



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO CONTRACTORS
AND
SPECIAL PROVISIONS**

FOR CONSTRUCTION ON STATE HIGHWAY IN

**SANTA CLARA COUNTY IN SAN JOSE FROM GUADALUPE PARKWAY OVERCROSSING TO 0.3 km NORTH
OF AIRPORT PARKWAY**

DISTRICT 04, ROUTE 87

**For Use in Connection with Standard Specifications Dated JULY 1995, Standard Plans
Dated JULY 1997, and Labor Surcharge and Equipment Rental Rates.**

CONTRACT NO. 04-4874A4

04-SCL-87-12.2/14.5

Federal Aid Project

ACNH-S087(016)E

Bids Open: April 4, 2000
Dated: February 7, 2000

OSD

IMPORTANT SPECIAL NOTICES

- The bidder's attention is directed to Section 5, containing specifications for "Disputes Review Board," of the Special Provisions, regarding establishing a Disputes Review Board (DRB) for the project.
- The Special Provisions for Federal-aid projects (with and without DBE goals) have been revised to incorporate changes made by new regulations governing the DBE Program (49 CFR Part 26).

The following sections incorporate the changes: 2-1.01, 2-1.02, 2-1.02A, 2-1.02B, 5-1.09, 5-1.093, 5-1.097, 5-1.098 and 5-1.099. Bidders should read all of these sections to become familiar with them. Attention is directed to the following significant changes:

Section 2-1.02, "Disadvantaged Business Enterprise (DBE)" revises the counting of participation by DBE primes, and the counting of trucking performed by DBE firms. The section also revises the information that must be submitted to the Department in order to receive credit for trucking.

Section 2-1.02B, "Submission of DBE Information" revises the information required to be submitted to the Department to receive credit toward the DBE goal. It also revises the criteria to demonstrate good faith efforts.

Section 5-1.09, "Subcontractor and DBE Records" revises the information required to be reported at the end of the project, and information related to trucking that must be submitted throughout the project.

Section 5-1.093, "DBE Certification Status" adds new reporting requirements related to DBE certification.

Section 5-1.097, "Subcontracting" describes the efforts that must be made in the event a DBE subcontractor is terminated or fails to complete its work for any reason.

Section 5-1.098, "Prompt Progress Payment to Subcontractors" requires prompt payment to all subcontractors.

Section 5-1.099, "Prompt Payment of Withheld Funds to Subcontractors" requires the prompt payment of retention to all subcontractors.

Insert Seal Sheet Here

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STANDARD PLANS LIST

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. The Revised Standard Plans (RSP) and New Standard Plans (NSP) which apply to this contract are included as individual sheets of the project plans.

A10A	Abbreviations
A10B	Symbols
A62A	Excavation and Backfill - Miscellaneous Details
A62D	Excavation and Backfill - Concrete Pipe Culverts

A62F	Excavation and Backfill - Metal and Plastic Culverts
A73A	Object Markers
A73C	Delineators, Channelizers and Barricades
RSP A77A	<i>Metal Beam Guard Railing - Wood Posts and Wood Blocks</i>
RSP A77B	<i>Metal Beam Guard Railing - Standard Hardware</i>
RSP A77C	<i>Metal Beam Guard Railing - Wood Posts and Wood Blocks</i>
NSP A81A	<i>Crash Cushion, Sand Filled (Unidirectional)</i>
A85	Chain Link Fence
A87	Curbs, Dikes and Driveways
D72	Drainage Inlets
D73	Drainage Inlets
D74C	Drainage Inlet Details
NSP D75A	<i>Pipe Inlets</i>
NSP D75C	<i>Pipe Inlets - Ladder, Step and Trash Rack Details</i>
RSP D77A	<i>Grate Details</i>
D77B	Bicycle Proof Grate Details
D87B	Overside Drains
D87C	Underdrains
D88	Construction Loads On Culverts
D93C	Pipe Riser with Debris Rack Cage
D94A	Metal and Plastic Flared End Sections
D94B	Concrete Flared End Sections
D97A	Corrugated Metal Pipe - Coupling Details No. 1, Annular Coupling Band Bar and Strap and Angle Connectors
D97B	Corrugated Metal Pipe - Coupling Details No. 2, Hat Band Coupler and Flange Details
D97C	Corrugated Metal Pipe - Coupling Details No. 3, Helical and Universal Couplers
D97D	Corrugated Metal Pipe - Coupling Details No. 4, Hugger Coupling Bands
D97E	Corrugated Metal Pipe - Coupling Details No. 5, Standard Joint
D97G	Corrugated Metal Pipe - Coupling Details No. 7, Positive Joints and Downdrains
D97H	Reinforced Concrete Pipe Or Non-Reinforced Concrete Pipe - Standard and Positive Joints
D98A	Slotted Corrugated Steel Pipe Drain Details
D98B	Slotted Corrugated Steel Pipe Drain Details
H1	Planting and Irrigation - Abbreviations
RSP H2	<i>Planting and Irrigation - Symbols</i>
H3	Planting and Irrigation - Details
H4	Planting and Irrigation - Details
H7	Planting and Irrigation - Details
H8	Planting and Irrigation - Details
RSP T2	<i>Temporary Crash Cushion, Sand Filled (Shoulder Installations)</i>
T3	Temporary Railing (Type K)
RSP T7	<i>Construction Project Information Signs</i>
T10	Traffic Control System for Lane Closure On Freeways and Expressways
B11-47	Cable Railing
B13-1	Slope Protection Details
RS1	Roadside Signs - Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RSP RS3	<i>Roadside Signs - Laminated Wood Box Post, Typical Installation Details No. 3</i>
RS4	Roadside Signs - Typical Installation Details No. 4

ES-1A	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-1B	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-2A	Signal, Lighting and Electrical Systems - Service Equipment
ES-2C	Signal, Lighting and Electrical Systems - Service Equipment Notes
ES-2D	Signal, Lighting and Electrical Systems - Service Equipment and Typical Wiring Diagram, Type A
ES-8	Signal, Lighting and Electrical Systems - Pull Box Details
ES-13	Signal, Lighting and Electrical Systems - Splicing Details

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 04-4874A4

04-SC1-87-12.2/14.5

Sealed proposals for the work shown on the plans entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION
ON STATE HIGHWAY IN SANTA CLATRA COUNTY IN SAN JOSE FROM GUADALUPE PARKWAY
OVERCROSSING TO 0.3 km NORTH OF AIRPORT PARKWAY**

will be received at the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, CA 95814, until 2 o'clock p.m. on April 4, 2000, at which time they will be publicly opened and read in Room 0100 at the same address.

Proposal forms for this work are included in a separate book entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL AND CONTRACT FOR
CONSTRUCTION ON STATE HIGHWAY IN SANTA CLATRA COUNTY IN SAN JOSE FROM GUADALUPE
PARKWAY OVERCROSSING TO 0.3 km NORTH OF AIRPORT PARKWAY**

General work description: Embankment, riparian grading, retaining walls and pump station.

This project has a goal of 17 percent disadvantaged business enterprise (DBE) participation.

No prebid meeting is scheduled for this project.

**THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE
TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE
TRANSPORTATION EFFICIENCY ACT OF 1991.**

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a combination of any of the following Class C licenses which constitutes a majority of the work: C-12.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, MS #26, Transportation Building, 1120 N Street, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Irvine, Oakland, and the district in which the work is situated. Standard Specifications are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are available at the office of the District Director of Transportation of the district in which the work is situated.

Contract No. 04-4874A4

The successful bidder shall furnish a payment bond and a performance bond.

The Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes entitled "Proposal and Contract," and in copies of this book that may be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract." If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

Bidder inquiries may be made as follows:

The Department will consider bidder inquiries only when a completed "Bidder Inquiry" form is submitted. A copy of the "Bidder Inquiry" form is available at the Internet address shown below. The bidder inquiry shall include the bidder's name and telephone number. Submit "Bidder Inquiry" forms to:

Construction Program Duty Senior
111 Grand Avenue
Oakland, CA 94612

Fax Number: (510) 286-5171
E-mail: DUTY_SENIOR_DISTRICT04@ dot.ca.gov
Tel. Number: (510) 286-5209

To expedite processing, submittal of "Bidder Inquiry" forms via Fax or E-mail is preferred.

To the extent feasible and at the discretion of the Department, completed "Bidder Inquiry" forms submitted for consideration will be investigated, and responses will be posted on the Internet at:

<http://www.dot.ca.gov/dist4/construction/CONTRACTINQUIRIES.html>

The responses to bidders' inquiries, unless incorporated into formal addenda to the contract, are not a part of the contract, and are provided for the bidder's convenience only. In some instances, the question and answer may

represent a summary of the matters discussed rather than a word-for-word recitation. The availability or use of information provided in the responses to bidders' inquiries is not to be construed in any way as a waiver of the provisions of Section 2-1.03 of the Standard Specifications or any other provision of the contract, the plans, Standard Specifications or Special Provisions, nor to excuse the contractor from full compliance with those contract requirements. Bidders are cautioned that subsequent responses or contract addenda may affect or vary a response previously given.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation

Engineering

Dated February 7, 2000

ET

COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)
04-4874A4

Item	Item Code	Item	Unit of Measure	Estimated Quantity
1	017400	HEALTH AND SAFETY PLAN	LS	LUMP SUM
2	070010	PROGRESS SCHEDULE (CRITICAL PATH)	LS	LUMP SUM
3	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
4	074020	WATER POLLUTION CONTROL	LS	LUMP SUM
5 (S)	017401	TEMPORARY CONCRETE WASHOUT FACILITY	LS	LUMP SUM
6 (F)	017402	TEMPORARY COVER	LS	LUMP SUM
7	017403	TEMPORARY DRAINAGE INLET PROTECTION	EA	13
8 (S)	017404	TEMPORARY FENCE (TYPE ESA)	M	2210
9 (S)	074025	TEMPORARY SOIL STABILIZER	KG	28 500
10 (F)	017405	TEMPORARY CONSTRUCTION ROAD	LS	LUMP SUM
11 (S)	074029	TEMPORARY SILT FENCE	M	3670
12 (S)	017406	PERMANENT SOIL STABILIZER	KG	38 000
13 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
14 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
15	129510	TEMPORARY RETAINING WALL	M2	4510
16	150206	ABANDON CULVERT	EA	15
17	150221	ABANDON INLET	EA	12
18	150662	REMOVE METAL BEAM GUARD RAILING	M	850
19	150668	REMOVE FLARED END SECTION	EA	7
20	150730	REMOVE CHANNELIZERS	EA	26

Item	Item Code	Item	Unit of Measure	Estimated Quantity
21	150742	REMOVE ROADSIDE SIGN	EA	1
22	150771	REMOVE ASPHALT CONCRETE DIKE	M	800
23	150805	REMOVE CULVERT	M	120
24	150820	REMOVE INLET	EA	8
25	017407	REMOVE SACKED CONCRETE SLOPE PROTECTION	M3	15
26	153210	REMOVE CONCRETE	M3	220
27	153221	REMOVE CONCRETE BARRIER	M	1850
28	155003	CAP INLET	EA	2
29	156590	REMOVE CRASH CUSHION (SAND FILLED)	EA	4
30	160101	CLEARING AND GRUBBING	LS	LUMP SUM
31	160120	REMOVE TREE	EA	510
32	170101	DEVELOP WATER SUPPLY	LS	LUMP SUM
33	190101	ROADWAY EXCAVATION	M3	42 800
34 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	M3	258
35 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	M3	169
36	193114	SAND BACKFILL	M3	70
37 (F)	197021	EARTH RETAINING STRUCTURE, LOCATION A	M2	1760
38 (F)	197022	EARTH RETAINING STRUCTURE, LOCATION B	M2	910
39 (F)	197023	EARTH RETAINING STRUCTURE, LOCATION C	M2	1320
40 (F)	197024	EARTH RETAINING STRUCTURE, LOCATION D	M2	3790

Item	Item Code	Item	Unit of Measure	Estimated Quantity
41 (F)	197025	EARTH RETAINING STRUCTURE, LOCATION E	M2	2140
42 (F)	197033	EARTH RETAINING STRUCTURE, LOCATION F	M2	2915
43	017408	GEOSYNTHETIC REINFORCEMENT	M2	120 011
44	198001	IMPORTED BORROW	M3	468 000
45	017409	IMPORTED BORROW (GEOSYNTHETIC REINFORCED EMBANKMENT)	M3	93 100
46 (S)	017410	SETTLEMENT INSTRUMENTATION	LS	LUMP SUM
47 (S)	017411	EMBANKMENT STABILIZATION FABRIC	M2	74 500
48 (S)	017412	REINFORCED MAT (EROSION CONTROL)	M2	5110
49 (S)	203003	STRAW (EROSION CONTROL)	TONN	10
50	203014	FIBER (EROSION CONTROL)	KG	1133
51	017413	COMPOST (EROSION CONTROL)	KG	4050
52 (S)	203021	FIBER ROLLS	M	2640
53 (S)	203045	PURE LIVE SEED (EROSION CONTROL)	KG	260
54	203056	COMMERCIAL FERTILIZER (EROSION CONTROL)	KG	1420
55	203061	STABILIZING EMULSION (EROSION CONTROL)	KG	320
56 (S)	017414	WILLOW BUNDLES	EA	58
57 (F)	208251	32 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	425
58	017415	50 MM WATER METER	EA	2
59	017416	100 MM HIGH DENSITY POLYETHYLENE IRRIGATION CONDUIT	M	430
60	208731	200 MM CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONDUIT	M	24

Item	Item Code	Item	Unit of Measure	Estimated Quantity
61	260301	CLASS 3 AGGREGATE BASE	M3	1600
62	390102	ASPHALT CONCRETE (TYPE A)	TONN	2600
63	394002	PLACE ASPHALT CONCRETE (MISCELLANEOUS AREA)	M2	8
64	395001	LIQUID ASPHALT, SC-70 (PRIME COAT)	TONN	14
65 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	M3	108
66 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	44
67 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	KG	8665
68	620905	300 MM ALTERNATIVE PIPE CULVERT (TYPE A)	M	23
69	620906	300 MM ALTERNATIVE PIPE CULVERT (TYPE B)	M	37
70	620910	450 MM ALTERNATIVE PIPE CULVERT (TYPE A)	M	110
71	620911	450 MM ALTERNATIVE PIPE CULVERT (TYPE B)	M	400
72	664009	300 MM CORRUGATED STEEL PIPE (1.63 MM THICK)	M	15
73	665732	450 MM SLOTTED CORRUGATED STEEL PIPE (1.63 MM THICK)	M	12
74	680931	150 MM PERFORATED PLASTIC PIPE UNDERDRAIN	M	25
75	017417	150 MM PLASTIC PIPE DRAIN	M	33
76	017418	SAND (CONCRETE BARRIER (TYPE K))	TONN	180
77	703282	900 MM CORRUGATED STEEL PIPE RISER (1.63 MM THICK)	M	2.1
78	703288	1200 MM CORRUGATED STEEL PIPE RISER (2.77 MM THICK)	M	2.6
79	703588	600 MM WELDED STEEL PIPE (6.35 MM THICK)	M	11
80	703660	900 MM WELDED STEEL PIPE (9.53 MM THICK)	M	62

Item	Item Code	Item	Unit of Measure	Estimated Quantity
81	705336	450 MM ALTERNATIVE FLARED END SECTION	M	2
82	705566	600 MM AUTOMATIC DRAINAGE GATE	EA	1
83	017419	900 MM DEBRIS RACK CAGE (H = 0.80 M)	EA	1
84	017420	1200 MM DEBRIS RACK CAGE (H = 0.80 M)	EA	1
85	720120	ROCK SLOPE PROTECTION (1/2T, METHOD A)	M3	810
86	722020	GABION	M3	2200
87	725001	SACKED CONCRETE SLOPE PROTECTION	M3	1.9
88	729010	ROCK SLOPE PROTECTION FABRIC	M2	1500
89	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	M3	110
90 (S)	740500	DRAINAGE PUMPING EQUIPMENT	LS	LUMP SUM
91	017421	DRAINAGE (LOCATION A)	LS	LUMP SUM
92 (S)	741001	PUMPING PLANT ELECTRICAL EQUIPMENT	LS	LUMP SUM
93 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	KG	1962
94 (S-F)	750520	PUMPING PLANT METAL WORK	KG	985
95 (S)	800385	CHAIN LINK FENCE (TYPE CL-1.2)	M	3320
96	833080	CONCRETE BARRIER (TYPE K)	M	2210
97	839521	CABLE RAILING	M	8
98 (S)	839591	CRASH CUSHION, SAND FILLED	EA	1
99 (S)	017422	ELECTRIC SERVICE (PUMP STATION)	LS	LUMP SUM
100	999990	MOBILIZATION	LS	LUMP SUM

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 04-4874A4

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1995, and the Standard Plans dated July 1997, of the Department of Transportation insofar as the same may apply, and these special provisions.

Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications. Whenever either the term "Standard Specifications is amended" or the term "Standard Specifications are amended" is used in the special provisions, the indented text following said term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and be used in lieu of the conflicting portions.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the Proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, Division Of Construction - Duty Senior, Mail Station: 3 - B, 111 Grand Avenue / P. O. Box 23660, Oakland, Ca 94623-0660, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient

deems appropriate. Each subcontract signed by the bidder must include this assurance.

2-1.015 FEDERAL LOBBYING RESTRICTIONS

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier subrecipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities,\" with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal shall constitute signature of the Certification.

The above-referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)

This project is subject to Part 26, Title 49, Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." The Regulations in their entirety are incorporated herein by this reference.

Bidders shall be fully informed respecting the requirements of the Regulations and the Department's Disadvantaged Business Enterprise (DBE) program developed pursuant to the Regulations; particular attention is directed to the following matters:

- A. A DBE must be a small business concern as defined pursuant to Section 3 of U.S. Small Business Act and relevant regulations promulgated pursuant thereto;
- B. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of material or supplies, or as a trucking company;
- C. A DBE bidder, not bidding as a joint venture with a non-DBE, will be required to document one or a combination of the following:
 - 1. The bidder will meet the goal by performing work with its own forces.
 - 2. The bidder will meet the goal through work performed by DBE subcontractors, suppliers or trucking companies.

3. The bidder, prior to bidding, made adequate good faith efforts to meet the goal.
- D. A DBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture. The DBE joint venturer must submit the joint venture agreement with the proposal or the DBE Information form required in the Section entitled "Submission of DBE Information" of these special provisions;
 - E. A DBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work;
 - F. DBEs must be certified by either the California Department of Transportation, or by a participating State of California or local agency which certifies in conformance with Title 49, Code of Federal Regulations, Part 26, as of the date of bid opening. It is the Contractor's responsibility to verify that DBEs are certified. Listings of DBEs certified by the Department are available from the following sources:
 1. The Department's DBE Directory, which is published quarterly. This Directory may be obtained from the Department of Transportation, Materiel Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520;
 2. The Department's Electronic Information Bulletin Board Service, which is accessible by modem and is updated weekly. The Bulletin Board may be accessed by first contacting the Department's Business Enterprise Program at Telephone: (916) 227-8937 and obtaining a user identification and password;
 3. The Department's web site at <http://www.dot.ca.gov/hq/bep/index.htm>;
 4. The organizations listed in the Section entitled "DBE Goal for this Project" of these special provisions.
 - G. Credit for materials or supplies purchased from DBEs will be as follows:
 1. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
 2. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph G.2. if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. Packagers, brokers, manufacturers'

representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this paragraph G.2.

3. Credit for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

H. Credit for DBE trucking companies will be as follows:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting the DBE goal;
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract;
3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks its owns, insures, and operates using drivers it employs;
4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract;
5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE;
6. For the purposes of this paragraph H, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

I. Noncompliance by the Contractor with the requirements of the regulations constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract;

J. Bidders are encouraged to use services offered by financial institutions owned and controlled by DBEs.

2-1.02A DBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disadvantaged Business Enterprise (DBE) participation for this project:

Disadvantaged Business Enterprise (DBE): 17 percent

Bidders may use the services of the following firms to contact interested DBEs. These firms are available to assist DBEs in preparing bids for subcontracting or supplying materials.

The following firms may be contacted for projects in the following locations:

Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County) and 10:

Triaxial Management Services, Inc.
- Oakland

1545 Willow Street, 1st Floor
Oakland, CA 94607
Telephone - (510) 286-1313

FAX No. - (510) 286-6792

Districts 08, 11 and 12:

Triaxial Management Services, Inc.
- San Diego

2725 Congress Street,
Suite 1-D
San Diego, CA 92110
Telephone -
(619) 543-5109

FAX No. - (619) 543-5108

Districts 07 and 08;
in San Luis Obispo and Santa Barbara Counties
in District 05; and in Kern County in District 06:

Triaxial Management Services, Inc.
- Los Angeles

2594 Industry Way, Suite 101
Lynwood, CA 90262
Telephone - (310) 537-6677

FAX No. - (310) 637-0128

Districts 01, 02, 03 and 09:

Triaxial Management Services, Inc.
- Sacramento

930 Alhambra Blvd., #205
Sacramento, CA 95816
Telephone - (916) 553-4172

FAX No. - (916) 553-4173

2-1.02B SUBMISSION OF DBE INFORMATION

The required DBE information shall be submitted on the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal. If the DBE information is not submitted with the bid, the DBE Information form shall be removed from the documents prior to submitting the bid.

It is the bidder's responsibility to make enough work available to DBEs and to select those portions of the work or material needs consistent with the available DBEs to meet the goal for DBE participation or to provide information to establish that, prior to bidding, the bidder made adequate good faith efforts to do so.

If DBE information is not submitted with the bid, the apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit DBE information to the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814 so the information is received by the Department no later than 4:00 p.m. on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening. DBE information sent by U.S. Postal Service certified mail with return receipt and certificate of mailing and mailed on or before the third day, not including Saturdays, Sundays and legal holidays, following bid opening will be accepted even if it is received after the fourth day following bid opening. Failure to submit the required DBE information by the time specified will be grounds for finding the bid or proposal nonresponsive. Other bidders need not submit DBE information unless requested to do so by the Department.

The bidder's DBE information shall establish that good faith efforts to meet the DBE goal have been made. To establish good faith efforts, the bidder shall demonstrate that the goal will be met or that, prior to bidding, adequate good faith efforts to meet the goal were made.

Bidders are cautioned that even though their submittal indicates they will meet the stated DBE goal, their submittal should also include their adequate good faith efforts information along with their DBE goal information to protect their

eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

The bidder's DBE information shall include the names, addresses and phone numbers of DBE firms that will participate, with a complete description of work or supplies to be provided by each, the dollar value of each DBE transaction, and a written confirmation from the DBE that it is participating in the contract. A copy of the DBE's quote will serve as written confirmation that the DBE is participating in the contract. When 100 percent of a contract item of work is not to be performed or furnished by a DBE, a description of the exact portion of that work to be performed or furnished by that DBE shall be included in the DBE information, including the planned location of that work. The work that a DBE prime contractor has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors, suppliers and trucking companies will count toward the goal.

The information necessary to establish the bidder's adequate good faith efforts to meet the DBE goal should include:

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder.
- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested.
- C. The items of work which the bidder made available to DBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to meet the DBE goal was made available to DBE firms.
- D. The names, addresses and phone numbers of rejected DBE firms, the firms selected for that work, and the reasons for the bidder's choice.
- E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs.
- F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate.
- G. The names of agencies contacted to provide assistance in contacting, recruiting and using DBE firms.
- H. Any additional data to support a demonstration of good faith efforts.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract.

A "Vendor Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, vendor shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or

suppliers. Failure to complete and return the "Vendor Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Vendor Data Record" form is in addition to any other retention of payments due the Contractor.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within 15 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

The work shall be diligently prosecuted to completion before the expiration of

450 WORKING DAYS

beginning on the fifteenth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$ 2,100 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above.

It is anticipated that water will be available in sufficient quantities for the prosecution of the work. However, water shortages may occur during the life of the contract. Any arrangements or commitments obtained by the Department are not a part of the contract and it is expressly understood and agreed that the Department assumes no responsibility to the bidder or Contractor whatsoever in respect to the arrangements made with any source and that the Contractor shall assume all risks in connection with the use of such source and the terms upon which such use shall be made, and there is no warranty or guaranty, either express or implied, as to the quantity of water that can be obtained from such source. If the Department has compiled "Materials Information" as referred to in "Watering" elsewhere in these special provisions, the bidder or Contractor is cautioned to make such independent investigations and obtain such commitments or allocations as the bidder or Contractor deems necessary to verify the quantity of water available. The Contractor shall, at the Contractor's own expense, make any arrangements or obtain any commitments or allocations necessary to provide water for the project.

During the progress of the work, if water becomes unavailable or unavailable in the quantities needed for prosecution of the work, the unavailability of water will be considered a "shortage of materials" as provided in Section 8-1.07, except for compensation. The Contractor will be granted an extension of time and will not be assessed with liquidated damages for any portion of the delay in completion of the work beyond the time shown above for the completion of the work caused by the unavailability of water, provided the Contractor notifies the Engineer and furnishes proof of the "shortage of materials" as required in the third and fourth paragraphs in Section 8-1.07. If the Contractor sustains delay costs or damages which could not have been avoided by the judicious handling of forces, equipment and plant, there shall be paid to the Contractor such amount as the Engineer may find to be a fair and reasonable compensation for such part of the Contractor's actual loss, as, in the opinion of the Engineer, was unavoidable, determined in the same manner as provided for right of way delays in Section 8-1.09, "Right of Way Delays," of the Standard Specifications. The Contractor shall be entitled to no other compensation for such delay. The provisions in Section 5-1.116, "Differing Site Conditions," of the Standard Specifications shall not apply to the unavailability of water.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.00 PLANS AND WORKING DRAWINGS

When the specifications require working drawings to be submitted to the Office of Structure Design, the drawings shall be submitted to: Office of Structure Design, Documents Unit, P.O. Box 942874, Mail Station 9, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816), Telephone (916) 227-8252.

5-1.003 TRANSPORTATION LABORATORY

Section 1-1.25, "Laboratory," of the Standard Specifications is amended to read:

1-1.25 Laboratory.—The Office of Materials and Foundations of the Department of Transportation, or established laboratories of the various Districts of the Department, or other laboratories authorized by the Department to test materials and work involved in the contract. When a reference is made in the specifications to the "Transportation Laboratory," the reference shall mean the Office of Materials and Foundations, located at 5900 Folsom Boulevard, Sacramento, CA 95819.

The telephone number of the "Transportation Laboratory" is (916) 227-7000.

5-1.005 CONTRACT BONDS

Attention is directed to Section 3-1.02, "Contract Bonds," of the Standard Specifications and these special provisions.

The payment bond shall be in a sum not less than the following:

1. One hundred percent of the total amount payable by the terms of the contract when the total amount payable does not equal or exceed five million dollars (\$5 000 000).
2. Fifty percent of the total amount payable by the terms of the contract when the total amount payable is not less than five million dollars (\$5 000 000) and does not exceed ten million dollars (\$10 000 000).
3. Twenty-five percent of the total amount payable by the terms of the contract when the total amount payable exceeds ten million dollars (\$10 000 000).

5-1.01 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

**NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM
(GOV. CODE, SECTION 12990)**

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt state contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The Specifications are applicable to all nonexempt state construction contracts and subcontracts of \$5000 or more.

5-1.02 LABOR CODE REQUIREMENTS

Section 7-1.01A(1), "Hours of Labor," of the Standard Specifications is amended to read:

7-1.01A(1) Hours of Labor.— Eight hours labor constitutes a legal day's work. The Contractor or any subcontractor under the Contractor shall forfeit,

as a penalty to the State of California, \$25 for each worker employed in the execution of the contract by the respective Contractor or subcontractor for each calendar day during which that worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay, as provided in Section 1815 thereof.

Section 7-1.01A(2), "Prevailing Wage," of the Standard Specifications is amended to read:

7-1.01A(2) Prevailing Wage.— The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the Contractor shall forfeit to the State or political subdivision on whose behalf the contract is made or awarded a penalty of not more than fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any public work done under the contract by the Contractor or by any subcontractor under the Contractor in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful failure by the Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or subcontractor. If a worker employed by a subcontractor on a public works project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

1. The contract executed between the contractor and the subcontractor for the performance of work on the public works project shall include a copy of the provisions of Sections 1771, 1775, 1776, 1777.5, 1813, and 1815 of the Labor Code.
2. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.
3. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for work performed on the public works project.
4. Prior to making final payment to the subcontractor for work performed on the public works project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has

paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the Department did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the Department. These moneys shall be retained by the Department pending the final decision of an enforcement action.

Pursuant to the provisions of Section 1773 of the Labor Code, the Department has obtained the general prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in Section 1773.8 of the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor Code, and similar purposes) applicable to the work to be done, for straight time, overtime, Saturday, Sunday and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned. The general prevailing wage rates and any applicable changes to these wage rates are available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated. For work situated in District 9, the wage rates are available at the Labor Compliance Office at the offices of the District Director of Transportation for District 6, located at Fresno. General prevailing wage rates are also available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>.

The wage rates determined by the Director of Industrial Relations for the project refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicated in the wage rate determinations to obtain predetermined wage changes.

Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least 10 days prior to the date of the Notice to Contractors for the project.

The State will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage

rate set forth in the contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the State on the contract.

7-1.01A(2)(a) Travel and Subsistence Payments.— Attention is directed to the requirements of Section 1773.8 of the Labor Code. The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in accordance with the requirements in Labor Code Section 1773.8.

The first and second paragraphs of Section 7-1.01A(3), "Payroll Records," of the Standard Specifications are amended to read:

7-1.01A(3) Payroll Records.— Attention is directed to the provisions of Labor Code Section 1776, a portion of which is quoted below. Regulations implementing Labor Code Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations.

"1776. (a) Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct.

(2) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.

"(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:

(1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

(2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

"(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

"(d) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

"(e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding

body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in a manner so as to prevent disclosure of an individual's name, address, and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated.

"(f) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

"(g) The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section."

The penalties specified in subdivision (g) of Labor Code Section 1776 for noncompliance with the provisions of Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

5-1.023 INDEMNIFICATION AND INSURANCE

Section 7-1.12, "Responsibility for Damage," of the Standard Specifications is deleted. All references to Section 7-1.12 in the Contract documents shall be deemed to mean Sections 7-1.121, "Indemnification," and 7-1.122, "Insurance," as added below.

The Standard Specifications is amended by adding the following Section 7-1.121, "Indemnification," and Section 7-1.122, "Insurance," before Section 7-1.125, "Legal Action Against the Department":

7-1.121 Indemnification.—With the exception that this section shall in no event be construed to require indemnification by the Contractor to a greater extent than permitted by law, the Contractor shall defend, indemnify and save harmless the State, including its officers, directors, agents (excluding agents who are design professionals), and employees, and each of them (Indemnitees), from any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, losses or liabilities, in law or in equity, of every kind and nature whatsoever (Claims), arising out of or in connection with the Contractor's performance of this contract for:

- A. Bodily injury including, but not limited to, bodily injury, sickness or disease, emotional injury or death to persons, including, but not limited to, the public, any employees or agents of the Contractor, State, Department, or any other contractor and;
- B. Damage to property of anyone including loss of use thereof;

caused or alleged to be caused in whole or in part by any negligent or otherwise legally actionable act or omission of the Contractor or anyone directly or indirectly employed by the Contractor or anyone for whose acts the Contractor may be liable.

Except as otherwise provided by law, the indemnification provisions above shall apply regardless of the existence or degree of fault of Indemnitees. The Contractor, however, shall not be obligated to indemnify Indemnitees for Claims

arising from conduct delineated in Civil Code section 2782. Further, the Contractor's indemnity obligation shall not extend to Claims to the extent they arise from any defective or substandard condition of the roadway which existed at or prior to the time the Contractor commenced work, unless this condition has been changed by the work or the scope of the work requires the Contractor to maintain existing Roadway facilities and the claim arises from the Contractor's failure to maintain. The Contractor's indemnity obligation shall extend to Claims arising after the work is completed and accepted only if these Claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work. No inspection by the Department, its employees or agents shall be deemed a waiver by the Department of full compliance with the requirements of this section.

The Contractor's obligation to defend and indemnify shall not be excused because of the Contractor's inability to evaluate liability or because the Contractor evaluates liability and determines that the Contractor is not liable to the claimant. The Contractor will respond within 30 days to the tender of any claim for defense and indemnity by the State, unless this time has been extended by the State. If the Contractor fails to accept or reject a tender of defense and indemnity within 30 days, in addition to any other remedy authorized by law, so much of the money due the Contractor under and by virtue of the contract as shall reasonably be considered necessary by the Department, may be retained by the State until disposition has been made of the claim or suit for damages, or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

With respect to third party claims against the Contractor, the Contractor waives any and all rights of any type to express or implied indemnity against the State, its directors, officers, employees, or agents (excluding agents who are design professionals).

7-1.122 Insurance.—Insurance shall conform to the following requirements:

7-1.122A Casualty Insurance.—The Contractor shall, at the Contractor's expense, procure and maintain insurance on all of its operations with companies acceptable to the Department as follows. All insurance shall be kept in full force and effect from the beginning of the work through final acceptance by the State. In addition, the Contractor shall maintain completed operations coverage with a carrier acceptable to the Department through the expiration of the patent deficiency in construction statute of repose set forth in Section 337.1 of the Code of Civil Procedure.

7-1.122A(1) Workers' Compensation and Employer's Liability Insurance.—Workers' Compensation insurance shall be provided as specified in Section 7-1.01A(6), "Workers' Compensation." Employer's Liability Insurance shall be provided in amounts not less than:

- (a) \$1 000 000 for each accident for bodily injury by accident.
- (b) \$1 000 000 policy limit for bodily injury by disease.
- (c) \$1 000 000 for each employee for bodily injury by disease.

If there is an exposure of injury to the Contractors' employees under the U.S. Longshoremen's and Harbor Workers' Compensation Act, the Jones Act or under laws, regulations or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.

7-1.122A(2) Liability Insurance.—The Contractor shall carry General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of the Contractor providing insurance for bodily injury liability, and property damage liability for the limits of liability indicated below and including coverage for:

- (a) premises, operations and mobile equipment
- (b) products and completed operations
- (c) broad form property damage (including completed operations)
- (d) explosion, collapse and underground hazards
- (e) personal injury
- (f) contractual liability

7-1.122A(3) Liability Limits/Additional Insureds.—The limits of liability shall be at least:

- (a) \$1 000 000 for each occurrence (combined single limit for bodily injury and property damage).
- (b) \$2 000 000 aggregate for products-completed operations.
- (c) \$2 000 000 general aggregate. This general aggregate limit shall apply separately to the Contractor's work under this Agreement.
- (d) \$5 000 000 umbrella or excess liability. For projects over \$25 000 000 only, an additional \$10 000 000 umbrella or excess liability (for a total of \$15 000 000). Umbrella or excess policy shall include products liability completed operations coverage and may be subject to \$5 000 000 or \$15 000 000 aggregate limits. Further, 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.

The State and the Department, including their officers, directors, agents (excluding agents who are design professionals), and State employees, shall be named as additional insureds under the General Liability and Umbrella Liability Policies with respect to liability arising out of or connected with work or operations performed by or on behalf of the Contractor under this contract. Coverage for such additional insureds shall not extend to liability:

- (1) arising from any defective or substandard condition of the Roadway which existed at or prior to the time the Contractor commenced work, unless such condition has been changed by the work or the scope of the work requires the Contractor to maintain existing Roadway facilities and the claim arises from the Contractor's failure to maintain; or
- (2) for claims occurring after the work is completed and accepted unless these claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work; or
- (3) to the extent prohibited by Section 11580.04 of the Insurance Code.

The policy shall stipulate that the insurance afforded the additional insureds shall apply as primary insurance. Any other insurance or self insurance maintained by the Department or State will be excess only and shall not be called upon to contribute with this insurance. Such additional insured coverage shall be provided by a policy provision or by an endorsement providing coverage at least as broad as Additional Insured (Form B) endorsement form CG 2010, as published by the Insurance Services Office (ISO).

7-1.122B Automobile Liability Insurance.—The Contractor shall carry automobile liability insurance, including coverage for all owned, hired and non-owned automobiles. The primary limits of liability shall be not less than \$1 000 000 combined single limit each accident for bodily injury and property damage. The umbrella or excess liability coverage required under Section

7-1.122A(3), "Liability Limits/Additional Insureds," shall also apply to automobile liability.

7-1.122C Policy Forms, Endorsements and Certificates.—The Contractor's General Liability Insurance shall be provided under Commercial General Liability policy form no. CG0001 as published by the Insurance Services Office (ISO) or under a policy form at least as broad as policy form no. CG0001.

Evidence of insurance in a form acceptable to the Department, including the required "additional insured" endorsements, shall be furnished by the Contractor to the Department at or prior to the pre-construction conference. The evidence of insurance shall provide that there will be no cancellation, lapse, or reduction of coverage without thirty (30) days' prior written notice to the Department. Certificates of Insurance, as evidence of required insurance, for the General Liability, Auto Liability and Umbrella-Excess Liability policies shall set forth deductible amounts applicable to each policy and all exclusions which are added by endorsement to each policy. The Department may expressly allow deductible clauses, which it does not consider excessive, overly broad, or harmful to the interests of the State. Standard ISO form CG 0001 or similar exclusions will be allowed provided they are not inconsistent with the requirements of this section. Allowance of any additional exclusions is at the discretion of the Department. Regardless of the allowance of exclusions or deductions by the Department, the Contractor shall be responsible for any deductible amount and shall warrant that the coverage provided to the Department is consistent with the requirements of this section.

7-1.122D Enforcement.—The Department may take any steps as are necessary to assure Contractor's compliance with its obligations. Should any insurance policy lapse or be canceled during the contract period the Contractor shall, within thirty (30) days prior to the effective expiration or cancellation date, furnish the Department with evidence of renewal or replacement of the policy. Failure to continuously maintain insurance coverage as herein provided is a material breach of contract. In the event the Contractor fails to maintain any insurance coverage required, the Department may, but is not required to, maintain this coverage and charge the expense to the Contractor or terminate this Agreement. The required insurance shall be subject to the approval of Department, but any acceptance of insurance certificates by the Department shall in no way limit or relieve the Contractor of the Contractor's duties and responsibilities under the Contract to indemnify, defend and hold harmless the State, its officers, agents, and employees. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve the Contractor for liability in excess of such coverage, nor shall it preclude the State from taking other actions as is available to it under any other provision of the contract or law. Failure of the Department to enforce in a timely manner any of the provisions of this section shall not act as a waiver to enforcement of any of these provisions at a later date.

7-1.122E Self-Insurance.—Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the State of evidence of the Contractor's financial capacity to respond. Additionally, self-insurance programs or retentions must provide the State with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance.

7-1.122F Miscellaneous.—Nothing contained in the Contract is intended to make the public or any member thereof a third party beneficiary of the Insurance or Indemnity provisions of these Standard Specifications, nor is any term, condition or other provision of the Contract intended to establish a standard of care owed to the public or any member thereof.

5-1.025 ARBITRATION

The last paragraph in Section 9-1.10, "Arbitration," of the Standard Specifications, is amended to read:

Arbitration shall be initiated by a Complaint in Arbitration made in compliance with the requirements of those regulations. A Complaint in Arbitration by the Contractor shall be made not later than 90 days after the date of service in person or by mail on the Contractor of the final written decision by the Department on the claim.

5-1.03 PAYMENT OF WITHHELD FUNDS

Section 9-1.065, "Payment of Withheld Funds," of the Standard Specifications, is amended by adding the following after the third paragraph:

Alternatively, and subject to the approval of the Department, the payment of retentions earned may be deposited directly with a person licensed under Division 6 (commencing with Section 17000) of the Financial Code as the escrow agent. Upon written request of an escrow agent that has not been approved by the Department under subdivision (c) of Section 10263 of the Public Contract Code, the Department will provide written notice to that escrow agent within 10 business days of receipt of the request indicating the reason or reasons for not approving that escrow agent. The payments will be deposited in a trust account with a Federally chartered bank or savings association within 24 hours of receipt by the escrow agent. The Contractor shall not place any retentions with the escrow agent in excess of the coverage provided to that escrow agent pursuant to subdivision (b) of Section 17314 of the Financial Code. In all respects not inconsistent with subdivision (c) of Section 10263 of the Public Contract Code, the remaining provisions of Section 10263 of the Public Contract Code shall apply to escrow agents acting pursuant to subdivision (c) of Section 10263 of the Public Contract Code.

5-1.04 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments and claim payments as follows:

1. Unpaid progress payments, payment after acceptance and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
2. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following the receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in accordance with the requirements of Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
3. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments and extra work payments shall be 10 percent per annum.
4. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

5-1.05 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle, or storage area when the following conditions exist:

- (1) Excavations.—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:
 - (a) Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
 - (b) Excavations less than 0.3-m deep.
 - (c) Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
 - (d) Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
 - (e) Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
 - (f) Excavations protected by existing barrier or railing.
- (2) Temporarily Unprotected Permanent Obstacles.—The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- (3) Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1995 Standard Plan T3 or 1992 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

The fourteenth paragraph of Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications is amended to read:

Each rail unit placed within 3 m of a traffic lane shall have a reflector installed on top of the rail as directed by the Engineer. A Type P marker panel shall also be installed at each end of railing installed adjacent to a two-lane, two-way highway and at the end facing traffic of railing installed adjacent to a one-way roadbed. If the railing is placed on a skew, the marker shall be installed at the end of the skew nearest the traveled way. Type P marker panels

shall conform to the provisions in Section 82, "Markers and Delineators," except that the Contractor shall furnish the marker panels.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Approved Traffic Products" of these special provisions.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these special provisions:

Approach speed of public traffic (Posted Limit) (Kilometers Per Hour)	Work Areas
Over 72 (45 Miles Per Hour)	Within 1.8 m of a traffic lane but not on a traffic lane
56 to 72 (35 to 45 Miles Per Hour)	Within 0.9-m of a traffic lane but not on a traffic lane

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.06 SURFACE MINING AND RECLAMATION ACT

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with the Surface Mining and Reclamation Act of 1975.

The requirements of this section shall apply to all materials furnished for the project, except for acquisition of materials in conformance with Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

5-1.07 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe, and shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In accordance with Section 25914.1 of the Health and Safety Code, all such removal of asbestos or hazardous substances including any exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay as provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.08 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California. Year 2000 compliance is defined as follows:

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product must also operate accurately in the manner in which it was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

5-1.085 BUY AMERICA REQUIREMENTS

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In accordance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance, conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, shall be furnished for steel and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall also specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1%) of the total contract cost or \$2500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of any foreign steel and iron prior to incorporating the materials into the work.

5-1.09 SUBCONTRACTOR AND DBE RECORDS

The Contractor shall maintain records showing the name and business address of each first-tier subcontractor. The records shall also show the name and business address of every DBE subcontractor, DBE vendor of materials and DBE trucking company, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all of these firms. DBE prime contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 (F) and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. \$10,000 will be withheld from payment until the Form CEM-2402 (F) is submitted. The amount will be returned to the Contractor when a satisfactory Form CEM-2402 (F) is submitted.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies listed in the Contractor's DBE information. This monthly documentation shall indicate the portion of the revenue paid to DBE trucking companies which is claimed toward DBE participation. The Contractor shall also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The records must confirm that the amount of credit claimed toward DBE participation conforms with Section 2-1.02, /

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month for which DBE participation will be claimed. This documentation shall be submitted on Form CEM-2404 (F).

5-1.093 DBE CERTIFICATION STATUS

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, Form CEM-2403 (F) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

5-1.095 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS

The DBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DBEs, shall perform the work and supply the materials for which they are listed, unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to use other forces or sources of materials may be requested for the following reasons:

- A. The listed DBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed DBE becomes bankrupt or insolvent.
- C. The listed DBE fails or refuses to perform the subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial conformance with the plans and

specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.

F. It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed DBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

5-1.097 SUBCONTRACTING

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, and Section 2, "Proposal Requirements and Conditions," and Section 3, "Award and Execution of Contract," of these special provisions.

Section 8-1.01 of the Standard Specifications is amended by adding the following before the sixth paragraph:

Pursuant to the provisions of Section 6109 of the Public Contract Code, the Contractor shall not perform work on a public works project with a subcontractor who is ineligible to perform work on the public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

Pursuant to the provisions of Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at:

http://www.dir.ca.gov/dir/Labor_law/DLSE/Debar.html.

The provisions in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications, that the Contractor shall perform with the Contractor's own organization contract work amounting to not less than 50 percent of the original contract price, is not changed by the Federal Aid requirement specified under "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions that the Contractor perform not less than 30 percent of the original contract work with the Contractor's own organization.

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions. This requirement shall be enforced as follows:

- A. Noncompliance shall be corrected. Payment for subcontracted work involved will be withheld from progress payments due, or to become due, until correction is made. Failure to comply may result in termination of the contract.

The DBE information furnished under Section 2-1.02B, "Submission of DBE Information," of these special provisions is in addition to the subcontractor information required to be furnished under Section 8-1.01, "Subcontracting," and Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications.

In conformance with the Federal DBE regulations Sections 26.53(f)(1) and 26.53(f)(2) Part 26, Title 49 CFR:

- A. The Contractor shall not terminate for convenience a DBE subcontractor listed in response to Section 2-1.02B, "Submission of DBE Information," and then perform that work with its own forces, or those of an affiliate without the written consent of the Department, and
- B. If a DBE subcontractor is terminated or fails to complete its work for any reason, the Contractor will be required to make good faith efforts to substitute another DBE subcontractor for the original DBE subcontractor, to the extent needed to meet the contract goal.

The requirement in Section 2-1.02, "Disadvantaged Business Enterprise (DBE)," of these special provisions that DBEs must be certified on the date bids are opened does not apply to DBE substitutions after award of the contract.

5-1.098 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code and Section 7108.5 of the Business and Professions Code concerning prompt payment to subcontractors.

5-1.099 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS

The Contractor shall return all moneys withheld in retention from the subcontractor within 30 days after receiving payment for work satisfactorily completed, even if the other contract work is not completed and has not been accepted in conformance with Section 7-1.17, "Acceptance of Contract," of the Standard Specifications. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or noncompliance by a subcontractor.

5-1.10 PARTNERING

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible management level.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the State and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator, and of the expenses for obtaining the workshop site. The State's share of such costs will be reimbursed to the Contractor in a change order written by the Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

5-1.11 DISPUTES REVIEW BOARD

To assist in the resolution of disputes or potential claims arising out of the work of this project, a Disputes Review Board, hereinafter referred to as the "DRB", shall be established by the Engineer and Contractor cooperatively upon approval of the contract. The DRB is intended to assist the contract administrative claims resolution process as set forth in the provisions of Section 9-1.04, "Notice of Potential Claim," and Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications. The DRB shall not be considered to serve as a substitute for any requirements in the specifications in regard to filing of potential claims. The requirements and procedures established in this special provision shall be considered as an essential prerequisite to filing a claim, for arbitration or for litigation prior or subsequent to project completion.

The DRB shall be utilized when dispute or potential claim resolution at the job level is unsuccessful. The DRB shall function until the day of acceptance of the contract, at which time the work of the DRB will cease except for completion of

unfinished dispute hearings and reports. After acceptance of the contract any disputes or potential claims that the Contractor wants to pursue that have not been settled, shall be stated or restated, by the Contractor, in response to the Proposed Final Estimate within the time limits provided in Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications. The State will review those claims in accordance with Section 9-1.07B, of the Standard Specifications. Following the completion of the State's administrative claims procedure, the Contractor may resort to arbitration as provided in Section 9-1.10, "Arbitration," of the Standard Specifications.

Disputes, as used in this section, shall include all differences of opinion, properly noticed as provided hereinafter, between the State and Contractor on matters related to the work and other subjects considered by the State or Contractor, or by both, to be of concern to the DRB on this project, except matters relating to Contractor, subcontractor or supplier claims not actionable against the State as specified in these special provisions. Whenever the term "dispute" or "disputes" is used herein, it shall be deemed to include potential claims as well as disputes.

The DRB shall serve as an advisory body to assist in the resolution of disputes between the State and the Contractor, hereinafter referred to as the "parties". The DRB shall consider disputes referred to it, and furnish written reports containing findings and recommendations pertaining to those disputes, to the parties to aid in resolution of the differences between them. DRB findings and recommendations are not binding on the parties.

The DRB shall consist of one member selected by the State, one member selected by the Contractor, and a third member selected by the first two members and approved by both the State and the Contractor. The third member shall act as DRB Chairperson.

The first two DRB members shall select a third DRB member subject to the mutual approval of the parties, or may mutually concur on a list of potentially acceptable third DRB members and submit the list to the parties for final selection and approval of the third member. The goal in selection of the third member is to complement the professional experience of the first two members, and to provide leadership for the DRB's activities.

No DRB member shall have prior direct involvement in this contract, and no member shall have a financial interest in this contract or the parties thereto, within a period of 6 months prior to award of this contract, or during the contract, except as follows:

1. Compensation for services on this DRB.
2. Ownership interest in a party or parties, documented by the prospective DRB member, that has been reviewed and determined in writing by the State to be sufficiently insignificant to render the prospective member acceptable to the State.
3. Service as a member of other Disputes Review Boards on other contracts.
4. Retirement payments or pensions received from a party that are not tied to, dependent on or affected by the net worth of the party.
5. The above provisions apply to any party having a financial interest in this contract; including but not limited to contractors, subcontractors, suppliers, consultants, and legal and business services.

DRB members shall be especially knowledgeable in the type of construction and contract documents potentially anticipated by the contract, and shall discharge their responsibilities impartially and as an independent body considering the facts and circumstances related to the matters under consideration, applicable laws and regulations, and the pertinent provisions of the contract.

The State and the Contractor shall select their respective DRB members, in accordance with the terms and conditions of the Disputes Review Board Agreement and these provisions, within 45 days of the approval of the contract. Each party shall

provide written notification to the other of the name of their selected DRB member along with the prospective member's written disclosure statement.

Before their appointments are final, the first two prospective DRB members shall submit complete disclosure statements to both the State and the Contractor. The statement shall include a resume of the prospective member's experience, together with a declaration describing all past, present and anticipated or planned future relationships, including indirect relationships through the prospective member's primary or full-time employer, to this project and with all parties involved in this construction contract; including, but not limited to, any relevant subcontractors or suppliers to the parties, the parties' principals or the parties' counsel. The DRB members shall also include a full disclosure of close professional or personal relationships with all key members of all parties to the contract. Either the Contractor or the State may object to the others nominee and that person will not be selected for the DRB. No reason need be given for the first objection. Objections to subsequent nominees must be based on a specific breach or violation of nominee responsibilities under this specification. A different person shall then be nominated within 14 Days. The third DRB member shall supply a full disclosure statement to the first two DRB members and to the parties prior to appointment. Either party may reject any of the three prospective DRB members who fail to fully comply with all required employment and financial disclosure conditions of DRB membership as described in the Disputes Review Board Agreement and elsewhere herein. A copy of the Disputes Review Board Agreement is included in this special provision.

The first duty of the State and Contractor selected members of the DRB is to select and recommend prospective third member(s) to the parties for final selection and approval. The first two DRB members shall proceed with the selection of the third DRB member immediately upon receiving written notification from the State of their selection, and shall provide their recommendation simultaneously to the parties within 21 days of the notification.

An impasse shall be considered to have been reached if the parties are unable to approve a third member within 14 days of receipt of the recommendation of the first two DRB members, or if the first two members are unable to agree upon a recommendation within the 14 day time limit allowed in the preceding paragraph. In the event of an impasse in selection of the third DRB member, the State and the Contractor shall each propose three candidates for the third position. The parties shall select all candidates proposed under this paragraph from the current list of arbitrators certified by the Public Works Contract Arbitration Committee created by Article 7.2 (commencing with Section 10245) of the State Contract Act. The first two DRB members shall then select one of the 6 proposed candidates in a blind draw.

The Contractor, the State, and all three members of the DRB shall complete and adhere to the Disputes Review Board Agreement in administration of this DRB within 14 days of the parties' concurrence in the selection of the third member. The State authorizes the Engineer to execute and administer the terms of the Agreement. The person(s) designated by the Contractor as authorized to execute Contract Change Orders shall be authorized to execute and administer the terms of this agreement, or to delegate the authority in writing. The operation of the DRB shall be in conformance with the terms of the Disputes Review Board Agreement.

The State and the Contractor shall bear the costs and expenses of the DRB equally. Each DRB board member shall be compensated at an agreed rate of \$1,000.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is greater than four hours. Each DRB board member shall be compensated at an agreed rate of \$600.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is less than or equal to four hours. The agreed rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof, that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time, (such as time spent evaluating and preparing recommendations on specific issues presented to the DRB),

has been specifically agreed to in advance by the State and Contractor. Time away from the project, that has been specifically agreed to in advance by the parties, will be compensated at an agreed rate of \$100.00 per hour. The agreed amount of \$100.00 per hour shall include all incidentals including any expenses for telephone, fax and computer services. Members serving on more than one DRB, regardless of the number of meetings per day, shall not be paid more than the all inclusive rate per day or rate per hour for an individual project. The State will provide, at no cost to the Contractor, administrative services such as conference facilities and secretarial services to the DRB. These special provisions and the Disputes Review Board Agreement state provisions for compensation and expenses of the DRB. All DRB members shall be compensated at the same daily and hourly rate. The Contractor shall make direct payments to each DRB member for their participation in authorized meetings and approved hourly rate charges from invoices submitted by each DRB member. The State will reimburse the Contractor for its share of the costs. There will be no markups applied to any expenses connected with the DRB, either by the DRB members or by the Contractor when requesting payment of the State's share of DRB expenses.

Service of a DRB member may be terminated at any time with not less than 14 days notice as follows:

1. The State may terminate service of the State appointed member.
2. The Contractor may terminate service of the Contractor appointed member.
3. Upon the written recommendation of the State and Contractor members for the removal of the third member.
4. Upon resignation of a member.

When a member of the DRB is replaced, the replacement member shall be appointed in the same manner as the replaced member was appointed. The appointment of a replacement DRB member will begin promptly upon determination of the need for replacement and shall be completed within 14 days. Changes in either of the DRB members chosen by the two parties will not require re-selection of the third member, unless both parties agree to such re-selection in writing. The Disputes Review Board Agreement shall be amended to reflect the change of a DRB member.

The following procedure shall be used for dispute resolution:

1. If the Contractor objects to any decision, act or order of the Engineer, the Contractor shall give written notice of potential claim as specified in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications, including provision of applicable cost documentation; or file written protests or notices pursuant to Sections 4-1.03A, "Procedure and Protest", 8-1.06, "Time of Completion", 8-1.07, "Liquidated Damages", or 8-1.10, "Utility and Non-Highway Facilities" of the Standard Specifications.
2. The Engineer will respond, in writing, to the Contractor's written protest or notice within 14 days of receipt of the written protest or notice.
3. Within 14 days after receipt of the Engineer's written response, the Contractor shall, if the Contractor still objects, file a written reply with the Engineer, stating clearly and in detail the basis of the objection.
4. Following the Contractor's objection to the Engineer's decision, the Contractor shall refer the dispute to the DRB if the Contractor wishes to further pursue the objection to the Engineer's decision. The Contractor shall make the referral in writing to the DRB, simultaneously copied to the State, within 21 days after receipt of the written reply from the Engineer. The written dispute referral shall describe the disputed matter in individual discrete segments so that it will be clear to both parties and the DRB what discrete elements of the dispute have been resolved, and which remain unresolved.
5. The Contractor, by failing to submit the written notice of referral of the matter to the DRB, within 21 days after receipt of the State's written reply, waives any future claims on the matter in contention.

6. The Contractor and the State shall each be afforded an opportunity to be present and to be heard by the DRB, and to offer evidence. Either party furnishing any written evidence or documentation to the DRB must furnish copies of such information to the other party a minimum of 14 days prior to the date the DRB is scheduled to convene the hearing for the dispute. Either party shall produce such additional evidence as the DRB may deem necessary to reach an understanding and determination of the dispute. The party furnishing additional evidence shall furnish copies of such additional evidence to the other party at the same time the evidence is provided to the DRB. The DRB will not consider any evidence not furnished in accordance with the terms specified herein.
7. The DRB shall furnish a report, containing findings and recommendations as described in the Disputes Review Board Agreement, in writing to both the State and the Contractor. The DRB shall complete its reports, including minority opinion if any, and submit them to the parties within 30 days of the DRB hearing, except that time extensions may be granted at the request of the DRB with the written concurrence of both parties. The report shall include the facts and circumstances related to the matters under consideration, applicable laws and regulations, the pertinent provisions of the Contract and the actual costs and time incurred as shown on the Contractor's cost accounting records.
8. Within 30 days after receiving the DRB's report, both the State and the Contractor shall respond to the DRB in writing signifying that the dispute is either resolved or remains unresolved. Failure to provide the written response within the time specified, or a written rejection of the DRB's recommendation presented in the report by either party, shall conclusively indicate that the party(s) failing to respond accepts the DRB recommendation. Immediately after responses have been received by both parties, the DRB will provide copies of both responses to the parties simultaneously. Either party may request clarification of elements of the DRB's report from the DRB prior to responding to the report. The DRB will consider any clarification request only if submitted within 10 days of receipt of the DRB's report, and if submitted simultaneously in writing to both the DRB and the other party. Each party may submit only one request for clarification for any individual DRB report. The DRB shall respond, in writing, to requests for clarification within 10 days of receipt of such requests.
9. The DRB's recommendations, stated in the DRB's reports, are not binding on either party. Either party may seek a reconsideration of a recommendation of the DRB. The DRB shall only grant a reconsideration based upon submission of new evidence and if the request is submitted within the 30 day time limit specified for response to the DRB's written report. Each party may submit only one request for reconsideration regarding any individual DRB recommendation.
10. If the State and the Contractor are able to resolve their dispute with the aid of the DRB's report, the State and Contractor shall promptly accept and implement the recommendations of the DRB.
11. The State or the Contractor shall not call members who served on the DRB for this contract as witnesses in arbitration proceedings which may arise from this contract, and all documents created by the DRB shall be inadmissible as evidence in subsequent arbitration proceedings, except the DRB's final written reports on each issue brought before it..
12. The State and Contractor shall jointly indemnify and hold harmless the DRB members from and against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of and resulting from the findings and recommendations of the DRB.
13. The DRB members shall have no claim against the State or the Contractor, or both, from any claimed harm arising out of the parties' evaluations of the DRB's report.

Disputes Involving Subcontractor Claims.—For purposes of this section, a "subcontractor claim" shall include any claim by a subcontractor (including also any pass through claims by a lower tier subcontractor or supplier) against the Contractor that is actionable by the Contractor against the Department which arises from the work, services, or materials provided or to be provided in connection with the contract. If the Contractor determines to pursue a dispute against the Department that includes a subcontractor claim, the dispute shall be processed and resolved in accordance with these special provisions and in accordance with the following:

1. The Contractor shall identify clearly in all submissions pursuant to this section, that portion of the dispute that involves a subcontractor claim or claims.
2. The Contractor shall include, as part of its submission pursuant to Step 4 above, a certification (False Claims Act Certification) by the subcontractor's or supplier's officer, partner, or authorized representative with authority to bind the subcontractor and with direct knowledge of the facts underlying the subcontractor claim. The Contractor also shall submit a certification that the subcontractor claim is acknowledged and forwarded by the Contractor. The form for these certifications are available from the Engineer.
3. At any DRB meeting on a dispute that includes one or more subcontractor claims, the Contractor shall require that each subcontractor that is involved in the dispute have present an authorized representative with actual knowledge of the facts underlying the subcontractor claim to assist in presenting the subcontractor claim and to answer questions raised by the DRB members or the Department's representatives.
4. Failure by the Contractor to declare a subcontractor claim on behalf of its subcontractor (including lower tier subcontractors' and suppliers' pass through claims) at the time of submission of the Contractor's claims, as provided hereunder, shall constitute a release of the Department by the Contractor on account of such subcontractor claim.
5. The Contractor shall include in all subcontracts under this contract that subcontractors and suppliers of any tier (a) agree to submit subcontractor claims to the Contractor in a proper form and in sufficient time to allow processing by the Contractor in accordance with the Dispute Review Board resolution specifications; (b) agree to be bound by the terms of the Dispute Review Board provisions to the extent applicable to subcontractor claims; (c) agree that, to the extent a subcontractor claim is involved, completion of all steps required under these Dispute Review Board special provisions shall be a condition precedent to pursuit by the subcontractor of any other remedies permitted by law, including without limitation of a lawsuit against the Contractor; and (d) agree that the existence of a dispute resolution process for disputes involving subcontractor claims shall not be deemed to create any claim, right, or cause of action by any subcontractor or supplier against the Department.

Notwithstanding the foregoing, this Dispute Review Board special provision shall not apply to, and the DRB shall not have the authority to consider, any subcontractor claim between the subcontractor(s) or supplier(s) and the Contractor that is not actionable by the Contractor against the Department.

A copy of the "Disputes Review Board Agreement" to be executed by the Contractor, State and the three DRB members after approval of the contract follows:

DISPUTES REVIEW BOARD AGREEMENT

(Contract Identification)

Contract No. _____

THIS DISPUTES REVIEW BOARD AGREEMENT, hereinafter called "AGREEMENT", made and entered into this _____ day of _____, _____, between the State of California, acting through the California Department of Transportation and the Director of Transportation, hereinafter called the "STATE"; _____ hereinafter called the "CONTRACTOR"; and the Disputes Review Board, hereinafter called the "DRB" consisting of the following members:

_____,
(Contractor Appointee)

_____,
(State Appointee)

and _____
(Third Person)

WITNESSETH, that

WHEREAS, the STATE and the CONTRACTOR, hereinafter called the "parties", are now engaged in the construction on the State Highway project referenced above; and

WHEREAS the special provisions for the above referenced contract provides for the establishment and operation of the DRB to assist in resolving disputes; and

WHEREAS, the DRB is composed of three members, one selected by the STATE, one selected by the CONTRACTOR, and the third member selected by the other two members and approved by the parties;

NOW THEREFORE, in consideration of the terms, conditions, covenants, and performance contained herein, or attached and incorporated and made a part hereof, the STATE, the CONTRACTOR, and the DRB members hereto agree as follows:

I
DESCRIPTION OF WORK

To assist in the resolution of disputes between the parties, the contract provides for the establishment and the operation of the DRB. The intent of the DRB is to fairly and impartially consider disputes placed before it and provide written recommendations for resolution of these disputes to both parties. The members of this DRB shall perform the services necessary to participate in the DRB's actions as designated in Section II, Scope of Work.

II
SCOPE OF WORK

The scope of work of the DRB includes, but is not limited to, the following:

A. Objective

The principal objective of the DRB is to assist in the timely resolution of disputes between the parties arising from performance of this contract. It is not

intended for either party to default on their normal responsibility to amicably and fairly settle their differences by indiscriminately assigning them to the DRB. It is intended that the mere existence of the DRB will encourage the parties to resolve disputes without resorting to this review procedure. But when a dispute which is serious enough to warrant the DRB's review does develop, the process for prompt and efficient action will be in place.

B. Procedures

The DRB shall render written reports on disputes between the parties arising from the construction contract. Prior to consideration of a dispute, the DRB shall establish rules and regulations that will govern the conduct of its business and reporting procedures in accordance with the requirements of the contract and the terms of this AGREEMENT. DRB recommendations, resulting from its consideration of a dispute, shall be furnished in writing to both parties. The recommendations shall be based on the pertinent contract provisions, and the facts and circumstances involved in the dispute. The recommendations shall find one responsible party in a dispute; shared or "jury" determinations shall not be rendered.

The DRB shall refrain from officially giving any advice or consulting services to anyone involved in the contract. The individual members shall act in a completely independent manner and while serving as members of the DRB shall have no consulting business connections with either party or its principals or attorneys or any other affiliates (subcontractors, suppliers, etc.) who have a beneficial interest in the contract.

During scheduled meetings of the DRB as well as during dispute hearings, DRB members shall refrain from expressing opinions on the merits of statements on matters under dispute or potential dispute. Opinions of DRB members expressed in private sessions shall be kept strictly confidential. Individual DRB members shall not meet with, or discuss contract issues with individual parties, except as directed by the DRB Chairperson. Any such discussions or meetings shall be disclosed to both parties. Any other discussions regarding the project between the DRB members and the parties shall be in the presence of all three members and both parties. Individual DRB members shall not undertake independent investigations of any kind pertaining to disputes or potential disputes, except with the knowledge of both parties and as expressly directed by the DRB Chairperson.

C. Construction Site Visits, Progress Meetings and Field Inspections

The DRB members shall visit the project site and meet with representatives of the parties to keep abreast of construction activities and to develop familiarity with the work in progress. All scheduled progress meetings shall be held at or near the job site. The DRB shall meet at least once at the start of the project, and at least once every six months thereafter. The frequency, exact time, and duration of additional site visits and progress meetings shall be as recommended by the DRB and approved by the parties consistent with the construction activities or matters under consideration and dispute. Each meeting shall consist of a round table discussion and a field inspection of the work being performed on the contract, if necessary. Each meeting shall be attended by representatives of both parties. The agenda shall generally be as follows:

1. Meeting opened by the DRB Chairperson.
2. Remarks by the STATE's representative.
3. A description by the CONTRACTOR's representative of work accomplished since the last meeting; the current schedule status of the work; and a forecast for the coming period.
4. An outline by the CONTRACTOR's representative of potential problems and a description of proposed solutions.

5. An outline by the STATE's representative of the status of the work as the STATE views it.
6. A brief description by the CONTRACTOR's or STATE's representative of potential claims or disputes which have surfaced since the last meeting.
7. A summary by the STATE's representative, the CONTRACTOR's representative, or the DRB of the status of past disputes and claims.

The STATE's representative will prepare minutes of all regular meetings and circulate them for revision and approval by all concerned.

The field inspection shall cover all active segments of the work, the DRB being accompanied by both parties' representatives. The field inspection may be waived upon mutual agreement of the parties.

D. DRB Consideration and Handling of Disputes

Upon receipt by the DRB of a written referral of a dispute, the DRB shall convene to review and consider the dispute. The DRB shall determine the time and location of DRB hearings, with due consideration for the needs and preferences of the parties while recognizing the paramount importance of speedy resolution of issues. If the matter is not urgent, it may be scheduled for the time of the next scheduled DRB visit to the project. For an urgent matter, and upon the request of either party, the DRB shall meet at its earliest convenience.

Normally, hearings shall be conducted at or near the project site. However, any location which would be more convenient and still provide all required facilities and access to necessary documentation shall be satisfactory.

Both parties shall be given the opportunity to present their evidence at these hearings. It is expressly understood that the DRB members are to act impartially and independently in the consideration of the contract provisions, and the facts and conditions surrounding any dispute presented by either party, and that the recommendations concerning any such dispute are advisory and nonbinding on the parties.

The DRB may request that written documentation and arguments from both parties be sent to each DRB member, through the DRB Chairperson, for review before the hearing begins. A party furnishing any written documentation to the DRB shall furnish copies of such information to the other party at the same time that such information is supplied to the DRB.

DRB hearings shall be informal. There shall be no testimony under oath or cross-examination. There shall be no reporting of the procedures by a shorthand reporter or by any electronic means. Documents and verbal statements shall be received by the DRB in accordance with acceptance standards established by the DRB. Said standards need not comply with prescribed legal laws of evidence.

The third DRB member shall act as Chairperson for dispute hearings and all other DRB activities. The parties shall have a representative at all hearings. Failure to attend a duly noticed meeting by either of the parties shall be conclusively considered by the DRB as indication that the non-attending party considers any written submittals as their entire and complete argument. The claimant shall discuss the dispute, followed by the other party. Each party shall then be allowed one or more rebuttals until all aspects of the dispute are thoroughly covered. DRB members may ask questions, seek clarification, or request further data from either of the parties. The DRB may request from either party documents or information that would assist the DRB in making its findings and recommendations including, but not limited to, documents used by the CONTRACTOR in preparing the bid for the project. A refusal by a party to provide information requested by the DRB may be considered by the DRB as an indication that the requested material would tend to disprove that party's position. Claims shall not necessarily be computed by merely subtracting bid price from the total cost of the affected work. However, if any claims are based on the "total cost method", then, to be considered by the DRB, they shall be supported by evidence furnished by the CONTRACTOR that (1) the nature of the dispute(s) makes it impossible or impracticable to determine cost impacts

with a reasonable degree of accuracy, (2) the CONTRACTOR's bid estimate was realistic, (3) the CONTRACTOR's actual costs were reasonable, and (4) the CONTRACTOR was not responsible for the added expenses. As to any claims based on the CONTRACTOR's field or home office accounting records, those claims shall be supported by an audit report of an independent Certified Public Accountant unless the contract includes special provisions that provide for an alternative method to calculate unabsorbed home office overhead. Any of those claims shall also be subject to audit by the DRB with the concurrence of the parties. In large or complex cases, additional hearings may be necessary in order to consider all the evidence presented by both parties. All involved parties shall maintain the confidentiality of all documents and information, as provided in this AGREEMENT.

During dispute hearings, no DRB member shall express an opinion concerning the merit of any facet of the case. All DRB deliberations shall be conducted in private, with all interim individual views kept strictly confidential.

After hearings are concluded, the DRB shall meet in private and reach a conclusion supported by two or more members. Private sessions of the DRB may be held at a location other than the job site or by electronic conferencing as deemed appropriate, in order to expedite the process.

The DRB's findings and recommendations, along with discussion of reasons therefor, shall then be submitted as a written report to both parties. Recommendations shall be based on the pertinent contract provisions, applicable laws and regulations, and facts and circumstances related to the dispute. The report shall be thorough in discussing the facts considered, the contract language, law or regulation viewed by the DRB as pertinent to the issues, and the DRB's interpretation and philosophy in arriving at its conclusions and recommendations. The DRB's report shall stand on its own, without attachments or appendices. The DRB chairman shall complete and furnish a summary report to the DRB Program Manager, Construction Program, M.S. 44, P.O. Box 942874, Sacramento, CA 94274.

With prior written approval of both parties, the DRB may obtain technical services necessary to adequately review the disputes presented; including audit, geotechnical, schedule analysis and other services. The parties' technical staff may supply those services as appropriate. The cost of any technical services, as agreed to by the parties, shall be borne equally by the two parties as specified in an approved contract change order. The CONTRACTOR will not be entitled to markups for the payments made for these services.

The DRB shall resist submittal of incremental portions of information by either party, in the interest of making a fully-informed decision and recommendation.

The DRB shall make every effort to reach a unanimous decision. If this proves impossible, the dissenting member shall prepare a minority opinion, which shall be included in the DRB's report.

Although both parties should place weight upon the DRB's recommendations, they are not binding. Either party may appeal a recommendation to the DRB for reconsideration. However, reconsideration shall only be allowed when there is new evidence to present, and the DRB shall accept only one appeal from each party pertaining to any individual DRB recommendation. The DRB shall hear appeals in accordance with the terms described in the Section entitled "Disputes Review Board" in the special provisions.

E. DRB Member Replacement

Should the need arise to appoint a replacement DRB member, the replacement DRB member shall be appointed in the same manner as the original DRB members were appointed. The selection of a replacement DRB member shall begin promptly upon notification of the necessity for a replacement and shall be completed within 14 days. This AGREEMENT will be amended to indicate change in DRB membership.

III CONTRACTOR RESPONSIBILITIES

The CONTRACTOR shall furnish to each DRB member one copy of all pertinent documents which are or may become necessary for the DRB to perform their function. Pertinent documents are any drawings or sketches, calculations, procedures, schedules, estimates, or other documents which are used in the performance of the work or in justifying or substantiating the CONTRACTOR's position. The CONTRACTOR shall also furnish a copy of such pertinent documents to the STATE, in accordance with the terms outlined in the special provisions.

**IV
STATE RESPONSIBILITIES**

The STATE will furnish the following services and items:

A. Contract Related Documents

The STATE will furnish to each DRB member one copy of Notice to Contractors and Special Provisions, Proposal and Contract, Plans, Standard Specifications, and Standard Plans, change orders, written instructions issued by the STATE to the CONTRACTOR, or other documents pertinent to any dispute that has been referred to the DRB and necessary for the DRB to perform its function.

B. Coordination and Services

The STATE, through the Engineer, will, in cooperation with the CONTRACTOR, coordinate the operations of the DRB. The Engineer will arrange or provide conference facilities at or near the project site and provide secretarial and copying services to the DRB without charge to the CONTRACTOR.

**V
TIME FOR BEGINNING AND COMPLETION**

Once established, the DRB shall be in operation until the day of acceptance of the contract. The DRB members shall not begin any work under the terms of this AGREEMENT until authorized in writing by the STATE.

**VI
PAYMENT**

A. All Inclusive Rate Payment

The STATE and the CONTRACTOR shall bear the costs and expenses of the DRB equally. Each DRB board member shall be compensated at an agreed rate of \$1,000.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is greater than four hours. Each DRB board member shall be compensated at an agreed rate of \$600.00 per day if time spent per meeting, including all on-site time plus one hour of travel time, is less than or equal to four hours. The agreed rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel and incidentals for each day, or portion thereof, that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time has been specifically agreed to in advance by the STATE and CONTRACTOR. Time away from the project, that has been specifically agreed to in advance by the parties, will be compensated at an agreed rate of \$100.00 per hour. The agreed amount of \$100.00 per hour shall include all incidentals including any expenses for telephone, fax and computer services. Members serving on more than one DRB, regardless of the number of meetings per day, shall not be paid more than the all inclusive rate per day or rate per hour for an individual project. The STATE will provide, at no cost

to the CONTRACTOR, administrative services such as conference facilities and secretarial services to the DRB.

B. Payments

All DRB members shall be compensated at the same rate. The CONTRACTOR shall make direct payments to each DRB member for their participation in authorized meetings and approved hourly rate charges from invoices submitted by each DRB member. The STATE will reimburse the CONTRACTOR for its share of the costs of the DRB.

The DRB members may submit invoices to the CONTRACTOR for partial payment for work performed and services rendered for their participation in authorized meetings not more often than once per month during the progress of the work. The invoices shall be in a format approved by the parties and accompanied by a general description of activities performed during that billing period. Payment for any hourly fees, at the agreed rate, shall not be paid to a DRB member until the amount and extent of those fees are approved by the STATE and CONTRACTOR.

Invoices shall be accompanied by original supporting documents, which the CONTRACTOR shall include with the extra work billing when submitting for reimbursement of the STATE's share of cost from the STATE. The CONTRACTOR will be reimbursed for one-half of approved costs of the DRB. No markups will be added to the CONTRACTOR's payment.

C. Inspection of Costs Records

The DRB members and the CONTRACTOR shall keep available for inspection by representatives of the STATE and the United States, for a period of three years after final payment, the cost records and accounts pertaining to this AGREEMENT. If any litigation, claim, or audit arising out of, in connection with, or related to this contract is initiated before the expiration of the three-year period, the cost records and accounts shall be retained until such litigation, claim, or audit involving the records is completed.

VII ASSIGNMENT OF TASKS OF WORK

The DRB members shall not assign any of the work of this AGREEMENT.

VIII TERMINATION OF AGREEMENT, THE DRB, AND DRB MEMBERS

DRB members may resign from the DRB by providing not less than 14 days written notice of the resignation to the STATE and CONTRACTOR. DRB members may be terminated by their original appointing power, in accordance with the terms of the contract.

IX LEGAL RELATIONS

The parties hereto mutually understand and agree that the DRB member in the performance of duties on the DRB, is acting in the capacity of an independent agent and not as an employee of either party.

No party to this AGREEMENT shall bear a greater responsibility for damages or personal injury than is normally provided by Federal or State of California Law.

Notwithstanding the provisions of this contract that require the CONTRACTOR to indemnify and hold harmless the STATE, the parties shall jointly indemnify and hold harmless the DRB members from and against all claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of and resulting from the findings and recommendations of the DRB.

X
CONFIDENTIALITY

The parties hereto mutually understand and agree that all documents and records provided by the parties in reference to issues brought before the DRB, which documents and records are marked "Confidential - for use by the DRB only", shall be kept in confidence and used only for the purpose of resolution of subject disputes, and for assisting in development of DRB findings and recommendations; that such documents and records will not be utilized or revealed to others, except to officials of the parties who are authorized to act on the subject disputes, for any purposes, during the life of the DRB. Upon termination of this AGREEMENT, said confidential documents and records, and all copies thereof, shall be returned to the parties who furnished them to the DRB. However, the parties understand that such documents shall be subsequently discoverable and admissible in court or arbitration proceedings unless a protective order has been obtained by the party seeking further confidentiality.

XI
DISPUTES

Any dispute between the parties hereto, including disputes between the DRB members and either party or both parties, arising out of the work or other terms of this AGREEMENT, which cannot be resolved by negotiation and mutual concurrence between the parties, or through the administrative process provided in the contract, shall be resolved by arbitration as provided in Section 9-1.10, "Arbitration," of the Standard Specifications.

XII
VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

In the event that any party, including an individual member of the DRB, deems it necessary to institute arbitration proceedings to enforce any right or obligation under this AGREEMENT, the parties hereto agree that any such action shall be initiated in the Office of Administrative Hearings of the State of California. The parties hereto agree that all questions shall be resolved by arbitration by application of California law and that the parties to such arbitration shall have the right of appeal from such decisions to the Superior Court in accordance with the laws of the State of California. Venue for the arbitration shall be Sacramento or any other location as agreed to by the parties.

XIII
FEDERAL REVIEW AND REQUIREMENTS

On Federal-Aid contracts, the Federal Highway Administration shall have the right to review the work of the DRB in progress, except for any private meetings or deliberations of the DRB.

All other Federal requirements in this agreement shall only apply to Federal-Aid contracts.

XIV
**CERTIFICATION OF THE CONTRACTOR,
THE DRB MEMBERS, AND THE STATE**

IN WITNESS WHEREOF, the parties hereto have executed this AGREEMENT as of the day and year first above written.

DRB MEMBER

DRB MEMBER

By: _____

By: _____

Title: _____

Title

: _____

DRB MEMBER

By : _____

Title : _____

CONTRACTOR

CALIFORNIA STATE DEPARTMENT
OF TRANSPORTATION

By: _____

By: _____

Title: _____

Title: _____

5-1.12 AREAS FOR CONTRACTOR'S USE

Attention is directed to the requirements specified in Section 7-1.19, "Rights in Land and Improvements," of the Standard Specifications and these special provisions.

The highway right of way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

There are no State-owned parcels adjacent to the right of way for the exclusive use of the Contractor within the contract limits. The Contractor shall secure, at the Contractor's own expense, any area required for plant sites, storage of equipment or materials, or for other purposes.

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State maintenance forces and to all other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for any damage to or loss of materials or equipment located within such areas.

5-1.13 PAYMENTS

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work which will be recognized for progress payment purposes:

Clearing and Grubbing	\$ 100,000
Develop Water Supply	\$ 50,000

After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the contract.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in the payment as materials furnished but not incorporated in the work:

- Geosynthetic Reinforcement
- Embankment Stabilization Fabric
- Reinforced Mat
- Fiber Rolls
- Water Meter
- Pipe (Irrigation Systems)
- Culvert Pipe and Appurtenances
- Miscellaneous Drainage Facilities
- Welded Steel Pipe
- Rock Slope Protection Fabric
- Miscellaneous Iron and Steel
- Fences
- Pumping Plant Metal Work
- Earth Retaining Structure
- Bar Reinforcing Steel (Bridge)
- Drainage Pumping Equipment
- Pumping Plant Electrical Equipment

5-1.14 SOUND CONTROL REQUIREMENTS

Sound control shall conform to the provisions in Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and these special provisions.

The noise level from the Contractor's operations, between the hours of 7:00 p.m. and 7:00 a.m., shall not exceed 86 dbA at a distance of 15 m. This requirement in no way relieves the Contractor from responsibility for complying with local ordinances regulating noise level.

The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.15 WATER CONSERVATION

Attention is directed to the various sections of the Standard Specifications and these special provisions which require the use of water for the construction of this project. Attention is also directed to the provisions of Section 7, "Legal Relations and Responsibility," of the Standard Specifications with regards to the Contractor's responsibilities for public convenience, public safety, preservation of property, indemnification, and insurance.

Attention is directed to "Watering" of these special provisions regarding the use of nonpotable water.

Nothing in this section "Water Conservation" shall be construed as relieving the Contractor from furnishing an adequate supply of water required for the proper construction of this project in accordance with the Standard Specifications or these special provisions or relieving the Contractor from the legal responsibilities defined in Section 7.

The Contractor shall, whenever possible and not in conflict with the above requirements, minimize the use of water during construction of the project. Watering equipment shall be kept in good working order; water leaks shall be repaired promptly; and washing of equipment, except when necessary for safety or for the protection of equipment, shall be discouraged.

Minor structures, and miscellaneous concrete construction shall not be cured by using water. The water cure for bridge decks shall be accomplished with the use of

a moisture retaining medium as described in Section 90-7.01A, "Water Method," of the Standard Specifications.

5-1.16 RELATIONS WITH CALIFORNIA DEPARTMENT OF FISH AND GAME

A portion of this project is located within the jurisdiction of the California Department of Fish and Game. An agreement regarding a stream or lake has been entered into by the Department of Transportation and the Department of Fish and Game. The Contractor shall be fully informed of the requirements of this agreement as well as all rules, regulations, and conditions that may govern the Contractor's operations in these areas and shall conduct the work accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents Section (MS 26), 1120 N Street, Room 200, Sacramento, CA 95814, Telephone No. (916)654-4490, and are available for inspection at the office of the District Director of Transportation at 111 Grand Avenue, Oakland, California 94612, Telephone No. (510) 286-5209.

It is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any stream, river, or lake without first notifying the Department of Fish and Game, unless the project or activity is noticed and constructed in accordance with all conditions imposed under Fish and Game Code Section 1601.

Attention is directed to Sections 7-1.01, "Laws to be Observed," 7-1.01G, "Water Pollution," 7-1.121, "Indemnification," and 7-1.122, "Insurance," of the Standard Specifications.

Any modifications to the agreement between the Departments of Transportation and Fish and Game which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Department of Fish and Game for their consideration.

When the Contractor is notified by the Engineer that a modification to the agreement is under consideration, no work will be allowed which is inconsistent with the proposed modification until the Departments take action on the proposed modifications. Compensation for delay will be determined in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Any modifications to any agreement between the Departments of Transportation and Fish and Game will be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

5-1.17 RELATIONS WITH U.S. ARMY CORPS OF ENGINEERS

A portion of this project is within an area controlled by the U.S. Army Corps of Engineers. A nationwide permit and special conditions have been issued covering work to be performed under this contract. The Contractor shall be fully informed of all rules, regulations and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Copies of the permit and letter may be obtained at the Department of Transportation, Plans and Bid Documents Section (MS 26), 1120 N Street, Room 200, Sacramento, CA 95814, Telephone No. (916)654-4490, and are available for inspection at the office of the District Director of Transportation at 111 Grand Avenue, Oakland CA 94612, (510)286-5209.

Attention is directed to Sections 7-1.11, "Preservation of Property," 7-1.121, "Indemnification," and 7-1.122, "Insurance," of the Standard Specifications.

The Contractor's attention is directed to the special conditions in the U.S. Army Corps of Engineers letter dated February 25, 1999 (File No. 19713S).

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days when the Contractor's operations are restricted by the requirements of this section shall not be considered to be nonworking days whether or not the controlling operation is delayed.

Full compensation for conforming to the requirements in the nationwide permit and special conditions shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefore.

5-1.18 RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD AND STATE WATER RESOURCES CONTROL BOARD

The location of this project is within an area controlled by the San Francisco Bay Regional Water Quality Control Board. This project shall conform to the requirements of Statewide Storm Water National Pollutant Discharge Elimination System (NPDES) Permit NO. CAS000003, Order No.99-06-DWQ issued by the State Water Resources Control Board. This order, hereafter referred to as the "Permit," regulates storm water discharges associated with construction activities. The Contractor shall be fully informed of all rules, regulations and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Attention is directed to Section 7-1.01G, "Water Pollution" of the Standard Specifications and these special provisions.

Copies of the permit may be obtained at the Department of Transportation, Plans and Bid Documents Section (MS 26), 1120 N Street, Room 200, Sacramento, CA 95814, Telephone No. (916)654-4490, and are available for inspection at the office of the District Director of Transportation at 111 Grand Avenue, Oakland, California, (510)286-5209.

Attention is directed to Sections 7-1.11, "Preservation of Property," 7-1.121, "Indemnification," and 7-1.122, "Insurance," of the Standard Specifications.

Attention is directed to Section 8-1.06, "Time of Completion," of the Standard Specifications. Days when the Contractor's operations are restricted by the requirements of this section shall not be considered to be nonworking days whether or not the controlling operation is delayed.

5-1.19 AERIALY DEPOSITED LEAD, GENERAL

Aerially Deposited Lead is defined as lead deposited within the Department of Transportation (Caltrans) Right of Way primarily due to vehicle emissions. Aerially deposited lead contamination has been discovered through testing of materials from within the project limits.

Attention is directed to "Material with Aerially Deposited Lead" under "Earthwork" of these special provisions regarding the handling of material with aerially deposited lead.

Portions of the Site Investigation Report are included in the "Material Information Handout." The report entitled "Site Investigation Report, Soil and Groundwater Investigation, Route 87, Guadalupe Parkway, San Jose, California (Volume 1 and Volume 2) Task Order NO. 04-4874A1- SG on Lead Sampling" is available for inspection at the Department of Transportation, Duty Senior's desk, 111 Grand Avenue Oakland, California, (510) 286-5209. Materials with total levels of lead greater than the Total Threshold Limit Concentration (TTLC) of 1000 milligrams per kilogram (mg/kg) or solubility levels, as established by the California Waste Extraction Test (WET), greater than the Solubility Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/l) shall be considered hazardous pursuant to California Code of Regulations, Title 22. The materials with aerially deposited lead are not regulated under the Federal Resource Conservation and Recovery Act (RCRA).

Caltrans has received from the California Department of Toxic Substances Control (DTSC) a variance regarding the use of these materials. This project is subject to the conditions of the variance and any supplemental amendments. Under the variance any materials with total levels of aerially deposited lead less than 1575 mg/kg and water solubility levels of less than 500 micrograms per liter ($\mu\text{g/l}$) may be placed under 1 foot of cover material or under a pavement (e.g., asphalt roadway) within the highway right of way. Water solubility is determined using a modified WET with deionized water as the extraction solution. Materials with total levels of

aerially deposited lead from 1575 mg/kg to 4150 mg/kg or water solubility levels greater than 500 µg/l, but less than 50 mg/l, may be placed under pavement (e.g. asphalt roadway) within the highway right of way. Materials reused in accordance with the variance shall be placed a minimum of 5 feet above maximum ground water level. Cover materials pursuant to this provision are soils with less than 130 mg/kg total lead and 5 mg/l soluble lead (using WET).

Provisions of this section shall be made a part of every subcontract executed pursuant to this contract. A copy of the DTSC/Caltrans variance is included in the "Materials Information Handout." The Contractor shall comply with the conditions of the variance.

Excavation, transportation, placement and handling of soils containing aerially deposited lead shall result in no visible dust. The Contractor shall have a water truck available at all times while performing earthwork, excavation or grubbing activities in work areas containing aerially deposited lead at hazardous levels.

Once the Contractor has completed the placement of materials containing aerially deposited lead, in accordance with the plans, as specified in the Standard Specifications and these special provisions, the Contractor shall have no responsibility for such materials in place and shall not be obligated for further cleanup, removal or remedial actions for such materials.

Excavation, reuse, and disposal of material with aerially deposited lead shall be in accordance with all rules and regulations of agencies including, but not limited to, the following:

- United States Department of Transportation (USDOT)
- United States Environmental Protection Agency (USEPA)
- California Department of Health Services
- California Environmental Protection Agency (Cal-EPA)
- Department of Toxic Substances Control (DTSC), Region 2
- Integrated Waste Management Board
- Regional Water Quality Control Board (RWQCB), Region 2
- State Air Resources Control Board
- Bay Area Air Quality Management District (BAAQMD)
- California Division of Occupational Safety and Health Administration (CAL-OSHA)

The Contractor shall prepare a project specific Health and Safety Plan to prevent or minimize exposure to potentially hazardous levels of lead. The Contractor's attention is directed to Title 8, California Code of Regulations, Section 5192 (b) (4) (B) and the Occupational Safety and Health Guidance Manual published by National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), and USEPA for elements of the site safety plan. The Health and Safety Plan shall contain as a minimum but not be limited to: identification of key personnel for the project, job hazard analysis for work assignments, summary of risk assessment, air monitoring plan, personal protective equipment, delineation of work zones on-site, decontamination procedures, general safe work practices, security measures, emergency response plans and worker training.

The Health and Safety Plan shall utilize monitoring and exposure standards based on Construction Standards of Title 8, California Code of Regulations Section 1532.1 and as a minimum shall contain a description of activities, specific means employed to achieve compliance, report of the technology considered, air monitoring, schedule for implementation of the program, a work practice program, administrative control schedule, description of arrangements for information transfer between contractors concerning potential exposure to lead and other relevant information. The Health and Safety Plan shall include an air monitoring plan that shall include, but not be limited to, upwind and downwind perimeter monitoring and a discussion of how the air monitoring will be conducted during the progression of roadway work in areas designated as containing aerially deposited lead. The Health and Safety plan shall be approved by the Contractor's Certified Industrial Hygienist before

submission to the Engineer. The plan shall be submitted to the Engineer for review and acceptance at least 15 days prior to beginning any work in areas containing aerially deposited lead.

Prior to performing any work in areas containing lead, personnel who have no prior training or are not current in their training status, including State personnel, shall complete a safety training program provided by the Contractor, which meets the requirements of Title 8, California Code of Regulations, Section 1532.1.

Personal protective equipment, training, and medical surveillance required by the Contractor's Health and Safety Plan shall be supplied to State personnel by the Contractor. The number of State personnel will be 5.

Stockpiles of materials containing lead that are designated for reuse under the DTSC/Caltrans variance shall be covered with sheets of polyethylene or 1 foot of cover material at the end of each day to prevent water and wind erosion. Stockpile locations shall be limited to areas within the highway right of way that contain lead. If lead levels in the stockpile areas are not known, the Contractor shall conduct initial sampling in the area to determine lead levels. The Contractor shall prepare a work plan for the handling and stockpiling of materials containing lead that are designated for reuse under the DTSC/Caltrans variance. The work plan shall include a proposal for reuse of this material and a plan for initial and confirmatory sampling of any stockpile area after removal of the materials to ensure that additional lead has not been deposited or has not migrated to surrounding soils. The sampling plan shall meet USEPA, SW 846, "Test Methods for Evaluating Solid Waste," Volume II: Field Manual Physical/Chemical, Chapter Nine, Section 9.1 requirements for the development of the sampling plan, statistical analysis, and reporting of the test results and shall be submitted to the Engineer for review and approval at least 15 days prior to beginning work in any areas containing lead.

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work, including registration for transporting vehicles carrying hazardous materials.

Full compensation for conforming to the requirements of this section (except preparation and implementation of Health and Safety Plan) shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

The contractor lump sum price paid for health and Safety Plan shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in preparing and implementing the Health and Safety Plan, as specified in the Standard Specifications, and these special provisions, and as directed by the Engineer.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the inch-pound (imperial) system which are of equal quality and of the required properties and characteristics for the purpose

intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.

Before other non-metric materials and products will be considered for use the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.

When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material as specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details the Contractor shall submit plans and working drawings in conformance with Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

SUBSTITUTION TABLE FOR SIZES OF HIGH STRENGTH STEEL
FASTENERS
ASTM Designation: A 325M

METRIC SIZE SHOWN ON THE PLANS mm x thread pitch	IMPERIAL SIZE TO BE SUBSTITUTED inch
M16 x 2	5/8
M20 x 2.5	3/4
M22 x 2.5	7/8
M24 x 3	1
M27 x 3	1-1/8
M30 x 3.5	1-1/4
M36 x 4	1-1/2

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT, ASTM Designation:
A 82

METRIC SIZE SHOWN ON THE PLANS mm ²	US CUSTOMARY UNITS SIZE TO BE SUBSTITUTED inch ² x 100
MW9	W1.4
MW10	W1.6
MW13	W2.0
MW15	W2.3
MW19	W2.9
MW20	W3.1
MW22	W3.5
MW25	W3.9, except W3.5 in piles only
MW26	W4.0
MW30	W4.7
MW32	W5.0
MW35	W5.4
MW40	W6.2
MW45	W6.5
MW50	W7.8
MW55	W8.5, except W8.0 in piles only
MW60	W9.3
MW70	W10.9, except W11.0 in piles only
MW80	W12.4
MW90	W14.0
MW100	W15.5

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

METRIC BAR DESIGNATION NUMBER SHOWN ON THE PLANS	EQUIVALENT IMPERIAL BAR DESIGNATION NUMBER TO BE SUBSTITUTED
13	4
16	5
19	6
22	7
25	8
29	9
32	10
36	11
43	14
57	18

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

The sizes in the following tables of materials and products are exact conversions of metric sizes of materials and products and are listed as acceptable equivalents:

CONVERSION TABLE FOR SIZES OF:

(1) STEEL FASTENERS FOR GENERAL APPLICATIONS, ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55, and

(2) HIGH STRENGTH STEEL FASTENERS, ASTM Designation: A 325 or A 449

METRIC SIZE SHOWN ON THE PLANS mm	EQUIVALENT IMPERIAL SIZE inch
6, or 6.35	1/4
8 or 7.94	5/16
10, or 9.52	3/8
11, or 11.11	7/16
13 or 12.70	1/2
14, or 14.29	9/16
16, or 15.88	5/8
19, or 19.05	3/4
22, or 22.22	7/8
24, 25, or 25.40	1
29, or 28.58	1-1/8
32, or 31.75	1-1/4
35, or 34.93	1-3/8
38 or 38.10	1-1/2
44, or 44.45	1-3/4
51, or 50.80	2
57, or 57.15	2-1/4
64, or 63.50	2-1/2
70 or 69.85	2-3/4
76, or 76.20	3
83, or 82.55	3-1/4
89 or 88.90	3-1/2
95, or 95.25	3-3/4
102, or 101.60	4

CONVERSION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

UNCOATED HOT AND COLD ROLLED SHEETS		HOT-DIPPED ZINC COATED SHEETS (GALVANIZED)	
METRIC THICKNESS SHOWN ON THE PLANS	EQUIVALENT US STANDARD GAGE	METRIC THICKNESS SHOWN ON THE PLANS	EQUIVALENT GALVANIZED SHEET GAGE
mm	inch	mm	inch
7.94	0.3125	4.270	0.1681
6.07	0.2391	3.891	0.1532
5.69	0.2242	3.510	0.1382
5.31	0.2092	3.132	0.1233
4.94	0.1943	2.753	0.1084
4.55	0.1793	2.372	0.0934
4.18	0.1644	1.994	0.0785
3.80	0.1495	1.803	0.0710
3.42	0.1345	1.613	0.0635
3.04	0.1196	1.461	0.0575
2.66	0.1046	1.311	0.0516
2.28	0.0897	1.158	0.0456
1.90	0.0747	1.006 or 1.016	0.0396
1.71	0.0673	0.930	0.0366
1.52	0.0598	0.853	0.0336
1.37	0.0538	0.777	0.0306
1.21	0.0478	0.701	0.0276
1.06	0.0418	0.627	0.0247
0.91	0.0359	0.551	0.0217
0.84	0.0329	0.513	0.0202
0.76	0.0299	0.475	0.0187
0.68	0.0269	-----	-----
0.61	0.0239	-----	-----
0.53	0.0209	-----	-----
0.45	0.0179	-----	-----
0.42	0.0164	-----	-----
0.38	0.0149	-----	-----

CONVERSION TABLE FOR WIRE

METRIC THICKNESS SHOWN ON THE PLANS mm	EQUIVALENT USA STEEL WIRE THICKNESS inch	GAGE NO.
6.20	0.244	3
5.72	0.225	4
5.26	0.207	5
4.88	0.192	6
4.50	0.177	7
4.11	0.162	8
3.76	0.148	9
3.43	0.135	10
3.05	0.120	11
2.69	0.106	12
2.34	0.092	13
2.03	0.080	14
1.83	0.072	15
1.57	0.062	16
1.37	0.054	17
1.22	0.048	18
1.04	0.041	19
0.89	0.035	20

CONVERSION TABLE FOR PIPE PILES

METRIC SIZE SHOWN ON THE PLANS mm x mm	EQUIVALENT IMPERIAL SIZE inch x inch
PP 360 x 4.55	NPS 14 x 0.179
PP 360 x 6.35	NPS 14 x 0.250
PP 360 x 9.53	NPS 14 x 0.375
PP 360 x 11.12	NPS 14 x 0.438
PP 406 x 12.70	NPS 16 x 0.500
PP 460 x T	NPS 18 x T"
PP 508 x T	NPS 20 x T"
PP 559 x T	NPS 22 x T"
PP 610 x T	NPS 24 x T"
PP 660 x T	NPS 26 x T"
PP 711 x T	NPS 28 x T"
PP 762 x T	NPS 30 x T"
PP 813 x T	NPS 32 x T"
PP 864 x T	NPS 34 x T"
PP 914 x T	NPS 36 x T"
PP 965 x T	NPS 38 x T"
PP 1016 x T	NPS 40 x T"
PP 1067 x T	NPS 42 x T"
PP 1118 x T	NPS 44 x T"
PP 1219 x T	NPS 48 x T"
PP 1524 x T	NPS 60 x T"

The thickness in inches (T") represents an exact conversion of the metric thickness in millimeters (T).

CONVERSION TABLE FOR STRUCTURAL TIMBER AND LUMBER

METRIC MINIMUM DRESSED DRY, SHOWN ON THE PLANS mm x mm	METRIC MINIMUM DRESSED GREEN, SHOWN ON THE PLANS mm x mm	EQUIVALENT NOMINAL US SIZE inch x inch
19x89	20x90	1x4
38x89	40x90	2x4
64x89	65x90	3x4
89x89	90x90	4x4
140x140	143x143	6x6
140x184	143x190	6x8
184x184	190x190	8x8
235x235	241x241	10x10
286x286	292x292	12x12

CONVERSION TABLE FOR NAILS AND SPIKES

METRIC COMMON NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC BOX NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC SPIKE, SHOWN ON THE PLANS Length, mm Diameter, mm	EQUIVALENT IMPERIAL SIZE Penny-weight
50.80 2.87	50.80 2.51	————	6d
63.50 3.33	63.50 2.87	————	8d
76.20 3.76	76.20 3.25	76.20 4.88	10d
82.55 3.76	82.55 3.25	82.55 4.88	12d
88.90 4.11	88.90 3.43	88.90 5.26	16d
101.60 4.88	101.60 3.76	101.60 5.72	20d
114.30 5.26	114.30 3.76	114.30 6.20	30d
127.00 5.72	127.00 4.11	127.00 6.68	40d
————	————	139.70 7.19	50d
————	————	152.40 7.19	60d

8-1.02 APPROVED TRAFFIC PRODUCTS

The Department maintains a List of Approved Traffic Products. The Engineer shall not be precluded from sampling and testing products on the List of Approved Traffic Products.

The manufacturer of products on the List of Approved Traffic Products shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

The following is the List of Approved Traffic Products:

PAVEMENT MARKERS, PERMANENT TYPE

RETROREFLECTIVE

Apex, Model 921 (100 mm x 100 mm)

Ray-O-Lite, Models SS (100 mm x 100 mm), RS (100 mm x 100 mm) and AA (100 mm x 100 mm)
Stimsonite, Models 88 (100 mm x 100 mm), 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
3M Series 290 (89 mm x 100 mm)

RETROREFLECTIVE WITH ABRASION RESISTANT SURFACE (ARS)

Ray-O-Lite "AA" ARS (100 mm x 100 mm)
Stimsonite, Models 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
3M Series 290 (89 mm x 100 mm)

RETROREFLECTIVE WITH ABRASION RESISTANT SURFACE (ARS)

(Used for recessed applications)

Stimsonite, Model 948 (58 mm x 119 mm)
Ray-O-Lite, Model 2002 (58 mm x 117 mm)
Stimsonite, Model 944SB (51 mm x 100 mm)*
Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)*

*For use only in 114 mm wide (older) recessed slots

NON-REFLECTIVE FOR USE WITH EPOXY ADHESIVE, 100 mm Round

Apex Universal (Ceramic)
Highway Ceramics, Inc. (Ceramic)

NON-REFLECTIVE FOR USE WITH BITUMEN ADHESIVE, 100 mm Round

Apex Universal (Ceramic)
Apex Universal, Model 929 (ABS)
Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
Highway Ceramics, Inc. (Ceramic)
Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
Alpine Products, D-Dot (ABS)
Road Creations, Model RCB4NR (Acrylic)

PAVEMENT MARKERS, TEMPORARY TYPE

TEMPORARY MARKERS FOR LONG TERM DAY/NIGHT USE (6 months or less)

Apex Universal, Model 924 (100 mm x 100 mm)
Davidson Plastics Corp., Model 3.0 (100 mm x 100 mm)
Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
Road Creations, Model R41C (100 mm x 100 mm)
Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

TEMPORARY MARKERS FOR SHORT TERM DAY/NIGHT USE (14 days or less)

(For seal coat or chip seal applications, clear protective covers are required)

Apex Universal, Model 932
Davidson Plastics, Models T.O.M., T.R.P.M., and "HH" (High Heat)
Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIALS

PERMANENT TRAFFIC STRIPING AND PAVEMENT MARKING TAPE

Advanced Traffic Marking, Series 300 and 400
Brite-Line, Series 1000
Swarco Industries, "Director 35" (For transverse application only)
Swarco Industries, "Director 60"
3M, "Stamark" Series 380 and 5730
3M, "Stamark" Series A320 Bisymmetric (For use on low-volume roadways only)
3M, "Stamark" Series A420, A440, N420, and N440 (For transverse application only)

TEMPORARY (REMOVABLE) STRIPING AND PAVEMENT MARKING TAPE
(6 months or less)

Brite-Line, Series 100
P.B. Laminations, Aztec, Grade 102
Swarco Industries, "Director-2"
3M, "Stamark," Series A620
3M Series A145 Removable Black Line Mask
(Black Tape: For use only on Asphalt Concrete Surfaces)
Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: For use only on Asphalt Concrete Surfaces)

PREFORMED THERMOPLASTIC (Heated in place)

Flint Trading, "Premark" and "Premark 20/20 Flex"
Pavemark, "Hotape"

REMOVABLE TRAFFIC PAINT

Belpro, Series 250/252 and No. 93 Remover

CLASS 1 DELINEATORS

ONE-PIECE DRIVEABLE FLEXIBLE TYPE, 1700 mm

Carsonite, Curve-Flex CFRM-400
Carsonite, Roadmarker CRM-375
Davidson Plastics, "Flexi-Guide Models 400 and 566"
FlexStake, Model 654TM
GreenLine Models HWD1-66 and CGD1-66
J. Miller Industries, Model JMI-375 (with soil anchor)

SPECIAL USE FLEXIBLE TYPE, 1700 mm

Carsonite, "Survivor" with 450 mm U-Channel base
FlexStake, Model 604
GreenLine Models HWD and CGD (with 450 mm U-Channel base)
Safe-Hit with 200 mm pavement anchor (SH248-GP1)
Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

SURFACE MOUNT FLEXIBLE TYPE, 1200 mm

Bent Manufacturing Company, "Masterflex" Model MF-180EX-48
Carsonite, "Super Duck II"
FlexStake, Surface Mount, Models 704 and 754TM

CHANNELIZERS

SURFACE MOUNT TYPE, 900 mm

Bent Manufacturing Company, "Masterflex" Models MF-360-36 (Round) and MF-180-36 (Flat)
Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
Carsonite, Super Duck II Model SDCF203601MB "The Channelizer"
Davidson Plastics, Flex-Guide Models FG300LD and FG300UR
FlexStake, Surface Mount, Models 703 and 753TM
GreenLine, Model SMD-36
The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
Repo, Models 300 and 400
Safe-Hit, Guide Post, Model SH236SMA

CONICAL DELINEATORS, 1070 mm

(For 700 mm Traffic Cones, see Standard Specifications)

Bent Manufacturing Company "T-Top"
Plastic Safety Systems "Navigator-42"
Roadmaker Company "Stacker"
Traffix Devices "Grabber"

OBJECT MARKERS

TYPE "K", 450 mm

Carsonite, Model SMD-615
FlexStake, Model 701KM
Repo, Models 300 and 400
Safe-Hit, Model SH718SMA
The Line Connection, Model DP21-4K

TYPE "K-4", 450-600 mm

(Shown as Type "Q" in the Traffic Manual)

Carsonite, Super Duck II
FlexStake, Model 701KM
Repo, Models 300 and 400
Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
The Line Connection, Model DP21-4Q

TEMPORARY RAILING (TYPE K) REFLECTORS AND CONCRETE BARRIER MARKERS

IMPACTABLE TYPE

ARTUK, "FB"
Davidson Plastics, Model PCBM-12
Duraflex Corp., "Flexx 2020" and "Electriflexx"

NON-IMPACTABLE TYPE

ARTUK, JD Series
Stimsonite, Model 967 (with 83 mm Acrylic cube corner reflector)
Stimsonite, Model 967LS
Vega Molded Products, Models GBM and JD

THRIE BEAM BARRIER MARKERS

(For use to the left of traffic)

Duraflex Corp., "Railrider"
Davidson Plastics, "Mini" (75 mm x 254 mm)

CONCRETE BARRIER DELINEATORS, 400 mm

(For use to the right of traffic. When mounted on top of barrier, places top of reflective element at 1200 mm)

Davidson Plastics, Model PCBM T-16
Safe-Hit, Model SH216RBM

CONCRETE BARRIER-MOUNTED MINI-DRUM

(260 mm x 360 mm x 570 mm)

Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied to a vertical surface. Top of reflective element at 1200 mm)

Davidson Plastics, PCBM S-36

GUARD RAILING DELINEATOR

(Top of reflective element at 1200 mm above plane of roadway)

WOOD POST TYPE, 686 mm

Carsonite, Model 427
Davidson Plastics FG 427 and FG 527
FlexStake, Model 102 GR
GreenLine GRD 27
J.Miller Model JMI-375G
Safe-Hit, Model SH227GRD

STEEL POST TYPE

Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

RETROREFLECTIVE SHEETING FOR:

CHANNELIZERS, BARRIER MARKERS, AND DELINEATORS

3M, High Intensity
Reflexite, PC-1000 Metalized Polycarbonate
Reflexite, AC-1000 Acrylic
Reflexite, AP-1000 Metalized Polyester
Reflexite, AR-1000 Abrasion Resistant Coating
Stimsonite, Series 6200 (For rigid substrate devices only)

TRAFFIC CONES, 330 mm Sleeves

Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

TRAFFIC CONES, 100 mm and 150 mm Sleeves

3M Series 3840
Reflexite Vinyl, "TR" (Semi-transparent) or "Conformalite"

BARRELS AND DRUMS

Reflexite, "Super High Intensity" or "High Impact Drum Sheeting"

3M Series 3810

BARRICADES: Type I, Engineering Grade

American Decal, Adcolite
Avery Dennison, 1500 and 1600
3M, Scotchlite, Series CW

BARRICADES: Type II, Super Engineering Grade

Avery Dennison, "Fasign" 2500 Series
Kiwalite Type II
Nikkalite 1800 Series

SIGNS: Type II, Super Engineering Grade

Avery Dennison, "Fasign" 2500 Series
Kiwalite, Type II
Nikkalite 1800 Series

SIGNS: Type III, High-Intensity Grade

3M Series 3800
Nippon Carbide, Nikkalite Brand Ultralite Grade II

SIGNS: Type IV, High-Intensity Prismatic Grade

Stimsonite Series 6200

SIGNS: Type VII, High-Intensity Prismatic Grade

3M Series 3900

SIGNS: Type VI, Roll-Up Signs

Reflexite, Vinyl (Orange), Reflexite "SuperBright" (Fluorescent orange)
3M Series RS34 (Orange) and RS20 (Fluorescent orange)

SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS

ALUMINUM

FIBERGLASS REINFORCED PLASTIC (FRP)

Sequentia, "Polyplate"
Fiber-Brite

8-1.03 MEASUREMENT OF QUANTITIES

Attention is directed to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications and these special provisions.

The following is added after the third paragraph in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications:

All elements of the material plant controller which affect the accuracy or delivery of data shall be made available for the application of security seals. These devices will be inspected and adjusting elements sealed prior to the first production of materials for the contract. The security seals will be furnished by the Engineer. Material production shall cease when alteration, disconnection, or otherwise manipulation of the security seals occur and

production shall not resume until the device is inspected and resealed by the Engineer.

8-1.04 ENGINEERING FABRICS

Engineering fabrics shall conform to the requirements in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

Filter fabric for this project shall be ultraviolet ray (UV) protected.

Nonwoven and woven rock slope protection fabric shall conform to the following additional requirement:

Specification	ASTM Designation	Requirement
Permittivity, 1/second, Minimum	D 4491	0.5

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Unless the use of mineral admixture is prohibited, whenever the word "cement" is found in the Standard Specifications or the special provisions, it shall be understood to mean "cementitious material" when both of the following conditions are met:

- A. The cement content of portland cement concrete is specified, and
- B. Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.

Unless otherwise specified, Type C accelerating chemical admixture conforming to the requirements of ASTM Designation: C 494, may be used in portland cement concrete for precast steam cured concrete members.

Section 90-1.01, "Description," of the Standard Specifications is amended to read:

90-1.01 Description.—Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.

Unless otherwise specified, cementitious material to be used in portland cement concrete shall conform to the requirements for cement and mineral admixtures in Section 90-2, "Materials" and shall be either: 1) "Type IP (MS) Modified" cement; or 2) a combination of "Type II Modified" portland cement and mineral admixture.

Concrete for each portion of the work shall comply with the requirements for the Class, cementitious material content in kilograms per cubic meter, 28-day compressive strength, minor concrete, or commercial quality concrete, as shown on the plans or specified in these specifications or the special provisions.

Class 1 concrete shall contain not less than 400 kg of cementitious material per cubic meter.

Class 2 concrete shall contain not less than 350 kg of cementitious material per cubic meter.

Class 3 concrete shall contain not less than 300 kg of cementitious material per cubic meter.

Class 4 concrete shall contain not less than 250 kg of cementitious material per cubic meter.

Minor concrete shall contain not less than 325 kg of cementitious material per cubic meter unless otherwise specified in these specifications or the special provisions.

Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic meter of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content (kg/m ³)
Concrete which is designated by compressive strength:	400 min., 475 max.
Deck slabs and slab spans of bridges	400 min., 475 max.
Roof sections of exposed top box culverts	350 min., 475 max.
Other portions of structures	
Concrete not designated by compressive strength:	400 min.
Deck slabs and slab spans of bridges	400 min.
Roof sections of exposed top box culverts	400 min.
Prestressed members	350 min.
Seal courses	
Other portions of structures	
Concrete for precast members	350 min., 550 max.

Whenever the 28-day compressive strength shown on the plans is greater than 25 MPa, the concrete shall be considered to be designated by compressive strength. If the plans show a 28-day compressive strength which is 31 MPa or greater, an additional 7 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans which are 25 MPa or less, are shown for design information only and are not to be considered a requirement for acceptance of the concrete.

Concrete designated by compressive strength shall be proportioned such that the concrete will conform to the strength shown on the plans or specified in the special provisions.

The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete.

Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.

Compliance with cementitious material content requirements will be verified in conformance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.

If any concrete used in the work has a cementitious material content, consisting of cement, mineral admixture, or cement plus mineral admixture, which is less than the minimum required for the work, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State \$0.55 for each kilogram of cement, mineral admixture, or cement plus mineral admixture which is less than the minimum required for the work. The Department may deduct the amount from any monies due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the

contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions for cementitious material content will be made based on the results of California Test 518.

The requirements of the preceding paragraph shall not apply to minor concrete nor commercial quality concrete.

All concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.

The first paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

90-2.01 Portland Cement.—Unless otherwise specified, portland cement shall be either "Type IP (MS) Modified" cement or "Type II Modified" portland cement.

"Type IP (MS) Modified" cement shall conform to the specifications for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate mixture of Type II cement and not more than 25 percent of a mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in conformance with the provisions of Section 90-4.08, "Required Use of Mineral Admixtures."

"Type II Modified" portland cement shall conform to the specifications for Type II portland cement in ASTM Designation: C 150.

In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:

- A. The cement shall not contain more than 0.60 percent by mass of alkalies, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O , when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in conformance with the requirements of ASTM Designation: C 114.
- B. The autoclave expansion shall not exceed 0.50 percent.
- C. Mortar, containing the cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

The second paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

Type III and Type V portland cements shall conform to the specifications in ASTM Designation: C 150, and the additional requirements listed above for Type II Modified portland cement, except that when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.

The third paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is deleted.

The twelfth paragraph in Section 90-2.02, "Aggregates," of the Standard Specifications is deleted.

The first paragraph in Section 90-2.03, "Water," of the Standard Specifications is amended to read:

90-2.03 Water.—In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4 . In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4 . In no case shall the

water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in conformance with ASTM Designation: C 191 or ASTM Designation: C 266; or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in conformance with ASTM Designation: C 109, when compared to the results obtained with distilled water or deionized water, tested in conformance with ASTM Designation: C 109.

The following section is added to Section 90-2, "Materials," of the Standard Specifications:

90-2.04 Admixture Materials.—Admixture materials shall conform to the requirements of the ASTM Designations shown below:

Chemical Admixtures—ASTM Designation: C 494.

Air-entraining Admixtures—ASTM Designation: C 260.

Calcium Chloride—ASTM Designation: D 98.

Mineral Admixtures—Coal fly ash, raw or calcined natural pozzolan as specified in ASTM Designation: C 618, except that the loss on ignition shall not exceed 4 percent, or, silica fume as specified in ASTM Designation: C 1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

Mineral admixtures shall be used in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

Section 90-4.02, "Materials," of the Standard Specifications is amended to read:

90-4.02 Materials.—Admixture materials shall be as specified in Section 90-2.04, "Admixture Materials."

Section 90-4.05, "Optional Use of Chemical Admixtures," of the Standard Specifications is amended to read:

90-4.05 Optional Use of Chemical Admixtures.—The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate any concrete construction application subject to the following conditions:

When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by mass except that the resultant cementitious material content shall be not less than 300 kilograms per cubic meter.

When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

Section 90-4.07, "Optional Use of Air-entraining Admixtures," of the Standard Specifications is amended to read:

90-4.07 Optional Use of Air-entraining Admixtures.—When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate

at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.08 Required Use of Mineral Admixtures.—Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material for use in portland cement concrete.

The calcium oxide content of mineral admixtures shall not exceed 10 percent and the available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when measured in conformance with the requirements of ASTM Designation: C 618.

The amounts of cement and mineral admixture used in cementitious material for portland cement concrete shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content.

The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:

- A. When the calcium oxide content of a mineral admixture, measured in conformance with the requirements of ASTM Designation: C 618 and Section 90-2.04, "Admixture Materials," is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
- B. When the calcium oxide content of a mineral admixture, measured in conformance with the requirements of ASTM Designation: C 618 and Section 90-2.04, "Admixture Materials," is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix.
- C. When a mineral admixture is used, which conforms to the requirements for silica fume in Section 90-2.04, "Admixture Materials," is used, the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix.

If more than the required amount of cementitious material is used, the additional cementitious material in the mix may be either cement, any mineral admixture conforming to the requirements of Section 90-2.04, "Admixture Materials," or a combination of both; however, the maximum total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

Section 90-4.09, "Optional Use of Mineral Admixture," of the Standard Specifications is deleted.

Section 90-4.11, "Storage, Proportioning, and Dispensing of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.11 Storage, Proportioning, and Dispensing of Mineral Admixtures.—Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection and identification for each shipment.

Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.

Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.

When interlocks are required for cement and mineral admixture charging mechanisms by Section 90-5.03A, "Proportioning for Pavement," and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the mass of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."

Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.

Section 90-5.02, "Proportioning Devices," of the Standard Specifications is amended to read:

90-5.02 Proportioning Devices.—All weighing, measuring or metering devices used for proportioning materials shall conform to the requirements in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, any automatic weighing systems used shall comply with the requirements for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." These automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.

Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.

Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the mass of each batch of material shall not vary from the mass designated by the Engineer by more than the tolerances specified herein.

Equipment for cumulative weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ± 0.5 percent of the individual batch mass designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of ± 0.5 percent of their designated individual batch masses. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated mass or volume.

The mass indicated for any batch of material shall not vary from the preselected scale setting by more than the following:

- A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch mass of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch masses.
- B. Cement shall be within 1.0 percent of its designated batch mass. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch mass. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch mass, and the total for cement and mineral

admixture shall be within 1.0 percent of the sum of their designated batch masses.

C. Water shall be within 1.5 percent of its designated mass or volume.

Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5 kg graduations.

Section 90-5.03, "Proportioning," excluding Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

90-5.03 Proportioning.—Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture and water as provided in these specifications. Aggregates shall be proportioned by mass.

At the time of batching, all aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry mass.

Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

Bulk "Type IP (MS) Modified" cement, that conforms to the requirements in Section 90-2.01, "Portland Cement," shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer.

Bulk cement to be blended with mineral admixture for use in portland cement concrete for pavement and structures may be weighed in separate, individual weigh hoppers or may be weighed in the same weigh hopper with mineral admixture and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer. If the cement and mineral admixture are weighed cumulatively, the cement shall be weighed first.

When cement and mineral admixtures are weighed in separate weigh hoppers, the weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material weighing device. The cement and the mineral admixture shall be discharged into the mixer simultaneously with the aggregate.

The scale and weigh hopper for bulk weighing cement, mineral admixture, and cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

When the source of any aggregate is changed for concrete structures, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using such aggregates. When the source of any aggregate is changed for other concrete, the Engineer shall be allowed sufficient time to adjust the mix and such aggregates shall not be used until necessary adjustments are made.

For all batches with a volume of one cubic meter or more, the batching equipment shall conform to one of the following combinations:

- A. Separate boxes and separate scale and indicator for weighing each size of aggregate.
- B. Single box and scale indicator for all aggregates.
- C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

In order to check the accuracy of batch masses, the gross mass and tare mass of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

90-5.03A Proportioning for Pavement.—Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by mass by means of automatic proportioning devices of approved type conforming to the requirements specified in this Section 90-5.03A.

The Contractor shall install and maintain in operating condition an electrically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by mass of the fine aggregate.

The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with masses which are within the tolerances specified in Section 90-5.02, "Proportioning Devices."

The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture, or cement plus mineral admixture into the aggregate as directed by the Engineer.

When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.

Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.

When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required mass is discharged into the weigh box, after which the gate shall automatically close and lock.

The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

The third paragraph in Section 90-6.01, "General," of the Standard Specifications is amended to read:

All concrete shall be homogeneous and thoroughly mixed, and there shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.

The third and fourth paragraphs in Section 90-6.02, "Machine Mixing," of the Standard Specifications are amended to read:

The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one-fourth of the specified mixing time.

Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, or in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cementitious material in the concrete mixture.

The sixth paragraph in Section 90-6.02, "Machine Mixing," of the Standard Specifications is amended to read:

The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.

The seventh through tenth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30° C, or above, a time less than 1.5 hours may be required.

When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30° C, or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

Each load of concrete delivered at the jobsite shall be accompanied by a weight certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This weight certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.

Weight certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on 90 mm diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be LFCR (one line, separate record) with allowances for sufficient fields to satisfy the amount of data required by these specifications.

The Contractor may furnish a weight certificate that is accompanied by a separate certificate which lists the actual batch masses or measurements for a load of concrete provided that both certificates are 1) imprinted with the same non-repeating load number that is unique to the contract and 2) delivered to the jobsite with the load.

All weight certificates furnished by the Contractor shall conform to the requirements of Section 9-1.01, "Measurement of Quantities."

Section 90-6.05, "Hand-Mixing," of the Standard Specifications is amended to read:

90-6.05 Hand-Mixing.—Hand-mixed concrete shall be made in batches not more than one-fourth cubic meter and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and

spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than 0.3 meters in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

The table in the first paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

Type of Work	Nominal Penetration (mm)	Maximum Penetration (mm)
Concrete pavement	0-25	40
Non-reinforced concrete facilities	0-35	50
Reinforced concrete structures:	0-35	65
Sections over 300 mm thick	0-50	75
Sections 300 mm thick or less		
Concrete placed under water	75-100	115
Cast-in-place concrete piles	65-90	100

The first paragraph following the table of penetration ranges in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

The amount of free water used in concrete shall not exceed 183 kg/m³, plus 20 kg for each required 100 kg of cementitious material in excess of 325 kg/m³.

The fourth paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

Where there are adverse or difficult conditions which affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic meter of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 kg of water per added 100 kg of cementitious material per cubic meter. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.

Section 90-9.01, "General," of the Standard Specifications is amended to read:

90-9.01 General.—Concrete compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified elsewhere or are shown on the plans.

The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled in conformance with California Test 539. Test cylinders will be molded and initial field cured in conformance with California Test 540. Test cylinders will be cured and tested after receipt

at the testing laboratory in conformance with California Test 521. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.

When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in conformance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.

When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$14.00 for each in-place cubic meter of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$20.00 for each in place cubic meter of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. All concrete represented by a single test which indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials."

If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in conformance with the specifications of ASTM Designation: C 42.

No single compressive strength test shall represent more than 250 cubic meters.

When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders which have been handled and stored in conformance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.

When concrete is specified by compressive strength, prequalification of materials, mix proportions, mixing equipment, and procedures proposed for use, will be required prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.

Certified test data, in order to be acceptable, must indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.

Trial batch test reports, in order to be acceptable, must indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 4 MPa greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches which were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.

All tests shall be performed in conformance with either the appropriate California Test methods or the comparable ASTM test methods. All equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.

The certified test data and trial batch test reports shall include the following information:

- A. Date of mixing.
- B. Mixing equipment and procedures used.
- C. The size of batch in cubic meters and the mass, type and source of all ingredients used.
- D. Penetration of the concrete.
- E. The air content of the concrete if an air-entraining admixture is used.
- F. The age at time of testing and strength of all concrete cylinders tested.

All certified test data and trial batch test reports shall be signed by an official of the firm which performed the tests.

When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.

After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making any changes which, in the judgment of the Engineer, could result in a lowering of the strength of the concrete below that specified.

The Contractor's attention is directed to the time required to test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of

the materials, mix proportions, mixing equipment, and procedures will not be required.

Section 90-10.02A, "Portland Cement," of the Standard Specifications is renamed "Cementitious Material" and is amended to read:

90-10.02A Cementitious Material.—Cementitious material shall conform to the provisions in Section 90-1.01, "Description." Compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified elsewhere or are shown on the plans.

The fifth paragraph in Section 90-10.02B, "Aggregate," of the Standard Specifications is deleted.

Section 90-10.03, "Production," of the Standard Specifications is amended to read:

90-10.03 Production.—Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice, which will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and which conforms to requirements specified herein. "Recognized standards of good practice" are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or California Department of Transportation.

The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."

The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.

Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before any stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 32° C. will be considered as conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.

The required mixing time in stationary mixers shall be not less than 50 seconds nor more than 5 minutes.

The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.

Each load of ready-mixed concrete shall be accompanied by a weight certificate which shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weight certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.

A Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets all contract requirements, including minimum cementitious material content specified.

The third and fourth paragraphs in Section 90-11.02, "Payment," of the Standard Specifications are amended to read:

Should the Engineer order the Contractor to incorporate any admixtures in the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D.

Should the Contractor use admixtures as permitted under Sections 90-4.05, "Optional Use of Chemical Admixtures;" or 90-4.07, "Optional Use of Air-entraining Admixtures;" or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them in the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

8-2.02 CEMENT AND WATER CONTENT

The amount of free water used in concrete for deck slabs of bridges and structure approach slabs shall not exceed 195 kg/m^3 , plus 20 kg for each required 100 kg of cementitious material in excess of 400 kg/m^3 .

SECTION 8-3. WELDING

8-3.01 WELDING ELECTRODES

Flux core welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform any type of welding for this project.

SECTION 9. DESCRIPTION OF BRIDGE WORK

The bridge work to be done consists, in general, of constructing 6 retaining walls and a pump plant for the Guadalupe River Corridor Transitway briefly described as follows:

RETAINING WALL NO. 1

Bridge No. 37-597M

A mechanically stabilized embankment of varying design height approximately 234 m long.

RETAINING WALL NO. 2

Bridge No. 37-598M

A mechanically stabilized embankment approximately 128 m long with varying design height from 6.0 m to 9.75 m.

RETAINING WALL NO. 3

Bridge No. 37-599M

A mechanically stabilized embankment of varying design height approximately 349 m long.

RETAINING WALL NO. 4

Bridge No. 37-600M

A mechanically stabilized embankment, average design height of 15 m, approximately 263 m long.

RETAINING WALL NO. 5

Bridge No. 37-601M

A mechanically stabilized embankment of varying design height approximately 236 m long.

RETAINING WALL NO. 6

Bridge No. 37-602M

A mechanically stabilized embankment of varying design height approximately 466 m long.

AIRPORT PARKWAY PUMP PLANT

Bridge N

o. 37-0593W

A groundwater drainage pump plant.

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.00 CONSTRUCTION PROJECT INFORMATION SIGNS

Before any major physical construction work readily visible to highway users is started on this contract, the Contractor shall furnish and erect 2 Type 2 Construction Project Information signs at the locations designated by the Engineer.

The signs shall be of a type and material consistent with the estimated time of completion of the project and shall conform to the details shown on the plans.

The sign letters, border and Caltrans construction logos shall conform to the colors (non-reflective) and details shown on the plans, and shall be on a white background (non-reflective). The colors blue and orange shall conform to PR Color Number 3 and Number 6, respectively, as specified in the Federal Highway Administration's Color Tolerance Chart.

The sign messages to be used for fund types shall consist of the following, in the order shown:

**FEDERAL HIGHWAY TRUST FUNDS
STATE HIGHWAY FUNDS**

The sign message to be used for type of work shall consist of the following:

HIGHWAY CONSTRUCTION

The sign message to be used for the Year of Completion of Project Construction will be furnished by the Engineer. The Contractor shall furnish and install the "Year" sign overlay within 10 working days of notification of the year date to be used.

The letter sizes to be used shall be as shown on the plans. The information shown on the signs shall be limited to that shown on the plans.

The signs shall be kept clean and in good repair by the Contractor.

Upon completion of the work, the signs shall be removed and disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Standard Specifications.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the construction project information signs shall be considered as included in the contract lump sum price paid for construction area signs and no additional compensation will be allowed therefor.

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

No work shall be performed on Sunday.

Attention is directed to "Environmentally Sensitive Area", "Obstruction" and "Cooperation" elsewhere in these special provisions.

Attention is directed to Environmentally Sensitive Area (ESA) and Temporary Fence (Type ESA) as specified in these special provisions. Prior to beginning

work, the boundaries of the Environmentally Sensitive Areas (ESA) shall be clearly delineated in the field. The boundaries shall be delineated by the installation of Temporary Fence (Type ESA).

Attention is directed to Contractor's conformance to requirements of permits entered into with U.S. Army Corps of Engineers and California Department of Fish and Game.

Attention is directed to "Embankment Stabilization Fabric" of these special provisions. Embankment stabilization fabric shall be installed concurrent with the placement of geosynthetic reinforced embankment and surcharge embankment slope construction.

The Contractor shall not start the work between Station G 155+65 and Station G 160+00 until the Contractor for job 04-4874S4 (Detour II) have finished the work in this area.

The first order of work shall be to obtain approved submittals for the drainage pumps and place an order with the vendor. The Contractor shall furnish the Engineer with a statement from the vendor that the order for the drainage pumps has been received and accepted by the vendor.

The work required to construct the Airport parkway Pumping Plant shall be performed in conformance with the stages of construction shown on the plans. Non-conflicting work in subsequent stages may proceed concurrently with work in preceding stages, provided satisfactory progress is maintained in the preceding stages of construction.

Provisions for maintaining roadway drainage on the detour adjacent to Retaining Walls #4 and Temporary Retaining Walls #4 and #5 shall be made prior to the construction of said walls.

Temporary sedimentation Basins and temporary unlined ditches shall be installed prior to the winter season for water pollution control as provided for in these special provisions.

Attention is directed to willow cuttings, elsewhere in these special provisions, which requires adequate lead time in order to obtain and propagate willow cuttings for installation during the course of construction.

Attention is directed to the requirements specified under "Erosion Control (Type D)" elsewhere in these special provisions, regarding time restrictions for seed application.

No above ground electrical work shall be performed on any system within the project site until all Contractor-furnished electrical materials for that individual system have been tested and delivered to Contractor.

Attention is directed to "Maintaining Traffic" of these special provisions and to the stage construction and traffic handling plans sheets of the plans.

Attention is directed to "Progress Schedule (Critical Path)" of these special provisions regarding the submittal of a general time-scaled logic diagram within 10 days after approval of the contract. The diagram shall be submitted prior to performing any work that may be affected by any proposed deviations to the construction staging of the project.

The work shall be performed in conformance with the stages of construction shown on the plans. Nonconflicting work in subsequent stages may proceed concurrently with work in preceding stages, provided satisfactory progress is maintained in the preceding stages of construction.

In each stage, after completion of the preceding stage, the first order of work shall be the removal of existing pavement delineation as directed by the Engineer. Pavement delineation removal shall be coordinated with new delineation so that lane lines are provided at all times on traveled ways open to public traffic.

Before obliterating any pavement delineation that is to be replaced on the same alignment and location, as determined by the Engineer, the pavement delineation shall be referenced by the Contractor, with a sufficient number of control points to reestablish the alignment and location of the new pavement delineation. The references shall also include the limits or changes in striping pattern, including one- and 2-way barrier lines, limit lines, crosswalks and other pavement markings. Full compensation for referencing pavement delineation shall be considered as

included in the contract prices paid for new pavement delineation and no additional compensation will be allowed therefor.

All work in the Guadalupe River shall be confined to the period between April 15 and October 15, except that no work shall occur in the active waterway until June 1. No equipment shall be operated in live stream channels.

At locations exposed to public traffic where guard railings are to be removed the Contractor shall schedule the operations so that at the end of each working day there shall be no post holes open nor shall there be any railing posts installed without the blocks and rail elements assembled and mounted thereon.

Concrete barrier (Type K) and crash cushions, at locations shown on the plans, shall be in place prior to the commencement of any adjacent construction activities.

When embankment settlement periods or surcharge embankment settlement periods are specified, the settlement periods and the deferment of portions of the work shall comply with the provisions in Section 19-6.025, "Settlement Period," of the Standard Specifications, and in "Earthwork" of these special provisions.

Installation of the Airport Parkway Pumping Plant will be required for the completion of this contract. The Contractor shall be responsible for temporary erosion control, as described elsewhere in these special provisions. Upon completion of the pumping plant work as described in Section 74, "Pumping Plant Equipment," of the Standard Specifications, and these special provisions, the Contractor shall be responsible for maintaining drainage pumping capacity of the drainage area, and maintenance of the pumping plant throughout the life of the contract. Section 7-1.15, "Relief From Maintenance and Responsibility," of the Standard Specifications shall not apply to the Airport Parkway Pumping Plant.

The total drainage capacity to be maintained shall not be less than 29,000 liters per minute at 2.5 meters of head. Maintenance of the pumping plant shall include, but not be limited to, providing necessary adjustments and repairs, and cleaning of the storage box, entrance bay, and the various sumps, for the proper operation of the Drainage Pumping Plant Equipment and Pumping Plant Electrical Equipment, Pumping capacity shall be maintained at the Contractor's option, by one of the following methods:

- 1) Staging the work such that the entire pumping plant is complete in place and capable of maintaining drainage pumping capacity. Attention is directed to Section 74-1.055, "Use of Pumps by Contractor Prior to Acceptance of Work", of the Standard Specifications.
- 2) Providing an auxiliary pumping system consisting of temporary drainage system, sump pumps and discharge piping.
- 3) A combination of the above two methods.

The Contractor shall submit his proposed method for maintaining drainage pumping capacity to the Engineer for approval.

10-1.02 ENVIRONMENTALLY SENSITIVE AREA (GENERAL)

The Contractors attention is directed to the designated Environmentally Sensitive Area (ESA), shown on the plans. The exact location of the boundaries of environmentally sensitive area shall be established by the Engineer and clearly delineated by the placement of Temporary Fence (Type ESA) as described in these special provisions.

Within the boundaries of an ESA, no project related activities shall take place. This specifically prohibits vehicle access, storage or transport of any materials, including hydrocarbon and lead contaminated material, or any other project related activities.

10-1.03 ARCHAEOLOGICAL SENSITIVE AREAS

The Contractor's attention is directed to the fact that the entire project is within an Archaeological Sensitive Area (ASA). All construction activities within

the Archaeological Sensitive Areas shall be performed in accordance with these special provisions and as directed by the Engineer.

General

It is the intent of the Department under Section 106 of the National Historic Preservation Act of 1966, the Caltrans Environmental Handbook (Vol. 2:1-2.2), and the approved Historic Properties Treatment Plan for the Upgrade of the Guadalupe Parkway, that an archaeologist shall be present to monitor any Earthwork. Further, if archaeological resources are discovered during construction, the Contractor shall stop construction activities until the finds are evaluated. If the finds are significant, the archaeologist will record and extract them. Should human skeletal remains be uncovered within the project area, monitoring by a Native American consultant retained by the Department will be required.

The California Public Resources Code Chapter 1.7, Section 5097.5, makes it a misdemeanor for anyone to knowingly disturb a historical feature. California Public Resources Code Sections 5097.98 and 5097.00 require protection of Native American remains which might be discovered and outline procedures for handling any burials found. The California Public Resources Code Section 5097.9 and Health and Safety Code 7050 require coordination with the State Native American Heritage Commission (NAHC).

Construction

No sub-surface construction activities are permitted within the ASA without an archaeological monitor. Sub-surface disturbance requiring an archaeological monitor includes excavation, installation of shoring, grading, grubbing, non-production demonstration piling work, auger borings and any other earthmoving or land surface alteration activities. An archaeological investigation is required when human skeletal remains or other archaeological finds are uncovered anywhere within the project limits. The Contractor shall cooperate and assist the archaeologists in their work in the SA under the direction of the Department staff archaeologist.

The Contractor shall notify the Engineer at least 5 working days in advance of commencing any earthwork within the ASA. The notification shall include a schedule of the hours to be worked, including Saturdays and legal holidays. The Department archaeologist must be included in any pre-construction meetings with the Contractor and their subs.

Should an archaeological find be made, the Contractor will be directed to continue work outside of a clearly delineated location established around the find, and the archaeologists will require 14 working days to complete investigations. If in the opinion of the Engineer, the Contractor's operation is delayed or interfered with by reason of the archaeological investigation, the State will compensate the Contractor for such delays to the extent provided for in Section 8-1.09, "Right of Way Delays" of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities" of the Standard Specifications.

Contractor labor, equipment and materials in assisting the archaeologist will be paid for as extra work as provided in Section 4-1.03D of the Standard Specification, except for the work described as follows:

1. Removal (including saw cutting) and disposal of roadway, pavement structural section, sidewalk, curb and gutter.
2. Handling and disposal of soils within the structure excavation limits.
3. All forces provided by the Contractor in order that the work performed by both the Contractor and the archaeological team conforms to the requirements in "Hazardous and Non-Hazardous Materials, General," and "Hazardous and Non-Hazardous, Excavation," elsewhere in these provisions.

Full compensation for the 3 items of work listed above shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

10-1.04 WATER POLLUTION CONTROL

Water pollution control work shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

This project shall conform to the requirements of Order No.99-06-DWQ issued by the State Water Resources Control Board . This order, hereafter referred to as the "Permit," regulates storm water discharges associated with construction activities.

Water pollution control work shall conform to the requirements in the Construction Contractor's Guide and Specifications of the Caltrans Storm Water Quality Handbooks, dated April 1997, and addenda thereto issued up to and including the date of advertisement of the project, hereafter referred to as the "Handbook". Copies of the Handbook may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

Copies of the Handbook and the Permit are also available for review at 111 Grand Avenue Oakland, California 94601. Please call the Construction office Duty Senior, telephone number (510) 286-5209 to reserve a copy of the documents at least 24 hours in advance.

The Contractor shall become fully informed of and comply with the applicable provisions of the Handbook, Permit and Federal, State and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall maintain a copy of the Permit at the project site and shall make the Permit available during construction activities.

Unless arrangements for disturbance of areas outside the project limits are made by the Department and made part of the contract, it is expressly agreed that the Department assumes no responsibility to the Contractor or property owner whatsoever with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for the costs and for any liability imposed by law as a result of the Contractor's failure to comply with the requirements set forth in this section "Water Pollution Control", including but not limited to, compliance with the applicable provisions of the Handbook, Permit and Federal, State and local regulations. For the purposes of this paragraph, costs and liabilities include, but are not limited to, fines, penalties and damages whether assessed against the State or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to any remedy authorized by law, so much of the money due the Contractor under the contract that shall be considered necessary by the Department may be retained by the State of California until disposition has been made of the costs and liabilities.

The retention of money due the Contractor shall be subject to the following:

1. The Department will give the Contractor 30 days notice of its intention to retain funds from any partial payment which may become due to the Contractor prior to acceptance of the contract. Retention of funds from any payment made after acceptance of the contract may be made without prior notice to the Contractor.
2. 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.
3. If the Department has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Department shall be liable for

interest on the amount retained at the legal rate of interest for the period of the retention.

Conformance with the requirements of this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities, as provided in Sections 7-1.11, "Preservation of Property," 7-1.121, "Indemnification," and 7-1.122, "Insurance," of the Standard Specifications.

The Contractor shall, at reasonable times, allow authorized agents of the California Regional Water Quality Control Board, State Water Resources Control Board, U. S. Environmental Protection Agency and local storm water management agency, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the construction site and the Contractor's facilities pertinent to the work;
2. Have access to and copy any records that must be kept as specified in the Permit;
3. Inspect the construction site and related soil stabilization practices and sediment control measures; and
4. Sample or monitor for the purpose of ensuring compliance with the Permit.

The Contractor shall notify the Engineer immediately upon request from regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records.

STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND UPDATES

As part of the water pollution control work, a Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP," is required for this contract. The SWPPP shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Handbook, the requirements of the Permit and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be deemed to fulfill the requirements of Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the SWPPP has been approved by the Engineer.

Within 30 days after the approval of the contract, the Contractor shall submit 3 copies of the SWPPP to the Engineer. The Contractor shall allow 15 days for the Engineer to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 15 days of receipt of the Engineer's comments and shall allow 5 days for the Engineer to review the revisions. Upon the Engineer's approval of the SWPPP, 3 additional copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed.

The objectives of the SWPPP shall be to identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and to identify, construct, implement and maintain water pollution control measures, hereafter referred to as control measures, to reduce to the extent feasible pollutants in storm water discharges from the construction site both during and after construction is completed under this contract.

The SWPPP shall incorporate control measures in the following categories:

1. Soil stabilization practices;
2. Sediment control practices;
3. Sediment tracking control practices;
4. Wind erosion control practices; and
5. Non-storm water management and waste management and disposal control practices.

Specific objectives and minimum requirements for each category of control measures are contained in the Handbook.

The Contractor shall consider the objectives and minimum requirements presented in the Handbook for each of the above categories. When minimum requirements are listed for any category, the Contractor shall incorporate into the SWPPP, and implement on the project, the listed minimum controls required in order to meet the pollution control objectives for the category. In addition, the Contractor shall consider other control measures presented in the Handbook and shall incorporate into the SWPPP and implement on the project the control measures necessary to meet the objectives of the SWPPP. The Contractor shall document the selection process in accordance with the procedure specified in the Handbook. The following special minimum requirements are established:

Category	Minimum Requirement(s)
Soil Stabilization Practices	CD23 Preservation of Existing vegetation
Sediment Control Practices	CD40 (2) Storm Drain Inlet Protection CD42 Sediment Basin/ Temporary Sedimentation Basin 304mm Flexible Drain Pipe Temporary Unlined Ditch
Non-Storm Water Management & Waste Management & Disposal	CD8 Paving operations, CD12 Spill Prevention and control, CD13 Solid Waste Management

The following contract items of work, as shown on the project plans, shall be incorporated into the SWPPP as critical temporary control measures: Temporary Fence (Type ESA), Temporary Soil Stabilizer, Temporary Drainage Inlet Protection, Temporary Construction Road, Temporary Concrete Washout Facility, Temporary Cover, and Temporary Silt Fence. The Contractor shall consider other control measures to supplement the critical temporary control measures when necessary to meet the pollution control objectives of the SWPPP.

The following contract items of work, as shown on the project plans, shall be incorporated into the SWPPP as permanent post-construction control measures: Permanent Soil Stabilizer, Embankment Stabilization Fabric, Permanent Erosion Control, Erosion Control (Reinforced Mat) and Fiber Rolls. These control measures shall be utilized as construction period control measures. Attention is directed to "Order of Work" of these special provisions.. The Contractor shall consider other control measures to supplement these permanent, post-construction control measures when necessary to meet the pollution control objectives of the SWPPP. The Contractor shall maintain and protect the permanent control measures throughout the duration of the project and shall restore these controls to the lines and grades shown on the plans prior to acceptance of the project.

The SWPPP shall include, but not be limited to, the following items as described in the Handbook and Permit:

1. Source Identification;
2. Erosion and Sediment Controls;
3. Non-Storm Water Management;
4. Waste Management and Disposal;
5. Maintenance, Inspection and Repair;
6. Training;
7. List of Contractors and Subcontractors;
8. Post-Construction Storm Water Management;
9. Preparer;
10. Amendment Log;
11. Copy of the Order No. 99-06-DWQ;
12. BMP Consideration Checklist;
13. SWPPP Checklist;
14. Schedule of Values; and
15. Water Pollution Control Drawings.

The Contractor shall amend the SWPPP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems, or when deemed necessary by the Engineer. The SWPPP shall also be amended if it is in violation of any condition of the Permit, or has not effectively achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially approved SWPPP, which are required on the project to control water pollution effectively. Amendments to the SWPPP shall be submitted for review and approval by the Engineer in the same manner specified for the initially approved SWPPP. Approved amendments shall be dated and logged in the SWPPP. Upon approval of the amendment, the Contractor shall implement the additional control measures or revised operations.

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

By June 15 of each year, the Contractor shall submit an annual certification to the Engineer stating compliance with the requirements governing the Permit. If the project is in non-compliance at any time, the Contractor shall make a written report to the Engineer within 5 days of identification of non-compliance.

SCHEDULE OF VALUES

The Contractor shall submit with the SWPPP, for approval by the Engineer, a schedule of values detailing the cost breakdown of the contract lump sum item for water pollution control. The schedule of values shall reflect the items of work, quantities and costs for control measures shown in the SWPPP, except for critical temporary controls and permanent control measures which are shown on the project plans and for which there is a contract item of work. Adjustments in the items of work and quantities listed in the schedule of values shall be made when required to address approved amendments to the SWPPP.

The sum of the amounts for the units of work listed in the schedule of values shall be equal to the contract lump sum price for water pollution control.

If approved in writing by the Engineer, the schedule of values will be used to determine progress payments for water pollution control during the progress of the work, and as the basis for calculating any adjustment in compensation for the contract item for water pollution control due to changes in the work ordered by the Engineer.

SWPPP IMPLEMENTATION

Upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting and maintaining the control measures included in the SWPPP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these special provisions, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in accordance with Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal and disposal of control measures are specified in the Handbook and these special provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the winter season, defined as between October 1 and May 1.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas of the project site shall be completed, except as provided for below, no later than 20 days prior to the beginning of the winter season or upon start of applicable construction activities for projects which begin either during or within 20 days of the winter season.

Throughout the winter season, the active, soil-disturbed area of the project site shall be no more than 2.0 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active, soil-disturbed area limit. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control measures to protect soil-disturbed areas of the project site before the onset of precipitation. The Contractor shall maintain a quantity of soil stabilization and sediment control materials on site equal to 125 percent of that sufficient to protect unprotected, soil-disturbed areas on the project site and shall maintain a detailed plan for the mobilization of sufficient labor and equipment to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. The Contractor shall include a current inventory of control measure materials and the detailed mobilization plan as part of the SWPPP.

Throughout the winter season, soil-disturbed areas of the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 5 or more days and the areas are fully protected with soil stabilization practices and sediment control measures. Areas that will become nonactive either during the winter season or within 5 days thereof shall be fully protected with soil stabilization practices and sediment control measures within 2 days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

Throughout the winter season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control measures unless fair weather is predicted through the following work day. The weather forecast shall be monitored by the Contractor on a daily basis. The National Weather Service forecast shall be used, or an alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following work day, construction scheduling shall be modified, as required, and the Contractor shall deploy functioning control measures prior to the onset of the precipitation.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the SWPPP for sediment tracking, wind erosion, non-storm water management and waste management and disposal.

The Engineer may order the suspension of construction operations which create water pollution if the Contractor fails to conform to the requirements of this section "Water Pollution Control" as determined by the Engineer.

MAINTENANCE

To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the

control measures identified in the SWPPP. The Contractor shall identify corrective actions and time frames to address any damaged measures or reinstate any measures that have been discontinued.

The construction site inspection checklist provided in the Handbook shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. The Contractor shall submit one copy of each site inspection record to the Engineer.

During the winter season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

1. Prior to a forecast storm;
2. After any precipitation which causes runoff capable of carrying sediment from the construction site;
3. At 24 hour intervals during extended precipitation events; and
4. Routinely, at a minimum of once every 2 weeks.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected by the Contractor immediately, or by a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the State.

PAYMENT

The contract lump sum price paid for prepare storm water pollution prevention plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising and amending the SWPPP as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for prepare storm water pollution prevention plan will be made as follows:

1. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate; and
2. After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in accordance with Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing and disposing of control measures, except those shown on the project plans and for which there is a contract item of work, and excluding developing, preparing, obtaining approval of, revising and amending the SWPPP, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Changes in control measures required by an approved amendment to the SWPPP, except changes to those control measures shown on the project plans and for which there is a contract item of work, will be considered as follows:

If the control measure is listed in the approved SWPPP schedule of values, an adjustment in compensation for the contract item for water pollution control will be made by applying the increase or decrease in quantities to the approved schedule of values. No adjustment of compensation will be made to the unit price listed for any item in the schedule of values due to any increase or

decrease in the quantities, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," shall not apply to items listed in the schedule of values.

If the control measure is not listed in the approved SWPPP schedule of values, payment will be made by extra work, in accordance with Section 4-1.03D of the Standard Specifications.

Those control measures which are shown on the project plans and for which there is a contract item of work will be measured and paid for as that item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the requirements of this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the requirements of this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the requirements of this section will be released for payment on the next monthly estimate for partial payment following the date that an approved SWPPP has been implemented and maintained, and water pollution is adequately controlled, as determined by the Engineer.

10-1.05 TEMPORARY CONCRETE WASHOUT FACILITY

Temporary concrete washout facilities shall be constructed, maintained, and later removed as shown on the plans and in conformance with these special provisions.

Temporary concrete washout facilities shall be installed prior to beginning any placement of concrete and located a minimum of 15 m from storm drain inlets, open drainage facilities, and watercourses, unless determined unfeasible by the Engineer. Each facility shall be located away from construction traffic or access areas to prevent disturbance or tracking.

A sign shall be installed as shown on the plans adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.

Temporary concrete washout facilities shall be constructed above grade or below grade at the option of the Contractor. The minimum quantity of concrete washouts required for this project shall be six (6). Temporary concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations for all concrete wastes.

MATERIALS.—Materials shall conform to the provisions in Section 6, "Control of Materials," of the Standard Specifications and the following:

Plastic sheeting shall be new and a minimum of 12 mil (0.33 mm) in thickness.

Rock bag fabric shall be woven polypropylene, polyethylene or Polyamide with a minimum unit weight of 135 g/m². The fabric shall have a mullen burst strength of at least 2067 kPa, per ASTM Designation D3786 and an ultraviolet (UV) stability exceeding 70 percent. Rock bags shall have a length of 600 mm to 800 mm, width of 400 mm to 450 mm, thickness of 150 mm to 200 mm, and capable of containing a weighted mass of 13 kg to 22 kg. Rock bag fill material shall be non-cohesive, gravel, free from deleterious material. Rock bags shall be filled to a capacity of at least 15 kg and the opening secured such that rock shall not escape from the bag.

Straw bales, wood stakes and frame shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications

TEMPORARY CONCRETE WASHOUT FACILITY (TYPE ABOVE GRADE)

Temporary concrete washout facility (type above grade) shall be constructed as shown on the plans with a minimum length of 3 m and a minimum width of 3 m. The length and width of a facility may be increased, at the Contractor's expense, upon approval of the Engineer.

TEMPORARY CONCRETE WASHOUT FACILITY (TYPE BELOW GRADE)

Temporary concrete washout facility (type below grade) shall be constructed as shown on the plans with a minimum length of 3 m and a minimum width of 3 m. The length and width of a facility may be increased, at the Contractor's expense, upon approval of the Engineer.

MAINTENANCE AND REMOVAL

Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm for above grade facilities and 300 mm for below grade facilities. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials shall be removed and disposed of in conformance with the provisions in Section 15-3.02, "Removal Methods," of the Standard Specifications.

When temporary concrete washout facilities are no longer required for the work, as determined by the Engineer, the hardened concrete shall be removed and disposed of in conformance with the provisions in Section 15-3.02 of the Standard Specifications. Materials used to construct temporary concrete washout facilities shall become the property of the Contractor, shall be removed from the site of the

work, and shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

PAYMENT

The contract lump sum price paid for temporary concrete washout facilities shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing, maintaining and removing temporary concrete washout facilities, complete in place, including straw bales, plastic lining, sign, portable delineators, lath and flagging, and excavation and backfill, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.06 TEMPORARY COVER

Temporary cover shall conform to the Standard Specifications and these special provisions. The minimum quantity of temporary cover required for this project shall be 600 square meters.

The Contractor shall use temporary cover as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall graphically show the use of temporary cover in relation to other water pollution control work specified elsewhere in these special provisions.

MATERIALS.--Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following for either plastic or fabric sheeting:

If fabric is used, the fabric shall be a minimum 115-170 g/m² slit film woven fabric made of monofilaments of polypropylene. The fabric shall be non biodegradable, resistant to sunlight deterioration, inert to most soil chemicals and furnished with sealed edges on all sides to prevent unraveling. The fabric shall also conform to the following:

Properties	
Grab tensile strength (minimum)	0.85-0.95 kn
Elongation at break (minimum)	15%

If plastic sheeting is used, the sheeting shall be new and a minimum of 0.33 mm thickness.

Fabric or plastic sheeting shall be placed as shown on the plans with a 0.6 m overlap. A weight such as rock bags shall be placed on the overlap area at a maximum spacing of 2.4 m. Edges shall be embedded a minimum of 150 mm in native soil.

Temporary cover damaged as a result of the Contractors operations shall be replaced by the Contractor at his expense.

MEASUREMENT AND PAYMENT.--The contract lump sum price paid for temporary cover shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing, maintaining and removing temporary cover, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. If the Contractor removes the temporary cover in order to facilitate any other work, the temporary cover shall be replaced and secured by the contractor at no additional cost to the State.

10-1.07 TEMPORARY DRAINAGE INLET PROTECTION

Temporary drainage inlet protection shall be installed, maintained and later removed as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

The Contractor shall select the appropriate drainage inlet protection shown on the plans commensurate to the field condition around the drainage inlet. Drainage inlet protection for all other drainage inlets where field conditions around the inlets are not provided for on the plans shall be provided for as outlined in the Caltrans Storm Water Quality Handbook 'Construction Contractors Guide and Specifications CD40 (2) and in Water Pollution Control elsewhere in these special provisions.

Throughout the duration of the Contract, the Contractor shall be required to provide protection commensurate with the changing condition of the drainage inlet. The percentage of completion of the drainage inlet varies subject to the staging and phasing of construction. It is recognized that the drainage inlet changes during the course of construction and the actual protection provided may require selecting the appropriate type or types of drainage inlet protection as it changes during the course of construction.

The Contractor shall use temporary drainage inlet protection as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall graphically show the use of temporary drainage inlet protection in relation to other water pollution control work specified elsewhere in these special provisions.

MATERIALS.--Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.

SILT FENCE.--Sedimentation control fabric for temporary silt fence shall be a prefabricated silt fence with a minimum woven polypropylene fabric width of 900 mm and a minimum tensile strength of 0.44-kN, conforming to ASTM Designation: D 4632.

ROCK BAG.--Rock bag fabric shall be woven polypropylene, polyethylene or Polyamide with a minimum unit weight of 135 g/m². The fabric shall have a mullen burst strength of at least 2067 kPa, per ASTM Designation: D3786 and an ultraviolet (UV) stability exceeding 70 percent.

Rock bags shall have a length of 600 mm to 800 mm, width of 400 mm to 450 mm, thickness of 150 mm to 200 mm, and capable of containing a weighted mass of 13kg to 22kg.

Rock bag fill material shall be non-cohesive, gravel, free from deleterious material. Rock bags shall be filled to a capacity of at least 15 kg and the opening secured such that rock shall not escape from the bag.

EROSION CONTROL BLANKET.--Erosion control blanket shall consist of straw and coconut or wood excelsior mats secured in place with wire staples and shall conform to one of the following:

EXCELSIOR BLANKET.--Excelsior blanket material shall consist of machine produced mats of curled wood excelsior with 80 percent of the fiber 150 mm or longer. The erosion control blanket shall be of consistent thickness and the wood fiber shall be evenly distributed over the entire area of the blanket. The top surface of the blanket shall be covered with a photo-degradable extruded plastic mesh. The blanket shall be smolder resistant without the use of chemical additives and shall be non-toxic and non-injurious to plant and animal life. Erosion control blanket shall be furnished in rolled strips, 1220 mm -2440 mm in width, and shall have an average mass of 0.5-kg/m², ± 10 percent, at the time of manufacture.

STRAW AND COCONUT BLANKET.—Straw and coconut blanket shall be machine produced mats of straw and coconut with a light weight photo-degradable netting on top. The straw and coconut shall adhere to the netting with biodegradable thread or glue strip. The straw and coconut erosion control blanket shall be of consistent thickness with the straw and coconut evenly distributed over the entire area of the blanket. Straw and coconut erosion control blanket shall be furnished in rolled strips with a minimum width of 1.8 meters, minimum length of 20 meters (+ 1 meter) and a minimum weight of 0.27-kg/m².

STAPLES.—Staples for erosion control blankets shall be made of 11-gage minimum steel wire and shall be U-shaped with 150-mm legs and 25-mm crown or 200-mm legs and a 50-mm crown.

INSTALLATION AND MAINTENANCE.—When no longer required for the purpose, as determined by the Engineer, temporary drainage inlet protection facilities shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the site of the work.

Temporary drainage inlet protection damaged due to storms or as a result of the Contractor's operations shall be replaced by the Contractor at his expense.

MEASUREMENT AND PAYMENT.—The quantity of temporary drainage inlet protection to be paid for will be determined from actual measurement of each drainage inlet protected conforming to the details shown on the plans. The protection is measured one time only and no additional measurement is recognized, and no additional compensation made, if it changes during the course of construction.

The contract price paid per temporary drainage inlet protection shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary drainage inlet protection, complete in place, including excavation and backfill, all modifications occurring during the course of construction, and maintenance and removal of temporary drainage inlet protection, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary drainage inlet protection for protection at drainage inlets other than as shown on the project plans or directed by the Engineer, in accordance with the Contractor's Storm Water Pollution Prevention Plan (SWPPP), will not be measured as temporary drainage inlet protection. Payment for drainage inlet protection that is required as part of the SWPPP, but is not shown on the project plans, will be paid for as specified in "Water Pollution Control" elsewhere in these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary drainage inlet protection required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," shall not apply to temporary drainage inlet protection.

10-1.08 TEMPORARY FENCE (TYPE ESA)

Temporary fence (Type ESA) shall be furnished and constructed, maintained, and later removed as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Temporary fence (Type ESA) shall be constructed prior to any clearing and grubbing work and a sufficient distance from protected plants to enclose all of the foliage canopy and not encroach upon visible roots of the plants.

Temporary fence (Type ESA) shall be located so that it will be obvious to heavy equipment operators.

Used materials may be installed providing the used materials are good, sound, and are suitable for the purpose intended, as determined by the Engineer.

Fabric used for Temporary fence (Type ESA) shall also conform to the following:

Material:	Polypropylene or Polyethylene
Color:	Orange
Mesh opening:	50 mm x 50 mm
UV Resistance:	Fully Stabilized
Fabric Width, min.:	1.22 m

Posts shall be either metal or wood at the Contractor's option, shall be suitable for the purpose intended and shall be driven into the soil a minimum of 400 mm. Post spacing shall be adequate to completely support the fence fabric in an upright position.

Galvanizing and painting of steel items will not be required.

Treating wood with wood preservatives will not be required.

Concrete footings for posts will not be required.

Temporary fence (Type ESA) shall be constructed in accordance with the manufacturer's recommendations.

Temporary fence (Type ESA) that is damaged from any cause during the progress of the work shall be repaired or replaced by the Contractor at the Contractor's expense.

When no longer required for the work as determined by the Engineer, temporary fence (Type ESA) shall be removed. Removed facilities shall become the property of the Contractor and shall be removed from the site of the work, except as otherwise provided in this section.

Holes caused by the removal of temporary fence (Type ESA) shall be backfilled in accordance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

The contract price paid per meter for temporary fence (Type ESA) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing temporary fence (Type ESA) complete in place, including installation, maintenance, removal and disposal of materials as specified in these special provisions and as directed by the Engineer.

10-1.09 TEMPORARY CONSTRUCTION ROAD

Temporary construction road shall conform to the details shown on the plans and these special provisions. The minimum quantity of temporary construction road entrance/exit required for this project shall be four (4).

Temporary construction road shall be furnished, installed, maintained and removed at the locations shown on the plans.

Preparation shall conform to the requirements in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" elsewhere in these special provisions.

The Contractor shall use temporary construction road as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall graphically show the use of temporary construction road in relation to other water pollution control work specified elsewhere in these special provisions.

MATERIALS.—Materials shall conform to Section 20-2, "Materials," of the Standard Specifications and the following:

Subgrade Enhancement Fabric.--Subgrade enhancement fabric shall be placed where shown on the plans and at locations designated by the Engineer in accordance with this special provision.

Subgrade enhancement fabric shall be manufactured from one or more of the following materials: polyester, nylon or polypropylene.

Subgrade enhancement fabric shall be, at the option of the contractor, either a woven filament or nonwoven type fabric conforming to the following:

	Woven	Non-Woven
Weight, grams per Square Meter, Min. ASTM Designation: D3776	205	205
Grab Tensile Strength, Newtons (N), Min. ASTM Designation: D4632	890	800
Tensile Strength at 10% Elongation, N, Min. ASTM Designation: D4632	490	--
Elongation at Break, Percent, Max. ASTM Designation: D4632	35 Max.	50 Min.

Subgrade enhancement fabric shall be furnished in an appropriate protective cover which shall protect it from ultraviolet radiation and from abrasion due to shipping and handling, and shall remain in said cover until installation.

Subgrade enhancement fabric shall be accompanied by a Certificate of Compliance conforming to the provision in Section 6-L07, "Certificate of Compliance" of the Standard Specifications.

The subgrade to receive the fabric, immediately prior to placing, shall conform to the compaction and elevation tolerance specified in Section 25-1.03, "Subgrade", of the Standard Specifications and these special provisions and shall be free of loose or extraneous material and sharp objects that may damage the fabric during the installation.

Subgrade enhancement fabric shall be handled and placed in accordance with the manufacturer's recommendation and shall be positioned longitudinally along the alignment, pulled taut to form a tight wrinkle-free mat.

Adjacent borders of the fabric shall be overlapped a minimum of 450 mm.

The amount of subgrade enhancement fabric placed shall be limited to that which can be covered with aggregate base material within 72 hours.

Fill, subbase, or base material to be placed directly over the subgrade enhancement fabric shall be spread in the direction of fabric overlaps. Stockpiling of materials directly on the subgrade enhancement fabric is not allowed. Once a sufficient working platform has been constructed, all remaining materials shall be placed in accordance with the applicable sections of the special provisions and the Standard Specifications.

Should the fabric be damaged during placing, the damaged section shall be repaired by placing a new piece of fabric over the damaged area. Said piece of fabric shall be large enough to cover the damaged area and provide a minimum 900 mm overlay on all edges.

Damage to the fabric resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

During spreading of the aggregate base material, vehicles or equipment shall not be driven directly on the fabric. A sufficient thickness of material shall be maintained between the fabric and the equipment to prevent damage to the fabric.

Aggregate Base.--Aggregate base shall be Class 3 and shall conform to the provisions in Section 26, "Aggregate Base, " of the Standard Specifications and these special provisions.

The first paragraph of Section 26-1.02B, "Class 3 Aggregate Base, " of the Standard Specifications is amended by adding the following sentences:

Aggregate may include or consist of material processed from reclaimed asphalt concrete, portland cement concrete base, cement treated base, glass or a combination of any of these materials. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

Aggregate for Class 3 aggregate base shall conform to the following requirements:

Sieve Size	Percentage Passing 37.5 mm Maximum	
	Operating Range	Contract Compliance
50 mm	100	100
37.5 mm	90-100	87-100
25 mm	--	--
19 mm	50-85	45-90
4.75 mm	25-45	20-50
600- μ m	10-25	6-29
75- μ m	2-11	0-14

The aggregate shall not be treated with lime, cement or other chemical material before the Durability Index test is performed. Untreated reclaimed asphalt concrete and portland cement concrete will not be considered to be treated with, cement or other chemical material for purposes of performing the Durability Index test.

INSTALLATION.—Temporary construction road shall be installed as shown on the plans and as follows:

Prior to placing the aggregate base on areas to receive temporary construction road, the areas shall be cleared of all trash and debris. Weeds shall be removed to the ground level. Cleared trash, debris, and removed weeds shall be disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Standard Specifications.

Any depressions in the areas designated as part of the temporary construction road as shown on the plans shall be graded to a uniform surface.

Following grading, a subgrade enhancement fabric—shall be placed prior to spreading aggregate base CL 3 Aggregate base CL 3 shall be uniformly placed and spread with 1:4 (V:H) tapers at the perimeter edges of the temporary construction road where it conforms to existing roadway.

The Contractor shall maintain the temporary construction road throughout the contract period and shall prevent displacement or migration of the aggregate base CL 3 Any significant depressions, as determined by the Engineer, which form due to settling or heavy traffic shall be repaired by the Contractor.

Once the temporary construction road is no longer needed, the aggregate base and subgrade enhancement fabric shall be removed and disposed of as provided for in Section 7-1.13 'Disposal of Material Outside of the Highway Right of Way' of the Standard Specifications. Following removal of the temporary construction road, the areas shall be graded smooth and compacted to conform with adjacent areas.

PAYMENT.—

The contract lump sum price paid for temporary construction road shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing, maintaining and removing temporary construction road, complete in place, including transporting and disposing of material removed from temporary construction road and any incidental grading required to grade and compact areas within the limits of temporary construction road as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.10 TEMPORARY SOIL STABILIZER

Temporary soil stabilizer shall be applied in accordance with these special provisions.

Temporary soil stabilizer work shall consist of applying a mixture of processed gypsum plaster, color hardener, fiber and water to unfinished embankment slopes and other areas designated on the plans. Temporary soil stabilizer work shall be completed in the designated areas during the period starting September 1 and ending October 31 or within 2 days after an area becomes inactive during the winter season as defined in "Water Pollution Control" in these special provisions.

Preparation shall conform to the requirements in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" in these special provisions.

MATERIALS.—Materials shall conform to Section 20-2, "Materials," and the following requirements for soil stabilizers:

STABILIZING EMULSION (SOLIDS) .—Material shall consist of a gypsum plaster processed into a dry, ground powder of calcium sulfate hemihydrate. Plaster shall be furnished either in bags or bulk. Plaster that has set into a lumpy or caked condition prior to use shall be rejected.

Emulsion (solids) material shall be formulated specifically for use in erosion control and soil stabilization. Emulsion (solids) material shall be non-corrosive and shall be a water-soluble emulsion that, upon application, cures to a water insoluble binding and cementing agent.

COLOR HARDENER.—Coloring material shall consist of a processed powdered cementitious hardener with a muted green color conforming to ASTM C 979.

APPLICATION.—Temporary soil stabilizer shall be applied in one application as follows:

The application shall consist of applying the following mixture in the proportions indicated with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope measurement)
Fiber	842
Stabilizing Emulsion (solids)	4,446
Color Hardener (solids)	53.5

The application of temporary soil stabilizer will be applied in a down slope direction to provide uniform coverage when possible. Application of material shall be performed during dry weather with a minimum of 8 hours of dry weather predicted following application prior to any anticipated rain.

Any areas disturbed or displaced by construction operations or equipment following application shall be replaced by the Contractor at no cost to the State.

Due to the cementitious nature of the stabilizing emulsion (solids) and color hardener, it is recommended that application of the temporary soil stabilizer be performed continuously without interruption to prevent setting up of the material. All equipment used to apply temporary soil stabilizer shall be flushed immediately following application and cleaned thoroughly as soon as possible as recommended by the manufacturer.

Stabilizers shall not be applied to areas with standing water.

MEASUREMENT AND PAYMENT.—Temporary soil stabilizer will be measured and paid for by the kilogram of solids prior to dilution.

The contract price paid per kilogram for temporary soil stabilizer (solids) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in temporary soil stabilizer, complete in place, including fiber, and color hardener, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary soil stabilizer required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," shall not apply to temporary soil stabilizer.

10-1.11 SOIL STABILIZER

Soil stabilizer shall be applied in accordance with these special provisions.

Soil stabilizer work shall consist of applying a mixture of processed gypsum plaster, color hardener, fiber and water to finished embankment slopes and other areas designated on the plans. Soil stabilizer shall be applied during the period starting September 1 and ending October 31; or, if the slope on which the soil stabilizer is to be placed is finished during the winter season as specified in "Water Pollution Control" in these special provisions, the soil stabilizer shall be applied immediately; or, if the slope on which the erosion control is to be placed is finished outside both specified periods and the contract work will be completed before September 1, the soil stabilizer shall be applied as a last item of work.

Preparation shall conform to the requirements in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" in these special provisions.

MATERIALS.—Materials shall conform to Section 20-2, "Materials," and the following requirements for soil stabilizers:

STABILIZING EMULSION (SOLIDS).—Material shall consist of a gypsum plaster processed into a dry, ground powder of calcium sulfate hemihydrate. Plaster shall be furnished either in bags or bulk. Plaster that has set into a lumpy or caked condition prior to use shall be rejected.

Emulsion (solids) material shall be formulated specifically for use in erosion control and soil stabilization. Emulsion (solids) material shall be non-corrosive and shall be a water-soluble emulsion that, upon application, cures to a water insoluble binding and cementing agent.

COLOR HARDENER.—Coloring material shall consist of a processed powdered cementitious hardener with a muted green color conforming to ASTM C 979.

APPLICATION.—Soil stabilizer shall be applied in one application as follows:

The application shall consist of applying the following mixture in the proportions indicated with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope measurement)
Fiber	842
Stabilizing Emulsion (solids)	4,446
Color Hardener (solids)	53.5

The application of soil stabilizer will be applied in a down slope direction to provide uniform coverage when possible. Application of material shall be performed during dry weather with a minimum of 8 hours of dry weather predicted following application prior to any anticipated rain.

Any areas disturbed or displaced by construction operations or equipment following application shall be replaced by the Contractor at no cost to the State.

Due to the cementitious nature of the stabilizing emulsion (solids) and color hardener, it is recommended that application of the soil stabilizer be performed continuously without interruption to prevent setting up of the material. All equipment used to apply soil stabilizer shall be flushed immediately following application and cleaned thoroughly as soon as possible as recommended by the manufacturer.

Stabilizers shall not be applied to areas with standing water.

MEASUREMENT AND PAYMENT.—Soil stabilizer will be measured and paid for by the kilogram of solids prior to dilution.

The contract price paid per kilogram for soil stabilizer (solids) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in soil stabilizer, complete in place, including fiber, and color hardener, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.12 TEMPORARY SILT FENCE

Temporary silt fence shall conform to the details shown on the plans and these special provisions.

Temporary silt fence shall be furnished, installed, maintained and removed at the locations shown on the plans.

Preparation shall conform to the requirements in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" elsewhere in these special provisions.

The Contractor shall use temporary silt fence as one of the various measures to prevent water pollution. The Storm Water Pollution Prevention Plan shall graphically show the use of temporary silt fence in relation to other water pollution control work specified elsewhere in these special provisions.

MATERIALS.—Materials shall conform to Section 20-2, "Materials," of the Standard Specifications and one of the following:

Temporary silt fence shall be a prefabricated silt fence with a minimum woven polypropylene fabric width of 900 mm and a minimum tensile strength of 0.44-kN, conforming to ASTM Designation: D 4632.

Temporary silt fence shall be a prefabricated silt fence with a minimum woven polypropylene fabric width of 900 mm and a minimum tensile strength of 0.44-kN, conforming to ASTM Designation: D 4632 and having an integral reinforcement

layer. The reinforcement layer shall be a polypropylene or equivalent net provided by the manufacturer.

INSTALLATION.—Temporary silt fence shall be installed as shown on the plans and as follows:

When joints are necessary, the temporary silt fence shall overlap a minimum of 150 mm with both posts tied together.

Temporary silt fences shall be maintained to provide for adequate sediment holding capacity. Sediment deposits shall be removed when the sediment deposit reaches approximately one-third of the fence height. Removed sediment shall be deposited within the project in such a way that it is not subject to erosion by wind or water, or as directed by the Engineer.

When no longer required for the intended purpose, as determined by the Engineer, temporary silt fence shall be removed from the site of the work.

Holes, depressions or any other ground disturbance caused by the removal of the temporary silt fence shall be backfilled and repaired in accordance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT.—The quantity of temporary silt fence to be paid for will be determined by the meter from actual measurements, the measurements to be made parallel with the ground slope along the line of the completed temporary silt fence, deducting the widths of openings.

The contract price paid per meter for temporary silt fence shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary silt fence, complete in place, including trench excavation and backfill, and maintenance and removal of temporary silt fence, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary silt fence placed at location other than as shown on the project plans or directed by the Engineer, in accordance with the Contractor's Storm Water Pollution Prevention Plan, will not be measured and will be paid for as specified in "Water Pollution Control" elsewhere in these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary silt fence required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," shall not apply to temporary silt fence.

10-1.13 PRESERVATION OF PROPERTY

Attention is directed to the provisions in Section 7-1.11, "Preservation of Property," of the Standard Specifications and these special provisions.

Existing trees that are not to be removed as shown on the plans or specified elsewhere in these special provisions, and are injured or damaged by reason of the Contractor's operations, shall be replaced by the Contractor at a 5:1 ratio (5 replacement plants for each injured or damaged plant) as directed by the Engineer. The minimum size of tree replacement shall be 600 mm box. Replacement planting shall conform to the requirements in Section 20-4.07, "Replacement," of the Standard Specifications.

A tree is defined as a plant with trunk diameter of 150 mm or larger, measured 1.2 m from the ground.

Replacement planting of injured or damaged trees shall be completed not less than 20 working days prior to acceptance of the contract. Replacement plants shall be watered as necessary to maintain the plants in a healthy condition.

10-1.14 COOPERATION

Attention is directed to Sections 7-1.14, "Cooperation," and 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

It is anticipated that work will be in progress by other contractors within or adjacent to the project limits of this contract.

Contracts which may be in progress during the working period of this contract include but are not necessarily limited to the following:

State Contract No. 04-4874Q4. Work is located on Route 87 (Guadalupe Parkway) at Taylor Street between KP 10.3 and KP 11.4. The work will upgrade the intersection of Route 87/Taylor Street to an urban interchange. It is anticipated that construction will begin in Spring 2000 and will be complete by Summer 2003.

Contract No. 04-4874S4. Work is located on Route 87 (Guadalupe Parkway) from north of Taylor Street (KP 11.17) to north of Route 880 (KP 12.62). The work will construct a detour road for the Route 87 Freeway Upgrade project. The detour will need to be in place before construction between Sta. "G" 146+00 and 149+00 (Stage 3) can begin. It is anticipated that construction for the detour will begin in Spring 2000.

Copies of the plans for above-mentioned projects are available for review at 111 Grand Avenue, Oakland, California 94612. Please call the Construction office Duty Senior, telephone number (510) 286-5209 to reserve a copy of the documents for review at least 24 hours in advance.

Progress schedules for above contracts and other work in progress, when available, may be inspected by the Contractor. Such progress schedules are tentative and cannot be guaranteed to be accurate.

Work by State forces will be underway during the progress of the work under this Contract.

The Contractor shall participate in joint weekly meetings, to be organized by the Engineer, with State forces, other contractors and/or local agencies on adjacent projects in order to minimize potential conflicts and coordinate traffic control. The Contractor shall coordinate with and accommodate other segment contractors when preparing operations and work schedules.

The Contractor shall coordinate his operation with other Contractors working in the same general area during stage construction, traffic shifts, opening of new lanes, closing of lanes, or local roads, and during any other operation that may affect or be influenced by adjacent projects.

In the event of a loss caused to the Contractor due to unnecessary delays or failure to finish the work within the time specified for completion caused by another contractor under contract with the Department performing work for the State, the State will reimburse the delayed contractor in conformance with the provisions in Section 8-1.09 "Right of Way Delays," of the Standard Specifications. Deductions will be made from any moneys due or that may become due the contractor causing the loss or delay.

10-1.15 PROGRESS SCHEDULE (CRITICAL PATH)

Progress schedules will be required for this contract and shall conform to the requirements of these special provisions. Progress schedules shall utilize the Critical Path Method (CPM). Contractor's attention is directed to "Cooperation" and "Obstructions" elsewhere in these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7, "Legal Relations and Responsibility," of the Standard Specifications.

Definitions.—The following definitions shall apply to these special provisions:

Activity.—Any task or item of work that shall be performed in order to complete a project.

Baseline Schedule.—The initial CPM progress schedule as accepted by the Engineer representing the Contractor's original work plan.

Concurrent Delay.—Two or more delays on the critical path that occur at the same time.

Contract Completion Date.—The date the Contractor is contractually obligated to complete the project, including any authorized adjustments, as specified in Section 8-1.06, "Time of Completion," of the Standard Specifications.

Contractor Delay.—A delay that extends the time required to complete a controlling operation caused by and within the control of the Contractor, his subcontractor at any tier or suppliers.

Controlling Operation.—A feature of work or activity on the critical path.

Critical Path.—In a project network, the sequence of activities yielding the longest path in a CPM analysis necessary to complete the project.

Critical Path Method (CPM).—A mathematical calculation method using the sequence of activities and their interrelationships, interdependencies, resources and durations to determine the critical path that shows the expected time to complete a project.

Data Date.—The day after the date through which progress updates have been calculated; everything occurring earlier than the data date is "As-Built," and everything on or after the data date is "Planned."

Early Completion Time.—The difference in time between the contract completion date and the current State-accepted scheduled completion date.

Excusable Delay.—A delay as defined in Section 8-1.07, "Liquidated Damages," of the Standard Specifications where the Contractor may be granted an extension of time commensurate with the provisions in Section 8-1.06, "Time of Completion," of the Standard Specifications with no entitlement for adjustment in compensation.

Float.—The amount of time between the early start date and the late start date or the early finish date and the late finish date of any activity or group of activities in the network.

Free Float.—The amount of time an activity can be delayed before delaying a subsequent activity.

Fragnet.—A section or fragment of the network diagram comprised of a group of activities.

Milestone.—A marker in a network which is typically used to mark a point in time or denote the beginning or end of a sequence of activities. A milestone has zero duration and zero resources, but will otherwise function in the network as if the milestone were an activity.

Narrative Report.—A report that identifies potential problem areas, current and anticipated delaying factors and their impact, actions taken or proposed, proposed changes in schedule logic, extension or contraction of activities, proposed addition or deletion of activities, explanation for changes in the critical path, explanation for changes in scheduled completion date, out of sequence work, and any other topics related to job progress or scheduling.

Near Critical Path.—A path having 10 working days or less of total float.

Punch List.—A list of details needing attention to complete task or work for both contract item and extra work.

Schedule Revision.—A change in the future portion of the schedule that modifies logic; alters construction sequences such as performing sequential activities concurrently or concurrent activities sequentially; adds or deletes activities or significantly alters activity durations, as determined or accepted by the Engineer.

Scheduled Completion Date.—The Contractor's scheduled completion date as shown on the accepted baseline schedule as modified by subsequent accepted schedule updates and revisions.

State Delay.—A delay that is attributable solely to the State, is beyond the control of the Contractor, and extends the time required to complete a controlling operation.

State Owned Float Activity.—The activity documenting time saved on the critical path by contract changes or other actions of the State, except contract change orders that result from significant Contractor development and investment.

Time Impact Analysis.—An analysis demonstrating the estimated time impact of a contract change order, delay or other event on the scheduled completion date.

Total Float.—The amount of time that an activity may be delayed without delaying the scheduled completion date.

Update.—The routine modification of the CPM progress schedule through a regular monthly review to incorporate actual past progress to date by activity, projected completion dates, and approved time adjustments.

Materials (Computer System).—The Contractor shall provide a computer system for the State's exclusive possession and use for CPM progress schedules. The minimum computer system to be furnished shall be complete with keyboard, mouse, monitor, printer and plotter. The system shall be from those identified by the Gartner Group as Tier 1 and shall also conform to the following requirements:

1. Latest industry-available Intel Pentium processor, Motorola RISC processor or equivalent.
2. Latest computer operating system software compatible with the selected processor, either Windows or MACINTOSH.
3. Minimum of 128 megabytes of random access memory (RAM).
4. Internal drives, including: one 4-gigabyte minimum hard disk drive, one 1.44 megabyte 3.5-inch floppy disk drive, one Iomega Jaz drive with two 1-gigabyte minimum cartridges, and one 32x speed CD-ROM drive.
5. Internal fax/modem, latest speed and software version of U.S. Robotics, 3COM or equivalent.
6. A 17-inch minimum, color monitor capable of at least 1,024 x 768 pixels.
7. A color-ink-jet-type, E-size plotter with a minimum 8 megabytes RAM, capable of 300 dots per inch color, 600 dots per inch monochrome, or equivalent, compatible with the selected system capable of plotting, in color, fully legible time-scaled logic diagrams, network diagrams, and bar charts. The plotter shall have the capability of being connected to or networked with a minimum of 5 computers.
8. A color-ink-jet-type, B-size plotter compatible with the selected system capable of printing fully legible, time-scaled charts, network diagrams and reports.
9. A manual parallel cable switching device, with connecting cables, allowing the user to alternate printing between the plotters.
10. CPM software shall be compatible with the hardware provided, shall be the latest version of Primavera Project Planner for Windows, SureTrak for Windows, or equal, and shall be able to create files that can easily be imported into the latest version of Primavera.
11. General software shall be latest versions of Microsoft Office Professional and McAfee VirusScan virus protection. The general software shall be compatible with the hardware provided.
12. Upgrades to the CPM and general software shall be provided, as the upgrades become available.

The computer hardware and software furnished by the Contractor shall be compatible with that used for the production of the CPM progress schedule required by these special provisions, including original instruction manuals and other documentation normally provided with the CPM and general software. Before delivery and setup of the computer system, the Contractor shall submit to the Engineer for approval a detailed list of the computer hardware and software the Contractor proposes to furnish, including an itemized schedule of costs for the system.

The Contractor shall furnish, install, set up, maintain and repair the computer system ready-for-use, and provide plotter supplies as necessary during the course

of the project at a location determined by the Engineer. The first submittal of the baseline schedule will not be considered complete until the hardware and software are installed and ready for use with the submitted baseline schedule. The Contractor shall instruct and assist the Engineer in the use of the hardware and software. When requested by the Engineer, the Contractor shall provide one 8-hour session of outside commercial training in the use of the CPM software for a maximum of 2 project staff at a location acceptable to the Engineer. Hardware repairs shall be made within 48 hours of notification by the Engineer, or replacement equipment shall be furnished and installed by the Contractor until repairs have been completed.

Computer hardware and software furnished shall remain the property of the Contractor and shall be removed by the Contractor upon acceptance of the contract if no claims involving contract progress are pending. If contract claims involving contract progress are pending, computer hardware or software shall not be removed until the final estimate has been submitted to the Contractor.

General.—Early completion time shall be considered a resource for the exclusive use of the Contractor. The Contractor may increase early completion time by increasing production or reallocating resources to be more efficient, or by proposing, and the State accepting, contract change orders that are the result of significant Contractor development and investment or from an appropriate share of an accepted Cost Reduction Incentive Proposal.

State owned float shall be considered a resource for the exclusive use of the State. The Engineer may either accrue State owned float to mitigate past or anticipated future State delays, or reduce contract working days. The State may reduce contract working days if the action is the result of a contract change order other than those that result from significant Contractor development and investment. The Engineer will document State owned float by directing the Contractor in writing to update the State owned float activity and the activity relative to the State action that created the float. The Contractor shall conduct a time impact analysis to determine the effect of the change in the same manner described in "Schedule Time Adjustment", specified herein and shall include the impacts acceptable to the Engineer in the next update or revision. The Contractor shall include a log of the action in the State owned float activity, and include a discussion of the action in the narrative report of the next schedule update.

Contractor delays that are concurrent with State delays may be excusable, but are not compensable. Other Contractor delays are not excusable. Changes or delays that do not affect the controlling operation or operations on the critical path will not be considered as the basis for a time adjustment.

The State will be responsible for the impacts of: State delays; State's action or lack of action; utility companies who perform work on the project or impact the project schedule as set forth in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications; and other contractors working directly for the State who impact the project or project schedule as specified in "Cooperation" of these special provisions. The Contractor shall mitigate these delays and impacts, and shall minimize the costs of these delays and impacts. If an unanticipated State delay or project impact results in an increased cost to the Contractor, the Contractor will be entitled to an adjustment in compensation in conformance with the provisions in Section 8-1.09, "Right of Way Delays" of the Standard Specifications.

The Contractor shall be responsible for assuring that the work sequences are logical and the network shows a coordinated plan for complete performance of the work. Failure of the Contractor to include in the schedule any element of work required for the performance of the contract shall not relieve the Contractor from completing the work within the time limit specified in the contract. If the Contractor or the Engineer discovers an undefined element of work, activity or logic, it shall be corrected by the Contractor in a schedule revision, as specified in these special provisions. If a planned activity requires greater-than-normal

daily resources to accomplish, relative submittals shall include a narrative describing the activity, and the amount and use of the extraordinary resources.

The Baseline Schedule or Schedule Update submitted for acceptance shall not show variances from the requirements of these special provisions unless approved by the Engineer. The Contractor shall make specific mention of the variations in the letter of transmittal, and shall make the associated adjustments to the project schedule. The Contractor will not be relieved of the responsibility for executing the work in strict conformance with the provisions in the requirements of these special provisions. In the event of a conflict between the requirements of these special provisions and the information provided or shown on an accepted schedule, the requirements of these special provisions shall take precedence.

Each schedule submitted to the Engineer shall comply with the limits imposed by these special provisions, with the specified intermediate milestones and completion dates, and with the constraints, restraints or sequences included in these special provisions, except that after the Engineer accepts the baseline schedule, the Contractor may show a late scheduled completion date on subsequent updates or revisions. The degree of detail shall include factors to the satisfaction of the Engineer, including, but not limited to:

1. Physical breakdown of the project;
2. Contract milestones and completion dates, substantial completion dates, constraints, restraints, sequences of work shown in these special provisions, the planned substantial completion date, and the final completion date;
3. Type of work to be performed, the sequences, and the activities to be performed by subcontractors;
4. Procurement, submittal, submittal review, manufacture, test, delivery, and installation of major materials and equipment that require approval;
5. Preparation, submittal, and approval of shop or working drawings and material samples showing time, as specified in these special provisions, for the Engineer's review;
6. Identification of interfaces and dependencies with preceding, concurrent and follow-on contractors, railroads, and utilities as indicated in these special provisions;
7. Identification of each utility relocation or interface as a separate activity;
8. Batch plant erection and plant certification;
9. Erection and removal of falsework or shoring;
10. Submission and approval of reports or results for major tests, such as that for pile loading or traffic controllers;
11. Indicate long-term ramp and connector closing and opening events, traffic switches, and opening and closing of pavements to traffic as separate one day activities;
12. Punch-list and final clean-up.
13. State owned float as the last activity in the schedule, at the end of which is the Scheduled Completion Date.
14. Activity coding conventions shall include the following:

	Code	Value	Description
(1) Responsibility	RESP	CT	Caltrans
		UTIL	Utility Company
		RAIL	Railroad
		xxxx	Contractor
		xxxx	Subcontractor
		xxxx	others, as needed
(2) Stage	STGE	1	Stage 1
		2	Stage 2
		other designations	other descriptions, as needed
(3) Phase	PHAS	1	Phase 1
		2	Phase 2
		other phases	other phases, as needed
(4) Utilities	UTIL	PGE	Pacific Gas & Electric
		BELL	Pacific Bell
		GTE	GTE
		SCE	Southern California Edison
		other utilities	other utilities, as needed
The Contractor may include additional coding conventions, such as Ramps (RAMP), Facilities (FAC), and Events (EVNT).			

The work shall be executed in the sequence indicated in the accepted baseline schedule and subsequent accepted updates and revisions. Once the Engineer accepts a CPM schedule, the Contractor shall neither artificially improve the progress nor artificially change the quantity of float in any part of the schedule by artificially adding or deleting activities, revising schedule logic restraints, or changing planned activity durations. Schedule changes of planned work shall be documented in a properly submitted revision. The Contractor may improve the progress by performing sequential activities concurrently or by performing activities more quickly than planned. In the case of multiple critical paths, float generated by early completion of one or a sequence of activities will be considered in determining if that sequence of activities remains on the critical path.

The schedule shall be modified to reflect actual events and conditions, including non-work days, as these events and conditions occur for historical purposes and for use in time impact analysis. Submittals and Engineer review time shall be shown in the progress schedule, including CPM schedule updates and revisions. The duration of the Engineer review activity shall be 15 days unless specified otherwise in these special provisions.

The Contractor will be allowed to show an early or late scheduled completion date on schedule updates and revisions. The Engineer shall use the most current, accepted schedule update and revision, and Contractor-provided cause, time-impact and schedule-delay analysis that is acceptable to the Engineer to determine apparent impacts.

The Engineer shall be allowed 20 days to review and accept or reject the baseline schedule. The Engineer shall be allowed 15 days to review and accept or reject any updated or revised schedule. Rejected schedules shall be resubmitted to the Engineer within 5 days, at which time a new review period of 5 days will begin. After the baseline schedule is accepted, schedules that are not accepted or rejected within the required review period will be deemed to have been accepted by

the Engineer. Acceptance of any schedule does not relieve the Contractor from the responsibility of submitting complete and accurate information.

Pre-Construction Scheduling Conference.—The Contractor shall schedule, and the Engineer will conduct a Pre-Construction Scheduling Conference with the Contractor's Project Manager and Construction Scheduler within 10 days after approval of the contract. At this meeting, the Engineer will review the requirements of this section of the special provisions with the Contractor. The Contractor shall submit a general time-scaled logic diagram displaying the major activities and sequence of planned operations and shall be prepared to discuss the proposed work plan and schedule methodology that complies with the requirements in these special provisions. If the Contractor proposes deviations to the construction staging of the project, the Contractor shall submit a general time-scaled logic diagram displaying the deviations and resulting time impacts, and shall be prepared to discuss the proposal. At this meeting, the Contractor shall additionally submit the alpha-numeric coding structure and the activity identification system for labeling the work activities. To easily identify relationships, each activity description shall indicate its associated scope or location of work by including such terms as quantity of material, type of work, Bridge Number, Station to Station location, side of highway (such as left, right, northbound, southbound), lane number, shoulder, ramp name, ramp line descriptor or mainline. The Engineer will review and comment on the logic diagram, the coding structure and activity identification system within 15 days after submission by the Contractor. The Contractor shall make all modifications to the time-scaled logic diagram, the coding structure, and activity identification system that the Engineer requests and shall employ that coding structure and identification system. The Contractor shall include the Engineer-requested modifications in the baseline schedule.

Network Diagram and Project Schedule Reports—Schedules submitted to the Engineer, including the baseline schedule, shall include originally-plotted time-scaled network diagram(s). Network diagrams shall be based on early start and early finish dates of activities shown. The network diagrams submitted to the Engineer shall also be accompanied by the CPM software-generated tabular reports for each activity included in the project schedule. Three different report sorts shall be provided: Early Start, Total Float, and Activity Number which shall show the predecessors and successors for each activity. Tabular reports (8 1/2" x 11" size) shall be submitted to the Engineer and shall include at a minimum, the following:

1. Data date;
2. Predecessor and successor activity numbers and descriptions;
3. Activity number and description;
4. Activity code(s);
5. Scheduled, or actual and remaining durations for each activity;
6. Earliest start date (by calendar date);
7. Earliest finish date (by calendar date);
8. Actual start date (by calendar date);
9. Actual finish date (by calendar date);
10. Latest start date (by calendar date);
11. Latest finish date (by calendar date);
12. Free Float, in work days;
13. Total Float, in work days;
14. Percentage of activity complete and remaining duration for incomplete activities;
15. Lag(s); and
16. Imposed constraints.

The networks shall be drafted time-scaled to show a continuous flow of information from left to right. The primary path(s) of criticality shall be clearly and graphically identified on the network(s). The network diagram shall be prepared on E-size sheets (34" x 44"), and shall have a title block in the lower right-hand corner and a timeline on each page. Exceptions to the size of the network sheets and the use of computer graphics to generate the networks shall be subject to the Engineer's approval.

The narrative report shall be organized as follows:

1. Contractor's Transmittal Letter
2. Work completed during the period
3. Identification of any unusual resources: manpower, material, or equipment restrictions or use, including multiple shifts, six day weeks, specified overtime, or work at times other than regular days or hours
4. Description of the current critical path
5. Changes to the critical path since the last schedule submittal
6. Description of problem areas
7. Current and anticipated delays
 - a. Cause of the delay
 - b. Impact of the delay on other activities, milestones, and completion dates
 - c. Corrective action and schedule adjustments to correct the delay
8. Pending items and status thereof
 - a. Permits
 - b. Change Orders
 - c. Time Adjustments
 - d. Non-Compliance Notices
9. Contract completion date(s) status
 - a. Ahead of schedule and number of days
 - b. Behind schedule and number of days
 - c. If date changes, explain the cause
- 10 Attached Updated Network Diagram and Reports

Schedule network diagrams, tabular reports and the narrative reports shall be submitted to the Engineer for acceptance in the following quantities:

1. Two sets of originally-plotted, time-scaled network diagram(s);
2. Two copies of each of the three sorts of the CPM software-generated tabular reports (8 1/2" x 11" size);
3. One 1.44-megabyte 3.5 inch floppy diskette containing the schedule data.
4. Two copies of the narrative report.

Baseline Schedule Requirements.—Within 30 days after approval of the contract, the Contractor shall submit a baseline schedule to the Engineer. The baseline project schedule shall have a data date of the first working day of the contract and shall not include any completed work to-date. The baseline schedule shall be practicable; include the entire scope of work; meet interim target dates, milestones, stage construction requirements, and internal time constraints; show logical sequence of activities; and shall not extend beyond the number of working days originally provided in these special provisions. An early completion schedule will be acceptable provided that the schedule meets the requirements of these special provisions and the Standard Specifications.

The baseline CPM progress schedule submitted by the Contractor shall have a sufficient number of activities to assure adequate planning of the project, and to permit monitoring and evaluation of progress, and the analysis of time impacts.

The baseline schedule shall depict how the Contractor plans to complete the whole work involved, and shall show the activities that define the critical path. Multiple critical paths and near-critical paths shall be kept to a minimum, as determined by the Engineer. A total of not more than 50 percent of the baseline schedule activities shall be critical or near-critical, unless otherwise approved by the Engineer.

Activities shall have a duration of not less than one working day nor more than 20 working days, unless otherwise approved by the Engineer. The activities in the baseline schedule, with the exception of the first and last activities, shall have a minimum of one predecessor and a minimum of one successor. The baseline schedule shall not attribute negative float or negative lag to any activity.

Monthly Schedule Updates.—On or before the first calendar day of each month, the Contractor shall meet with the Engineer to review contract progress. At the monthly progress meeting the Contractor shall submit to the Engineer an update of the network diagram and project schedule reports as defined above. Update schedules shall have a data date of the twenty-first calendar day of the month, or other date as established by the Engineer, and shall include the information available up to that date. Durations for work that has been completed will be shown on the schedule as the work actually occurred, including Engineer submittal review and Contractor resubmittal times.

Schedule Revisions.—When the Contractor proposes a revision to an accepted schedule, the Contractor shall state in writing the reasons for the change, as well as the specifics, such as, but not limited to, revisions to activities, logic, durations, and other matters pertinent to the proposed revisions. If the Engineer considers a schedule revision to be of a major nature, the Engineer may require the Contractor to revise and submit for acceptance the affected portion(s) of the project schedule and an analysis to show the effect on the entire project. In addition to the revision submittal, the Contractor shall submit a schedule update with the same data date as the revision which is to reflect the project condition just prior to implementing the revision. The Contractor shall discuss contemplated revisions with the Engineer prior to the submittal.

Within 15 days, the Contractor shall submit a revised CPM network for approval when requested by the Engineer, or when any of the following occurs:

1. There is a significant change in the Contractor's operations that affects the critical or near critical path(s).
2. The scheduled completion date of the current submitted updated CPM schedule indicates that the contract progress is 20 days or more behind the current accepted schedule or revision.
3. The Contractor or the Engineer considers that an approved or anticipated change will impact the critical or near critical path or contract progress.

Schedule Time Adjustment.—When the Contractor requests a time adjustment due to contract change orders or delays, or if the Contractor or the Engineer considers that an approved or anticipated change will impact the critical path or contract progress, the Contractor shall submit a written time impact analysis to the Engineer illustrating the impacts of each change or delay on the current scheduled completion date or milestone completion date. The analysis shall use the currently accepted schedule that has a data date closest to and prior to the event. If the Engineer determines that the currently accepted schedule does not appropriately represent the conditions prior to the event, the schedule shall be updated to the day before the event being analyzed. An additional analysis shall be performed after the completion of said event. If the event is on the critical path at the time of its completion, then the difference between the scheduled completion dates of these 2 analyses shall be equal to the adjustment in time. The time impact analysis shall include one or more fragnet(s) demonstrating how the Contractor proposes to incorporate the event(s) into the schedule, including logic and

duration of the proposed activities. Until such time that the Contractor provides the analysis, the Engineer may, at his option, construct and utilize the project as-built schedule or other recognized method to determine delay impacts.

Time impact analyses shall be submitted in duplicate within 15 days of a delay, and shall be used in determining contract change order days. Approval or rejection of each time impact analysis by the Engineer will be made within 15 days after receipt of the time impact analysis. In the event the Contractor does not agree with the decision of the Engineer regarding the impact of a change or delay, notice shall be given in conformance with the provisions in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications.

Final Schedule Update.—Within 30 days after acceptance of the contract by the Director, the Contractor shall submit a final update of the schedule (as-built schedule) with actual start and actual finish dates for the activities. The Contractor shall submit a written certificate with this submittal signed by the Contractor's Project Manager and an officer of the company stating "To the best of my knowledge, the enclosed final update of the project schedule reflects the actual start and completion dates of the actual activities for the project contained herein." An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager. Submittal of the final schedule update and the certification shall be a condition precedent to the release of any retained funds under the contract.

Payment.—Progress schedule (critical path) will be paid for at a lump sum price. The contract lump sum price paid for progress schedule (critical path) shall include full compensation for furnishing all labor, material (including computer hardware and software), tools, equipment, and incidentals; and for doing all the work involved in preparing, furnishing, updating, and revising progress schedules; maintaining and repairing the computer hardware; and instructing and assisting the Engineer in the use of the computer hardware and software, as specified in the Standard Specifications and in these special provisions, and as directed by the Engineer. Payments for the progress schedule (critical path) contract item will be made as follows:

1. A total of 50 percent of the progress schedule (critical path) contract item amount will be made upon achieving all of the following: 5 percent of all work completed, accepted baseline, all accepted required schedule updates and revisions, and required CPM training.
2. A total of 60 percent of the progress schedule (critical path) contract item amount will be made upon achieving all of the following: 25 percent of all work completed, accepted baseline, and all accepted required schedule updates and revisions.
3. A total of 75 percent of the progress schedule (critical path) contract item amount will be made when 50 percent of all work completed, accepted baseline, and all accepted required schedule updates and revisions.
4. A total of 100 percent of the progress schedule (critical path) contract item amount will be made when 100 percent of all work completed, accepted baseline, all accepted required schedule updates and revisions, and a completed and certified Final Schedule Update.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the item of progress schedule (critical path). Adjustments in compensation for progress schedule (critical path) will not be made for any increased or decreased work ordered by the Engineer in furnishing progress schedules.

Retention.—The Department will retain an amount equal to 25 percent of the estimated value of the work performed during each estimate period in which the Contractor fails to submit pre-construction scheduling documents, an acceptable

baseline, acceptable updated schedule, or acceptable revised progress schedule (critical path) conforming to the requirements of these special provisions as determined by the Engineer. Retentions for failure to submit acceptable CPM progress schedules shall be in addition to other retentions provided for in the contract. Retentions for failure to submit progress schedules (critical path) will be released for payment on the next monthly estimate for partial payment following the date that pre-construction scheduling documents and acceptable progress schedules (critical path) are submitted to the Engineer, and no interest will be due the Contractor.

10-1.16 OBSTRUCTIONS

Attention is directed to Sections 8-1.10, "Utility and Non-Highway Facilities," and 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

The following utility facilities will be relocated during the progress of the contract. The Contractor shall notify the Engineer in writing prior to doing any work in the vicinity of the facility. The utility facility will be relocated within the listed working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications, after said notification is received by the Engineer:

Utility	Location	Working Days
P.G.&E		
1. Overhead Electric Line	1. Sonora Avenue	60
	2. Rosemary Street	60
2. Overhead Electric Line	3. North of Airport Blvd.	60
3. 12 KV Electric Line		

In the event that the utility facilities mentioned above are not removed or relocated by the date specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities not being removed or relocated by the date specified, the State will

compensate the Contractor for the delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

10-1.17 DUST CONTROL

Dust control shall conform to the provisions in Section 10, "Dust Control," of the Standard Specifications and these special provisions.

Trucks carrying material shall be either wetted down or covered with traps to prevent the blowing of dirt and dust from the trucks.

10-1.18 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.19 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing excavation for construction area sign posts. The regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

The second sentence of the third paragraph in Section 12-3.02, "Barricades," of the Standard Specifications is amended to read:

The entire area of orange and white stripes shall be Type I, engineering grade, or Type II, super engineering grade, retroreflective sheeting conforming to the requirements of ASTM Designation: D 4956-95.

The third paragraph in Section 12-3.06A, "Stationary Mounted Signs," of the Standard Specifications is amended to read:

Sign panels for stationary mounted signs shall consist of Type III or Type IV reflective sheeting applied to an aluminum substrate conforming to the requirements in the Department's "Specifications for Reflective Sheeting Aluminum Signs." The type of reflective sheeting, Type III or Type IV, shall be at the Contractor's option and sign substrates fabricated from materials other than aluminum may be used when specified in the special provisions.

Legend and border may be applied by a screening process or by use of pressure sensitive cut-out sheeting. Size and spacing of letters and symbols shall be as depicted on the sign specification sheets published by the Department.

Rectangular signs over 1375 mm measured along the horizontal axis, and diamond-shaped signs 1500 mm and larger shall be framed unless otherwise specified. Frames shall be constructed in conformance with the requirements of

the Department's "Framing Details for Sheet Aluminum Signs," Sheets 1 through 4 and Table 1 on Sheet 5.

Copies of the Department's "Specifications for Reflective Sheeting Aluminum Signs," "Framing Details for Sheet Aluminum Signs," and sign specification sheets may be obtained from the Department's Office of Business Management, Materiel Operations Branch, 1900 Royal Oaks Drive, Sacramento, CA 95815.

The second paragraph in Section 12-3.06B, "Portable Signs," of the Standard Specifications is amended to read:

Sign panels for portable signs shall conform to the provisions of sign panels for stationary mounted signs in Section 12-3.06A, "Stationary Mounted Signs," or shall be Type VI reflective sheeting as specified in the special provisions, or shall be cotton drill fabric, flexible industrial nylon fabric, or other approved fabric. Fabric signs shall not be used during the hours of darkness. Size, color, and legend requirements for portable signs shall be as described for stationary mounted sign panels in Section 12-3.06A. The height to the bottom of the sign panel above the edge of traveled way shall be at least 0.3-m.

The third paragraph in Section 12-3.06B, "Portable Signs," of the Standard Specifications is deleted.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Approved Traffic Products" of these special provisions.

Type VI reflective sheeting for sign panels for portable construction area signs shall conform to the provisions in "Approved Traffic Products" of these special provisions.

10-1.20 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the Section entitled "Public Safety" elsewhere in these special provisions, and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

Lane closures shall conform to the provisions in the section of these special provisions entitled "Traffic Control System for Lane Closure."

Personal vehicles of the Contractor's employees shall not be parked within the right of way.

The Contractor shall notify local authorities of the Contractor's intent to begin work at least 5 days before work is begun. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make all arrangements relative to keeping the working area clear of parked vehicles.

The Contractor shall notify the City of San Jose's Department of Streets and Traffic, Signal Operations (Phone: 408-277-5341), in writing, 2 weeks in advance of any lane closure on Guadalupe Parkway or on any city street.

The Contractor shall obtain a hauling route permit from the City of San Jose. Hauling operations shall not be allowed between 6 a.m. and 9 a.m. and between 3 p.m. and 9 p.m., Monday through Fridays. No hauling operations on the City of San Jose street will be allowed the day before and after any designated legal holidays.

Whenever vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed as shown on the plans.

Lanes shall be closed only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under Sections 7-1.08 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a

Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

Chart No. 1 Multilane Lane Requirements																									
Location: Northbound Route 87. From Junction Route 880 to Junction Route 101																									
FROM HOUR TO HOUR	a.m.												p.m.												
	1	1	2	3	4	5	6	7	8	9	1	1	12	1	2	3	4	5	6	7	8	9	1	1	1
Mondays through Thursdays	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Fridays	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Saturdays	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sundays	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Day before designated legal holiday	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Designated legal holidays	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Legend:																									
<div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 15px; height: 15px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></div> Provide at least one traffic lane. </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 15px; height: 15px; background-color: #999999; border: 1px solid black; margin-right: 5px;"></div> Provide at least two traffic lanes. </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #ffffff; border: 1px solid black; margin-right: 5px;"></div> No lane closure permitted. </div>																									
REMARKS:																									

Chart No. 2 Multilane Lane Requirements																							
Location: Southbound Route 87. From Junction Route 880 to Junction Route 101																							
FROM HOUR TO HOUR	a.m.												p.m.										
	1	1	2	3	4	5	6	7	8	9	1	1	12	1	2	3	4	5	6	7	8	9	1
Mondays through Thursdays	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Fridays	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Saturdays	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Sundays	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Day before designated legal holiday	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Designated legal holidays	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

Legend:

- Provide at least one traffic lane.
- Provide at least two traffic lanes.
- No lane closure permitted.

REMARKS:

10-1.21 CLOSURE REQUIREMENTS AND CONDITIONS

Lane closures shall conform to the provisions in "Maintaining Traffic" of these special provisions and these special provisions.

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

CLOSURE SCHEDULE

By Noon Monday, the Contractor shall submit a written schedule of planned closures for the next week period, defined as Friday Noon through the following Friday Noon.

The Closure Schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor shall use closure schedule request forms furnished by the Engineer for this purpose. Closure schedules submitted with incomplete, unintelligible or inaccurate information will be returned for correction. The Contractor will be notified of disapproved closures or closures that will require coordination with other parties as a condition of approval.

Amendments to the Closure Schedule, including additional closures, shall be submitted to the Engineer, in writing, at least 3 working days in advance of any planned closure. Approval of amendments to the Closure Schedule will be at the discretion of the Engineer.

The Contractor shall confirm, in writing, all scheduled closures by no later than 8:00 a.m. 3 working days prior to the date on which the closure is to be made. Approval or denial of scheduled closures will be made by no later than 4:00 p.m. 2 working days prior to the date on which the closure is to be made. Closures not confirmed or approved will not be allowed.

Confirmed closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer for the next working day.

CONTINGENCY PLAN

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. The Contractor shall not make any further closures until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

For each 10-minute interval, or fraction thereof past the time specified to reopen the closure, the Department will deduct \$2,500.00 per interval from moneys due or that may become due the Contractor under the contract.

COMPENSATION

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these special provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09.

10-1.22 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes in accordance with the details shown on the plans, the provisions of Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" elsewhere in these special provisions and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take the measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with either stationary or moving type lane closures. During all other operations traffic shall be controlled with stationary type lane closures. The Contractor's attention is directed to the provisions in Section 84-1.04, "Protection From Damage," and Section 85-1.06, "Placement," of the Standard Specifications.

If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the component to its original condition or replace the component and shall restore the component to its original location.

STATIONARY TYPE LANE CLOSURE.—When lane closures are made for work periods only, at the end of each work period, all components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations, approved by the Engineer, within the limits of the highway right of way.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining, or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining and removing of components of a traffic control system, and shall be in place before a lane closure requiring its use is completed.

MOVING TYPE LANE CLOSURE.—Flashing arrow signs used in moving lane closures shall be truck-mounted. Changeable message signs used in moving lane closure operations shall conform to Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 2.1 m above the ground, but should be as high as practicable.

Truck-mounted crash cushions (TMCC) for use in moving lane closures shall be any of the following approved models, or equal:

Hexfoam TMA Series 3000, Alpha 1000 TMA Series 1000, Alpha 2001 TMA Series 2001, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, Telephone (312) 467-6750.

Distributor(Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX (916) 387-9734.

Distributor(Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274.

Cal T-001 Model 2 or Model 3, manufacturer and distributor; Hexcel Corporation, 11711 Dublin Boulevard, P.O. Box 2312, Dublin, CA 94568, Telephone (510) 828-4200.

Renco Rengard Model Nos. CAM 8-815 and RAM 8-815, manufacturer and distributor, Renco Inc., 1582 Pflugerville Loop Road, P.O. Box 730, Pflugerville, TX 78660-0730, Telephone 1-800-654-8182.

Each TMCC shall be individually identified with the manufacturer's name, address, TMCC model number, and a specific serial number. The names and numbers shall each be a minimum 13 mm high, and located on the left (street) side at the lower front corner. The TMCC shall have a message next to the name and model number in 13 mm high letters which states, "The bottom of this TMCC shall be _____ mm \pm _____ mm above the ground at all points for proper impact performance." Any TMCC which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMCCs supplied under this contract need recertification. Each unit

shall be certified by the manufacturer to meet the requirements for TMCCs in accordance with the standards established by the Transportation Laboratory Structures Research Section.

Approvals for new TMCC designs proposed as equal to the above approved models shall be in accordance with the procedures (including crash testing) established by the Transportation Laboratory Structures Research Section. For information regarding submittal of new designs for evaluation contact: Transportation Laboratory, Structures Research Section, P.O. Box 19128, 5900 Folsom Boulevard, Sacramento, CA 95819.

New TMCCs proposed as equal to approved TMCCs or approved TMCCs determined by the Engineer to need recertification shall not be used until approved or recertified by the Transportation Laboratory Structures Research Section.

PAYMENT.—The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor, materials (including signs), tools, equipment and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work, and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.23 TEMPORARY PAVEMENT DELINEATION

Temporary pavement delineation shall be furnished, placed, maintained and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from his responsibility as provided in Section 7-1.09, "Public Safety," of the Standard Specifications.

GENERAL

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. On multilane roadways (freeways and expressways) edgeline delineation shall be provided at all times for traveled ways open to public traffic.

Work necessary, including required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removeable traffic type tape which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

TEMPORARY LANELINE DELINEATION

Whenever lanelines are obliterated the minimum laneline delineation to be provided shall be temporary reflective raised pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary reflective raised pavement markers shall be the same color as the laneline the markers replace. Temporary reflective raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Approved Traffic Products" of these special provisions.

Temporary reflective raised pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline delineation consisting entirely of temporary reflective raised pavement markers placed on longitudinal intervals of not more than 7.3 m shall be used on lanes opened to public traffic for a maximum of 14 days. Prior to the end of the 14 days the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, the Contractor shall provide, at the Contractor's expense, additional temporary pavement delineation. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing the temporary reflective raised pavement markers, used for temporary laneline delineation and for providing equivalent patterns of permanent traffic lines for these areas when required; shall be considered as included in the contract prices paid for the items of work that obliterated the laneline pavement delineation and no separate payment will be made therefor.

TEMPORARY EDGELINE DELINEATION

Whenever edgelines are obliterated on multilane roadways (freeways and expressways), the edgeline delineation to be provided for that area adjacent to lanes open to public traffic shall consist of, at the option of the Contractor, either solid 100-mm wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces, or shall consist of traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 m.

100-mm wide traffic stripe placed for temporary edgeline delineation, which will require removal, shall consist of temporary removeable construction grade striping and pavement marking tape listed in "Approved Traffic Products" of these special provisions. Temporary removeable construction grade striping and pavement marking tape when used shall be applied in conformance with the manufacturer's recommendations. Where removal of the 100-mm wide traffic stripe will not be required, painted traffic stripe used for temporary edgeline delineation shall conform to "Paint Traffic Stripes and Pavement Markings" of these special provisions, except for payment and the number of coats shall be, at the option of the Contractor, either one or two coats. The quantity of painted traffic stripe used for temporary edgeline delineation will not be included in the quantities of paint traffic stripe to be paid for.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall provide personnel to remain at the job site to maintain the cones or delineators during hours of the day that they are in use.

Channelizers used for temporary edgeline delineation shall be surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in "Pavement Markers" of these special provisions, except epoxy adhesive shall not be

used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types (900 mm) listed in "Approved Traffic Products" of these special provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing temporary edgeline delineation shall be considered as included in the contract prices paid for the items of work that obliterated the edgeline pavement delineation and no separate payment will be made therefor.

10-1.24 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing and maintaining sand filled temporary crash cushion modules in groupings or arrays specified in the special provisions or directed by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in accordance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety" of these special provisions.

GENERAL

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

MATERIALS

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules manufactured after March 31, 1997, or equal:

Energite III Inertial Modules manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, Telephone 1-312-467-6750, FAX 1-800-770-6755.

Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734

Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.

Fitch Inertial Modules, national distributor; Roadway Safety Service, Inc., 1050 North Rand Road, Wauconda, IL 60084, Telephone 1-800-426-0839, FAX 1-847-487-9820.

Distributor: Singletree Sales Company, 1533 Berger Drive, San Jose, CA 95112, Telephone 1-800-822-7735, FAX 1-408-287-1929.

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and

quality of the types specified above may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in accordance with the manufacturer's directions, and to the sand capacity in kilograms for each module as shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water, as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

INSTALLATION

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods approved by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in permanent work.

MEASUREMENT AND PAYMENT

Temporary crash cushion modules placed in accordance with the provisions in "Public Safety" elsewhere in these special provisions will not be measured nor paid for.

10-1.25 TEMPORARY RETAINING WALL

Temporary retaining wall shall be designed, constructed, and maintained as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

The temporary retaining wall shall last for at least 5 years and remain in place.

The report entitled "Geotechnical Design Report" is available for inspection at the Department of Transportation, Duty Senior's Desk, 111 Grand Avenue, Oakland, California, (510) 286-5209.

Within 30 days after the approval of the contract, the Contractor shall submit complete working drawings for the temporary retaining wall to the Engineer for review in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. Four sets of drawings and 2 copies of the design calculations including criteria as basis of the temporary retaining wall designs shall be submitted to the Engineer. The temporary retaining wall shall be designed to withstand 90 percent of the maximum designed settlement for 5 years. The Contractor shall allow the Engineer 30 working days to review the drawings and design calculations after a complete submittal has been received. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the drawings and calculations within 15 working days of receipt of the Engineer's comments and shall allow 30 working days for the Engineer to review the revisions. Upon the Engineer's approval of the drawings and design calculations, 4 additional sets of drawings and 2 copies of the design calculations, incorporating the required changes, shall be submitted to the Engineer.

Working drawings shall be either 280 mm x 432 mm, or 560 mm x 864 mm in size and each drawing and calculation sheet shall include the State assigned designations for the contract number and District-County-Route-Kilometer Post. The design firm's name, address, and phone number shall be shown on the working drawings. Each sheet shall be numbered in the lower right hand corner and shall contain a blank space in the upper right hand corner for future contract sheet numbers.

The Contractor shall verify the existing ground elevations at the site prior to preparing the working drawings. Said working drawings shall contain all information required for the proper construction of the temporary retaining wall, including existing ground line at face of wall as verified at the site and any required revisions or additions to drainage systems or other facilities. The working drawings shall be supplemented as necessary with calculations for the particular installation. Said working drawings and calculations shall be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California.

The Contractor shall not commence constructing temporary retaining wall until the Engineer has reviewed and approved the working drawings in writing.

Approval by the Engineer of the temporary retaining wall drawings or the inspection performed by the Engineer will in no way relieve the Contractor of full responsibility for the temporary retaining wall.

If the Contractor elects to use an acceptable earth retaining system noted in "Earth Retaining Structures," elsewhere in these special provisions, the soil reinforcement for the temporary retaining walls shall be staggered vertically with the soil reinforcement for the adjacent earth retaining structure.

EARTHWORK.--Excavation and backfill shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications, and these special provisions.

The Contractor shall substantiate all values used in the design of the temporary retaining wall shown on the working drawings.

MATERIAL.--All material shall comply to the provisions of the applicable sections of the Standard Specification and these special provisions.

MEASUREMENT AND PAYMENT.--Temporary retaining wall will be measured and paid for by the square meter. Regardless of the type of temporary retaining wall actually constructed, the square meter area for payment will be based on the vertical height and length of each section which was constructed. The vertical height of each section will be taken as the difference in elevation on the outer face, from the existing ground elevation to the top of wall profile complete in place.

The contract price paid per square meter for temporary retaining wall shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in temporary retaining wall, complete in place, including designing, preparing working drawings, constructing (including structure excavation and structure backfill), maintaining, and leaving in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The temporary retaining wall shall not be removed at the end of this contract. It will be removed by another contract.

10-1.26 EXISTING HIGHWAY FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

10-1.26A ABANDON CULVERTS

Existing culverts, where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the culverts shall be removed and disposed of. All resulting openings into existing structures, that

are to remain in place, shall be plugged with commercial quality concrete containing not less than 300 kg of cement per cubic meter.

Abandoning culverts in place shall conform to the following:

Culverts that intersect the side slopes, shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.

Culverts 600 mm in diameter and larger and metal culverts 300 mm and larger, shall be backfilled with sand by any method, acceptable to the Engineer, which completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.

The ends of culverts shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

Culverts shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended culvert or pipe abandonment.

If the Contractor elects to remove and dispose of any culvert or pipe line which is specified to be abandoned, as provided herein, any sand backfill specified for the pipe will be measured and paid for in the same manner as if the culvert or pipe line has been abandoned in place.

Sand backfill will be measured by the cubic meter determined from the dimensions of the culverts and pipe lines to be abandoned.

The contract price paid per cubic meter for sand backfill shall include full compensations for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in backfilling pipes with sand, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.26B ABANDON INLETS

Existing pipe and drainage inlets, where shown on the plans to be abandoned, shall be abandoned.

The top portion of the inlets shall be removed to a depth of 1 meter below finished grade.

Removed frames and grates shall be disposed of.

10-1.26C REMOVE METAL BEAM GUARD RAILING

Existing metal beam guard railing, where shown on the plans to be removed, shall be removed and disposed of.

Existing concrete anchors shall be removed to a depth of not less than 0.3-m below subgrade or 0.3-m below finished grade, whichever is greater in depth. Full compensation for removing concrete anchors shall be considered as included in the contract price paid per meter for remove metal beam guard railing and no separate payment will be made therefor.

Full compensation for removing cable anchor assemblies shall be considered as included in the contract price paid per meter for remove metal beam guard railing and no separate payment will be made therefor.

10-1.26D REMOVE CONCRETE BARRIER

Existing concrete barrier, where shown on the plans to be removed, shall be removed and disposed of.

Removed concrete shall be disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Removed concrete barrier will be measured and paid for by the meter.

10-1.27E REMOVE DRAINAGE FACILITIES

Existing flared end sections, culverts, sacked concrete slope protection and inlets where shown on the plans to be removed, shall be completely removed and disposed of.

10-1.27F REMOVE ASPHALT CONCRETE DIKE

Existing asphalt concrete dike, where shown on the plans to be removed, shall be removed.

Prior to removing the dike, the outside edge of the asphalt concrete to remain in place shall be cut to a neat line. The cut shall be a minimum depth of 50 mm.

The dike shall be removed in such a manner so that the surfacing which is to remain in place is not damaged.

The dike shall be disposed of outside the highway right of way. The disposal shall conform to the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

10-1.26G REMOVE ROADSIDE SIGNS

Existing roadside signs, at locations shown on the plans to be removed, shall be removed and disposed of.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

10-1.26H REMOVE CHANNELIZERS

Existing channelizers where shown on the plans to be removed shall be removed and disposed of.

Existing channelizers shall be removed when existing channelizers are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

10-1.26I CAP INLETS

Existing drainage inlets where shown on the plans to be capped, shall be capped and the bottoms of the inlets shall be rounded with portland cement concrete as shown on the plans.

Portland cement concrete shall conform to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications, or may be produced from commercial quality aggregates and cement containing not less than 350 kg of cement per cubic meter.

Inlets shall be removed to a depth of at least 0.3-m below the grading plane.

Concrete removal shall be performed without damage to any portion that is to remain in place. All damage to the existing concrete, which is to remain in place, shall be repaired by the Contractor to a condition equal to that existing prior to the beginning of removal operations. The repair of existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of all adhering material before being embedded in new concrete.

The quantity of capping inlets will be determined as units from actual count.

The contract unit price paid for cap inlet shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in capping inlets, including removing portions of inlets, rounding bottoms of inlets, bar reinforcing steel, and structure excavation and structure backfill, as shown on the plans, as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

10-1.26J REMOVE CONCRETE

Concrete, designated on the plans to be removed, shall be removed.

Granite facing and sign lettering of the San Jose International Airport Entrance sign will be salvaged by the San Jose International Airport before June 2000.

The San Jose International Airport entrance sign shall not be removed before it is directly in conflict with construction activities and as approved by the Engineer.

The Contractor shall notify Senior Civil Engineer at San Jose International Airport, Telephone No. (408) 501-7703, one month prior to removing the Airport Sign Structures.

The Contractor shall notify City of San Jose, Telephone No. (408) 277-4777 for de-energization of the sign 10 working days prior to removing the sign structure.

The pay quantities of concrete to be removed will be measured by the cubic meter, measured before and during removal operations.

Concrete removed shall be disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Standard Specifications.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut in a neat line to a minimum depth of 50 mm with a power driven saw before concrete is removed.

Full compensation for cutting concrete with power driven saw, removing and disposing of concrete, and steel box including all metal components and all electrical items of the San Jose Airport Entrance Signs shall be considered as included in the contract price per cubic meter for remove concrete and no additional compensation will be allowed therefor.

Where concrete has been removed outside the roadway prism, the backfilled areas shall be graded to drain and blend in with the surrounding terrain.

Concrete to be removed which has portions of the same structure both above and below ground will be considered as concrete above ground for compensation.

10-1.26K REMOVE CRASH CUSHION (SAND FILLED)

Existing crash cushion (sand filled), where shown on the plans to be removed, shall be removed and disposed of.

Removing sand filled crash cushions, regardless of the number of modules in each sand filled crash cushion, will be measured and paid for by the unit as remove crash cushion (sand filled). The quantity to be paid for will be determined from actual count of the units removed.

10-1.27 CLEARING AND GRUBBING

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Attention is directed to "Aerially Deposited Lead, General," elsewhere in these special provisions.

Attention is directed to "Order of Work" and "Environmentally Sensitive Area" of these special provisions.

Clearing and grubbing operations shall result in no visible dust. No material containing lead shall be deposited on public roads. The Contractor shall indemnify the State from any costs due to spillage of material containing lead during transport.

The Contractor shall separate soil from vegetation, and the soils shall remain on the site.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

At locations where there is no grading adjacent to a bridge or other structure, clearing and grubbing of vegetation shall be limited to 1.5 meters outside the physical limits of the bridge or structure.

Existing vegetation outside the areas to be cleared and grubbed, shall be protected from injury or damage resulting from the Contractor's

operations. Attention is directed to "Preservation of Property," elsewhere in these special provisions.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of the Contractor's responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

Removal of irrigation systems shall be paid for as extra work.

10-1.28 REMOVE TREE

Existing trees larger than 0.3 meter in diameter as measured 1.2 meter above the ground shown on the plans and identified to be removed shall be removed in their entirety as provided for in Section 16-1.03 'Construction', 16-1.04 'Removal and Disposal of Material' and Section 20-4.025 'Roadside Clearing' of the Standard Specifications.

Existing trees shall be removed from within the limits shown on the plan. Tree removal shall extend from G and T lines to the limits of tree removal shown on the plans and as directed by the Engineer.

Root systems of individual trees shall be removed in their entirety to the depth of 2 meters as part of the removal operations. All cavities created by removal of the root systems shall be graded immediately to allow any individual or animal to escape readily from the cavity or depression.

If the Contractor elects to chip combustible material within the project limits, the stockpiling and disposal of chipped material within the Right of Way shall not be allowed unless authorized in writing by the Engineer.

Appropriate safety measures shall be installed adjacent to the roadway to protect motorists from entering into any depression or cavity created as a result of the tree removal work.

Remove tree will be measured by the unit determined by actual count.

The contract unit price paid for remove tree shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in remove tree, complete in place, including removal and disposal of root systems and grading cavities created by removal of the root system, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.29 WATERING

Watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications and these special provisions.

Water for use on this project shall be nonpotable water and shall be furnished and applied as required in the specifications.

Attention is directed to the source or sources of reclaimed waste water for use on the project specified in "Materials Information" available to contractors.

Copies of the "Materials Information" regarding the source of reclaimed waste water are available for inspection at the office of the District Department of Transportation, Duty Senior's Desk, 111 Grand Avenue, Oakland, California, (510)286-5259.

Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages," elsewhere in these special provisions, regarding availability of water.

Reclaimed waste water from sources, not listed in the "Materials Information," that are developed for use on the project shall meet the California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board requirements, and the Contractor shall obtain either a waste water discharge permit or a waiver from the Regional Water Quality Control Board. Copies of permits or waivers from the Regional Water Quality Control Board, for sources not listed in the "Materials Information," shall be delivered to the Engineer before using reclaimed waste water on the project.

Full compensation for developing nonpotable water supply, loading and transporting nonpotable water, and labeling as specified shall be considered as

included in the contract lump sum price paid for develop water supply and no additional compensation will be allowed therefor.

If the Engineer orders the use of potable water, an adjustment of compensation for develop water supply will be made in accordance with Section 4-1.03C, "Changes in Character of Work," of the Standard Specifications.

10-1.30 EARTHWORK

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

When a layer of specified material is not to be placed on the basement material, the finished grading plane shall not vary more than 30 mm above or below the grade established by the Engineer. The requirements for obtaining a relative compaction of 95 percent, as provided in the first two paragraphs in Section 19-5.03, "Relative Compaction (95 Percent)," of the Standard Specifications, shall not apply when a layer of specified material is not to be placed on the basement material.

Where a portion of existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting existing surfacing shall be considered as included in the contract price paid per cubic meter for roadway excavation and no additional compensation will be allowed therefor.

The portion of imported borrow placed within 1.5 m of the finished grade and surcharge embankment shall have a Resistance (R-Value) of not less than 15. Excavated material shall be buried in embankments 1.5m below the profile grade.

The material sites for imported borrow shall be pre-qualified by a certified lab. The Contractor shall furnish the Engineer with the test results from the certified lab when submitting samples of imported borrow for approval.

Temporary unlined ditch shall be constructed as shown on the plans. Full compensation for temporary unlined ditch shall be considered as included in the contract Lump sum price paid for Water Pollution control and no separate payment will be made therefor.

Imported borrow will be measured and paid for by the cubic meter and the quantity to be paid for will be computed in the following manner:

The total quantity of embankment will be computed by the method specified for roadway excavation in Section 19-2.08, "Measurement," of the Standard Specifications, on the basis of the planned or authorized cross section for embankments as shown on the plans and the measured ground surface.

The Contractor, at the Contractor's option, may compact the ground surface on which embankment is to be constructed before placing any embankment thereon. If the compaction results in an average subsidence exceeding 75 mm, the ground surface will be measured after completion of the compaction. The Engineer shall be allowed the time necessary to complete the measurement of an area before placement of embankment is started in that area.

The quantities of roadway excavation, structure excavation and ditch excavation, which have been used in the embankment, will be adjusted by multiplying by a specified grading factor of 0.95. No further adjustment will be made in the event that the specified grading factor does not equal the actual grading factor.

The quantity of imported borrow to be paid for will be that quantity remaining after deducting the adjusted quantities of excavation from the total embankment quantity. The Contractor shall propose a plan whereby the Contractor would be paid on the basis of measured settlement. The proposal shall include complete details of the subsidence-measuring devices including subsidence-measuring devices included in the "Settlement Instrumentation" section elsewhere in these special provisions and a detailed plan of each installation. If the proposed plan is approved by the Engineer, the Contractor, at the Contractor's expense, shall provide, install and maintain the subsidence-measuring devices. The Engineer will take readings as are necessary to determine the progress of

subsidence, if any, and the Contractor shall provide assistance as is necessary to make the readings.

Any installed device which is determined by the Engineer to have been damaged will not be used for the determination of subsidence for the area it represents in the pattern of approved installations. The subsidence of all of the area as determined to be represented by that installation shall be considered as zero, regardless of the subsidence measured at other installations.

The volumes required as a result of the subsidence will be computed from the original measurements and the final measurements, including zero subsidence at all points and for all areas as provided herein, by the average-end-area method. It shall be understood and agreed that the subsidence at the point of intersection of the side slopes (and end slopes at structures) with the ground line as established by the original cross sections shall be considered as zero. Unless otherwise agreed to by the Engineer, the subsidence shall be considered as zero at the points on the cross sections 15 m beyond the beginning and ending of the instrumented area. The computed volumes for such subsidence will be added to the quantities of embankment measured as specified herein.

Detachable elements of the subsidence-measuring devices which can be salvaged without damage to the work shall remain the property of the Contractor and shall be removed by the Contractor from the right of way after all final measurements are made. Subsidence-measuring devices installed as a part of "Settlement Instrumentation" elsewhere in these special provisions shall be left in place at the end of this contract.

Settlement periods are required for the roadway embankments at the earth retaining structures listed in the following tables.

Surcharge embankments shall be constructed above the grading plane where listed in the following tables.

Retaining Wall No. 1,
Bridge No. 37-597M

Surcharge Height, Meters	Settlement Period, Days
up to 4.6 m	later of 540 days or until desired amount of settlement occurs as measured by field monitoring devices

Retaining Wall No. 2,
Bridge No. 37-598M

Surcharge Height, Meters	Settlement Period, Days
up to 4.6 m	later of 540 days or until desired amount of settlement occurs as measured by field monitoring devices

Retaining Wall No. 4,
Bridge No. 37-600M

Surcharge Height, Meters	Settlement Period, Days
up to 4.6 m	later of 540 days or until desired amount of settlement occurs as measured by field monitoring devices

Retaining Wall No. 5,
Bridge No. 37-601M

Surcharge Height, Meters	Settlement Period, Days
up to 4.6 m	later of 540 days or until desired amount of settlement occurs as measured by field monitoring devices

Retaining Wall No. 6,
Bridge No. 37-602M

Surcharge Height, Meters	Settlement Period, Days
up to 4.6 m	later of 540 days or until desired amount of settlement occurs as measured by field monitoring devices

The duration of the required settlement period at each location will be determined by the Engineer. The estimated duration of the settlement periods are listed in the tables of settlement data. The Engineer may order an increase or decrease in any estimated settlement period. An ordered increase or decrease in any settlement period will result in an increase or decrease in the number of working days allowed for the completion of the work if the settlement period involved is considered to be the current controlling operation as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications. Neither the Contractor nor the State will be entitled to any compensation other than an adjustment of contract time due to increases or decreases in the settlement periods.

The surplus embankment material placed as a settlement or surcharge embankment, including material placed shall conform to the slope lines shown on the plans.

The earth retaining structures shall not be constructed in segments. A controlled rate of loading shall be used to backfill the earth retaining structures. Each row of wall panels, including structure backfill and reinforcement elements as well as the roadway embankment fill behind the mechanically stabilized embankment reinforcing zone shall be completed for the entire length of each earth retaining structure. Following the completion of each

element for the entire length, the next row of panels, including structure backfill lifts, can be installed. The maximum difference in fill elevation (including structural backfill and reinforcement elements) shall not exceed 2 m in height. When the height of embankment fill becomes more than 3 m, the rate of fill from the time of its placement shall be limited to 1.25 m per week.

The surcharge embankment may be removed as directed by the Engineer if the desired amount of settlement occurs during the duration of this contract.

The removal of surcharge embankment will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

At the locations and to the limits shown on the plans, material below the bottom of earth retaining structures shall be removed and replaced with structure backfill in accordance with the placing and compacting requirements for structure backfill. The relative compaction shall be not less than 90 percent.

Full compensation for removal and replacement of the material, including furnishing and compaction of the replacement material, shall be considered as included in the contract price per square meter for earth retaining structure and no separate payment will be allowed therefor.

MEASUREMENT AND PAYMENT (EARTHWORK)

Measurement and payment for earthwork shall conform to all provisions for "Measurement" and "Payment" in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

Pervious backfill material in connection with the bridge work will be measured and paid for as structure backfill (bridge).

If structure excavation or structure backfill involved in bridge work 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 paid for at the contract price per cubic meter for structure excavation (bridge) or structure backfill (bridge).

Full compensation for pervious backfill material within the limits of payment for earth retaining structures shall be considered as included in the contract price paid per square meter of earth retaining structure and no separate payment will be allowed therefor.

MATERIAL WITH AERIALY DEPOSITED LEAD.--Attention is directed to "Aerially Deposited Lead, General" elsewhere in these special provisions.

Existing materials in the contractors work zone (see TABLE "A" below) contain less than 1575 mg/kg total lead and less than 500 ug/l water soluble lead are designated as Type Y materials. Type Y materials excavated in accordance with the contract documents shall be placed as backfill for permanent retaining walls as specified in these special provisions.

TABLE "A"

Location	Station	Depth
G Line	155+41.16 to 168+40	0 to 0.92 m
G Line	169+65.00 to 174+63	0 to 1.50 m
G Line	174+63 to 176+40	0 to 0.92 m
T Line	176+40 to 177+64	0 to 0.92 m

Existing materials from a depth of 0 meters to 1.50 meter within the contractors work zone between station G 168+47.00 and station G 169+65.00 contain greater than 1575 mg/kg total lead but less than 4150 mg/kg total lead or greater than 500 ug/l water soluble lead but less than 50 mg/l soluble lead (using DI- WET) are designated as Type Z materials. Type Z materials excavated in accordance with the contract documents shall be placed as backfill for permanent retaining walls as specified in these special provisions. All other existing material excavated from

areas within the project limits qualifies as cover material. Use of such material within the project limits is not restricted.

Type Y and Type Z materials, when excavated from outside the limits of payment for contract items, shall be the responsibility of the Contractor. This material shall not be placed in embankments or backfill unless the Contractor can show that such placement will not cause Type Y and Type Z materials from within the limits of payment for contract items to become surplus material.

All materials excavated from areas within the project limits are designated as containing aerially deposited lead shall be based on project plans and the site investigation report Task Order No. 04-487411-01, 04-487411-02, and No. 04-487481-01. Temporary surplus material will be generated on this project due to stage construction constraints. Such surplus material shall not leave the highway right of way. In order to conform with provision, it is anticipated that the Contractor will have to stockpile materials for subsequent stages and/or construct some embankments out of stage and/or handle the surplus material more than once.

The Contractor shall monitor the air quality during excavation operations in accordance with the Health and Safety Plan. Results of air quality tests shall be made available to the Engineer upon request.

Surplus material from outside the limits of Type Y and Type Z material, which cannot be used in accordance with Section 19-2.06, "Surplus Material," of the Standard Specifications, shall become the property of the Contractor and shall be disposed of in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. The written authorization from the property owner shall include acknowledgment that the material contains lead, and shall state the levels of lead reported from testing. Test results for this material are included in the "Material Information Handout."

The Contractor shall conduct any further investigation deemed necessary by the owner of the disposal site for acceptance of the material. This investigation shall be at the Contractor's expense. The Contractor shall submit to the Engineer, his sampling and analysis procedure and name of laboratory fifteen days prior to beginning any sampling or analysis. The Contractor shall use a laboratory certified by the California Department of Health Services. Characterization of the material shall be based on guidelines in USEPA, SW 846, "Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical , Chapter Nine, Section 9.1.

Full compensation for conforming to the requirements of this section involving materials containing aerially deposited lead, except as otherwise specifically provided in these special provisions, shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

10-1.31 EARTH RETAINING STRUCTURES

Earth retaining structures shall be constructed at the locations and in conformance with the details shown on the plans and in these special provisions.

Portland cement to be used in portland cement concrete for earth retaining structures shall be "Type II Modified."

The earth retaining structure to be constructed shall be mechanically stabilized embankment as shown on the plans.

At the Contractor's option, one of the following acceptable alternative earth retaining systems may be constructed:

Proprietary Earth Retaining System	Address and Phone Number
Retained Earth (1.52-meter square concrete face panels)	Foster Geotechnical 1660 Hotel Circle North - Suite 304 San Diego, CA 92108 (619) 688-2400
MSE Plus	SSL 4740 Scotts Valley Drive, Suite "E" Scotts Valley, CA 95066 (831)430-9300

Attention is directed to the section, "Engineering Fabrics," of these special provisions.

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

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

The list of prequalified earth retaining systems has been developed from data previously furnished by suppliers or manufacturers of each system. Approval of additional earth retaining systems is contingent on the system meeting the full range of parameters for which prequalification is required. The prequalification requirements can be obtained from the Office of Structure Design, P.O. Box 942874, Sacramento, CA 94274-0001.

If the Contractor elects to use a proprietary earth retaining system from the list of acceptable alternative systems, the Contractor shall submit complete working drawings for each installation of the system to the Office of Structure Design (OSD) in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. For initial review, 4 sets of drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to OSD for final approval and use during construction.

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

The Contractor shall verify the existing ground elevations at the site before preparing the working drawings. The working drawings shall contain all information required for the proper construction of the system at each location including existing ground line at face of wall as verified at the site and any required revisions or additions to drainage systems or other facilities. The working drawings shall be supplemented as necessary with calculations for the particular installation. The working drawings and calculations shall be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California. The Contractor shall allow the Engineer 4 weeks to review the drawings after a complete set has been received.

One set of the corrected prints on 90-g/m² (minimum) bond paper, 279 mm x 432 mm in size, of all working drawings prepared by the Contractor for each earth retaining structure shall be furnished to OSD within 3 weeks after final working drawing approval.

The top of wall profile of alternative earth retaining systems shall conform to that of top of wall profile for mechanically stabilized embankment shown on the plans. The top of leveling pad elevations of alternative earth retaining systems

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

EARTHWORK

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

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

Gradation Requirements

Sieve Size	Percentage Passing	California Test
159-mm	100	202
75-mm	78 - 100	202
4.75-mm	----	202
600- μ m	0 - 60	202
75- μ m	0 - 25	202

Property Requirements

Test	Requirement	California Test
Sand Equivalent	12 min.	217
Plasticity Index	10 max.	204
Minimum Resistivity	1500 ohm-cm min.	643
Chlorides	500 ppm max.	422
Sulfates	2000 ppm max.	417
pH	5.5 to 10.0	643

If 12 percent or less passes the No. 75- μ m sieve and 50 percent or less passes the No. 4.75-mm sieve, the sand equivalent and plasticity index requirements shall not apply.

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

Property Requirements

Test	Requirement	California Test
Minimum Resistivity	1500 ohm-cm min.	643
Chlorides	500 ppm max.	422
Sulfates	2000 ppm max.	417
pH	5.5 to 10.0	643

Permeable material shall be placed in layers not exceeding 0.6-m in thickness.

Structure backfill for earth retaining structures with soil reinforcement shall be compacted to a relative compaction of not less than 90 percent except that when the backfill is within 50 meters of a bridge abutment or for a minimum depth of one meter below the grading plane for the width between the outer edges of shoulders, the backfill shall be compacted to a relative compaction of not less than 95 percent.

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

The earth retaining structures shall not be constructed in segments. A controlled rate of loading shall be used to backfill the earth retaining structures. Each row of wall panels, including structure backfill and reinforcement elements as well as the roadway embankment fill behind the mechanically stabilized embankment reinforcing zone shall be completed for the entire length of each earth retaining structure. Following the completion of each element for the entire length, the next row of panels, including structure backfill lifts, can be installed. The maximum lift height per week for the earth retaining structures shall be 0.9 m per week.

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

At each level of the soil reinforcement, the structure backfill shall be constructed to a plane 45 mm above the elevation of the soil reinforcement connection, and shall start one meter from the back of the face panel and extend for at least the remaining length of soil reinforcement. This grading shall be complete before placing the next layer of soil reinforcement.

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

GEOSYNTHETIC REINFORCEMENT

Geosynthetic reinforcement used in earth retaining structures shall conform to "Geosynthetic Reinforced Embankment" of these special provisions.

CONCRETE

All concrete used in precast and cast-in-place reinforced concrete members of earth retaining structures shall conform to the details shown on the plans, the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

The concrete leveling pads shall conform to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications. Concrete for the leveling pads shall be placed at least 24 hours prior to erecting face panels.

ARCHITECTURAL SURFACE (TEXTURED CONCRETE)

Architectural textures for concrete surfaces shall conform to the details shown on the plans and the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions:

Architectural textures listed below are required at concrete surfaces shown on the plans:

Smooth face stone

Test Panel

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

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

Form Liners

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

Form liners shall have the following properties:

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

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

Form liners shall extend the full length of texturing with transverse joints at 2.5 m minimum spacing. Small pieces of form liners shall not be used. Grooves shall be aligned straight and true. Grooves shall match at joints between form liners. Joints in the direction of grooves in grooved patterns shall be located only in the depressed portion of the textured concrete. Adjoining liners shall be butted together without distortion, open cracks or offsets at the joints. Joints between liners shall be cleaned before each use to remove any mortar in the joint.

Adhesives shall be compatible with the form liner material and with concrete. Adhesives shall be approved by the liner manufacturer. Adhesives shall not cause swelling of the liner material.

Releasing Form Liners

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

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

Curing

Concrete surfaces with architectural texture shall be cured only by the forms-in-place or water methods. Seals and curing compounds shall not be used.

ELASTOMERIC BEARING PADS

Elastomeric bearing pads shall conform to the provisions in Section 51-1.12H, "Elastomeric Bearing Pads," of the Standard Specifications and these special provisions.

REINFORCEMENT

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

GALVANIZING

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

INSPECTION WIRE

If a proprietary alternative system is selected, inspection elements representative of the particular soil reinforcement shall be furnished in the same number and approximate location as detailed for the Mechanically Stabilized Embankment.

The threaded end may be formed before or after galvanizing. The end 100 mm of the wire shall be coated with 2 applications of approved unthinned commercial quality zinc-rich primer (organic vehicle type). The threaded end of the wire shall be encapsulated with corrosion inhibiting mastic filled round vinyl enclosure secured with a nylon tie as shown on the plans. If the threaded end is galvanized

after threading, the threads shall be cleaned with a die before painting. There shall be no damage to the unthreaded portion of the galvanized inspection wire.

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

DRAINAGE SYSTEM

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

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

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

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

Permeable material shall be Class 1, Type B, conforming to the provisions in Section 68-1.025, "Permeable Material," of the Standard Specifications and these special provisions.

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

Filter fabric shall conform to the provisions for fabric for underdrains as specified in Section 88-1.03, "Filter Fabric," of the Standard Specifications, and shall be placed at the locations and in conformance with the details shown on the plans and in these special provisions.

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

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

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

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

Should the fabric be damaged during placing, the torn or punctured section shall be repaired by placing a piece of fabric that is large enough to cover the damaged area and which meets the overlap requirement.

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

Adhesive for bonding filter fabric to concrete panels shall conform to Federal Specification MMM-A-121.

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

STATE-DESIGNED EARTH RETAINING STRUCTURES

If the Contractor elects to construct one of the earth retaining structures shown on the plans, the structure shall be constructed to the lines and grades and the details shown on the plans, in conformance with these special provisions and the following:

MECHANICALLY STABILIZED EMBANKMENT

This work shall consist of constructing earth retaining structures of mechanically stabilized embankments with concrete face panels in conformance with the details shown on the plans and these special provisions.

At the Contractor's option, provisions may be made for the use of alignment pins at the horizontal joints between panels.

Laminated pads for elastomeric bearing pads shall consist of alternate layers of elastomer and fabric reinforcement bonded together. The pads shall contain 3 layers of reinforcement, one each at the top and bottom of the pad and one at the middle of the pad. The top and bottom layers of reinforcement shall be single ply at all layers. The reinforcement shall be parallel to the top and bottom surfaces of the pad. Variations in the location of the reinforcement in excess of 3 mm from its theoretical location shall be cause for rejection. The total out to out thickness of a pad shall not exceed the thickness shown on the plans nor shall be thinner than 4 mm less than that thickness.

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

The coupler at the mat connection shall be a seamless steel sleeve. It shall be applied over the button-headed wires and swaged by means of a hydraulic press. The coupler shall develop the minimum tensile strength of the wire without exceeding a total slip of the wires of 5 mm.

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

MW70 and MW130 steel wire shall conform to the ASTM Designation: A 82. The welded wire mat shall conform to ASTM Designation: A 185.

MD70 and MD130 deformed steel wire may be substituted for MW70 and MW130 steel wire. The welded wire mat utilizing deformed steel wire shall conform to ASTM Designation: A 497.

PROPRIETARY EARTH RETAINING SYSTEMS

If the Contractor elects to construct one of the acceptable proprietary alternative earth retaining systems, the structure shall be constructed to the lines and grades shown on the plans. The construction shall include a drainage system as shown on the plans, and conform to the details shown on the approved working drawings, these special provisions, approved proprietary system details and special provisions, and the following:

Within the limits of the surcharge shown on the plans, the density of the soil reinforcement furnished shall be determined using the same criteria, including a 50 year service life, as that used for the preapproved system.

The reinforced concrete leveling pad shown on the plans for mechanically stabilized embankment shall be constructed for the alternative earth retaining system chosen by the Contractor.

The location of the top level of soil reinforcement, assuming no leveling pad settlement, shall be placed parallel to the top of wall and at a distance below the top of wall as shown on the plans within a maximum tolerance of plus 40 mm.

Additional connections for soil reinforcement shall be cast into the top panels at the same locations as shown on the plans. The additional connections shall provide for the same density soil reinforcement as placed at the top level of soil reinforcement.

The top of top face panels, assuming no leveling pad settlement, shall be parallel to the top of the wall at the distance below the top of wall as shown on the plans within a maximum tolerance of plus 40 mm.

The alternative earth retaining system shall be constructed to accommodate the drainage inlet panels as shown on the plans.

MEASUREMENT AND PAYMENT

Earth retaining structures will be measured and paid for by the square meter. Regardless of the type of earth retaining structure actually constructed, the square meter area for payment will be based on the vertical height and length of each section of mechanically stabilized embankment shown on the plans which was or would have been constructed. The vertical height of each section will be taken as the difference in elevation on the outer face from the top of leveling pad to the top of face panels profile.

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

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

Full compensation for architectural texture shall be considered as included in the contract price paid per square meter for earth retaining structure and no separate payment will be made therefor.

10-1.32 SETTLEMENT INSTRUMENTATION

This work shall consist of installing settlement platforms, survey hubs, and piezometers to monitor settlements and excess pore pressure as provided for in "Earthwork," elsewhere in these special provisions and as directed by the Engineer. The settlement platforms, survey hubs, and piezometers shall be procured, tested and installed in accordance with the Contractor's proposed procedure that was reviewed and approved by the Engineer. A minimum of 48-hour notice shall be required before installation of these instruments.

The Contractor's instrumentation personnel shall monitor these instruments during the period of the contract as mentioned herein these special provisions or as directed by the Engineer. These instruments shall be left in place for the entire duration of the project unless otherwise directed by the Engineer. The settlement platforms, survey hubs, and piezometers shall be left in place at the end of this contract unless otherwise directed by the Engineer.

Settlement platforms, survey hubs, and piezometers that are damaged from any cause during the progress of the work shall be repaired or replaced by the Contractor at the Contractor's expense.

SETTLEMENT PLATFORMS.--The Contractor shall install fluid level settlement platforms at eight (8) locations as directed by the Engineer.

Settlement platforms shall be installed as per Caltrans Standard Test Methods, California Test 112.

After completion of the installation, contractor shall provide elevations, northings and eastings of the top of the settlement platforms.

The Contractor shall monitor and record the amount of settlements once a week or as directed by the Engineer during the entire period of contract. A copy of all readings shall be furnished to the Engineer within the following working day after the readings are taken.

SURVEY HUBS.--The Contractor shall install hubs at a maximum of twenty (20) locations before fill placement as directed by the Engineer.

The survey hub shall consist of 50-mm square x 0.6-m long stake with nail on top.

The monitoring of survey hub shall consist of elevations, northings, and eastings of the top of the center of the nail. The Contractor shall survey and collect the data of the survey hubs weekly during the duration of the contract.

The survey data shall include locations on the plans and elevation of all survey hubs.

The collected data shall be furnished to the Engineer within the following working day after the readings are taken.

PIEZOMETERS.--The Contractor shall install push-in type vibration wire (VW) piezometers at six (6) locations before fill placement as directed by the Engineer according to the following:

A. SUBMITTALS:

At least 15 days before beginning installation, the Contractor shall submit manufacturer's literature and specifications for piezometer, cable and readout unit to the Engineer. At least 10 days before beginning installation a detail, step by step procedure for installation along with a sample installation record sheet shall be submitted. The installation procedure shall include, if applicable, details regarding

- The method to be used for cleaning the inside of augers or casing,
- Specification for proposed grout mix, tremie pipe, drill casing, or auger,
- Method for conducting pre and post installation acceptance test
- Method of protecting leads from potential damage resulting from embankment construction

B. MATERIALS:

Piezometers shall have operative range of -345 kPa to 345 kPa (-50 psi to 50 psi) and be enclosed in stainless steel cone-shaped rigid shells. The type and response of VW piezometer shall be suitable for the cohesive soils with medium to high plasticity present at the site.

Cable shall be furnished by the same manufacture or his recommended source. The length of the connecting cable for each piezometer shall be determined before ordering, and splicing of the cable shall not be permitted. The cable shall be laid down in a 150 mm by 150-mm trench

The read out unit/mini-logger shall be from the same manufacture or their recommended source.

Other necessary materials and/or accessories shall conform to the manufacturer's specification or relevant ASTM standard.

C. CALIBRATION:

All supplied instruments shall be calibrated by the manufacturer and shall include all necessary calibration curve and detail tabulation of the data.

D. PRE-INSTALLATION ACCEPTANCE TEST:

Following the receipt of the instruments at the project site, the Contractor's instrumentation personnel shall conduct pre-installation acceptance test and verify the supplied instrument function properly before they are installed. A step by step detail for this test shall be submitted to the Engineer for prior approval. Any supplied instrument failing to meet the

acceptance standard shall be repaired or replaced at Contractor's expense without any additional cost to the State.

E. INSTALLATION:

VW piezometers shall be installed in accordance with the Contractor's detail step by step procedure that was reviewed and approved by the Engineer. A minimum of 48-hour notice shall be required prior to any such installation. For each piece of instrument, an installation record sheet shall be prepared and maintained by the Contractor. Such sheet shall contain detail site-specific information, result of post-installation test, any problems encountered during the installation process, etc. Specific items to be included in the record sheet shall be furnished by the Engineer upon receipt of the documents as mentioned herein under Section A "SUBMITTAL" above. For each piezometer, a larger diameter hole than the piezometer diameter shall be drilled to a depth of about 1.5 m below the groundwater table. The piezometer shall be pushed in the previously drilled hole to a maximum depth of 10 meters below the original ground. The actual depth of installation shall be determined by the Engineer.

F. POST-INSTALLATION ACCEPTANCE TEST:

Any instrument that does not meet the post-installation acceptance standards as directed by the Engineer shall be replaced at Contractor's expense without any additional cost to the State.

G. DATA COLLECTION:

Piezometers shall be connected to an automatic mini-logger that can be programmed to store a minimum of two readings per day.

The monitoring of piezometers shall consist of downloading the data from the automatic mini-logger to a floppy disk and should be provided to the Engineer as per his direction and schedule.

The contract lump sum price paid for settlement instrumentation (settlement platforms, survey hubs, and piezometers) shall include full compensation for providing all labor, materials, tools, equipment, and incidentals required for furnishing, installing, maintaining, leaving in place and monitoring. This price includes collection and compilation of data and furnishing reports as specified in these special provisions; and as directed by the Engineer.

10-1.33 GEOSYNTHETIC REINFORCED EMBANKMENT

Geosynthetic reinforced embankment shall consist of placing geosynthetic reinforcement material between layers of imported material in accordance with the details shown on the plans, as specified in Section 19 "Earthwork," of the Standard Specifications and these special provisions, and as directed by the Engineer.

MATERIAL SPECIFICATIONS.--The geosynthetic reinforcement material shall meet the requirements of these special provisions. The Contractor shall furnish a Certificate of Compliance in accordance with the provisions in Section 6-1.07, "Certificate of Compliance," of the Standard Specifications for the geosynthetic reinforcement. The Certificate of Compliance shall be prepared and signed by a representative of the manufacturer. Geosynthetic reinforcement material shall consist of material designed for use in subsurface geotechnical slope reinforcement applications. Geosynthetic reinforcement shall have a regular and defined open area. Geosynthetic reinforcement shall obtain pullout resistance from the soil by a combination of soils shearing friction on the plane surfaces parallel to the direction of shearing and soils bearing on transverse geosynthetic reinforcement surfaces normal to the direction of geosynthetic reinforcement movement. The percentage of the open area for geosynthetic reinforcement shall be

between the range of 50 to 90 percent of the total projection of a section of the material.

Geosynthetic reinforcement material shall meet the following requirements:

1. Long Term Design Strength (LTDS) for geosynthetic reinforcement shall be equal to or greater than values shown on the plans or elsewhere in these specifications as determined by Geosynthetic Research Institute (GRI) Test Methods. LTDS for geosynthetic reinforcement shall be determined by Standard Practice GRI G4 (a) and (b) . These values are minimum average roll values.

Long Term Design Strength is the strength of the geosynthetic reinforcement calculated by applying all partial factors of safety in accordance with GRI Standard Practice G4 (a) and (b). The factor of safety for creep deformation shall be determined for a 75-year design life as determined by GRI G4 (a) and (b) for geosynthetic reinforcement. The 75-year design life strength is determined from the creep curve which becomes asymptotic to a constant strain line of 10 percent or less.

In the absence of specific test data, the partial factor of safety default values (installation damage, creep deformation, chemical degradation, biological degradation, and joint) as indicated in the Standard Practice GRI G4 (a) and (b) shall be applied to the calculations of the LTDS.

2. Geosynthetic reinforcement material shall be resistant to naturally occurring alkaline and acidic soil conditions, and to attack by bacteria.

All test results which contributed to the calculations of the LTDS shall be submitted to the Engineer no less than one week prior to beginning placement of the geosynthetic reinforcement. All test results, which contribute to the calculations of the LTDS, shall be prepared and signed by a registered Civil Engineer in the State of California.

Geosynthetic reinforcement material shall consist of high-density polyethylene, polypropylene, high-density polypropylene sheets, high tenacity polyester yarn, or polyaramide and shall meet the applicable material requirements found below.

High Density Polyethylene.--Geosynthetic reinforcement material consisting of high density polyethylene shall meet or exceed the following material requirements:

- 1) Be manufactured from high density polyethylene (HDPE) which conforms to ASTM Method D 1248.
- 2) Shall have a LTDS in the primary strength direction greater than or equal to values shown on the plans in kilonewtons per meter

Polypropylene.--Geosynthetic reinforcement material consisting of polypropylene or high-density polypropylene sheets shall meet or exceed the following material requirements:

- 1) Shall meet the requirements of ASTM Designation: D 4101, Group 1/Class1/Grade 2.
- 2) Shall have a LTDS in the primary strength direction greater than or equal to values shown on the plans in kilonewtons per .

High Tenacity Polyester Encapsulated.--Geosynthetic reinforcement material consisting of high tenacity polyester yarn shall meet or exceed the following material requirements:

- 1) Be manufactured from high tenacity polyester yarn as determined by ASTM Designation: D 629. In addition to meeting the requirements for geosynthetic, geogrid shall be encapsulated in an acrylic latex coating or similar.

- 2) Shall have a LTDS in the primary strength direction greater than or equal to values shown on the plans in kilonewtons per meter.

Polyaramides.--Geosynthetic reinforcement material consisting of polyaramide shall meet or exceed the following material requirements:

- 1) Be manufactured from high tenacity polyester yarn as determined by ASTM Designation: D 629.
- 2) Shall have a LTDS in the primary strength direction greater than or equal to values shown on the plans in kilonewtons per meter.

IMPORTED BORROW (GEOSYNTHETIC REINFORCED EMBANKMENT).--All imported borrow used in the geosynthetic reinforced embankment, except for the embankment backfill used for the surcharge areas, shall be free from organic or other deleterious materials and shall conform to the following:

PROPERTY	VALUE	CA TEST NO.
Percent passing	Gradation	202
Sieve Size		
75- millimeters	100	
19 millimeters	70 - 100	
4.75- millimeters	5 - 70	
75 -µm	0- 45	
Sand Equivalent	10 minimum	217
Plasticity Index	20 maximum	204
pH	between 3 and 9	643

HANDLING AND STORAGE.--Geosynthetic reinforcement shall be handled and stored in accordance with the manufacturer's recommendations and these special provisions. Geosynthetic reinforcement shall be furnished in an appropriate protective cover which shall protect it from ultraviolet radiation and from abrasion during shipping and handling. Geosynthetic reinforcement shall not be placed more than what can be covered with backfill in the same work shift.

CONSTRUCTION.--The Contractor shall prepare the grade that is to receive the layers of geosynthetic reinforcement to the compaction and elevation tolerances described in the Standard Specifications under Section 19-2.05, "Slopes," and these special provisions. The grade shall be free of loose or extraneous material and objects that may damage the geosynthetic reinforcement during installation. Relative compaction of not less than 95 percent shall be obtained in the embankment foundation under the lowest layer of geosynthetic reinforcement for a minimum depth of 0.15 meter.

Geosynthetic reinforcement shall be handled and placed in accordance with the manufacturer's recommendations and these special provisions. The geosynthetic reinforcement shall be laid horizontally as shown on the plans. The geosynthetic reinforcement shall be placed in a wrinkle free manner, pulled taut, aligned, and anchored slack in geosynthetic reinforcement shall be removed in a manner, and to such a degree, as approved by the Engineer. Geosynthetic reinforcement shall be installed in a horizontal plane at the intervals, elevations, and for the minimum embedment length shown on the plans. Each layer of geosynthetic reinforcement shall not vary more than 0.15 meter from the theoretical horizontal plane established for that layer for the entire width and length of the reinforced embankment.

Where the full embedment length of geosynthetic reinforcement as shown on the plans cannot be achieved along the sides or for other limited areas of the

embankment zone, the geosynthetic reinforcement shall be trimmed as necessary to avoid the obstruction and to achieve the maximum embedment possible.

Geosynthetic reinforcement shall be secured in place in accordance with the manufacturer's recommendations, these special provisions as directed by the Engineer to prevent the displacement of the geosynthetic reinforcement during compaction and placement of the embankment material.

Geosynthetic reinforcement shall not extend into the pavement structural section.

Secondary geosynthetic reinforcement shall have an embedment length as shown on the plans and shall be installed in a horizontal plane at intervals as shown on the plans and shall not vary more than 0.15 meter from the theoretical horizontal plane established for that layer for the entire width and length of the geosynthetic reinforced embankment.

Overlapping and splicing geosynthetic reinforcement shall be in accordance with the manufacturer's recommendations, these special provisions and as directed by the Engineer.

The geosynthetic reinforcement shall be placed in such a manner that the direction of tensile strength is oriented perpendicular to the project centerline. The Contractor shall verify correct orientation of the geosynthetic reinforcement. Each layer of geosynthetic reinforcement shall be placed onto the embankment material to form a continuous mat. Adjacent strips of geosynthetic reinforcement placed in this manner need not be overlapped.

During spreading and compacting the imported borrow, at least 150 millimeters (measured vertically) of backfill shall be maintained between the geosynthetic reinforcement and the Contractor's equipment. Equipment or vehicles shall not be operated or driven directly on the geosynthetic reinforcement.

At locations where guard rail posts will later be placed at the top of the geosynthetic reinforced embankment and the geosynthetic reinforcement would interfere with placement of such posts, prior to backfilling the Contractor shall be allowed to cleanly pre-cut the reinforcement material of the affected layers into a cross-shaped pattern to aid the later placement of the guard rail posts. The dimensions of the pre-cutting shall not exceed the post dimensions by greater than 750 millimeters.

If the geosynthetic reinforcement is damaged during construction operations, the damaged sections shall be repaired, at the Contractor's expense, by placing sufficient additional geosynthetic reinforcement to cover the damaged area and to meet the overlap requirements in accordance with the manufacturer's recommendations, these special provisions as directed by the Engineer.

MEASUREMENT AND PAYMENT.--Geosynthetic reinforcement will be measured and paid for by the square meter for the total area in each level (plan view) as shown on the plans and for any additional area as directed by the Engineer. Payment shall not include additional reinforcement required for overlaps.

Imported borrow (Geosynthetic Reinforced Embankment) shall be measured and paid for by the cubic meter in the same manner specified for imported borrow as specified in Section 19 of the Standard Specifications.

The contract price paid per square meter of geosynthetic reinforcement shall include full compensation for furnishing all labor and materials, including tools and equipment, and incidentals, and for doing all the work involved in placing the geosynthetic reinforcement complete in place, including splicing, overlapping and anchoring as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

The contract price paid per cubic meter for Imported Borrow (Geosynthetic Reinforced Embankment) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in obtaining and hauling borrow material, spreading and compacting embankment material, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1 34 EMBANKMENT STABILIZATION FABRIC

Embankment stabilization fabric shall conform to the details shown on the plans, the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Embankment stabilization fabric work shall consist of installing stabilization fabric in conjunction with embankment construction and placement of geosynthetic reinforcement as shown on the plans and other areas designated by the Engineer.

Compaction of the slope face to the maximum extent practical or as directed by Engineer shall be performed prior to wrapping of the slope surface with stabilization fabric.

MATERIALS.—Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following:

Embankment stabilization fabric shall be an engineered geotextile fabric of woven polypropylene resistant to ultraviolet degradation due to exposure and shall conform to the following:

Property	Test Method	Minimum Average Roll Value
Grab Tensile Strength, Min.	ASTM Designation: 4632	1.2 kN
Puncture	ASTM Designation 4833	0.530 kN
Trapezoidal Tear	ASTM Designation 4533	0.470 kN
Flow Rate	ASTM Designation 4491	1424 L/min/m ²
Grab Elongation, Percent Max.	ASTM Designation: D4632	35 %
Roll Length (Min)	N/A	4.57 m
Mullen Burst	ASTM Designation 3786	4067 kPa

Embankment stabilization fabric shall be furnished in an appropriate protective cover which shall protect it from ultraviolet radiation and form abrasion due to shipping and handling, and shall remain covered until installation.

Embankment stabilization fabric shall be accompanied by a Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificate of Compliance," of the Standard Specifications.

The subgrade to receive the fabric, immediately prior to placing, shall conform to the compaction and elevation tolerance specified in Section 25-1.03, "Subgrade," of the Standard Specifications and these special provisions and shall be free of loose or extraneous material and sharp objects that may damage the fabric during installation.

Embankment stabilization fabric shall be handled and placed in accordance with the manufacturer's recommendation and shall be positioned longitudinally along the alignment, pulled taut to form a tight wrinkle-free mat.

Adjacent borders of the fabric shall be overlapped a minimum of 450 mm. Individual sections shall be continuous with no overlapping of material allowed except at the borders.

Should the fabric be damaged during placing, the damaged section shall be repaired by placing a new piece of fabric over the damaged area. Said piece of fabric shall be large enough to cover the damaged area and provide a minimum 900 mm overlap on all edges.

Damage to the fabric resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

INSTALLATION.—Embankment stabilization fabric shall be placed as shown on the plans and as follows:

Embankment stabilization fabric shall be placed in conjunction with the placement of geosynthetic reinforcement during the construction of embankment slopes. Longitudinal and transverse joints of fabric shall be overlapped 304 mm. The back edge of the fabric shall be anchored through the geosynthetic reinforcement. Anchors shall be driven perpendicular to the fabric such that the top of the anchor is flush with the ground surface, and shall be located and spaced in accordance with the plans.

A slope board or similar device shall be used during embankment construction to attain the specified slope plane.

MEASUREMENT AND PAYMENT.—The quantity of embankment stabilization fabric to be paid for will be determined by the square meter from actual measurement of the fabric including embedment in to the embankment.

10-1.35 REINFORCED MAT (EROSION CONTROL)

Reinforced mat (erosion control) shall conform to the details shown on the plans, the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Reinforced mat (erosion control) work shall consist of applying fiber, compost, seed, commercial fertilizer and installing reinforced mat (erosion control) at the location shown on the plans.

MATERIALS.—Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following:

SEED.—Seed shall conform to the requirements in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed not required to be labeled under the California Food and Agricultural Code shall be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts, or a seed technologist certified by the Society of Commercial Seed Technologists.

Seed shall have been tested for purity and germination not more than one year prior to application of seed.

Results from testing seed for purity and germination shall be furnished to the Engineer prior to applying seed.

NON-LEGUME SEED.—Non-legume seed shall consist of the following types of seed:

NON-LEGUME SEED TYPE 1

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms pure live seed per hectare (Slope measurement)
Avena Sativa 'rubra' (California Red Oats)	90	35
Hordeum vulgare 'UC 603' (Cereal Barley)	90	35

NON-LEGUME SEED TYPE 2

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms pure live seed per hectare (Slope measurement)
Festuca rubra 'Molate' (Molate Red Fescue)	35	10.0
Agropyron trachycaulum majus (Slender wheatgrass)	35	10.0
Elymus triticoides 'Rio' (Creeping wildrye)	30	15.0
Deschampsia elongata (Slender hairgrass)	30	8.0

Seed shall be delivered to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

COMPOST.—Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or a Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost.

The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume.

A minimum internal temperature of 57°C shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 6 mm screen.

The moisture content of the compost shall not exceed 35 percent. Moisture content shall be determined by California Test 226. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with a moisture content of 35 percent.

Compost will be tested for maturity and stability with a solvita test kit. The compost shall measure a minimum of 6 on the slovita maturity and stability scale.

REINFORCED MAT.—Reinforced mat shall consist of a three dimensional woven webbing of polypropylene geosynthetic (webbing). The reinforced mat shall have a nominal roll size of 2.5 m X 27.0 m. The reinforced mat shall be rated to resist flow velocities of up to 7.6m/sec (vegetated) and 6.1m/sec (unvegetated) of the reinforced mat shall also conform to the following minimum requirements:

Specification	ASTM Standard.	Requirement
Thickness	D-1777	12.5mm
Resiliency	D-1777	80%
Tensile strength	D-4595	45 X 32 kN/m
Tensile elongation	D-4595	45% (max)
UV resistance	D-4355	80% at 1000hrs.
Mass Per Unit Area	D-5261	470 g/m2

Rock slope protection for anchor trench shall conform to the provisions in Section 72, "Slope Protection," of the Standard Specifications.

Staples for reinforced mat (erosion control) shall be made of 8 gage minimum steel wire and shall be U-shaped with 203.2-mm legs and 50-mm crown.

INSTALLATION.— Reinforced mat (erosion control) materials shall be placed in 3 separate applications—as follows:

The first application shall consist of hydro seeding a mixture of fiber, compost seed and commercial fertilizer throughout all areas to be covered with reinforced mats at the following rates:

Material	Kilograms per hectare (Slope measurement)
Compost	2250
Fiber	340
Non-Legume Seed (Type 1)	70

The mixture shall be applied within 30 minutes after the seed has been added to the mixture. The second application shall consist of installing the reinforced mat (erosion control) over the fiber, compost, and seed application as follows:

Reinforced mat (erosion control) strips shall be placed loosely on the slope with the longitudinal joints parallel to the slope contour lines and the webbing flush to the ground surface. Longitudinal and transverse joints of reinforced mat shall be overlapped a minimum of 152 mm with the uphill strip over the lower strip along the entire length of each seam.

Staples shall be driven perpendicular to the reinforced mat such that the top of the staple is flush with the ground surface. Staples, shall be located and spaced in accordance with the plans.

The third application shall consist of hydro seeding a mixture of compost, and seed over all areas covered with reinforced mats at the following rates:

Material	Kilograms per hectare (Slope measurement)
Compost	560
Fiber	560
Non-Legume Seed (Type 2)	43
Commercial fertilizer	500

Hydroseeding shall be performed at close range onto the netting face in the second application such that the materials are well integrated into the netting and in close contact with the ground surface. Application shall be perpendicular to the slope face such that the application does not displace the netting. Any netting displacement shall be immediately repaired by the Contractor.

MEASUREMENT AND PAYMENT.—The quantity of reinforced mat (erosion control) to be paid for will be determined by the square meter from actual slope measurement of the area covered by the reinforced mat (erosion control).

The contract price paid per square meter for reinforced mat (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, except for compost, seed, fiber and commercial fertilizer, and for doing all the work involved in Reinforced mat (erosion control), complete in place, including key trench and anchor trench as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.36 EROSION CONTROL (TYPE D)

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Erosion control (Type D) work shall consist of applying erosion control materials to embankment and excavation slopes and other areas designated by the Engineer. Erosion control (Type D) shall be applied during the period starting September 1 and ending October 31; or, if the slope on which the erosion control is to be placed is finished during the winter season as specified in "Water Pollution Control" elsewhere in these special provisions the erosion control shall be applied immediately; or, if the slope on which the erosion control is to be placed is finished outside both specified periods and the contract work will be completed before September 1, the erosion control shall be applied as a last item of work.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials and other debris shall be removed from areas to receive erosion control.

MATERIALS.—Materials shall conform to Section 20-2, "Materials," of the Standard Specifications and the following:

SEED.—Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed not required to be labeled under the California Food and Agricultural Code shall be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts, or a seed technologist certified by the Society of Commercial Seed Technologists.

Seed shall have been tested for purity and germination not more than one year prior to application of seed.

Results from testing seed for purity and germination shall be furnished to the Engineer prior to applying seed.

LEGUME SEED.—Legume seed shall be pellet-inoculated or industrial-inoculated.

Pellet-inoculated seed shall be inoculated in accordance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.

Inoculated seed shall have a calcium carbonate coating.

Pellet-inoculated seed shall be sown within 90 days after inoculation.

Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.

Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.

Legume seed shall consist of the following:

LEGUME SEED TYPE 1

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms pure live seed per hectare (Slope measurement)
Trifolium fragarium (O'Connor's Strawberry Clover)	60	4.0
Lotus scoparius (Deerweed)	60	4.0
Lupinus bicolor (Pygmy-leaved Lupine)	60	4.0
Lupinus succulentus (Arroyo Lupine)	60	6.0

NON-LEGUME SEED.—Non-legume seed shall consist of the following:

NON-LEGUME SEED TYPE 3

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms pure live seed per hectare (Slope measurement)
Eschscholzia californica* (California Poppy)	50	1.5
Achillea millefolia (White Yarrow)	50	0.5
Clarkia unguiculata (Mountain Garland)	50	0.5
Oenothera hookeri (California Evening Primrose)	50	0.5
Hordeum brachyantherum* (California Meadow Barley)	50	16.0
Festuca rubra 'Molate'* (Molate Red Fescue)	50	12.0
Agropyron trachycaulum majus* (Slender Wheatgrass)	50	10.0
Elymus triticoides 'Rio'* (Creeping Wildrye)	50	15.0
Deschampsia elongata* (Slender Hairgrass)	30	8.0

NON-LEGUME SEED TYPE 4

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms pure live seed per hectare (Slope measurement)
Eschscholzia californica* (California Poppy)	50	1.5
Achillea millefolia (White Yarrow)	60	0.5
Clarkia amoena (Farewell to Spring)	50	0.5
Lasthenia glabrata (Goldfields)	50	0.5
Agrostis diegoensis* (Thin Grass)	50	10.0
Festuca rubra 'Molate'* (Molate Red Fescue)	50	10.0
Bromus carinatus* (California Brome)	50	10.0
Elymus glaucus 'Berkeley'* (Blue Wildrye)	50	13.0
Hordeum brachyantherum* (California Meadow Barley)	50	13.0
Vulpia microstachys* (Three Weeks Fescue)	50	5.0

*Use California produced California native species seed only.

Seed shall be delivered to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag will not be accepted.

A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

COMMERCIAL FERTILIZER.—Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Standard Specifications and shall have a guaranteed chemical analysis of 6 percent nitrogen, 20 percent phosphoric acid and 20 percent water soluble potash.

STRAW.—Straw shall be derived from wheat and barley. Wheat and barley straw shall not be derived from dry farmed cereal crops.

STABILIZING EMULSION .—Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

The requirement of an effective life of at least one year for stabilizing emulsion shall not apply.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive derivative of *Plantago insularis* used as a soil binder.

COMPOST.—Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or a Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost.

The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume.

A minimum internal temperature of 57°C shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 6 mm screen.

The moisture content of the compost shall not exceed 35 percent. Moisture content shall be determined by California Test 226. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with a moisture content of 35 percent.

Compost will be tested for maturity and stability with a solvita test kit. The compost shall measure a minimum of 6 on the maturity and stability scale.

APPLICATION.—Erosion control materials shall be applied in 3 separate applications in the following sequence:

In areas designated on the plans to receive Erosion Control (Type D) Seed (Type 3), the following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 30 minutes after adding seed to the mixture:

Material	Kilograms per hectare (Slope measurement)
Fiber	170
Compost	560
Legume Seed Type 1	18.0
Non-Legume Seed Type 3	64.0
Commercial fertilizer	500

In areas designated on the plans to receive Erosion Control (Type D) Seed (Type 4), the following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 30 minutes after adding seed to the mixture:

Material	Kilograms per hectare (Slope measurement)
Fiber	170
Compost	560
Legume Seed Type 1	18.0
Non-Legume Seed Type 4	64.0
Commercial fertilizer	500

Straw shall be applied at the rate of 4 tonnes per hectare based on slope measurements. Incorporation of straw will not be required.

The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

Material	Kilograms per hectare (Slope measurement)
Fiber	170
Compost	560
Stabilizing emulsion (solids)	135

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.

Once straw work is started in an area, the remaining applications shall be completed in that area on the same working day.

The proportions of erosion control materials may be changed by the Engineer to meet field conditions.

MEASUREMENT AND PAYMENT.—The quantity of pure live seed (erosion control) to be paid for by the kilogram will be determined by multiplying the percentage of purity by the percentage of germination by the marked mass on the sack.

The contract price paid per kilogram for compost (erosion control) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying compost for erosion control, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Pure live seed (erosion control) will be paid for by the kilogram in the same manner specified for seed in Section 20-3.07 of the Standard Specifications.

10-1.37 FIBER ROLLS

Fiber rolls shall conform to the details shown on the plans and to the provisions in these special provisions.

MATERIALS

Fiber rolls shall consist of one of the following:

Fiber rolls shall be constructed on the site with manufactured blankets consisting of one or a combination of wood excelsior, rice, wheat or coconut fibers. The blanket shall measure approximately 3.5 meters wide by 26 to 29 meters in length. Wood excelsior material shall have individual fibers, 80 percent of which shall be 150 mm or longer in fiber length. The blanket shall have a photodegradable plastic netting. The blanket shall be rolled on the blanket's width and secured with jute twine spaced 2 meters apart along the roll for the full length and 150 mm from each end of the individual rolls. The blanket shall be rolled so that the netting is on the outside of the finished roll. The finished roll diameter shall be a minimum of 175 mm and a maximum of 225 mm and shall weigh not less than 1.3 kg per meter.

Fiber rolls shall be pre-manufactured rice or wheat straw, wood excelsior or coconut fiber rolls encapsulated within a photodegradable plastic netting. Each roll shall be a minimum of 175 mm and a maximum of 225 mm in diameter and 7 to 9 meters in length and shall weigh not less than 1.3 kg per meter. The netting shall be ultraviolet (UV) degradable plastic. The netting shall have a minimum durability of one year after installation. The netting shall be secured tightly at each end of the individual rolls.

Stakes shall be fir or pine and shall be a minimum of 25 mm x 25 mm x 600 mm in length. Metal stakes may be used as an alternative. The Contractor shall submit a sample of the metal stake to the Engineer prior to installation. The tops of the metal stakes shall be bent over at a 90-degree angle. No additional compensation will be allowed for the use of a metal stake.

INSTALLATION

Fiber rolls shall be joined tightly together to form a single linear roll that is installed approximately parallel to the slope contour. Fiber rolls shall be installed prior to the application of other erosion control materials.

Furrows shall be constructed at a slight angle to the slope contour shown on the plans, to a depth of 50 to 100 mm, and at a sufficient width to hold the fiber rolls.

Individual rolls shall be placed with adjacent ends butted firmly to each other to create a continuous linear roll.

Fiber rolls adjacent to lined swales and concrete gutters shall be installed as shown on the plans.

Stakes shall be installed 1.2 meters apart along the total length of the rolls and 125 mm from the end of each individual roll. Stakes shall be driven flush or a maximum of 50 mm above the roll.

MEASUREMENT AND PAYMENT

Fiber rolls will be measured by the meter from end to end along the centerline of the installed rolls.

The contract price paid per meter for fiber rolls shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing fiber rolls, complete in place, including stakes, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.38 WILLOW BUNDLE

Willow bundle work shall consist of obtaining, transporting, propagating and planting willow cuttings assembled into individual bundles as shown on the plans. The work shall conform to the provisions in Section 20-4, "Highway Planting," of the Standard Specifications and these special provisions.

Willow cuttings shall be collected from areas along the Ordinary High Water (OHW) elevation of the river. Each bundle shall consist of 8-10 individual cuttings.

MATERIALS.—Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following:

COIR NETTING.—netting shall consist of 100 percent spun coir fiber and shall conform to the following:

Properties

ASTM 3776C Weight	400 g/m2
Roll Width (minimum)	2 m
Area/roll (minimum)	200 m2
Open Area (maximum)	63-70%
D4595-86 Minimum tensile Strength	0.23/0.14 kN (dry) 0.17/0.11 kN (wet)

IMPORTED TOPSOIL.—Imported topsoil shall conform to the provisions in Section 20-2.01 'Topsoil' of the Standard Specifications. Select material from within the project limits may be used as an alternative to imported topsoil providing that it meets the provisions for topsoil.

Willow cuttings shall be propagated to develop root growth between the time of collection and planting. Rooting hormone, moisture enhancers and fertilizer may be used to stimulate root development. Individual cuttings shall be assembled and covered in a mixture of peat moss and potting soil suitable for root development. Peat moss and potting soil shall be thoroughly mixed and distributed generously around all sides of each cutting. The cuttings shall be bundled in coir netting to a diameter ranging from 304 to 457mm. There shall be a minimum of 25.4 mm of peat / soil uniformly layered between the outermost willow cuttings and coir netting. Each individual willow bundle shall be thoroughly rooted at the time of planting such that roots are protruding uniformly along the full length of the bundle through the openings in the netting.

Individual bundles shall be maintained and to stimulate root growth from the time of collection until the time of planting.

Willow cuttings shall be planted in conjunction with the placement of Rock slope protection between Station MP 30+80 to 33+40 as shown on the plans. Prior to placing the individual bundles onto the rock slope protection, a 2.4 X 1.8 m sheet of coir netting shall be loosely placed over the rock at each bundle location conforming to the undulations of the rock. Imported topsoil shall be placed around all sides of each bundle to fill the void and crevices between individual rocks. Water shall be applied as necessary to thoroughly moisten the soil and to ensure that the soil infiltrates all portions of the bundle uniformly. Following placement of the bundle and wetting operations, another 2.4 X 1.8 m sheet of coir netting shall be loosely placed over the soil and bundle to encapsulate the soil prior to the placement of the next layer of rock.

The Contractor shall notify the Engineer, in writing, 10 working days prior to gathering willow cuttings. The cuttings shall be taken only from the areas shown on the plans or other adjacent areas designated by the Engineer.

Willow cuttings shall be taken at random from healthy, vigorous plants and preferably when the plants are in a dormant condition. Not more than 50 percent of the plants in any designated area shall be cut, nor shall more than 25 percent of each individual plant be cut. Cuts shall be made with sharp, clean tools.

Willow cuttings shall be reasonably straight, 1.8-2.4m in length, and 20 mm to 76.2 mm in diameter at the base of the cutting. The top of each willow cutting shall be cut square above a leaf bud, and the base of each willow cutting shall be cut below a leaf bud at an angle of approximately 45 degrees. Willow cuttings shall have leaves and branches trimmed off flush with the stem. Pruned branches and trimmings shall be spread in the designated willow cutting areas so as not to leave the areas unsightly.

Willow bundles shall be watered and maintained in a healthy condition from the time the bundles are planted until December 1 following planting. Willow bundles that die shall be replaced at the Contractor's expense. The method of planting and location for replacement willow bundles shall be determined by the District Landscape Architect.

The quantity of willow bundles will be measured as units determined from actual count in place, excluding additional willow bundles required for replacement bundles.

Full compensation for obtaining, transporting, propagating willow cuttings, assembling-willow bundles, furnishing and placing imported topsoil, furnishing and placing coir netting, watering during willow placement, placing willow bundles, furnishing and placing fertilizer, , applying root stimulant and moisture enhancers (if necessary), and for watering and maintaining willow bundles shall be considered as included in the contract unit price paid for Willow Bundles and no additional compensation will be allowed therefor.

10-1.39 TEMPORARY SEDIMENT BASIN

Temporary sediment basin shall conform to the Standard Specifications, these special provisions and the provisions for Sediment basin CD42 (2) as provided for in the Caltrans Storm Water Quality Handbook 'Construction Contractor's Guide and Specifications'. Temporary sediment basin work shall consist of, but not limited to, grading, installing geomembrane and geotextile cushion fabric, plastic pipe, perforated plastic pipe underdrain and a Grated Metal Pipe (GMP) inlet.

MATERIALS.—Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following:

GEOMEMBRANE.—Geomembrane shall function as a leak free water barrier to prevent infiltration. The geomembrane shall have the shape and dimensions as shown on the plans. The dimensions shall be adequate to cover the facility, including transverse anchor trenches at the beginning and end of the facility and longitudinal anchor trenches along its length. Geomembrane shall be smooth on both sides. Geomembrane shall consist of a single ply material. If the geomembrane is scrim-reinforced, the material requirements below pertain to an individual geomembrane ply, not the composite material with the scrim. The major component of geomembrane shall be either polyvinyl chloride (PVC), very low density polyethylene (VLDPE), chloro-sulfonated polyethylene (CSPE), or other comparable flexible materials or combinations thereof. The geomembrane shall be flexible enough to bend in anchor trenches and to conform to subgrade irregularities by its own weight, in ambient job-site air temperatures, without any overburden placed on it, and without additional heating and bending.

Geomembrane shall be manufactured from either virgin raw materials or from a combination of virgin and recycled materials. None of the materials, whether virgin or recycled, shall contain biodegradable filler materials that degrade the physical or chemical characteristics of the finished roll products, such

that they no longer function as leak-free water barriers. To confirm the absence of biodegradable filler materials the engineer may order tests such as ASTM E 204 (Fourier Transformed Infrared Spectroscopy-FTIR) or other appropriate tests.

Geomembrane shall be free from holes or punctures and shall conform to the following minimum or maximum requirements, not average roll properties:

Specification	Requirement
Thickness, mm, min. ASTM Designation: D 1593 *	0.68
Grab tensile strength at break, kiloNewtons, min. both machine and cross directions (25 mm wide strip of material) ASTM Designation: D 882 *	0.267
Elongation at break, percent (%) min. ASTM Designation: D 882 *	50
Toughness, kiloNewtons, min. (Percent elongation x grab tensile strength) example 0.30 kn x 100 % = 30 kN-%	17.8
Puncture resistance, kiloNewtons, min. FTMS 101C Method 2065 *	0.13

* or appropriate test method for a comparable geomembrane polymer material

A certificate of compliance shall be furnished in accordance with the provision of Section 6-1.07, "Certificates of Compliance" of the Standard Specifications. It shall state that the geomembrane complies with all of the above conditions and material requirements.

SEAMS.--There shall be one factory-seamed geomembrane delivered to the job site. Geomembrane seams shall be leak free, as tested by the VACUUM BOX METHOD, ASTM 4437, or other comparable seam test for the specific polymer. Leaky geomembrane, as determined by the engineer, shall be replaced at the expense of the contractor.

Geomembrane sheets shall be welded (heat or ultrasonic or other), or shall be solvent-bonded with a material that is compatible with the geomembrane as recommended by the manufacturer, to meet the required shape and dimensions as shown on the plans. Actual bonding along the entire length of any seam shall be at least 25 mm wide. Additional overlapped material is permitted, but will not be considered as additional area for compensation. Filler-sealer compounds shall not be permitted for factory or field seams.

GEOTEXTILE.--Geotextile cushion fabric shall consist of a separate geotextile and shall be placed where shown on the plans. Geotextile cushion fabric shall be a nonwoven, needle-formed fabric, free of any needles which may have broken off during manufacturing. It can be manufactured from either virgin polymer materials, (for example, polypropylene or polyester), recycled materials, or a combination of recycled and virgin polymer materials, (for example, polyester polyethylene terephthalate "PETE"). None of the materials, whether virgin or recycled, shall contain biodegradable filler materials that degrade the physical or chemical characteristics of the finished roll products. To confirm the absence of biodegradable filler materials the engineer may order tests such as

ASTM E 204 (Fourier Transformed Infrared Spectroscopy-FTIR) or other appropriate tests.

Geotextile cushion fabric shall meet the following physical requirements, specified as minimum or maximum, not average roll properties:

Properties	
Weight (mass), grams per square meter, minimum, ASTM Designation D 5261 *	271
Grab tensile strength, kiloNewtons, minimum 25 mm grip, both directions, ASTM Designation D 4632 *	0.89
Elongation at break, percent, minimum, ASTM Designation D 4632 *	50
Toughness, kN-percent, minimum, (percent elongation times grab tensile strength) for example 0.93 kN x 60 = 55.8.	53

* or appropriate test method for comparable geotextile polymer material

A certificate of compliance shall be furnished in accordance with the provision of Section 6-1.07, "Certificates of Compliance" of the Standard Specifications.

INSTALLATION.--Geomembrane and geotextile cushion fabric shall be installed in accordance with the following requirements:

Material Configuration.--A separate bottom geotextile cushion fabric shall first be placed directly on subgrade and other surfaces. Geomembrane shall then be placed. Then another separate geotextile cushion fabric shall be placed on top of the geomembrane.

Subgrade.--Subgrade shall be free of sharp protruding materials and objects.

Anchor trenches.--The transverse and longitudinal edges of the sandwiched geomembrane and geotextile cushion fabrics shall be anchored in trenches at least 150 mm deep, as shown on the plans.

Joints.--Segments of fabric shall be shingled. Overlaps shall be a minimum of 300 mm.

Damage.--No construction equipment shall drive directly on the geomembrane or geotextile cushion fabric. Damage to the materials resulting from the Contractor's vehicles, equipment, or operations shall be replaced or repaired by the Contractor at his expense. Any damaged material shall be either completely replaced or repaired with new material according to the above specifications for joints, except that 450 mm of patching material shall extend beyond any damage.

Full compensation for installing Temporary Sediment Basins including grading, installing geomembrane and geotextile cushion fabric, drainage pipe, grated metal pipe inlets, maintenance, modifying basins throughout construction and final removal of temporary sediment basins and materials, shall be considered as included in the contract Lump sum price paid for Water Pollution Control and no separate payment will be made therefor.

10-1.40 IRRIGATION CROSSOVERS

Irrigation crossovers shall conform to the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications and these special provisions.

Irrigation crossovers shall include conduits, water line crossovers, sprinkler control crossovers and appurtenances. Sizes of the conduits, water line crossovers and sprinkler control crossovers shall be as shown in the table for "Irrigation Crossovers" in the plans.

Conduits shall be placed in open trenches in accordance with the provisions in Section 20-5.03B, "Conduit for Water Line Crossovers and Sprinkler Control Crossovers," of the Standard Specifications.

Conduits shall be corrugated high density polyethylene (HDPE) pipe. Corrugated high density polyethylene pipe shall conform to ASTM Designation: F 405 or F 667, or AASHTO Designation: M 252 or M 294 and shall be Type S. Couplings and fittings shall be as recommended by the pipe manufacturer.

Water line crossovers shall conform to the provisions in Section 20-5.03C, "Water Line Crossovers," of the Standard Specifications, and shall be polyvinyl chloride (PVC) plastic pipe, 1120 or 1220. PVC plastic pipe water line crossovers shall have a minimum pressure rating (PR) of 315 unless otherwise shown on the plans..

Sprinkler control crossovers shall conform to the provisions in Section 20-5.027D, "Sprinkler Control Crossovers," of the Standard Specifications.

Full compensation for sprinkler control crossovers, water line crossovers and appurtenances, and for pressure testing water line crossover in the conduit shall be considered as included in the contract price paid per meter for 200mm corrugated high density polyethylene pipe conduit and no additional compensation will be allowed therefor.

10-40A WATER METERS

Water meters for the irrigation systems will be furnished and installed by the serving utility at the locations shown on the plans.

The Contractor shall make the arrangements and pay the costs and fees required by the serving utility.

The San Jose Water Company has established a fee of \$ 5,500.00 for furnishing and installing a water meter. If, at the time of installation, this fee has been changed, the State will take a credit for any reduction in the fee, or the State will pay the difference for any increase in the fee. The credit or payment will be taken or paid on the first monthly progress payment made after the meter is installed. The Contractor shall furnish the Engineer with a copy of the invoice for the installation fee.

Attention is directed to Section 20-4.06, "Watering," of the Standard Specifications. The Contractor shall make the arrangements for furnishing and applying water until the water meters have been installed by the serving utility.

The quantity of water meters will be measured as units determined from actual count in place.

The contract unit price paid for water meter shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing water meters, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.41 AGGREGATE BASE

Aggregate base shall be Class 3 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

The first paragraph of Section 26-1.02B, "Class 3 Aggregate Base," of the Standard Specifications is amended by adding the following sentences:

Aggregate may include or consist of material processed from reclaimed asphalt concrete, portland cement concrete, lean concrete base, cement treated base, glass or a combination of any of these materials. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

Aggregate for Class 3 aggregate base shall conform to the following requirements:

Grading Requirements (Percentage Passing)

19 mm Maximum

Sieve Sizes	Operating Range	Contract Compliance
50 mm		
37.5 mm		
25 mm	100	100
19 mm	90-100	87-100
4.75 mm	35-60	30-65
600- μ m	10-30	5-35
75- μ m	2-11	0-14

Except for the grading requirements, all requirements pertaining to Class 2 aggregate base as specified in Section 26-1.02 "Class 2 Aggregate Base," of the Standard Specifications shall apply to Class 3 aggregate base.

The aggregate shall not be treated with lime, cement or other chemical material before the Durability Index test is performed. Untreated reclaimed asphalt concrete and portland cement concrete will not be considered to be treated with lime, cement or other chemical material for purposes of performing the Durability Index test.

10-1.42 ASPHALT CONCRETE

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

The amount of asphalt binder used in asphalt concrete placed in overside drains 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.

The miscellaneous areas to be paid for at the contract price per square meter for place asphalt concrete (miscellaneous area) in addition to the prices paid for the materials involved shall be limited to the areas listed on the plans.

If the Contractor selects the batch mixing method, asphalt concrete shall be produced by the automatic batch mixing method as provided in Section 39-3.03A(2), "Automatic Proportioning," of the Standard Specifications.

10-1.43 CONCRETE STRUCTURES

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

General.—Portland cement to be used in portland cement concrete for concrete structures shall be "Type II Modified."

Shotcrete shall not be used as an alternative construction method for reinforced concrete members unless otherwise specified.

The first sentence of the tenth paragraph in Section 51-1.05, "Forms," of the Standard Specifications is amended to read:

Form panels for exposed surfaces shall be plywood conforming to or exceeding the requirements of U.S. Product Standard PS 1 for Exterior B-B (Concrete Form) Class I Plywood or any material which will produce a smooth uniform concrete surface substantially equal to that which would result from the use of that plywood.

The third paragraph in Section 51-1.15, "Drains in Walls," of the Standard Specifications is amended to read:

In addition to the drain holes and weep holes specified in the preceding paragraph, holes approximately 75 mm in diameter for relief of hydrostatic pressure shall be provided at the bottom of walls, immediately above the footing, at approximately 4500-mm centers.

MEASUREMENT AND PAYMENT.--Measurement and payment for concrete in structures shall conform to the provisions in Sections 51-1.22, "Measurement," and 51-1.23, "Payment," of the Standard Specifications.

10-1.44 REINFORCEMENT

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

The first paragraph of Section 52-1.02A, "Bar Reinforcement," of the Standard Specifications is amended to read:

52-1.02A Bar Reinforcement.--Reinforcing bars shall be low-alloy steel deformed bars conforming to the requirements in ASTM Designation: A 706/A 706M, except that deformed or plain billet-steel bars conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 300 or 420, may be used as reinforcement in the following 5 categories:

1. Slope and channel paving;
2. Minor structures;
3. Sign and signal foundations (pile and spread footing types);
4. Roadside rest facilities; and
5. Concrete barrier Type 50 and Type 60 series and temporary railing.

Deformations specified in ASTM Designation: A 706/A 706M will not be required on bars used as spiral or hoop reinforcement in structures and concrete piles.

Section 52-1.02C, "Welded Wire Fabric," of the Standard Specifications is amended to read:

52-1.02C Welded Wire Fabric.--Welded wire fabric shall be either plain or deformed conforming to the requirements in ASTM Designation: A 185 or ASTM Designation: A 497, respectively.

The last paragraph of Section 52-1.07, "Placing," of the Standard Specifications is amended to read:

Whenever a portion of an assemblage of bar reinforcing steel that is not encased in concrete exceeds 6 m in height, the Contractor shall submit to the Engineer for approval, in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," working drawings and design calculations for the temporary support system to be used. The working drawings and design calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California. The temporary support system shall be designed to resist all expected loads and shall be adequate to prevent collapse or overturning of the assemblage. If the installation of forms or other work requires revisions to or temporary release of any portion of the temporary support system, the working drawings shall show the support system to be used

during each phase of construction. The minimum horizontal wind load to be applied to the bar reinforcing steel assemblage, or to a combined assemblage of reinforcing steel and forms, shall be not less than 960 Pa on the gross projected area of the assemblage.

The first paragraph of Section 52-1.08, "Splicing," of the Standard Specifications is amended to read:

52-1.08 Splicing.—Splicing of reinforcing bars shall be by lapping, butt welding, mechanical butt splicing, or mechanical lap splicing, at the option of the Contractor. Reinforcing bars Nos. 43 through 57 shall not be spliced by lapping.

The sixth paragraph of Section 52-1.08, "Splicing," of the Standard Specifications is amended to read:

Except when otherwise specified, mechanical lap splicing shall conform to the details shown on the plans, the requirements for mechanical butt splices as specified in this Section 52-1.08, and Sections 52-1.08C, "Mechanical Butt Splices," 52-1.08D, "Qualification of Welding and Mechanical Splicing," and 52-1.08E, "Job Control Tests," and the following:

The mechanical lap splice shall be a unit consisting of a sleeve, in which the reinforcing bars are positioned, and a wedge driven through holes in the sleeve and between the reinforcing bars. The mechanical lap splice shall only be used for splicing non-epoxy-coated deformed reinforcing bars Nos. 13, 16 and 19.

The eighth and ninth paragraphs of Section 52-1.08, "Splicing," of the Standard Specifications are amended to read:

Unless otherwise shown on the plans or approved by the Engineer, splices in adjacent reinforcing bars at any particular section shall be staggered. The minimum distance between staggered lap splices or mechanical lap splices shall be the same length required for a lapped splice in the largest bar. The minimum distance between staggered butt splices shall be 600 mm. Distances shall be measured between the midpoints of the splices along a line which is centered between the axes of the adjacent bars.

Completed butt splices shall develop a minimum tensile strength, based on the nominal bar area, of 430 MPa for ASTM Designation: A 615/A 615M, Grade 300 bars, and 550 MPa for ASTM Designation: A 615/A 615M, Grade 420 and ASTM Designation: A 706/A 706M bars. If butt splices are made between 2 bars of dissimilar strengths, the minimum required tensile strength for the splice shall be that required for the weaker bar.

The second sentence of the eleventh paragraph of Section 52-1.08, "Splicing," of the Standard Specifications is amended to read:

Job control tests shall be made on sample splices representing each lot of mechanical butt splices as provided in Section 52-1.08E, "Job Control Tests."

The third and fourth paragraphs of Section 52-1.08A, "Lapped Splices," of the Standard Specifications are amended to read:

Where ASTM Designations: A 615/A 615M, Grade 420 or A 706/A 706M reinforcing bars are required, the length of lapped splices shall be as follows: Reinforcing bars No. 25, or smaller, shall be lapped at least 45 diameters of the smaller bar joined, and reinforcing bars Nos. 29, 32 and 36 shall be lapped

at least 60 diameters of the smaller bar joined, except when otherwise shown on the plans.

Where ASTM Designation: A 615/A 615M, Grade 300 reinforcing bars are permitted, the length of lapped splices shall be as follows: Reinforcing bars No. 25, or smaller, shall be lapped at least 30 diameters of the smaller bar joined, and reinforcing bars Nos. 29, 32 and 36 shall be lapped at least 45 diameters of the smaller bar joined, except when otherwise shown on the plans.

Section 52-1.08B, "Butt Welded Splices," of the Standard Specifications is amended to read:

52-1.08B Butt Welded Splices.—Butt welded splices in reinforcing bars shall be complete joint penetration butt welds conforming to the requirements in AWS D1.4, and the requirements of these specifications and the special provisions.

At the option of the Contractor, shop produced resistance butt welds, that are produced by a fabricator who is approved by the Transportation Laboratory, may be used. These welds shall conform to the requirements of these specifications and the special provisions.

Only the joint details and dimensions as shown in Figure 3.2, "Direct Butt Joints," of AWS D 1.4-92, shall be used for making complete joint penetration butt welds of bar reinforcement. Split pipe backing shall not be used.

Material used as backing for complete joint penetration butt welds of bar reinforcement shall be a flat plate conforming to the requirements in ASTM Designation: A 709/A 709M, Grade 36[250]. The flat plate shall be 6 mm thick with a width, as measured perpendicular to the axis of the bar, equal to the nominal diameter of the bar, and a length which does not exceed twice the nominal diameter of the bar. The flat plate backing shall be fitted tightly to the bar with the root of the weld centered on the plate. Any bar deformation or obstruction preventing a tight fit shall be ground smooth and flush with the adjacent surface. Tack welds used to fit backing plates shall be within the weld root area so that they are completely consumed by the finished weld. Backing plates shall not be removed.

Butt welds shall be made with multiple weld passes using a stringer bead without an appreciable weaving motion. The maximum stringer bead width shall be 2.5 times the diameter of the electrode and slagging shall be performed between each weld pass. Weld reinforcement shall not exceed 4 mm in convexity.

Before any electrodes or flux-electrode combinations are used, the Contractor, at the Contractor's expense, shall furnish certified copies of test reports for all the pertinent tests specified in AWS A5.1, AWS A5.5, AWS A5.18 or AWS A5.20, whichever is applicable, made on electrodes or flux-electrode combinations of the same class, brand and nearest specified size as the electrodes to be used. The tests may have been made for process qualification or quality control, and shall have been made within one year prior to manufacture of the electrodes and fluxes to be used. The report shall include the manufacturer's certification that the process and material requirements were the same for manufacturing the tested electrodes and the electrodes to be used. The forms and certificates shall be as directed by the Engineer.

Electrodes for manual shielded metal arc welding of ASTM Designation: A 615/A 615M, Grade 420 bars shall conform to the requirements in AWS A5.5 for E9018-M or E10018-M electrodes.

Electrodes for manual shielded metal arc welding of ASTM Designation: A 706/A 706M bars shall conform to the requirements of AWS A5.5 for E8016-C3 or E8018-C3 electrodes.

Solid and composite electrodes for semiautomatic gas metal-arc and flux-cored arc welding of Grade 300 reinforcing bars shall conform to the requirements of AWS A5.18 for ER70S-2, ER70S-3, ER70S-6 or ER70S-7 electrodes; or AWS A5.20 for E70T-1, E70T-5, E70T-6 or E70T-8 electrodes.

Electrodes for semiautomatic welding of ASTM Designation: A 615/A 615M, Grade 420 and ASTM Designation: A 706/A 706M bars shall produce a weld metal

deposit with properties conforming to the requirements of Section 5.3.4 of AWS D1.1-96 for ER80S-Ni1, ER80S-Ni2, ER80S-Ni3, ER80S-D2, E90T1-K2 and E91T1-K2 electrodes.

Reinforcing bars shall be preheated for a distance of not less than 150 mm on each side of the joint prior to welding.

For all welding of ASTM Designation: A 615/A 615M, Grade 300 or Grade 420 bars, the requirements of Table 5.2, "Minimum Preheat and Interpass Temperatures," of AWS D1.4-92 are superseded by the following:

The minimum preheat and interpass temperatures shall be 200°C for Grade 300 bars and 300°C for Grade 420 bars. Immediately after completing the welding, at least 150 mm of the bar on each side of the splice shall be covered by an insulated wrapping to control the rate of cooling. The insulated wrapping shall remain in place until the bar has cooled below 90°C.

When welding different grades of reinforcing bars, the electrode shall conform to Grade 300 bar requirements and the preheat shall conform to the Grade 420 bar requirements.

In the event that any of the specified preheat, interpass and post weld cooling temperatures are not met, all weld and heat affected zone metal shall be removed and the splice rewelded.

Welding shall be protected from air currents, drafts, and precipitation to prevent loss of heat or loss of arc shielding. The method of protecting the welding area from loss of heat or loss of arc shielding shall be subject to approval by the Engineer.

Reinforcing bars shall not be direct butt spliced by thermite welding.

The first paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

52-1.08C Mechanical Butt Splices.—Mechanical butt splices shall be the sleeve-filler metal type, the sleeve-threaded type, the sleeve-swaged type, the sleeve-filler grout type, the sleeve-lockshear bolt type, the two-part sleeve-forged bar type, or the two-part sleeve-friction bar type, at the option of the Contractor.

The third paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

The total slip of the reinforcing bars within the splice sleeve after loading in tension to 200 MPa and relaxing to 20 MPa shall not exceed the following, measured between gage points clear of the splice sleeve: 250 µm for reinforcing bars No. 43, or smaller, or 750 µm for reinforcing bars No. 57.

The following is added after the third paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications:

Slip requirements shall not apply to mechanical lap splices.

The fourth subparagraph of the last paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

4. A statement that the splicing systems and materials used in accordance with the manufacturer's procedures will develop not less than the minimum tensile strengths, based on the nominal bar area, of 430 MPa for ASTM Designation: A 615/A 615M, Grade 300 bars and 550 MPa for ASTM Designations: A 615/A 615M, Grade 420 and A 706/A 706M bars, and will comply with the total slip requirements and the other requirements in these specifications.

Section 52-1.08C(5), "Sleeve-Extruded Mechanical Butt Splices," of the Standard Specifications is amended to read:

52-1.08C(5) Sleeve-Lockshear Bolt Mechanical Butt Splices.—The sleeve-lockshear bolt type of mechanical butt splices shall consist of a seamless steel sleeve, 2 serrated steel strips welded to the inside of the sleeve, center hole with centering pin, and bolts that are tightened until the bolt heads shear off and the bolt ends are embedded in the reinforcing bars.

52-1.08C(6) Two-Part Sleeve-Forged Bar Mechanical Butt Splices.—The two-part sleeve-forged bar type of mechanical butt splices shall consist of a shop machined two-part threaded steel sleeve that interlocks 2 hot-forged reinforcing bars ends. The forged bar ends may be either shop produced or field produced.

52-1.08C(7) Two-Part Sleeve-Friction Bar Mechanical Butt Splices.—The two-part sleeve-friction bar type of mechanical butt splices shall consist of a shop machined two-part threaded steel sleeve whose ends are friction welded, in the shop, to the reinforcing bars ends.

The fourth paragraph of Section 52-1.08D, "Qualification of Welding and Mechanical Splicing," of the Standard Specifications is amended to read:

Each operator qualification test for mechanical splices shall consist of 2 sample splices. Each mechanical splice procedure test shall consist of 2 sample splices.

For sleeve-filler, sleeve-threaded, sleeve-lockshear bolt and two-part sleeve friction bar mechanical butt splices, all sample splices shall be made on the largest reinforcing bar size to be spliced by the procedure or operator being tested except that No. 43 bars may be substituted for No. 57 bars.

For sleeve-swaged and two-part sleeve-forged mechanical butt splices, and mechanical lap splices, all sample splices shall be made on the largest reinforcing bar size of each deformation pattern to be spliced by the procedure or operator being tested. When joining new reinforcing bars to existing reinforcement, the qualification test sample bars shall be made using only the deformation patterns of the new reinforcement to be joined.

Section 52-1.08E, "Job Control Tests," of the Standard Specifications is amended to read:

52-1.08E Job Control Tests.—When mechanical butt splices, shop produced complete joint penetration butt welded splices, or shop produced resistance butt welded splices are used, the Contractor shall furnish job control tests from a local qualified testing laboratory. A job control test shall consist of the fabrication, under conditions used to produce the splice, and the physical testing of 3 sample splices for each lot of 150 splices.

A lot of mechanical butt splices is defined as 150, or fraction thereof, of the same type of mechanical butt splices used for each combination of bar size and bar deformation pattern that is used in the work.

A lot of shop produced complete joint penetration butt welded splices, or shop produced resistance butt welded splices, is defined as 150, or fraction thereof, of the same type of welds used for each combination of bar size and bar deformation pattern that is used in the work.

When joining new reinforcing bars to existing reinforcement, the job control test shall be made using only the deformation patterns of the new reinforcement to be joined.

A sample splice shall consist of a splice made at the job site to connect two 760 mm, or longer, bars using the same splice materials, position, location, and equipment, and following the same procedures as are being used to make splices in the work. Shorter sample splice bars may be used if approved by the Engineer.

Sample splices shall be made and tested in the presence of the Engineer or the Engineer's authorized representative.

Sample splices shall be suitably identified with weatherproof markings prior to shipment to the testing laboratory.

For sleeve-threaded mechanical butt splices, the reinforcing bars to be used for job control tests shall be fabricated on a random basis during the cutting of threads on the reinforcing bars of each lot and shipped to the job site with the material they represent.

For shop produced complete joint penetration butt welds, shop produced resistance butt welded splices and all types of mechanical butt splices, except the sleeve-threaded type, the Engineer will designate when samples for job control tests are to be fabricated, and will determine the limits of the lot represented by each job control test.

Should the average of the results of tests made on the 3 sample splices or should more than one sample splice in any job control test fail to meet the requirements for splices, all splices represented by that test will be rejected in accordance with the provisions in Section 6-1.04, "Defective Materials," of the Standard Specifications. This rejection shall prevail unless the Contractor, at the Contractor's expense, obtains and submits evidence, of a type acceptable to the Engineer, that the strength and quality of the splices in the work are acceptable.

Section 52-1.08F, "Nondestructive Splice Tests," of the Standard Specifications is amended to read:

52-1.08F Nondestructive Splice Tests.—All required radiographic examinations of complete joint penetration butt welded splices shall be performed by the Contractor in accordance with the requirements of AWS D1.4 and these specifications.

Prior to radiographic examination, welds shall meet the requirements of Section 4.4, "Quality of Welds," of AWS D1.4-92.

Radiographic examinations shall be performed on 25 percent of all complete joint penetration butt welded splices from a production lot. The size of a production lot will be a maximum of 100 splices. The Engineer will select the splices which will compose the production lot and also the splices within each production lot to be radiographically examined.

Should more than 12 percent of the splices which have been radiographically examined in any production lot be defective, an additional 25 percent of the splices, selected by the Engineer from the same production lot, shall be radiographically examined. Should more than 12 percent of the cumulative total of splices tested from the same production lot be defective, all remaining splices in the lot shall be radiographically examined.

Additional radiographic examinations performed due to the identification of defective splices shall be at the Contractor's expense.

All defects shall be repaired in accordance with the requirements of AWS D1.4.

Radiographic examinations will not be required for either shop produced complete joint penetration butt welds or shop produced resistance butt welded splices of No. 25 or smaller bars used as spiral or hoop reinforcement.

In addition to radiographic examinations performed by the Contractor, any mechanical or welded splice may be subject to inspection or nondestructive testing by the Engineer. The Contractor shall provide sufficient access facilities in the shop and at the jobsite to permit the Engineer or his agent to perform the inspection or testing.

The Contractor shall notify the Engineer in writing 48 hours prior to performing any radiographic examinations.

The radiographic procedure used shall conform to the requirements of ASME Boiler and Pressure Vessels Code, Section V, Article 2 and the following:

Two exposures shall be made for each complete joint penetration butt welded splice. For each of the two exposures, the radiation source shall be centered on each bar to be radiographed. The first exposure shall be made with the radiation source placed at zero degrees from the top of the weld and perpendicular to the weld root and identified with a station mark of "0." When obstructions prevent a zero degree placement of the radiation source for the first exposure, and when approved in writing by the Engineer, the source may be rotated, around the centerline of the reinforcing bar, a maximum of 25 degrees. The second exposure shall be at 90 degrees to the "0" station mark and shall be identified with a station mark of "90."

For field produced complete joint penetration butt welds, no more than one weld shall be radiographed during one exposure. For shop produced complete joint penetration butt welds, if more than one weld is to be radiographed during one exposure, the angle between the root line of each weld and the direction to the radiation source shall be not less than 65 degrees.

Radiographs shall be made by either X-ray or gamma ray. Radiographs made by X-ray or gamma rays shall have densities of not less than 2.3 nor more than 3.5 in the area of interest. A tolerance of 0.05 in density is allowed for densitometer variations. Gamma rays shall be from the iridium 192 isotope and the emitting specimen shall not exceed 4.45 mm in the greatest diagonal dimension.

The radiographic film shall be placed perpendicular to the radiation source at all times; parallel to the root line of the weld unless source placement determines that the film must be turned; and as close to the root of the weld as possible.

The minimum source to film distance shall be maintained so as to insure that all radiographs maintain a maximum geometric unsharpness of 0.020 at all times, regardless of the size of the reinforcing bars.

Penetrameters shall be placed on the source side of the bar and perpendicular to the radiation source at all times. One penetrometer shall be placed in the center of each bar to be radiographed, perpendicular to the weld root, and adjacent to the weld. Penetrometer images shall not appear in the weld area.

When radiography of more than one weld is being performed per exposure, each exposure shall have a minimum of one penetrometer per bar, or 3 penetrameters per exposure. When 3 penetrameters per exposure are used, one penetrometer shall be placed on each of the 2 outermost bars of the exposure, and the remaining penetrometer shall be placed on a centrally located bar.

An allowable weld buildup of 4 mm may be added to the total material thickness when determining the proper penetrometer selection. No image quality indicator equivalency will be accepted. Wire penetrameters or penetrometer blocks shall not be used.

Penetrameters shall be sufficiently shimmed using a radiographically identical material. Penetrometer image densities shall be a minimum of 2.0 and a maximum of 3.6.

All radiographic film shall be Class 1, regardless of the size of reinforcing bars.

Radiographs shall be free of film artifacts and processing defects, including, but not limited to, streaks, scratches, pressure marks, or marks made for the purpose of identifying film or welding indications.

Each splice shall be clearly identified on each radiograph and the radiograph identification and marking system shall be established between the Contractor and the Engineer before radiographic inspection begins. Film shall be identified by lead numbers only; etching, flashing, or writing in identifications of any type will not be permitted. Each piece of film identification information shall be legible and shall include, as a minimum, the following information: Contractor's name, date, name of nondestructive testing firm, initials of radiographer, contract number, part number, and

weld number. The letter "R" and repair number shall be placed directly after the weld number to designate a radiograph of a repaired weld.

Radiographic film shall be developed within a time range of one minute less to one minute more than the film manufacturer's recommended maximum development time. Sight development will not be allowed.

Processing chemistry shall be done with a consistent mixture and quality, and processing rinses and tanks shall be clean to ensure proper results. Records of all developing processes and any chemical changes to the developing processes shall be kept and furnished to the Engineer upon request. The Engineer may request, at any time, that a sheet of unexposed film be processed in the presence of the Engineer to verify processing chemical and rinse quality.

All radiographs shall be interpreted and graded by a Level II or Level III technician who is qualified in accordance with the American Society for Nondestructive Testing's Recommended Practice No. SNT-TC-1A. The results of these interpretations shall be recorded on a signed certification and a copy kept with the film packet.

Technique sheets prepared in accordance with ASME Boiler and Pressure Vessels Code, Section V, Article 2 Section T-291 shall also contain the developer temperature, developing time, fixing duration and all rinse times.

All radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the Contractor's Quality Control Manager (QCM), name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the Contractor's Quality Control Plan (QCP). In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the Contractor's QCP.

The third paragraph of Section 52-1.10, "Measurement," of the Standard Specifications is amended to read:

The lap of bars for all splices, including splices shown on the plans where a continuous bar is used, will be measured for payment. The mass calculated shall be based upon the following table:

BAR REINFORCING STEEL

Deformed Bar Designation Number	Mass Kilogram Per Meter	Nominal Diameter, Millimeters
10	0.560	9.5
13	0.994	12.7
16	1.552	15.9
19	2.235	19.1
22	3.042	22.2
25	3.973	25.4
29	5.060	28.7
32	6.404	32.3
36	7.907	35.8
43	11.38	43.0
57	20.24	57.3

Note: Bar numbers approximate the number of millimeters of the nominal diameter of the bars. The nominal diameter of a deformed bar is equivalent to the diameter of a plain round bar having the same mass per meter as the deformed bar.

MEASUREMENT AND PAYMENT.--Measurement and payment for reinforcement in structures shall conform to the provisions in Sections 52-1.10, "Measurement," and 52-1.11, "Payment," of the Standard Specifications.

10-1.45 ALTERNATIVE PIPE

Alternative pipe culverts shall conform to the provisions in Section 62, "Alternative Culverts," of the Standard Specifications and these special provisions.

10-1.46 PLASTIC PIPE DRAIN

Plastic pipe drain shall conform to the provisions in Section 64, "Plastic Pipe," of the Standard Specifications and these special provisions.

The first paragraph in Section 64-1.01, "Description," of the Standard Specifications is amended to read:

64-1.01 Description.--This work shall consist of furnishing and installing corrugated or ribbed plastic pipe for culverts, drains and conduits, with all necessary fittings and coupling systems, as shown on the plans or as determined by the Engineer in conformance with the provisions in these specifications and the special provisions.

The second paragraph in Section 64-1.01, "Description," of the Standard Specifications is amended to read:

Plastic pipe shall be either Type C, Type D or Type S corrugated polyethylene pipe, or ribbed profile wall polyethylene pipe or ribbed polyvinyl chloride (PVC) drain pipe.

The fourth paragraph in Section 64-1.01, "Description," of the Standard Specifications is amended to read:

Where designated on the plans as smooth interior wall type, plastic pipe shall be, at the Contractor's option, either Type D or Type S corrugated polyethylene pipe, or ribbed profile wall polyethylene pipe or ribbed PVC drain pipe.

The first subparagraph of the first paragraph in Section 64-1.02, "Materials" of the Standard Specifications is amended to read:

Type C, Type D and Type S corrugated polyethylene pipe shall conform to the requirements in AASHTO Designation: M 294 and MP6-95, except as otherwise specified.

The first paragraph in Section 64-1.03, "Pipe Thickness, Stiffness and Unit Mass," of the Standard Specifications is amended to read:

64-1.03 Pipe Thickness, Stiffness and Unit Mass.--Wall thickness of Type C corrugated polyethylene pipe shall be measured at the inside valley of the corrugation. Wall thickness of Type D corrugated polyethylene pipe shall be measured as the thickness of the inner liner. Wall thickness of Type S corrugated polyethylene pipe shall be the thickness of the inner liner measured between corrugation valleys. Wall thickness of ribbed profile wall polyethylene pipe shall be measured in the gap between ribs. The wall thickness of the various types of polyethylene pipe, measured as specified above, shall equal or exceed the minimum wall thickness values in Table 1. The wall thickness of ribbed profile wall PVC pipe measured in the gap between ribs shall equal or exceed the minimum wall thickness values in Table 3.

Tables 1, 2 and 3 in Section 64-1.03, "Pipe Thickness, Stiffness and Unit Mass," are amended to read:

TABLE 1
HDPE Pipe

Nominal Diameter (millimeters)	Minimum Wall Thickness (millimeters)	Minimum Pipe Stiffness (kPa)
300	0.89	345
375	0.89	290
450	1.27	275
525	1.27	260
600	1.27	235
675	1.27	215
750	1.27	195
825	1.27	170
900	1.27	150
1050	1.80	140
1200	1.80	125

TABLE 2
HDPE Pipe

Nominal Diameter (millimeters)	Minimum Unit Mass			
	Type C Corrugated (Kilograms per meter)	Type D Corrugated (Kilograms per meter)	Type S Corrugated (Kilograms per meter)	Ribbed (Kilograms per meter)
300	4.2	na	4.0	na
375	6.0	na	6.0	na
450	8.6	na	8.9	14.3
525	na	na	na	19.6
600	14.3	na	15.2	26.2
675	na	na	na	na
750	na	na	22.3	na
825	na	na	na	na
900	na	na	26.9	na
1050	na	33.0	33.0	na
1200	na	47.5	40.1	na

Note: "na" in the above table indicates that the pipe size of that type of pipe either is not available from manufacturers or has not been approved for use.

TABLE 3
Ribbed PVC Pipe

Nominal Diameter (millimeters)	Minimum Wall Thickness (millimeters)	Minimum Pipe Stiffness (kPa)	Minimum Pipe Unit Mass (kilograms per meter)
450	2.41	220	11.9
525	2.67	190	16.4
600	2.92	165	19.3
675	3.18	150	25.3
750	3.43	130	29.8
900	3.94	110	40.2
1050	4.32	95	56.6
1200	4.83	80	77.4

Section 64-1.04, "Joints," of the Standard Specifications is amended to read:

64-1.04 Joints.—Plastic pipe culvert joints shall conform to either standard or positive joint requirements in Section 61-1.02, "Performance Requirements for Culvert and Drainage Pipe Joints," except that where sleeve joint connections are utilized, the sleeve minimum width shall be 195 mm, and at least two corrugations from each pipe to be joined are engaged by the sleeve.

Where watertight joints are not specified, Type S corrugated polyethylene pipe shall incorporate, on each side of the joint, a closed-cell expanded rubber gasket meeting the requirements of ASTM Designation: D 1056, Grade 2A2. Type D corrugated polyethylene pipe shall incorporate a rubber gasket in a groove on the spigot end of the pipe. The gasket for Type D polyethylene pipe shall meet the requirements of ASTM Designation: F 477 or D 1056, Grade 2A2. The gaskets described in this paragraph shall be installed by the pipe manufacturer. Pipe shall be stored in a manner that protects the gaskets from weather. Cracks or splits occurring on gaskets will be cause for rejection.

Corrugated polyethylene pipe joints manufactured to conform to the integral joint provisions in Section 61-1.02, "Performance Requirements for Culvert and Drainage Pipe Joints," shall be laid to line and grade with the sections jointed closely. Corrugated polyethylene pipe to be joined by sleeve joints shall be laid to line and grade with the separate sections not more than 40 mm apart and then joined together firmly with at least 2 corrugations from each pipe section engaged in the coupler.

Joints for pipe designated on the plans as watertight, shall be watertight under pressure and all conditions of expansion, contraction, and settlement, and shall conform to the provisions for watertightness in Section 61-1.02, "Performance Requirements for Culvert and Drainage Pipe Joints."

10-1.47 CORRUGATED METAL PIPE

Corrugated Steel Pipe and Slotted Corrugated Steel Pipe shall conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications and these special provisions.

Corrugated steel pipe shall be fabricated from zinc-coated steel sheet.

The first paragraph in Section 66-1.03, "Protective Coatings, Linings and Pavings," of the Standard Specifications is amended to read:

66-1.03 Protective Coatings, Linings and Pavings.—When required by the special provisions or designated in the Engineer's Estimate, pipes shall be protected with bituminous coating, bituminous lining or have the invert paved with bituminous material or coated with polymerized asphalt. Moisture, dirt, oil, unbonded or incompatible paint, grease, alkalies or other foreign matter

shall be removed from the surface to be coated before the coating material is applied.

Section 66-1.03, "Protective Coatings, Linings and Pavings," of the Standard Specifications is amended by adding the following paragraphs after the eighth paragraph:

Polymerized asphalt invert coating shall be applied in conformance with the requirements in ASTM Designation: A 849 for "Invert Paved Type with Polymer Material (Class P)," except that polymerized asphalt coatings shall be applied by immersion to a minimum thickness of 1.3 mm above the crests and troughs of the corrugations of the interior and exterior invert including pipe ends. Polymerized asphalt material shall conform to the "Requirements for Polymer Coating" contained in ASTM Designation: A 742/A 742M, and the following:

Polymerized asphalt shall be hot-applied thermoplastic material containing a minimum of 7.0 percent styrene-butadiene-styrene block copolymer.

There shall be not more than 6.4 mm undercutting or delamination from the scribe when a minimum 300 mm by 300 mm coupon cut from the coated pipe is exposed for 1000 hours in accordance with the requirements in ASTM Designation: B 117. Cut edges shall be sealed by dipping in a sample of the polymerized asphalt coating heated to the manufacturer's recommended application temperature. There shall be no corrosion or delamination from the sealed edges following exposure as specified.

The last paragraph in Section 66-1.03, "Protective Coatings, Linings and Pavings," of the Standard Specifications is amended to read:

Damaged protective coatings, linings and invert paving shall be repaired by the Contractor at the Contractor's expense. Bituminous material conforming to the requirements in AASHTO Designation: M 190 or other materials approved by the Engineer shall be used to repair damaged bituminous coatings; asphalt mastic material conforming to the requirements in AASHTO Designation: M 243 shall be used to repair damaged asphalt mastic coatings; and tar base material conforming to the provisions of AASHTO Designation: M 243 shall be used to repair damaged polymeric coatings. The repair of damaged polymerized asphalt coatings shall conform to the requirements in ASTM Designation: A 762, Section 11, "Repair of Damaged Coatings."

Section 66-3.06, "Damaged Aluminum Coatings," of the Standard Specifications is amended to read:

66-3.06 Damaged Aluminum Coatings.—In lieu of the requirements in AASHTO Designation: M 36/M 36M, damaged aluminum coatings shall be repaired as provided for damaged galvanizing in Section 75-1.05, "Galvanizing," or Section 66-3.05, "Damaged Galvanizing."

10-1.48 UNDERDRAINS

Perforated plastic pipe underdrains shall conform to the provisions in Section 68-1, "Underdrains," of the Standard Specifications and these special provisions.

The first paragraph of Section 68-1.01, "Description," of the Standard Specifications is amended to read:

68-1.01 Description.—This work shall consist of furnishing and installing alternative pipe, perforated steel pipe, perforated aluminum pipe, and perforated plastic pipe or tubing underdrains, and furnishing and placing permeable material and filter fabric as shown on the plans or directed by the Engineer, and as specified in these specifications and the special provisions.

Sections 68-1.02A, "Clay Drain Tile," 68-1.02B, "Concrete Drain Tile," 68-1.02C, "Porous Concrete Pipe," 68-1.02E, "Perforated Clay Pipe," and 68-1.02H, "Perforated Concrete Pipe," of the Standard Specifications are hereby deleted.

The sixth paragraph in Section 68-1.03, "Installing Underdrains," of the Standard Specifications is amended to read:

Lengths of perforated steel pipe and perforated aluminum pipe shall be joined by couplers.

Permeable material shall be Class 3.

The percentage composition by mass of Class 3 permeable material in place shall conform to the following grading:

Grading Requirements	
Sieve Sizes	Percentage Passing
37.5-mm	100
25-mm	90 - 100
19-mm	40 - 100
9.5-mm	0 - 50
4.75-mm	0 - 15
2.36-mm	0 - 5

Class 3 permeable material shall have a Durability Index of not less than 40.

No less than 90 percent by weight of Class 3 permeable material shall be crushed particles as determined by California Test 205.

10-1.49 OVERSIDE DRAINS

Asphalt concrete overside drains shall conform to the provisions in Section 69, "Overside Drains," of the Standard Specifications.

10-1. 50 LOCATION A DRAINAGE

This work shall consist of constructing all Location A Drainage in accordance with these special provisions and the details shown on the plans. This work includes removing the existing headwall, wingwalls and automatic drainage gate, constructing a new headwall, mounting a new automatic drainage gate, constructing a manhole, installing a welded steel pipe, installing and grouting a plastic pipe liner, providing slope restoration, placing rock slope protection fabric and rock slope protection and installing reinforced concrete pipe in conformance with the design and details shown on the plans.

Plastic Pipe-Liner

Plastic pipe-liner shall be furnished and installed in the welded steel pipe at the locations shown on the plans and in accordance with the details shown on the plans and these special provisions.

Plastic pipe-liner shall have a nominal diameter, outside diameter and inside diameter as shown on the plans or specified.

At the Contractor's option, plastic pipe-liners shall be either:

Ribbed polyvinyl chloride (PVC) drain pipe conforming to the provisions of Section 64, "Plastic Pipe," of the Standard Specifications; or

Type S high density polyethylene (HDPE) pipe conforming to the provisions of Section 64, "Plastic Pipe," of the Standard Specifications; or

Polyvinyl chloride (PVC) closed profile wall pipe conforming to the requirements of ASTM Designation: F 794; or

High density polyethylene (HDPE) solid wall pipe conforming to the requirements of ASTM Designation: F 714.

In accordance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, a Certificate of Compliance shall be furnished to the Engineer for each type of plastic pipe-liner furnished.

Plastic pipe-liner joints shall be joint systems or couplers conforming to the manufacturer's requirements. Joint systems or couplers shall perform the intended function and comply with the "Standard" shear strength requirements set forth in Section 61-1.02, "Performance Requirements for Culvert and Drainage Pipe Joints," of the Standard Specifications. The Contractor shall furnish to the Engineer a Certificate of Compliance in accordance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, that the material being furnished conforms to the joint property requirements as described above.

The Contractor shall extend 1200 mm welded steel pipe before installation of plastic pipe liner.

The existing culvert shall be cleaned thoroughly prior to inserting the plastic pipe-liner. Earthy material, trash, cuttings and other waste materials removed from existing culverts shall be disposed of in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. During the installation of the plastic pipe-liner, the Contractor shall provide all necessary protection to prevent damage to the plastic pipe-liner and the existing culvert.

The entire annular space between the plastic pipe-liner and the existing culvert shall be filled with grout. All voids in and around the culvert shall also be filled for the entire length of the culvert.

The grout (low density foam concrete) shall be composed of water, portland cement, sand, and a foaming agent. The foaming agent shall conform to the requirements of ASTM Designations: C 869 and C 796. Portland cement shall conform to the requirements of Section 90-2.01, "Portland Cement," of the Standard Specifications. Sand shall be clean and free from deleterious coatings, clay balls, roots and other extraneous material and be of such size that all will pass a 2.36-mm sieve.

The grout shall have a cast density, at the point of placement, of between 675 and 950 kg/m³ and shall have a minimum compressive strength of 1400 kPa at 28 days. Compressive strength will be determined from test cylinders sampled, molded, cured, and tested in accordance with the provisions in Section 90-9, "Compressive Strength," of the Standard Specifications.

The water, cement, and sand shall be mixed prior to adding the foaming agent. The foaming agent shall not be added until the material is at the jobsite.

The Contractor shall determine the mix proportions of the grout.

Before using grout for which the mix proportions have been determined by the Contractor, the Contractor shall submit in writing to the Engineer a copy of the mix design for approval. Certified test data or trial batch reports, verifying that the mix design complies with the density and compressive strength requirements of these special provisions, shall be submitted with the mix design.

The Contractor shall develop and submit to the Engineer a grouting plan. The grouting plan shall address all aspects of the grouting procedure, including plans for diverting any existing stream flow. Grouting shall not begin until the grouting plan has been approved by the Engineer. The Contractor shall allow 2 days for review of the grouting plan.

Grouting pressure shall not exceed 35 kPa for plastic pipe-liners with a pipe stiffness of less than 200 kPa and the grouting pressure shall not exceed 50 kPa for all other plastic pipe-liners.

Prior to grouting, the existing culvert shall be free from water and debris. Grouting shall not begin until the existing stream flow has been temporarily diverted. Grout shall be placed in a continuous manner. The Contractor's placement method shall prevent floating or shifting of the plastic pipe-liner and shall also prevent segregation or voids from occurring in the grout mix.

Trenches or pits caused by the installation of plastic pipe liner shall be backfilled in accordance with the provisions in the second paragraph of Section 15-1.02 "Preservation of Property," of the Standard Specifications.

Reinforced Concrete Pipe

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe," of the Standard Specifications.

Welded Steel Pipe

Welded steel pipe shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

Automatic Drainage Gate

The automatic drainage gate shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions.

Headwall

Concrete headwalls shall be constructed in conformance with Section 51-1.02, "Minor Structures," of the Standard Specifications, as shown on the plans and as specified in these special provisions.

Manhole

Manholes shall be constructed in conformance with Section 70, "Miscellaneous Facilities," of the Standard Specifications, as shown on the details in the contract plans and as specified in these special provisions.

Remove Drainage Facilities

Existing headwalls, wingwalls and automatic drainage gates where shown on the plans to be removed, shall be completely removed and disposed of.

Slope Restoration

Slope restoration shall include regrading the slopes in accordance with Section 19, "Earthwork" of the Standard Specifications and providing surface treatment in accordance with the "Erosion Control (type D)" found elsewhere in these special provisions.

Slope Protection

Rock slope protection shall conform to the provisions in Section 72, "Slope Protection," of the Standard Specifications and these special provisions.

Rock slope protection fabric shall be woven or nonwoven type fabric, Type A or Type B, at the option of the Contractor.

The contract lump sum price paid for Location A Drainage shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Location A Drainage complete in place including removing the existing headwall, wingwalls and automatic drainage gate, constructing a new headwall, mounting a new automatic drainage gate, constructing a manhole, installing a welded steel pipe, installing and grouting a plastic pipe liner, providing slope restoration, placing rock slope protection fabric and rock slope protection and installing reinforced concrete pipe as shown on the plans, as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

10-1.51 MISCELLANEOUS FACILITIES

Alternative flared end sections and corrugated steel pipe risers shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions.

Debris rack cage shall conform to the provisions in Section 75-1.02 "Miscellaneous Iron and Steel" of the Standard Specifications and these special provisions.

Debris rack cage will be measured and paid for as unit.

Metal flared end sections shall be used with plastic pipe.

Class 3 permeable material for use with corrugated steel pipe risers shall conform to the provisions of Section 68-1.025, "Permeable Material," of the Standard Specifications and the following:

The percentage composition by mass of Class 3 permeable material in place shall conform to the following grading:

Sieve Sizes	Percentage Passing
37.5-mm	100
25-mm	90 - 100
19-mm	40 - 100
9.5-mm	0 - 50
4.75-mm	0 - 15
2.36-mm	0 - 5

Class 3 permeable material shall have a Durability Index of not less than 40.

No less than 90 percent by mass of Class 3 permeable material shall be crushed particles as determined by California Test 205.

Filter fabric for use with corrugated steel pipe risers shall conform to the requirements for filter fabric in Section 88, "Engineering Fabrics," of the Standard Specifications.

Full compensation for Class 3 permeable material and filter fabric for use with corrugated steel pipe risers shall be considered as included in the contract price paid per meter for corrugated steel pipe risers of the types listed in the Engineer's Estimate and no additional compensation will be allowed therefor.

10-1.52 WELDED STEEL PIPE

Welded steel pipe shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

10-1.53 AUTOMATIC DRAINAGE GATES

Heavy duty automatic drainage gates shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions.

The gates shall be designed to operate under 15 m of face pressure measured from the center of the gate cover to the highest water level. The gate shall provide for a free outflow, but shall prevent backflow. The gate shall be adaptable for attaching to the required pipe size or for anchoring to a concrete wall.

The gate shall be complete with cover, spigot-back seat, or flat-back or flange-back seat, gate links, bushings, bolts and nuts.

The gate cover and spigot-back seat, or flat-back or flangeback seat and pivot lugs and gate links shall be manufactured of cast steel or steel conforming to the specifications of ASTM Designation: A 27, Grade 65-35, or A 36/A 36M, respectively. The bushings shall be manufactured of commercial quality bronze. The assembly bolts, anchor bolts when required, and nuts shall conform to the specifications of ASTM Designation: A 307, Grade A. The gate links, bolts and nuts shall be galvanized in accordance with the specifications of ASTM Designation: A 153.

The gate cover shall be ribbed or domed with ample section to withstand the face pressure. The seating surfaces of the cover and spigot-back seat or flat-back or

flange-back seat shall be machined or ground to fit together within a tolerance of not more than 0.10-mm throughout their circumference.

The gate cover shall be hinged from the spigot-back seat, or flat-back or flange-back seat by 2 supporting links, one on each side of the gate, pivotally connected to the top of the seat and at the bottom to the cover above its center of gravity. Bushings of suitable length and diameter shall be provided at the 4 hinge points.

The gate shall be assembled in the shop and all parts shall be given a shop coat of commercial quality asphaltic paint furnished by the manufacturer.

The cover of the gate, when installed, shall fit tight against the seat when there is no pressure on the cover face.

The cover shall be equipped with an eye bolt at the bottom for opening the gate under pressure.

10-1.54 SLOPE PROTECTION

Slope protection shall conform to the provisions in Section 72, "Slope Protection," of the Standard Specifications and these special provisions.

Rock slope protection fabric shall be woven or nonwoven type fabric, Type B.

10-1.55 SACKED CONCRETE SLOPE PROTECTION

This work shall consist of placing sacked concrete slope as shown on the plans, in accordance with these special provisions, and as directed by the Engineer.

Materials.—The portland cement and mixing shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

The reinforcing bar pins shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications.

The aggregate used may be pit-run material, at least 80 percent of which shall pass a 50-mm sieve. The aggregates need not be separated into primary sizes before batching. Washing will be required only to provide that the cleanness value of the portion passing a 25-mm sieve and retained on a 4.75-mm sieve shall not be less than 50 and the Sand Equivalent of the portion passing a 4.75-mm sieve shall not be less than 85 percent of the strength developed by Ottawa sand.

The mixed concrete shall contain not less than 300 Kg of portland cement per cubic meter. The amount of water added at the time of mixing shall be such as will produce a mixture with a penetration of from 38-mm to 64-mm when tested in accordance with the method described in Section 90. "Portland Cement Concrete," of the Standard Specifications.

Sacks for concrete shall be made of at least 300-gram burlap and shall be approximately 500-mm x 910-mm measured inside the seams when the sack is laid flat. The capacity of each sack shall be approximately .04 cubic meter. Sound reclaimed sacks may be used. The sacks shall be filled with approximately .03 cubic meter of plastic concrete loosely placed so as to leave room for folding at the top. The fold shall be just enough to retain the concrete at the time of placing. Immediately after being filled with concrete, the sacks shall be placed and lightly trampled to cause them to conform with the slope and with adjacent sacks in place.

Placing.—The sacks shall be placed so that the face coverage per cubic meter of sacked concrete slope protection measured on the slope shall not be more than 2.5 square meters, exclusive of foundations, cut-off stubs, and end returns. The slope on which the sacked concrete is to be placed shall be finished within 60-mm of the grade established by the Engineer. The first course shall consist of a double row of stretchers laid in a neatly trimmed trench. The second course shall consist of a single row of headers. The third and remaining courses shall consist of stretchers or headers as shown on the plans and shall be placed in such a manner that joints in succeeding courses are staggered. All dirt and debris shall be removed from the top of the sacks before the next course is laid thereon.

Stretchers shall be placed so that the folded ends will not be adjacent. Headers shall be placed with the folds in toward the bank. Not more than 4 vertical courses of sacks shall be placed in any tier until initial set has been taken place in the first course of any such tier.

When, in the opinion of the Engineer, there will not be proper bearing or bond for the concrete due to delays in placing succeeding layers of sacks or due to the work having been hampered by storms, or mud, or for any course, a trench shall be excavated back of the row of sacks already in place, which trench shall be filled with fresh concrete before the next layer of sacks is laid. Excavating these trenches will be paid for as structure excavation and concrete placed in the trenches will be paid for at the contract price per cubic meter for sacked concrete slope protection.

Sacked concrete slope protection shall be cured as provided in Section 90-7, "Curing Concrete," of the Standard Specifications.

At the completion of slope protection work, the footing trench shall be filled with excavated material and compaction will not be required.

Measurement.—Sacked concrete for slope protection work will be measured at the mixer as provided in Section 90-11, "Measurement and Payment," of the Standard Specification and will be paid for by the cubic meter.

Payment.—The contract price paid per cubic meter for sacked concrete slope protection shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in constructing the sacked concrete slope protection, complete in place, including bar reinforcement, excavation, and backfill, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.56 GABION-FACED REINFORCED EMBANKMENT

Gabion-faced reinforced embankment shall be constructed as shown on the plans and in conformance with the provisions these special provisions.

Gabion-faced reinforced embankment shall be Terramesh® System units or comparable product. The Terramesh® System units consist of reinforcing panels consisting of double-twisted woven wire mesh coated heavily with zinc and PVC and should conform to the standards mentioned herein this special provisions.

Gabion-facing shall consist of wire mesh, box-shaped baskets.

Empty gabions shall be assembled individually and joined successively. Individual gabion mesh panels (base, front, ends, back, diaphragms, and lid) and successive gabions shall be assembled so that the strength and flexibility along the joints is comparable to a single panel.

MATERIALS

All materials for the gabion shall conform to the provisions in these special provisions. Each shipment of gabion to the project site shall be accompanied by a Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Mesh

Individual wires of the twisted mesh style shall conform to the definitions and requirements in ASTM Designation: A641/A641 M .

Cubical celled gabions that are one meter high by one meter wide shall be made from 12-gage (2.69 mm) twisted mesh.

GABION MESH MATERIAL PROPERTIES

Characteristic	Test Designation	Requirement
		nt

Minimum tensile strength	ASTM A370	410 MPa
Wire Size	USA Steel Wire Gage	12
Wire Diameter (Minimum)	ASTM A641/A641 M ASTM A641/A641 M	2.69 mm 2.59 mm
Galvanizing, Zinc	ASTM A641/A641 M, Class 3 and ASTM A90 / A90M	230 g/m ²

Twisted-mesh wires shall form a uniform hexagonal pattern and shall be formed with a nonraveling twist. The area of the hexagonal opening shall not exceed the dimensions shown on the plans. Twisted-mesh gabion panels shall be manufactured from 12-gage (2.69 mm) wires with 10-gage (3.43 mm) selvage wires.

Polyvinyl Chloride (PVC) Coating

External coating shall consist of a nonconductive material, primarily polyvinyl chloride (PVC). Mesh wire, standard tie wires, standard spiral binders, internal connecting wires, preformed stiffeners, and selvage wire shall be coated with the PVC material after the zinc coating is applied in conformance with the manufacturers specifications.

The PVC coating shall be evaluated by infrared (IR) spectral scan. The scan must closely match those of tested known acceptable products already on file at the Transportation Laboratory.

The minimum thickness of PVC which covers the wire shall be 0.38-mm, measured radially at any cross-section transverse to the wire length.

The PVC coating shall be complete by visual inspection. There shall be no nicks, cuts, holidays or abraded areas in the PVC coating of the mesh. Minor cuts, nicks, and other minor imperfections due to manufacturing, will be permitted along selvage-wrapped edges of twisted mesh. PVC will not be required to coat the ends of either style of mesh where the PVC has been trimmed along wire or panel edges during the normal manufacturing process.

PVC coating shall be resistant to degradation by ultraviolet (UV) radiation. A suitable, UV-resistant additive shall be blended with the PVC. This additive shall be identified on the Certificate of Compliance.

The color of the PVC shall be gray. The color shall be resistant to fading when exposed to natural sunlight.

Joints

Standard tie wire and standard spiral binder shall conform to the definitions and requirements in ASTM Designation: A641/A641 M and shall conform to the following provisions:

Minimum Tensile Strength	ASTM A370	410 MPa
Tie Wire		
Wire Size (Minimum)	USA Steel Wire Gage	13.5
Wire Diameter (Minimum)	ASTM A641/A641 M	2.19 mm
	ASTM A641/A641 M	2.09 mm
Zinc Coating	ASTM A641/A641 M, Class 3 and ASTM A90 / A90M	220 g/m ²

Alternative fasteners shall conform to the definitions and requirements in ASTM Designation: A313/A313 M for "Stainless Steel Spring Wire" and shall be Tensile Type 302, Class 1.

Internal Connecting Wire

Internal connecting wires shall be 13.5-gage (2.19 mm) minimum. Each wire shall conform to the minimum requirements for standard tie wire in these special provisions and shall be installed in conformance with the provisions in these special provisions and as shown on the plans. Alternatively, at the Contractor's option, preformed stiffeners may be substituted for internal connecting wires. Preformed stiffener wire shall meet the requirements specified for standard tie wire and shall be installed in conformance with these special provisions and the manufacturers recommendations.

Geotextile (Filter Fabric)

Geotextile (Filter fabric) for use with gabion-faced reinforced embankment shall conform to the provisions in Section 88-1.03, "Filter Fabric," of the Standard Specifications.

Rock

Rock for filling gabions, shall vary in size and shall conform to the following:

Screen Size (mm)	Percent Passing
305	100
102	0-5

Rock shall conform to the provisions for rock slope protection in Section 72-2.02, "Materials," of the Standard Specifications.

The minimum unit mass of a rock-filled gabion shall be 1750 kg/m³. Verification of the 1750 kg/m³ shall be performed when ordered by the Engineer. Verification shall be performed on the smallest standard gabion size to be used on the project. The rock supplied for the project shall be used for verification. Filling shall be done using the same method intended for actual construction. The mass of a rock-filled gabion shall be determined using available certified scales. The volume for calculating the unit mass shall be determined on the theoretical volume of the standard gabion which is rock-filled and weighed.

GRADING, EXCAVATION AND BACKFILL

Areas where gabions are to be placed shall be constructed to the lines and grades shown on the plans and as determined by the Engineer. Structure backfill shall be placed within the limits as shown on the plans and shall conform to the Earthwork of "Earth Retaining Structures" of these special provisions. Excavation or backfill for achieving the required grades shall conform to the provisions for structure excavation and backfill in Section 19, "Earthwork," of the Standard Specifications.

CONSTRUCTION

Gabions shall be assembled individually as empty units. Each gabion shall be manufactured with the necessary reinforcement and panels, properly spaced and secured, so that the panels can be rotated into position at the construction site with no additional tying of the rotation joint. The panels and diaphragms shall be rotated into position and joined along the vertical edges.

At the Contractor's option, interlocking fasteners or overlapping fasteners may be used for assembly of the twisted mesh gabions. A fastener shall be placed in each mesh opening along the joint (a minimum of 10 fasteners per meter).

An authorized representative of the manufacturer should be available at the job site to provide any construction support the Contractor may need.

ASSEMBLY OF SUCCESSIVE GABIONS (GABION-TO-GABION JOINTS)

Empty gabions shall be set in place. Individually constructed empty gabions shall then be joined successively to the next empty gabion with 13.5-gage (2.19 mm) tie wire before filling the gabion with rock. The 13.5-gage (2.19 mm) standard tie wire or 9-gage (3.76 mm) standard spiral binder shall secure, in one pass, all selvage or end wires of the panels of all adjacent gabions along the joint.

When forming successive gabion-to-gabion joints with alternative fasteners, there shall be one alternative fastener in each mesh opening. The alternative fastener shall contain and secure all the wires along the joint.

Gabion baskets shall be joined along the front, back, and ends, including the tops and bottoms of the adjacent gabions.

ASSEMBLY OF MULTIPLE LAYERED GABIONS

Multi-layered gabion configurations shall be stepped and staggered as shown on the plans or as directed by the Engineer.

When constructing multi-layered gabion configurations, each layer of gabions shall be joined to the underlying layer along the front, back, and ends.

ASSEMBLY OF TRANSITIONAL GABIONS

To match the geometry of the planned gabion configuration, or to meet specific conditions, panels shall be folded, cut, or retied as shown on the plans or as directed by the Engineer.

FILLING WITH ROCK

Before filling each gabion with rock, all kinks and folds in the wire fabric shall be straightened and all successive gabions shall be properly aligned.

Rock shall be placed in the gabions to provide proper alignment, avoid bulges in the wire mesh, and provide a minimum of voids. All exposed rock surfaces shall have a smooth and neat appearance. Sharp rock edges shall not project through the wire mesh.

Internal connecting wires or preformed stiffeners shall be used to produce a flat, smooth external surface, when constructing with 0.5-m high or one meter high gabions. If the Engineer determines that there is excessive bulging or dimpling of the outside panels, the unit shall be reconstructed at the Contractor's expense.

When filling one meter high gabions, rock shall be placed in 2 nominal 0.33-m layers to allow placement of the 13.5-gage (2.19 mm) internal connecting wires. The wires shall be fastened as shown on the plans. Alternatively, preformed stiffeners may be installed at the one-third points in conformance with the recommendations of the manufacturer, to produce a smooth external surface.

The last layer of rock shall slightly overfill the gabions so that the lid will rest on rock when the lid is closed.

CLOSURE OF LIDS

Lids shall be tied along the front, ends, and diaphragms in conformance with the provisions in "Assembly of Successive Gabions (Gabion-to-Gabion Joints)" of these special provisions.

During spreading and compacting the structure backfill, at least 150 millimeters (measured vertically), of backfill shall be maintained between the reinforcement and the Contractor's equipment. Equipment or vehicles shall not be operated or driven directly on the reinforcement.

MEASUREMENT

Gabions will be measured by the cubic meter as determined from the dimensions shown on the plans.

PAYMENT

The contract price paid per cubic meter for gabion for gabion-faced reinforced embankment shall include full compensation for furnishing all labor, materials (including rock, reinforcements, structure backfill within the reinforced zone, and geotextile (filter fabric)), tools, equipment, and incidentals, and for doing all the work involved in constructing gabion-faced reinforced embankment, complete, in place, including excavation, backfill and compaction, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.57 MISCELLANEOUS CONCRETE CONSTRUCTION

Concrete mow strips and concrete aprons shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications and these special provisions.

Reinforcement for concrete mow strip and concrete aprons shall comply to "Reinforcement" elsewhere in these special provisions.

Full compensation for reinforcement shall be considered as included in the contract price paid per cubic meter for minor concrete (miscellaneous construction) and no separate payment will be made therefore.

10-1. 58 PUMPING PLANT EQUIPMENT

DESCRIPTION.--The work shall consist of furnishing and installing pumping plant equipment in accordance with these special provisions, the details shown on the plans and the provisions in Section 74, "Pumping Plant Equipment," of the Standard Specifications. In addition, the Contractor's attention is directed to Order of Work, of these Special Provisions, regarding responsibility for maintaining drainage pumping capacity of the drainage area and Section 74-1.055, of the Standard Specifications, regarding use of the pumping equipment prior to acceptance of work.

Earthwork, foundations, sheet metal, electrical, and all other work incidental and necessary to the proper installation and operation of the mechanical work shall conform to the requirements for similar type work elsewhere in these special provisions.

All electrical components of mechanical work and their installation shall conform to the National Electrical Code; the California Administrative Codes, Title 24, Part 3, "Basic Electrical Regulations," and Title 8, Chapter 4, "Electrical Safety Orders".

The first paragraph of Section 74-1.02, "Regulations and Code," of the Standard Specifications is amended to read:

All electrical equipment shall conform to the standards of the NEMA and shall be listed by a recognized independent testing laboratory. In addition to the requirements of the plans, these specifications and the special provisions, all materials and workmanship shall conform to the requirements of the National Electrical Code; National Fire Code, Flammable Liquids and Gases; California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 5, "Electrical Safety Orders," and Subchapter 7, "General Industry Safety Orders"; California Code of Regulations, Title 19, Chapter 1, "Public Safety," Regulations of State Fire Marshal; California Code of Regulations, Title 24, Part 3, "California

Electrical Code"; Rules for Overhead Electrical Line Construction, General Order No. 95, of the Public Utilities Commission; and any local ordinances which may apply.

CERTIFICATION.--Certification required for drainage pumps shall be delivered to the Engineer in triplicate before pump installation.

The seventh paragraph of Section 74-1.04, "Data to be Furnished," of the Standard Specifications is deleted.

SUBMITTALS.--Submittals shall be as specified in Section 74 of the Standard Specifications. In addition, submittals shall include the following information:

1. Descriptive Data.--Five (5) bound identified copies of the complete description and performance data covering materials and equipment specified herein shall be submitted for approval. Submittals shall be approved prior to installation and shall include, but not necessarily be limited to, the following:

Drainage pump, including motor and shaft coupling
Flexible expansion coupling
Flap valve
Pumphouse door

2. Manuals.--Before completion of project, 3 bound identified copies of operation and maintenance instructions and parts lists for equipment furnished shall be delivered to the Engineer at the jobsite. Manuals that are inadequate or incomplete will be returned and the Contractor shall resubmit adequate and complete manuals. Manuals shall be included for the following equipment:

Drainage pump
Motor Control Center

3. Warranties and Guarantees.--Manufacturer's warranties and guarantees furnished for materials or equipment used in the work shall be delivered to the Engineer at the jobsite prior to acceptance of the contract.

PAINTING.--All field supplied paint shall be as specified in Section 74-1.06, "Painting," of the Standard Specifications.

The fifth paragraph of Section 74-1.06, "Painting," of the Standard Specifications is amended to read:

Uncoated or primed only drainage pumping equipment and all uncoated metal and damaged surfaces of coated metal shall be painted with 2 applications of unthinned zinc-rich primer (organic vehicle type) conforming to the provisions in Section 91, "Paint," one application of wash primer, and 2 finish applications of industrial quality gray gloss enamel. Aerosol can application of primer or finish paint shall not be permitted.

The seventh paragraph of Section 74-1.06, "Painting," of the Standard Specifications is amended to read:

Electrical equipment and enclosures not supplied with a factory painted finish shall be cleaned, lightly sanded, and painted before installation with 2 applications of gray gloss industrial quality enamel which matches the surrounding pumping equipment color.

TESTING.--Testing of the completed drainage pumping equipment shall be in accordance with Section 74-1.07 "Tests," of the Standard Specifications, and as described elsewhere in these special provisions.

The second paragraph of Section 74-1.07, "Tests," of the Standard Specifications is amended to read:

The drainage pumping equipment shall be tested to demonstrate satisfactory operation throughout the full pumping range of the installed pumping equipment. Testing shall be volumetric or other approved method and shall show that the installed pumping equipment delivers a minimum of 97% of the factory certified performance curve for a corresponding head and flow rate without overloading the motor (when supplied with the rated nameplate voltage) to more than the actual full load nameplate amperage, regardless of head. To determine compliance with this requirement, the maximum motor current will be calculated by converting the current measured at the test horsepower to the current that would be drawn (at the same terminal voltage) at the maximum horsepower certified for this range of heads, and converting this current to the current that would be drawn at the rated nameplate voltage.

Section 74-1.07, "Tests," of the Standard Specifications is amended by adding the following paragraph after the second paragraph:

For the purpose of making the test, all debris shall be removed from within the pump plant, storage box, and pump sump before testing.

MISCELLANEOUS.--Discharge pipe, joints, fittings, flexible expansion couplings, bracing hardware and storage cabinets are specified in Section 74, "Pumping Plant Equipment", of the Standard Specifications.

10-1.58A DRAINAGE PUMPING EQUIPMENT

DESCRIPTION.--Drainage pumping equipment shall conform to the provisions in Section 74-2, "Drainage Pumping Equipment," of the Standard Specifications and these special provisions.

The first paragraph of Section 74-2.01, "Description," of the Standard Specifications is amended to read:

Drainage pumping equipment shall consist of pumps, pumping apparatus, motors, pipe, joints and fittings, bracing, hardware, pump house door, and tools.

DRAINAGE PUMP.--Drainage pump shall be a submersible type, close coupled, submersible motor wastewater pump. Pump casing, bracket, and volute shall be gray cast iron construction. All external nuts and bolts shall be non-magnetic stainless steel. The impeller shall be dual-vane, non-clogging type and shall be capable of passing 115 mm solids, sludge and fibrous materials. The impeller shall be dynamically balanced and factory certified to not exceed 73 g-mm/kg of rotating mass at 900 RPM (sync.). Balancing of impeller shall not weaken or deform the impeller. The drainage pump shall include replaceable bronze impeller or ductile iron impeller (Grade 60-40-18), and bronze casing wear rings, the pump shaft shall be supported by roller bearings.

The pump motor shall be a 3-phase NEMA Design B, oil-filled or continuous-duty in-air induction motor. Motor shall be housed in a cast iron casing and shall have moisture resistant NEMA Class F insulation. Motor shall have built-in thermal overload protection. Horsepower, voltage, and rpm shall be as shown on the plans. The pump motor shall be a standard efficiency motor.

The pump motor shall be protected from contamination by the liquid being pumped, by a tandem, double-mechanical seal running in an oil reservoir. The oil reservoir of the pump shall be equipped with a seal failure alarm system. Seals shall be tungsten carbide or silicon carbide.

The pump motor shall be have portable Type SO cord, or cords, of sufficient length to reach from the pump to the motor starter enclosure without splicing. Cords shall be sealed into the motor with epoxy by the pump manufacturer. A second set of motor nameplates, supplied by the manufacturer, shall be provided to the Engineer.

The drainage pump shall be foot mounted, with the discharge pipe bolted directly to the pump discharge flange. The foot mounted base shall be cast integrally with the volute/casing and shall be designed to support the assembled weight of the pump and motor.

Two submittals shall be submitted for approval. The first submittal shall be the pump manufacturer's standard or representative performance data for the pump being proposed. It shall show that the pump meets the specified performance points and does not develop more the 95% of the motor nameplate power, anywhere on the pumping curve.

The second submittal shall be the pump manufacturer's factory certified test data for each approved pump. Each pump supplied shall be factory tested as an assembled pumping unit, and certified capable of pumping water under test according to the flow rates at the total heads indicated on the plans. Testing shall be done in accordance with the Hydraulics Institute, Centrifugal Pump Test Standard. The certified test shall show that the pump does not develop more than 100% nor less than 97% of the motor nameplate power, at the point the pump requires the maximum power. The pumping unit shall be defined as the actual driver, and actual pump and impeller combination supplied.

Documentation of the factory certified test shall include:

- a record of the actual test points used to generate the pump curve.
- a pump performance curve showing flow rate verses total dynamic head.
- the points specified in the contract documents plotted on the submitted curve.
- the power and efficiency curves from cutoff head down to 1.3 meters.
- the rpm of the actual driver.
- the actual impeller diameter.

The pump and motor shall be shipped in a condition capable of being in storage before final installation. If the Contractor elects to store the drainage pumping equipment before final installation, the Contractor shall maintain the pump in accordance with the manufacturer's recommended storage and warrantee requirements.

The complete pump and motor assembly shall be factory coated with an approved manufacturer recommended coating system compatible with the intended application of the drainage pumping equipment.

Section 74-2.03, "Blank," of the Standard Specifications is amended to read:

74-2.03 Pump House Door.-Pump house door shall be as specified in the special provisions.

The fourth paragraph of Section 74-2.04, "Pipe, Joints and Fittings," of the Standard Specifications is amended to read:

Steel pipe shall be furnished with flanged joints. Flanges shall be either threaded or welded to the piping. Threaded flanges shall be ductile iron conforming to ANSI/AWWA Standard: C115/A21.15. Flanges for welding shall be slip-on type steel hub flanges conforming to ANSI/AWWA Standard: C207, Class D. If steel flanges are welded to pipe, the completed assembly shall be hot-dip galvanized after fabrication.

The sixth, seventh, eighth, and ninth paragraphs of Section 74-2.04, "Pipe, Joints and Fittings," of the Standard Specifications are amended to read:

All flange bolts and nuts shall be non-magnetic stainless steel.

Ductile iron pipe shall conform to ANSI/AWWA Standard: C151/A21.51. The pipe and fittings shall be of the size shown on the plans. Each length of pipe shall be marked with "DI" or "Ductile" and the Class.

Ductile iron pipe shall be furnished with mechanical joints conforming to ANSI/AWWA Standard: C111/A21.11. A standard bituminous coating shall be applied to the inside and outside of all pipe and fittings.

Fittings shall be ductile iron and conform to ANSI/AWWA Standard: C110/A21.10, or to ANSI Standard: B16.1, Class 125, and shall be of the size shown on the plans.

Section 74-2.05, "Bracing and Hardware," of the Standard Specifications is amended by adding the following paragraph after the fourth paragraph:

All pumping plant metal work shall conform to "Pumping Plant Metal Work," elsewhere in these special provisions.

FLAP VALVE.--Flap valve shall be the type and size shown on the plans and shall be iron body with bronze mating surfaces and pipe flange frames.

FASTENERS.--All fasteners, including expansion anchors, nuts, bolts and washers, shall be stainless steel unless otherwise noted.

PUMPHOUSE DOOR.--The pumphouse door shall be a 914 mm x 2134 mm x 44 mm flush type, vertically stiffened, hollow metal door, and metal frame. The door shall be formed of 1.52 mm thick, galvanized stretcher leveled face sheets, turned over and fully covering all vertical edges. Seams shall be continuously welded. The door shall have 1.52 mm thick minimum, steel stiffener channels along hinge and lock edges. End channels (top and bottom) shall be fully flush and continuously closed. The door shall have continuous one piece, full length, vertical steel rib stiffeners spaced not to exceed 150 mm apart, with insulation between. The door shall also be reinforced around the hinges and lockset. The door shall be provided with a weather cap over the top end or shall have the steel face sheets turned over the top end and continuously welded for a water-proof unit. The bottom end shall have moisture vents to drain condensation. The door and frame shall be factory prepared and reinforced to receive hardware. All parts of the door shall be securely welded together. Exterior welds shall be ground flush.

The door frame shall be formed of 1.9 mm thick, pressed sheet steel 140 mm x 51 mm section with mitered, full welded corners and at least 3 standard casting anchors on each side supplied by manufacturer. The frame shall have adequate metal housing closures at hinges and latch to prevent intrusion of concrete or grout. Exterior welds shall be ground flush. The threshold shall be the rectangular or half saddle, bumper type for outswing doors, and securely anchored to the floor.

Pumphouse door hardware shall consist of the following: Hinges shall be 1 1/2 pair, non-removable pins, full mortise butt hinges. Hinges shall be industrial, heavy weight quality, stainless steel or brass, 5 knuckle, concealed ball bearing, and designed in accordance with Federal Specification FF-H-116E. Latch shall be passage latch, brass or stainless steel, heavy duty, corrosion resistant, and designed in accordance with Federal Specification FF-H-106. The door lock cover shall be fabricated and installed as shown on the plans and as directed by the Engineer. Pad lock will be furnished by others after acceptance of pumphouse.

The door frame shall be set true and plumb and shall be adequately braced to prevent distortion when the concrete is placed. All doors shall fit correctly in their frames, shall swing freely and shall close properly.

The hollow metal door and frame shall be adequately cleaned and treated by the bonderizing process or by an approved phosphatizing process and then given one shop application of metal protective rust inhibitive primer well bonded to the metal and dried to a flat sheen.

After installation, the door and frame shall be cleaned and painted with 2 finish applications of commercial quality gray gloss enamel.

If the Contractor desires to lock the pumphouse during construction, he shall furnish his own lock for the door until acceptance of the pumphouse.

DIMENSIONS AND LOCATIONS.--Dimensions and locations of pumping equipment shown on the plans are approximate. Contractor shall submit detailed drawings showing installation details of pumps and associated hardware. If pumps selected by the Contractor require revisions to pump plant metal work or other construction details, the Contractor shall submit detailed drawings of these revisions for approval. No additional compensation shall be made for revisions resulting from Contractor's pump selection.

10-1. 59 PUMPING PLANT ELECTRICAL EQUIPMENT

SCOPE.--Work covered by this section shall include furnishing all labor, materials, equipment and services required to construct and install the complete electrical system, including earthwork, in accordance with the details shown on the plans, the provisions of Section 74, "Pumping Plant Equipment" of the Standard Specifications and as specified in this section, and the work of installing and wiring motors and controls as specified under "Pumping Plant Equipment" of these special provisions.

Related Work.--Earthwork, foundations, sheet metal, painting, mechanical and such other work incidental to and necessary for the proper installation and operation of the electrical work shall be done in accordance with the requirements specified for similar work elsewhere in these special provisions or in the Standard Specifications.

The first paragraph of Section 74-3.01, "Description," of the Standard Specifications is amended to read:

Pumping plant electrical equipment consists of control and power equipment, conduit, insulated wire and cable, lights, and floor covering but does not include pump motors.

The first paragraph of Section 74-3.06, "Installation of Conductors and Cable," of the Standard Specifications is amended to read:

All pulling of conductors shall be done with special care to avoid injury to sheath or insulation. An inert lubricant listed by a recognized independent testing laboratory shall be used whenever pulling conductors through conduit.

The second paragraph of Section 74-3.07, "Splices," of the Standard Specifications is amended to read:

Splices shall be made by soldering or by the use of pressure connectors. Soldering of joints, where necessary, shall be by the use of hot irons. Open flame soldering shall not be permitted. All splices in underground pull boxes shall be made watertight. Conductor splices shall be wrapped with rubber splicing tape and then coated with Scotchkote or other equivalent electrical coating. Products to be utilized for watertight splices shall be submitted for approval.

The fourth paragraph of Section 74-3.09, "Identification of Units and Conductors," of the Standard Specifications is amended to read:

All conductors shall be marked as shown on the approved working drawings and plans at each termination by either (1) adhesive backed paper or cloth

wrap-around markers with clear, heat shrinkable tubing sealed over either type of marker, or (2) pre-printed, white heat shrinkable tubing.

TRAINING.--Training of State personnel in programming, connection, operation, trouble shooting, and maintenance of the programmable logic controller and operator panel shall be provided. The training period shall be for a minimum of 8 hours and shall be conducted for not more than 6 State personnel at the job site or at a site mutually agreed upon by the Contractor and the Engineer. The trainer shall be an authorized representative of the PLC manufacturer, shall have complete knowledge of PLC and operator panel installation and operation, and shall be qualified as a trainer.

All trainees shall be supplied with books, manuals, programmer or personal computer, software, and such other training material, guides and equipment, not mentioned, but required for a complete and thorough training course. Training shall include hands-on experience in programming techniques and operation.

MANUFACTURER'S SOFTWARE TECHNICAL SUPPORT.--The manufacturer of the programmable logic controller and operator panel shall provide technical assistance and guidance in the operation, maintenance and trouble shooting of operational problems of the PLC for one year following the acceptance of the contract. The technical support shall be provided at no additional cost to the State.

Technical support shall be provided at the facility site by an authorized representative of the PLC manufacturer and by a toll free telephone service to the manufacturer.

SUBMITTALS.--Submittals shall be as specified in section 74-1.04 "Data to be Furnished" of the Standard Specifications. All dimensions illustrated on working drawings and all units of measurement shall be shown in the International System of Units (metric system). In addition, the proposed ladder logic diagram and user manual(s) including complete software and programming instructions for the programmable logic controller and operator panel shall be submitted for approval.

OPERATION AND MAINTENANCE MANUALS.--Prior to the completion of the contract, 3 identified copies of the operation and maintenance instructions with parts lists for the equipment specified herein shall be delivered to the Engineer at the jobsite. The instructions and parts lists shall be in a bound manual form and shall be complete and adequate for the equipment installed. Inadequate or incomplete material will be returned. The Contractor shall resubmit adequate and complete manuals at no expense to the State.

Manuals shall be submitted for the following equipment:

Programmable logic controller
Operator panel

WARRANTIES, GUARANTIES AND INSTRUCTION SHEETS.--Manufacturer's warranties and guaranties furnished for materials used in the work and instruction sheets and parts lists supplied with materials shall be delivered to the Engineer prior to acceptance of the project.

TESTING.--After the electrical system installation work has been completed, the electrical system shall be tested in the presence of the Engineer to demonstrate that the electrical system functions properly. The testing shall include all the functions of the programmable logic controller and operator panel. The Contractor shall make necessary repairs, replacements, adjustments and retests at his expense.

DESCRIPTION OF OPERATION.--Automatic operation of the drainage pumps shall be controlled by the trapped air level monitoring system, the Power Transfer Switch (PTS) auxiliary contact, and the Programmable Logic Controller (PLC). The monitoring system shall measure the water pressure and convert it to a 4-20

milliampere signal, which shall then be scaled to provide the depth of the water in the sump . The PLC shall output a signal to the operator panel to display the current water level and shall determine which pump to turn on. The normally-open PTS auxiliary contact will only influence the control scheme if it becomes closed (when switched to "standby" position).

Either pump no. 1 or pump no. 2 shall start when the water level rises to the "Start lead pump" elevation and continue to run until the water level falls to the "Stop lead pump" elevation as shown on the plans. The remaining pump shall start when the water level rises to the "Start lag pump" elevation and continue to run until the water level falls to the "Stop lag pump" elevation as shown on the plans. Pump no. 1 and pump no. 2 shall alternate with each lead pump call. Should the PLC call for both pumps to operate at the same time for any reason (such as when power is restored after an interruption and the water level is above the "Start lag pump" elevation), there shall be a programmed time delay of 10 seconds between the starting of each pump. There shall also be a 10 second backspin time delay to prevent immediate restart of a pump after a pump shut off as part of the PLC programming.

Pilot light PL3 and indicating light IL1 shall be energized whenever control power is present. If the PLC calls for any pump to start, the pump demand pilot light PL4 shall be activated. If the water level reaches the "high water" elevation, the high water pilot light PL5 shall be energized. When motor current is sensed by a current switch, the PLC shall activate the corresponding pilot light and time meter of the pump and indicating light IL2.

A seal failure indication on a seal failure relay shall be treated as an alarm indication only and in no way affect the control operation of a pump.

The phase failure relay shall provide sensing for voltage unbalance or failure. Whenever an abnormal condition occurs for more than 5 seconds, the PLC shall deactivate all outputs until the condition returns to normal except when the PTS is switched to "standby".

EXCAVATING AND BACKFILLING.--

Excavating and backfilling shall conform to Section 86-2.01 "Excavating and Backfilling" in the Standard Specifications.

FOUNDATIONS.--

Foundations shall conform to Section 86-2.03 "Foundations" in the Standard Specifications.

PRODUCTS.--

Conduit.--

Conduit shall conform to Section 86-2.05 "Conduit" in the Standard Specifications and as specified in these special provisions.

Unless otherwise shown, all conduit shall be threaded, hot-dip galvanized inside and outside, rigid steel conduit with threaded steel or malleable iron fittings.

Conductors.--

Conductors shall conform to Section 86-2.08 "Conductors" in the Standard Specifications and as specified in these special provisions.

Conductors shall be stranded copper. Unless otherwise shown, conductor types shall be as follows: (1) conductors across hinges of control panel enclosures shall be MTW, (2) all other conductors shall be THHN in dry locations and XHHW in wet locations.

Telephone cable.--Three (3) twisted shielded conductor pairs, minimum #22 AWG solid bare copper, high-density polyethylene insulated conductors rated 300 volts with an overall polyethylene jacket rated for direct burial.

Motor Control Center (MCC).--

Motor control center shall consist of enclosed vertical sections joined together to form a rigid, free standing assembly. The construction of the motor control center shall meet the requirements set forth by Underwriters' Laboratories UL 845 and NEMA ICS-2-322 and be UL listed. The motor control center shall be in accordance with NEMA standards for Type 1 gasketed enclosure.

The motor control center shall be suitable for operation with 480/277-volt, 3-phase 4-wire plus ground, 60 Hertz service. Motor control center shall have a minimum fault interrupting capacity of 42,000 amperes (symmetrical) at 480 volts, AC.

Vertical sections shall support the vertical buses, combination starter units, covers, and doors, and shall be designed to allow for easy rearrangement of units. Vertical sections shall have structural supporting members formed of a minimum 2.66 mm thick hot rolled steel. Each section shall be maximum 2286 mm high and shall have 4.55 mm thick steel, 76 mm high removable lifting angle and two 38 mm high base channels. Base channels shall be provided with holes to permit bolting the motor control center to the floor.

Vertical sections, except control section, shall be designed to accommodate plug-on units in front-of-board construction. Vertical sections housing plug-on units shall be 508 mm wide and shall be 381 mm deep, control section shall be 762 mm wide and shall be 381 mm deep. Removable blank plates shall cover all unused unit mounting spaces. Blank plates shall be flanged on all four sides and shall be mounted with captive screws.

Vertical sections shall be mounted with both horizontal and vertical wireways. Sufficient clearances shall be provided in the horizontal wireway so that no restriction is encountered in running wires from the vertical to horizontal wireway.

Horizontal wireways shall be provided in the top and bottom of each vertical section and shall be arranged to provide full length of continuity throughout the entire assembly. The top horizontal wireway shall have a cross sectional area of not less than 12,903 square mm with openings between sections of not less than 7420 square mm. The bottom horizontal wireway shall extend through the length and depth of the vertical sections and shall also be provided with an opening of not less than 7420 square mm to allow for full length continuity throughout the entire assembly. The bottom horizontal wireway shall have a cross sectional area of not less than 5968 square mm. Covers for all wireways shall be equipped with captive screws.

A vertical wire trough shall be located on the right hand side of each vertical section and shall extend from the top horizontal wireway to the bottom of the available unit mounting space. Each vertical wire trough shall have a cross sectional area of not less than 12,258 square mm. A separately hinged door having captive type screws shall cover the vertical wire trough to provide easy access to control wiring without disturbing control units.

Reusable wire ties shall be furnished in each vertical wire trough for the purpose of grouping and securely holding wires in place. All wireways shall be isolated from the bus bars.

Main three-conductor horizontal bus and power terminal block for connection shall be provided. Horizontal bus bars shall be rated 600-ampere continuous and be mounted edgewise and supported by insulated bus supports of high strength glass reinforced alkyd material.

For distribution of power from the main horizontal bus to each unit compartment, a three-phase vertical bus shall be provided. The main vertical buses shall be made of aluminum and the entire length shall be electrolytically plated. The rating of the vertical buses shall be minimum 300-ampere continuous current rating and shall be in accordance with UL, ANSI, and NEMA standards.

Each unit shall have a door securely mounted with concealed type hinges which shall allow the door to swing open a minimum of 112 degrees. Doors shall be fastened to the structure so that they may remain in place when a unit is withdrawn and may be closed to cover the unit space when the unit has been temporarily removed. Doors shall be held closed with captive screws which engage self-aligning cage nuts. Each starter unit door shall house an external low-profile overload reset button for resetting the overload relay.

Each plug-on unit shall be supported and guided by tilt and lift-out removable pan.

An external operator handle shall be supplied for each switch or circuit breaker. The operator handle shall be color coded to display red in the "ON" position and black in the "OFF" position. The operator handle shall have a conventional up-down motion and shall be designed so that the down position will indicate the unit is "OFF". For safety it shall be possible to lock this handle in the "OFF" position with up to three padlocks. The operator handle shall be interlocked with the unit door to prevent switching to the "ON" position while the unit door is open. A defeater mechanism shall be provided for the purpose of defeating this interlock.

A schematic diagram and a ladder diagram of the control system under transparent protective cover shall be provided with the motor control center.

The motor control center wiring shall be NEMA Class II-Type B-T wiring.

A shelf (either slide out or fold up type) capable of supporting a portable computer shall be installed at approximately 1300 mm high inside the control section of the motor control center.

Standby Power Receptacle (SPR).--

600-volt, 200-ampere, 3-wire, 4-pole circuit breaking, weather resistant, rain tight receptacle with male interior assembly complete with an AJ back box angle adapter with a screw on dust cover and chain or self-closing, spring actuated cover. The receptacle shall be compatible with the plug of the State portable standby generator. The plug of the generator is Crouse-Hinds, Catalog No. AP20468-S22 with female interior assembly. Standby power receptacle shall be Crouse-Hinds, Catalog No. AREA 20427-S22 or equal.

Power Switch (PS).--

Three-pole, 600-volt, 250-ampere frame, 200-ampere trip, molded case circuit breaker with adjustable AC magnetic trip set at 1500 amperes mounted in the motor control center where shown on the plans. The interrupting capacity of the breaker shall be minimum 42,000 amperes RMS (symmetrical) at 480 volts, AC. Breaker shall be equipped with means to padlock in the "OFF" position.

Power Transfer Switch (PTS).--

Two 3-pole, 600-volt, 225-ampere frame, molded case switches with one (1) permanently affixed manual operating handle with mechanical interlock to prevent simultaneous "ON" for both switches. Switch shall not have an off position. Each molded case switch shall have an auxiliary normally-open contact rated 10 amperes at 120 volt, AC. Nameplates ("UTILITY" and "STANDBY") or other positive means of identification of the switch position shall be installed on the exterior of the motor control center. The interrupting capacity of the switches shall be minimum 25,000 amperes RMS (symmetrical) at 480 volts, AC.

Spare Breaker (SB).--

Three-pole, 600-volt, 100-ampere frame, 80-ampere trip, molded case circuit breaker mounted in the motor control center where shown on the plans. The interrupting capacity of the breaker shall be minimum 25,000 amperes RMS (symmetrical) at 480 volts, AC.

Phase Failure Relay (PFR).--

480-volt, AC, socket mounted, adjustable, automatic reset, voltage sensing phase failure relay with single-pole, double-throw, 5-ampere, 120-volt contacts. Relay shall be capable of sensing phase loss, phase unbalance and phase reversal and shall have a LED indicating the relay is energized. Relay shall be mounted in the motor control center where shown on the plans.

Motor Starters (ST1 and ST2).--

NEMA Size 3, NEMA rated, 3-pole, line-voltage combination starter and motor circuit protector mounted in the motor control center where shown on the plans. Starter shall have 120-volt coil, double-break silver contacts, and 3 manual-reset, non-adjustable—thermal overloads set to trip between 115 and 125 percent of full load motor current as quoted on the nameplate by the motor manufacturer. Overload reset shall be externally operable. Starter shall have one normally-closed and one normally-open auxiliary contacts. The pilot lights, selector switch and time meter shall be as specified elsewhere in these special provisions.

Lighting Disconnect (LD).--

Two-pole, 600-volt, AC, 100-ampere frame, 30-ampere trip, molded case circuit breaker mounted in the motor control center where shown on the plans. The interrupting capacity of the breaker shall be 25,000 amperes RMS (symmetrical) at 480 volts, AC.

Lighting Transformer (LT).--

Double-wound, 10-KVA, 60-Hz, surface-mounted, dry type transformer with 480-volt primary, 120/240-volt secondary. Transformer shall be mounted in the motor control center as shown on the plans.

Panel LP.--

Indoor type, surface-mounted box and cover, factory assembled, single-phase, 3-wire, 120/240-volt, AC panelboard with 2-pole main circuit breaker, insulated neutral and molded case circuit breakers as shown on the plans. Panel shall be mounted in the motor control center where shown on the plans.

Trapped Air Level Monitoring System.--

Trapped air level monitoring system shall consist of an air compressor, three-way solenoid valve, pressure transducer, sensing tube and a compression bell. The system shall operate based on the output of the pressure transducer which is connected to a trapped air column. The air column pressure changes in accordance with the water level. The compression bell,

which is submerged in the water, shall provide sufficient air volume to maintain the desired accuracy. The system shall operate over a range of 0 to 10 meters of water with an accuracy of ± 1 cm for an ambient condition ranging from 0 to 93°C. The transducer shall provide a 4 to 20 milliampere output signal to the PLC to determine the water level. The air compressor shall operate at 120 volt, AC and be constructed of an aluminum piston with Teflon-sleeved cylinder for long service life. Compressor motor shall be approximately a 37-watt, shaded pole motor with integral overload protection. Compressor shall have a capacity 0.0184 m³/min at 345 kPa and capable of initializing against a 1724 kPa head. The direct acting, three-way, plastic bodied solenoid valve operating at 120 volt, AC with compression connections for air shall isolate the pressure transducer during the purge cycle of the air column.

Programmable Logic Controller (PLC).--

The programmable logic controller shall include a power supply and a central processing unit (CPU) that operates at 120 volts, 60 Hz, AC line voltage.

The controller shall be capable of operating in the following environmental conditions:

1. Operating temperature: Between 0 and 60°C.
2. Humidity: 15 to 95% non-condensing.
3. Vibration: 57 to 150 Hz, const. accel. 2g.
4. Shock: 15 g, semisinusoidal 11 ms.
5. Noise immunity: 1,500 volts, NEMA showering arc.

The PLC shall be programmable with a ladder logic diagram consisting of relay symbols and function blocks. The program shall be stored in a non-volatile memory without the need for battery back-up. The PLC shall be equipped with two computer link modules that will allow the PLC to communicate with a portable computer for programming and monitoring and an external operator panel. The PLC shall have the capability to function as a remote terminal unit (RTU) capable of communicating with a remote SCADA computer. Communication mode shall be either thru a dial up telephone line or thru a radio modem. RTU protocols shall be a common industry standard such as Modbus. PLC shall incorporate password security protection against unauthorized caller from changing the operation of the PLC. PLC shall be capable of initiating communication with a host computer upon sensing any alarm conditions. Communication with the host computer shall report all alarms and status changes since the last communication upon establishing communication with the host. Configuration for phone number to call, baud rate (9,600 to 56,000), password, communication protocol and pump plant ID shall be accomplished with a portable computer. Software for configuration shall have a pull down menu and user friendly interface to enable simple setup by the user without using programming code or statement. The PLC shall be furnished with a 56K telephone dial up modem.

In addition to the requirements listed under "Description of Operation", the PLC ladder logic program shall include the following provisions:

1. The PLC shall be programmed to purge the air column every eight hours for ten seconds in duration.

2. The operational sequence of the PLC shall be capable of being manually tested by using the operator panel. During this manual test, the PLC shall not attempt to start the next pump due to the lack of a feedback signal.

3. Alarms shall include power failure, intrusion, high water, pump failure and pump seal failure. Power failure alarm shall occur when the utility power fails, as indicated by the phase failure relay, and when the water level in the storage box is at 150 mm below the "Start lead pump" elevation or higher. Intrusion alarm shall occur whenever the door switch (DS) is opened and the intrusion defeat switch (IDS) is not deactivated within 30 seconds. The intrusion alarm shall be set when the user activates the IDS and closes the pump plant door within 30 seconds. High water alarm shall be activated when the water level is 300 mm above the "Start lag pump" elevation or higher. Pump failure alarm shall occur when the controller sends a signal to turn on any pump and no feedback signal from the corresponding current switch appears after 10 seconds. Pump seal failure shall occur when the seal failure relay senses moisture in the oil reservoir of the pump motor.

The Contractor shall furnish a copy of all programming software and a disk copy of the ladder logic program to the Engineer. In addition, a 2meter length cable to link the PLC to a portable computer serial port shall be supplied by the Contractor to the Engineer.

INPUTS AND OUTPUTS (I/O).--

The inputs and outputs (I/O) shall be the digital and analog type as shown on the plans. Terminal strip for I/O shall have a marking strip under a clear plastic cover inscribed with the wire identification. Each I/O shall have LED indicator to show when each input or output is activated. Each I/O shall operate at the voltage level of the connected devices and shall be optically isolated from the PLC. Analog output shall have the current or voltage level output required by the connected equipment.

Provide at least 10 percent of the I/O count as spares.

Operator panel.--

Operator panel shall be NEMA type 4 or 12 panel mounted on the motor control center door and shall be powered by the PLC. The panel shall be connected to the PLC with a communication cable as required. Operator panel shall support the native protocol of the PLC and shall be the same brand as the PLC. The panel shall include a message area capable of displaying a minimum of eight alpha numeric characters, "up-down" push buttons, "enter" push button, "exit" push button, LED event status lights and at least four user-defined push buttons. The message area shall display description of variable and the value of the variable by scrolling between the two. Time between each scroll shall be between 5 and 8 seconds. Variables to display shall include all pumps' set points, alarms, timers, etc. Water level in the sump measured to hundredths of a meter or foot (XX.XX) shall be displayed at all times unless a pre-programmed user-defined push button is pressed. The LED event status lights shall be illuminated if the monitored condition exists and, in the case of an alarm condition, shall blink on and off until acknowledged.

The user-defined push buttons shall be programmable to perform actions as follows:

One user-defined push button shall be labeled "WET WELL LEVEL". Pushing the button shall cause the display to show the current water level in the sump. From this point, the user shall be able to open a menu directory to examine or change set points. When the "change set point" option is selected, it

shall cause the message area to display each pumps' "Start" and "Stop" levels and the "Alarm" levels. Multiple display shall scroll upon successive pushes of the button. Password protection shall be built-in to allow set point changes. Upon entering change mode, a timer shall allow the user to change set point within a window of five (5) minutes. At the end of the five minute window the PLC shall return to the run mode. User shall be prompted to each change by a blinking numerical display that stops when the new set point is accepted.

The next user-defined push button shall be labeled "LEVEL TEST/PURGE". Pushing the button once shall allow the user to test the output of the PLC by bypassing the trapped air level monitoring system signal and vary the water level input to the PLC via the operator panel's "up-down" push buttons. The "up-down" push buttons shall increment the signal level by 0.05 meter with each push. This shall allow the operator to test all the pumps' "Start" and "Stop" levels and the "Alarm" levels. This test mode shall continue for at least 3 minutes and shall be canceled automatically within five (5) minutes. Pushing the button twice shall manually activate the solenoid valve and air compressor for ten (10) seconds such that the compression bell and air lines are purge of water.

Another user-defined push button shall be labeled "METRIC/ENGLISH". Pushing the button shall toggle the variable between English and Metric units. All values in the registry shall change including the display. The display shall show the water level in the chosen measuring unit with either "FT" or "M" showing at the end of the display line.

The last user-defined push button shall be labeled "ALARM RESET". The user shall be able to acknowledge any blinking alarm condition by pressing this button. If the alarm condition is still present, the LED event status light will remain illuminated.

Operator panel shall display all alarms as defined elsewhere in these special provisions or as shown on the plans. Operator panel shall be driven by the PLC or be programmable by a portable computer.

The Contractor shall furnished the State with all programming software and the connecting cable when the later applies.

Portable computer (PC).--

The Contractor shall furnish to the Engineer a portable computer set up with Microsoft Office 97 running under MS Windows NT. Portable computer shall also serve as an interfacing and programming device for the PLC and the operator panel and shall have the programming software for these devices installed. Portable computer shall have a 300 MHz processor, minimum of 6.0 GB of hard drive space, 64 MB EDO RAM, 56 KB modem, internal 24X CD ROM drive, one 3 1/2-inch drive, 15-inch XGA TFT active matrix LCD display and a lithium ion battery. A spare battery shall be supplied with the portable computer. The portable computer shall be Dell Inspiron 7000, Compact Armada 1750, Sony Notebook PC GF270, or equal. The portable computer shall be furnished with a nylon carrying case.

DC Power Supply.--

DC power supply shall be rated for 115-volt, AC input and DC voltage and current outputs as required by the equipment installed. The power supply shall be panel or channel mounted, convection cooled, completely protected and short circuit proof with an adjustment range of ± 5 percent (minimum) and shall be operable at temperatures between 0°C to 50°C.

Uninterruptable Power Supply (UPS).--

1.4 KVA, 120-volt, AC, 60 Hz input line voltage, output voltage of 120-volt ± 3.5 volts at 60 Hz sine wave. Total harmonic distortion shall not exceed 7 percent. Power transfer to UPS shall occur at approximately 102 volts and return to utility power shall occur when the measured voltage is above 110 volts. Transfer time shall not be more than 10 milliseconds, with 4 milliseconds being typical. UPS shall be equipped with sealed maintenance free battery that requires no more than 16 hours to recharge and provides 5 minutes of back-up time at full load or 15 minutes at half load. UPS shall have four NEMA 5-15R output receptacles. UPS shall be capable of operating at 40°C ambient temperature and 95 percent noncondensing humidity. UPS shall fit within the area of the motor control center section as shown on the plans.

Seal Failure Relays (SFR1 and SFR2).--

Seal failure relay shall be as shown on the plans and as recommended by the pump manufacturer. The seal failure relay, complete with pump leak indicator light, sensor probe continuity test push-button and test indicator light, shall be a factory assembled unit mounted inside the motor control center where shown on the plans. Relay shall include one normally-open and one normally-closed contact and shall operate at 120-volt, AC.

Current Switches (CS1 thru CS4).--

Self-powered, solid state, AC current sensing switch mounted in each motor starter and elsewhere as shown on the plans. Switch shall have a single-pole, normally-open contact rated one-ampere at 240 volts, AC. Current sensing level shall be chosen between a low range of one to 15 amperes and a high range of 15 to 300 amperes. Switch shall have a thru-hole of 14 mm minimum diameter for sensing the AC current.

Time Meters (TM1 and TM2).--

120-volt, 60-Hz, non-resettable running time meter with 0 to 99,999.9 hours range. Meter shall be mounted on the motor control center door as shown on the plans.

Selector Switches (SS1 and SS2).--

30.5 mm, NEMA Type 4, single-pole, 2-position maintained, 10-ampere, 120-volt rotary switch mounted on the motor control center door as shown on the plans. Switch contacts shall have an inductive pilot duty rating of 60 amperes (make), 6 amperes (break) and 10 amperes (continuous) at 120-volt and 35 percent power factor. Selector switch shall have legend plate marked "HAND-AUTO".

Pilot Lights (PL1 thru PL7).--

30.5 mm, NEMA Type 4, panel mounted, 120-volt, AC, high visibility light emitting diode (LED) type lamp with colored plastic lens and screw cap. Lights shall be mounted on motor control center door as shown on the plans.

Control Relays (CR1 thru CR3).--

120-volt, AC, general purpose relay with 3-pole, double-throw, 10-ampere contacts. Relay shall be enclosed in a clear plastic with 11-pin plug base. Socket for the relay shall be barrier type, 11-contacts relay socket with 10-ampere contacts and screw terminals.

Terminal Blocks (TB).--

30-ampere, 600-volt, NEMA rated, molded plastic with two or more terminals and two or more mounting holes in each cast block or channel mounted type (DIN rail). The molded plastic shall have a high resistance to heat, moisture, mechanical shock and electric potential and shall have a smooth

even finish. Terminal blocks shall have tubular, high-pressure clamp connectors.

Each terminal block or row of blocks shall have a molded marking strip attached with screws or a computer printed plastic label securely fastened to the blocks. The identifying numbers of the terminating conductors, as shown on the plans or on the approved submittal drawings, shall be engraved in the marking strip or permanently printed on the plastic label. The marking strip shall be laminated phenolic plastic with white core and black front and back.

Coils.--

All coils of relays, starters and other operating equipment shall have magnet coils wound for an operating range having a mean equal to the actual voltage to be applied.

Indicating Lights (IL1 and IL2).--

Cast-metal, vapor-tight, fluorescent lighting fixture with metal guard and colored, shatterproof, polycarbonate plastic globe and twin tube 18-watt, 120-volt fluorescent lamp with integral ballast. The indicating lights shall be installed as shown on the plans.

Room Light.--

Surface or pendant mounted fluorescent fixture with one, F48T12SPEC30 lamp and -20°C ballast. Fixture housing shall be white, ABS slow burning thermoplastic. Housing shall have neoprene gasket around the perimeter and stainless steel lens latches. Lens shall be hi-impact clear acrylic. Fixture shall be suitable for wet locations.

Sump Light.--

Weatherproof, die-cast non-ferrous metal, chrome-finish, 2lamp fixture with porcelain socket, adjustable swivel arm, 150-watt PAR-38 flood lamp, mounting flange, gasket and cast ferrous metal outlet box.

Area Light.--

Area light shall be Type 15 Lighting Standard as shown on sheet ES-6B of the Standard Plans. Luminaire shall be 250-watt, 120-volt, high pressure sodium fixture with integral ballast and photoelectric cell. Luminaire shall be as specified in section 86-6.01 "High Pressure Sodium Luminaires" in the Standard Specifications.

Entry Light.--

Outdoor, wall mounted, 50-watt, 120-volt high pressure sodium luminaire with integral ballast and photocell.

Light Switch (LS).--

20-ampere, 120/277-volt AC, specification grade switch suitable for wiring with stranded conductors in a cast metal box.

Intrusion Defeat Switch (IDS).--

Same as Selector Switch mounted on the motor control center door as shown on the plans, except with legend plate marked "OFF-ON."

Door Switch (DS).--

Magnetic door switch shall consist of two-section, high security, magnetically balanced type, long life reed switch. Switch cannot be defeated by an externally applied magnet and shall be compatible with the material of the door at the pump house. Magnetic door switch shall be provided with a connector for 16 millimeter conduit.

Duplex Plug Receptacles (DP1 and DP2).--

DP1 shall be 15-ampere, 3-wire, 125-volt grounding type duplex receptacle outlet suitable for wiring with stranded conductors in a cast metal box. Outlet shall be combination of a twist lock outlet and parallel blade outlet.

DP2 shall be 15-ampere, 3-wire, 125-volt, grounding type, specification grade, duplex receptacle with ground fault interruption suitable for wiring with stranded conductors in a cast metal box. Receptacle shall detect and trip at current leakage of 5 milliamperes and shall have front mounted test and reset buttons.

DP3 shall be 15-ampere, 3-wire, 125-volt computer power strip with built-in surge protector mounted inside the motor control center as shown on the plans.

Junction and Outlet Boxes.--

All boxes shall be cast ferrous metal box with hubs and gasketed cover. Weatherproof switches and receptacles shall have hinged flaps to cover switches and receptacles.

Underground Pull Boxes.--

Concrete type and shall be as shown on sheet ES-8 of the Standard Plans.

Pull ropes.--

Pull ropes shall be nylon or polypropylene with a minimum tensile strength of 225 kg.

Nameplates.--

Nameplates shall be laminated phenolic plastic with white core and black front and back. Nameplate inscription shall be in capital letters etched through the outer layer of the nameplate material.

Warning Plates.--

Warning plates shall be laminated phenolic plastic with white core and red front and back. Warning plate inscription shall be in 6 mm high capital letters etched through the outer layer of the warning plate material.

Each pump motor starter shall have a warning plate with the inscription "WARNING: MOTOR DISCONNECT DOES NOT OPEN CONTROL CIRCUIT".

A warning plate with 13 mm high capital letters shall be installed above the standby power receptacle with the inscription "480 VOLTS ONLY"

EXECUTION.--In addition to the requirements of Section 74, "Pumping Plant Equipment" of the Standard Specifications, the execution of the work shall conform to the following requirements:

Conduits.--Do not install any conduits behind ladders or within 380 mm of the center line of the ladder.

Motor control center.--MCC shall be mounted on channel and anchored to the concrete slab with expansion anchors and bolts. The motor control center shall be shimmed as required to make each section level. The Contractor shall provide the Engineer with an order of work for installation of the motor control center.

Conductors.--Feeder and branch circuit ungrounded conductors shall be color coded by continuously colored insulation, except conductors No. 6 AWG or larger may be color coded by colored tape at each connection and where accessible. Ungrounded conductor color coding shall be as follows:

SYSTEM	COLOR CODE
120/240V-Single phase	Black, blue
480/277V-Three phase	Brown, orange, yellow

Panel LP.--Where "Space" is indicated on the plans, branch connectors, mounting brackets, and other hardware shall be furnished and installed for future breaker.

A typewritten directory under transparent protective cover shall be provided and set in metal frame inside the cabinet door. Directory panel designation for each circuit breaker shall include complete information concerning equipment controlled including area designated on the plans.

Component mounting.--Components in the motor control center shall be mounted where shown on the plans.

Current Switches CS3 and CS4.--Current switches CS3 and CS4 shall require the wire to be wrapped around the sensing coil multiple times to sense the current.

Pull boxes.--Pull boxes shall be installed as specified in Section 86-2.06C "Installation and Use" of the Standard Specifications.

Nameplates.--Inscriptions on nameplates shall be as shown on the plans. Nameplates shall be mounted with self-tapping cadmium plated screws or nickel plated bolts except the nameplates mounted on the back of an enclosure cover shall be attached with a strong adhesive.

Supporting devices.--Hangers, brackets, supports, and electrical equipment shall be secured to surfaces by means of expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction.

Supporting devices shall be corrosion resistant.

PAYMENT.--Full compensation for foundation, excavating and backfilling shall be considered as included in the contract lump sum price paid for pumping plant electrical equipment and no separate payment will be allowed therefor.

Full compensation for the training and manufacturer's software technical service support shall be considered as included in the contract lump sum price paid for pumping plant electrical equipment and no separate payment will be allowed therefor.

10-1.60 PUMPING PLANT METAL WORK

Pumping plant metal work shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Paragraphs four, five, six, seven, eight, nine, ten, eleven and thirteen of Section 75-1.04, "Pumping Plant Metal Work," of the Standard Specifications are deleted.

Section 75-1.04, "Pumping Plant Metal Work," of the Standard Specifications is amended by adding the following paragraph after the seventeenth paragraph:

Manhole covers and frames for pumping plant discharge boxes shall be watertight and certified by the manufacturer to be rated to the pressure as shown on the plans. Modifications to the manhole cover and frame by the contractor to achieve pressure rating will not be acceptable.

10-1.61 MISCELLANEOUS IRON AND STEEL

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications.

10-1.62 CHAIN LINK FENCE

Chain link fence shall be Type CL-1.2 and shall conform to the provisions in Section 80, "Fences," of the Standard Specifications.

10-1.63 CABLE RAILING

Cable railing shall conform to the provisions in Section 83-1, "Railings," of the Standard Specifications.

10-1.64 CONCRETE BARRIER (TYPE K)

Concrete barrier (Type K) shall conform to the provisions in Section 83-2, "Barriers," of the Standard Specifications and these special provisions.

Attention is directed to "Order of work," of these special provisions.

Concrete barrier (Type K) shall consist of precast units conforming to the provisions for temporary railing (Type K) in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications, except that removable panels shall not be used and the concrete barrier (Type K) shall remain in place at completion of the contract.

The Contractor shall fill the gap between concrete barrier (Type K) and the face of retaining walls with sand as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Sand used to fill the gap between concrete barrier (Type K) and the retaining walls shall be of commercial quality, clean, free draining, and free from roots and other deleterious substances.

Filter fabric shall be used to wrap around the sand. Filter fabric shall conform to the requirements for filter fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.

Sand used to fill the gap between the concrete barrier (Type K) and retaining wall as specified in this section will be measured and paid for by the tonne and the quantity to be paid for will be determined as provided in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

When no longer required for the work as determined by the Engineer, the sand and the filter fabric shall be removed and disposed of. Removed sand and filter fabric shall become the property of the Contractor and shall be disposed of as provided in Section 7-1.13, "Disposal of material Outside the Highway Right-of-way."

The contract price paid per tonne for sand (concrete barrier Type K) shall include full compensations for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing and maintaining the sand in the gap between concrete barrier and retaining wall, and removing from the site of the work when no longer required, complete in place including filter fabric, as shown on the plans, as specified in the in these special provisions, and as directed by the Engineer.

Temporary railing (Type K) reflectors on concrete barrier (Type K) shall conform to the provisions in "Approved Traffic Products" of these special provisions.

Full compensation for furnishing and installing temporary railing (Type K) reflectors on concrete barrier (Type K) shall be considered as included in the contract price paid per meter for concrete barrier (Type K) and no additional compensation will be allowed therefor.

10-1.65 CRASH CUSHION, SAND FILLED

Sand filled crash cushions shall be furnished and installed as shown on the plans, and as specified in the Standard Specifications and these special provisions.

A sand filled crash cushion shall consist of a grouping of sand filled modules.

Crash cushions shall be installed at the following locations:

Rt. Sta. "T" 177+62.

At the Contractor's option, modules for use in sand filled crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules manufactured after March 31, 1997, or equal:

Energite III Inertial Modules manufactured by Energy Absorption Systems, Inc. One East Wacker Drive, Chicago, IL 60601-2076, Telephone 1-312-467-6750, FAX 1-800-770-6755.

Distributor (Northern): Traffic Control Service, Inc. 8585 Thys Court, Sacramento, CA 95828 Telephone 1-800-884-8274, FAX 1-916-387-9734.

Distributor (Southern): Traffic Control Service, Inc. 1881 Betmor Lane, Anaheim, CA 92805 Telephone 1-800-222-8274, FAX 1-714-937-1070.

Fitch Inertial Modules National Distributor: Roadway Safety Service, Inc. 1050 North Rand Road, Wauconda, IL 60084, Telephone 1-800-426-0839, FAX 1-847-487-9820.

Distributor: Singletree Sales Company 1533 Berger Drive, San Jose, CA 95112 Telephone 1-800-822-7735, FAX 1-408-287-1929.

Modules contained in the crash cushion shall be of the same type at each location. The color of modules shall be the standard yellow color as furnished by the vendor, with black lids. The exterior components of the modules shall be formulated or processed to resist deterioration from ambient ultraviolet rays. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that the crash cushions comply with the contract plans and specifications, conform to the prequalified design and material requirements, and were manufactured in accordance with the approved quality control program.

Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water, as determined by California Test 226.

Modules placed on bridge decks shall be provided with positioning blocks fastened to the deck surface. Positioning blocks shall be shaped as segments of a ring and placed along the inner or outer periphery of the module wall. A minimum of 2 blocks, a minimum of one-sixth of a ring in length shall be provided for each module. Positioning blocks and fasteners shall be of a material that is corrosion and water resistant.

Module cylinders shall be filled with sand in accordance with the manufacturer's directions, and to the sand capacity in kilograms for each module as shown on the plans.

Lids shall be securely attached as recommended by the manufacturer.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods approved by the Engineer.

Sand filled crash cushions, regardless of the number of modules required in each sand filled crash cushion, will be measured and paid for by the unit as crash cushion, sand filled. The quantity to be paid for will be determined from actual count of the units in place in the completed work.

The contract unit price paid for crash cushion, sand filled shall include full compensation for furnishing all labor, materials (including sand and marker panels), tools, equipment and incidentals, and for doing all the work involved in furnishing and installing the crash cushion complete in place, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

SECTION 10-2. (BLANK)

SECTION 10-3. ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Electric service (pump station) shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

10-3.02 CONDUIT

Conduit to be installed underground shall be Type 1 or Type 3 unless otherwise specified. The conduit in a foundation and between a foundation and the nearest pull box shall be Type 1.

Conduit sizes shown on the plans and specified in the Standard Specifications and these special provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

Size Designation for Metallic Type Conduit	Equivalent Size for Rigid Non-metallic Conduit
21	20
27	25
41	40
53	50
63	65
78	75
103	100

When a standard coupling cannot be used for joining Type 1 conduit, a UL listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C, "Installation," of the Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

When Type 3 conduit is placed in a trench (not in pavement or under portland cement concrete sidewalk), after the bedding material is placed and the conduit is installed, the trench shall be backfilled with commercial quality concrete, containing not less than 250 kg of portland cement per cubic meter, to not less than 100 mm above the conduit before additional backfill material is placed.

After conductors have been installed, the ends of conduits terminating in pull boxes and in service cabinet shall be sealed with an approved type of sealing compound.

At locations where conduit is required to be installed under pavement and if delay to any vehicle will not exceed 5 minutes, conduit may be installed by the "Trenching in Pavement Method."

Pull ropes for use when installing cables in Type 3 conduit shall consist of a flat, woven, lubricated, soft-fiber polyester tape with a minimum tensile strength of 8000 N and shall have printed sequential measurement markings at least every meter.

10-3.03 PULL BOXES

Grout shall not be placed in bottom of new or existing pull boxes.

10-3.04 TRAFFIC PULL BOXES

Traffic pull boxes and covers shall have a vertical proof-load strength of 111 kN. The 111 kN load shall be distributed through a 229-mm x 229-mm x 51-mm steel plate according to Federal Specification RR-F-621e. This load shall be placed anywhere on the box and cover for a period of one minute without causing any cracks or permanent deformations.

The No. 5(T) pull boxes shall be reinforced with a galvanized Z-bar welded frame and cover similar to that shown on the plans for No. 6(T) pull boxes. Frames shall be anchored to the boxes by means of 6-mm x 57-mm long concrete anchors. Six concrete anchors shall be provided for each No. 5(T) and No. 6(T) pull box, one placed in each corner and one placed near the middle of each of the longer sides.

Hold down screws shall be 9-mm hex flange cap screws of Type 316 stainless steel. The nut shall be zinc plated carbon steel and shall be made vibration resistant with a wedge ramp at the root of the thread. The nut shall be spot welded to the underside of, or fabricated with, the galvanized Z-bar pull box frame.

Steel covers shall be countersunk approximately 6 mm to accommodate the bolt head. The bolt head shall not extend more than 3 mm above the top of the cover when tightened down. A 6-mm tapped hole and brass bonding screw shall be provided.

The opening of traffic pull boxes shall have the following dimensions:

Pull Box Type	Width (±25 mm)	Length (±25 mm)
No. 5(T)	330 mm	600 mm
No. 6(T)	430 mm	760 mm

Concrete placed around and under traffic pull boxes as shown on the plans shall contain a minimum of 325 kg of portland cement per cubic meter.

After the installation of traffic pull boxes, the steel covers shall be installed and kept bolted down during periods when work is not actively in progress at the pull box. When placing the steel cover for the final time, the cover and the Z-bar frame shall be cleaned of all debris and securely tightened down.

10-3.05 CONDUCTORS AND WIRING

Splices shall be insulated by "Method B".

10-3.06 SERVICE

Continuous welding of exterior seams in service equipment enclosures is not required.

Type III(Modified) service equipment enclosures shall be the aluminum type.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

Dead front panel or panels, and corresponding exterior door, shall be hinged on one side and shall be openable without the use of tools.

10-3.07 ELECTRIC SERVICE (PUMP STATION)

Electric service (pump station) shall be from the service point to the pump station as shown on the plans.

The types of service for the pump station shall conform to the following:

PUMP STATION.—Electric service (pump station) shall be a metered 480-V, 3-phase service in a Type III (Modified) service equipment enclosure.

Electric service (pump station) will be paid for on a lump sum basis.

The contract lump sum price paid for electric service (pump station) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing electric service

(pump station) for the pump station, complete in place, including conductors, conduit and pull boxes to the pump station and telephone service conduit and pull boxes, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-3.08 ELECTRIC SERVICE (IRRIGATION)

Electric service (irrigation) shall be from the service point to the pull box provided for future irrigation controller as shown on the plans.

The types of service for future irrigation controller shall conform to the following:

FUTURE IRRIGATION CONTROLLER.—A, single-pole, 20-A circuit breaker shall be installed in the existing service cabinet. The circuit breaker shall be of the same manufacturer and model and interrupting capacity as the existing circuit breakers.

Full compensation for electric service (irrigation) shall be considered as included in the contract lump sum price paid for electric service (pump station) and no separate payment will be made therefor.

10-3.09 NUMBERING ELECTRICAL EQUIPMENT

The placement of numbers on electrical equipment will be done by others.

SECTION 11. (BLANK)

SECTION 12. (BLANK)

SECTION 13. (BLANK)

SECTION 14. FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 23, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

- 1. Name _____ of _____ joint _____ venture
- 2. Address _____ of _____ joint _____ venture
- 3. Phone _____ number _____ of _____ joint _____ venture
- 4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

a. Describe the role of the MBE firm in the joint venture.

b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____

5. Nature of the joint venture's business

6. Provide a copy of the joint venture agreement.

7. What is the claimed percentage of MBE ownership?

8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).

- a. Profit and loss sharing.
- b. Capital contributions, including equipment.
- c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

a. Financial decisions

b. Management decisions, such as:

(1) Estimating

(2). Marketing and sales

(3). Hiring and firing of management personnel

(4) Purchasing of major items or supplies

c. Supervision of field operations

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the

undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

_____ Name of Firm	_____ Name of Firm
_____ Signature	_____ Signature
_____ Name	_____ Name
_____ Title	_____ Title
_____ Date	_____ Date

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

- a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
- b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the

provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

- a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
- b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

- a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
- b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
- c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
- d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
- e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation

among minority groups in the area from which the project work force would normally be derived.

- a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
- b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
- c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of

training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

- c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
- d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
- c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
- d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

- b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
- c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

- a. The records kept by the contractor shall document the following:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
 - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
- b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas,

parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;
 - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages

of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

a. Apprentices:

- (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
- (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
- (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.
- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. **Helpers:**

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime

contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.
- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

- 1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
 - c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
- 2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

- 1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding

any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

- a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
 3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
 4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

Notice To All Personnel Engaged On Federal-Aid Highway Projects

18 U.S.C. 1020 READS AS FOLLOWS:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal

Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may

contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary
Exclusion – Primary Covered Transactions**

- 1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

- c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the

eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary
Exclusion - Lower Tier Covered Transactions**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the

required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

Goal for Women (applies nationwide).....(percent) 6.9

The following are goals for minority utilization:

CALIFORNIA ECONOMIC AREA

	Goal (Percent)
174 Redding, CA:	
Non-SMSA Counties	6.8
CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama.	
175 Eureka, CA	
Non-SMSA Counties	6.6
CA Del Norte; CA Humboldt; CA Trinity.	
176 San Francisco-Oakland-San Jose, CA:	
SMSA Counties:	
7120 Salinas-Seaside-Monterey, CA	28.9
CA Monterey.	
7360 San Francisco-Oakland	25.6
CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo.	
7400 San Jose, CA	19.6
CA Santa Clara.	
7485 Santa Cruz, CA.	14.9
CA Santa Cruz.	
7500 Santa Rosa, CA	9.1
CA Sonoma.	
8720 Vallejo-Fairfield- Napa, CA	17.1
CA Napa; CA Solano	
Non-SMSA Counties	23.2
CA Lake; CA Mendocino; CA San Benito	
177 Sacramento, CA:	
SMSA Counties:	
6920 Sacramento, CA	16.1
CA Placer; CA Sacramento; CA Yolo.	
Non-SMSA Counties	14.3
CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba.	
178 Stockton-Modesto, CA:	
SMSA Counties:	
5170 Modesto, CA	12.3
CA Stanislaus.	
8120 Stockton, CA	24.3
CA San Joaquin.	
Non-SMSA Counties	19.8
CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne.	

	Goal (Percent)
179 Fresno-Bakersfield, CA	
SMSA Counties:	
0680 Bakersfield, CA CA Kern.	19.1
2840 Fresno, CA CA Fresno.	26.1
Non-SMSA Counties CA Kings; CA Madera; CA Tulare.	23.6
180 Los Angeles, CA:	
SMSA Counties:	
0360 Anaheim-Santa Ana-Garden Grove, CA CA Orange.	11.9
4480 Los Angeles-Long Beach, CA CA Los Angeles.	28.3
6000 Oxnard-Simi Valley-Ventura, CA CA Ventura.	21.5
6780 Riverside-San Bernardino-Ontario, CA. CA Riverside; CA San Bernardino.	19.0
7480 Santa Barbara-Santa Maria-Lompoc, CA CA Santa Barbara.	19.7
Non-SMSA Counties CA Inyo; CA Mono; CA San Luis Obispo.	24.6
181 San Diego, CA:	
SMSA Counties	
7320 San Diego, CA. CA San Diego.	16.9
Non-SMSA Counties CA Imperial.	18.2

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereon.

FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be 10.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is

the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.