPRR.

C. A detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to be performed, shall be provided to the Agency for submittal to UPRR's Designated Representative for review prior to commencement of work. This schedule shall also include the anticipated dates when the above listed events will occur. This schedule shall be updated for the above listed events as necessary, but at least monthly so that site visits may be scheduled.

UPRR REPRESENTATIVES

A. UPRR representatives, conductors, flag person or watch person will be provided by UPRR at expense of the Agency or Contractor (as stated elsewhere in these bid documents) to protect UPRR facilities, property and movements of its trains or engines. In general, UPRR will furnish such personnel or other protective services as follows:

1. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from centerline of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
2. For any excavation below elevation of track subgrade if, in the opinion of UPRR's Designated Representative, track or other UPRR facilities may be subject to settlement or movement.

3. During any clearing, grubbing, excavation or grading in proximity to UPRR facilities, which, in the opinion of UPRR's Designated Representative, may endanger UPRR facilities or operations.
4. During any contractor's operations when, in the opinion of UPRR's Designated Representative, UPRR facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.
5. The Contractor shall arrange with the UPRR Designated Representative to provide the adequate number of flag persons to accomplish the work.

WALKWAYS REQUIRED

Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than twelve feet (12') from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while UPRR's flagman service is provided shall be removed before the close of each work day. Walkways with railings shall be constructed by Contractor over open excavation areas when in close proximity of track, and railings shall not be closer than 8' – 6" horizontally from center line of tangent track or 9' – 6" horizontally from centerline of curved track.

COMMUNICATIONS AND SIGNAL LINES

If required, UPRR will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by UPRR's forces in connection with its operation at expense of the Agency. This work by UPRR will be done by its own forces and it is not a part of the Work under this Contract.

TRAFFIC CONTROL

Contractor's operations that control traffic across or around UPRR facilities shall be coordinated with and approved by the UPRR's Designated Representative.

CONSTRUCTION EXCAVATIONS

A. The Contractor shall be required to take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of OSHA, AREMA and SJVRR "Guidelines for Temporary Shoring".

B. The Contractor shall contact UPRR's "Call Before Your Dig" at least 48 hours prior to commencing work at 1-800-336-9193 during normal business hours (6:30 a.m. to 8:00 p.m. central time, Monday through Friday, except holidays - also a 24 hour, 7 day a week number for emergency calls) to determine location of fiber optics. If a telecommunications system is buried anywhere on or near UPRR property, the Contractor will co-ordinate with UPRR and the Telecommunication Company(ies) to arrange for relocation or other protection of the system prior to beginning any work on or near UPRR property.

RAILROAD FLAGGING

Performance of any work by the Contractor in which person(s) or equipment will be within twenty-five (25) feet of any track, or will be near enough to any track that any equipment extension (such as, but not limited to, a crane boom) will reach within twenty-five (25) feet of any track, may require railroad flagging services or other protective measures. Contractor shall give the advance notice to the UPRR as required in the "Contractor's Right of Entry Agreement" before commencing any such work, so that the UPRR may determine the need for flagging or other protective measures to ensure the safety of the railroad's operations. Contractor shall comply with all other requirements regarding flagging services covered by the "Contractor's Right of Entry Agreement." Any costs associated with failure to abide by these requirements will be borne by the Contractor.

CLEANING OF RIGHT-OF-WAY

Contractor shall, upon completion of the work to be performed by Contractor upon the premises, over or beneath the tracks of UPRR, promptly remove from the Right-of-Way of UPRR all of Contractor's tools, implements, and other materials whether brought upon the Right-of-Way by Contractor or any subcontractors, employee or agent of Contractor or of any subcontractor, and leave the Right-of-Way in a clean and presentable condition to satisfaction of UPRR.

BID ITEM LIST
06-471004

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	152320	RESET ROADSIDE SIGN	EA	3		
42	152370	RELOCATE MAILBOX	EA	13		
43	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	1,920		
44	024454	REMOVE CONCRETE (STRUCTURE) (MID)	CY	79		
45	153215	REMOVE CONCRETE (CURB AND GUTTER)	LF	2,130		
46	153221	REMOVE CONCRETE BARRIER	LF	330		
47	157551	BRIDGE REMOVAL, LOCATION A	LS	LUMP SUM	LUMP SUM	
48	157552	BRIDGE REMOVAL, LOCATION B	LS	LUMP SUM	LUMP SUM	
49	157553	BRIDGE REMOVAL, LOCATION C	LS	LUMP SUM	LUMP SUM	
50	157554	BRIDGE REMOVAL, LOCATION D	LS	LUMP SUM	LUMP SUM	
51	024455	SALVAGE QUADGUARD	EA	2		
52	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM	LUMP SUM	
53	190101	ROADWAY EXCAVATION	CY	221,000		
54	190110	LEAD COMPLIANCE PLAN	LS	LUMP SUM	LUMP SUM	
55 (F)	192001	STRUCTURE EXCAVATION	CY	520		
56 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	7,486		
57 (F)	192020	STRUCTURE EXCAVATION (TYPE D)	CY	265		
58 (F)	192037	STRUCTURE EXCAVATION (RETAINING WALL)	CY	1,840		
59 (F)	193001	STRUCTURE BACKFILL	CY	262		
60 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	4,992		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (F)	193013	STRUCTURE BACKFILL (RETAINING WALL)	CY	2,477		
62	193114	SAND BACKFILL	CY	110		
63	024456	SAND BACKFILL (MID)	CY	64		
64	198010	IMPORTED BORROW (CY)	CY	57,600		
65	203002	EROSION CONTROL (COMPOST BLANKET)	CY	1,620		
66	203006	EROSION CONTROL (DRY SEED) (SQFT)	SQFT	18,700		
67	203021	FIBER ROLLS	LF	8,420		
68	203034	ROLLED EROSION CONTROL PRODUCT (NETTING)	SQFT	18,700		
69	204017	PLANT (GROUP W)	EA	200		
70	208808	8" WELDED STEEL PIPE CONDUIT (.250" THICK)	LF	240		
71	208812	12" WELDED STEEL PIPE CONDUIT (.250" THICK)	LF	380		
72	260203	CLASS 2 AGGREGATE BASE (CY)	CY	99,700		
73	390131	HOT MIX ASPHALT	TON	82,200		
74	394060	DATA CORE	LS	LUMP SUM	LUMP SUM	
75	394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	900		
76	394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	LF	7,630		
77	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	440		
78	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	90		
79	397005	TACK COAT	TON	290		
80	490742	FURNISH PILING (CLASS 90) (ALTERNATIVE W)	LF	430		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
81	490743	DRIVE PILE (CLASS 90) (ALTERNATIVE W)	EA	8		
82	490746	FURNISH PILING (CLASS 140) (ALTERNATIVE W)	LF	14,332		
83	490747	DRIVE PILE (CLASS 140) (ALTERNATIVE W)	EA	189		
84	490782	FURNISH PILING (CLASS 200) (ALTERNATIVE W)	LF	42,118		
85	490783	DRIVE PILE (CLASS 200) (ALTERNATIVE W)	EA	516		
86	495115	FURNISH 24" CAST-IN-STEEL SHELL CONCRETE PILING	LF	2,876		
87	495116	DRIVE 24" CAST-IN-STEEL SHELL CONCRETE PILE	EA	42		
88	500001	PRESTRESSING CAST-IN-PLACE CONCRETE	LS	LUMP SUM	LUMP SUM	
89 (F)	510050	STRUCTURAL CONCRETE	CY	128		
90 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	1,470		
91 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	16,375		
92 (F)	510060	STRUCTURAL CONCRETE, RETAINING WALL	CY	1,125		
93 (F)	510086	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)	CY	847		
94 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	121		
95 (F)	024457	MINOR CONCRETE (MINOR STRUCTURE) (MID)	CY	135		
96	510526	MINOR CONCRETE (BACKFILL)	CY	18		
97	519091	JOINT SEAL (MR 1 1/2")	LF	208		
98	519097	JOINT SEAL ASSEMBLY (MR 5")	LF	345		
99	519100	JOINT SEAL (MR 2")	LF	369		
100 (F)	520101	BAR REINFORCING STEEL	LB	15,435		

BID ITEM LIST
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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
101 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	4,052,367		
102 (F)	520103	BAR REINFORCING STEEL (RETAINING WALL)	LB	139,630		
103 (F)	560213	FURNISH SIGN STRUCTURE (LIGHTWEIGHT)	LB	12,707		
104 (F)	560214	INSTALL SIGN STRUCTURE (LIGHTWEIGHT)	LB	12,707		
105 (F)	560218	FURNISH SIGN STRUCTURE (TRUSS)	LB	61,130		
106 (F)	560219	INSTALL SIGN STRUCTURE (TRUSS)	LB	61,130		
107 (F)	560223	FURNISH SIGN STRUCTURE (BRIDGE MOUNTED WITHOUT WALKWAY)	LB	2,360		
108 (F)	560224	INSTALL SIGN STRUCTURE (BRIDGE MOUNTED WITHOUT WALKWAY)	LB	2,360		
109	560244	FURNISH LAMINATED PANEL SIGN (1"-TYPE A)	SQFT	1,120		
110	560248	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	820		
111	560249	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-UNFRAMED)	SQFT	250		
112	560251	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED)	SQFT	94		
113	560252	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-FRAMED)	SQFT	140		
114	561004	30" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	52		
115	561005	36" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	13		
116	561016	60" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	73		
117	566011	ROADSIDE SIGN - ONE POST	EA	120		
118	566012	ROADSIDE SIGN - TWO POST	EA	14		
119	620140	24" ALTERNATIVE PIPE CULVERT	LF	3,960		
120	650014	18" REINFORCED CONCRETE PIPE	LF	950		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
201	861504	MODIFY LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
202	BLANK					
203	150820	REMOVE INLET	EA	2		
204	155316	24" CURED-IN-PLACE PIPELINER	LF	68		
205	665005	8" CORRUGATED STEEL PIPE (.064" THICK)	LF	32		
206	709522	INLET DEPRESSION	EA	24		
207	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

TOTAL BID: **$** _____