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**** WARNING ** WARNING ** WARNING ** WARNING ****
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October 13, 2006

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04-1123U4
ACSTP-ER-1187(011)E

Addendum No. 4

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in SAN MATEO COUNTY NEAR PACIFICA FROM 4.7 KM TO 1.0 KM SOUTH OF LINDAMAR BOULEVARD.

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 November 14, 2006. The original bid opening date was previously postponed under Addendum No. 1 dated August 15, 2006.

This addendum is being issued to set a new bid opening date as shown herein and revise the Project Plans and the Notice to Contractors and Special Provisions, and the Federal Minimum Wages with Modification Number 41 dated 9-22-06.

Project Plan Sheets 12, 63, 67, 70, 88, 94, 95, 97B, 97C, 98, 99, 103, 199, 212, 220, 223, 230, 313, 487, 493, and 494 are revised. Half-sized copies of the revised sheets are attached for substitution for the like-numbered sheets.

Project Plan Sheet 330 is deleted.

In the special provisions, Section 5-1.018, "GUARANTEE," in subsection, "GENERAL," the fifth paragraph is revised as follows:

"The Contractor shall have insurance coverage during corrective work operations in accordance with Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications."

In the Special Provisions, Section 5-1.13, "OWNER CONTROLLED INSURANCE PROGRAM (OCIP)," is revised as attached.

In the Special Provisions, Section 5-1.18, "PROJECT INFORMATION," in the third paragraph, item Q is revised as follows:

"Q. Owner Controlled Insurance Program (OCIP), October 2006."

In the Special Provisions, Section 5-1.18, "PROJECT INFORMATION," in the third paragraph, item R is added as follows:

"R. Disposal Site and South Portal Storm Water and Non-Storm Water Discharges Informational Handout, September 2006."

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In the Special Provisions, Section 10-1.015, "DISPOSAL CONTROL PLAN," the following paragraph is added after the second paragraph as follows:

"Attention is directed to the Disposal Site and South Portal Storm Water and Non-Storm Water Discharges Information Handout prepared for this contract."

In the Special Provisions, Section 10-1.015, "DISPOSAL CONTROL PLAN," in subsection, "MEASUREMENT AND PAYMENT," the second paragraph is revised as follows:

"Full compensation for providing power to operate equipment; furnishing, designing, installing, maintaining and removal of effluent treatment systems, all BMPs and materials; and implementation of the DSSAP including visual monitoring, water quality sampling and testing, documentation and reporting, inspection, and providing all necessary maintenance, labor, vehicles, equipment, and other incidentals; including removal and disposal of accumulated sediment shall be considered as included in the prices paid for various contract items of work, and no additional compensation will be allowed therefore."

In the Special Provisions, Section 10-1.02, "WATER POLLUTION CONTROL," in subsection, "STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND AMENDMENTS," the sixth paragraph is revised as follows:

"The following contract items of work shall be incorporated into the SWPPP as "Temporary Water Pollution Control Practices": Stabilized Construction Roadway, Non-Storm Water Discharge Control, Temporary Hydraulic Mulch (Bonded Fiber Matrix), Temporary Concrete Washout Facility, Temporary Construction Entrance, Temporary Cover, Temporary Check Dam, Temporary Silt Fence, Disposal Control Plan and Temporary Drainage Inlet Protection. The Contractor's attention is directed to the special provisions provided for Temporary Water Pollution Control Practices and to the Disposal Site and South Portal Storm Water and Non-Storm Water Discharges Information Handout."

In the Special Provisions, Section 10-1.33, "CLEARING AND GRUBBING," the seventh paragraph is revised as follows:

"The existing vegetation within the "Clearing and Grubbing and Topsoil Limits" at the dedicated disposal site and at the south portal shall be cleared to a height of 50 mm up to the limits shown on the plans. This work shall be completed prior to February 15, 2007."

In the Special Provisions, Section 10-1.03, "NON-STORM WATER DISCHARGE CONTROL," is revised as attached.

In the Special Provisions, Section 10-1.34, "EARTHWORK," the following paragraphs are added after the eleventh paragraph:

"Pervious backfill material placed within the limits of payment for retaining walls will be measured and paid for as structure backfill (retaining wall).

If structure excavation or structure backfill for retaining wall is not otherwise designated by type and payment for the structure excavation, or structure backfill has not otherwise been provided for in the Standard Specifications or these special provisions, the structure excavation or structure backfill will be measured and paid for as structure excavation (retaining wall) or structure backfill (retaining wall), respectively."

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In the Special Provisions, Section 10-1.36, "GEOCOMPOSITE DRAIN," the third and fourth paragraphs are deleted.

In the Special Provisions, Section 10-1.56, "ASPHALT CONCRETE," is revised as attached.

In the Special Provisions, Section 10-1.57, "REPLACE ASPHALT CONCRETE SURFACING," is deleted.

In the Special Provisions, Section 10-1.61, "CONCRETE STRUCTURES," in subsection, "FINAL LINING CONSTRUCTION," the fourth paragraph is revised as follows:

"Unless otherwise specified in these special provisions, the final exposed surface finish of final lining and portals shall be Class 1 Surface Finish in conformance with the provisions in Section 51-1.18B, "Class 1 Surface Finish," of the Standard Specifications. An Ordinary Surface Finish in conformance with the provisions in Section 51-1.18A shall apply at exposed surfaces of final lining abutment, invert arch, and portal invert slab surfaces."

In the Special Provisions, Section 10-1.73, "CAST-IN-PLACE CONCRETE BOX CULVERT," the second paragraph is revised as follows:

"Cast-in-place concrete box culvert shall be constructed of class 1 concrete in accordance to the provisions in Section 90, “Portland Cement Concrete,” of the Standard Specifications."

In the Special Provisions, Section 10-5.08, "LEACH WATER SYSTEM AND CARBON DIOXIDE STORAGE TANK," is revised as attached.

In the Special Provisions, Section 10-5.18, "TUNNEL JET FANS," in subsection, "QUALITY ASSURANCE," in the first paragraph, item B is revised as follows:

"B. American Iron and Steel Institute (AISI):

1. 316 Stainless and Heat Resisting Steel."

In the Special Provisions, the heading of, "Section 10-6 SHOTCRETE," is revised as follows:

"SECTION 10-6.6 SHOTCRETE"

In the Special Provisions, Section 10-6.301, "PART 1-GENERAL," in subsection, "SCOPE," the fourth paragraph is revised as follows:

"Support measures include both standard support measures and local support measures. Standard support measures shall include those measures required to maintain the inherent strength of the ground surrounding the tunnel openings, and to enhance the stress redistribution process while preventing unnecessary loosening. Standard support measures shall conform to the details shown on the plans. Local support measures are required by ground conditions revealed during excavation, and are as proposed by the Contractor and approved by the Engineer. Local support measures will be paid for as extra work as provided in Section 4-l.03D, "Extra Work," of the Standard Specifications."

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In the Special Provisions, Section 10-6.301, "PART 1-GENERAL," subsection, "SCOPE," the sixth paragraph is revised as follows:

"The schedule of values shall be accurately divided into sections representing the cost of each separate type of tunnel excavation and support category listed in the Engineer's Estimate and shall include all the work involved in initial lining construction and south portal shotcrete canopies. The schedule of values shall include, but not limited to, the cost of:

Excavation for top heading, bench and invert.
Support measures as defined in items A through G above.
Dewatering, including drainage holes, drainage mats, hoses, pipes, pumps.
Bore holes for probing ahead.
Hauling, placement, and compacting of excavated material at the disposal site
Safety training program, and personal protective equipment for State personnel.

Indirect costs shall be listed as a separate line item of work. A subtotal for each section shall be provided and the sections representing each separate type of support measure shall be identified and broken down to show the corresponding values for labor, materials, and equipment."

In the Special Provisions, Section 10-6.301, "PART 1-GENERAL," in subsection, "DEFINITIONS," the first paragraph is revised as follows:

"Excavation Design Line.--Designed limits of excavation inside of which no earth or surrounding ground shall intrude. The shotcrete lining has been designed to withstand ground loads. The Contractor shall add the deflection compensation and initial lining thickness, as shown on the plans, to the radii of initial lining inside surface after deformation."

In the Special Provisions, Section 10-6.301, "PART 1-GENERAL," in subsection, "DEFINITIONS," the twentieth paragraph is revised as follows:

"Contingency Procedures.--Procedures to implement local measures as required by ground conditions, proposed by the Contractor, and approved by the Engineer."

In the Special Provisions, Section 10-6.301, "PART 1-GENERAL," in subsection, "WORKING DRAWINGS," in the fourth paragraph, item G is revised as follows:

"G. Contingency Plans. The Contractor shall develop a Contingency Plan including a detailed assessment of ground and site conditions that may require local measures. Conditions to be assessed shall include groundwater, soil and lining conditions, equipment, traffic restrictions, and water control. Risks associated with these conditions and countermeasures to either avoid or mitigate these situations shall be described in detail in the Contingency Plan. The Contingency Plan shall include the following:

1. Name and qualification of personnel responsible for implementing contingency procedures.
2. Description of conditions considered to require contingency measures.
3. Plans outlining contingency procedures to be employed in the event of:

    a) Tunnel deformations beyond specified limits.
    b) Face instability.
    c) Unexpected inflow of groundwater.
    d) Overbreak - minor and significant.
    e) Detailed description of response procedure monitoring values exceeding the alarm values specified Section 10-6.5, "Tunnel Instrumentation and Monitoring," of these special provisions.

4. Plans detailing surveillance during stoppages including weekends, holidays, and directed stoppages.
5. Plans detailing measures to be applied for the resumption of tunneling operation after stoppages.
6. Methods of verification of the successful implementation of contingency measures.
7. Procedures detailing surveillance during longer stoppages."

In the Special Provisions, Section 10-6.302, "PRODUCTS," in subsection, "DRAIN TUBING AND WELL POINTS," is revised as follows:

"**DRAIN TUBING AND WELL POINTS**
Drain pipes shall conform to the details shown on the plans and shall be driven or drilled into the ground."

In the Special Provisions, Section 10-6.303, "PART 3 – EXECUTION," in subsection, "SEM TUNNEL EXCAVATION AND SUPPORT," in the second paragraph, item C is revised as follows:

"C. When the initial 75 mm probe hole indicates jointed and unsound rock, as approved by the Engineer, the Contractor shall use core drilling to extract cores with a minimum diameter of 54 mm. The length of the cores to be extracted shall be determined by the initial 75 mm probe hole. Dry core drilling method shall be used where feasible. Cores shall be placed in foil lined cases and labeled with permanent writing and made available for inspection immediately after extraction. Color pictures shall be taken immediately after placing of the undisturbed cores into the marked casings using a tripod which allows for a perpendicular shot of the cores. Core cases shall be stored on site to render them accessible for inspection at all times. An accurate log shall be kept from each drilling operation indicating drilling progress as related to time, installation and removal of core sample, advancing of casing tube, description of core, water ingress, and all other observations. The logs shall be submitted to the Engineer within 24 hours after completion of the respective core drilling. Core drilling will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications."

In the Special Provisions, Section 10-6.304, "PART 4-MEASUREMENT AND PAYMENT," the following paragraph is added after the last paragraph:

"The contract price paid per meter for perforated PVC drain pipe of sizes as listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and doing all the work involved in furnishing and installing perforated PVC drain pipe, complete in place, including strip drains, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer."

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In the Special Provisions, Section 10-6.401, "PART 1 – GENERAL," in subsection, "QUALITY CONTROL," in the second paragraph, item D is added as follows:

"D The maximum deflection of the test piece shall not exceed 20 centimeters."

In the Special Provisions, Section 10-6.402, "PART 2 – PRODUCTS," in subsection, "MATERIALS," the third paragraph is revised as follows:

"Lattice girder as shown on the plans shall conform to ASTM A572, Grade 65. Lattice girder accessories shall be ASTM A325. At the Contractor's option and when approved by the Engineer, lattice girder conforming to ASTM A706 may be used. When the Contractor proposes the use of lattice girder in conformance with ASTM A706, the Contractor shall submit the lattice girder dimensions, bar sizes, and configuration substantiated by calculations in conformance with Section "Working Drawings" specified herein. Lattice girder testing shall conform to the requirements specified in Section "Quality Control" of these special provisions."

In the Special Provisions, Section 10-6.601, "PART 1 - GENERAL," in subsection, "QUALITY CONTROL," in the second paragraph, item H, number 9 is revised as follows:

"9. Initial lining shotcrete test shall conform to ASTM C803-03 and the requirements specified herein. For early age stresses less than 3 MPa, Paragraph 6.2 of ASTM C803 shall include any device that measures the force on a pin inserted a given distance into the shotcrete. Table 2 of ASTM C803-03 shall not apply to stress measurements less than 0.4 MPa, but the device may be used for lower strength shotcrete, after calibration in accordance with the manufacturer's recommendations. The device and its pin shall be tested and calibrated to be within 15% of strength measured by a direct unconfined test method or other test procedure such as cylinder or cube samples, extrapolated back to early ages, or maturity testing, or other procedure proposed by the Contractor. Shotcrete field trial shall conform to the following requirements:

a) Average strength of 6 tests on 3 vertical panels, at 10 minutes: 275 kPa minimum.
b) Average strength of 6 tests on 3 vertical panels, at 1 hour: 485 kPa minimum.
c) Average strength of 6 tests on 3 vertical panels, at 10 hours: 2.1 MPa minimum.
d) Average strength of 6 core compressive strength tests on 3 vertical panels, at 24 hours: 9.7 MPa minimum.
e) Average strength of 6 core compressive strength tests on 3 vertical panels, at 7 days: 22.1 MPa minimum
f) Average strength of 6 core compressive strength tests on 3 vertical panels, at 28 days: 28 MPa minimum.
g) No individual strength test falls below the required 28-day strength by more than 3.5 MPa."

In the Special Provisions, Section 10-6.601, "PART 1 - GENERAL," in subsection, "QUALITY CONTROL," in the third paragraph item G is revised as follows:

"G. Shotcrete strength determined by testing in conformance with ASTM C803-03 and the modified requirements specified in these special provisions shall conform to the following requirements:

1. Average strength of 3 tests from one area, at 10 minutes: 275 kPa minimum.
2. Average strength of 3 tests from one area, at 1 hour: 485 kPa minimum.
3. Average strength of 3 core compressive strength tests from one area: 9.7 MPa when tested at 24 hours after application.
4. Average strength of 3 cores from one area: 22.1 MPa minimum when tested at 7 days.
5. Average strength of 3 cores from on area: 28 MPa minimum when tested at 28 days.

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In the Special Provisions, Section 10-6.602, "PRODUCTS," in subsection, "REINFORCEMENT," in the first paragraph, item B is revised as follows:

"B. Fibers shall conform to the requirements in ASTM Designation: A820, Type I or II, with an aspect ratio of 45 to 85. Fibers shall have bent or deformed ends. Fibers shall be of a single length ranging from 20 mm to 40 mm. Fibers shall be of the deformed end type. Straight or continuously corrugated fibers shall not be used. Synthetic fibers shall conform to the requirements in ASTM Designation: C1116, Section 4.1.3 and Note 3. In addition International Code Council ES, Acceptance Criteria 32, Section 3.1.1 and 3.1.2.D shall apply. Glass fibers will not be permitted."

In the Special Provisions, Section 10-6.602, "PRODUCTS, " in subsection, "FIBER-REINFORCED SHOTCRETE (FRS)," the second paragraph is revised as follows:

"The Contractor shall perform toughness performance level testing in conformance with the requirements in ASTM Designation: C1550. The toughness performance level testing shall be done for the initial trial test and after every 100 cubic meter shotcrete constructed. The test results shall be submitted to the Engineer."

In the Special Provisions, Section 10-6.602, "PRODUCTS," in subsection, "DELIVERY, STORAGE, AND HANDLING," in the first paragraph, item B is revised as follows:

"B. Shotcrete materials including fibers shall be stored in a dry place."

In the Special Provisions, Section 10-6.603, "EXECUTION," in subsection, "BATCHING AND MIXING," in the first paragraph, item B is revised as follows:

"B. Volume batching will not be permitted."

In the Special Provisions, Section 10-6.703, "EXECUTION," in subsection, "PREPARATION OF SURFACE" in the second paragraph, item D is revised as follows:

"D. Fiber reinforced shotcrete shall be covered with plain shotcrete with a minimum thickness of 25 mm prior to waterproofing installation."

In the Special Provisions, Section 10-6.801, "PART 1-GENERAL," in subsection, "WORKSITE CONDITIONS," is deleted.

In the Special Provisions, Section 10-7.101, "SCOPE," the first paragraph is revised as follows:

"Tunnel architectural work described herein and as shown on the plans shall conform to the requirements of these special provisions and Sections 1 through 9 of the Standard Specifications. Sections 10 through 95 of the Standard Specifications shall not apply to the work in this Section 10-7 except when specific reference is made thereto."

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In the Special Provisions, Section 10-7.201, "TUNNEL ARCHITECTURAL MISCELLANEOUS METAL," in subsection, "MATERIALS," the third paragraph is revised as follows:

"Steel grating for ceilings.--
Steel grating shall be standard pressure locked conforming to ASTM Designation: A 167 type 304 stainless steel. Bearing bar size shall be 19 mm by 3 mm spaced 52 mm on center with cross bar spaced at 52 mm on center. Surface shall be plain and finish shall be stainless steel. Loose support plates and hanger brackets shall be stainless steel. Gratings shall be removable. All steel support framing for metal panel shall be above the gratings except hook hangers. The Contractor's attention is directed to the special provisions, Section 10-7.604, "METAL PANEL," subsection "PERFORMANCE REQUIREMENTS," for the design of steel support framing for metal panels."

In the Special Provisions, Section 10-7.601, "CONCRETE TEXTURE," in subsection, "REFERENCE SAMPLE," the first paragraph is revised as follows:

"Concrete textures for the types listed in the Engineer's Estimate shall match the texture, color and pattern of reference samples obtained from actual rock formations at the site. The Contractor's attention is directed to the "Devil's Slide Surface Textures and Colors Illustrated Matrix Exhibit," as listed in Section 5-1.18, "Project Information," of these special provisions, for information regarding the general location of various reference samples at the site. The exact location of various reference samples at the site shall be as directed by the Engineer."

In the Special Provisions, Section 10-7.601, "CONCRETE TEXTURE," in subsection, "MOCK-UPS FOR PAINTING AND REPAIR OF DEFECT APPROVAL," the third paragraph is revised as follows:

"If ordered by the Engineer, additional mock-ups shall be constructed and finished until the specified finish, texture and color are obtained, as determined by the Engineer. Additional mock-ups ordered by the Engineer will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications."

In the Special Provisions, Section 10-7.603, "PREPARE AND STAIN CONCRETE," in subsection, "MATERIALS," in the second paragraph, item D is added as follows:

"D. A two coat anti-graffiti coating material consisting of a permanent base coat and sacrificial top coat listed by the manufacturer as graffiti resistant shall be applied over all color 2 surfaces. The permanent base coat shall be a co-polymer material that dries clear, non-yellowing with low luster sheen, and V.O.C. compliant. The sacrificial top coating shall be a water base emulsion, clear, non-yellowing with low luster sheen, and V.O.C. compliant. The Contractor shall submit to the Engineer, not less than one week prior to initial application of the concrete coating, a copy of the manufacturer's recommendations and written application instructions."

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In the Special Provisions, Section 10-7.604, "METAL PANEL," in subsection "QUALITY ASSURANCE," the tenth paragraph is revised as follows:

"Support framing for stainless steel metal grating for ceilings specified in Section 10-7.201, "Tunnel Architectural Miscellaneous Metal," of the special provisions shall be installed as part of this section."

In the Special Provisions, Section 10-7.604, "METAL PANEL," in subsection "SUBMITTALS," the eighth paragraph is revised as follows:

"The Contractor shall provide design calculations confirming that metal panel system including steel support framing for fire hose cabinet and integral custom cabinet module for fire and telephone equipment, steel grating for ceiling and louvers meets the design criteria. The structural design calculations shall be stamped and signed by the supervising engineer."

In the Special Provisions, Section 10-7.604, "METAL PANEL," in subsection "SUBMITTALS," the ninth paragraph is revised as follows:

"Working drawings shall show all materials required; shall indicate sections, layout of panels on all building surfaces, including all associated components and penetrations through panels, dimensions of units, jointing, anchoring attachments, and other necessary details; identify units with setting numbers as required for the installation. All items provided by others attached to the metal panel system shall be shown on the working drawings. Steel support framing for fire hose cabinet and integral custom cabinet module for fire and telephone equipment, steel grating for ceilings and louver shall be indicated. All steel support framing for fire hose and integral custom cabinet module for fire and telephone equipment, steel grating for ceiling and louvers shall be provided."

In the Special Provisions, Section 10-7.604, "METAL PANEL," in subsection "PRODUCTS," in subsection "Referee Sample," the first paragraph is revised as follows:

"The tunnel architectural finish of the porcelain enameled metal panels shall match the texture, color and pattern of the referee samples. A color sample is available for inspection at the District Office at 111 Grand Avenue, Oakland, California 94612; phone (510) 286-5209."

To Proposal and Contract book holders:

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the NOTICE TO CONTRACTORS section of the Notice to Contractors 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 proposal.

Submit bids in the Proposal and Contract 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.

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This office is sending this addendum by UPS overnight mail to Proposal and Contract book holders to ensure that each receives it. A copy of this addendum and the modified wage rates are available for the contractor's use on the Internet Site:

http://www.dot.ca.gov/hq/esc/oe/weekly_ads/addendum_page.html

If you are not a Proposal and Contract 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,

ORIGINAL SIGNED BY

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

Attachments

5-1.13 OWNER CONTROLLED INSURANCE PROGRAM (OCIP)

The Contractor's obligations regarding the requirements for insurance shall conform to these special provisions.

GENERAL

Section 7-1.12B, "Insurance," of the Standard Specifications does not apply. References to the insurance requirements in Section 7-1.12, "Indemnification and Insurance," of the Standard Specifications shall be interpreted as references to "Owner Controlled Insurance Program (OCIP)" of these special provisions.

Changes to any OCIP requirement or procedure during or after the bid process shall be approved by the Department or the Engineer, as applicable. No contractor or subcontractor has the authority to change the OCIP requirements.

Nothing in the contract is intended to establish a standard of care owed to any member of the public or to extend to the public the status of a third-party beneficiary for any of these insurance specifications.

The Department has elected to implement an Owner Controlled Insurance Program (OCIP). An OCIP Manual will be distributed to all participants and is incorporated by reference into the contract. An OCIP is a series of insurance polices issued by one or more insurance companies to cover the Contractor and eligible subcontractors of all tiers on a given contract. The OCIP requirements do not create any contractual relationship between the subcontractors and the Department. The Contractor shall be responsible for compliance with all OCIP requirements for itself and all its enrolled subcontractors of all tiers. The Department will administer the OCIP with the assistance of an OCIP Administrator.

INSURANCE PROVIDED UNDER AN OCIP

The Department will provide general liability, excess liability and workers' compensation coverages as primary insurance in connection with work performed under this contract. The Department will pay all premiums associated with the OCIP, thereby providing the Contractor and enrolled subcontractors of all tiers insurance coverage as specified in "Insurance Provided by the Department" of this section "Owner Controlled Insurance Program (OCIP)."

An OCIP does not constitute any representation by the Department with respect to the adequacy of the insurance to protect the Contractor or its covered subcontractors against the obligations imposed by law or by this contract. The coverage is limited in scope and may not include all insurance coverages the Contractor or its subcontractors may deem necessary. In addition to any insurance provided by the Department, all contractors are responsible for providing certain insurance as specified in "Contractor-Furnished Insurance" of this section, "Owner Controlled Insurance Program (OCIP)." It is the Contractor's responsibility to discuss the OCIP with its insurance agents, brokers or consultants and verify if any additional proper non-OCIP coverages are required.

Coverage under the OCIP applies to all work under this contract performed on the job site and covers the Department, Contractor, and subcontractors enrolled in the OCIP. The Contractor and all eligible subcontractors of any tier will be enrolled in the OCIP upon completion and acceptance of the forms included in the OCIP Enrollment Package.

For purposes of the OCIP, job site shall be defined as the areas within the boundaries of the project and also includes areas adjacent to or nearby where incidental operations are performed, excluding permanent locations of the Contractor and any enrolled subcontractor, other than those areas approved by the Department or the Engineer, as applicable, and scheduled on the insurance policies. Work at the job site includes operations necessary or incidental to the project completion. Off-site locations include the Contractor's and subcontractor's of any tier regularly established workplace, plant, factory, office, shop, warehouse, yard or other property even if operations are for fabrications of materials to be used at the job site or training of apprentices. Unless approved by the Engineer, off-site locations will not be covered under the OCIP.

Participation in the OCIP is mandatory but not automatic. The Department retains the right to determine eligibility. Each eligible contractor must follow the enrollment procedures shown in the Department's OCIP Manual. Eligible contractors include all contractors and subcontractors providing direct labor on the project. Temporary labor services and employee leasing companies are to be treated as eligible contractors. Upon OCIP enrollment completion, an eligible contractor will become an enrolled contractor.

Ineligible contractors include consultants, engineers, surveyors, soil testing companies, hazardous waste removal and transport companies, suppliers that do not perform or subcontract installation, vendors, material dealers, guard services, non-construction janitorial services, truckers (including trucking to the project where delivery is the only scope of work performed), haulers, drivers, and others who merely transport, pick up, deliver or carry materials, personnel, parts, equipment to or from the job site. Any party deemed an ineligible contractor but who has direct labor on the project shall participate in the project safety program and comply with the Project Safety Administration provisions of these special provisions. Ineligible subcontractors are required to provide their own insurance according to requirements specified in "Contractor-Furnished Insurance" of this section, "Owner Controlled Insurance Program (OCIP)."

Eligible Contractors and subcontractors shall maintain their own insurance for coverages *not* provided under the OCIP policies until completion and final acceptance of the work. Required coverage types and limits are shown in "Contractor Insurance Cost Identification" and "Contractor-furnished Insurance" of this section, "Owner Controlled Insurance Program (OCIP)."

Before its mobilization on-site, the Contractor shall furnish the Engineer Certificates of Insurance evidencing that all required insurance is in force. Any subcontractor of any tier who enrolls in the OCIP 30 days or more after its mobilization on-site will have to provide a No Known Loss Letter to the OCIP Administrator along with the enrollment documentation to:

Willis Insurance Services of California, Inc.
One Bush Street, Suite 900
San Francisco, CA 94104
Attention: OCIP Administrator

Participation in the OCIP is mandatory for all eligible contractors. The Department retains the right to determine eligibility. However, the OCIP insurance company reserves the right to reject late OCIP enrollments.

The Contractor and subcontractors of all tiers shall adhere to and perform all reporting and administrative requirements as detailed in the Department's OCIP Manual.

OCCUPATIONAL SAFETY AND HEALTH QUALIFICATIONS

Pursuant to Government Code Section 4420, prospective bidders, including contractors and subcontractors, shall meet minimum occupational safety and health qualifications established to bid on the contract. The evaluation of prospective bidders will be based on consideration of the following factors:

A. Serious and willful violations of Part 1 (commencing with Section 6300) of Division 5 of the Labor Code, by a contractor or subcontractor during the past 5-year period.
B. The Contractor's and subcontractor's workers' compensation experience modification factor.
C. The Contractor's and subcontractor's injury prevention program instituted pursuant to Section 3201.5 or 6401.7 of the Labor Code.

Prospective contractors and subcontractors of any tier with an insurance experience modifier greater than 1.25 will be required to submit additional safety documentation satisfactory to the Department that substantiates improvement in loss experience before the Department will award the contract. A bidder’s failure to submit additional safety documentation satisfactory to the Department that substantiates improvement in loss experience may cause its bid to be nonresponsive.

The Contractor and subcontractors of all tiers shall submit their current Experience Modification as calculated by the California Workers Compensation Insurance Rating Bureau (WCIRB) or the National Council on Compensation Insurance (NCCI), whichever is applicable for the Work. A contractor who is self-insured shall submit its Certificate of Consent to Self-Insure in place of its Experience Modification.

CT OCIP Form 4, "Occupational Safety and Health Qualifications," is included in the "Proposal and Contract" and must be submitted by the bidder with its proposal. A bidder's failure to provide CT Form 4 in its sealed bid and failure to satisfy the minimum insurance requirements pursuant to Government Code Section 4420 may cause its bid to be nonresponsive.

For each listed subcontractor, the bidder shall submit CT Form 4 to Department of Transportation, MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816. This form must be received by the Department no later than the fourth day following bid opening. A bidder's failure to provide CT Form 4 for the listed subcontractors may cause its bid to be nonresponsive.

Any nonlisted subcontractor, after award, must satisfy the minimum qualifications specified in this section, "Occupational Safety and Health Qualifications," by completing CT OCIP Form 4 for evaluation. If the nonlisted subcontractor does not meet the qualifications, the Contractor shall replace the nonlisted subcontractor at its own expense.

CONTRACTOR INSURANCE COST IDENTIFICATION

The Contractor's bid for the work shall include the costs of procuring and maintaining from the beginning of work through contract acceptance, the insurance coverages with the indicated limits or coverages as required by laws and regulations, whichever is greater. The insurance limits specified may be provided through a combination of primary and excess policies, including the umbrella form of policy.

The Department will take a deduction for general liability, excess liability and workers' compensation. The lowest responsible bidder, the second lowest responsible bidder, and the third lowest responsible bidder shall identify these costs using CT OCIP Form 1, Notice of Contract Award and Insurance Enrollment Form, a copy of which is provided in the Department's OCIP Manual. The completed form shall be submitted to Department of Transportation, MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816 so the form is received by the Department no later than the fourth day following bid opening. After contract approval, Department will execute a deductive change order reducing the total bid by an amount equal to the cost of insurance as identified by CT OCIP Form 1.

Workers' Compensation, general and excess liability coverage (as specified in "Insurance Provided by the Department" of this section "Owner Controlled Insurance Program (OCIP)") is provided by the Department for the Contractor and subcontractors of all tiers enrolled in the OCIP. The Department expects the Contractor's insurance costs included in its bid, and detailed on CT OCIP Form 1, to be based upon the Contractor's rates and costs for workers' compensation, general and excess liability coverages with no deductibles. The Contractor and subcontractors of all tiers shall use the following rules to identify all costs for insurance as described in this section:

A. Deductible and self-insured retention credits shall be identified but not allowed. Since these types of programs require loss funding, the credits or the loss pick must be identified but not allowed in calculating the total workers' compensation premium and total general liability premium. Composite rates must have rating sheets. Corporate allocations must include the actual insurance company rating. Provide additional documentation for all such credits.

    1. Policies using composite rates must show, at a minimum, the deductible or self-retention or self-insured amount, and the rating breakdown. If the credit percentage is not available, minimum and maximum rates for the program must be identified.
    2. Corporate allocations shall be identified but not allowed. The same format for calculation as shown for composite rates must be shown on CT OCIP Form 1. The OCIP Administrator will include such information in verifying the Contractor's and subcontractors' of all tiers individual deduct rates.

B. Any rate credits, other than credits for deductibles or self-retention or self-insured plans, or surcharges shown on the declaration or rating sheets will be used to verify the contractor's actual cost and determine the OCIP deduct rates. The OCIP Administrator will include such information in verifying the Contractor's and subcontractors' of all tiers individual deduct rates

By completing and submitting CT OCIP Form 1, including supporting documents (i.e. copies of the contractor's insurance policy declaration pages and premium rating pages) to the Department, the Contractor and subcontractors of all tiers certify that all costs for insurance as described in this section have been correctly identified.

If the Contractor or any listed subcontractor does not furnish the required information and documentation shown above within 4 days after opening of the proposals, the Department retains the right to formulate and issue a default OCIP deduct. California State Compensation Insurance Fund base rates will be used for workers' compensation and rates furnished by the OCIP insurance company will be used for general liability calculations for the duration of this contract.

The Contractor shall show 4 percent of its total subcontract value for each subcontractor's estimated insurance costs that are unknown at the time of the bid. The 4 percent will be used when a subcontractor's costs are unknown or a subcontractor has not been identified. The 4 percent will serve as a placeholder deduct and does not affect the bid amount for bid evaluation and award. Once the subcontractor has provided the required documentation, the 4 percent deduct will be adjusted at the end of the contract as specified in "Audit and Recovery provisions of Contractor and Subcontractor Insurance Costs" of this section, "Owner Controlled Insurance Program (OCIP)." If the Contractor has complied with all OCIP requirements, his actual insurance costs will be calculated, including those of all enrolled subcontractors, and the 4 percent placeholder deduct will not be assessed. If a subcontractor's cost was more than 4 percent, his actual cost will be collected. If the Contractor or any subcontractors of all tiers have not complied with all insurance cost identification requirements, the Department will formulate and issue the default OCIP deduct described above for the Contractor or any listed subcontractor not furnishing the required information and documentation; and retain a minimum of 4 percent of each applicable contract value from the Contractor.

The OCIP deduct rates of the Contractor and subcontractors of all tiers will be verified by the Department before contract approval and used for all OCIP deduct calculations for the duration of the contract and not modified based upon future years' insurance rates. These deduct rates will also be used for audits and change orders.

Coverage and limit requirements for purposes of calculating the insurance cost deduction are as follows:

A. Workers' Compensation Insurance Statutory benefits as provided by California statute and Employer's Liability Limits as follows:

1. $1,000,000 for each accident for bodily injury by accident.
2. $1,000,000 policy limit for bodily injury by disease.
3. $1,000,000 for each employee for bodily injury by disease.

B. Commercial or General Liability Insurance. Coverage shall include the following supplementary coverages:

1. Contractual Liability to cover liability assumed under the agreement.
2. Products and Completed Operations Liability insurance.
3. Broad Form Property Damage Liability insurance.
4. Explosion, collapse, and underground hazards (deletion of the X,C,U exclusions) if such exposure exists.
5. Independent Contractors.
6. The policy shall be issued on an occurrence basis, as distinguished from a claims-made basis.

Limit requirements for purposes of calculating the Contractor's or subcontractor's insurance cost deduction will vary depending on the amount of the Bid/Contract/Subcontract as follows:

Bids/Contracts/Subcontracts Less Than $5,000,000

1. $1,000,000 combined single limit each occurrence for bodily injury and property damage.
2. $2,000,000 aggregate for products-completed operations.
3. $2,000,000 general aggregate. This limit shall apply separately to the Contractor's work under this contract.
4. $50,000 for fire damage legal liability.
5. $5,000 for medical payments.

Bids/Contracts/Subcontracts Greater Than $5,000,000

1. $2,000,000 combined single limit each occurrence for bodily injury and property damage.
2. $2,000,000 aggregate for products-completed operations.
3. $4,000,000 general aggregate. This limit shall apply separately to the Contractor's work under this contract.
4. $50,000 for fire damage legal liability.
5. $5,000 for medical payments.

C. Umbrella or Excess Liability Insurance. The umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

Limit requirements for purposes of calculating the Contractor's or subcontractor's insurance cost deduction will vary depending on the amount of the Bid/Contract/Subcontract as follows:

Bids/Contracts/Subcontracts Less Than $1,000,000

1. $5,000,000 for each occurrence
2. $5,000,000 aggregate

Bids/Contracts/Subcontracts Between $1,000,000 and $5,000,000

1. $10,000,000 for each occurrence
2. $10,000,000 aggregate

Bids/Contracts/Subcontracts Between $5,000,000 and $25,000,000

1. $15,000,000 for each occurrence
2. $15,000,000 aggregate

Bids/Contracts/Subcontracts Greater Than $25,000,000

1. $25,000,000 for each occurrence
2. $25,000,000 aggregate

Items A, B, and C are required of the Contractor and subcontractors of all tiers.

The insurance specified by this provision shall conform to the Department's requirements and be written by companies rated A-, VII or higher by A.M. Best, Inc. and authorized to do business in the State of California.

The Contractor shall ensure subcontractors of all tiers follow the same instructions in this section, "Contractor Insurance Cost Identification." All information furnished during this process will be considered confidential.

In addition to the provisions of Section 7.1.01A (3), "Payroll Records," of the Standard Specifications, the Contractor shall:

A. Keep and maintain, and cause its subcontractors to keep and maintain, for insurance purposes, accurate and properly classified records of payroll and other data necessary for the proper computation of premiums with respect to the insurance provided by the Department. The Contractor's and its subcontractor's records shall be maintained to show separately by employee and class of work, or comparable information acceptable to the Department, all necessary pertinent payroll data excluding the premium portion of overtime for the purpose of developing and determining premiums and shall keep their records relating to the work performed under this contract in such a manner that the records can readily be separated from other work of the Contractor or subcontractors of all tiers.
B. Submit monthly records of payroll and other data for itself and its subcontractors to the Department using CT OCIP Form 2. Upon completion of a subcontractor's work under this contract, the Contractor shall submit to the Department all necessary data to permit complete insurance premium determination for each of its subcontractors. Upon contract acceptance, the Contractor shall submit to the Department all necessary data to permit complete insurance premium determination for the Contractor and its subcontractors of all tiers. The Contractor and subcontractors of all tiers shall permit the Department and its representatives to examine or audit its books and records.

AUDIT AND RECOVERY OF CONTRACTOR AND SUBCONTRACTOR INSURANCE COST

The Contractor shall submit to the Engineer the Monthly Payroll Reporting Form, CT OCIP Form 2, for the prior month's work by the 10th day of the subsequent month. Certified payroll is not an acceptable substitution. If CT OCIP Form 2 is not submitted as required, the Department will retain an amount equal to 10 percent of the month from the current month's estimate in addition to any other retentions. The Contractor and subcontractors of all tiers shall keep and maintain accurate records by workers' compensation classifications of their payroll for work insured by the OCIP.

At the end of the contract and each subcontract, and at any other time as determined by the Engineer, an audit will be performed using the reported payroll and receipts furnished during the OCIP policy term. The Department will deduct all costs of insurance from the contract price and change orders. If the Contractor's or the subcontractor's of all tiers original estimate was lower than its audited insurance costs, the Department will deduct the difference. If its original estimate was higher than the audited insurance cost, an additive change order will be issued to the Contractor or subcontractor for the excess deduction taken. Neither the Department nor the Contractor nor its subcontractors of all tiers is entitled to interest under this audit recovery process.

FORMS TO BE SUBMITTED FOLLOWING CONTRACT AWARD

The Contractor shall submit the following forms as specified:

A. CT OCIP Form 1, Notice of Contract Award and Insurance Enrollment Form. Nonlisted eligible subcontractors of all tiers, before starting work, shall complete and submit CT OCIP Form 1 to the Engineer. The OCIP coverage will not be in effect until CT OCIP Form 1 has been received and approved by the Engineer.
B. CT OCIP Form 2, Monthly Payroll Reporting Form. The Contractor and enrolled subcontractors of all tiers shall complete and submit CT OCIP Form 2 to the Engineer for the prior month's work by the 10th day of the subsequent month. This form shall be submitted monthly until CT OCIP Form 3, Contractor's Notice of Work Termination Form, is submitted, even if there was no on-site work performed. CT OCIP Form 2 is in addition to any payroll records required by Section 7-1.01A(3), "Payroll Records," of the Standard Specifications.
C. CT OCIP Form 3, Contractor's Notice of Work Termination. The Contractor and enrolled subcontractors of all tiers shall complete and submit this form to the Engineer upon completion of its work by the 5th work day after the last day of the month including punch list items under the contract. The Contractor shall ensure subcontractors of all tiers complete this form.
D. CT OCIP Form 4, Occupational Safety and Health Qualifications. Nonlisted subcontractors of all tiers, before starting work, shall complete and submit CT OCIP Form 4 to the Engineer for each eligible subcontractor of every tier. If the subcontractor does not meet the qualifications, the Contractor shall replace the subcontractor.

Failure of the Contractor to submit complete OCIP documents to the Engineer will result in the assessment of a penalty against the Contractor in the amount of $500 for each day any of the CT OCIP forms are not submitted within the above time frames. The Contractor will not be compensated for any delays or costs resulting from failure to comply with these requirements.

INSURANCE PROVIDED BY THE DEPARTMENT

The Department will provide and maintain in force the types of insurance listed in this section, "Insurance Provided by the Department," as a part of the OCIP for an enrolled contractor. For contractors enrolled in the OCIP, the insurance company policy limits of liability, coverage terms, and conditions will determine the scope of coverage provided by the OCIP.

Each enrolled contractor will receive a separate workers' compensation policy. Certificates of Insurance will be furnished for the general liability and excess liability coverages. All insurance policies are available for review by the Contractor upon request to the Engineer. The policies may be amended from time to time. The Contractor and enrolled subcontractors of all tiers are bound by the terms of coverage as contained in the insurance policies.

The OCIP provides the following insurance coverages for the Contractor and enrolled subcontractors of all tiers:

A. Workers Compensation Insurance

1. Coverage A—Worker's Compensation: Statutory
2. Coverage B—Employers Liability: $1,000,000 bodily injury per accident per employee; $1,000,000 bodily injury per disease per employee; and $1,000,000 policy limit by disease.
3. Deductible: None

B. Commercial General Liability, Primary Coverage

1. Limits for bodily injury, including death arising from the bodily injury, and property damage: $2,000,000 for each occurrence; $4,000,000 aggregate for completed operations; $4,000,000 general annual aggregate. Aggregate limits are annually reinstated each year of construction.
2. Completed-operations coverage: Coverage will be extended for 10 years beyond the earlier of acceptance or policy expiration.
3. Deductible Assessment: $ 25,000 each occurrence. The Contractor or subcontractor primarily responsible for causing any loss shall be responsible for payment of the deductible assessment as determined by the OCIP insurance company. The responsible contractor or subcontractor will be notified of such claims and its input sought for claims investigation, but final determination of liability and payment will be made by the OCIP insurance company.

C. Umbrella or Excess Liability policy limits: Not less than $98,000,000 following form to the commercial general liability policy. General aggregate limits are annually reinstated each year of construction.

Any contractor who has completed its work at the job site and whose insurance as provided by the Department's OCIP has been terminated, who returns to the job site to perform warranty work does so under its own insurance coverages and not under those provided by the Department's OCIP.

ASSIGNMENT OF RETURN PREMIUM

The Department will pay all OCIP premiums. The Department will be the sole beneficiary of any dividends or return premiums generated by the OCIP.

In consideration of the Department providing an OCIP, the Contractor and subcontractors waive any right to and shall irrevocably assign to and for the benefit of the Department, all return premiums, premium refunds, premium discounts, dividends, retentions, credits, and any other moneys due the Department in connection with the insurance that the Department will provide and shall evidence same by a formal instrument of assignment, if requested, to be promptly executed in the form prepared by the Department. The Contractor shall execute and require all tiers of enrolled subcontractors to execute a similar assignment for the benefit of the Department.

COVERAGE EXPIRATION

Except for completed operations coverage, the OCIP insurance will terminate upon contract acceptance or policy expiration.

ALTERNATIVE INSURANCE

The Department reserves the right to terminate or modify all or part of the Department's OCIP with 30 days prior written notice. In the event of termination or modification, the Contractor and its subcontractors of all tiers shall procure and maintain insurance required by the Department. The Department will reimburse to the Contractor the cost of the replacement insurance.

CONTRACTOR-FURNISHED INSURANCE

For any work under this contract and until completion and final acceptance of the work, the Contractor shall furnish Certificates of Insurance to the Department, for itself and subcontractors of all tiers, evidencing the following coverages are in force on a primary basis for coverages not provided under the OCIP Insurance Policies.

The Certificates of Insurance shall provide that there will be no cancellations, lapse, or reduction of coverage without 30 days' prior written notice to the Department. Certificates of Insurance, as evidence of required insurance, for the general liability, workers' compensation and employer's liability, automobile liability, umbrella or excess liability policies, and any applicable professional liability insurance shall set forth deductible amounts or self-insured retentions applicable to each policy.

The Certificates of Insurance shall evidence coverage for:

A. Automobile Liability Insurance: Commercial automobile liability insurance to cover all vehicles owned by, hired by, or used on behalf of the Contractor with limits no less than $1,000,000 combined single limit per accident.
B. Workers' Compensation and Employer's Liability Insurance:

    1. Workers' Compensation: Statutory benefits (other states).
    2. Employer's Liability: $1,000,000 for bodily injury for each accident; $1,000,000 policy limit for bodily injury by disease; $1,000,000 for each employee for bodily injury by disease.

C. Commercial General Liability Insurance
    Coverage must include the following supplementary coverages:

    1. Contractual Liability to cover liability assumed under the agreement.
    2. Products and Completed Operations Liability insurance.
    3. Broad Form Property Damage Liability insurance.
    4. Explosion, collapse, and underground hazards (deletion of the X,C,U exclusions) if such exposure exists.
    5. Independent Contractors.
    6. The policy shall be issued on an occurrence basis, as distinguished from a claims-made basis.

Limits required of the Contractor or subcontractors will vary depending on the amount of the Bid/Contract/Subcontract as follows:

Bids/Contracts/Subcontracts Less Than $5,000,000

1. $1,000,000 combined single limit each occurrence for bodily injury and property damage.
2. $2,000,000 aggregate for products-completed operations.
3. $2,000,000 general aggregate. This limit shall apply separately to the Contractor's work under this contract.
4. $50,000 for fire damage legal liability.
5. $5,000 for medical payments.

Bids/Contracts/Subcontracts Greater Than $5,000,000

1. $2,000,000 combined single limit each occurrence for bodily injury and property damage.
2. $2,000,000 aggregate for products-completed operations.
3. $4,000,000 general aggregate. This limit shall apply separately to the Contractor's work under this contract.
4. $50,000 for fire damage legal liability.
5. $5,000 for medical payments.

D. Umbrella or Excess Liability Insurance. The umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted. Coverage shall apply and follow form over primary coverages shown above. Limits shall apply per any one occurrence and general aggregate annually; and annual aggregate products and completed operations. Coverages and terms shall include (a) excess of general liability, (b) excess of employer's liability; (c) excess of products-completed operations, (d) excess of commercial automobile liability.

Limits required of the Contractor or subcontractors will vary depending on the amount of the Bid/Contract/Subcontract as follows:

Bids/Contracts/Subcontracts Less Than $1,000,000

1. $5,000,000 for each occurrence
2. $5,000,000 aggregate

Bids/Contracts/Subcontracts Between $1,000,000 and $5,000,000

1. $10,000,000 for each occurrence
2. $10,000,000 aggregate

Bids/Contracts/Subcontracts Between $5,000,000 and $25,000,000

1. $15,000,000 for each occurrence
2. $15,000,000 aggregate

Bids/Contracts/Subcontracts Greater Than $25,000,000

1. $25,000,000 for each occurrence
2. $25,000,000 aggregate

E. Professional Liability Insurance: If the Contractor's work requires design or design-assist services, the Contractor shall obtain and maintain, or require its subcontractors responsible for performing such design or design-assist services to obtain and maintain, at all times during the term of this contract, professional liability (errors and omissions) insurance for all professional services provided. This professional liability insurance shall include full prior acts coverage sufficient to cover the services under this contract, the limits of which shall be not less than $2,000,000 per claim and $4,000,000 aggregate per claim written on a claims-made basis, including coverage of contractual liability. Professional liability insurance shall be maintained during the term of the contract and for so long as the insurance is reasonably available as specified, for a period of 5 years after completion of the services.

F. Tools and Equipment Floater Insurance: Whatever fire and extended coverage the Contractor may deem necessary for protection against loss of owned, rented, or borrowed capital equipment and tools, including any tools owned by mechanics, and any tools, equipment, scaffolding, staging, trailers, cranes, towers, and forms owned, rented, or borrowed by it or it's subcontractors. The Department will have no liability with respect to such equipment and tools. Failure of the Contractor to secure such insurance or to maintain adequate levels of coverage does not obligate the Department or its agents and employees for any losses on owned, rented, or borrowed equipment. Any policies maintained by the Contractor on their owned or rented equipment and materials shall contain a provision requiring the insurance companies to waive their rights of subrogation against the Department.

The job site shall be identified on the Certificate of Insurance. The State, including its officers, directors, agents (excluding agents who are design professionals), and employees shall be named as additional insureds under the insurance described above except for Items B, E, and F with respect to liability arising out of or connected with work performed by or on behalf of the Contractor or subcontractors of all tiers.

If the Contractor chooses to have its policy endorsed to include the job site during the construction period, coverage shall be excess or difference in conditions of the OCIP. The Department will not pay for this additional cost. Inclusion of the job site on such insurance policies shall not replace the OCIP coverage or otherwise affect the cost identification requirements in "Contract Insurance Cost Identification" of this section, "Owner Controlled Insurance Program (OCIP)."

If by the terms of the Contractor-furnished insurance any mandatory deductibles are required or if the Contractor should elect, with the Department's approval, to increase the mandatory deductible amounts or purchase this insurance with voluntary deductible amounts, the Contractor shall pay the amount of all deductibles. If separate contractors are added as insureds to be covered by this policy, the separate contractors shall be responsible for payment of appropriate part of any deductibles if claims are paid on their part of the project.

Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the State.

If the Contractor uses a self-insurance program or self-insured retention, the Contractor shall provide the State with the same protection from liability and defense of suits as would be afforded by first-dollar insurance. Execution of the Contract is the Contractor's acknowledgement that the Contractor will be bound by all laws as if the Contractor were an insurer as defined under Insurance Code Section 23 and that the self-insurance program or self-insured retention shall operate as insurance as defined under Insurance Code Section 22.

Any type of insurance or any increase of limits of liability not described in this section, "Contractor-Furnished Insurance," that the Contractor requires for the Contractor's own protection or on account of any statute shall be the Contractor's own responsibility.

CONTRACTOR RESPONSIBILITIES

The Contractor shall be responsible for and require its subcontractors of all tiers to be responsible for:

A. Compliance with all rules and regulations of the California Workers Compensation Rating Bureau.

B. Compliance with applicable claims handling responsibilities and project safety administration as specified in "Claim Handling Responsibilities" and "Project Safety Administration" of this section, "Owner Controlled Insurance Program (OCIP)."

C. Provision of necessary contract, operations, and insurance information including full certified copies of complete insurance polices.

D. Cooperation with the Department and its representatives as regards the administration and operation of the OCIP.

FAILURE TO MAINTAIN INSURANCE

In the event the Contractor or any subcontractor fails to furnish and maintain required insurance or to furnish satisfactory evidence of the required insurance, the Department may procure and maintain the coverages for the Contractor or subcontractor. The Department will furnish all necessary information to the Contractor and deduct the cost from any moneys due or to become due the Contractor.

Failure to provide evidence of such insurance may result in the Contractor or subcontractor being excluded from the job site until proper coverage is verified. The cost of any resulting delay will be borne by the Contractor.

NO RELEASE

The OCIP does not relieve the Contractor or its subcontractors of any tier of any responsibility or liability under this contract or any applicable law, statute, regulation or order.

The Contractor shall not be relieved from his responsibility for safety in accordance with Section 7-1.06, "Safety and Health Provisions," Section 7-1.08, "Public Convenience," and Section 7-1.09, "Public Safety," of the Standard Specifications.

CLAIM HANDLING RESPONSIBILITIES

The Contractor shall adhere to and perform all reporting requirements as set forth in the Claims Procedures part of the Department's OCIP Manual.

PROJECT SAFETY ADMINISTRATION

The Contractor shall maintain total control of safety to ensure that its employees and the general public will be provided an environment free of recognized hazards during construction activities. In carrying out this policy, the only accepted level of performance is to be incident free on this project each and every day.

The ultimate responsibility for providing a safe place to work rests with the Contractor. The Contractor shall develop its own written Site-Specific Safety Program (SSSP). At minimum, the SSSP shall conform to the requirements addressed in the California Code of Regulations (CCR) Title 8, and CCR Tunnel Safety Orders, Section 8405 (T8-CCR's; Cal/OSHA) and other safety regulations. This includes, but is not limited to, all applicable Local, State, and Federally recognized Safety Standards and Codes.

Without diminishing the Contractor's responsibility for safety, the Department through its OCIP will provide an OCIP site safety manager to assist the Engineer in monitoring the safety, health, and environmental performance of the Contractor and its subcontractors of all tiers. The Contractor and its subcontractors of all tiers shall be monitored for effectiveness and application of their respective safety programs at the job site.

The Contractor and its subcontractors of all tiers shall adhere to a 100% drug/alcohol free work zone. At a minimum pre-employment and post accident testing is required.

The employees of the Contractor and subcontractors of all tiers shall attend an orientation program conducted by an OCIP site safety manager. This orientation is designed to communicate all project-specific safety policies, procedures, and expectations of the Department in regard to the construction of the project.

The Contractor shall provide safety training and a certification of completion of the Safety Training Program to all personnel, in accordance with the Safety Requirements of Section 10-6.303 of the Notice to Contractors and Special Provisions.

10-1.03 NON-STORM WATER DISCHARGE CONTROL

Non-Storm water discharges shall conform to the requirements in Section 7-1.01G, "Water Pollution" of the Standard Specifications, "Water Pollution Control" of the special provisions, and these special provisions. Ground water encountered during tunnel excavation or structure excavation shall be considered as non-storm water. Stormwater runoff, runon from drainage courses, stream flows or accumulated precipitation shall not be allowed to mix with non-storm water.

Leach water includes groundwater collected in the underdrains, as described in "Underdrain (Tunnel and Portals)," of these special provisions.

Attention is directed to "Leach Water System And Carbon Dioxide Storage Tank," of these special provisions for the treatment and disposal of leached groundwater.

Attention is directed to "Leach Water And Emergency Outflow Pump Stations Piping And Appurtenances," of these special provisions for installation of leach water pump stations and appurtenances.

Attention is directed to "Storm Water Pumps," of these special provisions for installation of leach water pumps.

Attention is directed to "Monitoring and Reporting Program," in this section for the monitoring location "INF-002" for the measurement of average monthly suspended solids in the leached groundwater collected in the underdrains.

As soon as leached ground water is available from the tunnel site, it shall be tested as required in the Monitoring and Reporting Program in this section.

The leached groundwater collected in the underdrains shall also be considered as non-storm water if the average monthly suspended solids measured at the monitoring location "INF-002" is greater than 60 mg/l and treated as specified.

All post tunnel construction leached water 60 milligrams/liter (mg/l) and less shall be conveyed to the Leach Water Treatment System for pH adjustment and disposal.

All non-storm water shall be conveyed to the Temporary Non-Storm Water Treatment System (TNSWTS), as described in this section, for treatment prior to disposal. Non-storm Water Discharge Control work shall consist of collection, conveyance, treatment, and disposal of treated non-storm water during tunnel excavation for the duration of the contract. Discharge of treated non-storm water shall be in accordance with the "Disposal" section described elsewhere in this section.

Conformance with the requirements of this section shall in no way relieve the Contractor from the Contractor's responsibilities, as provided in Section 7 1.11, "Preservation of Property," and Section 7 1.12, "Responsibility for Damage," of the Standard Specifications.

The non-storm water flow rate at any point during the excavation is estimated to range from 20 liters per second to 50 liters per second.

A Conceptual Preliminary Design Report for the Tunnel Excavation Groundwater Treatment System has been prepared by the Department. The Conceptual Preliminary Design Report provides a conceptual model of the Groundwater Treatment System hereinafter referred to as the Temporary Non-Storm Water Treatment System (TNSWTS) described elsewhere in this special provision. This report also includes background water quality of groundwater, expected water quality characteristics of the influent to the TNSWTS, potential staging areas, potential non-storm water flow rates, pre-treatment measures, TNSWTS components, reuse and disposal of treated non-storm water with discharge locations.

Attention is directed to "Relations With California Regional Water Quality Control Board" of these special provisions. The California Regional Water Quality Control Board Region 2, San Francisco Bay Region (RWQCB) has issued a permit to the Department which governs treated groundwater discharges during construction and the post-construction phases from this project. The Department's permit is titled: "Final Order No. R2-2006-0049, NPDES Permit No. CA0038831 for the Devil's Slide Tunnel Project", is hereafter referred to as the "Permit" in this section.

The Permit incorporates by reference the conditions and prohibitions of the California Ocean Plan (2005) adopted by the State Water Resources Control Board, hereafter referred to as the "Ocean Plan" in this section.

Disposal Site And South Portal Storm Water and Non-Storm Water Discharge Information Handout

Copies of the Conceptual Preliminary Design Report, Permit and California Ocean Plan are included in a Disposal Site And South Portal Storm Water and Non-Storm Water Discharge Information Handout (Information Handout) prepared for this contract.

The Contractor shall be responsible for fully complying with all the sections of this Permit including, but not limited to:

1. Sections III - Discharge Prohibitions
2. Section IV - Effluent Limitations and Discharge Specifications
3. Section V - Receiving Water Limitations
4. Section VI – Provisions
5. Section VII - Compliance Determination for effluent limitations
6. Attachment D – Standard Provisions
7. Attachment E – Monitoring and Reporting Program (MRP)
8. Attachment G – Self Monitoring Program, Part A, adopted August 1993; Standard Provisions and Reporting Requirements, August 1993

The Contractor shall be responsible for complying with all the sections of the Ocean Plan including, but not limited to:

1. Section III.A – General Provisions
2. Section III B – Table A Effluent Limitations
3. Section III.C – Implementation Provisions for Table B
4. Appendix II – Minimum Levels for the lowest concentrations of a pollutant that can be quantitatively measured in a sample given the current state of performance in analytical chemistry methods in California.

The Permit identifies discharge and monitoring locations for tunnel construction dewatering referred to as TNSWTS in this section, and for post-construction pH-treated groundwater referred to as Leach Water Treatment System as described in "Leach Water System And Carbon Dioxide Storage Tank," of these special provisions. Discharge and Monitoring locations for the temporary TNSWTS and the Leach Water Treatment System are described in “Disposal" and “Monitoring and Reporting Program,” in this section respectively.

The Contractor shall not change these discharge and monitoring locations specified in the Permit.

The Contractor shall be responsible for designing and constructing all components of the TNSWTS which should conform to “In-Tunnel Water Control,” “SEM Tunnel Excavation and Support,” in section 3-3.03 “Part 3 – Execution,” of these special provisions, and as directed by the Engineer.

The Contractor shall list “Non-storm Water Discharge Control” as one of the various measures to prevent water pollution within the SWPPP, described in “Water Pollution Control” of these special provisions.

RETENTION OF FUNDS

Notwithstanding any other remedies authorized by law, the Department will retain money due the Contractor under the contract, in an amount determined by the Department, up to and including the entire amount of Penalties proposed, assessed, or levied as a result of the Contractor's violation of the Permit, or Federal or State law, regulations or requirements. Funds may be retained by the Department until final disposition has been made as to the Penalties. The Contractor shall remain liable for the full amount of Penalties until such time as they are finally resolved with the entity seeking the Penalties.

Retention of funds for failure to conform to the provisions in this section, "Non-storm Water Discharge Control," shall be in addition to the other retention amounts required by the contract. The amounts retained for the Contractor's failure to conform to provisions in this section will be released for payment on the next monthly estimate for partial payment following the date when an approved NSDCP has been implemented and maintained, and when water pollution has been adequately controlled, as determined by the Engineer.

When a regulatory agency identifies a failure to comply with the Permits and modifications thereto, the Manuals, or other Federal, State or local requirements, the Department will retain money due the Contractor, subject to the following:

A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.

B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9 1.06, "Partial Payments," of the Standard Specifications.

C. If the Department has retained funds, and it is subsequently determined that the State is not subject to the entire amount of the Costs and Liabilities assessed or proposed in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained for the period of the retention. The interest rate payable shall be 6 percent per annum.

During the first estimate period that the Contractor fails to conform to the provisions in this section, "Non-storm Water Discharge Control," the Department will retain an amount equal to 25 percent of the estimated value of the contract work performed. These funds may be retained for several continuous pay periods until the Contractor conforms to the provisions in this section.

MATERIALS

Collection And Conveyence System

Non-storm water shall be collected and conveyed to the TNSWTS and from the TNSWTS to the point of discharge described in “Disposal” of this section. Collection and conveyance system of non-storm water shall not allow commingling of storm water with non-storm water. The collection and conveyance system shall be capable of handling a maximum flow rate of 50 liters per second, and not allow unintentional bypass of non-storm water discharges prior to treatment.

The Contractor shall be responsible for providing all temporary storage, pumps, piping required to convey the non-storm water to the TNSWTS and to the point of discharge. Collection and conveyance system components for non-storm water shall include all temporary drainage system components including but not limited to installation of drain inlet structures, piping, trenches, and pumps.

Materials shall conform to the provisions in Section 6, "Control of Materials," Section 7-1.16, "Contractor’s Responsibility for the Work and Materials," and Section 74-2, "Drainage Pump Equipment" of the Standard Specifications and these special provisions.

The Contractor shall use a flow meter, as described in "Discharge Volume Records” of this section, to measure all discharges to and from the TNSWTS to discharge locations 001 and 002, and measure the volume of treated non-storm water that is reused, as described in “Disposal,” of this section.

Pretreatment Measures

Pre-treatment measures shall be employed to minimize sediment discharges in the influent prior to the TNSWTS during the collection and conveyance of non-storm water discharges. Pre-treatment measures including but not limited to any or all of these components shall be employed in conformance with the “Manuals” described in “Water Pollution Control” of these special provisions:

1. Stockpile Management to prevent runon or sediment-laden runoff (WM-3);
2. Plastic Covers to prevent contamination of soils during shotcreting operations (SS-7);
3. Silt Fences (SC-1);
4. Sediment Traps (SC-3);
5. Check Dams (SC-4);
6. Mechanical separation devices for removal of particles to approximately 10 to 20 microns in size (Sand Separators and Mechanical Filters).

Sediment accumulated as a result of the employment of pretreatment measures shall be removed periodically to levels acceptable for TNSWTS treatment as per manufacturer’s recommendations or when sediment accumulation reaches one-third (1/3) of the height of the measure used, to ensure proper functioning of these components. Sediment removed shall be disposed of in conformance with "Earthwork," of these special provisions.

Temporary Non-Storm Water Treatment System (TNSWTS)

The Contractor shall provide a TNSWTS to treat the non-storm water collected during tunnel excavation, and structure excavations. The non-stormwater shall be conveyed to the temporary TNSWTS for treatment prior to disposal.

The temporary treatment system shall be capable of processing the influent non-storm water at a maximum flow rate of 50 liters per second, and remove pollutants expected in the non-storm water influent as described in the Conceptual Preliminary Design Report to achieve and maintain compliance with the effluent limitations and receiving water limitations listed in the Permit. Treatment systems shall be appropriately sized to prevent delay of work.

The contractor shall provide treatment system components for two separate treatment trains as part of the TNSWTS, each capable of processing a maximum flow rate of 50 liters per second, as a backup or auxiliary system to allow for redundancy during emergency shut down or scheduled maintenance.

Treatment System Components

The Contractor shall not allow the non-storm water discharges to bypass the TNSWTS. TNSWTS components including but not limited to any or all of these components shall be employed as part of the TNSWTS to provide adequate treatment and polishing to achieve compliance with the Permit:

1. pH adjustment using carbon dioxide;
2. Chemical Coagulation and Flocculation using an organic, or inorganic polymer;
3. Chemically Enhanced Filtration using an organic, or inorganic polymer;
4. Settling Tanks;
5. Sand Media Filters;
6. Cartridge Filters
7. Granular Activated Carbon Filters;
8. Ion-Exchange Units;
9. Belt Filter Press to dewater solids removed from the non-storm water discharge through settling or filtration;
10. Back-flow control mechanisms to prevent partially non-treated non-storm water from commingling with the influent stream.

The Contractor shall ensure that the treatment system components are steam cleaned to remove any residual contaminants. Sampling ports shall be provided as part of the TNSWTS. Sampling ports shall be spigots attached to the piping system and capable of obtaining a representative sample of water at each location of the TNSWTS as directed by the Engineer.

A Supervisory Control and Data Acquisition (SCADA) system shall be used to control and monitor the TNSWTS, and generate weekly Water Quality Monitoring Records. Continuous monitors shall be used in the TNSWTS to measure influent and effluent pH, and turbidity for each treatment train. Streaming current detectors shall be used to provide feedback from the continuous monitors for adjustment of chemical dose for turbidity or pH control. The SCADA system shall provide alarms, automatic control to route non-storm water flows, and notify the Certified Technician described elsewhere in this special provision, in the event of a failure or exceedance of the effluent limitations.

Staging Area

Potential staging areas are identified in the Conceptual Preliminary Design Report prepared by the Department, available as part of the Information Handout. The staging area for the Non-storm Water Treatment System shall be secured against entry by the public and non-authorized construction personnel.

Attention is directed to "Erosion Control (Type D)" of these special provisions regarding the requirement to stabilize and restore all disturbed soil areas following removal of all facilities and equipment associated with TNSWTS.

DISPOSAL

Treated non-storm water discharged from the TNSWTS shall conform with the Permit's effluent and receiving water limitations. Treated non-storm water from the TNSWTS shall be discharged at the authorized discharge location "001" as required in the Permit.

Treated leach groundwater from the Leach Water Treatment System as described in "Leach Water System And Carbon Dioxide Storage Tank," of these special provisions, shall be discharged at the authorized discharge location "002" as required in the Permit, and as shown on the contract plans. The Contractor shall not change these discharge locations specified in the Permit.

The discharge shall not cause erosion at the point of discharge. Disposal of the treated non-storm water from the TNSWTS at discharge location "001" shall not be allowed until the Contractor has maximized the reuse of treated non-storm water for the following uses:

1. Irrigation at the Disposal Site
2. Dust Control
3. Construction watering for fill compaction at the Disposal Site
4. Water for mixing concrete at a temporary concrete batch plant (if required) provided the treated non-storm water is in conformance with Section 90-2.03, "Water," of the Standard Specifications.

Irrigation at the Disposal Site, a State-owned property (Parcel No. 59266-1) as shown on the Conceptual Preliminary Design Report, shall be done by broadcasting in a controlled manner and at a controlled rate over the existing vegetation using "Temporary Irrigation Systems," described elsewhere in these special provisions. The irrigation system shall be designed to adjust spray pattern and flow rate to prevent erosion and ponding. The irrigation system discharge shall maximize water reuse through infiltration and evaporation. The Contractor shall prevent any discharged effluent from running off the State-owned property. Attention is directed to "Order of Work" of these special provisions for the items of work to be completed prior to beginning irrigation at the Disposal Site.

The Contractor shall provide written documentation for each reuse option that is not feasible, in the Non-Storm Water Discharge Control Plan (NSDCP) to be approved by the Engineer. The Contractor shall conduct monitoring at locations specified in the Permit, as described in "Monitoring and Reporting Program" of this section.

Solids generated from the TNSWTS shall be disposed in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the standard Specifications. The Contractor shall perform additional monitoring if required for disposal of solids in accordance with Section 7-1.13, of the standard specifications.

OPERATION AND MAINTENANCE OF TNSWTS

The Contractor shall fully comply with Section IV - "Provisions" and Attachment D - "Standard Provisions," of the Permit.

The Contractor shall at all times properly operate and maintain the TNSWTS to comply with the conditions in the Permit, which includes adequate laboratory controls and appropriate quality assurance procedures.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to non-storm water discharge control work. The Contractor and the Department shall provide copies of correspondence, notices of violation, enforcement actions or proposed fines by regulatory agencies to the requesting regulatory agency.

TNSWTS Bypass

The Contractor shall comply with the section on "Bypass", as described in Attachment D of the Permit. This section of the Permit includes the definition of bypass, prohibition and procedures for submittal of a notification of anticipated and unanticipated bypass to the Engineer.

TNSWTS Upset

The Contractor shall comply with the section on "Upset", as described in Attachment D of the Permit. This section of the Permit includes the definition of upset, prohibition and procedures for submittal of a notification of upset to the Engineer.

Records

The Contractor shall comply with the section on "Standard Provisions - Records", as described in Attachment D of the Permit. This section of the Permit requires retention of records of all monitoring information, including calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required in the Permit for a period of three years from the date of sample, measurement or report. The Contractor shall upon request by the Engineer furnish copies of records. Any request for records from regulatory agencies shall be directed to the Engineer.

Logs and documentation of all monitoring and testing shall be kept on site in a secure weatherproof structure.

Reporting

The Contractor shall comply with the section on "Standard Provisions - Reporting", as described in Attachment D of the Permit for the following: signatory and certification of all submittals including monitoring reports; twenty-four hour reporting to the Engineer; notification of planned changes to the permitted facility; notification of anticipated non-compliance; other non-compliance; and other information.

The notifications, reports or submittals to the Engineer that are required in the Permit shall be signed by either the Contractor's principal executive officer, chief executive officer or the a duly authorized representative who has overall responsibility for operation of the regulated facility or activity.

The Contractor shall conduct daily visual inspection of the TNSWTS, when in operation, to ensure that the various components are functional. Components shall be routinely maintained or replaced to prevent leakage and to ensure efficient operation of the TNSWTS.

Any treatment system component that is found to be damaged or to affect the performance of the TNSWTS shall be either immediately repaired or replaced.

MONITORING AND REPORTING PROGRAM (MRP)

Monitoring Locations and Parameters

The Contractor shall be responsible for fully implementing the "Monitoring and Reporting Program (MRP)" for construction stage and post-construction stage as described in Attachment E and Attachment G of the Permit. The Contractor shall propose and identify site specific monitoring locations in the MRP for the Engineer's approval. Construction stage and post-construction stage monitoring refer to monitoring of "TNSWTS" of this section and the Leach Water Treatment System described in "Leach Water System And Carbon Dioxide Storage Tank," of these special provisions respectively.

The Contractor shall conduct monitoring for all the parameters at the following general locations (to be field determined), as described in the MRP:

1. INF-001: Influent to TNSWTS prior to treatment
2. MON-001: Effluent from TNSWTS after treatment and prior to discharge
3. INF-002: Influent to Leach Water Treatment System prior to treatment
4. MON-002: Effluent from Leach Water Treatment System after treatment and prior to discharge.

A violation shall be defined as an exceedance of any of the effluent or receiving water limitations and the Reporting Level for the analysis for the constituent as defined in Attachment A of the Permit.

Daily Inspection Report (DIR)

The Contractor shall furnish a Certified Technician with the qualifications described in this section. The Contractor shall submit to the Engineer a statement of qualifications, describing the training, previous work history and expertise of the individual selected to serve as Certified Technician. A trained technician certified through an approved Operators Training Program shall operate the TNSWTS. Valid technician certificate(s) shall be posted onsite. TNSWTS training content shall include, but is not limited to: Stormwater regulatory framework and requirements; Stormwater treatment chemistry (pH, filtration, coagulation, flocculation); Stormwater treat ability including jar test procedure; Treatment system components and their operation; Operating the treatment system; Testing turbidity, pH, and chemical residual; Optimizing chemical dosing rates.

The Certified Technician shall provide written proof of operator certification training to the Engineer; Provide names and contact information for all individuals involved with the site design, installation process, maintenance, operation of, and monitoring of the TNSWTS.

The Technician shall be responsible for compiling the Daily Inspection Report (DIR) to be submitted to the Engineer on a weekly basis and performing other monitoring and sampling work. The DIR form shall include the following items: Physical Observations; Discharge Volume Records; Water Quality Monitoring Records described elsewhere in this section.

In developing the DIR, the Contractor may refer to Attachment C in the Field Guide to Construction Site Dewatering available at: http://www.dot.ca.gov/hq/construc/stormwater/
manuals.htm. The DIR form shall be developed as part of the NSDCP and approved by the Engineer prior to use.

All information and recorded data collected or submitted as part of the DIR shall be certified as true and accurate and signed by the Certified Technician.

Physical Observations

The Contractor shall monitor the discharges at the monitoring locations specified in this section. The information recorded in the DIR shall include physical observations of the receiving water body including color, size of affected area, presence of suspended material, presence of water fowl or aquatic wildlife, wind direction and velocity, tidal conditions, atmospheric condition, time and date. In addition, the Certified Technician shall supplement the observations with photographs.

The Certified Technician shall conduct observations at a minimum, one hour prior to discharge, during the first ten minutes of initiating discharge, every four hours during discharge, and upon cessation of discharge. The observations shall be recorded daily in a tabular format known as the Daily Inspection Report (DIR) described elsewhere in this section.

Observations or measurements which indicate that the discharge is of a purity such that turbidity and apparent color are beyond the present natural background levels shall be immediately reported to the Engineer. The discharge activity shall immediately cease, so that corrective action are undertaken to repair, modify operations or replace equipment. The commencement of discharge activities shall be allowed upon approval by the Engineer.

Discharge Volume Records

Flow meters that have been approved by the Engineer for exclusive use in TNSWTS during construction shall be used to measure average-daily volumes of non-storm water effluent discharge to the Pacific Ocean, and the average-daily volumes for each of the reuse options described in "Disposal" section of this special provision.

For every day when discharges occur from the TNSWTS and the Leach Water Treatment System described elsewhere in these special provisions, the Certified Technician shall record the flow-meter totalizer readings, and compute average daily volumes. The Discharge Records shall include:

A. Daily documentation of construction operation that could affect the quantity and quality of influent non-storm water discharge to the TNSWTS.
B. Flow meter totalizer readings including the computed average daily volumes that account for all the treated non-storm water discharges to the Pacific Ocean and the reuse options.
C. The Discharge Volume Records shall include calibration logs for the flow meters. All calibrations shall be done in conformance with the manufacturer's instructions in the presence of the Engineer.
D. Daily records of the mass of sediment accumulated in the pretreatment measures.
E. Daily records of the mass of sediment and solids accumulated in the TNSWTS and disposed off-site

Water Quality Monitoring Records (WQMR)

The Certified Technician shall conduct monitoring activities as described in "Monitoring and Reporting Program (MRP)" in the Permit. The Certified Technician shall conduct each monitoring event by collecting samples for analyses of parameters at the specified monitoring locations at a frequency described within the MRP section described in the Permit.

The Certified Technician shall include results of analyses and visual observations in the Water Quality Monitoring Records.

Monitoring Periods and Reporting Schedule

The Contractor shall be responsible for fully complying within "Reporting Requirements," as described in Attachment E in the Permit. The Certified Technician shall prepare Self Monitoring Reports (SMR) and Discharge Monitoring Reports (DMR) as required in the monitoring periods and reporting schedule described in Attachment E.

Attention is directed to "Submittals" in this section for the contents and the requirements for completing the SMR and DMR.

SUBMITTALS

The Contractor shall be responsible for preparing and submitting the following documents to the Engineer in accordance with the schedules described in this section:

1. Non-storm Water Discharge Control Plan (NSDCP)
2. Operations Plan (OP)
3. Coagulant Pollution Prevention Plan (CPP)
4. Blasting Plan (BP)
5. Self Monitoring Reports (SMR) and Discharge Monitoring Reports (DMR)
6. Data Summary Report (DSR)

As part of the non-storm water discharge control work, the Contractor shall prepare the submittals required in the Permit and as described in this section.

The submittals shall conform to the provisions in Section 7 1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manual, the requirements of the Permits, and these special provisions. Upon the Engineer's approval of the submittals, the submittals shall be considered to partially fulfill the provisions in Section 7 1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Storm Water Pollution Prevention Plan.

The Contractor shall assign a Professional Engineer certified in the State of California to: oversee the work of the Certified Technician, prepare the submittals required in this section, including the required modifications or amendments; oversee the TNSWTS operation and maintenance activities; be responsible for the implementation and adequate functioning of the components for the collection, conveyance, pretreatment, treatment and disposal from the TNSWTS in compliance with the Permit requirements.

The Professional Engineer shall furnish evidence of at least 10 years experience in treatment systems of comparable size and complexity as the TNSWTS, in the following areas including, but not limited to:

1. Selection of appropriate treatment technology for non-storm water treatment
2. Design and building of treatment systems
3. Trouble Shooting
4. Operations and Maintenance
5. Compliance Monitoring and Reporting
6. Safety and Hazard Operability Reviews

Evidence including, but not limited to project references, dates, names, phone numbers and color photographs shall be submitted to the Engineer.

The Contractor shall complete the required submittals within the time frames prescribed in this section. In order to allow construction activities to proceed, the Engineer may conditionally approve the submittals required in this section while minor revisions are being completed. In the event the Engineer fails to complete the review within the time allowed as required for each submittal and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for resulting losses, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Non-Storm Water Discharge Control Plan (NSDCP)

As part of the non-storm water discharge control work, the Contractor shall prepare a Non-Storm Water Discharge Control Plan (NSDCP). Non-storm water discharges shall not commence until the NSDCP has been approved by the Engineer. Approval shall not constitute a finding that the NSDCP complies with applicable requirements of the Permits, the Manuals and applicable Federal, State and local laws, regulations, and requirements.

The Certified Technician shall implement the NSDCP under the oversight of the Professional Engineer. The Water Pollution Control Manager as described in “Water Pollution Control” of these special provisions shall be the primary contact for issues related to the NSDCP or its implementation.

The NSDCP shall apply to the areas within and those outside of the highway right of way that are directly related to construction operations including, but not limited to, tunnel excavation, staging areas for the TNSWTS, and reuse of treated non-storm water.

Within 45 days after the approval of the contract, the Contractor shall submit 6 copies of the draft NSDCP to the Engineer. The Engineer will have 50 days to review the NSDCP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the NSDCP within 15 working days of receipt of the Engineer's comments. The Engineer will have 10 working days to review the revisions. Upon the Engineer's approval of the NSDCP, 6 approved copies of the NSDCP, incorporating the required changes, shall be submitted to the Engineer. The Contractor shall prepare an amendment to the NSDCP when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, or when the Contractor's activities or operations result in an exceedance of an effluent limitation or receiving water limitation, or when directed by the Engineer.

Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved NSDCP. Amendments to the NSDCP shall be prepared and submitted for review and approval within a time approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the NSDCP. At a minimum, the NSDCP shall be amended annually and submitted to the Engineer 45 days prior to the defined rainy season.

The Contractor shall keep one copy of the approved NSDCP along with the SWPPP and approved amendments at the project site. The NSDCP shall be made available upon request by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or the local storm water management agency. Requests by the public shall be directed to the Engineer.

The NSDCP shall incorporate all the items identified in the “Non-storm Water Discharge Control Cost Break Down” of this section.

The NSDCP shall be in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. At a minimum, the NSDCP shall include the following:

1. Title sheet
2. Table of contents
3. Certification and approval sheet (Section 100 of the SWPPP/WPCP Preparation Manual described in "Water Pollution Control" of these special provisions)
4. Amendment log & Amendment format (Section 200 of the SWPPP/WPCP Preparation Manual described in "Water Pollution Control" of these special provisions)
5. Organization of the NSDCP

REFERENCES

6. References: Provide specific information about how documents are to be utilized in coordination with the NSDCP.
7. Project Description that includes project background, site information including topography site hydrology, geology, construction operations, sequence and schedule, TNSWTS staging area, discharge locations and reuse options described in "Disposal" section of this special provision.

NON-STORM WATER QUANTITY AND QUALITY ASSESSMENT

8. The Contractor's NSDCP shall provide narrative descriptions of the construction operations that require non-storm water discharge control. The narratives shall also include, but not be limited to, an estimate of the discharge volume, flow rate, frequency of discharge.
9. Estimation of non-storm water flow rate, and quality assessment. Provide estimated non-storm water flows and a non-storm water quality assessment that includes description of all construction operations, materials used, pollutants generated from the tunnel excavation.

PERMIT REQUIREMENTS

10. Description of the permit requirements including the Discharge Prohibitions; Effluent and Receiving Water Limitations listed in the Permit
11. Description of Monitoring and Reporting Program and a Sampling and Analysis Plan
12. Provide detailed information on how the monitoring data will be used to maintain TNSWTS in operational compliance. Provide information on method for updating and storing operational records.
13. Samples of Transmittal Cover Letter, SMR, DMR, DIR, DVR, WQMR and Non-Compliance Report (NCR)

SELECTION OF TREATMENT TECHNOLOGY.

14. Provide information collection and conveyance system
15. Description of the rationale for selection of treatment technologies for pretreatment, treatment and disposal of non-storm water and reuse options.
16. Description of pretreatment and treatment technologies and the process sequence.
17. Non-Storm Water Discharge Control Cost Breakdown

DESIGN INFORMATION

18. Design calculations for sizing the collection and conveyance systems, pretreatment measures and treatment technologies and the reuse options for disposal.
19. Provide information, including shop plans and sectional views, showing how the components of the TNSWTS are sized and connected. This section shall include plans showing the location of the TNSWTS relative to drainage features, aquatic resources, and pump system sizing calculations. Plans and working drawings shall be submitted in accordance with "Working Drawings" of these special provisions. The NSDCP shall graphically depict the dewatering process in plan and sectional views detailing the control practices for pH adjustment, removal techniques for suspended solids, turbidity, and other pollutants anticipated in the non-stormwater influent. The NSDCP shall define the flow path and placement of pipes, hoses, pumps, and other equipment used to convey the discharge to the locations required in the Permit or the feasible reuse options.
20. Equipment specifications, operational flow rates, chemical dosing rates, and monitoring equipment as applicable.

TNSWTS OPERATION, MAINTENANCE AND CONTINGENCY PLAN

21. Description of a step-by-step procedure the TNSWTS operator will follow during system start-up, routine operation, monitoring and shutdown. Identify special procedures to be followed during periods of extreme weather and extended system shutdown.
22. Description of a step-by-step procedure the TNSWTS operator will follow when intentional diversion or bypass of non-storm water discharges is required; preparation of notification of anticipated and unanticipated bypasses to the Engineer.

23. Description of a step-by-step procedure the TNSWTS operator will follow when TNSWTS upset occurs or an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Certified Technician
24. Description of emergency overflow elements of the TNSWTS.
25. Description of procedures for chemical handling, containment and storage of chemicals.
26. Describe security and safety measures to be installed and maintained as part of the TNSWTS.
27. Provide step-by-step procedures when (1) pH or turbidity of influent is outside of operational range of TNSWTS or Water Quality Requirements, (2) inflows exceed capacity of the TNSWTS, and (3) additional pre-treatment is required (if influent turbidity exceeds 600 NTUs).
28. Describe situations requiring immediate system shutdown. Outline notification procedures and provide name and phone number(s) of the individual(s) responsible for contacting the Engineer in the event that a discharge from the TNSWTS is out of compliance including actions to be taken should any part of the operation result in damage to vegetation, erosion of existing soils, and/or receiving water bodies.
29. Describe contingency strategies in the event that the system becomes inoperable.

DISPOSAL OF TREATED NON-STORMWATER

30. Provide location information of discharge point(s) from the TNSWTS and their proximity to natural water bodies and sensitive areas. Provide detailed drawings of discharge systems.
31. Justification for reuse options that are considered unfeasible on a daily basis.
32. Water balance calculations including volume of influent non-storm water to the treatment system per day, treated non-storm water reused on-site and volume of treated water discharged to the designated locations 001 and 002 as described in "Disposal" of this section. This information shall be included in a Daily Water Balance Report (DWBR) which shall also include description of daily construction activity and location with stationing.

SUBMITTALS

33. Operations Plan (OP).
34. Coagulant Prevention Plan (CPP).
35. Blasting Plan (BP)
36. Data Summary Report: DWBR; DIR; DVR; WQMR; SMR; DMR and NCR approved by the Engineer
37. Spill Contingency Plan

Upon approval of the NSDCP by the Engineer, the Contractor shall be responsible for implementing the NSDCP. The Contractor shall be responsible for updating the project's NSDCP to reflect all changes associated with the TNSWTS.

Operations Plan (OP)

The Contractor shall prepare and submit an Operations Plan (OP) to the Engineer for approval. The Contractor shall describe in the OP, the adjusting and testing procedures that will be used to calibrate the TNSWTS. The Contractor shall identify in the OP, procedures designed to prevent violations and the shortest time period necessary for adjusting and testing, not to exceed 30 days.

Concurrently with the NSDCP submittal, the Contractor shall submit 6 copies of the draft OP to the Engineer. The Engineer will have 50 days to review the OP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the OP within 15 working days of receipt of the Engineer's comments. The Engineer will have 10 working days to review the revisions. Upon the Engineer's approval of the OP, 6 approved copies of the OP, incorporating the required changes, shall be submitted to the Engineer.

Coagulant Prevention Plan (CPP)

The Contractor shall prepare and submit a Coagulant Prevention Plan (CPP) to the Engineer for approval. The Contractor shall describe in the CPP, the best management practices (BMPs) to prevent accidental spillage, overfeeding into the TNSWTS, or other mishandling of coagulant agents; and, a monitoring plan for all coagulants to be used.

Concurrently with the NSDCP submittal, the Contractor shall submit 6 copies of the draft CPP to the Engineer. The Engineer will have 50 days to review the CPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the CPP within 15 working days of receipt of the Engineer's comments. The Engineer will have 10 working days to review the revisions. Upon the Engineer's approval of the CPP, 6 approved copies of the CPP, incorporating the required changes, shall be submitted to the Engineer.

Blasting Plan (BP)

Attention is directed to "Blasting," of these special provisions for requirements related to the preparation and submittal of a Blasting Plan.

Self Monitoring Reports (SMR)

The Certified Technician shall prepare Self Monitoring Reports (SMR) to report results for all monitoring specified in the Monitoring and Reporting Program (MRP) in Attachment E under sections III through IX of the Permit.

The Contractor shall submit the SMR complying with all requirements in Attachment E, section X of the Permit to complete the SMR, including but not limited to:

1. General Monitoring and Reporting Requirements
2. Self Monitoring Reports (SMRs)
3. Monitoring and Reporting Schedule
4. Reporting Protocols
5. Discharge Monitoring Reports (DMRs)

Quarterly Self Monitoring Reports

The Contractor shall submit Quarterly Self Monitoring Reports (SMR) to the Engineer on a calendar quarter basis, not later than 15 days following the last day of the quarter. The reports shall be comprised of the following information, including, but not limited to:

A. A letter transmitting self monitoring reports should accompany each report. Such a letter shall include:

i. Identification of all violations of the Permit found during the reporting period, including the date of occurrence and date of determination for each violation,
ii. Details of the magnitude, frequency, and dates of all violations,
iii. The cause of the violations,
iv. Discussion of the corrective actions taken or planned and the time schedule for completion.
v. A signature from the Contractor's principal executive officer, or duly authorized representative of that person, along with the following certification: "I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

B. Compliance Evaluation Summary: The report format shall be acceptable to the Engineer. These reports shall also include a description of operation and maintenance (O&M) of the collection and conveyance, pretreatment measures and TNSWTS consistent with the O&M manual available to all personnel who are responsible for operation and maintenance activities.

C. Map or Aerial Photograph: A map or aerial photograph shall accompany the report showing sampling and observation station locations.

D. Visual Observations and Water Quality Monitoring Records

E. Monitoring data in a tabular format including results of laboratory analysis, effluent limitations and receiving water limitations, reporting limits to clearly illustrate whether the TNSWTS is operating in compliance.

F. Continuous pH and turbidity Monitoring records.

F. Discharge Volume Records.

G. Operation Status: Summary of treatment system status during the reporting period (e.g. in operation/on standby) and reason(s) for non-routine treatment system shut down. Any notifications of bypass, upset or planned changes shall also be included.

The Contractor shall submit any additional monitoring data collected more frequently than required in the Permit, and shall include the results in the calculations and data reported in the SMR.

Semi-Annual and Annual Self-Monitoring Report

The Certified Technician shall prepare and the Contractor shall submit the Semi-Annual Report and the Annual Report to the Engineer not later than 30 days following the last day of the quarter. The Engineer shall have 15 days to review and provide comments to the Contractor. The Contractor shall have 15 days to incorporate the comments and submit 3 copies of the final Annual Report.

The second quarter SMR shall be combined with the semi-annual report. The fourth quarter SMR shall be combined with the Annual Report.

The report shall contain tabular summary of the monitoring data obtained during the previous year. In addition, the report shall contain a comprehensive discussion of the compliance record and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.

Data Summary Report

Upon completion of the non-storm water discharge activities, a Data Summary Report shall be submitted to the Engineer 30 days after the end of non-storm water discharge activities. This report shall summarize all Physical Observations, Discharge Volume Records, Water Quality Monitoring Records, SMR, DMR, and NCRs described elsewhere in this section.

NON-STORM WATER DISCHARGE CONROL COST BREAKDOWN

The Contractor shall include a Non-Storm Water Discharge Control Cost Break Down in the NSDCP, which itemizes the contract lump sum for Non-Storm Water Discharge Control work. The Contractor shall use the Non-Storm Water Discharge Control Cost Break Down provided in this section as the basis for the cost break-down submitted with the NSDCP. The Contractor shall use the Non-Storm Water Discharge Control Cost Break Down to identify items, quantities and values for Non-Storm Water Discharge Control work. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break down submitted with the NSDCP. Partial payment for the item of non-storm water discharge control will not be made until the Non-Storm Water Discharge Control Cost Break Down is approved by the Engineer.

In the Non-Storm Water Discharge Control Cost Break Down submitted with the NSDCP, the Contractor shall list only those items selected for the project, including quantities and values required to complete the work for those items.

The sum of the amounts for the items of work listed in the Non-Storm Water Discharge Control Cost Break Down shall be equal to the contract lump sum price bid for Non-Storm Water Discharge Control. Overhead and profit, except for time related overhead, shall be included in the individual items listed in the cost break down.

Non-Storm Water Discharge Control Cost Break Down
Contract No. 04-1123U4

ITEM DESCRIPTION	Unit	Quantity	Value	Amount
Prepare Non-Storm Water Discharge Control Plan (NSDCP)	LS	Lump Sum	Lump Sum	
Collection and Conveyance System	LS	Lump Sum	Lump Sum	
Pretreatment Measures and Disposal of Sediment	LS	Lump Sum	Lump Sum	
Non-storm Water Treatment System (TNSWTS)	EA	1		
TNSWTS Operation and, Maintenance	LS	Lump Sum	Lump Sum	
Monitoring and Reporting Program Implementation including preparation of SMRs, DMRs, Notifications, NCR and Data Summary Report	LS	Lump Sum	Lump Sum	
Disposal and Reuse of Treated Non-storm Water	LS	Lump Sum	Lump Sum	
Handling and Disposal of Solids from the TNSWTS	LS	Lump Sum	Lump Sum	
Preparation of Operations Plan (OP)	LS	Lump Sum	Lump Sum	
Preparation of Coagulant Prevention Plan (CPP)	LS	Lump Sum	Lump Sum	
Total				

Adjustments in the items of work and quantities listed in the approved cost break down shall be made when required to address amendments to the NSDCP, except when the adjusted items are paid for as extra work.

No adjustment in compensation will be made to the contract lump sum price paid for Non-Storm Water Discharge Control due to differences between the quantities shown in the approved cost break down and the quantities required to complete the work as shown on the approved NSDCP. No adjustment in compensation will be made for ordered changes to correct NSDCP work resulting from the Contractor's own operations or from the Contractor's negligence.

The approved cost break down will be used to determine partial payments during the progress of the work and as the basis for calculating the adjustment in compensation for the item of non-stormwater discharge control due to increases or decreases of quantities ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down item, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4 1.03B, "Increased or Decreased Quantities," of the Standard Specifications. If an ordered change requires a new item which is not on the approved cost break down, the adjustment in compensation will be determined in the same manner specified for extra work in conformance with Section 4 1.03D, "Extra Work," of the Standard Specifications.

If requested by the Contractor and approved by the Engineer, changes to the items listed in the approved cost break-down, including addition of new water pollution control practices, will be allowed. Changes shall be included in the approved amendment of the NSDCP. If the requested changes result in a net cost increase to the lump sum price for non-storm water discharge control, an adjustment in compensation will be made without change to the non-storm water discharge control item. The net cost increase to the water pollution control item will be paid for as extra work as provided in Section 4 1.03D, "Extra Work," of the Standard Specifications.

Spill Contingency

The Contractor shall prepare and submit to the Engineer a Spill Contingency Plan concurrently with the NSDCP, described in this section for the management of spills or leaks of any materials or wastes that may impact the water quality of the receiving water body.

The contingency plan shall include instructions and procedures for preventing spills, reporting spills, and a list of spill containment and collection materials and equipment to be maintained onsite. The contingency plan shall be reviewed and updated as directed by the Engineer.

If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited where it is, or probably will be discharged in or on any receiving waters, the discharger shall report such a discharge to the Engineer, at (510) 622-2300 on weekdays during office hours from 8 a.m. to 12 p.m. and 1 p.m. to 5 p.m., and to the Office of Emergency Services at (800) 852 7550 during non office hours. A written report shall be filed with the Engineer within two (2) working days and shall contain information relative to:

A. Nature of waste or pollutant,
B. Quantity involved,
C. Duration of incident,
D. Cause of spilling,
E. Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any,
F. Estimated size of affected area,
G. Nature of effects (i.e., fish kill, discoloration of receiving water, etc.),
H. Corrective measures that have been taken or planned, and a schedule of these activities, and
I. Persons/agencies notified.

Liquids, Residues, And Debris

The Contractor shall not allow for any slurries, liquids, residues and debris associated with the operations to cause contamination of the soil to be disposed off at the Disposal Site. The control and disposal of the liquids, residues, and debris shall be described within the NSDCP. The NSDCP shall, at a minimum, depict and describe the procedural and structural methods of detaining, collecting, and disposing of all slurries, liquids, residues, and debris associated with the operations.

Attention is directed to “Explosive Materials”, “Delivery Storage and Handling”, “Blasting” in Section 6-8.01 “Blasting,” for selection, delivery, storage and handling of explosive material, and spill prevention procedures. The Contractor shall prevent any spillage of explosive material from commingling with non-storm water or storm water.

Redundancy shall be incorporated into the procedural and structural methods such that the liquids, residues, and debris are not conveyed into or become present in receiving waters, drainage systems, or other water bodies.

No adjustment in compensation will be made for ordered changes to correct NSDCP work resulting from the Contractor's own operations or from the Contractor's negligence.

Full compensation for conforming to “Spill Contingency” and “Liquids, Residues, And Debris” shall be considered as included in the prices paid for the various contract items of work affected by this section and no additional compensation will be allowed therefor.

PAYMENT

The contract lump sum price paid for non-storm water discharge control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in non-storm water discharge control, complete in place, including preparing and amending the NSDCP; conforming to the requirements of the approved NSDCP including the submittals required in this section, except for Blasting Plan; furnishing, installing, operating, maintaining, and removing all components of the collection and conveyance system, pretreatment measures, and the TNSWTS; providing power to operate all equipment; collecting, conveying, treating, disposing and reusing treated non-storm water, including off-site disposal of solids removed from the TNSWTS and additional monitoring of solids required for off-site disposal; consumables including but not limited to chemicals used in the various components of the treatment system; implementing the TNSWTS Operation, Maintenance and Contingency Plan; implementing the MRP including sample collection, laboratory analysis, preparing and submitting the monitoring reports, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.56 ASPHALT CONCRETE

GENERAL

Asphalt concrete shall be Type A and Open Graded and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

Open graded asphalt concrete may be placed when the atmospheric temperature is below 20°C, but above 10°C, provided the following requirements are met:

A. Open graded asphalt concrete shall not be placed in a windrow or stockpile. Open graded asphalt concrete shall be transferred directly from the hauling vehicle to the asphalt paver hopper.
B. Immediately prior to adding the asphalt binder to the open graded asphalt concrete mixture, the temperature of the aggregate shall be not more than 163°C. Open graded asphalt concrete shall be spread at a temperature of not less than 135°C measured in the hopper in the asphalt paver.
C. The compaction operation shall be such that the maximum distance between the asphalt paver and the initial breakdown rolling shall be no greater than 15 m.
D. During the placement of open graded asphalt concrete, the speed of the asphalt paver shall not exceed 10 m per minute.
E. The Contractor shall cover loads of open graded asphalt concrete with tarpaulins. The tarpaulins shall completely cover exposed open graded asphalt concrete in the hauling vehicle until the open graded asphalt concrete has been completely transferred into the asphalt paver hopper.

The grade of asphalt binder to be mixed with aggregate for Type A asphalt concrete shall be Grade PG 64-10 conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications.

The grade of asphalt binder to be mixed with aggregate for Type Open Graded asphalt concrete shall be PBA Grade 6A conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications.

The grade of asphalt binder to be mixed with aggregate for Type Dikes asphalt concrete shall be Grade PG 70-10 conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications.

The amount of asphalt binder used in asphalt concrete placed in dikes, gutters, gutter flares, overside drains and aprons at the ends of drainage structures shall be increased one percent by mass of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way.

Open graded asphalt concrete shall not be less than 50 mm in compacted thickness.

A minimum of 90% of the aggregate for the 25-mm open graded asphalt concrete shall have a minimum of two mechanically, freshly-fractured faces as determined by the California Test Method 205.

The aggregate for Type Open Graded to the following grading

Sieve Sizes	Percentage Passing
37.5-mm	100
25-mm	99 - 100
19-mm	85 - 96
12.5-mm	55 - 71
4.75-mm	10 - 25
2.36-mm	6 - 16
75-µm	1 - 6

The asphalt content of the asphalt mixture will be determined in conformance with the requirements in California Test 379, or in conformance with the requirements in California Test 382.

When portland cement concrete is placed on asphalt concrete Type A, the finished surface of the asphalt concrete Type A shall not extend above the grade established by the Engineer. Asphalt concrete Type A with a surface higher than the grade established by the Engineer shall be cold planed until the surface of asphalt concrete Type A conforms to the tolerances specified. Cold planing equipment shall be power driven and specifically designed to produce a smooth surface that conforms to the straight edge requirements specified in Section 39-6.03, "Compacting" of the Standard Specifications. Asphalt concrete Type A with a surface lower than 15 mm below the grade established by the Engineer shall be removed and replaced with asphalt concrete Type A which complies with requirements of these specifications.

The Contractor may produce asphalt concrete using reclaimed asphalt pavement (RAP). Asphalt concrete produced using RAP shall conform to the provisions for asphalt concrete in this section, "Asphalt Concrete," and these special provisions. The Contractor may substitute RAP for a portion of the virgin aggregate in asphalt concrete in an amount not exceeding 15 percent of the asphalt concrete dry aggregate mass.

RAP shall be processed from asphalt concrete removed from pavement surfaces. RAP shall be stored in stockpiles on smooth surfaces free of debris and organic material. RAP stockpiles shall consist only of homogeneous RAP. The Contractor may process and stockpile RAP throughout the project's life. Processing and stockpiling operations shall prevent material contamination and segregation.

The Contractor shall determine the amount of asphalt binder to be mixed with the combined virgin aggregate and RAP in conformance with California Test 367 amended by Lab Procedure-9 (LP-9), "Asphalt Concrete Using Up To 15% Reclaimed Asphalt Pavement (RAP)." LP-9 is available at:

http://www.dot.ca.gov/hq/esc/Translab/fpmlab.htm

At least 3 weeks before starting production of asphalt concrete using RAP, the Contractor shall submit a proposed asphalt concrete mix design in writing to the Engineer. The mix design submittal shall consist of the following:

A. RAP:

1. Processed stockpile locations.
2. LP-9 test results.
3. Correlation factor for aggregate gradations from California Test 382 and LP-9.
4. Three 32-kg samples of processed RAP representing the material to be used. The three samples shall be split from the sample the Contractor uses to determine the mix design. The Contractor shall obtain and split the samples in conformance with the requirements in California Test 125 and LP-9.
5. The substitution rate for virgin aggregate and percent RAP.

B. Virgin aggregate and supplemental fine aggregate blend:

1. Percent passing values for each sieve size.
2. Aggregate quality tests results.
3. Each aggregate source to be used including producer, location, and California Mine Identification number.
4. Percentage of each aggregate stockpile, cold feed, and hot bin to be used.
5. Gradation of each aggregate stockpile, cold feed, and hot bin to be used.

C. Asphalt binder:

1. Source.
2. Material Safety Data Sheets.

D. Antistrip additives**,** if used:

1. Name of product.
2. Name of manufacturer.
3. Proposed rate.
4. Location and method of addition.
5. Material Safety Data Sheets.

E. Asphalt concrete:

A. A completed mix design that reflects the percent of RAP to be used including the electronic worksheet identified in LP-9.
B. In graphical format, stability and air voids versus asphalt binder percentage of asphalt in conformance with the requirements in CTM 367.

Asphalt concrete production using RAP shall not begin until the Engineer approves the mix design. If the Engineer fails to review the mix design in 3 weeks, and if, in the opinion of the Engineer, work completion is delayed as a result of the failure to review, the Engineer will adjust payment and contract time in conformance with the requirements in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

If proposing a change in the RAP substitution rate, the Contractor shall notify the Engineer. If the substitution rate changes more than 5 percent by dry aggregate mass in the asphalt concrete mixture, the Contractor shall submit a new mix design.

The aggregate gradation for the asphalt concrete produced with RAP shall be calculated based on the mathematical combination of the virgin aggregate gradation during production and the daily RAP gradation. RAP shall be sampled and gradation shall be determined in conformance with the requirements in LP-9. RAP gradations shall be:

A. Determined daily by the Contractor.
B. Used for the mathematical combination of that day's asphalt concrete production.
C. Reported to the Engineer.

The Contractor shall perform quality control testing of the RAP source each day asphalt concrete using RAP is produced.

The Contractor shall perform quality control testing of the aggregates and the asphalt concrete mixture at least once for every 1000 tonnes of asphalt concrete using RAP produced, but not less than 2 tests per day.

Daily, the Contractor shall submit to the Engineer:

A. Results for RAP gradation and the asphalt binder content in RAP determined in conformance with the requirements in LP-9.
B. Virgin aggregate gradation.
C. Mathematical calculation of the gradation of the virgin aggregate and RAP aggregate blend.
D. Correlation factor for RAP burn-off determined in conformance with the requirements in LP-9.
E. The asphalt concrete mixture's asphalt binder content for that day.

RAP proportioning shall conform to the provisions for aggregate proportioning specified in Section 39-3.03, "Proportioning," of the Standard Specifications and these special provisions. The Contractor's mixing equipment shall have a device that safely provides a sample representative of the virgin aggregate and RAP incorporated into the asphalt concrete. The Contractor shall sample in conformance with the requirements in California Test 125 and LP-9.

The temperature of asphalt concrete using RAP shall not exceed 165°C.

If batch mixing is used, RAP shall be kept separate from the virgin aggregate until both ingredients enter the weighhopper or pugmill. After introduction to the pugmill and before asphalt binder is added, the mixing time for the virgin aggregate and RAP shall not be less than 5 seconds. After asphalt binder is added, the mixing time shall not be less than 30 seconds.

If continuous mixing is used, the RAP shall be protected from direct contact with the burner flame with a device such as a shield, separator, or second drum.

PAINT BINDER (TACK COAT)

Paint binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of asphalt concrete, except when eliminated by the Engineer.

Paint binder (tack coat) shall be, at the option of the Contractor, either slow-setting asphaltic emulsion, rapid-setting asphaltic emulsion or paving asphalt. Slow-setting asphaltic emulsion and rapid-setting asphaltic emulsion shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications. When paving asphalt is used for paint binder, the grade will be determined by the Engineer. Paving asphalt shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 92, "Asphalts," of the Standard Specifications.

Paint binder (tack coat) shall be applied in the gallon per square yard range limits specified for the surfaces to receive asphalt concrete in the tables below. The exact application rate within the range will be determined by the Engineer.

Application Rates for Asphaltic Emulsion Paint Binder (Tack Coat) on Asphalt Concrete (except Open Graded) and on Portland Cement Concrete Pavement (PCCP)		
Type of surface to receive paint binder (tack coat)	Slow-Setting Asphaltic Emulsion L/m^2(Note A)	Rapid-Setting Asphaltic Emulsion L/m^2(Note B)
Dense, compact surfaces, between layers, and on PCCP	0.20 – 0.35	0.10 – 0.20
Open textured, or dry, aged surfaces	0.35 – 0.90	0.20 – 0.40

Note A: Slow-setting asphaltic emulsion is asphaltic emulsion diluted with additional water. Water shall be added and mixed with the asphaltic emulsion (containing up to 43 percent water) so the resulting mixture contains one part asphaltic emulsion and not more than one part added water. The water shall be added by the emulsion producer or at a facility that has the capability to mix or agitate the combined blend.
Note B: Undiluted rapid-setting asphaltic emulsion.

Application Rates for Paint Binder (Tack Coat) on Asphalt Concrete (except Open Graded) and on Portland Cement Concrete Pavement (PCCP)	
Type of surface to receive paint binder (tack coat)	Paving Asphalt L/m^2
Dense, compact surfaces, between layers, and on PCCP	0.05 – 0.10
Open textured, or dry, aged surfaces	0.10 – 0.25

Application Rates for Asphaltic Emulsion Paint Binder (Tack Coat) on Open Graded Asphalt Concrete		
Type of surface to receive paint binder (tack coat)	Slow-Setting Asphaltic Emulsion L/m^2(Note A)	Rapid-setting Asphaltic Emulsion L/m^2(Note B)
Dense, compact surfaces and between layers	0.25 – 0.50	0.10 – 0.25
Open textured, or dry, aged surfaces	0.50 – 1.10	0.25 – 0.55

Note A: Slow-setting asphaltic emulsion is asphaltic emulsion diluted with additional water. Water shall be added and mixed with the asphaltic emulsion (containing up to 43 percent water) so the resulting mixture contains one part asphaltic emulsion and not more than one part added water. The water shall be added by the emulsion producer or at a facility that has the capability to mix or agitate the combined blend.
Note B: Undiluted rapid-setting asphaltic emulsion.

Application Rates for Paint Binder (Tack Coat) on Open Graded Asphalt Concrete	
Type of surface to receive paint binder (tack coat)	Paving Asphalt L/m^2
Dense, compact surfaces and between layers	0.05 – 0.15
Open textured, or dry, aged surfaces	0.15 – 0.30

When asphaltic emulsion is used as paint binder (tack coat), asphalt concrete shall not be placed until the applied asphaltic emulsion has completely changed color from brown to black.

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

Shoulder or median borders adjacent to a lane being paved shall be surfaced prior to opening the lane to traffic.

10-5.08 LEACH WATER SYSTEM AND CARBON DIOXIDE STORAGE TANK

GENERAL

This work shall include a pre-engineered water treatment system and equipment using carbon dioxide as the primary treatment fluid for reducing the alkalinity of the post tunnel construction leach water to acceptable standards prior to discharge to a detention basin.

During tunnel construction operations, all suspended solid content in the leached water and alkalinity shall be treated at the TemporaryNon-Storm Water Treatment System (TNSWTS), as described elsewhere in these special provisions. All post tunnel construction leached water 60 milligrams/liter (mg/l) and less shall be conveyed to the Leach Water Treatment system for alkalinity treatment and disposal.

Attention is directed to “Relations With California Regional Water Quality Control Board” of these special provisions. The California Regional Water Quality Control Board Region 2, San Francisco Bay Region (RWQCB) has issued a permit to the Department, which governs treated ground water discharges from the Leach Water Treatment System described in this section.

The Department's permit is titled: "Final Order No. R2-2006-0049, NPDES Permit No. CA0038831 for the Devil's Slide Tunnel Project", is hereafter referred to as the “Permit” in this section. The Contractor shall be responsible for fully complying with all the sections of this Permit.

Attention is directed to "Non-Storm Water Discharge Control," of these special provisions for the contents of the Storm Water Information Handout which contains the Permit and the Ocean Plan.

As soon as leached ground water is available from the tunnel site, it shall be tested as required in the Monitoring and Reporting Program (MRP) section in "Non-Storm Water Discharge Control," of these special provisions. The MRP requires monitoring of influent and effluent discharges from the Leach Water Treatment System.

SUMMARY

Scope.--Leach water system and carbon dioxide storage tank shall consist of furnishing and installing a three stage leach water treatment system including treatment tanks, mixers, circulation pumps, and carbon dioxide delivery system, accessory piping and valves, metering, and monitoring and control system, in conformance with the details shown on the plans and the requirements specified in these special provisions. The first two stages shall consist of primary and secondary treatment while the third and final stage shall consist of the monitoring and recording functions.

The carbon dioxide storage tank shall consist of insulated tank, tank accessories, piping, refrigeration unit, and vaporizer.

The scope of work shall include demonstration and training in the operation of the treatment system as described in "Mechanical Materials and Methods" of these special provisions.

QUALITY ASSURANCE

All components of the pH adjustment system shall be free of defects. Any defects or design flaws shall be corrected by the manufacturer prior to acceptance of the unit.

The pre-engineered system designer shall provide a system that will handle the flows and chemistries. The system shall be capable of handling flows from 0 L/s to 63 L/s and field encountered influent chemistries.

Factory tests shall be performed on the major system components in accordance with the applicable pump, valve and agitator standard, and results shall be submitted in writing.

Field tests shall be performed as specified in these special provisions, and results shall be submitted in writing.

Manufacturer's seismic qualification certification: The Contractor shall submit certification that leach water treatment system and components will withstand seismic forces in conformance with the provisions in "Mechanical Vibration Controls and Seismic Restraints" of these special provisions. The submitted information shall include the following:

A. Basis for certification: indicate whether withstand certification is based on actual test of assembled components or on calculation.
B. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

SUBMITTALS

The Contractor shall submit working drawings in conformance with the details shown on the plans and with the provisions in Section 5-1.02, "Plans and Working Drawings" of the Standard Specifications and the requirements specified in these special provisions.

Product Data.--Component product data to be submitted shall include the following:

A. Manufacturers' technical data, including rated capacities, operating characteristics, furnished specialties, and accessories for complete leach water treatment system. Include manufacturer's catalog cuts and certificates of conformance for the following items:

    1. Treatment tanks.
    2. Mixers.
    3. Circulation pumps.
    4. Pipe and fittings.
    5. Joints and couplings (including gaskets).
    6. Valves.
    7. Flow switches.
    8. Gauges.
    9. Water meters.
    10. pH control devices.
    11. Main control panel.
    12. Treatment service support skid.
    13. Carbon dioxide storage tank with refrigeration and vaporizer unit.

B. Factory test reports.
C. Field quality control test reports.
D. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
E. Operation and maintenance manuals shall include the following;

    1. Data and detailed drawings for all equipment components and parts.
    2. Written sequence of operation on an annual basis for the application as required to achieve the water quality specified in these special provisions.

Working Drawings.--Working drawings shall include complete details, information, and drawings for the leach water system. The working drawings shall include the following:

A. Field erection drawings showing complete and accurate information and dimensioned layout of all components of the leach water treatment system, including tanks and skid-mounted components, piping layout, complete with locations of all supports. The field erection drawings shall include plans, elevations, sections, details, attachments to other work, and maintenance space required. The drawings shall include numbers on match marked components, for ease of identification in the field.
B. Dimensioned outline drawings of equipment unit: Identify center of gravity and locate and describe mounting and anchorage provisions for the treatment tanks, carbon dioxide tank, and skid-mounted equipment.
C. Schematic flow diagram of entire system complete with component parts list and all instruments and instrument locations shown on the plans and specified in these special provisions.

Product Delivery, Storage, and Handling.--Damaged products shall be removed from the job site and replaced with new products. Products shall be stored safe from damage or deterioration, keeping the interior of pipe, fittings, valves, and appurtenances free from dirt or foreign matter. Valves shall be drained and stored in a manner that will protect valves from damage by freezing. Gaskets, plastic pipe and fittings, and other products, which will be deteriorated by sunlight, shall be stored in a cool location, out of direct sunlight. Gaskets shall not come in contact with petroleum products.

PRODUCTS

Leach Water Treatment System Description.--System shall consist of 2-stage treatment system and final stage effluent monitoring system. The first stage is a coarse adjustment stage that shall neutralize most, if not all of the influent alkalinity while the second stage shall be designed to be a fine tune stage, and a stabilization stage filtering oscillations from the first stage. The second stage shall act as a primary treatment step if the pH adjustment system within the first stage either fail or be shutdown for service. Both stages shall employ a pH control algorithm providing feed-back control based upon a programmed titration curve, absolute value of pH, and pH rate of change. Linear control algorithms such as Proportional Integral Derivative (PID) loops shall not be employed. The final stage is a final effluent monitoring system that shall measure the effluent flow and the pH level using an independent pH probe, on a circular chart recorder.

The system shall be configured to use carbon dioxide and shall allow for mineral acid as a supplement, if carbon dioxide tank refills are determined to be required more than once a week.

As soon as leached ground water is available from the tunnel site for titration testing, the treatment equipment supplier shall arrange for testing to determine the anticipated carbon dioxide usage.

If after the titration tests it is determined that supplementary acid treatment will be required, the equipment manufacturer shall design and provide the supplementary on site acid holding tank, covered structure, containment structure and associated pump and piping in complete compliance with all the State of California safety regulations. The supplementary acid holding tank, if required, shall be located within the confines of the retaining wall and traffic protection bollards as shown on the plans.

The supplementary acid treatment system shall be capable of controlling up to 4 chemical injection pumps or a combination of up to 8 CO2 spargers and chemical injection pumps. There shall be controls for two bulk chemical addition pumps for the first stage and for two bulk chemical addition pumps for the second stage. The controls and piping for the 4 mineral acid injection systems, each having a standby pump, shall be put to use when the need for supplementary mineral acid is determined by the pH monitoring and control system. This configuration shall allow for bidirectional pH control using either carbon dioxide or mineral acids.

An independent six slope curve for each metering (acid injection) pump shall be user defined to fit the titration curve for the waste stream to be treated. The response curve shall be defined in the field by the operator, via the use of the OIU.

This supplementary acid injection system, when ordered by the Engineer, will be paid for as extra work as provided in Section 4 l.03D, "Extra Work," of the Standard Specifications.

Performance Requirements.--The system shall be capable of accepting water flow at a rate that varies from zero to 63 L/s without interrupting incoming flow. Flow versus influent chemistry handling capability of the system shall be as follows:

Flow	pH	Alkalinity
83L/s	pH < 12.5	<25 mg/L
63 L/s	pH < 11.0	<50 mg/L
32 L/s	< 13.0	<500 mg/L

Effluent aggregate of the waste stream shall be primarily alkaline. The waste stream temperature shall range from 15.5°C to 40°C.

The pH of the effluent stream shall be between 6.5 and 8.5. Stability of the waste stream shall be demonstrated prior to purge to the detention pond. The discharge range shall be user configurable and variable from 0-14 pH units. The stability time measurement shall also be user configurable.

The effluent monitoring stage shall continuously monitor and record the flow rate and pH of the system discharge. The system shall be equipped with a flow totalizer and pH alarms. The final effluent measuring probe shall be independent of the primary treatment pH probe and shall be continuously monitored by the control system. In the event that the effluent pH exceeds the user defined effluent alarm setpoints, the system discharge shall be halted until the pH is back within the acceptable range.

When system effluent discharge is halted due to high set point alarm or any other malfunction of the treatment plant, electric operated butterfly valves provided on the influent side of the system, shall divert influent water to the emergency sump until the malfunction is fixed and the system reset to operate in normal treatment mode. See plans and leach water flow diagram.

Recirculation pumps shall be duplex pairs with automatic failure detection and backup. If one pump fails, it shall be detected and the process shall not be interrupted.

System Components.--The entire system with the exception of the two treatment tanks and carbon dioxide tank shall be skid mounted, and shall be supplied as a completely fabricated, pre-piped, pre-wired and tested system. The major components on the treatment service support skid will be the Main Control Panel (MCP), recirculation pumps, and the carbon dioxide distribution and metering system. All components shall be sized by the leach water treatment system designer and system integrator to achieve water quality requirements.

Treatment Tanks.--The treatment tanks shall be vertical cylindrical Fiberglass Reinforced Plastic (FRP) with flat bottom and flat tops. The tanks covers shall be integral to the tank and shall be equipped with mixer bridges, all required ports and a 610 mm manway. The first stage tank shall be 22,710 liter with dimensions of 2,590 mm x 4,620 mm high; while the second stage shall be 37,850 liters with dimensions of 3,580 mm x 4,040 mm high. Influent shall flow into the top of the first stage, down through the first stage exiting the bottom and gravity flowing to the bottom of the second stage; influent continues up through the second stage and finally out through a top mounted discharge port. Tank connections shall be flanged. Hold down lugs shall be provided on all vertical flat bottom tanks. The design, number, and attachment of the lugs shall be the responsibility of the fabricator, based on the wind and seismic loads specified for California Zone 4.

Agitator/Mixers.--The mixers shall be gear reduced propeller-type mixers, 316 stainless steel construction, sized to provide 1.5 tank turns per minute of agitation.

Recirculating Pumps.--The two (2) first stage and two (2) second stage recirculation pumps shall be horizontal centrifugal pumps, each supplying 10 L/s @ 24.4 meter TDH of recirculation flow each, through a series of eduction mixers. Motors shall be 3.7 kW, non overloading, TEFC, 460V, 3 phase, 60 Hz. Each pump shall be equipped with a liquid filled pressure gauge and a gauge isolator. In the event of a first stage or second stage pump failure, automatic backup shall be employed. Alternative scheme shall be employed for operation and pumps.

Recirculation Piping.--Recirculation loop piping shall be Schedule 80 PVC; with isolation and check valves, and pH probes installed in accessible locations. The pH probes and chemical injection shall not be installed in the treatment tanks. The recirculation loops shall be fitted with a flow switches. The entire piping system shall be rated for 345 kPa @ 60°C, or higher.

Eduction Mixers.--Three eduction mixers shall be provided for each treatment tank for mixing and carbon dioxide introduction. The eductors shall provide 63 L/s of effective mixing per treatment tank. Isolation valves shall be provided to enable each eduction mixer to be serviced independently.

Monitoring System.--Final stage effluent monitoring system shall continuously monitor the quality of the effluent flow discharged from the treatment system. A totalizing function on the recorder or on the flow measuring instrumentation shall totalize effluent flow. If the pH of the treated effluent deviates from the specified parameters, the pH adjustment system shall automatically discontinue discharging, an alarm shall be activated and the electric operated diverting valves shall be driven to their by pass positions. The alarm points shall be sufficiently within the discharge window so that by the time the system reacts to the deviation, fluid pH will not have drifted out of the acceptable discharge range. Major components shall include the following:

A. Microprocessor based two pen circular chart recorder for simultaneously recording final effluent pH and flow. The recorder chart time is programmable from one hour to one week.
B. One pH probe, flat surface, self cleaning, double junction; and pH transmitter.
C. One ultrasonic open-channel flow monitoring system, 0-94.6 L/s.
D. Canadian Standards Association (CSA) or UL listed control components including ph probe and transmitter, flow switch, and high level sensor.

Carbon Dioxide Injection.--In the current configuration, the Contractor shall provide for one bulk carbon dioxide addition system and plan for minimal future modifications to accommodate a separate chemical injection system for an ultimate configuration of two parallel chemical injection systems for each treatment stage as specified in these special provisions.

A. Two precision carbon dioxide addition systems shall be provided with bulk carbon dioxide addition system. Each system shall accept carbon dioxide from the storage tank and distribute carbon dioxide to the first and second stage treatment systems. Fine bubble diffusers (spargers) in each treatment tank shall be used to ensure that the carbon dioxide is completely dissolved into the water.
B. The fine bubble diffusers shall be sized to ensure that a sufficient volume of carbon dioxide is dissolved into solution to neutralize an influent alkalinity of up to 1,000 mg per Liter at a flow of up to 82 L/s. Additionally the diffusers shall be installed through a nozzle in the tank wall, near the bottom, and shall be able to be removed from service for cleaning or replacement.
C. The distribution system shall include a 304SS header, isolation valves, and control valve.

Treatment service support skid.—The Contractor shall provide a single shop-fabricated skid to serve all treatment system components, except the tanks. The frame of the skid shall be fabricated from 102 mm steel C channel and topped with a 6.4 mm steel deck plate. A 51 mm box tube shall form the 4 walls to which all pipe and conduit supports are attached. The entire steel structure shall be bead blasted, primed and coated with a 2 part epoxy coating. The skid shall then be lined by a polypropylene liner with a floor drain discharging to the pavement. Lifting pads beneath the skid shall be supplied to allow fork lift entry under the skid for moving the system during installation.

Instruments & Controls.--

A. The pH sensor employed by this system shall be PVC bodied double junction combination "self cleaning" type electrode. The probes shall be configured with quick connect electrical connections and shall be able to be removed from service. Measuring range of the sensor shall be 0-14 pH.
B. The pH transmitters shall be microprocessor based units that provide pH buffer solution tables that assist the operator in the calibration of the pH probe. The transmitter shall provide a 4-20 mA output. The pH indicator shall be a dedicated backlit LCD display or LED capable of providing readout in a wide range of lighting conditions. The display resolution shall be 0.01 units over a range of 0.00 to 14.00. The unit shall employ probe diagnostics to warn of a pH probe problem.
C. The effluent recorder shall be a fully programmable two pen circular chart recorder. Pen 1 (red pen) shall display the effluent pH and pen 2 (green pen) shall display the effluent flow rate. Both pens shall be configured to accept isolated 4-20 mA inputs from the respective transmitters. Chart rotation time shall be programmable from 1 to 168 hours.
D. The effluent flow sensor shall employ a magnetic flow sensor and tube that is directly interfaced to a transmitter to provide an isolated 4-20ma signal to the chart recorder. Flow measuring range shall be 0 to 106 L/s.

Electrical Requirements.--All electrical components shall conform to industry standards for use in wet corrosive environments. Electrical enclosures shall be NEMA 4X and all conduits shall be watertight and corrosion resistant. Galvanized metallic conduit shall not be considered corrosion resistant. All metal enclosures shall be epoxy coated and all motors shall be painted with a baked on Epoxy OSHA safety blue coating. The electrical system, as an entity, shall be "hose down proof" after the system is completed. Frequent cleanings with a pressurized water stream shall not affect the integrity of the system. The system shall comply with NFPA 79 and shall be UL508 certified.

Main control panel (MCP).--The MCP and all associated wiring and documentation shall conform to all applicable industry standards such as NEC, NEMA, ISA, ANSI, and NFPA79, and UL 508A:

A. The MCP shall house the central control system. The central control system shall include the following:

1. A main disconnect switch, fused control transformer, distribution block, and lighting panel.
2. Programmable Logic Controller (PLC), with a central processing unit (CPU), an Operator Interface/message display center also referred to as the Operator Interface Unit (OIU), pH transmitter and pH indicator.
3. Power supplies, annunciator lights, alarm horn, common trouble alarm contacts for interface to the OMC Bldg. PLC.
4. Motor starters for the agitators, duplex motor starters for the pumps and branch circuit protection.

B. Electrical: 480 V(ac), 3 phase, 60 Hz.
C. Main disconnect for single point power connection, sized in accordance with the NEC.
D. The MCP shall be a NEMA 4X epoxy coated electrical enclosure sized to house all the required components. All conduit penetrations to the panel shall be watertight and the integrity of the panel shall not be violated by any of the penetrations.
E. Three-phase 277/480 V(ac) lighting distribution panel with overcurrent protection devices. Panel shall contain 1-pole and 2-pole breakers for distribution to loads. Panel shall be designed and installed in accordance with the NEC.
F. The status of the pumps, valves, and mixers, CARBON DIOXIDE tank refrigeration unit and vaporizer unit shall be indicated on the MCP with pilot lights. An OPEN - CLOSED - AUTO selector switch shall be provided for the automatic valves. A panel mounted HAND - OFF - AUTO switch shall be provided for the recirculation pumps and mixer.
G. The control circuit shall operate from ground isolated 24 V(dc) to assure operator protection.
H. Motor load switching devices shall protect the motor from long term overload and short circuit protection, phase loss, and brown outs. All wiring shall comply with NEC, NFPA79, UL 508 and local codes.
I. Motor power wiring shall be 14 (or 12) AWG Black MTW, 24 V(dc) control circuit wiring shall be 18 (or 16) AWG Blue MTW.
J. Pilot lights shall be 24V(dc) and equipped with a Push To Test (PTT) button for lamp check. The following status and alarms shall be annunciated with pilot lights.
K. Level Alarms: The three conditions listed below shall be annunciated via an individual red light and an audible alarm. The audible alarm shall be equipped with a silence pushbutton to temporarily mute the horn for the current event. The following three alarms shall also be individually displayed on the MCP:

1. Treatment Tank High Level.
2. Carbon Dioxide Pressure Low.
3. Final Effluent pH Alarm.

L. Status indicators: status indicators, consisting of pilot lights shall display the following system status:

1. First Stage Recirculation Pump1 Run.
2. First Stage Recirculation Pump 2 Run.
3. Second Stage Recirculation Pump 1 Run.
4. Second Stage Recirculation Pump 2 Run.
5. First Stage Mixer Run.
6. Second Stage Mixer Run.
7. 120 V(ac) Control Power On.
8. 24 V(dc) Control Power On.

M. All of the alarms listed above shall also be displayed on the Operator Interface Unit (OIU). These alarms shall be latched such that they remain visible on the screen until acknowledged by an operator. In addition to the alarms listed above any other alarm or significant event shall also be displayed on the OIU, including the following:

1. Excessive Treat Alarm (Detects pH not responding).
2. Final Effluent pH Alarm.
3. Probable Pump Failure (detects loss of recirculation pump).

N. An audible alarm with silence button shall be provided to indicate the presence of any alarm or anomaly. The silence circuit shall allow reactivation of the horn when a new alarm is detected.

O. At least two separate programmable alarm contacts shall be available to provide an indication of an alarm state at a remote location. The alarm contacts shall be field programmable and shall be able to represent any failure mode or system status.

P. The PLC shall include a modular input and output (I/O) platform that will accommodate input only, output only, or combination I/O modules with analog and digital I/O circuits, in densities including 4, 8, 12, 16, and 32 point. The PLC shall allow for a maximum I/O capacity of 4096 points. The PLC shall be provided with power supply to serve the total quantity of I/O modules, and each power supply shall have an LED indicating proper supply power. The power supply shall be designed to withstand a brief power loss without affecting the operation of the system (20 millisecond to 3 second hold-up time). The I/O modules shall interface to AC, DC, and TTL voltage levels. The PLC shall have the necessary battery-backed EEPROM memory capacity to control all automated system components, but not less than 16 kilobytes, and shall be equipped with DH-485 and RS-232 communication ports. The communication ports shall be compatible with the operator interface unit. The entire PLC shall be UL listed.

Q. The PLC shall be provided with all parameters factory programmed based on preliminary information as specified in these special provisions. The PLC shall provide control over all automated system components such as pumps, mixers, and alarms. The control systems shall be capable of being configured for any titration curve. A Promotional Integral (PI) control algorithm shall be provided that allows for control curve customization.

R. A multiple window control mechanism shall be established to define an acceptable discharge window, a discharge limit window, a treatment window, and a bulk assist window. The definition for the windows shall be as follows:

1. The discharge limit window is an operator configurable set of parameters that defines the absolute limits of the system discharge. If the discharge, as indicated by the effluent monitor, reaches either end of this window then a process alarm is initiated and the system reverts back to the treatment mode.
2. The acceptable discharge window is an operator configurable set of parameters which define the pH range that the system discharge may occur. This window always resides inside of the discharge limit window.
3. The treatment window is an operator configurable set of parameters that defines the treatment goals for the metering pumps. This window always resides inside of the acceptable discharge window.
4. Initial settings for the windows shall be as follows:

Treatment Window : $7.00 < pH < 8.00$
Acceptable discharge : $6.50 < pH < 8.50$
Alarm Window : $6.20 < pH < 8.80$

S. The PLC shall control the recirculation pumps, and mixer for each treatment tank. All pumps and mixers shall be setup as conventional alternating duplex units each sharing in the duty cycle. Automatic failure detection shall be employed that will assure that a lag pump will be put online automatically upon determination of a problem with the lead pump.

T. A modem interface shall be supplied for the PLC that allows for remote access by the system supplier for the purpose of monitoring the system, performing tuning changes or programming changes, and for diagnostics.

Field Wiring.--All shop and interconnect field wiring shall be sized by the leach water treatment system designer and the component suppliers in accordance with the NEC, for power and controls, and in conformance with Section 10-3 "Electrical Systems" of these special provisions.

Operator Interface Unit (OIU).--An Operator Interface Unit (OIU) shall be directly interfaced to digital communication port on the PLC. This interface shall provide direct indication of system mode or alarm status through it's message display center. All user configurable set points and parameters shall be accessible through this unit. A detailed manual shall be provided by the system manufacturer describing the use of each variable and the meaning of all messages.

Carbon Dioxide Storage Tank.--The liquid carbon dioxide storage tank shall be of the horizontal arrangement type with a nominal carbon dioxide storage capacity of 12,700 kg. Tank shall be complete with insulation and outer jacket, saddle mounts, lifting lugs, piping and valves, safety shut offs, inspection manway, refrigeration unit with weather cover and electric vaporizer.

Carbon dioxide storage tank shall be built per ASME code Section 8, Div. 1 for a design pressure of 2,410 kPa and a minimum design temperature of minus 40 degrees Celsius. The carbon dioxide storage tank shall be insulated using 100 mm of closed cell polyurethane foam with a 1.6 mm pre-finished white aluminum jacket.

Tank appurtenances shall include schedule 80 seamless stainless steel pipe, 907.2 kg forged steel fittings, liquid level gage, pressure gauge, stainless steel vented ball valves, an ASME direct spring loaded or pilot operated relief valve sized for outdoor installation and a high pressure bleeder valve set at 2,350 kPa.

The storage tank shall be equipped to sound an alarm if the pressure in the vessel is 170 kPa above or below normal. Refrigeration unit shall consist of semi-hermetic condensing unit utilizing R404A refrigerant, pressure switch for automatic operation, low and high pressure reset, compressor motor thermal overload reset, disconnect switch, NEMA 3R electrical enclosure. Refrigeration unit and associated accessories and controls shall be tank mounted using aluminum angle framework and shall have a weather enclosure that can be removed to access the refrigeration unit. Refrigeration unit shall maintain carbon dioxide at 2,070 kPa and -17.8 degreee Celcius (adjustable). Capacity shall be 2.8 kW at minus 28.9 degree Celsius evaporation temperature and electrical characteristics shall be 460 V, 60 Hz, 3 phase.

All electrical components shall be UL listed. Vaporizer shall be electric pressure build-type, having a 25mm blow down drain, high temperature shutdown switches, 3,100 kPa relief valve, disconnect switch, NEMA 3R control enclosure. Capacity shall be 18 kW, 222.26 kg/hr at 460 V, 60 Hz, 3 phase. Vaporizer shall operate between 1,690 kPa and 1,760 kPa (adjustable).

All carbon dioxide high pressure stainless steel piping and valves between the main carbon dioxide tank and the spargers on the treatment tanks shall be included. The carbon dioxide tank shall be shipped complete with supporting cradles and tank mounted control cabinet to house all the controls for the refrigeration system and the vaporizer. The Control Cabinet shall be NEMA 3R rated complete with service disconnect and built to accept a single 480V, 3 phase, 60 Hz power supply as shown in the plans.

The Contractor shall provide all carbon dioxide required to initially fill and conduct all test on the system. The Contractor shall refill the system to maximum capacity after tests are accepted by the Engineer.

INSTALLATION

Leach water treatment support skid, treatment tanks, and carbon dioxide storage tank shall be installed on concrete bases, plumb and level, maintaining manufacturer's recommended clearances and arranging units so controls and devices that require servicing are accessible. Coordinate with all interfacing structural work shown on the plans for equipments bases and support pads.

Anchorage shall be provided for fastening work securely in place. Equipment anchors shall be set in concrete as the work progresses and spaced as shown on the plans. Anchors and supports for piping and equipment shall conform to "Hangers and Supports" of these special provisions. All anchors, bolts, nuts and washers shall be Type 316 stainless steel.

Mixers, piping, valves, electrical and control devices, provided by the leach water treatment system designer and equipment suppliers for field installation, shall be installed in accordance with the designer and system integrators written instructions and approved field erection drawings.

Seismic restraints shall be provided for equipment and tanks and anchored to the structure, in conformance with the provisions in "Mechanical Vibration Controls and Seismic Restraints" of these special provisions.

Interconnecting control wiring shall be installed for treatment system controls and sensors. All power and control wiring, conduit, and all miscellaneous accessory devices for wiring shall be provided for a complete and functional leach water treatment system in conformance with these special provisions, NFPA 70, and all local code requirements. Equipment shall be grounded in conformance with the provisions in "Grounding and Bonding" of Section 10-3 of these special provisions.

FIELD QUALITY CONTROL

A factory-authorized service representative shall inspect assemblies, equipment installation and all connections. The representative shall also conduct start up and functional testing, adjust components and report results in writing.

The Contractor shall test and inspect individual components of leach water treatment system for compliance with manufacturers' installation instructions. In addition to manufacturer's testing and inspection requirements, the following shall be performed:

A. Inspect field-assembled components and equipment installation, including piping and all electrical connections.
B. The Contractor shall not put the system into operation until all mechanical and electrical connections are inspected, the piping systems are leak tested to 1 1/2 times the pump working pressure and satisfactory test results are achieved.
C. Test for leaks and defects. Separate report shall be submitted for each tested segment, complete with diagram of section of piping tested. Leaks and defects shall be repaired with new materials and retest piping until no leaks exist.
D. Malfunctioning units shall be repaired or replaced, and retested.

PAYMENT

The contract lump sum price paid for leach water system shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in furnishing and installing the leach water system, complete in place, including demonstration and testing, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Full compensation for conforming to the MRP for monitoring the influent and effluent discharges from the Leach Water Treatment System shall be considered as included in the contract lump sum price paid for non-storm water discharge control and no additional compensation will be allowed therefor.