CONTRACT NO. 50918

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HONOLULU, HAWAII

SPECIAL PROVISIONS
PROPOSAL
CONTRACT AND BOND

FOR

KANEOHE BAY DRIVE IMPROVEMENTS

VICINITY OF PUOHALA STREET TO KAWA BRIDGE

FEDERAL-AID PROJECT NO. STP-065-1(9)

DISTRICT OF KOOLAULOA

ISLAND OF OAHU

FY 2003

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 1

FOR

KANEOHE BAY DRIVE IMPROVEMENTS

VICINITY OF PUOHALA STREET TO KAWA BRIDGE

FEDERAL AID PROJECT NO. STP-065-1(9)

DISTRICT OF KOOLAUPOKO

ISLAND OF OAHU

2003

Amend the Bid Documents as follows:

1. SPECIAL PROVISIONS

a. Replace Federal Wage Rates dated 1/10/2003 with the attached Federal Wage Rates dated 01/24/2003.

b. Replace Pages 203-12a through 203-14a dated 8/04/98 with the attached Pages 203-12a through 203-14a dated r2/07/03.

c. Replace Page 610-1a dated 10/11/98 with the attached Page 610-1a dated r1/14/03.

d. Replace Page 612-1a dated 01/02/03 with the attached Page 612-1a dated 2/05/03.

e. Replace Section 693 – Quadguard System Terminal Impact Attenuator, Pages 693-1a and 693-2a, dated 9/10/98 with the attached Section 693 – Quadguard System or Tau-II Terminal Impact Attenuator, Pages 693-1a through 693-3a, dated 1/14/03.

2. PROPOSAL

a. Replace Pages P-8 through P-19 dated 01/21/2003 with the attached Pages P-8 through P-19 dated 02/07/03

3. PLANS

a. Replace Plan Sheet Nos. 11,14,18, 27, 29 through 34, 36, 38 through 41, 43, 74, 89, and 113 with the attached Plans Sheet Nos. ADD11, ADD14, ADD18, ADD27, ADD29 through ADD34, ADD36, ADD38 through ADD41, ADD43, ADD74, ADD89, and ADD113.
b. The attached Plan Sheet Nos. ADD18 S-1 and ADD33 S-1 shall be incorporated and made a part of the Plans.

Please acknowledge receipt of this Addendum No. 1 by recording the date of its receipt in the space provided on Page P-4 of the Proposal.

RODNEY K. HARAGA
Director of Transportation

General Decision Number HI020001

Superseded General Decision No. HI010001

State: Hawaii

Construction Type:
BUILDING
DREDGING
HEAVY
HIGHWAY
RESIDENTIAL

County(ies):
STATEWIDE

BUILDING CONSTRUCTION PROJECTS; RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories); HEAVY AND HIGHWAY CONSTRUCTION PROJECTS AND DREDGING

Modification Number	Publication Date
0	03/01/2002
1	03/08/2002
2	04/19/2002
3	05/03/2002
4	07/05/2002
5	08/02/2002
6	08/16/2002
7	09/06/2002
8	09/27/2002
9	10/04/2002
10	11/08/2002
11	11/15/2002
12	11/22/2002
13	01/03/2003
14	01/10/2003
15	01/24/2003

COUNTY(ies):
STATEWIDE

ASBE0132A 08/30/1998

	Rates	Fringes
ASBESTOS WORKERS/INSULATORS Includes application of all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems. Also the application of firestopping material for wall openings and penetrations in walls, floors, ceilings and curtain walls.	26.50	14.89

BOIL0204A 10/01/1998

	Rates	Fringes
BOILERMAKERS	26.25	13.76

BRHI0001A 09/02/2002

	Rates	Fringes
BRICKLAYERS; Caulkers; Cement Block Layers; Cleaners; Pointers; and Stonemasons	25.92	16.72

BRHI0001B 09/02/2002

	Rates	Fringes
TERRAZZO WORKERS:		
Terrazzo Workers	26.17	16.72
Terrazzo Base Grinders	24.36	16.72
Terrazzo Floor Grinders and Tenders	22.81	16.72

BRHI0001C 09/03/2001

	Rates	Fringes
MARBLE MASONS	25.77	15.76

BRHI0001D 09/03/2001

	Rates	Fringes
TILE LAYERS (CERAMIC)	25.77	15.76
TILE LAYER FINISHERS (CERAMIC)	22.41	15.76

CARP0745A 03/04/2002

	Rates	Fringes
CARPENTERS:		

Carpenters; Hardwood Floor Layers; Patent Scaffold Erectors (14 ft. and over); Piledrivers; Pneumatic Nailers; Wood Shinglers; and Transit and/or Layout Man	30.90	15.45
Millwrights and Machine Erectors	31.15	15.45
Power Saw Operators (2 H.P. and over)	31.05	15.45

CARP0745B 03/04/2002

	Rates	Fringes
DRYWALL HANGERS	31.15	15.42
LATHERS	31.15	15.42

ELEC1186A 08/18/2002

	Rates	Fringes
ELECTRICIANS:		
Electricians	31.70	6.54+30.6%
Technicians	32.65	6.54+30.6%
Cable Splicers	34.87	6.54+30.6%

ELEC1186B 08/18/2002

	Rates	Fringes
LINE CONSTRUCTION:		
Linemen	31.70	6.54+30.6%
Technicians	32.65	6.54+30.6%
Heavy Equipment Operators	28.53	6.54+30.6%
Cable Splicers	34.87	6.54+30.6%
Groundmen; Truck Drivers	23.78	6.54+30.6%

ELEV0126A 10/04/1999

	Rates	Fringes
ELEVATOR MECHANICS	34.65	6.935+a+b

a. VACATION: Employer contributes 8% of basic hourly rate for 5 years service and 6% of basic hourly rate for 6 months to 5 years service as vacation pay credit.

b. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day after Thanksgiving Day and Christmas Day.

ENGI0003I 09/01/2002

	Rates	Fringes
POWER EQUIPMENT OPERATORS (Includes All Types of Paving):		
GROUP 1	28.59	16.53
GROUP 2	28.70	16.53
GROUP 3	28.87	16.53

GROUP 4	29.14	16.53
GROUP 5	29.45	16.53
GROUP 6	30.10	16.53
GROUP 7	30.42	16.53
GROUP 8	30.53	16.53
GROUP 9	30.64	16.53
GROUP 9A	30.87	16.53
GROUP 10	30.93	16.53
GROUP 10A	31.08	16.53
GROUP 11	31.25	16.53
GROUP 12	31.58	16.53
GROUP 12A	31.95	16.53

WAGE RATES FOR TUNNEL WORK:

GROUP 1	28.89	16.53
GROUP 2	29.00	16.53
GROUP 3	29.17	16.53
GROUP 4	29.44	16.53
GROUP 5	29.75	16.53
GROUP 6	30.40	16.53
GROUP 7	30.72	16.53
GROUP 8	30.83	16.53
GROUP 9	30.94	16.53
GROUP 9A	31.17	16.53
GROUP 10	31.23	16.53
GROUP 10A	31.38	16.53
GROUP 11	31.53	16.53
GROUP 12	31.89	16.53
GROUP 12A	32.25	16.53

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Fork Lift (up to and including 10 tons); Partsman (heavy duty repair shop parts room when needed).

GROUP 2: Conveyor Operator (Handling building material); Hydraulic Monitor; Mixer Box Operator (Concrete Plant).

GROUP 3: Brakeman; Deckhand; Fireman; Oiler; Oiler/Gradechecker; Signalman; Switchman; Highline Cableway Signalman; Bargeman; Bunkerman; Concrete Curing Machine (self-propelled, automatically applied unit on streets, highways, airports and canals); Leveeman; Roller (5 tons and under); Tugger Hoist.

GROUP 4: Boom Truck or dual purpose "A" Frame Truck (5 tons or less); Concrete Placing Boom (Building Construction); Dinky Operator; Elevator Operator; Hoist and/or Winch (one drum); Straddle Truck (Ross Carrier, Hyster and similar).

GROUP 5: Asphalt Plant Fireman; Compressors, Pumps, Generators and Welding Machines ("Bank" of 9 or more, individually or collectively); Concrete Pumps or Pumpcrete Guns; Lubrication and

Service Engineer (Grease Rack); Screedman.

GROUP 6: Boom Truck or Dual Purpose "A"Frame Truck (over 5 tons); Combination Loader/Backhoe (up to and including 3/4 cu. yd.); Concrete Batch Plants (wet or dry); Concrete Cutter, Groover and/or Grinder (self-propelled unit on streets, highways, airports, and canals); Conveyor or Concrete Pump (Truck or Equipment Mounted); Drilling Machinery (not to apply to waterliners, wagon drills or jack hammers); Fork Lift (over 10 tons); Loader (up to and including 3 and 1/2 cu. yds); Lull High Lift (under 40 feet); Lubrication and Service Engineer (Mobile); Maginnis Internal Full Slab Vibrator (on airports, highways, canals and warehouses); Man or Material Hoist; Mechanical Concrete Finisher (Large Clary, Johnson Bidwell, Bridge Deck and similar); Mobile Truck Crane Driver; Portable Shotblast Concrete Cleaning Machine; Portable Boring Machine (under streets, highways, etc.); Portable Crusher; Power Jumbo Operator (setting slip forms, etc., in tunnels); Rollers (over 5 tons); Self-propelled Compactor (single engine); Self-propelled Pavement Breaker; Skidsteer Loader with attachments; Slip Form Pumps (Power driven by hydraulic, electric, air, gas, etc., lifting device for concrete forms); Small Rubber Tired Tractors; Trencher (up to and including 6 feet); Underbridge Personnel Aerial Platform (50 feet of platform or less).

GROUP 7: Crusher Plant Engineer, Dozer (D-4, Case 450, John Deere 450, and similar); Dual Drum Mixer, Extend Lift; Hoist and/or Winch (2 drums); Loader (over 3 and 1/2 cu. yds. up to and including 6 yards.); Mechanical Finisher or Spreader Machine (asphalt), (Barber Greene and similar) (Screedman required); Mine or Shaft Hoist; Mobile Concrete Mixer (over 5 tons); Pipe Bending Machine (pipelines only); Pipe Cleaning Machine (tractor propelled and supported); Pipe Wrapping Machine (tractor propelled and supported); Roller Operator (Asphalt); Self-Propelled Elevating Grade Plane; Slusher Operator; Tractor (with boom) (D-6, or similar); Trencher (over 6 feet and less than 200 h.p.); Water Tanker (pulled by Euclids, T-Pulls, DW-10, 20 or 21, or similar); Winchman (Stern Winch on Dredge).

GROUP 8: Asphalt Plant Operator; Barge Mate (Seagoing); Cast-in-Place Pipe Laying Machine; Concrete Batch Plant (multiple units); Conveyor Operator (tunnel); Deckmate; Dozer (D-6 and similar); Finishing Machine Operator (airports and highways); Gradesetter; Kolman Loader (and similar); Mucking Machine (Crawler-type); Mucking Machine (Conveyor-type); No-Joint Pipe Laying Machine; Portable Crushing and Screening Plant; Power Blade Operator (under 12); Saurman Type Dragline (up to and including 5 yds.); Stationary Pipe Wrapping, Cleaning and Bending Machine; Surface Heater and Planer Operator, Tractor (D-6 and similar); Tri-Batch Paver; Tunnel Badger; Tunnel Mole and/or Boring Machine Operator Underbridge Personnel Aerial Platform (over 50 feet of platform).

GROUP 9: Combination Mixer and Compressor (gunite); Do-Mor Loader and Adams Elegrader; Dozer (D-7 or equal); Wheel and/or Ladder Trencher (over 6 feet and 200 to 749 h.p.).

GROUP 9A: Dozer (D-8 and similar); Gradesetter (when required by the Contractor to work from drawings, plans or specifications without the direct supervision of a foreman or superintendent); Push Cat; Scrapers (up to and including 20 cu. yds); Self-propelled Compactor with Dozer; Self-Propelled, Rubber-Tired Earthmoving Equipment (up to and including 20 cu. yds) (621 Band and similar); Sheep's Foot; Tractor (D-8 and similar); Tractors with boom (larger than D-6, and similar).

GROUP 10: Chicago Boom; Cold Planers; Heavy Duty Repairman or Welder; Hoist and/or Winch (3 drums); Hydraulic Skooper (Koehring and similar); Loader (over 6 cu. yds. up to and including 12 cu. yds.); Saurman type Dragline (over 5 cu. yds.); Self-propelled, rubber-tired Earthmoving Equipment (over 20 cu. yds. up to and including 31 cu. yds.) (637D and similar); Soil Stabilizer (P & H or equal); Sub-Grader (Gurries or other automatic type); Tractors (D-9 or equivalent, all attachments); Tractor (Tandem Scraper); Watch Engineer.

GROUP 10A: Boat Operator; Cable-operated Crawler Crane (up to and including 25 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (up to and including 1 cu. yd.); Dozer D9-L; Dozer (D-10, HD41 and similar) (all attachments); Gradall (up to and including 1 cu. yd.); Hydraulic Backhoe (over 3/4 cu. yds. up to and including 2 cu. yds.); Mobile Truck Crane Operator (up to and including 25 tons) (Mobile Truck Crane Driver Required); Self-propelled Boom Type Lifting Device (Center Mount) (up to and including 25 tons) (Grove, Drott, P&H, Pettibone and similar; Trencher (over 6 feet and 750 h.p. or more); Watch Engineer (steam or electric).

GROUP 11: Automatic Slip Form Paver (concrete or asphalt); Band Wagon (in conjunction with Wheel Excavator); Cable-operated Crawler Cranes (over 25 tons but less than 50 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (over 1 cu. yd. up to 7 cu. yds.); Gradall (over 1 cu. yds. up to 7 cu. yds.); DW-10, 20, etc. (Tandem); Earthmoving Machines (multiple propulsion power units and 2 or more Scrapers) (up to and including 35 cu. yds.," struck" m.r.c.); Highline Cableway; Hydraulic Backhoe (over 2 cu. yds. up to and including 4 cu. yds.); Leverman; Lift Slab Machine; Loader (over 12 cu. yds); Master Boat Operator; Mobile Truck Crane Operator (over 25 tons but less than 50 tons); (Mobile Truck Crane Driver required); Pre-stress Wire Wrapping Machine; Self-propelled Boom-type Lifting Device (Center Mount) (over 25 tons m.r.c); Self-propelled Compactor (with multiple-propulsion power units); Single Engine Rubber Tired Earthmoving Machine (with Tandem Scraper); Tandem Cats; Trencher (pulling attached shield).

GROUP 12: Clamshell or Dipper Operator; Derricks; Drill Rigs; Multi-Propulsion Earthmoving Machines (2 or more Scrapers) (over 35 cu. yds "struck"m.r.c.); Operators (Derricks, Piledrivers and Cranes); Power Shovels and Draglines (7 cu. yds. m.r.c. and over); Self-propelled rubber-tired Earthmoving equipment (over 31 cu. yds.) (657B and similar); Wheel Excavator (up to and including 750 cu. yds. per hour); Wheel Excavator (over 750 cu.

yds. per hour).

GROUP 12A: Dozer (D-11 or similar or larger); Hydraulic Excavators (over 4 cu. yds.); Lifting cranes (50 tons and over); Pioneering Dozer/Backhoe (initial clearing and excavation for the purpose of providing access for other equipment where the terrain worked involves 1-to-1 slopes that are 50 feet in height or depth, the scope of this work does not include normal clearing and grubbing on usual hilly terrain nor the excavation work once the access is provided); Power Blade Operator (Cat 12 or equivalent or over); Straddle Lifts (over 50 tons); Tower Crane, Mobile; Traveling Truss Cranes; Universal, Liebher, Linden, and similar types of Tower Cranes (in the erection, dismantling, and moving of equipment there shall be an additional Operating Engineer or Heavy Duty Repairman); Yo-Yo Cat or Dozer.

HELICOPTER WORK:		
Pilot of Helicopter	32.76	16.53
Co-Pilot of Helicopter	32.59	16.53
Airborne Hoist Operator for Helicopter	32.45	16.53
DIVERS (AQUA LUNG) (SCUBA):		
Diver (Aqua Lung) (Scuba) (up to a depth of 30 feet)	43.28	16.53
Diver (Aqua Lung) (Scuba) (over a depth of 30 feet)	52.65	16.53
Stand-by Diver (Aqua Lung) (Scuba)	33.90	16.53
DIVERS (OTHER THAN AQUA LUNG):		
Diver (Other than Aqua Lung)	52.65	16.53
Stand-By Diver (Other than Aqua Lung)	33.90	16.53
Diver Tender (Other than Aqua Lung)	30.87	16.53

BOOMS AND/OR LEADS (HOURLY PREMIUMS):
The Operator of a crane (under 50 tons) with a boom of 80 feet or more (including jib), or of a crane (under 50 tons) with leads of 100 feet or more, shall receive a per hour premium for each hour worked on said crane (under 50 tons) in accordance with the following schedule:

Booms of 80 feet up to but not including 130 feet or Leads of 100 feet up to but not including 130 feet	0.50
Booms and/or Leads of 130 feet up to but not including 180 feet	0.75
Booms and/or Leads of 180 feet up to and including 250 feet	1.15
Booms and/or Leads over 250 feet	1.50

The Operator of a crane (50 tons and over) with a boom of 180 feet or more (including jib) shall receive a per hour premium for each hour worked on said crane (50 tons and over) in accordance with the following schedule:

Booms of 180 feet up to and including 250 feet	1.25
Booms over 250 feet	1.75

ENGI0003K 09/01/2002

	Rates	Fringes
TRUCK DRIVERS:		
GROUP 1	28.87	16.53+a
GROUP 2	29.14	16.53+a
GROUP 3	29.45	16.53+a
GROUP 4	30.10	16.53+a
GROUP 5	30.42	16.53+a
GROUP 6	30.53	16.53+a

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Utility, flatbed, or similar.
GROUP 2: Dump, 8 yards, and under (water level); water truck, up to and including 2,000 gallons.
GROUP 3: Tandem Dump, over 8 yards (water level); water truck (over 2,000 gallons).
GROUP 4: Semi-trailer, rock cans, or semi-dump.
GROUP 5: Slip-in or pup.
GROUP 6: End dumps (unlicensed); tractor trailer (hauling equipment).

a. An employee who has completed 1 but less than 2 years service- 1 week's paid vacation; 2 but less than 10 years service - 2 weeks paid vacation; 10 but less than 15 years service - 3 weeks paid vacation; and 15 or more years service - 4 weeks paid vacation.

ENGI0003L 09/01/2002

	Rates	Fringes
DREDGING:		
CLAMSHELL OR DIPPER DREDGES:		
GROUP 1	31.59	16.53
GROUP 2	30.93	16.53
GROUP 3	30.53	16.53
GROUP 4	28.87	16.53

DREDGING CLASSIFICATIONS

GROUP 1: Clamshell or Dipper Operator.
GROUP 2: Mechanic or Welder; Watch Engineer.

GROUP 3: Barge Mate; Deckmate.
GROUP 4: Bargeman; Deckhand; Fireman; Oiler.

HYDRAULIC SUCTION DREDGES:

GROUP 1	31.23	16.53
GROUP 2	31.08	16.53
GROUP 3	30.93	16.53
GROUP 4	30.87	16.53
GROUP 5	30.53	16.53
GROUP 6	30.42	16.53
GROUP 7	28.87	16.53

DREDGING CLASSIFICATIONS

GROUP 1: Leverman.
GROUP 2: Watch Engineer (steam or electric).
GROUP 3: Mechanic or Welder.
GROUP 4: Dozer Operator.
GROUP 5: Deckmate.
GROUP 6: Winchman (Stern Winch on Dredge).
GROUP 7: Deckhand (can operate anchor scow under direction of Deckmate); Fireman; Leveeman; Oiler.

DERRICKS:

GROUP 1	31.59	16.53
GROUP 2	30.93	16.53
GROUP 3	30.53	16.53
GROUP 4	28.87	16.53

DERRICK CLASSIFICATIONS

GROUP 1: Operators (Derricks, Piledrivers and Cranes).
GROUP 2: Saurman Type Dragline (over 5 cubic yards).
GROUP 3: Deckmate; Saurman Type Dragline (up to and including 5 yards).
GROUP 4: Deckhand, Fireman, Oiler.

BOAT OPERATORS:

Master Boat Operator	31.23	16.53
Boat Operator	31.08	16.53
Boat Deckhand	28.87	16.53

IRON0625A 09/02/2002

	Rates	Fringes
IRONWORKERS	27.00+a	20.81

a. Employees will be paid $.50 per hour more while working in tunnels and coffer dams; $1.00 per hour more when required to work under or are covered with water (submerged) and when they are required to work on the summit of Mauna Kea, Mauna Loa or Haleakala.

LABO0368A 09/03/2001

	Rates	Fringes
LABORERS:		
GROUP 1	22.85	11.20
GROUP 2	21.25	11.20
GROUP 3	23.85	11.20
GROUP 4	23.35	11.20
GROUP 5	22.35	11.20
GROUP 6	15.25	6.95
MASON TENDERS	23.10	11.20

LABORERS CLASSIFICATIONS

GROUP 1: Asbestos Removal Worker (EPA certified workers); Asphalt Ironer, Raker, Luteman, and Handroller, and all types of Asphalt Spreader Boxes; Asphalt Shoveler; Assembly and Installation of Multiplates, Liner Plates, Rings, Mesh, Mats; Batching Plant (portable and temporary); Boring Machine Operator (under streets and sidewalks); Buggymobile; Burning, Welding, Signalling, Choke Setting, and Rigging in connection with Laborers' work (except demolition); Chainsaw, Faller, Logloader, and Bucker; Compactors (Jackson and similar); Concrete Bucket Dumpman; Concrete Chipping; Concrete Chuteman/Hoseman (pouring concrete) (the handling of the chute from ready-mix trucks for such jobs as walls, slabs, decks, floors, foundations, footings, curbs, gutters, and sidewalks); Concrete Core Cutter (Walls, Floors, and Ceiling); Concrete Curer (impervious membrane and form oiler); Concrete Grinding or Sanding; Concrete: Hooking on, signaling, dumping of concrete for treme work over water on caissons, pilings, abutments, etc.; Concrete: Mixing, handling, conveying, pouring, vibrating, otherwise placing of concrete or aggregates or by any other process; Concrete: Operation of motorized wheelbarrows or buggies or machines of similar character, whether run by gas, diesel, or electric power; Concrete Pump Machine (laying, coupling, uncoupling of all connections and cleaning of equipment); Concrete and/or Asphalt Saw (Walking or Handtype) (cutting walls or flatwork) (scoring old or new concrete and/or asphalt) (cutting for expansion joints) (streets and ways for laying of pipe, cable or conduit for all purposes); Concrete Shovelers/Laborers (Wet or Dry); Concrete Screeding for Rough Strike-Off; Rodding or striking-off, by hand or mechanical means prior to finishing; Concrete Vibrator Operator; Coring Holes: Walls, footings, piers or other obstructions for passage of pipes or conduits for any purpose and the pouring of concrete to secure the hole; Curbing, Concreting, and Asphalt; Curing of Concrete, mortar, and other materials by any mode or method; Cut Granite Curb Setter (setting, leveling and grouting of all precast concrete or stone curbs); Cutting and Burning Torch (demolition); Dri Pak-It Machine; Driller (Track, Diamond Core, and Wagon); Driller (Joydrill Model TWM-2A, Gardner Denver DH-143 and similar type drills); Driller (Mechanical) (not

covered elsewhere) (including multiple unit); (Ingersoll-Rand DM45E/DM50E/LM-100/LM-600C, Gardner-Denver SCH2500/SCH3500BV, Furukawa HCR-C300, Tamrock Drilltech CHA800/DHH 850 Tamrock Commando) (similar and replacement equipment thereof); Drilling for blasting; Operation of all rock and concrete drills and Jack Hammers, including handling, carrying, laying out of hose; (Ingersoll-Rand DM45E/DM50E/LM-100/LM-600C), Gardner-Denver SCH2500/SCH3500 BV, Furukawa HCR-C300, Tamrock Drilltech CHA 800/DHH 850/Tamrock Commando) (similar and replacement equipment thereof); Drilling (Mechanical) on the site or along the right-of-way as well as access roads, reservoirs, including areas adjacent or pertinent to construction sites); Falling, bucking, yarding, loading or burning of all trees or timber on construction site; Fence and/or Guardrail Erector; Forklift (9 ft. and under); Grating and Grill work for drains or other purposes; Green Cutter of concrete or aggregate in any form, by hand, mechanical means, grindstone or air and/or water; Grout: Spreading for any purpose; Guinea Chaser (Grade Checker) for general utility trenches, sitework, and excavation; Headerboard Man (Asphalt or Concrete); Heat Welder of Plastic (Laborers' AGC certified workers) (when work involves waterproofing for waterponds, artificial lakes and reservoir, or heat welding for sewer pipes); Heavy Highway Laborer (Rigging, signaling, handling, and installation of pre-cast catch basins, manholes, curbs and gutters); High Pressure Nozzleman - Hydraulic Monitor (over 100# pressure); Installation of Gilsulate 500XR; Jackhammer Operator; Jacking of slip forms; All semi and unskilled work connected therewithin; Laying of all multi-cell conduit or multi-purpose pipe; Magnesite and Mastic Workers (Wet or Dry) (including mixer operator); Mortar Man; Mortar Mixer (Block, Brick, Masonry, and Plastering); Nozzleman (Sandblasting and/or Water Blasting); Operation, Manual or Hydraulic jacking of shields and the use of such other mechanical equipment as may be necessary; Pavement Breakers; Paving, curbing and surfacing of streets, ways, courts, under and overpasses, bridges, approaches, slope walls, and all other labor connected therewith; Pilecutters; Pipe Accessment in place, bolting and lining up of sectional metal or other pipe including corrugated pipe; Pipelayer performing all services in the laying and installation of pipe from the point of receiving pipe in the ditch until completion of operation, including any and all forms of tubular material, whether pipe, metallic or non-metallic, conduit, and any other stationary-type of tubular device used for conveying of any substance or element, whether water, sewage, solid, gas, air, or other product whatsoever and without regard to the nature of material from which tubular material is fabricated; No-joint pipe and stripping of same, Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, treating Creosote and similar-type materials (6-inch) pipe and over); Piping: resurfacing and paving of all ditches in preparation for laying of all pipes; Pipe laying of lateral sewer pipe from main or side sewer to buildings or structure (except Contactor may direct work be done under proper supervision); Pipe laying, leveling and marking of the joint used for main or side sewers and storm sewers; Laying of all clay, terra cotta, ironstone, vitrified concrete or other pipe for drainage; Placing and setting of water mains, gas mains

and all pipe including removal of skids; Plaster Mortar Mixer/ Pump; Pneumatic Impact Wrench; Portable Sawmill Operation: Choker setters, off bearers, and lumber handlers connected with clearing; Posthole Digger (Hand Held, Gas, Air and Electric); Power Broom Sweepers (Small); Preparation and Compaction of roadbeds for railroad track laying, highway construction, and the preparation of trenches, footings, etc., for cross-country transmission by pipelines, electrical transmission or underground lines or cables (by mechanical means); Raising of structure by manual or hydraulic jacks or other methods and resetting of structure in new locations, including all concrete work; Ramming or compaction; Riprap, Stonepaver, and Rock Slinger (includes placement of stacked concrete, wet or dry and loading, unloading, signaling, slinging and setting of other similar materials); Rotary Scarifier (including multiple head concrete chipping Scarifier); Salamander Heater, Drying of plaster, concrete mortar or other aggregate; Sandblaster (Nozzleman) handling, placing and operation of nozzle; Scaffold Erector; Scaffolds: (Swing and hanging) including maintenance thereof; Scaler; Septic Tank/Cesspool and Drain Fields Digger and Installer; Shredder/Chipper (tree branches, brush, etc.); Stripping and Setting Forms; Stripping of Forms: Other than panel forms which are to be re-used in their original form, and stripping of forms on all flat arch work; Tampers (Barko, Wacker, and similar type); Tank Scaler and Cleaners; Tarman; Tree Climbers and Trimmers; Trencher (includes hand-held, Davis T-66 and similar type); Trucks (flatbed up to and including 2 1/2 tons when used in connection with on-site Laborers'work; Trucks (Refuse and Garbage Disposal) (from job site to dump); Vibra-Screed (Bull Float in connection with Laborers' work); Well Points, Installation of or any other dewatering system.

GROUP 2: Air Blasting; Appliance Handling (job site) (after delivery and unloading in storage area); Asphalt Laborer; Asphalt Plant Laborer; Backfill work connected with the installation of Gilsulate 500XR; Backfilling, Grading and all other labor connected therewith; Boring Machine; Bridge Laborer; Burning of all debris (crates, boxes, packaging waste materials); Cemetary Laborers; Chainman, Rodmen, and Grade Markers; Cleaning and Clearing of all debris; Cleaning, clearing, grading and/or removal for streets, highways, roadways, aprons, runways, sidewalks, parking areas, airports, approaches, and other similar installations; Cleaning or reconditioning of streets, ways, sewers and waterlines, all maintenance work and work of an unskilled and semi-skilled nature; Cleanup of Grounds and Buildings (other than "Light Clean-Up") (Janitorial Laborer); Clean-up of right-of-way; Clearing and slashing of brush or trees by hand or mechanical cutting; Concrete Bucket Tender (Groundman) hooking and unhooking of bucket; Concrete Forms; moving, cleaning, oiling and carrying to the next point of erection of all forms; Concrete Products Plant Laborers; Conveyor Tender (conveying of building materials); Cribbers, Shorer, Lagging, Sheeting, and Trench Jacking and Bracing, Hand-Guided Lagging Hammer Whaling Bracing; Crushed Stone Yards and Gravel and Sand Pit Laborers and all other similar plants; Demolition, Wrecking and Salvage Laborers: Wrecking and dismantling of buildings and

all structures, with use of cutting or wrecking tools, burning or cutting, breaking away, cleaning and removal of all masonry, wood or metal fixtures for salvage or scrap, All hooking, unhooking, signaling of materials for salvage or scrap removed by crane or derrick; Digging under streets, roadways, aprons or other paved surfaces; Driller, Chuck Tender, Outside Nipper; Dry-packing of concrete (plugging and filling of she-bolt holes); Excavation, Preparation of street ways and bridges; Fence and/or Guardrail Erector; Dismantling and/or re-installation of all fence; Finegrader; Firewatcher; Flagman (Coning, preparing, establishing and removing portable roadway barricade devices); Signal Men on all construction work defined herein, including Traffic Control Signal Men at construction site; Garbage and Debris Handlers and Cleaners; Gas, Pneumatic, and Electric Tools, not listed Group 1 (except Rototiller); General Clean-up: sweeeping, cleaning, washdown, wiping of construction facility, and equipment (other than "Light Clean-up" [Janitorial] Laborer); General Excavation and Grading (all labor connected therewith); Digging of trenches, ditches and manholes and the leveling, grading and other preparation prior to laying pipe or conduit for any purpose; Excavations and foundations for buildings, piers, foundations and holes, and all other construction; General Laborer; Gunite Operator; Junk Yard Laborers (same as Salvage Yard); Landscape Nursery Laborers; Laser Beam "Target Man" in connection with Laborers' work; Layout Person for Plastic (when work involves waterproofing for waterponds, artificial lakes and reservoirs); Limbers, Brush Loaders, and Pilers; Loading, Unloading, carrying, distributing and handling of all rods and material for use in reinforcing concrete construction (except when a derrick or outrigger operated by other than hand power is used); Loading, unloading, sorting, stockpiling, handling and distribution of water mains, gas mains and all pipes; Loading and unloading of all materials, fixtures, furnishings and appliances from point of delivery to stockkpile to point of installation; hooking and signalling from truck, conveyance or stockpile; Material Yard Laborers; Parks and Sports arenas and all recreational center employees; Pipelayer Tender; Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, Creosote, and similar-type materials (pipe under 6 inches); Plasterer Laborer (including Hod Carrier); Preparation, construction and maintenance of roadbeds and sub-grade for all paving, including excavation, dumping, and spreading of sub-grade material; Prestressed or prescast concrete slabs, walls, or sections: all loading, unloading, stockpiling, hooking on of such slabs, walls or sections; Quarry Laborers; Railroad, Streetcar, and Rail Transit Maintenance and Repair; Removal of surplus material; Roustabout; Rubbish Trucks in connection with Building Construction Projects (excluding clearing, grubbing, and excavating); Salvage Yard: All work connected with cutting, cleaning, storing, stockpiling or handling of materials, all cleanup, removal of debris, burning, back-filling and landscaping of the site; Scaffolds: Erection, planking and removal of all scaffolds used for support for lathers, plasters, brick layers, masons, and other construction trades crafts; Scaffolds: (Specially designed by carpenters) laborers shall tend said carpenter on erection and dismantling therof, preparation for

foundation or mudsills, maintenance; Scraping of floors; Screeds: Handling of all screeds to be reused; handling, dismantling and conveyance of screeds; Setting, leveling and securing or bracing of metal or other road forms and expansion joints; Sheeting Piling/trench shoring (handling and placing of skip sheet or wood plank trench shoring); Ship Scalers; Shipwright; Sign Erector (subdivision traffic, regulatory, and street-name signs); Sloper; Slurry Seal Crews (Mixer Operator, Applicator, Squeegee Man, Shuttle Man, Top Man); Snapping of wall ties and removal of tie rods; Soil Test operations of semi and unskilled labor such as filling sand bags; Striper (Asphalt, Concrete or other Paved Surfaces); Tagging and Signaling of all building materials into high-rise units; Tool Room Attendant (Job Site); Traffic Delineating Device Applicator; Underpinning, lagging, bracing, propping and shoring, loading, signaling, right-of-way clearance along the route of movement, The clearance of new site, excavation of foundation when moving a house or structure from old site to new site; Utilities employees; Water Man; Waterscape/Hardscape Laborers; Wire Mesh Pulling (all concrete pouring operations); Wrecking, stripping, dismantling and handling concrete forms an false work.

GROUP 3: Licensed Powdermen.

GROUP 4: Gunnite Operator; High Scaler (working suspended), Pipelaying.

GROUP 5: Window Washer (Outside) (Working from bosun's chair and/or cable-suspended scaffold or work platform).

GROUP 6: Light Clean-Up.

LABO0368B 09/30/2002

	Rates	Fringes
LANDSCAPE AND IRRIGATION LABORERS:		
Group 1	17.66	5.47
Group 2	18.16	5.47
Group 3	14.51	5.47

LABORERS CLASSIFICATIONS

GROUP 1: Installation of non-potable permanent or temporary irrigation water systems performed for the purposes of Landscaping and Irrigation architectural horticultural work; the installation of drinking fountains and permanent or temporary irrigation systems using potable water for Landscaping and Irrigation architectural horticultural purposes only. This work includes (a) the installation of all heads, risers, valves, valve boxes, vacuum breakers (pressure and non-pressure), low voltage electrical lines and, provided such work involves electrical wiring that will carry 24 volts or less, the installation of sensors, master control panels, display boards, junction boxes, conductors, including all other components for controllers, (b) and metallic (copper, brass, galvanized, or similar) pipe, as

well as PVC or other plastic pipe including all work incidental thereto, i.e., unloading, handling and distribution of all pipes fittings, tools, materials and equipment, (c) all soldering work in connection with the above whether done by torch, soldering iron, or other means; (d) tie-in to main lines, thrust blocks (both precast and poured in place), pipe hangers and supports incidental to installation of the entire irrigation system, (e) making of pressure tests, start-up testing, flushing, purging, water balancing, placing into operation all irrigation equipment, fixtures and appurtenances installed under this agreement, and (f) the fabrication, replacement, repair and servicing oflandscaping and irrigation systems. Operation of hand-held gas, air, electric, or self-powered tools and equipment used in the performance of Landscape and Irrigation work in connection with architectural horticulture; Choke-setting, signaling, and rigging for equipment operators on job-site in the performance of such Landscaping and Irrigation work; Concrete work (wet or dry) performed in connection with such Landscaping and Irrigation work. This work shall also include the setting of rock, stone, or riprap in connection with such Landscape, Waterscape, Rockscape, and Irrigation work; Grubbing, pick and shovel excavation, and hand rolling or tamping in connection with the performance of such Landscaping and Irrigation work; Sprigging, handseeding, and planting of trees, shrubs, ground covers, and other plantings and the performance of all types of gardening and horticultural work relating to said planting; Operation of flat bed trucks (up to and including 2 1/2 tons).

GROUP 2: Layout of irrigation and other non-potable irrigation water systems and the layout of drinking fountains and other potable irrigation water systems in connection with such Landscaping and Irrigation work. This includes the layout of all heads, risers, valves, valve boxes, vacuum breakers, low voltage electrical lines, hydraulic and electrical controllers, and metallic (coppers, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe. This work also includes the reading and interpretation of plans and specifications in connection with the layout of Landscaping, Rockscape, Waterscape, and Irrigation work; Operation of Hydro-Mulching machines (sprayman and driver), Drillers, Trenchers (riding type, Davis T-66, and similar) and fork lifts used in connection with the performance of such Landscaping and Irrigation work; Tree climbers and chain saw tree trimmers, Sporadic operation (when used in connection with Landscaping, Rockscape, Waterscape, and Irrigation work) of Skid-Steer Loaders (Bobcat and similar), Cranes (Bantam, Grove, and similar), Hoptos, Backhoes, Loaders, Rollers, and Dozers (Case, John Deere, and similar), Water Trucks, Trucks requiring a State of Hawaii Public Utilities Commission Type 5 and/or type 7 license, sit-down type and "gang" mowers, and other self-propelled, sit-down operated machines not listed under Landscape & Irrigation Maintenance Laborer; Chemical spraying using self-propelled power spraying equipment (200 gallon capacity or more).

GROUP 3: Maintenance of trees, shrubs, ground covers, lawns and

other planted areas, including the replanting of trees, shrubs, ground covers, and other plantings that did not "take" or which are damaged; provided, however, that re-planting that requires the use of equipment, machinery, or power tools shall be paid for at the rate of pay specified under Landscape and Irrigation Laborer, Group 1; Raking, mowing, trimming, and pruning, including the use of "weed eaters", hedge trimmers, vacuums, blowers, and other hand-held gas, air, electric, or self-powered tools, and the operation of lawn mowers (Note: The operation of sit-down type and "gang" mowers shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer, Group 2); Guywiring, staking, propping, and supporting trees; Fertilizing, Chemical spraying using spray equipment with less than 200 gallon capacity, Maintaining irrigation and sprinkler systems, including the staking, clamping, and adjustment of risers, and the adjustment and/or replacement of sprinkler heads, (Note: the cleaning and gluing of pipe and fittings shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer(Group 1); Watering by hand or sprinkler system and the peformance of other types of gardening, yardman, and horticultural-related work.

LABO0368C 09/04/2000

	Rates	Fringes
UNDERGROUND LABORERS:		
GROUP 1	21.45	10.74
GROUP 2	22.95	10.74
GROUP 3	23.45	10.74
GROUP 4	24.45	10.74
GROUP 5	24.80	10.74
GROUP 6	25.05	10.74
GROUP 7	25.50	10.74

GROUP 1: Watchmen; Change House Attendant

GROUP 2: Swamper; Brakeman; Bull Gang-Muckers, Trackmen; Dumpmen (any method); Concrete Crew (includes rodding and spreading); Grout Crew; Reboundmen

GROUP 3: Chucktenders and Cabletenders; Powderman (Prime House); Vibratorman, Pavement Breakers

GROUP 4: Miners - Tunnel (including top and bottom man on shaft and raise work); Timberman, Retimberman (wood or steel or substitute materials thereof); Blasters, Drillers, Powderman (in heading); Headman; Cherry Pickerman (where car is lifted); Nipper; Grout Gunmen; Grout Pumpman & Potman; Gunite, Shotcrete Gunmen & Potmen; Concrete Finisher (in tunnel); Concrete Screed Man; Bit Grinder; Steel Form Raisers & Setters; High Pressure Nozzleman; Nozzleman (on slick line); Sandblater-Potman (combination work assignment interchangeable); Tugger

GROUP 5: Shaft Work & Raise (below actual or excavated ground level); Diamond Driller; Gunite or Shotcrete Nozzleman

GROUP 6: Shifter
GROUP 7: Shifter (Shaft Work & Raiser)

PAIN1791A 07/01/2002

	Rates	Fringes
PAINTERS:		
Brush	26.55	19.35
Sandblaster; Spray	27.05	19.35

PAIN1889A 01/01/2001

	Rates	Fringes
GLAZIERS	23.07	17.30

PAIN1926B 02/25/2001

	Rates	Fringes
SOFT FLOOR LAYERS	22.90	15.50

PAIN1944A 01/01/2003

	Rates	Fringes
TAPERS	32.75	13.05

PLAS0630A 09/02/2002

	Rates	Fringes
PLASTERERS	26.71	16.72

PLAS0630B 09/02/2002

	Rates	Fringes
CEMENT MASONS:		
Cement Masons	25.87	16.72
Trowel Machine Operators	26.02	16.72

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* PLUM0675A 01/05/2003

	Rates	Fringes
PLUMBERS, PIPEFITTERS, STEAMFITTERS & SPRINKLER FITTERS	30.30	16.70

ROOF0221A 04/28/2002

	Rates	Fringes
ROOFERS	28.10	12.83

SHEE0293A 09/01/2002

	Rates	Fringes
SHEET METAL WORKERS	33.47	14.12

SUHI1001A 09/15/1997

	Rates	Fringes
DRAPERY INSTALLERS	13.60	1.20

SUHI2001A 09/15/1997

	Rates	Fringes
FENCE ERECTORS (Chain Link)	9.33	1.65

RIGGERS; WELDERS - Receive rate prescribed for craft performing operation to which rigging or welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

percentage points, the Engineer will apply a suitable correction to the measured quantities taken from the pit when calculating pay quantities.

(C) Overhaul. The Engineer will measure overhaul according to Section 205 - Overhaul.

(D) Embankment. The Engineer will not measure embankment for payment.

203.05 Basis of Payment.

(A) Roadway Excavation. The Engineer will pay for the accepted roadway excavation at the contract unit price per cubic yard.

The price includes full compensation for obliterating old roadways and raised island; preparing the subgrade; placing selected material in final position; disposing surplus excavation material; rounding of slopes; using water for compaction; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for stockpiling selected material or subsequently placing it in final position. The Engineer will consider payment for this work to be included in the contract unit price for roadway excavation.

The Engineer will pay for removing and disposing of slide material as roadway excavation:

(1) that slides from outside the planned roadway slopes and into the planned roadway prism, and

(2) the removal and disposal of unstable material in natural position outside the planned roadway slopes.

The Engineer will consider full compensation to be included in the contract price for roadway excavation within the authorized lines and elevations for removing and disposing of material that may come into excavations for structures and drainage facilities.

The Engineer will not include slide material quantities that slide across the roadway prism in the roadway excavation quantities unless the Contractor rehandles and reuses the material. The Engineer will only pay for the quantities rehandled.

When choosing to remove the rocks and lumps or break up hardened material and the contract specifies the source of the selected material, such work shall be at no cost to the State. When the contract does not specify the source of the selected material, the Engineer will pay this work as extra work as specified in Subsection 104.03 - Extra Work.

When specified, the Engineer will pay for:

(1) removing of the unsuitable material below the subgrade and
(2) backfilling and compacting to the finished grade with acceptable material.

The Engineer will pay the following excavation for unlined gutters as roadway excavation:

(1) within the median area of a divided highway; and
(2) between the roadbed shoulder and an adjacent cut slope.

(B) Borrow Excavation. The Engineer will pay for the accepted borrow excavation at the contract unit price per cubic yard complete in place.

The price includes full compensation for staking out and cross sectioning the site; establishing the borrow area; providing, replacing, and maintaining temporary and permanent fencing; confining livestock; watering; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for selected material from ditch and channel or structure excavations, when used, instead of borrow.

(C) Overhaul. The Engineer will pay for overhaul according to Section 205 - Overhaul.

(D) Embankment. The Engineer will not pay for embankments separately. The Engineer will consider the cost for constructing embankments included in the contract price for roadway excavation or borrow excavation.

The price includes full compensation for drying embankment material; constructing earth dikes for roadway protection within or outside the highway right-of-way; placing and compacting acceptable material within the roadway area where the Contractor removed unsuitable fill foundation material; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	Pay Unit
Roadway Excavation	Cubic Yard
Roadway Excavation for Temporary Pavement	Cubic Yard
Borrow Excavation	Cubic Yard"

END OF SECTION

SECTION 610 - REINFORCED CONCRETE DRIVEWAYS

Make the following amendments to said Section:

(I) Amend **610.04 Method of Measurement** to read as follows:

"**610.04 Method of Measurement.** The Engineer will measure reinforced concrete driveways per square yard complete in place."

(II) Amend **610.05 Basis of Payment** to read as follows:

"**610.05 Basis of Payment.** The Engineer will pay for the accepted reinforced concrete driveways at the contract unit price per square yard.

The price includes full compensation for removing unsuitable material; installing wire mesh; excavating and backfilling; furnishing, placing and compacting bed course material ;furnishing and placing reinforced concrete driveway and driveway curbs as specified in the contract or by the Engineer; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
_____ - Inch Reinforced Concrete Driveway	Square Yard

The Engineer will not pay for the accepted excavation and backfill. These items of work shall be considered incidental to the various contract items.

END OF SECTION

SECTION 612 - GROUTED RUBBLE PAVING

Make the following amendments to said Section:

(I) Amend **612.04 Method of Measurement** to read as follows:

"**612.04 Method of Measurement.** The Engineer will measure grouted rubble paving for Type "1" and Type "2" Outlet Structures per cubic yard.

The Engineer will not measure grouted rubble paving for driveway culverts."

(II) Amend **612.05 Basis of Payment** to read as follows:

"**612.05 Basis of Payment.** The Engineer will pay for the accepted grouted rubble paving for Type "1" and Type "2" Outlet Structures at the contract unit price per cubic yard.

The price includes full compensation for excavating, laying stones, grouting, backfilling, furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will not pay for grouted rubble paving for driveway culverts. The cost of installing the grouted rubble paving at the inlet and outlet sections of the driveway culverts shall be considered incidental to the Driveway Culverts."

The Engineer will make payment under:

Pay Item	**Pay Unit**
Grouted Rubble Paving for Outlet Structures	Cubic Yard"

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 693 - QUADGUARD SYSTEM OR TAU-II TERMINAL IMPACT ATTENUATOR

693.01 Description. This section is for furnishing and installing a Quadguard System or TAU-II terminal impact attenuators at the prepared sites according to the contract.

693.02 Materials. Materials shall conform to the following:

Concrete Structures	503.02
Reinforcing Steel	602.02

The Quadguard System terminal impact attenuator shall consist of crushable cartridge assemblies surrounded by a framework of steel Quad-beam guardrail which can telescope rearward during head-on impacts. The Quadguard System shall have a center monorail which resists lateral movement during side angle impacts. The nose shall consist of a formed plastic nose wrap.

The TAU-II terminal impact attenuator shall consist of independent collapsible energy absorbing cartridges guided and supported by high strength galvanized steel cables. The TAU-II cable system shall resist lateral movement during side angle impacts. The nose shall consist of a formed plastic nose wrap.

Concrete shall conform to Section 601 - Structural Concrete. Compressive strength shall be 4000 psi at 28 days.

693.03 Construction Requirements.

(A) Equipment List and Drawings. Within 10 working days following the Award of Contract, submit to the Engineer for acceptance 6 copies of a list of materials and equipment to be incorporated in the work. The list shall include the name of the manufacturer, dimensions and catalog number of the unit, detailed scale drawings of special equipment, shop drawings for fabrication and proposed deviations.

(B) Site Preparation. Before installing the Quadguard System or TAU-II terminal impact attenuator, prepare the site as shown in the contract or specified by the Engineer. Excavate and backfill according to the Section 206 - Excavation and Backfill for Conduits and Structures. Exercise extreme care so as not to damage underground facilities. Repair damages by the Contractor immediately at no cost to the State.

The placing and curing of the concrete shall conform to Section 503 - Concrete Structures.

The placing of reinforcing steel shall conform to Section 602 - Reinforcing Steel and the manufacturer's recommendations.

(C) Quadguard System or TAU-II Terminal Impact Attenuator. Install Quadguard System or TAU-II terminal impact attenuator according to the recommendations of the manufacturer. Provide training for the installation of the system in the field for a period not to exceed three hours. Also provide a minimum of 8 hours of training at the District Office for the installation and maintenance of the system. Furnish five copies of specially prepared manual on the installation and maintenance of the system.

(D) Replacement Cartridge Cells. Furnish and deliver one set of replacement cartridge cells for each installation to locations designated by the Engineer and stored as specified.

(E) Replacement Nose Section Cover and Cartridge Cells. Furnish and deliver one set of replacement nose section cover and cartridge cell for each installation to locations designated by the Engineer and stored as ordered.

693.04 Method of Measurement. The Engineer will measure Quadguard System or TAU-II terminal impact attenuator per each.

The Engineer will measure unassembled replacement cartridge cells per cell as specified in the proposal.

The Engineer will measure unassembled replacement nose section cover and cartridge cell per each.

693.05 Basis of Payment. The Engineer will pay for the accepted Quadguard or TAU-II terminal impact attenuator at the contract unit price per each. The price includes full compensation for doing work necessary for installing the Quadguard system or TAU-II terminal impact attenuator complete in place including site preparation, excavation, backfill, reinforced concrete foundation, and services for training and furnishing labor, materials, tools, and equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted unassembled replacement cells at the contract unit price per cell. The price includes full compensation for furnishing and delivering the unassembled replacement cells and furnishing labor, materials, tools, and equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted unassembled replacement nose section cover and cartridge cells at the contract unit price per each. The price includes full compensation for furnishing and delivering unassembled replacement nose section cover and cartridge cells and furnishing labor, materials, tools, and equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	Pay Unit
Terminal Impact Attenuator	Each
Replacement Cartridge Cell (Unassembled)	Cell
Replacement Nose Section Cover and Replacement Cartridge Cell (Unassembled)	Each"

END OF SECTION

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
203.0010	Roadway Excavation for Temporary Pavement	230	Cu. Yd.	$_____	$_____
203.0100	Roadway Excavation	4,100	Cu. Yd.	$_____	$_____
203.0110	Borrow Excavation	1,010	Cu. Yd.	$_____	$_____
206.2020	Structure Excavation for Drainage Systems	2,369	Cu.Yd.	$_____	$_____
206.7001	Structural Excavation for Retaining Walls	2,146	Cu.Yd.	$_____	$_____
206.7002	Structural Backfill for Retaining Walls	1,629	Cu. Yd.	$_____	$_____
206.7003	Filter Material for Retaining Walls	98	Cu. Yd.	$_____	$_____
209.1000	Water Pollution and Erosion Control	F.A.	F.A.	F.A.	$50,000.00
305.1000	Aggregate Subbase for Temporary Pavement	115	Cu. Yd.	$_____	$_____
305.1110	Aggregate Subbase	1,640	Cu. Yd.	$_____	$_____
306.1000	Untreated Permeable Base Course	690	Cu. Yd.	$_____	$_____
312.0001	Plant Mix Glassphalt Concrete Base Course for Temporary Pavement	160	Tons	$_____	$_____
312.1000	Plant Mix Glassphalt Concrete Base Course	2,950	Tons	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
401.1000	Asphalt Concrete Pavement, Mix No. IV for Temporary Pavement	80	Tons	$_____	$_____
402.0001	Superpave Asphalt Concrete Pavement	1,840	Tons	$_____	$_____
402.0600	Pavement Smoothness Incentive	allowance	allowance	allowance	$12,000.00
411.1212	13-Inch Reinforced Concrete Pavement for bus bay	58	Cu. Yd.	$_____	$_____
503.0001	Reinforced Concrete Jacket for 8 inch waterline	452	Lin. Ft.	$_____	$_____
503.1200	Driveway Culverts	156	Lin. Ft.	$_____	$_____
503.1210	Reinforced Concrete Jacket for culvert	173	Lin. Ft.	$_____	$_____
503.1310	Concrete in Footings in CMU Wall (38 Cu. Yd.)	L.S.	L.S.	L.S.	$_____
503.2010	Concrete in Retaining Walls (554 Cu. Yd.)	L.S.	L.S.	L.S.	$_____
513.4000	Type "L2" CMU Wall	150	Sq. Yd.	$_____	$_____
513.5000	Type "L1" CMU Wall	96	Sq. Yd.	$_____	$_____
602.1002	Reinforcing Steel in Retaining Walls (136,023 Lbs.)	L.S.	L.S.	L.S.	$_____
602.1003	Reinforcing Steel in CMU Wall Concrete Footings (12,573 Lbs.)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
603.0010	Bed Course Material for Culverts	468	Cu. Yd.	$_____	$_____
603.1008	18-Inch Reinforced Concrete Pipe, Class III or 18-Inch High Density Polyethylene Pipe (Type S), or 18-Inch Aluminum Spiral Rib Pipe, thickness = 0.105"	73	Lin. Ft.	$_____	$_____
603.1010	24-Inch Reinforced Concrete Pipe, Class III or 24-Inch High Density Polyethylene Pipe (Type S), or 24-Inch Aluminum Spiral Rib Pipe, thickness = 0.105"	2,048	Lin. Ft.	$_____	$_____
604.1000	Adjusting Water Valve Box Frame and Cover	1	Each	$_____	$_____
604.1010	Relocation of Water Meter, Water Meter Box Frame and Cover	3	Each	$_____	$_____
604.2000	Adjusting Water Valve Manhole Frame and Cover	13	Each	$_____	$_____
604.5104	Type "A" Storm Drain Manhole 4.00 to 4.99 Feet	5	Each	$_____	$_____
604.5105	Type "A" Storm Drain Manhole 5.00 to 5.99 Feet	3	Each	$_____	$_____
604.5125	Type "B-1" Catch Basin, 6.00 to 6.99 Feet	1	Each	$_____	$_____
604.5126	Type "C" Catch Basin, 4.00 to 4.99 Feet	1	Each	$_____	$_____
604.5254	Type "A-9P" Grated Drop Inlet, 4.00 to 4.99 Feet	8	Each	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.5255	Type "A-9P" Grated Drop Inlet, 5.00 to 5.99 Feet	2	Each	$_____	$_____
604.5262	Type "61614P" Grated Drop Inlet, 2.00 to 2.99 Feet	2	Each	$_____	$_____
604.5274	Type "2A-9P" Grated Drop Inlet, 4.00 to 4.99 Feet	1	Each	$_____	$_____
604.5284	Special Type "A-9P" Grated Drop Inlet, 4.00 to 4.99 Feet	3	Each	$_____	$_____
605.1000	Perforated Underdrain Pipe	1,117	Lin. Ft.	$_____	$_____
605.2000	Non-Perforated Underdrain Pipe	60	Lin. Ft.	$_____	$_____
606.1000	Guardrail Type 3 Single w/Steel Post	327	Lin. Ft.	$_____	$_____
606.1001	Triton Barrier	150	Each	$_____	$_____
607.1001	4.0 Feet Chain Link Fence Without Top Rail	391	Lin. Ft.	$_____	$_____
608.1200	4-Inch Reinforced Concrete Sidewalk	1,620	Sq. Yd.	$_____	$_____
608.1300	4-Inch Reinforced Concrete Walkway	30	Sq. Yd.	$_____	$_____
608.1400	4-Inch Modified Reinforced Concrete Sidewalk	38	Sq. Yd.	$_____	$_____
609.2020	Curb, Type 2D	1,200	Lin. Ft.	$_____	$_____
609.2720	Curb and Gutter, Type 2DG	1,740	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
609.2740	Thru Gutter	144	Lin. Ft.	$_____	$_____
610.0300	8-Inch Reinforced Concrete Driveway	110	Sq. Yd.	$_____	$_____
610.0400	6-Inch Reinforced Concrete Driveway	700	Sq. Yd.	$_____	$_____
611.1000	Hand Laid Riprap	12	Cu. Yd.	$_____	$_____
612.6410	Grouted Rubble Paving for Outlet Structures	27	Cu. Yd.	$_____	$_____
621.5000	Regulatory and Warning Signs (10 Sq. Ft. or Less)	5	Each	$_____	$_____
621.5100	Regulatory and Warning Signs (10 Sq. Ft. or Less) with Post	25	Each	$_____	$_____
621.5600	Relocation of Existing Regulatory and Warning Signs (10 Sq. Ft. or Less) with Posts	2	Each	$_____	$_____
621.7100	Construction Signs with Posts	5	Each	$_____	$_____
621.8100	Street Name Sign on Mast Arm with New Brackets	2	Each	$_____	$_____
622.1001	Street Lighting Luminaire	9	Each	$_____	$_____
622.2001	Street Lighting Luminaire with House Side Shield	7	Each	$_____	$_____
622.3001	2' x 4' Handhole	2	Each	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.4001	2 - 3" C Ductline	100	Lin. Ft.	$_____	$_____
622.5001	4 - 5" C Ductline	125	Lin. Ft.	$_____	$_____
622.6001	8 - 5" C Ductline	125	Lin. Ft.	$_____	$_____
622.7001	HECO Service Charges	L.S.	L.S.	L.S.	$_____
622.8001	2-5" C Ductline	125	Lin. Ft.	$_____	$_____
623.2011	Type I Signal Standard	1	Each	$_____	$_____
623.2021	Type II Signal Standard with 40' - 0" Mast Arm	1	Each	$_____	$_____
623.2031	Foundation for Type I Signal Standard	1	Each	$_____	$_____
623.2041	Foundation For Type II Signal Standard with 40' - 0" Mast Arm	1	Each	$_____	$_____
623.2061	Relocate Existing Solar Power Flashing Beacon with Foundation	1	Each	$_____	$_____
623.3001	Traffic Signal Assembly (One-way, 12-Inch, 1-3 Section with Slip Fitter Mounting)	1	Each	$_____	$_____
623.3055	Traffic Signal Assembly (Two-way, 12-Inch, 2-3 Section Vertical with Bracket Mounting)	1	Each	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.3060	Traffic Signal Assembly (One-way, 12-Inch, 1-3 Section Vertical with Mast Arm Mounting)	2	Each	$_____	$_____
623.4040	Pedestrian Push Button with Sign	4	Each	$_____	$_____
623.5000	Traffic Signal Ductline, One 2-Inch Conduit, Schedule 80 (110 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
623.5010	Traffic Signal Ductline, Two 2-Inch Conduit, Schedule 80 (20 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
623.5050	Traffic Signal Ductline, Four 2-Inch Conduit, Schedule 40 (100 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
623.6000	Type A Pullbox	1	Each	$_____	$_____
623.6010	Type B Pullbox	3	Each	$_____	$_____
623.7040	Type 1 Traffic Control Cable (110 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
623.7042	Type 2 Loop Detector Lead-In Cable (505 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
623.7046	Type 6 Power Cable (110 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
623.7051	Loop Detector Sensing Unit (6' x 6') One Loop	12	Each	$_____	$_____
624.0020	12-Inch waterline relocation at sta 23+11	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
624.0030	8-Inch waterline relocation at sta 23+23	L.S.	L.S.	L.S.	$_____
624.0040	12-Inch waterline relocation at sta 25+09	L.S.	L.S.	L.S.	$_____
624.0050	8-Inch waterline relocation at sta 30+20	L.S.	L.S.	L.S.	$_____
624.0060	8-Inch waterline relocation at sta 34+36	L.S.	L.S.	L.S.	$_____
624.0070	20-Inch waterline relocation at sta 34+36	L.S.	L.S.	L.S.	$_____
624.0090	Fire Hydrant Relocation Including All Appurtenances at Station 27+33	1	Each	$_____	$_____
629.0110	4-Inch Pavement Striping - Tape, Type I or Thermoplastic Extrusion (170 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.0120	8-Inch Pavement Striping - Tape, Type I or Thermoplastic Extrusion (320 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.0130	Double 4-Inch Pavement Striping - Tape, Type I or Thermoplastic Extrusion (420 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.0210	4-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (3080 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.0220	6-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (2400 Lin. Ft.)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.0230	8-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (80 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.0240	12-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (120 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.0250	Double 4-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (1500 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.1010	4-Inch Pavement Striping - Tape, Type III or Thermoplastic Extrusion (680 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.1017	12-Inch Pavement Striping - Tape, Type III or Thermoplastic Extrusion (90 Lin. Ft.)	L.S.	L.S.	L.S.	$_____
629.1021	Crosswalk Marking - Tape, Type III or Thermoplastic Extrusion	10	Lane	$_____	$_____
629.1031	Pavement Arrows - Tape, Type III or Thermoplastic Extrusion	12	Each	$_____	$_____
629.1041	Pavement Words - Tape, Type III or Thermoplastic Extrusion	6	Each	$_____	$_____
629.1051	Pavement Symbol - Paint	12	Each	$_____	$_____
629.1061	Detour 4-Inch Pavement Striping - Tape	10,100	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.1062	Detour Double 4-Inch Pavement Striping - Tape	5,740	Lin. Ft.	$_____	$_____
629.2030	Type A Pavement Marker	108	Each	$_____	$_____
629.2040	Type C Pavement Marker	112	Each	$_____	$_____
629.2041	Detour Type C Pavement Marker	250	Each	$_____	$_____
629.2050	Type D Pavement Marker	21	Each	$_____	$_____
629.2051	Detour Type D Pavement Marker	200	Each	$_____	$_____
629.2060	Type H Pavement Marker	81	Each	$_____	$_____
629.2061	Detour Type H Pavement Marker	120	Each	$_____	$_____
629.2070	Type DB Pavement Marker	1	Each	$_____	$_____
636.1001	Maintenance of Field Office and Project Site Laboratory	F.A.	F.A.	F.A.	$24,000.00
638.1000	Cellular phone (Not to exceed $4,800 for 3 phones)	L.S.	L.S.	L.S.	$_____
640.1000	Grass Swale	710	Lin. Ft.	$_____	$_____
641.0100	Hydro-Mulch Seeding	28,600	Sq. Ft.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
645.0200	Additional Police Officers and/or Additional Traffic Control Devices	F.A.	F.A.	F.A.	$100,000.00
650.0001	Curb Ramp Type D	10	Each	$_____	$_____
650.0002	Curb Ramp Type D-1	1	Each	$_____	$_____
650.0004	Curb Ramp Type C	1	Each	$_____	$_____
650.0005	Curb Ramp Type B Modified	2	Each	$_____	$_____
652.0150	2 Inch Cold Planing	4,900	Sq. Yd.	$_____	$_____
656.1000	Mailbox	14	Each	$_____	$_____
693.1000	Terminal Impact Attenuator	2	Each	$_____	$_____
693.1100	Replacement Cartridge Cell (Unassembled)	12	Cell	$_____	$_____
693.1200	Replacement Nose Section Cover and Replacment Cartridge Cell (Unassembled)	4	Each	$_____	$_____
699.1000	Mobilization (Not to Exceed 10% of the Sum of All Items Excluding the Bid Price of this Item, cellular phones, allowances, and force account items)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
A.	SUM OF ALL ITEMS				$_____
B.	EITHER FURNISH FOREIGN STEEL NOT TO EXCEED AMOUNT (INSERT "0") OR FURNISH FOREIGN STEEL IN EXCESS OF MINIMAL AMOUNT (INSERT 25% X A)				$_____
C.	AMOUNT FOR COMPARISON OF BIDS (A+B)				$_____
	ALL BIDDERS MUST FILL IN B AND COMPLETE C				
NOTE:	BIDDERS MUST COMPLETE ALL UNIT PRICES AND AMOUNTS. FAILURE TO DO SO MAY BE GROUNDS FOR REJECTION OF BID.				

ANNOUNCEMENT

The bidder's attention is directed to the following changes to our construction specifications:

1. Revised Instructions to Bidders.

2. Added "Instructions for Contractor's Licensing".

3. The Declaration of Non-Collusion is now part of the Proposal. There is no separate Declaration of Non-Collusion form. (Sections 2.15 and 102.15)

4. The Non-Gratuity Affidavit is now part of the Proposal. There is no separate Non-Gratuity Affidavit form. (Sections 9.9 and 109.10)

5. Submission of "Chapter 104, HRS Compliance Certificate" with the executed contract added as an additional requirement. (Sections 3.6 and 103.07)

6. Value Engineering project application limit is increased from "in excess of $100,000" to "in excess of $250,000". (Sections 5.14 and 104.10)

7. The form entitled "Request for Approval of Subcontractors" is no longer required. If requested by the Engineer, the Contractor shall provide a copy of any subcontract within seven calendar days. (Sections 8.1 and 108.01)

8. The requirement for work performed by the prime contractor with his own organization is amended from "not less than 50%" to "not less than 30%" and added clause for adding subcontractor for work equal to or less than one percent of the total bid amount. (Sections 8.1 and 108.01)

Contracts Office
Department of Transportation
9/01/02

9. Commercial General Liability is increased from $1,000,000 to $2,000,000. (Sections 8.3 and 103.09)

10. Revised Proposal Pages.

FOR FEDERAL AID PROJECTS ONLY:

In addition to the items above, the following changes are applicable to our Federal Aid construction specifications:

1. "Notice of Requirements for Participation by Disadvantaged Business Enterprises" is replaced with the two inserts titled "General Information Regarding Disadvantaged Business Enterprises" and "Regulatory Requirements for Federal Aid Projects Regarding Disadvantaged Business Enterprises (DBE's)" both dated 4/15/02.

2. Revised Retainage: No retainage on Prime Contractor. (Regulatory Requirements for Federal Aid Projects Regarding Disadvantaged Business Enterprises (DBEs))

3. Revised Confirmation by DBE form.

4. Revised Monthly Report of DBE Participation form.

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NOTICE TO BIDDERS

SEALED PROPOSALS for:

Kaneohe Bay Drive Improvements
Vicinity of Puohala Street to Kawa Bridge
Federal-Aid Project No. STP-065-1(9)
District of Koolaupoko
Island of Oahu

will be received at the:

__X__ Contracts Office, Department of Transportation, 869 Punchbowl Street, Honolulu, Hawaii 96813,

until 2:00 P.M., March 6, 2003, at which time and place they will be publicly opened and read.

The project includes widening of Kaneohe Bay Drive including excavation, grading, asphalt concrete pavement, building a bus bay, metal guardrail, concrete barriers, retaining walls, CMU walls, highway lighting, drainage improvements, sidewalks, traffic signal, building driveways and pavement striping marking and signing.

Plans and specifications may be examined and borrowed at the appropriate above offices. Borrowed plans and specifications shall be returned in good condition within 30 calendar days after the bid opening date.

To be eligible to bid, bidders must possess a valid State of Hawaii General Engineering Contractor's "A" license prior to the award of the contract.

Bidder's notice of intention to bid must be received at said Contracts Office no later than 4:30 P.M., 10 calendar days prior to the bid opening date. If the tenth day is on a Saturday, Sunday or State holiday, the notice of intention is due on the last working day prior to the due date. Fax notice is

acceptable provided the Contracts Office receives the faxed notice within the time stated above. The fax number is (808) 587-2132. It is the bidder's responsibility to ensure that the Contracts Office receives the notice of intent on time and in a legible condition.

The Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the U.S. Department of Transportation (Title 49, Code of Federal Regulations Part 21) issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the grounds of race, color, religion, sex, national origin, age, or disability.

The Equal Employment Opportunity Regulations of the Secretary of Labor implementing Executive Order 11246, as amended shall be complied with on this project.

The U.S. Department of Transportation Regulations entitled "Participation by Disadvantaged Business Enterprise in Department of Transportation Programs", Title 49, Code of Federal Regulations, Part 26 is applicable to this project.

The contract Disadvantaged Business Enterprise (DBE) goal for this project is indicated in the Proposal. The bidder is directed to the Supplemental Notice - Disadvantaged Business Enterprise (DBE) Program contained herein and made an integral part of this bid.

Each proposal shall be on a form furnished by said Department.

Estimated construction cost is between $1,000,000 and $5,000,000.

The State reserves the right to reject any or all proposals and to waive any defects in said proposals for the best interest of the public.

for RODNEY K. HARAGA
Director of Transportation

Advertised: Honolulu Star Bulletin
January 31, 2003

SUPPLEMENTAL NOTICE

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM

Bidders are hereby notified that the Department of Transportation will strictly enforce full compliance with all of the requirements of the Disadvantaged Business Enterprise (DBE) program with respect to this project.

Bidders are directed to read and be familiar with the Notice of Requirements for Participation by Disadvantaged Business Enterprises (49 CFR Part 26) included herewith, which establishes the program requirements and, particularly, the requirements of certification, method of award, and evidence of good faith.

Bidder's attention is further directed to the additional form now required to be executed and submitted by the Bidder as part of its bid, entitled "Statement of Affirmation and Acknowledgment of DBE Requirements", which is included herewith. By this statement the bidder certifies that the bidder has read and is fully knowledgeable and aware of the requirements and responsibilities with respect to the project's DBE requirements.

All of the above DBE program requirements, including the good faith effort requirements, will be strictly enforced in evaluating the bidder's efforts in obtaining DBE participation in this contract.

A bid that fails to meet these requirements will be considered nonresponsive and will be rejected.

INSTRUCTIONS TO BIDDERS

1. **BIDDER'S QUALIFICATION AND INTENTION TO BID.** According to Section 103D-310, Hawaii Revised Statutes, the bidder shall submit a written Notice of Intention to Bid by 4:30 P.M., 10 calendar days before the designated bid opening date (not including the bid opening date) to the Contracts Office at 869 Punchbowl Street, Honolulu, Hawaii 96813. If the tenth day is on a Saturday, Sunday or State holiday, the Notice of Intention to Bid is due on the last working day before the due date. Faxed notice is acceptable provided the Contracts Office receives the faxed notice within the time stated above. The fax number is (808) 587-2132. It is the bidder's responsibility to ensure that the Contracts Office receives the faxed notice of intent on time and in a legible condition.

In accordance with said Section 103D-310, HRS the Director may require any prospective bidder to fill out a questionnaire regarding its qualifications.

No person, firm, or corporation may bid where (1) the person, firm, or corporation, or (2) a corporation owned substantially by the person, firm, or corporation, or (3) a substantial stockholder or an officer of the corporation, or (4) a partner or substantial investor in the firm is in arrears in payments owed to the State of Hawaii or its political subdivisions or is in default as a surety or failure to do faithfully and diligently previous contracts with the State.

2. **ADDENDA.** Any addenda issued before the opening of proposals shall be binding upon the bidder and shall be made a part of the contract.

3. **BID DOCUMENTS.** The bidder shall return the borrowed bid documents in good condition within 30 calendar days after the bid opening date.

4. **BID AND TAX CLEARANCE REQUIREMENTS.**

a. The bidder's attention is directed to Section 102 - Bidding Requirements and Conditions.

b. All bidders should submit original tax clearance certificates or certified copies from the Department of Taxation and the Internal Revenue Service with their bid proposals when the bid is $25,000 or more. Bidders are required to provide a tax clearance prior to entering into a public contract of $25,000 or more, pursuant to ACT 352, SLH 1997. Only an original tax clearance certificate or certified copy issued by the State Department of Taxation and the Internal Revenue Service will be accepted. Bidder's attention is directed to Section 102.20 - Tax Clearance of the Special Provisions.

c. For information on Tax Clearances, contact the Department of Taxation at (808)587-4242, 587-1455 or 587-1598 or the Internal Revenue Service at (808)541-1160 or visit the Department of Taxation's Website at http:/www.hawaii.gov/tax/tax.html. To receive forms by mail or FAX, call (808)587-7572 or 1-800-222-7572.

5. **AWARD OF CONTRACT.** The bidder's attention is directed to Section 103 - Award and Execution of Contract.

6. **EMPLOYMENT OF CONTRACTORS SUSPENDED BY THE STATE.** The bidder shall not submit a proposal on behalf of any Contractor suspended by the State. The successful bidder shall not subcontract any portion of the contract to any Contractor who has been suspended by the State; nor shall the successful bidder hire any person on the management level of a Contractor suspended by the State in order to circumvent the provisions of this paragraph 1. The State may void the award of or refuse to award a contract for violation of this paragraph.

7. **CONTRACTOR'S LICENSE.** If the contract requires the Contractor's license by law for the performance of this work, then the bidder must have the required license before the Department awards the contract for a Federal-Aid project. Subcontractors must be licensed prior to their performance of work.

8. LISTING OF JOINT CONTRACTORS AND/OR SUBCONTRACTORS. The bidder's attention is directed to the Proposal where the names of all joint Contractors and/or subcontractors including the nature of work involved, DBE status and the contract dollar value of the subcontract must all be indicated on the form provided. Failure to comply shall result in the rejection of the bid. The bidder must also submit a copy of the "Confirmation by DBE" for all DBE subcontractors, manufacturers and suppliers with the bid, but no later than 5 calendar days after the bid opening date. DBE credit will not be given if the confirmation sheet is not submitted within the time stated above. If no joint Contractor or subcontractor is to be engaged, the bidder must complete the form by writing "NONE" on the form. If left blank, the Department will interpret the blank as no joint Contractors and/or subcontractors will be used.

9. PENALTY FOR FRAUD, BRIBERY AND OTHER VIOLATIONS. According to Title 23 Code of Federal Regulations (CFR), Chapter 1, Section 2.4, a Contractor shall be unacceptable for employment on any future highway project requiring Federal Highway Administration approval or concurrence for three months to three years where a clear and convincing evidence of fraud, bribery, collusion, conspiracy or other serious offense involving violation of State or Federal criminal statutes exists about said project.

10. FEDERAL-AID REQUIRED CONTRACT PROVISIONS. The bidder's attention is directed to the "Required Federal Aid Construction Contract Provisions", "Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity", "General Information Regarding Disadvantaged Business Enterprises (DBE's)" and "Regulatory Requirements for Federal Aid Projects Regarding Disadvantaged Business Enterprises (DBE's)".

11. DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION REQUIREMENTS. The Department will award this contract to the lowest responsive, responsible bidder that meets the DBE goal or satisfies the Hawaii Department of Transportation (HDOT) that "good faith" efforts were taken in accordance with 49 CFR Part 26.

Prospective prime bidders are advised that HDOT must certify their prospective subcontractors, manufacturers and suppliers as DBEs (for those claiming DBE status) by the bid opening date. The Department advises the prime bidders to encourage their prospective subcontractors, manufacturers and suppliers to submit their application for certification as eligible DBE as early as possible, well before bid opening. Application forms may be obtained from the Office of Civil Rights, 869 Punchbowl Street, Honolulu, Hawaii 96813 or from their Website at http://www.hawaii.gov/dot/administration/dbe/index.htm. Completed application forms should be returned to the Office of Civil Rights.

12. STATEMENT OF AFFIRMATION AND ACKNOWLEDGEMENT OF DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS. Bidder shall execute and submit the attached "Statement of Affirmation and Acknowledgement of Disadvantaged Business Enterprise (DBE) Requirements" with its bid. Failure to execute and submit said statement shall be sufficient grounds for rejection of bid.

INSTRUCTIONS FOR CONTRACTOR'S LICENSING

"A" general engineering contractors and "B" general building contractors are reminded that due to the Hawaii Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area where the general contractor has no license. Although the "A" and "B" contractor may still bid on and act as the "prime" contractor on an "A" or "B" project *(See, HRS § 444-7 for the definitions of an "A" and "B" project.)*, respectively, the "A" and "B" contractor may only perform work in the areas in which they have the appropriate contractor's license *(An "A" or "B" contractor obtains "C" specialty contractor's licenses either on its own, or automatically under HAR § 16-77-32.)*. The remaining work must be performed by appropriately licensed entities. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Bidder's attention is called to the "Equal Opportunity" and the "Specific Equal Employment Opportunity Responsibilities" set forth in the "Required Federal Aid Construction Contract Provisions."

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work on this project are as follows:

CATEGORY	TIMETABLE	GOAL
Female participation in each trade	Indefinite	6.9%
Minority participation in each	None	69.1% (Oahu)
Trade (female included)	None	70.4% (Hawaii, Maui, Kauai)

These goals are applicable to all the Contractor's aggregate on-site construction workforce whether or not part of that workforce is performing work on a Federal or Federally assisted construction contract or subcontract.

The Contractor's compliance with the Executive Order shall be based on its implementation of the Equal Opportunity Clause, and its efforts to meet the goals established for the contract resulting from this solicitation. The hours of female and minority employment and training must be substantially uniform throughout the length of the contract, and in trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract and Executive Order. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Area Director, Hawaii Area Office, Office of Federal Contract Compliance Programs, U.S. Department of Labor, 300 Ala Moana Blvd., P.O. Box 50149, Honolulu, Hawaii 96850, within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; and estimated starting and completion dates of the subcontract. The Contractor shall indicate which are minority group subcontractors and the ethnic identity and sex of the owner(s) and policy-making official(s).

GENERAL INFORMATION REGARDING DISADVANTAGED BUSINESS ENTERPRISES (DBEs)

I. **GENERAL** - The following shall be incorporated as part of the contract documents for compliance. If any requirements herein are in conflict with the general provisions, instruction to bidders, or special provisions applicable to this project, the requirements herein shall prevail unless specifically superseded or amended in the special provisions or by addendum.

II. **EFFECTS OF THE DECERTIFICATION OF A DBE**

A. Should a DBE become decertified during the term of its subcontract with the prime bidder, for reasons beyond the control of, and through no fault or negligence of the contractor, any incomplete work remaining under the subcontract may subject to the review by the Department. The prime bidder shall continue to be credited for the work or supplies of the decertified DBE towards the DBE goal, but the Department shall not count the decertified DBE work or supplies towards the accomplishment of its overall goal.

B. Should a DBE be decertified after the contract award, but before the notice to proceed has been issued by the Department, the contractor shall be required to meet the DBE goal by continuing with the subcontract with the decertified DBE and expending Good Faith Efforts to find other work not already subcontracted out to DBEs in an amount sufficient to meet the DBE goal. The work performed or supplies provided shall not be counted toward the DBE contract goal or the Department's overall goal.

III. **BIDDERS LIST**

A. All bidders are requested to register with the Office of Civil Rights, DBE section. All bidders that previously bid on Department federal aid projects after January 1, 2001 and certified DBEs are considered registered with the Department. Registered bidders are posted on the Internet at www.state.hi.us/dot/administration/dbe/index.htm.

B. New bidders are requested to complete a Bidder Registration form that may be obtained from the Office of Civil Rights, DBE Section. The completed form may be faxed to 587-6306, e-mailed to: dbe_student@exec.state.hi.us or mailed to address on the Bidder's Registration form.

IV. **EVIDENCE OF GOOD FAITH EFFORTS** - The kinds of effort that will be considered demonstrative of "Good Faith Efforts", include but are not limited to the following:

A. Whether the bidder solicited through all reasonable and available means (e.g. attendance at meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform part or all of the work to be included under the contract. The Hawaii Department of Transportation ("HDOT") will also consider whether the bidder solicited the participation of potential DBEs in sufficient time to allow the DBEs to properly inquire about the project and respond to the solicitation, and will also review whether the bidder took appropriate steps to follow up with interested DBEs in a timely manner to facilitate participation by DBEs in this project;

B. Whether the bidder identified and broke up portions of work that can be performed by DBEs in order to increase the likelihood that DBEs will be able to participate, and that the DBE goal could be achieved (e.g. breaking out contract items into economically feasible units to facilitate DBE participation, even when the bidder might otherwise prefer to perform these work items with its own forces);

C. Whether the bidder made available or provided interested DBEs with adequate information about the plans, specifications, and requirements of the project in a timely manner, and assisted them in responding to the bidder's solicitation;

D. Whether the bidder negotiated in good faith with interested DBEs. Evidence of such negotiations includes documenting: a) the names, addresses, and telephone numbers of DBEs that were contacted by the bidder; b) a description of the information that was provided to DBEs regarding the plans and specifications; and c) detailed explanations for not utilizing individual DBEs in the project;

The fact that there may be additional or higher costs associated with finding and utilizing DBEs are not, by themselves, sufficient reasons for a bidder's refusal to utilize a DBE, or the failure to meet the DBE goal, provided that such additional costs are not unreasonable. Also, the ability or desire of a bidder to perform a portion of the work with its own forces, that could have been undertaken by an available DBE, does not relieve the bidder of the responsibility to make good faith efforts to meet the DBE goal, and to make available and solicit DBE participation in other areas of the project to meet the DBE goal;

E. Whether the bidder rejected DBEs as being unqualified without sound reasons, based on a thorough investigation of their capabilities. The DBE's standing within the industry, membership in specific groups, organizations, or associations, and political or social affiliation, are not legitimate bases for the rejection or non-solicitation of bids from particular DBEs;

F. Whether the bidder made efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance;

G. Whether the bidder made efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services; and

H. Whether the bidder effectively used the services of available minority/women community organizations, minority/women business groups, contractors' groups, local, state, and federal minority/women business assistance offices, or other organizations to provide assistance in recruitment and placement of DBEs.

I. It is the sole responsibility of the bidder to submit any and all documents, logs, correspondence, and any other records or information to the HDOT that will demonstrate that the bidder made good faith efforts to meet the DBE goal. Additionally, for each DBE that was contacted by, but not utilized by the bidder for this contract, the bidder shall submit a detailed written explanation for each DBE of the reasons for the bidder's failure or inability to utilize, or to allow the DBE to participate in this contract. In its good faith evaluation, the HDOT may, but shall not be required to perform the following as part of its evaluation: a) Request additional information and documents from the bidder; b) Compare the bidder's bid against the bids of other bidders, and comparing the DBEs and DBE work areas utilized by the bidder with the DBEs listed in other bids submitted for this contract; c) Verify contacts by bidders with DBEs; and d) Compare the DBE

and the categories of DBE work targeted by the bidder for participation in this contract, with the total available pool of DBEs available for each particular subcontract targeted by the bidder.

V. **RECORDS AND REPORTS** – The bidder shall maintain and keep all records necessary for the HDOT to determine compliance with the bidder's DBE obligations. The records shall be available at reasonable times and places for inspection by the HDOT, and appropriate Federal agencies. The records to be kept by the bidder shall include:

A. The names of all DBE subcontractors and vendors identified as DBEs (for vendor, indicate also if a supplier or manufacturer);

B. The nature of work of each DBE subcontractor and vendor; and

C. The dollar amount contracted with each DBE subcontractor and vendor.

REGULATORY REQUIREMENTS FOR FEDERAL AID PROJECTS REGARDING DISADVANTAGED BUSINESS ENTERPRISES (DBEs)

I. **GENERAL** - The following shall be incorporated as part of the contract documents for compliance. If any requirements herein are in conflict with the general provisions, instruction to bidders, or special provisions applicable to this project, the requirements herein shall prevail unless specifically superseded or amended in the special provisions or by addendum.

II. **DISADVANTAGED BUSINESS ENTERPRISE** - This project is subject to Title 49, Code of Federal Regulations, Part 26, entitled "Participation by Disadvantaged Business Enterprise in Department of Transportation Programs," hereinafter referred to as the ("DBE Regulation") and is incorporated and made a part of this contract herein by this reference.

A. Policy. It is the policy of the U.S. Department of Transportation ("U.S. DOT") and the State of Hawaii, Department of Transportation and all of its political subdivisions ("Department") that Disadvantaged Business Enterprises ("DBE"), as defined in the DBE Regulation, have an equal opportunity to receive and participate in federally assisted projects. Consequently, the requirements of the DBE Regulation, apply to this project.

B. DBE Obligation. The contractor shall take all necessary and reasonable steps in accordance with the DBE Regulation, to ensure that DBEs have an equal opportunity to compete for and perform on contracts. The contractor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of contracts financed in whole or in part with Federal funds.

C. DBE Assurances. This agreement is subject to the requirements of the DBE Regulation. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in connection with the award or performance of this contract.

The contractor agrees to include the above statements in any subsequent contracts that it enters into with other contractors, and shall cause those contractors to include similar statements in further agreements.

D. Failure to Comply with DBE Requirements. All contractors and subcontractors are hereby advised that failure to carry out all DBE requirements specified herein constitutes a material breach of contract that may result in termination of the contract or such other remedy as deemed appropriate by the Department.

E. Bidders Responsibilities. Bidders shall fully inform themselves with respect to the requirements of the DBE Regulation. Particular attention is directed to the following matters:

1. A DBE may participate as a consultant, prime contractor, subcontractor, joint venture, partnership, trucker, and vendor of materials or supplies.

2. A DBE must perform a commercially useful function ("CUF"). This means that a DBE:

   a. must be responsible for the execution of a distinct element of the work,

b. must carry out its responsibility by actually performing, managing, and supervising the work involved by using its own employees and equipment,

c. must negotiate price, determine quality and quantity, order and install material (when applicable), and

d. must pay for the material itself.

3. A DBE must be certified by HDOT in order for credit to be allowed.

4. Information regarding the current certification status of DBEs is available on the Internet at www.state.hi.us/dot/administration/dbe/index.htm

F. Monthly Report of DBE Participation. The successful bidder shall on a monthly basis complete and sign the Monthly Report of DBE Participation for all DBE's used on the Project, and submit said Monthly Report together with its invoice to the Project Engineer. The Department will not process any invoices for payment without the submission of the Monthly Report.

III. PROPOSAL REQUIREMENTS.

A. The bidder shall list the names of all subcontractors to be used, along with the nature of work to be performed by each and the dollar amount of each subcontract. Failure to do so shall result in the rejection of bid. The dollar amount of work to be listed in the proposal shall be the estimated amount to be paid the firm.

B. The bidder shall list the names of the DBE manufacturers and suppliers to be used. DBE credit will be given only to those that are listed on the proposal.

C. Bidders must submit a completed "DBE Confirmation" with its bid or provide a copy to the Project Manager listed in the Proposal within five (5) calendar days after bid opening, for each DBE that is involved in any part of the contract. DBE credit will not be given towards the calculation of the DBE contract goal without a copy of the DBE confirmation form that is signed by the DBE.

C. A DBE must be certified by HDOT prior to the bid opening date in order for credit to be allowed toward the DBE project goal.

D. The DBE contract goal for this project (expressed in percentage terms) is the proportionate contract dollar value of work performed, materials, and goods to be supplied by DBEs. This DBE contract goal is applicable to all the contract work performed for this project. The bidder shall indicate in the appropriate space provided in the Proposal form furnished by the Department, the DBE contract goal percentage that the bidder will achieve in this contract, as well as the name of and the nature of work to be performed by, or materials and goods to be supplied by each DBE.

1. The DBE Percentage is determined as follows:

a. A bidder's DBE contract goal percentage shall be calculated as follows: DBE contract goal percentage = Contract Dollar Value of the work to be performed by DBE subcontractors and

manufacturers, plus 60% of the contract dollar value of DBE suppliers, divided by the sum of all contract items, less mobilization, force account items, and allowance items.

b. The credit to be allowed a prime bidder for each DBE vendor of materials or supplies listed in the proposal, will depend upon whether such vendor is:

   i. only a supplier of such commodities,
   ii. a supplier who is also the manufacturer of such commodities, or
   iii. a supplier who is not a manufacturer, but who is required to perform substantial alteration to such commodities before delivery to the prime contractor.

   The percentage of a vendor's quoted price to the prime bidder which will be credited toward the DBE goal, will be 100% for vendors in the (ii) and (iii) categories, and 60% for vendors in the (i) category.

2. The following is a list of appropriate DBE credit to be allowed for work to be performed by a DBE subcontractor.

   a. The bidder may receive DBE credit for the entire amount of the subcontract if the work is performed by the DBE's own forces, if supplies and materials are obtained by the DBE for the work, and if leased equipment is leased by the DBE for the work.

   b. The bidder may receive DBE credit for the entire amount of fees or commissions charged by a DBE firm for performing professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required by the project.

   c. The bidder may receive DBE credit for the work of a second tier subcontractor if the second tier subcontractor is a DBE and is listed on the Subcontractor Listing form in the Proposal.

3. The following is a list of appropriate DBE credit to be allowed when using truckers.

   a. The total value of the transportation services of a certified DBE trucker if the DBE trucker uses trucks it owns, insures, and operates using drivers it employs.

   b. The total value of the transportation services if a DBE trucker leases trucks from another DBE firm.

   c. The value of the fees, commission or mark up from a lease arrangement if a DBE trucker leases trucks from a non-DBE firm and credit is not allowed for the lease amount.

4. The bidder may be a joint venture or partnership that has a certified DBE as a partner. A "Joint Venture" means an association between a DBE firm and one or more other firms to carry out a single, for-profit, business enterprise for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract, and whose share in

the capital contribution, control, management, risks and profits are commensurate with its ownership interest.

IV. **AWARD OF CONTRACT** - The Department reserves the right to reject any or all bids. The award of contract, if it is awarded, will be to the lowest responsible bidder who meets or exceeds the DBE project goal, or who makes good faith efforts to meet or exceed the DBE project goal, as determined by the Department.

A. If the lowest responsible bidder meets or exceeds the DBE project goal, such bidder will be awarded the contract.

B. If the lowest responsible bidder does not meet the total DBE project goal, such bidder shall submit all information that the bidder believes is relevant, and which demonstrates to the Department, that the bidder made good faith efforts to meet the DBE project goal. The Department must receive all documents, and other information that the bidder believes supports its claim that it made good faith efforts to meet the DBE project goal. The documents and information must be received, no later than five (5) working days after requested by the Department. After a thorough review and investigation of the bidder's actions, such bidder will be awarded the contract if the Department is satisfied that such bidder has made sufficient good faith efforts to meet the DBE project goal.

C. If the lowest responsible bidder does not meet the DBE project goal and does not demonstrate to the satisfaction of the Department that it made good faith efforts to meet the DBE project goal, such bid shall be rejected as non-responsive. The Department will then consider the next lowest responsible bidder for award in accordance with paragraph A or B above.

V. **ADMINISTRATIVE RECONSIDERATION.** Under the provisions of 49 CFR, Part 26.53(d), if it is determined by the Department that the apparent low bidder has failed to meet the provisions of this subsection, the bidder may submit a request for an administrative reconsideration. The bidder must file this request with the Office of Civil Rights within five (5) working days of notification by the Department that the bidder failed to meet the requirements of this subsection. As part of this reconsideration request, it is the bidder's responsibility to provide to Department, any and all written documentation, correspondence, logs, and any other documents or evidence the bidder believes relates to the issue of whether it met the DBE project goal or made good faith effort to do so.

A. The Department's DBE Liaison Officer ("Liaison Officer") will be responsible for resolving the reconsideration dispute.

B. Upon request by the bidder, the bidder will be allowed an opportunity to meet in person with the Liaison Officer to discuss the issue of whether it met the DBE project goal, or made good faith effort to do so. If a meeting is requested, the bidder must be ready, willing, and able to meet with the Liaison Officer within 5 working days of the bidder's receipt of written notification that the bidder failed to meet the requirements of this subsection.

C. The Liaison Officer will render a written decision on the reconsideration, and notify the bidder in writing of the decision. The written decision will explain the basis for the Liaison Officer's findings and the decision.

D. The decision is not appealable to the U.S. DOT, but is appealable in accordance with Section 103D-709, HRS.

VI. SUBCONTRACTING

A. All bidders should be registered with the Office of Civil Rights, DBE Section, prior to submitting a bid.

B. No substitution of a DBE subcontractor shall be made at any time without the prior written consent of the Department.

C. If a DBE subcontractor is unable to perform work under the contract, and is to be replaced, the contractor's failure to obtain a substitute, certified DBE for said work, or to make good faith effort to obtain such a substitute DBE subcontractor to perform said work, may constitute a breach of this contract for which the Department may terminate the contract or pursue such remedy as deemed appropriate by the Department.

D. Agreements between a bidder and a DBE in which a DBE promises not to provide subcontracting quotations to other bidders are strictly prohibited.

VII. PAYMENT

A. The Department will make an estimate in writing each month based on the items of work performed and materials incorporated in the work and the value therefore at the unit prices or lump sum prices set forth in the contract. All progress estimates and payments will be approximate only and shall be subject to correction at any time prior to or in the final estimate and payment. The Department will not withhold any amount from any payment to the bidder.

B. The bidder shall pay all subcontractors within ten (10) calendar days after receipt of payment from the Department. This clause applies to both DBE and non-DBE subcontractors, and all tiers of subcontracts.

C. When any subcontractor has met all the terms and conditions of the subcontract, and there are no bona fide disputes, the bidder shall make full payment to the subcontractor of all monies due, including retainage, within ten (10) calendar days from the receipt of an approved invoice from the subcontractor. The bidder must obtain the prior approval from the Department before it can continue to withhold retainage from any subcontractor who has completed its portion of the work. This clause applies to both DBE and non-DBE subcontractors, and all tiers of subcontracts.

REQUIRED FEDERAL-AID CONTRACT PROVISIONS

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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, 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/her 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, pre-apprenticeship, and/or on-the-job training".

2. **EEO Officer:** The contractor will designate and make known to the Department 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/she 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/her 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/her 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/her 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 Department 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 Department.

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 26, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his/her 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 the Department.

c. The contractor will use his/her 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 Department and the Federal government.

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 Department 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. NON-SEGREGATED 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 Department 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 a 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 Department 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

Department 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 Department 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 Department 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" Form WH-348 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 that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked 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 Department, FAA, FHWA, FTL 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 Department, 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 Department 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 Department 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 Department 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 Department 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 Department 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 of 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 that $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 Department 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.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

HONOLULU, HAWAII

SPECIAL PROVISIONS

These Special Provisions shall supplement and/or amend the applicable provisions of the Hawaii Standard Specifications for Road, Bridge, and Public Works Construction, 1994, hereinafter referred to as the "Standard Specifications".

6/02/98

Amend **Section 101 - Definitions and Terms** to read as follows:

"SECTION 101 - TERMS, ABBREVIATIONS, AND DEFINITIONS

101.01 Meaning of Terms. The specifications are generally written in the imperative mood. In sentences using the imperative mood, the subject, "the Contractor shall", is implied. In the material specifications, the subject may also be the supplier, fabricator, or manufacturer supplying material, products, or equipment for use on the project. The word "will" generally pertains to decisions or actions of the Department and/or Engineer.

101.02 Abbreviations. Meanings of abbreviations used in the specifications, on the plans, or in other contract documents are as follows:

AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Accessibility Guidelines
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
ARA	American Railway Association
AREA	American Railway Engineering Association
ASA	American Standards Association
ASCE	American Society of Civil Engineers

ASLA	American Society of Landscape Architects
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWPA	American Wood Preserver's Association
AWS	American Welding Society
AWWA	American Water Works Association
CCO	Contract Change Order
CFR	Code of Federal Regulations
CRSI	Concrete Reinforcing Steel Institute
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration, U.S. Department of Transportation
FSS	Federal Specifications and Standards, General Services Administration
HAR	Hawaii Administrative Rules
HRS	Hawaii Revised Statutes
ICEA	Insulated Cable Engineers Association (formerly IPCEA)
IMSA	International Municipal Signal Association
ITE	Institute of Transportation Engineers
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways, FHWA, U.S. Department of Transportation
NCHRP	National Cooperative Highway Research Program
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association

NFPA	National Forest Products Association
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration/Act, U.S. Department of Labor
SAE	Society of Automotive Engineers
SI	International Systems of Units
UFAS	Uniform Federal Accessibility Standards
UL	Underwriter's Laboratory
USGS	U.S. Geological Survey

101.03 Definitions. Definitions of words or phrases used in the specifications, on the plans, or in other contract documents, except for other definitions found in the individual sections, are as follows:

Advertisement - A public announcement (Notice to Bidders) inviting bids for work to be performed or materials to be furnished.

Agency - The State Highway or Transportation Department, Commission or other organization, constituted under State laws, that administers highway or transportation work.

Award - Written notification to the bidder that the bidder has been awarded a contract.

Base Course - The layer or layers of specified material or selected material of a designed thickness placed on a subbase or subgrade to support a surface course.

Basement Material - The material in excavation or embankments underlying the lowest layer of subbase, base, pavement, surfacing or other specified layer.

Bidder - An individual, partnership, corporation, or other legal entity who submits a proposal for the work contemplated and acts either directly or through a properly authorized representative.

Bridge - A single or multiple span structure, including supports that carries vehicles, trains, pedestrians, or utilities on a roadway, walk, or track over water, highway, railroad, or other depression.

Calendar Day. Days shown on the calendar, beginning at midnight and ending at midnight of the following day. If there is no designation of calendar or working day, "day" shall mean calendar day.

Certificate of Compliance - A document clearly identifying specific lots of material signed by a person having legal authority to bind the manufacturer or supplier.

Contract - A written agreement between the Department and the Contractor setting forth the obligations of the parties for the performance of the prescribed work.

The contract includes the Notice to Bidders; instructions to bidders; proposal; contract form and contract bond; notice to proceed; specifications; supplemental specifications; special provisions; general, detailed, and standard plans; contract change orders; and supplemental agreements.

Contract Change Order - A written order to the Contractor covering changes in the contract, establishing the basis of payment, and adjusting time for the work influenced by the changes. Also, a contract change order is a written order concerning the performance of work and the furnishing of materials involving extra work. Such extra work may be done at agreed prices or on a force account basis as provided elsewhere in the Contract. A contract change order signed by the parties to the Contract is a supplemental agreement.

Contract Item (Pay Item) - A specific unit of work for which there is a price in the Contract.

Contract Payment Bond. The security executed by the Contractor and Surety or Sureties furnished to the Department to guarantee payment according to the terms of the contract.

Contract Performance Bond. The security executed by the Contractor and the Surety or Sureties furnished to the Department to guarantee the completion of the work according to terms of the contract.

Contract Time - The number of working or calendar days provided in the Contract for completion of the Contract, exclusive of authorized time extensions.

Contractor - The individual, partnership, corporation or other legal entity that has entered into a contract with the Department.

Culvert - A pipe, a reinforced concrete box, or a series of pipes or boxes that provide an opening under the ground for passage of water or other uses.

Department - The Department of Transportation of the State of Hawaii.

Director - The Director of the Hawaii Department of Transportation acting directly or through their duly authorized representatives.

Effective Dates and Laws - Reference to government laws, ordinances, regulations, standard specifications, and rules includes amendments thereto effective as of the date of the call for sealed tenders.

Engineer - The Administrator of the Highways Division acting directly or through a duly authorized representative. Also, Officer-in-Charge and Engineer are interchangeable.

Equipment - All machinery, tools, and apparatus needed to complete the contract.

Extra Work - (See Subsection 104.03 - Extra Work.)

Highway, Street, or Road - A public way for vehicular travel.

Highways Division - The Highways Division of the Hawaii Department of Transportation constituted under the laws of Hawaii for the administration of highway work.

Holidays - The days of each year set apart and established as State holidays according to Chapter 8, HRS, as amended.

Inspector - The Engineer's authorized representative assigned to make detailed inspections of contract performance, prescribed work, and materials supplied.

Laboratory - The testing laboratory of the Highways Division or other testing laboratories that may be designated by the Engineer.

Law - Any Federal, State, County law, ordinance, code, regulation, or rule.

Leveling Course - An aggregate mixture course of variable thickness used to restore horizontal and vertical uniformity to existing pavements or shoulders.

Material - Any natural or manmade substance or item specified in the contract for use in the construction of the project.

Notice to Bidders - The advertisement for proposals for work or materials requiring bids. Such advertisement will show the location of the work to be done or the character of the material to be furnished. Also the advertisement will show the time and place for the opening of proposals.

Notice to Proceed - Written notice to the Contractor showing the date on which the Contractor may begin the contract work. Also this date is the beginning of contract time.

Officer-in-Charge - See "Engineer".

Pavement - The uppermost layer of material placed on the traveled way or shoulders or both. Pavement and surfacing may be interchangeable.

Pavement Structure - The combination of subbase, base, pavement, surfacing or other specified layer of a roadway constructed on a subgrade to support the traffic load.

Plans - The contract drawings that show the location, type, dimensions, and details of the work to be done under the contract. Also, the current and applicable portions of the Standard Plans shall be part of the contract drawings.

Profile Grade - The elevation or gradient of a vertical plane intersecting the top surface of the proposed pavement.

Project - The specific property on which the contract work is to be performed as described in the contract.

Proposal - The written offer by a bidder on forms furnished by the Department to do the work required at the prices quoted.

Proposal Guaranty - The proposal bond or security furnished with a proposal to assure that the bidder will enter into the contract if the proposal is accepted.

Proposal Schedule - The prescribed schedule on which a bidder submits its proposal.

Public Traffic - Vehicular or pedestrian movement on a public way.

Right-of-Way - Land, property, or property interests acquired for or devoted to transportation purposes.

Roadbed - The graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

Roadside - The area between the outside edges of the shoulders and the right-of-way boundaries. Unpaved median areas between inside shoulders of divided highways and infield areas of interchanges are included.

Roadside Development - Those items situated on or within the roadside that provide for the preservation of landscaped materials and features. Also, the

rehabilitation and protection against erosion of areas disturbed by construction. This includes seeding, sodding, mulching and the placing of other ground covers.

Also, roadside development includes planting and other improvements designed to increase the effectiveness and enhance the appearance of the highway.

Roadway - The portion of a highway, street or road within the limits of construction.

Section and Subsection - Section or subsection shall be understood to refer to these specifications unless otherwise specified.

Shoulder - The portion of the roadway next to the traveled way for: accommodation of stopped vehicles, placement of underground facilities, emergency use, and lateral support of base and surface courses.

Sidewalk - That portion of the roadway primarily constructed for use by pedestrians.

Special Provisions - Additions and revisions to the standard specifications covering conditions peculiar to an individual project.

Specialty Items - Work items identified in the contract which are not normally associated with highway construction and require highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract; in general, these items are to be limited to minor components of the overall contract.

Specifications - The directions, provisions, and requirements contained in these standard specifications as supplemented by the Special Provisions.

Specified Completion Date - The date specified for completion of the prescribed contract work.

Standard Plans - Detailed drawings for specific items of work approved for repetitive use and considered as part of the contract plans.

State - The State of Hawaii acting through its authorized representative(s).

Structures - Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, sewers, service pipes, underdrains, foundation drains, and other such features that may be encountered in the work.

Subbase - A layer of specified material of specified thickness between the subgrade and a base.

Subcontractor. An individual, partnership, corporation, or joint venture to whom the Contractor subcontracts part of the contract.

Subgrade - The top surface of completed earthwork on which subbase, base, surfacing, pavement, or a course of other material is to be placed.

Substructure - Those parts of a structure which support the superstructure, including bents, piers, abutments, and integrally built wingwalls, up to the surfaces on which bearing devices rest. Substructure also includes portions above bearing surfaces when those portions are built integrally with a substructure unit (e.g. backwalls of abutments). When substructure and superstructure elements are built integrally, the division between substructure and superstructure is considered to be at the bottom soffit of the longitudinal or transverse beam, whichever is lower. Culverts and rigid frames are considered to be entirely substructure.

Superintendent - Contractor's authorized representative responsible for the contract work.

Superstructure - Those part of a structure above the substructure, including bearing devices.

Surety - Properly authorized corporation, partnership, individual, or other legal entity, other than the Contractor, who executes a bond furnished by the Contractor.

Surfacing - The uppermost layer of material placed on the traveled way or shoulders. This term is used interchangeably with pavement.

Traveled Way - The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

Unsuitable Material - Materials that contain organic matter, muck, humus, peat, sticks, debris, chemicals, toxic matter, or other deleterious materials not suitable for use in earthwork unless otherwise specified.

Utility - A line, facility, or system for producing, transmitting, or distributing communications, power, electricity, heat, gas, oil, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity, district, or cooperative, including any wholly owned or controlled subsidiary.

Wetlands - Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, vegetation typically adapted for life in saturated soil

conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Work - The furnishing of all labor, materials, equipment, and other incidentals necessary to successfully complete any individual item or the entire contract and the execution of duties and obligations imposed by the contract.

Working Day - Calendar days, exclusive of:

(1) Saturdays, Sundays, and State recognized legal holidays,

(2) days required by the contract to suspend construction operations, and

(3) days prevented by or resulting from inclement weather to permit the normal work force to proceed with construction operations for at least five hours. Also, the Contractor shall be performing the current controlling item or items of work.

Working Drawings - Documents furnished by the Contractor including stress sheets; shop drawings; bending diagrams for reinforcing steel, and plans for erection, falsework, framework, cofferdam(s); and other items or such other similar data required for the successful completion of the work."

END OF SECTION

SECTION 102 - BIDDING REQUIREMENTS AND CONDITIONS

Make the following amendments to said Section:

(I) Amend **102.01 Prequalification of Bidders** to read as follows:

"102.01 Prequalification of Bidders. Prospective bidders shall be capable of performing the work for which they are bidding.

According to Section 103D-310, HRS, each prospective bidder shall file written notice of its intention to bid no later than 4:30 P.M., 10 calendar days before the bid opening date (not including the bid opening date), at the Contracts Office, Department of Transportation, 869 Punchbowl Street, Honolulu, Hawaii 96813. If the tenth day is on a Saturday, Sunday, or State holiday, the Notice of Intention to Bid is due on the last working day before the due date. Mailed notice must be received in sufficient time to meet the deadline set above. Faxed notice is acceptable provided the Contracts Office receives the faxed notice within the time stated above. The fax number is (808) 587-2132. It is the bidder's responsibility to ensure that the Contracts Office receives the Notice of Intent on time and in a legible condition.

According to said Section 103D-310, the Department may require any prospective bidder to submit answers to questions contained in the 'Standard Qualification Questionnaire For Prospective Bidders On Public Works Contracts' on the form furnished by the Department, properly executed and notarized, setting forth a complete statement of the experience of such prospective bidder and its organization in performing similar work and a statement of the equipment proposed to be used, together with adequate proof of the availability of such equipment. Whenever it appears to the Department, from answers to the questionnaire or otherwise, that the prospective bidder is not fully qualified and able to perform the intended work, the Department will, after affording the prospective bidder an opportunity to be heard and if still of the opinion that the bidder is not fully qualified to perform the work, refuse to receive or consider any bid offered by the prospective bidder. All information contained in the answers to the questionnaire shall be kept confidential. Questionnaire so submitted shall be returned to the bidders after serving their purpose.

Failure to complete the prequalification questionnaire will be sufficient cause for the Department to disqualify a prospective bidder.

No person, firm or corporation may bid where (1) the person, firm, or corporation, or (2) a corporation owned substantially by the person, firm, or corporation, or (3) a substantial stockholder or an officer of the corporation, or (4) a partner or substantial investor in the firm is in arrears in payments owed to the State of Hawaii or its political subdivisions or is in default as a surety or failure to do faithfully and diligently previous contracts with the State."

(II) Amend **102.04 Estimated Quantities** by revising the last sentence of the last paragraph to read as follows:

"The Department may increase, decrease, or omit each scheduled quantities of work to be done and materials to be furnished. When the Department increases or decreases the estimated quantity of a contract item by more than 15% the Department will make payment for such items according to Subsection 104.02 - Alterations of Plans or Type of Work."

(III) Amend **102.07 Irregular Proposals** by adding the following after item **(5)**:

"**(6)** If in the opinion of the Director, the bidder and its listed subcontractors do not have the Contactor's licenses or combination of Contractor's licenses necessary to complete the work."

(IV) Amend **102.08 Proposal Guaranty** to read as follows:

"102.08 Proposal Guaranty. The Department will not consider a proposal of $25,000 or more unless accompanied by:

(1) a deposit of legal tender; or

(2) a valid surety bid bond, underwritten by a company licensed to issue bonds in the State of Hawaii, in the form and composed, substantially, with the same language as provided herewith and signed by both parties; or

(3) a certificate of deposit, share certificate, cashier's check, treasurer's check, teller's check, or official check drawn by, or a certified check accepted by and payable on demand to the State by a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation (FDIC) or the National Credit Union Administration (NCUA).

(a) The bidder may use these instruments only to a maximum of $100,000

(b) If the required security or bond amount totals over $100,000 more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be acceptable.

(c) The instrument shall be made payable at sight to the Department of Transportation, State of Hawaii.

According to Section 103D-323, H.R.S., the above shall be in a sum not less than 5% of the amount bid."

(V) Amend **102.12 Disqualification of Bidders** to read as follows:

"**102.12 Disqualification of Bidders.** The Department may disqualify a bidder and reject its proposal for the following reasons:

(1) Submittal of more than one proposal whether under the same or different name.

(2) Evidence of collusion among bidders. The Department will not recognize participants in collusion as bidders for any future work of the Department until such participants are reinstated as qualified bidders.

(3) Lack of proposal guaranty.

(4) Submittal of an unsigned or improperly signed proposal.

(5) Submittal of a proposal without a listing of subcontractors or containing only a partial or incomplete listing of subcontractors.

(6) Submittal of an irregular proposal according to Subsection 102.07 - Irregular Proposals.

(7) Failure to submit and comply with the Statement of Affirmation and Acknowledgment of Disadvantaged Business Enterprise (DBE).

(8) Evidence of assistance from a person who has been an employee of the agency within the preceding two years and who particpcated while in State office or employment in the matter with which the contract is directly concerned, pursuant to Section 84-15, HRS."

(VI) Amend **Section 102.14 - American Products Preference** to read as follows:

"**102.14 American Products Preference.** The 'Buy America' provision in the Surface Transportation Assistance Act of 1982 is applicable to Federal-Aid projects. The bidders shall give preference to American products, materials and supplies.

Bidders may submit a bid based upon furnishing domestic or foreign steel. The basis for determining the foreign or domestic character of the steel is on the place of manufacture. Any domestic steel furnished shall be manufactured from materials and supplies mined, produced or manufactured in the United States.

The 'Buy America' provision does not apply to minimal use of foreign steel such that the cost, delivered to the project site, is less than $2,500 or 0.1% of the total contract amount, whichever is greater.

The Department directs the bidder to the instructions in the Proposal regarding alternate bidding procedures for foreign steel. The Department will decide the total bid for bid comparison purposes as provided in the proposal.

The Department will award the contract to the bidder who submits the lowest total bid based on furnishing domestic steel, unless such total bid exceeds the lowest total bid based on furnishing foreign steel by more than 25%. If a tie occurs between a bid based upon furnishing foreign steel and a bid based upon furnishing domestic steel including the 25% price differential, the Department will consider the bid based on furnishing domestic steel as the lower bid.

The basis for the determination of foreign or domestic character of the steel are on place of manufacture. Manufacturing processes for domestic steel shall occur in the United States."

(VII) Amend **102.15 Declaration of Non-Collusion** to read as follows:

"**102.15** (Unassigned)"

(VIII) Amend **102.16 Substitution Of Materials and Equipment** to read as follows:

"**102.16 Substitution Of Materials and Equipment.**

(A) Substitution Before Bid Opening. The Department will not review substitution request before bid opening. Bidders shall base bids on the specified item.

(B) Substitution After Bid Opening. The Contractor may make substitutions that are equal or better after bid opening with the written acceptance by the Engineer."

(IX) Add the following:

"102.18 Preferences. Hawaii Products, Recycled Products, and In-State Preferences shall not apply to this project."

102.19 Certification for Safety and Health Program for Bids in excess of $100,000. According to Section 396-18 of the Hawaii Revised Statutes, the bidder or offeror, by signing and submitting this proposal, certifies that a written safety and health plan for this project will be available and implemented by the notice to proceed date for this project. Details of the requirements of this plan may be obtained from the State Department of Labor and Industrial Relations, Occupational Safety and Health Division (HIOSH)."

102.20 Tax Clearance. All bidders should submit original tax clearance certificates or certified copies from the Department of Taxation (DOTAX) and the

Internal Revenue Service (IRS) with their bid proposals when the bid is $25,000 or more. Bidders are required to provide a tax clearance prior to entering into a public contract of $25,000 or more, pursuant to ACT 352, SLH 1997.

Tax clearances may be obtained by completing the Tax Clearance Application (Form A-6) and submitting it to the DOTAX or the IRS. The application may be obtained from the DOTAX, or the IRS. The application may be mailed in or walked in to either the DOTAX or the IRS. Both tax agencies encourage the use of their mail-in process, which should be completed within 21 calendar days. Tax clearance certificates will be issued to the applicant upon determination that the applicant has filed all tax returns due, and has paid all amounts owing on such returns, including penalty and interest."

Only original tax clearances or certified copies will be accepted for this purpose. Failure to submit the required tax clearance certificates will be sufficient grounds for the State to refuse to receive or consider the prospective bidder's proposal.

Tax clearance certificates are valid for 6 months. The validity period will begin with the later approval date stamped on the tax clearance.

The tax clearance submitted with the bid proposals must be valid on the solicitation's first legal advertisement date or any date thereafter up to the bid opening date. Valid tax clearances submitted with the proposal will remain valid for the contract award and encumbrance.

If a business cannot obtain a tax clearance certificate because of tax delinquencies, it may submit a 'special letter' from DOTAX and/or the IRS. The 'special letter' may only be obtained if

(1) the business has an existing installment agreement with the tax agency, or

(2) the delinquency is the subject of an administrative or judicial appeal.

The bidder is cautioned that the 'special letter' from the IRS must be certified by DOTAX. All conditions applied to tax clearance certificates for this purpose are applicable to these 'special letters'. Instructions to obtain the 'special letter' are available from each respective tax agency.

Various combinations of tax clearance certificates and 'special letters' are acceptable for this purpose as follows:

(1) Tax clearance signed by both tax agencies;

(2) Individual tax clearance certificates from each tax agency, respectively;

(3) Tax clearance certificate from one tax agency and a 'special letter' from the other tax agency; or

(4) 'Special letter' from both tax agencies."

END OF SECTION

SECTION 103 - AWARD AND EXECUTION OF CONTRACT

Make the following amendments to said Section:

(I) Amend **103.03 Award of Contract** to read as follows.

"The award of contract, if it be awarded, will be made within 60 calendar days after the opening of bids, to the lowest responsible bidder whose proposal complies with all the requirements. The successful bidder will be notified by letter mailed to the address shown on his/her proposal, that his/her proposal has been accepted, and that he/she has been awarded the contract.

Pursuant to Sections 103-53 and 103(D)-308, H.R.S., and as provided in Section 102.20 Tax Clearance of the Special Provisions, the awardee is required to provide a valid state and federal tax clearance as a prerequisite to entering into a public contract.

The awardee shall submit to the Department for information and review the pre-construction data within 15 days from the date of award of the contract. Such data shall include:

(1) List of Supervisory Personnel;

(2) Name of person(s) authorized to sign for the Contractor;

(3) Work Schedule;

(4) Tax Rates;

(5) Insurance Rates and Insurance Certificate;

(6) Progress Schedule;

(7) Subcontractor's Form; and

(8) List of Suppliers."

(II) Amend **103.06 Requirement of Contract Bond** to read as follows:

"At the time of execution of the contract, the successful bidder shall file a good and sufficient performance bond and a payment bond on the forms furnished by the Department (see attached) conditioned for the full and faithful performance of the contract according to the terms and intent thereof and for the prompt payment to all others for all labor and material furnished by them to the bidder and used in the prosecution of the work provided for in the contract. The bonds, each of which shall be of an amount equal to 100% of the amount of the contract price and including 5% of the contract amount estimated to be

required for extra work. The bidder shall limit the acceptable performance and payment bonds to the following:

(a) Legal tender;

(b) Surety bond underwritten by a company licensed to issue bonds in the State of Hawaii; or

(c) A certificate of deposit; share certificate; cashier's check; treasurer's check, teller's check drawn by or a certified check accepted by and payable on demand to the State by a bank savings institution or credit union insured by the Federal Deposit Insurance Corporation (FDIC) or the National Credit Union Administration (NCUA).

1. The bidder may use these instruments only to a maximum of $100,000.

2. If the required security or bond amount totals over $100,000 more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be acceptable.

Such bonds shall also by the terms inure to the benefit of any and all persons entitled to file claims for labor done or material furnished in the work so as to give them a right of action as contemplated by Section 103D-324, HRS."

(III) Amend **103.07 Execution of the Contract** by revising the first paragraph to read as follows:

"**103.07 Execution of Contract.** The contract bond and 'Chapter 104, HRS Compliance Certificate ', similar to a copy of the same annexed hereto, shall be executed by the successful bidder and returned within ten days after the award of the contract or within such further time as the Director may allow after the bidder has received the contract for execution."

(IV) Amend **103.09 Submission of Insurance Certification** to read as follows:

"**103.09 Submission of Insurance Certification.** The Contractor shall submit to the Engineer within 15 days of the contract award date, three copies each of insurance certification stating that the Contractor has taken out and is keeping in effect:

(1) Commercial General Comprehensive Personal Injury and Property Damage Liability insurance with the following minimum limits of liability:

Products - Completed/Operations Aggregate	$2,000,000

Personal and Advertising Injury	$2,000,000
Bodily Injury and Property Damage	$2,000,000 each occurrence

naming the State of Hawaii as additional insured.

(2) Automobile Liability insurance with the following minimum limits of liability:

Bodily Injury Liability	$1,000,000 (Per accident)
Property Damage Liability	$1,000,000

naming the State of Hawaii as additional insured.

(3) Workers' Compensation.

The insurance mentioned above shall cover the insured for work done:

(1) under the contract including force account work,

(2) incidental to the contract including traffic detour work or other work done out of the work area,

(3) outside the project limits including hauling of equipment and materials, and

(4) contract change orders including force account work.

If the Contractor and/or its insurer wrongfully fails to defend and/or indemnify the State of Hawaii in any liability claims, the Department may bar the Contractor and/or its insurance company from bidding, working on construction projects, and/or insuring construction projects for a period of up to two consecutive years from the date determined by the Department.

This remedy is non-exclusive. The Department may exercise this remedy in addition to other remedies for breach of the project contract on account of any failure to defend and/or indemnify.

END OF SECTION

SECTION 104 - SCOPE OF WORK

Make the following amendments to said Section:

(I) Delete the paragraph before **104.01(B) Voluntary Partnering.**
(II) Amend **104.01(B) Voluntary Partnering** by adding the following before the first sentence of the first paragraph:

"This provision applies to non-resurfacing projects with a construction cost estimated at over one million dollars ($1,000,000.00)."

(III) Amend **104.01(B) Voluntary Partnering** by revising the fourth paragraph subparagraph (3):

(3) Other State Departments or Agencies such as:

(a) Health

(b) Land & Natural Resources

(c) Disabilities Communication Access Board

(IV) Amend **104.02 Alterations of Plans or Type of Work** to read as follows:

"104.02 Alterations of Plans or Type of Work. The Department reserves the right to make during the progress of the work, such increase or decrease in the quantity of contract items. Also, the Department reserves the right to alter the details of the work as necessary or desirable. Such increases or decreases and alteration shall not invalidate the contract or release the surety. The Contractor agrees to accept the work as increased, decreased or altered.

Alterations of plans or nature of the work shall not involve work beyond the limits of the original proposed work except as may be necessary to complete the project according to the contract.

The Contractor shall do the altered work as part of the contract unless the altered work significantly changes the scope of work to be done. Also, the Department will pay the altered work at the same contract prices as for other parts of the work.

For purposes of this subsection, an altered work shall be an ordered change involving:

(1) Work that is different in kind, nature or cost from items called for in the original contract; or

(2) More than 15% increase or decrease in the quantity of a contract item.

The Engineer will make an allowance on such agreed basis before the work starts if the altered work is significant. The Engineer will make an equitable adjustment in the contract price if there is no agreement.

The provisions of this subsection shall not apply to overruns and underruns on items which are estimated in the proposal.

The Contractor shall not make claims for loss of anticipated profits because of alteration or variation between the approximate quantities and the actual quantities.

The Department will make payment according to Subsection 109.03 - Compensation for Altered Quantities if the altered work is significant. The Department will make such time adjustment according to Subsection 108.07 - Determination and Extension of Contract Time if the altered work requires additional time to complete the project.

(A) Alterations in Quantities or Scope of Work for Contract Items with Unit Prices. The Engineer will make adjustment in the unit price only if the total quantity of that increased or decreased contract item is more than 15% of the original contract amount of that item. The total quantity includes quantity of previous orders.

The Engineer may base such adjustment on the increased or decreased actual cost to the Contractor per unit of said item. The Engineer has the option of making adjustment on a force account basis according to Subsection 109.04 - Extra and Force Account Work and the following:

(1) For increased quantities, the Engineer will apply such adjustments to the increased quantity over 15% of the original contract amount of that item.

(2) For decreased quantities, the Engineer will apply such adjustments to the decreased quantity over 15% of the original contract amount of that item.

(B) Alterations in Quantities or Scope of Work for Contract Items On Lump Sum Basis. If the Contractor makes the ordered alterations involving the quantity of lump sum items or portion of the lump sum work, the Engineer will make adjustment in payment only in work influenced by the alterations.

The Engineer will base the adjustment in lump sum price on a theoretical unit price when the increase or decrease does not exceed 15% of the original quantity. The Engineer will resolve the theoretical unit price by

dividing the original contract lump sum price by the original quantity. The adjustment in the original lump sum price shall be the product of the theoretical unit price and the quantity involved not exceeding 15% of the original quantity for the item of work.

When the increase exceeds 15% of the original quantity, the Contractor and the Engineer will mutually agree on the adjustment in payment for the quantity over 15%. If failure to agree, the Engineer will pay such increased work for on a force account basis according to Subsection 109.04 - Extra and Force Account Work.

When the decrease exceeds 15% of the original quantity, the adjustment in the original lump sum price shall be:

(1) the lesser of

(a) the amount of the reduction in quantity multiplied by the theoretical unit price, or

(b) adding

1. the amount of the reduction in quantity up to 15% multiplied by the theoretical unit price, and

2. the amount of the reduction in quantity over 15% as computed as if the work done was on a force account basis according to Subsection 109.04 - Extra and Force Account Work, or

(2) as mutually agreed to by the Contractor and the Engineer.

The Engineer will resolve the adjustment in lump sum price as if the increase or decrease was to be paid for on a force account basis according to Subsection 109.04 - Extra and Force Account Work, or as mutually agreed to by the Contractor and the Engineer when the lump sum item of work contains no quantity.

The following provision shall apply only to State and Federal-Aid projects:

(C) Differing Site Conditions. If the Contractor finds the following:

(1) Subsurface or latent physical conditions that differ materially from that shown on the contract, or

(2) other physical conditions that are unusual in nature and differ materially from that ordinarily encountered in the type of project under contract, or

(3) other physical conditions that were not discoverable by the Contractor before commencement of the project or that portions of the project work, or

(4) other physical conditions that are not generally recognized in the construction industry as inherent in the type of work specified in the project contract, the Contractor shall immediately notify the Engineer verbally of the above discovery. Within 24 hours, the Contractor shall inform the Engineer in writing of the above discovery. The affected work will stop immediately until the Engineer informs the Contractor to commence work in writing.

The Engineer will investigate, document and evaluate the site conditions found in the affected project area. The Engineer will determine and inform the Contractor if such conditions are materially different from the contract and if such conditions justify an adjustment to the project contract.

If an adjustment is warranted and cause an increase in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, an adjustment shall be made and the contract modified in writing accordingly. Any adjustment in contract price made pursuant to this clause shall be determined according to Subsection 104.09 - Price Adjustment.

The Department will not compensate the Contractor for loss of anticipated profits on deleted work.

If the Contractor fails to notify the Engineer as provided above, or commences or continues project work in or affecting that portion of the project area before receiving written authorization from the Engineer, the Department may refuse or deny contract adjustments for that portion of the project work."

(V) Amend **104.03 Extra Work** to read as follows:

"**104.03 Extra Work.** All changes will be set forth in a written order from the Engineer. Upon receipt of a written order, the Contractor shall proceed with the changes. If the Contractor does not agree with any of the terms or conditions or ~~in~~ the adjustment or nonadjustment to the contract time and/or contract price set forth therein, ~~it~~ the Contractor shall file with the Engineer, a written protest setting forth its reasons in detail within 30 days after receipt of the written order. In all cases, the Contractor shall proceed with the work as changed. The protest shall be determined as provided in Subsection 105.18 - Claims for Adjustment and Disputes. Failure to file such protest within the time specified shall constitute an agreement on the part of the Contractor with the terms, conditions, amounts and adjustment or nonadjustment to contract price and/or contract time set forth in the written order."

(VI) Amend **104.04 Maintenance of Traffic** to read as follows:

"**104.04 Maintenance of Traffic.**

(A) General. The Contractor shall keep the road open to traffic during the progress of the work according to Section 645 - Work Zone Traffic Control.

The Contractor shall furnish, erect, and maintain lights, barricades, signs and other traffic control devices. Also, the Contractor shall take precautions for the protection of the work and safety of the public according to Subsection 107.14 - Barricades and Warning Signs.

Obstructions to a roadway attributable to construction, maintenance, or engineering survey on or near public streets and highways are a major hazard to motorists, pedestrians and workers at the work site. The Contractor shall take such safety and precautionary measures as may be required according to Chapter 286, HRS; the Hawaii Administrative Rules, Title 19, Subtitle 5, Chapters 127, 128 and 129; and the most current editions or revisions of the MUTCD.

Where so provided on the plans, the Contractor may bypass traffic over an acceptable detour route. Keep the portion of the project used by public traffic in passable condition. Also, provide and maintain temporary crossings with trails, roads, streets, businesses, parking lots, garages, residences, and farms.

If elimination of abutting owners' access occurs, do not close the existing access until the replacement access facilities are usable. The Contractor may obtain written permission from the abutting owners setting the conditions for closing the existing access. Submit a copy of this agreement with the abutting owners to the Engineer for acceptance before such work begins.

Provide a smooth and even surface for public traffic use when working on an existing facility kept open to traffic. Conduct such work on only portion of the roadway. Alternate construction from one side to the other while routing traffic over the opposite side. Place sufficient fill at culvert and bridge locations to permit traffic to cross. Conduct culvert installation on only portions of the roadway to permit safe passage of traffic.

During subgrade and paving operations, consider use of shoulders for public traffic. If using part-width paving methods, consider use of side of the roadbed opposite the one under construction for public traffic. Keep a passageway wide enough to make at least two lanes of traffic open when sufficient width is available. The Engineer will consider shaping or maintaining the shoulders as included in the ~~bid~~ contract price of the various contract items and the Department will not make additional compensation.

Do not store material or equipment where the material or equipment will interfere with public traffic. Remove equipment and other obstructions to permit free and safe passage of public traffic when each day's work ends or if suspension of construction operations occurs.

Traffic incidental to other construction projects that abuts the principal routes of travel are part of the public traffic and shall be as required by contract.

The Contractor shall bear expenses of maintaining traffic over the section of road undergoing improvement or repair. Also, bear expenses of constructing, maintaining, removing, and furnishing approaches, crossings, intersections, and flaggers and their equipment, without direct compensation. Exceptions are as follows:

(1) Special Detours. The Department will cover payment for cost of constructing, maintaining, and removing such detour(s) when the proposal contains an item for "Construction and Maintenance of Detours". Also, the Department will include payment for the construction and removal of temporary bridges and accessory features. The Department will furnish right-of-way for temporary highways or bridges called for under this paragraph.

(2) Maintenance of Traffic During Suspension of Work. Provide safe passage for public traffic through the work site according to Subsection 108.06 - Temporary Suspension of Work.

(3) Special Maintenance Specified by the Engineer. The Engineer will pay the Contractor on the basis of unit prices or under Subsection 104.03 - Extra Work if the Engineer ~~orders~~ specifies the special maintenance. The Engineer will be the sole judge of work to be classified as special maintenance.

(B) Traffic Maintenance Plans. Submit in writing traffic maintenance plans and schedules, including plans and schedules for traffic detours, road or lane closures, lane switches and the placement of temporary traffic control devices, warning signs, barricades and other protective devices, to the Engineer for acceptance at least ten working days before the date such work is scheduled to begin.

Such plans and schedules shall contain:

(1) a brief description of the work,

(2) dates of work,

(3) times of day affected,

(4) proposed public information sign, and

(5) proposed news release.

(6) detour layout plans.

If doing work in a city or town, give the Fire Department at least 24 hours notice in writing before blocking or closing off access to streets. Keep fire hydrants accessible to the Fire Department. Do not place material or other obstruction closer to a fire hydrant than permitted by ordinances, rules or regulations. If there are no ordinances, rules or regulations, do not place material or other obstruction within 5 feet of a fire hydrant.

Make arrangements according to the contract for emergency work that may be required when work is not in progress.

The Engineer will permit lane closures only from 8:30 A.M. to ~~3:30~~ 3:00 P.M.

Exceptions to the above lane closure hours shall require the Engineer's acceptance in writing.

The Engineer will permit the Contractor to close only one lane of traffic during its working hours. During non-working hours, keep all lanes open to traffic and allow traffic to flow at the normal posted speed limit.

Failure to open lanes to traffic beyond the above lane closure hours shall result in assessment of liquidated damages as specified in Section 108.08 - Liquidated Damages and Failure to Complete on Time.

The Contractor shall not conduct operations on any roadway involving traffic lane closures or slowdown of traffic on the following dates:

(1) The day preceding a holiday from 3:00 PM to Midnight,

(2) All State Holidays,

(3) The Thanksgiving Holiday weekend (Thursday, Friday, Saturday and Sunday),

(4) The two week holiday period for Christmas and New Years, and

(5) The three week period for the 'Beat the School Jam' beginning on the third week of August.

Notify the State and County transportation agencies including Bus Systems Division, Police Department, Fire Department, Ambulance Service, and the Department of Health in writing at least five days before the start of construction.

Construct, install, maintain, and remove two advisory signs as specified by the Engineer. Place the signs within the project limits. The signs shall have black letters on orange background. The minimum size of the signs shall be four feet high by eight feet wide.

The sign message shall include the starting date, hours, limits and duration of construction. The height of the letters shall be 8 inches, Series D. If accepted by the Engineer, the Contractor may use a minimum height of 6 inches, Series D. The Engineer will review and accept the advisory sign wording before installing. Install the advisory sign two weeks before the start of construction.

Take measures necessary to insure that safe and easily accessible passage is provided for pedestrians who must travel in or near the construction zone.

The Engineer will consider payment for furnishing, placing, maintaining and removing the advisory signs and insuring safe and accessible passage for pedestrians included in the bid price of the various contract items. The Engineer will pay additional advisory signs as specified by the Engineer under Additional Police Officers and/or Additional Traffic Control Devices.

Submit requests for review and acceptance of detours and lane closures that will impact traffic during peak hours before scheduling the work to begin as follows:

(1) detours - 8 weeks, and

(2) lane closures - 6 weeks.

Also, these requests shall include:

(1) An explanation of proposed changes to the existing traffic pattern;

(2) A schedule of when installing informational and traffic control signs;

(3) A schedule of when publishing advertisements;

(4) A plan showing the proposed informational and traffic control

signs; and

(5) A plan showing the lane changes or detours. Plans for multi-lane highway lane changes and detours shall include details of the beginning of the lane changes or detours.

The Engineer will not make payment for reviewing request submittals.

(C) Advertisement. If requested by the Engineer, place an advertisement in the newspaper for the following traffic pattern changes in operation during peak hours or night work:

(1) Detours;

(2) Lane closure;

(3) Permanent road closure; and

(4) Permanent new route that changes a previous route.

The advertisement shall contain the following information:

(1) Map of traffic pattern change limits;

(2) Map showing lane(s) closure and detour pattern;

(3) Notice of starting and ending dates and duration; and

(4) Explanation of the lane(s) closure or detours "Notice To Motorist".

The quality of the map shall be as follows:

(1) The Department will not allow free hand printing or pencil;

(2) Highlight important feature in bold letters by darkening, cross-hatching, crossing-out or coloring;

(3) Minimum size shall be five columns wide and four columns deep. Lesser width columns may be considered to balance against the size of the drawing;

(4) Text Specifications.

(a) Work being featured - 3/16 inch text

(b) Major roads and features - 1/8 inch text

(c) Other roads and features- first letter upper case

(d) "Notice to Motorists" in upper case

(e) Message - first letter upper case

(5) Line Thickness.

(a) Important feature being advertised - thicker than rest of map

(b) Directional arrow - bolder than the rest of the lines shown on the map, when important, to show the route traffic should use.

(6) Show reference direction such as "TO HILO, WAILUKU, HONOLULU, or LIHUE" with arrow.

The Contractor shall submit:

(1) the "Notice to Motorists" for review and acceptance before placement in the newspaper 6 weeks before the start of work.

(2) the actual size of the notice to be published in the newspaper for review and acceptance. The Engineer will not allow reduction of the notices once accepted. The final "Notice to Motorists" submittal shall be a good copy of the camera ready advertisement.

Place the advertisement for three consecutive days and within one week before the traffic pattern changes in the:

_✔_ Honolulu Star-Bulletin and Honolulu Advertiser

Provide message boards as requested by the Engineer prior to lane or ramp closures.

The Contractor is directed to Section 645 - Work Zone Traffic Control for payment of advertisement.

(VII) Amend **104.05 Construction and Maintenance of Detour** by deleting the second paragraph in its entirety.

(VIII) Add the following:

"104.09 Price Adjustment. Any adjustment in contract price pursuant to a change or claim in this contract shall be made in one or more of the following ways:

(1) By agreement on a fixed price adjustment before commencement of the pertinent performance or as soon thereafter as practicable;

(2) By unit prices or other price adjustments specified in the contract or subsequently agreed upon;

(3) By the costs attributable to the event or situation covered by the clause, plus appropriate profit or fee, all as specified in the contract or subsequently agreed upon;

(4) In such other manner as the parties may mutually agree; or

(5) At the sole option of the Department, by the costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as specified in Subsection 109.04(A) Allowances for Overhead and Profit and the force account provision of 109.04 Payment for Additional Work;

(6) By a determination by the Department of the reasonable and necessary costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as computed by the generally accepted accounting principles and applicable sections of Chapter 3-123 and 3-126 of the HAR and Subsection 109.04(A) Allowances for Overhead and Profit herein."

(IX) Move **Subsection 105.19 Value Engineering** to this Section and make it read as "**Subsection 104.10 Value Engineering**".

(X) Amend **Subsection 105.19 Value Engineering** by revising the first sentence of the first paragraph to read as follows:

" In accordance with Section 103D-411, HRS, on projects with contract amounts in excess of $250,000 the following Value Engineering Incentive Clause shall apply, and the Contractor submitting cost reduction proposals, will be allowed to share in those cost savings that ensue from the cost reduction proposals, hereinafter referred to as Value Engineering Change Proposal (VECP)."

END OF SECTION

SECTION 105 - CONTROL OF WORK

Make the following amendments to said Section:

(I) Amend **105.02(B) Working and Shop Drawings** by revising the last sentence of the fifth paragraph to read as follows:

"The Engineer will not consider delays caused by the Contractor's failure to submit the working and shop drawings on time a justifiable reason for contract time extensions."

(II) Amend **105.08 Authority and Duties of Project Engineer** by revising the first sentence to read as follows:

"105.08 Authority and Duties of Project Engineer. As the direct representative of the Engineer, the Project Engineer has immediate charge of the engineering details of its construction project and is responsible for the administration and completion of the project."

(III) Amend **105.12 Removal of Unacceptable and Unauthorized Work** to read as follows:

"105.12 Removal of Unacceptable and Unauthorized Work.

(A) Unacceptable Work. The Engineer will consider work not conforming to the contract as unacceptable work. The Contractor is directed to Subsection 105.03 - Conformity with the Contract.

Remove unacceptable work found to exist before the final acceptance of the work. Replace the work according to the contract. Unacceptable work includes poor workmanship and use of defective materials.

The Engineer may remedy such unacceptable work and deduct the costs from monies due or to become due the Contractor if the Contractor fails to comply as specified by the Engineer.

(B) Unauthorized Work. The Engineer will consider work done contrary to the specifications of the Engineer, work done beyond the lines as given, or extra work done without authority as unauthorized. The Engineer will not make payment for such work. The Engineer may order such work removed or replaced at no cost to the State."

(IV) Amend **105.13 Load Restrictions** to read as follows:

"105.13 Load Restrictions. Comply with legal load restrictions in the hauling of materials on public roads. A special permit will not relieve the

Contractor of liability for damage that may result from the moving of material or equipment.

Limit hauling of materials over the base course or surface course under construction according to the contract. The Engineer will not permit loads on a concrete pavement, base or structure before the expiration of the curing period. All loads shall not exceed the legal load limits. The Contractor shall be responsible for damages done while hauling equipment.

When the MTV exceeds legal axle or total weight limits for vehicles under the Hawaii Revised Statutes, Chapter 291, the following are required when crossing bridges within the project limits unless otherwise noted on the plans or specified herein:

(1) The MTV shall be fully emptied of mix prior to crossing a bridge.

(2) The MTV shall move across the bridge at a relatively constant speed not exceeding 5 miles per hour. The MTV shall not stop on the bridge.

(3) No other vehicle or equipment shall be on the bridge while the MTV is crossing the bridge.

Transporting of MTV(s) by means of truck-tractor/trailer combination with size and weight exceeding legal limits shall be according to Chapter 104 of Title 19, Department of Transportation, entitled 'Movement by Permit of Oversize and Overweight Vehicles on State Highways'".

(V) Amend **105.18 Claims for Adjustments and Disputes** to read as follows:

"105.18 Claims for Adjustments and Disputes. The Contractor may give notice in writing to the Engineer for claims that extra compensation, damages, or an extension of time for completion is due the Contractor for one or more of the following reasons:

(1) Requirements not clearly covered in the contract, or not ordered by the Engineer as an extra work;

(2) Failure between the State and the Contractor to agree to an adjustment in price for a contract change order issued by the State; or

(3) An action or omission on the part of the Engineer requiring performance changes within the scope of the contract.

The Contractor shall continue with performance of the contract in compliance with the directions or orders of the Engineer, but by so doing, the Contractor shall not be deemed to have prejudiced any claim for additional compensation, damages, or an extension of time for completion; provided:

(1) The notice in writing be given:

(a) Before the commencement of the work involved, if at that time the Contractor knows of such requirements or the occurrence of such actions or omissions; or

(b) Within 30 calendar days after the Contractor knows of such requirements or the occurrence of such action or omission if the Contractor did not have such knowledge before the commencement of the work; or

(c) Within 30 calendar days after receipt of the written contract change order that was not agreed upon by both parties; or

(d) Within such further time as may be allowed by the Engineer in writing.

(2) The notice shall clearly state the Contractor's intention to make claim and the reasons why the Contractor believes that additional compensation, changes or an extension of time may be remedies to which the Contractor is entitled; and afford the Engineer every facility for keeping records of the actual cost of work. Failure on the part of the Contractor to give such notification or to afford the Engineer proper facilities for keeping strict account of actual cost shall constitute waiver of the claim for such extra compensation. The filing of such notice by the Contractor and the keeping of costs by the Engineer shall not in any way be construed to prove the validity of the claim.

The Engineer will review the notice and render a decision. The Engineer's decision shall be final and conclusive unless, within 30 calendar days from the date of the decision, the Contractor mails or otherwise furnishes a written appeal to the Director. The decision of the Director shall be final. Later notification of such claims shall not bar the Contractor's claim unless the State is prejudiced by the delay in notification. No claim by the Contractor for an adjustment hereunder shall be allowed if notice is not given before final payment under this contract. Any adjustment in the contract price made pursuant to this clause shall be determined according to Subsection 104.09 - Price Adjustment.

The provisions of this Subsection shall not be construed as establishing any claims contrary to the terms of Subsection 104.02 - Alteration of Plans or Type of Work.

Nothing herein contained, however, shall excuse the Contractor from compliance with any rules of law precluding any state officers and any Contractors from acting in collusion or bad faith in issuing or performing contract change orders which are clearly not within the scope of the contract."

(VI) Amend **105.20(A) General** by revising the first sentence to read as follows:

> **"(A) General.** The Contractor and the Department will establish a Disputes Review Board (Board) when the proposal amount is more than fifty million dollars ($50,000,000) or the completion time is more than 360 working days."

END OF SECTION

SECTION 106 - CONTROL OF MATERIAL

Make the following amendments to said Section:

(I) Amend **106.03 Sampling, Tests, Cited Specifications** by revising the third paragraph to read as follows:

"AASHTO, ASTM, HDOT, or other recognized national organizations in use by the Department at the time of the advertisement for project bid shall prevail for the project, except as otherwise specified."

(II) Amend **106.03 Sampling, Tests, Cited Specifications** by revising the last paragraph to read as follows:

"**(1)** AASHTO Standard Specifications for Highway Materials and Methods of Sampling and Testing, (Parts I and II), 21st Edition.

(2) ASTM Standards, Volumes 00.01 to 15.09, 1999 Edition."

(III) Amend **106.04 Plant Inspection** by revising the first paragraph to read as follows:

"**106.04 Manufacturing Plant Inspection.** When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The Engineer may get samples of materials for laboratory testing for compliance with material quality requirements. This may be the basis for acceptance of manufacturing lots as to quality."

(IV) Amend **106.09 Special Test Methods** to read as follows:

"**106.09 Special Test Methods.** The Department uses the test methods specified below and are modifications of standard procedures or methods peculiar to the Department. References to Hawaii Test Method may be found in the new manual "Hawaii Test Methods", published by State of Hawaii, Department of Transportation, Highways Division, Materials Testing and Research Branch, dated December 2000.

(A) Relative Compaction Test. This test determines the ratio of the dry unit weight (density) of in-place soil to the maximum dry unit weight of the same soil.

(1) Maximum Dry Unit Weight. The test procedure for determining the maximum dry unit weight shall be in accordance with AASHTO T 180 (20TH Edition), Method D, with correction for fraction over 3/4-inch.

(2) Density of Soil In-Place. The test procedure for determining the density of soil in-place shall be according to Hawaii Test Methods HDOT TM 1, 2, and 3.

(B) Wet Preparation of Disturbed Soil Samples. When designated by the Engineer, the wet method of sample preparation (Hawaii Test Method HDOT TM 5) shall be used for sensitive soil mixtures.

(C) Test for Field Resistivity And pH Of Backfill Material. The test to determine the field resistivity and pH of backfill material shall be determined according to Hawaii Test Method HDOT TM 4 to estimate the service life of metal pipes.

(D) Operation of the California Type Profilograph and Evaluation of Profiles. The test to determine the profile index shall be made in accordance with Hawaii Test Method HDOT TM 6.

(E) Relative Density Of Asphalt Pavement By Cores. The relative density of asphalt pavement by cores shall be determined by Hawaii Test Method HDOT TM 7.

(F) Determining Total Moisture Content of Bituminous Mixtures or Mineral Aggregates Using Microwave Ovens. The total moisture content of bituminous mixtures or mineral aggregates using the microwave ovens shall be determined in accordance with Hawaii Test Method HDOT TM 8."

(V) Amend **106.10 Certificate of Compliance** by revising the first sentence of the second paragraph to read as follows:

"A certificate of compliance shall accompany each lot of materials or assemblies delivered to the work site with substantiating test data of the lot clearly identified."

(VI) Add the following subsections:

"106.13 Ordering of Certain Materials. The intent of this contract is to complete work within the specified time. Therefore, the Contractor shall submit to the Department, within 7 days following award of contract, written evidence that the Contractor ordered the necessary materials/equipment with manufacturer's brochure/shop drawings specified for this project.

The Department will purchase said materials/equipment at cost which includes the cost of the materials/equipment based on invoices, the cost of

transporting the materials/equipment to the location designated by the Engineer, and applicable State excise taxes if the award is rescinded by the Department after the Contractor orders the materials specified above. The Contractor shall not include profit.

106.14 Assignment Of Antitrust Claims For Overcharges For Goods and Materials Purchased. Vendor and purchaser recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the purchaser. Therefore, vendor hereby assigns to purchaser any and all claims for such overcharges as to goods and materials purchased in connection with this order or contract, except as to overcharges which result from antitrust violations commencing after the price is established under this order or contract and which are not passed on to the purchaser under an escalation clause.

Contractor and owner recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the owner. Therefore, Contractor hereby assigns to owner any and all claims for such overcharges as to goods and materials purchased in connection with this order or contract, except as to overcharges which result from antitrust violations commencing after the price is established under this order or contract and any contract change order. In addition, Contractor warrants and represents that each of its first tier suppliers and subcontractors shall assign any and all such claims to owner, subject to the aforementioned exception."

106.15 Submittal Data. The contract contains the description of various items which the Contractor must submit to the Engineer for review and acceptance. The Contractor shall provide 6 copies of the required submissions. The Engineer will complete the review of the material within 30 days from the date of submission. The Engineer will advise the Contractor, in writing, as to the acceptability of the material submitted. The Engineer may determine that the item is acceptable, in which case no further action is required by the Contractor; or, the item may be partially or totally rejected, in which case the Contractor shall be required to modify the submittal as required by the Engineer and resubmit the item within 15 days. At this time, the review and acceptance cycle described above shall begin again.

Failure to furnish the required submissions by the time specified will result in the payments that may become due to the Contractor being suspended until the Engineer receives the submission.

The purpose of the submittal data is to show specifically and in detail how the Contractor intends to satisfy the contract requirements. The Contractor shall cross off and initial the statements on preprinted literature which conflict with the contract requirements.

Each submittal shall contain sufficient information and details to permit the Engineer to evaluate the situation. The Engineer will not review submittals that are not sufficient to permit proper evaluation.

Following the review of the submittal data, the Engineer will mark the submittal items 'Accepted', 'Corrections Noted', or 'Rejected'. The Engineer will also mark each item that the Contract must resubmit. The Contractor may proceed with the items marked 'Accepted'. The Contractor shall not proceed with items marked 'Rejected' or 'Corrections Noted' or with items for which resubmission is required, but shall proceed immediately to correct said items and resubmit them for review.

In no case shall installation commence before acceptance of material data by the Engineer. The Contractor shall be liable for materials purchased or work done before such acceptance."

END OF SECTION

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Make the following amendments to said Section:

(I) Amend **107.01 Laws to be Observed** by adding the following after the first paragraph:

"The Contractor shall expose the work to the inspection of the appropriate Federal agency. Such inspection shall not make the Federal Government a party to this contract."

(II) Amend **107.02 Wages and Hours Requirements** as follows:

Amend the first paragraph to read as follows:

"107.02 Wages and Hours Requirements. The Contractor shall at all times observe and comply with all provisions of Chapter 104, HRS, which are emphasized in Attachment I entitled 'Requirements of Chapter 104, HRS Wages and Hours of Employees On Public Work Law', appended hereto and which require, in part, the following:"

Amend **(A) Hours of Labor** by revising the first paragraph to read as follows:

"**(A) Hours of Labor.** No work shall be done over 8 hours in any one day, Saturdays, Sundays, or legal holidays of the State without written consent of the Engineer. If the Engineer gives consent, workers shall receive compensation at a rate of not less than one and a half times the worker's basic hourly rate if the worker works:

(1) over 8 hours in one day;

(2) over 40 hours in one week; or

(3) on Saturdays, Sundays or legal State holidays

plus the cost of fringe benefits according to wage rate schedules issued by the Director of Labor and Industrial Relations."

Amend **(B) Rate of Wages** to read as follows:

"(B) Rate of Wages. The Contractor shall pay:

(1) no less than the prevailing wages, and

(2) no less than the increases to the prevailing wages

to the various classes of laborers and mechanics as published in the wage rate bulletins determined by the Director of the Department of Labor and Industrial Relations (DLIR) for the entire term of the contract. For Federal projects, such wage rate schedule shall be applicable if consistent with Federal law, statutes or regulations.

For bidding purposes, the wage rate schedule established by DLIR five calendar days before the date of bid opening shall be applicable. For Federal-Aid projects, such wage rate schedule shall be applicable if consistent with Federal law, statutes or regulations.

Said wage rate schedule may be obtained from the Contracts Office, Department of Transportation, 869 Punchbowl Street, Honolulu, Hawaii 96813. The Department will include the current State wage rate schedule physically in the contract documents executed by the successful bidder.

The United States Department of Labor and the DLIR have established minimum wage rate schedules for workers. The Contractor shall not pay the workers less than the wages set forth on the applicable schedules.

Flaggers who perform traffic safety duties and no actual construction work on contract subject to the Davis Bacon labor standard provisions shall be considered laborers or mechanics within the meaning of the Davis Bacon Act.

On all Federal-Aid projects, both wage rate schedules shall apply, and the higher rates shall prevail.

The Contractor shall post the schedule of prevailing rates of minimum wages applicable to the work in a prominent and easily accessible place at the project site. The Contractor shall give to each worker employed under the contract a copy of that rates of wages required to be posted at the time of employment.

The following applicable wage rate schedule or schedules shall be appended hereto:"

(III) Delete **107.04 Citizen Labor** in its entirety.

(IV) Amend **107.07 Contractor's Licensing Laws** by revising the third paragraph to read as follows:

"If a Contractor's license is required by law for the performance of the work which is called for in this bid, the bidder and all subcontractors must have the required license before the submission of the bidder's proposal in the case of a

non-federal-aid project, and for federal-aid projects, the bidder must have the required license prior to the award of the project and all subcontractors prior to the start of the subcontracted work."

(V) Amend **107.08 Permits, Licenses, And Taxes** by adding the following paragraph:

"The Contractor shall be responsible in meeting the requirements of the grading, noise, and National Pollutant Discharge Elimination System (NPDES) permits and licenses needed to do its work on a timely basis.

If the Contractor decides to revise its working method that requires grading, noise, and/or NPDES permits, the Contractor shall be responsible in getting the necessary permits and licenses.

Delays in meeting the requirements of the permits and licenses shall not be a cause for time extension or cost increase."

(VI) Delete **107.11 Federal Aid Provisions** in its entirety.

(VII) Amend **107.12 Sanitary, Health, And Safety Provisions** to read as follows:

"**107.12 Sanitary, Health, And Safety Provisions.** The employees shall not work in conditions that are unsanitary, hazardous or dangerous to its health or safety. Provide and maintain sanitary, health and safety provisions for its employees according to the Department and local Boards of Health.

The Contractor is directed to the Federal, State, and County laws, rules, and regulations concerning construction safety and health standards."

(VIII) Amend **107.13 Public Convenience and Safety** to read as follows:

"**107.13 Public Convenience and Safety.** Provide for the safety and convenience of the public and the protection of people and property according to Subsection 104.04 - Maintenance of Traffic."

(IX) Delete **107.14 Barricades and Warning Signs** in its entirety.

(X) Amend **107.15 Use of Explosives or Combustibles** to read as follows:

"**107.15 Use of Explosives.** When the use of explosives or combustibles is necessary, do not endanger life or property including the new work. The Contractor shall be responsible for damages and injuries resulting from the use of explosives.

The storage and use of explosives shall be according to Section 396-9, HRS.

Notify each public utility company working near the work site in writing of its intentions to use explosives. Give 10 working days notice.

Use only electric detonators for blasting. Do not use common fuses."

(XI) Amend **107.17 Protection of Rivers, Streams, Impoundments, Forests and Archeological, Historical, and Burial Site Findings** as follows:

Amend **(B) Pollution** by adding the following after the first paragraph:

"The Contractor shall dispose of hazardous waste material according to local or State regulation or by the manufacturer and instruct the project personnel of these regulations. The Contractor shall be responsible for seeing that these regulations are followed."

(XII) Amend **107.21 Contractor's Responsibility for Utility Property and Services** as follows:

Amend **(B)(5)** to read as follows:

> **"(5)** The Contractor shall obtain an excavation permit two weeks before starting construction for work greater than 12 inches in depth and/or the addition of new sign or guardrail posts. The Contractor shall obtain the permits from HECO's Mapping and Records Division located on the fourth floor at 820 Ward Avenue."

Amend **(D) Notes for Wastewater Management (DWM) Facilities** to read as follows:

> **"(D) Notes for Wastewater Management (DWM) Facilities.**
>
> **(1)** The Contractor shall perform all sewer construction according to the City's specifications, September 1986; the DWM's standard details, September 1984; current city practices and Revised Ordinances of Honolulu, 1990 as amended; and the Design Standards of the DWM, Volume 1, July 1993.
>
> **(2)** The Contractor shall notify the Construction Section, DWM at 527-5820 or 523-4345 to arrange for inspection services and submit four sets of approved construction plans 7 days before commencement of sewer work.
>
> **(3)** The Engineer will show on the plans the underground pipes, cables, or ductlines known to exist from the Engineer's research of

records. The Contractor shall verify the location and depth of the facilities and exercise proper care in excavating the area. The Contractor shall be responsible and shall pay for all damaged utilities.

(4) The Contractor shall be responsible for maintaining continuous sewer service to all affected areas during construction.

(5) The Contractor shall be responsible for any sewage spills caused during construction. The Contractor shall notify the State Department of Health and utilize appropriate sampling and analyzing procedures. The Contractor shall be responsible for all public notification and press releases."

Amend **(E)(2)** by revising the telephone number "547-3575" in the second sentence of the second paragraph to read "594-5575".

(XIII) Add the following:

"**107.25 Contaminated and/or Hazardous Material.** The Contractor shall at all times conduct its operations according to all Federal and State permit requirements concerning the disposal of contaminated or hazardous materials. Permit requirements include those established by the federal regulations administered by the United States Coast Guard and the U.S. Army Corps of Engineers.

The Contractor shall require appropriate permits for all activities associated with or incidental to the Contractor's operations including those on the Project site and in all adjacent areas, waste and disposal areas, borrow and gravel banks, storage areas, haul roads, access roads, detours, field office areas, and any other temporary staging areas. The Contractor shall be responsible for, and hold the State harmless from, any penalties or fines which any authority may assess due to the Contractor's failure to comply with the terms of all applicable permit requirements.

The Contractor shall submit all applications and obtain all permits required for Contract work within the limits shown on the plans or identified elsewhere in the Contract documents.

The Contractor shall submit in writing any request for authorization of activities or methods not specifically called for by the Contract, plans, applications submitted or applicable permits issued for the project. Include a detailed description of the proposed activities and supporting documentation showing that the proposed activities or methods, the justification for those activities and supporting documentation showing that the proposed activity or method will not create risks of damage to the environment. If the Engineer accepts such proposal, the Contractor shall process an application to the

appropriate regulatory agency or agencies for any permit for any permit amendment, modification, revision, or new permit required for the Contractor to carry out the additional activities or implement the changed methods on the project.

The Engineer will not grant any extension of time as a result of the Contractor's request to perform work not authorized as part of the established permit requirements. No such proposed additional activity shall commence nor shall the Contractor implement such changed method until the Engineer accepts the Contractor's request in writing.

The Contractor shall acquire any permits, identification numbers, and approvals required under the Resource Conservation and Recovery Act; Comprehensive Environment Response, Compensation, and Liability Act; or any other applicable Federal, State, or local environment law, for the management and disposal of all contaminated and/or hazardous material known to exist or discovered during construction operations, provided that:

(1) such material is within the construction limits defined in the Contract, and;

(2) such material is not comprised of waste materials generated by the Contractor.

If the Department has defined an area of known or suspected contamination within the project limits, and if contaminated material in that area has not been removed before the start of the project, the Contractor shall arrange for the disposition of such material with an appropriate party.

If the Contractor encounters or exposes any material, not previously known or suspected to be contaminated, but which exhibits abnormal properties which may indicate the presence of hazardous or contaminated material, the Contractor shall cease all operations in the vicinity of the abnormal condition, and notify the Engineer immediately. The presence of barrels, discolored earth, metal, wood, visible fumes or smoke, abnormal odors or excessively hot earth may indicate the presence of hazardous or contaminated material, and shall treat them with extreme caution. The Contractor shall arrange for the proper disposition of the material with an appropriate party.

When the Contractor performs support work incidental to the removal, treatment, or disposal of hazardous or contaminated material, the Engineer will make payment at the unit prices for applicable pay items in the Contract. When the Contract does not include appropriate pay items, the Engineer will make payment according to Subsection 104.03 - Extra Work.

The Contractor shall faithfully observe all security precautions established according to OSHA regulations including all revisions and amendments and shall

not work in any area known to contain or suspected of containing hazardous or contaminated material without prior written acceptance of the Engineer.

The Contractor shall assume sole responsibility for the proper storage, handling, management, and disposal of all regulated materials and wastes associated with the Contractor's operations, including lubricants, antifreeze, engine fluids, paints, and solvents. All costs associated with the Contractor's failure to properly manage such materials according to Federal and State regulations, and all remedial and punitive costs incurred by the Department as a result of such failure will be charged to the Contractor. After properly disposing of such contaminated and/or hazardous material and after the State and/or utility company accepts such disposition in writing, the State and/or utility company will, thereafter, be responsible and liable for the contaminated and/or hazardous material."

(XIV) Amend **107.21 Contractor's Responsibility for Utility Property and Services** by adding the following

> **"(F) Notes for AT&T Facilities.** The Contractor shall notify, in writing, AT&T Fiber Optic Facilities, 96-1408 Waihona Place, Pearl City, Hi 96782 (Telephone 455-1010) at least two weeks before start of construction.

END OF SECTION

Amend Section 108 - Prosecution and Progress to read as follows:

"SECTION 108 - PROSECUTION AND PROGRESS

108.01 Subcontracting. The Contractor shall not subcontract, sell, transfer, assign, or otherwise dispose the contract or any portion thereof, or his/her right, title, or interest in the contract without the written consent of the Director. The Contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age, or disability in the selection or retention of subcontractors, and in the procurement of materials and leases.

Subject to the provisions of Section 103D-302, HRS, the Contractor may subcontract a portion of the work but the Contractor shall remain primarily responsible for the work so subcontracted, provided that the Contractor shall not be permitted to subcontract work to any subcontractor who has been suspended by the State. If requested by the Engineer, the Contractor shall provide a copy of any subcontract to the Engineer within seven calendar days.

The Contractor shall perform with his/her own organization, work amounting to not less than 30 percent of the total contract cost, except that any items designated in the contract as 'specialty items' may be performed by subcontract and the cost of any such specialty items so performed by subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the Contractor with his/her own organization. Where an entire item is subcontracted, the value of work subcontracted will be based on the contract item bid price. When a portion of an item is subcontracted, the value of work subcontracted will be estimated by the Director and be based on the cost of such portion of the contract item.

When any portion of the work which has been subcontracted is not prosecuted in a manner satisfactory to the Director, the Contractor, upon receipt of a written notice thereof, shall immediately remove the subcontractor from the project, and the subcontractor shall not again be employed on the project.

Under Section 103D-302, H.R.S., The Contractor is required to list the names of persons or firms to be engaged by the Contractor as a joint contractor or subcontractor in the performance of the contract. Bids that do not comply with the above requirements may be accepted if acceptance is in the best interest of the State and the value of the work to be performed by the subcontractor or joint contractor is equal to or less than one percent of the total bid amount. When a change in a listed subcontractor is requested by the Contractor, submission of a formal release from the listed subcontractor is required by the State before a substitution will be considered for approval regardless of whether the substitute is another subcontractor or said Contractor.

No subcontract shall in any case release the Contractor of his/her liability under the contract and bonds.

Under Section 103D-302, HRS, the Contractor is required to list the names of persons or firms to be engaged by the Contractor as a subcontractor or joint contractor in the performance of the contract. When a change in a listed subcontractor is requested by the Contractor, submission of a formal release from the listed subcontractor is required by the State before a substitution will be considered for approval regardless of whether the substitute is another subcontractor or the Contractor himself/herself.

The 'Specialty Items' of work for this project are as follows:

Section No.	Description
206	Contract Items under Section - 206 Excavation and Backfill for Conduits and Structures
503	All Contract Items under Section 503 – Concrete Structures
608	All Contract Item under Section 608 - Sidewalks
609	All Contract Items under Section 609 – Curb and/or Gutter
610	All Contract Items under Section 610 – Reinforced Concrete Driveway
621	All Contract Items under Section 621 – Traffic Control Signs
622	All Contract Items under Section 622 - Highway Lighting System
623	All Contract Items under Section 623 - Traffic Signal System
629	All Contract Items under Section 629 - Pavement Markings

108.02 Notice to Proceed (NTP). When the Director accepts the contract, the Department will give a NTP to the Contractor. The Department will show the date that the Contractor expects to begin the work and charge contract time. The date specified in the NTP will be no later than 120 days from the date of award unless there is no execution of contract and no written evidence of ordering the necessary materials/equipment as specified under Subsection 106.13 - Ordering of Certain Material.

The Contractor shall begin work within 10 working days from the specified date. Pursue the work diligently to completion within the contract time allowed. Do not work before the specified date without a written acceptance.

When the Contractor begins work before receiving the NTP, the Department will consider the Contractor doing work at its own volition and risk.

When the Department gives written consent to work before the specified date, the Contractor may begin work, subject to:

(1) assuming the risk that the Department may disapprove the contract,

(2) taking precautions required for public safety,

(3) observing the provisions in the contract before beginning operations,

(4) working as is necessary to leave the project site in a neat condition at no cost to the State, and

(5) restoring the site to its former condition at no cost to the State if the work done affects existing roads or highways.

The Engineer will pay for all acceptable work done before the NTP date when the Department executes the contract.

The Engineer will not allow additional compensation nor an extension of time for delay, hindrance or interference caused by doing the project work before the NTP date except when the same situation would have occurred if the Contractor had begun work after the NTP date.

108.03 Progress Schedules. The Contractor shall submit four sets of its detailed progress schedule along with all the files needed to re-create that time period's progress schedule's plot and reports on a 3-1/2 inch HD floppy disk to the Engineer for review before the date of NTP or 30 calendar days after award of the contract whichever is earlier. The schedule shall account for normal inclement weather, unusual soil or other conditions that may influence the progress of the work, schedules and coordination required by any utility, off or on site fabrications, and all other pertinent factors that relate to progress. The Engineer will review and comment on the submitted progress schedule. The Contractor shall adjust the schedule to address comments made by the Engineer. Submit progress schedules and along with the files on a 3-1/2 inch HD floppy disk to the Engineer for review until the Engineer finds it acceptable. The Engineer will not authorize progress payments until the Engineer acknowledges, in writing, a receipt of a schedule that meets all the requirements of this Subsection.

Upon request, provide two color timescaled Project Evaluation and Review Technique (PERT) charts using the activity box template of Logic – Early Start or any template requested by the Engineer.

All progress schedules submittal shall be a color Time-Scaled Logic Diagram (TSLD). The critical path shall be marked in red. For both the TSPD and PERT chart no blue or black line diagrams will be acceptable. The Engineer will designate the color to be used and the size of the plot and quality of paper for both the TSPD and PERT chart. The critical path is defined as the chain(s) of activities that take the longest time to accomplish completion of the project.

Submittal of and the Engineer's receipt of the progress schedule will not imply the Department's approval of the schedule breakdown, its individual elements, and any critical path that may be shown. Acceptance of the schedule will not be deemed an agreement by the Department that the constructions means, methods and resources shown on the schedule will result in work that conforms to the contract requirements. The Contractor has the risk of all elements (whether or not shown) of the schedule and its execution.

In the event the Contractor submits and the Department receives a schedule, e.g., shorter than the contract time, such will not constitute an agreement to modify the contract time or completion date, nor will the receipt and acceptance of such a schedule incur any obligation by the Department. The Contractor shall be solely responsible for and shall accept all risks and any delays, other than those that can be directly and solely attributed to the Department, that may materialize during the construction work until the contract completion date is reached. The contract time or completion date is established for the benefit of the Department and cannot be changed without an appropriate change order issued by the Department. The Department will not be responsible if the Contractor does not meet its accelerated schedule. Unless the Contractor can prove that the Department is solely responsible for its failure to meet its schedule. The Department will be responsible for or obligated to accept the work before the completion date established by the contract.

After construction starts submit four plotted progress schedules and reports on all construction activities every two weeks (bi-weekly). The bi-weekly submittal shall include an update on new activities and any changes in duration or start or finish dates of any activity. Setting for software shall be such that changes in the activity's start or finish dates shall result in a change in all activites that precedes. Also, submit with every update, in report form, any changes to the progress schedule since the previous schedule submittal. This scheduled bi-weekly submittal shall also include an updated version of the project schedule on a 3-1/2 inch HD floppy disk. The disk shall have all the information needed to re-create that time period's TSLD plot and reports. Non-compliance will be grounds for delaying the processing of the progress payment.

In addition, during the period when there is no acceptable progress schedule the Contractor shall make no claim for additional compensation for delays and waives the right to claim for additional compensation and/or time for that period of time. Progress schedules when submitted after the fact, more than four working days after the required submittal date, will not be considered timely. Therefore, it shall not acceptable as evidence for delays. The Engineer may change the frequency of the submittal requirements but may not require a submittal of the schedule to be more than once a week. The Engineer may decrease the frequency of the submittal of the bi-weekly schedule.

When requested by the Engineer, submit a schedule with supplementary revisions. Submit such changes within four calendar days from the date of request by the Engineer. Non-compliance will be grounds for delaying the processing of the progress payment until the submittal is received.

The Contractor shall meet on a bi-weekly basis with the Engineer to review the progress schedule. The Contractor shall have someone attending the meeting that can answer all questions on the TSLD submitted.

Any float in the project schedule is owned by the project, and as such neither the owner nor the Contractor owns it.

The software used for scheduling shall be the latest version of SureTrak Project Manager by Primavera Systems, Inc. No alternative software will be considered. The Contractor shall provide one independently licensed copy of the most current version of SureTrak Project Manager by Primavera Systems, Inc. to the State for its exclusive use which will become the property of the State at the end of the project. The providing of the SureTrak Project Manager software shall be considered incidental to various items of the contract and no separate payment shall be made.

(A) For Contracts One Million Dollars ($1,000,000) Or Less Or For Contract Time Of 100 Working Days or 140 Calendar Days Or Less. For contracts of less than one million dollars ($1,000,000) or for contract time of 100 working days or 140 calendar days or less, the progress schedule will be a Time Scaled Logic Diagram (TSLD). The Contractor shall submit a TSLD submittal package and it shall meet the following requirements and have these essential and distinctive elements:

(1) the major features of work, such as but not limited to grubbing, roadway excavation, structure excavation, structure construction, BMP installation, shown in the chronological order in which the Contractor proposes to work that feature or work and its location on the project;

(2) all features listed or not listed in the Special Provisions that the Contractor considers a controlling factor for the timely completion of the contract work;

(3) the time span and sequence of the activities or events for each feature, and its interrelationship and interdependencies in time and logic to other features in order to complete the project;

(4) the total anticipated time necessary to complete work required by the contract;

(5) a chronological listing of critical intermediate dates or time periods for features or milestone or phases that can affect timely completion of the project;

(6) major activities related to the location on the project;

(7) non-construction activities, such as submittal and acceptance periods for shop drawings and material, procurement, testing, fabrication, mobilization, and demobilization or order dates of long lead material;

(8) set schedule logic for out of sequence activities to retain logic. Also, open ends shall be non-critical;

(9) show target bars for all activities:

(10) vertical and horizontal sight lines both major and minor shall be used as well as a separator line between groups. The Engineer shall determine frequency and style.

(11) the file name, print date, data and project title and number shall be included in the title block; and

(12) have columns with the appropriate data in them for activity ID, Description, Original Duration, Remaining Duration, Early Start, Early Finish, Total Float, Percent Complete, Resources. The Resource column shall list who is responsible for the work to be done in the activity. These columns shall be to the left of the bar chart.

(B) For Contracts Which Have A Contract Amount More Than One Million Dollars ($1,000,000) Or Having A Contract Time Of More Than 100 Working Days Or 140 Calendar Days. For contracts which have a contract amount more than one million dollars ($1,000,000) or contract time of more than 100 working days or 140 calendar days, the Contractor shall submit a Timed-Scaled Logic Diagram (TSLD) submittal package and it shall meet the following requirements and have these essential and distinctive elements:

(1) have the information and requirements listed in A above;

(2) provide reports and graphics available from the software as requested by the Engineer;

(3) sufficient detail to allow at least weekly monitoring of the Contractor's and subcontractor's operations;

(4) the time scaled schematic shall be on a calendar or working days basis. What will be used shall be determined by how the Contract keeps track of time. It will be the same. Plot the critical calendar dates anticipated. Provide sufficient space for plotting actual calendar dates;

(5) breakdown of activity, such as forming, placing reinforcing steel, concrete pouring and curing, and stripping in concrete construction. Indicate location of work to be done in such detail that it would be easily determined where work would be occurring within approximately 200 feet;

(6) latest start and/or finish dates for critical phasing;

(7) identify responsible subcontractor, supplier, and others for their respective activity;

(8) no individual activity shall have duration of more than 20 calendar days unless requested and approved by the Engineer;

(9) all activities shall have work breakdown structure codes and activity codes. The activity codes shall have coding that incorporates information for phase, location, who is responsible for doing work and type of operation and activity description and

(10) incorporate all physical access and availability restraints.

If the TSLD indicates an early completion of the project the Contractor shall upon submittal of the schedule cooperate with the State in explaining how he will achieve it. In addition, the Contractor shall submit the above explanation in writing which shall include the State's part, if any, in achieving the early completion date. Early completion of the project shall not rely on changes to the Contract Documents unless approved by the Engineer.

Submit an anticipated work completion or payment graph plotting contract time and gross payment anticipated with the initial TSLD submittal and when the Engineer requests an updated graph.

Submit a listing of equipment that is anticipated to be used on the project. Include type, size, make, year of manufacture and all information necessary to

identify the equipment in the Rental Rate Blue Book for Construction Equipment with the initial TSLD submittal.

Submit an anticipated manpower requirement graph plotting contract time and total manpower required. This may be superimposed over the payment graph. Submit with the initial TSLD submittal and when the Engineer requests an updated graph.

Provide a Method Statement for each major activity group or description of work. A major activity is defined as an activity that has a duration longer than 5 days, or a milestone activity or a contract item that exceeds $10,000 for the total amount for that item on the Contract cost proposal or a critical path activity or an activity designated as such by the Engineer. Each Method Statement shall be a detailed narrative describing the work to be done and the method by which the work shall be accomplished. Included as part of each Method Statement shall be the planned quantity and type, make and model of equipment, the manpower to do the work, which shall also include worker classification and the production rate per eight hour day needed to meet the time frame indicated on the schedule. If the production rate varies by more than plus or minus ten percent or if planned equipment or manpower should change for any reason then another Method Statement shall be provided and additional information supplied to substantiate and differentiate it from other like activities.

The Contractor shall not construe receipt of TSLD to assign responsibility of performance or contingencies to the State. Also, receipt of the TSLD does not relieve the Contractor of responsibility to adjust forces, equipment and work schedules in order to meet the contract completion date.

When making TSLD adjustment submittals the Contractor shall show how they intend to make those adjustments and remain on the anticipated schedule and within the contract time.

The Contractor shall begin work according to the submitted TSLD after receiving the NTP. Prosecute the work in the order of the schedule expeditiously. The Engineer may require the Contractor to provide additional work forces and equipment to bring the operation into accordance with the submitted TSLD if failure to proceed as provided in the schedule or prosecution of the work in the current manner does not insure completion within the specified Contract time. This action by the State shall be not considered as a directive for constructive acceleration and therefore will be at no additional cost to the State.

When the Contractor fails to insure completion within the specified time, the Engineer will consider employing an outside work force and equipment. The Engineer will charge the Contractor all cost to do the work including but not limited to, profit, employee benefits and fringes, bonds, taxes, insurance, overhead and depreciation for plant and equipment.

In addition to the bi-weekly schedule meetings the Contractor shall meet once a week with the State to have a general discussion on but not limited to, the progress of the project, potential problems, coordination of work, submittals etc. The personnel attending shall have the ability to make decisions and answer questions.

The Contractor shall bring to weekly meeting a detailed work schedule showing the next three weeks work. The three-week schedule shall show:

1) All construction events, traffic control and BMP related activities and be of such detail that the Engineer will be able to determine at what location and type of work will be done for any day for the next three weeks. This is for the State to use to plan its manpower requirements for that time period;

2) The duration of all events and delays;

3) The critical path on the three-week schedule shall be clearly marked in red or marked in a manner that makes it clearly distinguishable from other paths and is acceptable to the Engineer;

4) The detail of the three-week schedule shall be significantly greater than the one presented in the TSLD. The Engineer will be the sole judge if the amount of detail presented is sufficient;

5) Critical submittals and RFI's that are expected to be needed in the next three weeks shall be listed also;

6) The three-week schedule is in addition to the TSLD and shall in no way be considered as a substitute for the TSLD.

The Contractor shall submit two days ahead of the weekly meeting a list of outstanding submittals or RFIs that will be needed in the near future with a rating of urgency. The status of which will be discussed at the weekly meeting.

In addition to the three-week schedule the Contractor shall submit and be ready to discuss all of their required erosion control inspection reports for the past week.

Full compensation for any additional costs occasioned by compliance with the provisions in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

The Contractor shall have on the work site as its designated agent, a competent superintendent. The superintendent shall be able to read and understand the project plans and specifications and shall be experienced in the type of project being undertaken and the work being performed. The superintendent shall receive instructions from the Engineer or its authorized representative. Authorize the superintendent to:

(a) execute the orders and directions of the Engineer or its authorized representative without delay and

(b) promptly supply such materials, equipment, tools, labor and incidentals as may be required to complete the project within the prescribed contract time.

Furnish a superintendent irrespective of the amount of project work sublet.

108.04 Limitation of Operations. Conduct work with the least interference of traffic. Use care to the location of detours and the provisions for handling traffic. Do not create more work to the prejudice or detriment of work already started. The Engineer may require the Contractor to finish a section before starting work on additional sections if the opening of that section is essential to public convenience.

108.05 Character Of Workers, Methods, And Equipment. Workers shall have sufficient skill and experience to do the assigned work properly. Workers engaged in special or skilled work shall have sufficient experience to do that work properly and satisfactorily. Also, they shall have sufficient experience in the operation of the equipment to do that work properly and satisfactorily.

The Contractor shall remove the workers who do not carry out the assigned work in a proper and skillful manner from the project at the written request of the Engineer. Also, remove the workers who are excessive or disorderly from the project at the written request of the Engineer. Such worker shall not work for two years on Federal-Aid, State, or County projects from the date of departure without the written acceptance of the Department.

If the Contractor fails to remove such worker or fails to furnish suitable and sufficient personnel for the proper prosecution of the work, the Engineer may suspend the work in writing until such orders are complied with.

The Department will consider Contractors using such workers within a period of two years from the date of departure non-responsible.

The Department may declare the Contractor using such workers in material default of the project contract.

Proposed equipment on the work shall be of sufficient size and in such mechanical condition to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on the project shall not injure the roadway, adjacent property, or other highway facilities.

The Contractor may use methods or equipment that will complete the non-prescribed work according to the contract.

If the contract specifies certain methods and equipment for that work, the Contractor shall use such methods and equipment unless the Engineer accepts the Contractor's choice of methods and equipment.

The Contractor shall submit a written request that includes a full description of the methods and equipment that the Contractor is proposing. Also, submit a written request that includes an explanation of the reasons for changing such methods and equipment. If the Engineer grants the request, the request will be on the condition that the Contractor shall be fully responsible for completing the work according to the contract. If the Engineer concludes that the work does not meet contract requirements after trial use of the requested methods or equipment, stop using the requested method or equipment. Complete the remaining work with the specified methods and equipment. Remove and replace the deficient work with work of specified quality or take such other corrective action. The authorized requested methods or equipment will not change the basis of payment for the contract items involved nor the project contract time.

108.06 Temporary Suspension of Work. The Engineer will have the authority to suspend the project in whole or in part for such period as the Engineer may deem necessary. Causes for temporary suspension of work include:

(1) unsuitable weather;

(2) other conditions out of the control of the Contractor which may prevent proper prosecution of the work or;

(3) failure to prosecute or do the work according to the contract;

(4) non-compliance with non-discrimination, Affirmative Action, EEO and wage and hour contract provisions.

The Contractor shall immediately comply with the Engineer's written order to suspend the affected work. Resume the suspended work only upon written NTP from the Engineer.

When the Engineer orders such suspension of project work, the Engineer will assume the cost of eliminating the hazards and inconveniences caused by such suspension according to Subsection 104.03 - Extra Work. The Engineer

may do the work at no cost to the Contractor at the Engineer's option. The Engineer will apply this provision only to the portion of the work suspended.

When the Engineer causes suspension of work and the Engineer chooses not to do the work of eliminating the hazards and inconveniences, the Engineer will pay the Contractor to do the work to such amount as the Engineer may in writing find to be fair, reasonable and auditable. The amount compensated will be the actual cost considered unavoidable by the Engineer. Take immediate steps, after consultation with the Engineer, to minimize costs.

When a contract phase or a controlling item of work is suspended more than two weeks, the Engineer may pay compensation for the following:

(1) direct project overhead costs excluding overhead equipment plus a markup of 10% for profit and indirect general and administrative expenses;

(2) overhead equipment at the Blue Book Rental Rate for actual operating hours;

(3) rental at rate determined by cost divided by expected useful life for major construction materials used temporarily in the construction work when their actual period of use is extended by the suspension;

(4) idle equipment at 40% of the applicable Blue Book Rental Rate without operation costs or equal to the direct cost;

(5) Demobilization and mobilization of workers and equipment as extra work according to Subsection 109.04 - Extra and Force Account (F.A.) Work.

The Contractor shall submit a claim for additional compensation in writing within 20 calendar days of the start of the suspension. Submit the amount of claim and the detailed supporting documents to justify the claim in writing within 60 calendar days after the completion of the suspension period.

Notwithstanding the suspension which may still be in progress, the Engineer may make progress payments for costs incurred under provisions of this section upon submission of cost documentation which the Engineer deems acceptable.

If the Contractor causes the suspension of the work, do the work necessary to eliminate and repair hazards and inconveniences caused by such suspension at no cost to the State. If the Contractor fails to do the work as specified herein, the Department may do such work and the Contractor shall pay the cost and the Engineer will deduct from payments due.

Before the Department assumes the cost of maintenance, the Contractor shall eliminate hazards and inconveniences and repair damages to the work that the Contractor could have done before the suspension. If the Contractor fails to do this work, the Department will do the work and the Contractor shall pay the cost of that work and the Engineer will deduct from payments due or become due.

The Engineer will not charge the Contractor a working day, if:

(1) the Department orders such suspension of project work and

(2) the Contractor is unable to proceed with 60% of its normal labor and equipment force engaged in the current controlling operation for at least five hours on working days.

If a non-controlling item of work does become the current controlling operation, make the time of completion of the work on the current controlling operation.

If the Contractor causes the suspension of the work, the Engineer will consider the days during which the suspension order is in effect to be working days. The Engineer will charge those days as part of completion time.

The Engineer will decide who is responsible for suspensions.

If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Engineer in the administration of this contract, or by the failure of the Engineer to act within the time specified in this contract (or if no time is specified, within reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract necessarily caused by such reasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent:

(1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor; or

(2) for which an adjustment is provided for or excluded under any other provision of this contract.

No claim under this clause shall be allowed:

(1) For any costs incurred more than 20 days before the Contractor shall have notified the Engineer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and

(2) Unless the claim is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract.

Any adjustment in contract price made pursuant to this clause shall be determined according to the price adjustment clause of this contract.

108.07 Determination and Extension of Contract Time. When the contract time is on a working day basis, the Engineer will furnish the Contractor a weekly statement. The Engineer will show the number of days charged to the contract for the preceding week. Also, the Engineer will show the number of days specified for completion of the contract. The Engineer will allow the Contractor one week in which to file a written protest setting forth in what respect said weekly statement is incorrect. If the Contractor does not file a written protest within such time period, the Engineer will assume that the Contractor accepts the statement as correct.

When the contract time is on a calendar day basis, the Engineer will include the number of calendar days stated in the contract. This includes the NTP, Sundays, holidays and non-work days. The Engineer will exclude calendar days elapsing between the orders of the Engineer to suspend work and to resume work for suspensions not the fault of the Contractor.

When the contract completion time is a fixed calendar date, the contract completion time shall be the date when completing work.

The Engineer will determine the completion time allowed as awarded from the original proposal quantities. If the Engineer orders more quantities than those set forth in the proposal, the Engineer will increase the contract time allowed for performance. The Engineer will decide the increase in contract time.

When the Contractor desires an extension of time for delays, the Contractor shall notify the Engineer in writing 7 days before the start of that delay. The Contractor shall then submit to the Engineer within 30 days of that delay a written request for an extension of time. The extension of time shall set forth reasons in support of the request. Claiming insufficient time is not a valid reason for extension of time. If the delayed work was because of conditions beyond its control and without the fault of the Contractor, the Engineer may extend the time for completion. The extended time for completion shall then be in full force and effect the same as though the extended time was the original time for completion.

When the Engineer gives final acceptance or relief of maintenance according to Subsection 105.17 - Acceptance, the daily time charge will cease.

108.08 Liquidated Damages and Failure to Complete on Time. The Contractor shall comply with the contract terms regarding opening lanes to traffic

during the hours specified in Subsection 104.04(B) - Traffic Maintenance Plans. The Engineer will assess liquidated damages of $1,500 for every one-to fifteen-minute increment for each lane not open to the public if the Contractor fails to comply with the requirement. The maximum amount assessed per day shall be $15,000. The Engineer will decide the time and liquidated damages assessed.

The Engineer may consider delays caused by a problem beyond the Contractor's control in opening lane(s) closure on time for not charging liquidated damages. Equipment breakdown is not a cause to waive liquidated damages.

Before closing lane(s), the Contractor shall submit a contingency plan for acceptance by the Engineer which will indicate what steps and efforts the Contractor shall take to open lane(s) to the public on time. The Engineer will not allow lane closures until the Engineer accepts the contingency plan. The Engineer will not make separate payment for work to implement a contingency plan.

The Contractor shall complete the work within the number of working days specified in the contract. The contract will begin officially from the date designated in the NTP. If the contract specifies a calendar date as the date of completion, the Contractor shall complete the work by that date.

Delay in the completion of the work within the required time will inconvenience the public, obstruct traffic and interfere with business.

The Contractor shall pay the amount shown in Table 108-I - Schedule of Liquidated Damages for each working day delayed in the completion of the contract. The Contractor shall not pay by way of a penalty. The Department may deduct the amount from monies due or that may become due under the contract if the Contractor does not pay the liquidated damages. Table 108-I do not include actual cost of engineering, superintendence, inspection, and traveling expenses.

TABLE 108-I - SCHEDULE OF LIQUIDATED DAMAGES

Total Amount Including Extras Set Up On Contract		Liquidated Damage Amount
For More Than	To And Including	Per Working Day
$ 0	$ 25,000	$ 125
$ 25,000	$ 50,000	$ 200
$ 50,000	$ 100,000	$ 260
$ 100,000	$ 500,000	$ 440
$ 500,000	$ 1,000,000	$ 700
$ 1,000,000	$ 2,000,000	$1,000
$ 2,000,000	$ 5,000,000	$1,300
$ 5,000,000	$10,000,000	$2,300

$10,000,000	---	$2,800

The findings of the Director shall be accepted by the parties hereto as final, but any allowance of time and remission of charges shall in no other manner affect the rights or obligations of the parties under this contract, nor be construed to prevent action under Subsection 108.09 - Default and Termination of Contract in case the Contractor fails in the judgment of the Director to make reasonable and satisfactory progress after such allowance of time has been granted. Liquidated damages shall be assessed in the amount set forth in the Schedule of Liquidated Damages or as specified in the proposal.

(a) Liquidated Damages Upon Termination. If the Department so terminates the Contractor's right to proceed, the resulting damage will consist of such liquidated damages for such reasonable time as may be required for final completion of work.

(b) Liquidated Damages In The Absence Of Termination. If the Department does not terminate the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until the work is completed or accepted.

108.09 Default and Termination of Contract.

(A) If the Contractor:

(1) Fails to begin the work under the contract within the time specified in the Notice to Proceed, or

(2) Fails to perform the work with sufficient workers and equipment or with sufficient materials to assure the prompt completion of said work, or

(3) Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

(4) Discontinues the prosecution of the work, or

(5) Fails to resume work which has been discontinued within a reasonable time after notice to do so, or

(6) Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or

(7) Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or

(8) Makes an assignment for the benefit of creditors, or

(9) Fails to comply with 49 CFR Part 26, 'Participation by Disadvantaged Business Enterprises in Department of Transportation Programs', or

(10) For any other cause whatsoever, fails to carry on the work in an acceptable manner,

the Engineer will give notice in writing to the Contractor and its surety of such delay, neglect, or default.

The Department may take the prosecution of the work out of the hands of the Contractor or surety without violating the contract if the Contractor or surety receives written notification from the Engineer of such delay, neglect or default and the Contractor or surety fails to proceed according to the notice to remedy the delay, neglect or default, within a period of 10 days after receipt of said notice. The Department may appropriate or use any or all materials and equipment on the ground as may be suitable and acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods required for the completion of the project according to the contract.

All costs and charges incurred by the Department, together with the cost of completing the work under contract, will be deducted from any monies due or which would or might have become due to the Contractor had the Contractor been allowed to complete the work under the contract. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the surety shall be liable and shall pay to the Department the amount of such excess.

The Department may bar Contractors from bidding and working on construction projects of the Department for two consecutive years from the date of termination. This includes its owners, officers, and managerial and supervisory staff terminated under provisions of this section.

(B) Erroneous Termination For Default. If, after notice of termination of the Contractor's right to proceed under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the contract contains a clause providing termination for convenience of the State, be the same as if the notice of termination had been issued pursuant to such clause.

(C) Additional Rights and Remedies. The rights and remedies of the State provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

(D) Termination For Convenience.

(1) Terminations. The Department may, when the interests of the State so require, terminate this contract in whole or in part, for the convenience of the State. The Department shall give written notice of the termination to the Contractor specifying the part of the contract terminated and when termination becomes effective.

(2) Contractor's Obligations. The Contractor shall incur no further obligations in connection with the terminated work and on the date set in the notice of termination the Contractor shall stop work to the extent specified. The Contractor shall also terminate outstanding orders and subcontracts as they relate to the terminated work. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders connected with the terminated work. The Department may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to the State. The Contractor must still complete the work not terminated by the notice of termination and may incur obligations as necessary to do so.

(3) Right to Construction and Goods. The Department may require the Contractor to transfer title and deliver to the State in the manner and to the extent ordered by the Department:

(a) Any completed constructions; and

(b) The partially completed construction, goods, materials, parts, tools, dies, jigs, fixtures, plans, drawings, information, and contract rights (hereinafter called "construction material") as the Contractor has specifically produced or specially acquired for the performance of the terminated part of this contract.

The Contractor shall protect and preserve property in the possession of the Contractor in which the State has an interest. If the Director does not exercise this right, the Contractor shall use best efforts to sell such construction, goods, and construction materials according to the standards of Section 490:2-706, HRS. This in no way implies that the State has breached the contract by exercise of the termination for convenience clause.

(4) Compensation.

(a) The Contractor shall submit a termination claim specifying the amounts due because of the termination for convenience together with cost or pricing data, submitted to the extent required by Subchapter 15, Chapter 3-122, HAR, bearing on such claim. If the Contractor fails to file a termination claim within one year from the effective date of termination, the Department may pay the Contractor, if at all, an amount set according to Subparagraph 108.09(D)(4)(c)2.

(b) The Department and the Contractor may agree to a settlement provided the Contractor has filed a termination claim supported by cost or pricing data submitted as required and that the settlement does not exceed the total contract price plus settlement costs reduced by payments previously made by the State, the proceeds of any sales of construction, supplies, and construction materials under paragraph 108.09(D)(3) of this clause, and the contract price of the work not terminated.

(c) Absent complete agreement under subparagraph 108.09(D)(4)(b) of this paragraph, the Department shall pay the Contractor the following amounts, provided payments under subparagraph 108.09(D)(4)(b) shall not duplicate payments under this paragraph the total (without duplication of any items) of:

1. The cost of all contract work performed before the effective date of the notice of termination work plus a fair and reasonable profit on such portion of the work (such profit shall not include anticipatory profit or consequential damages) less amounts paid or to be paid for completed portions of such work; provided, however, that if it appears that the Contractor would have sustained a loss if the entire contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss;

2. Costs of settling and paying claims arising from the termination of subcontracts or orders pursuant to paragraph 108.09(D)(2) of this clause. These costs must not include costs paid according to subparagraph 108.09(D)(4)(c)1 of this paragraph;

3. The reasonable settlement costs of the Contractor including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the contract and for the termination and settlement of subcontracts thereunder, together with reasonable storage, transportation, and other costs incurred in connection with the protection or disposition of property allocable to the terminated portion of this contract; and

4. The total sum to be paid the Contractor under this paragraph shall not exceed the total contract price plus the reasonable settlement costs of the Contractor reduced by the amount of any sales of construction supplies, and construction materials under paragraph 108.09(D)(3) of this clause, and the contract price of work not terminated.

(d) Cost claimed, agreed to, or established under subparagraphs 108.09(D)(4)(b) and 108.09(D)(4)(c) of this paragraph shall be according to Chapter 3-123, HAR.

108.10 Emergency and Legally Justifiable Cause for Termination of Contract. The Engineer may end the contract when a national emergency or other reasons beyond the control of the Engineer makes the termination necessary. The Department will give the Contractor a written notice of termination. The Engineer will pay the Contractor for work done and accepted at the contract unit prices or lump sum prices upon termination. The Engineer will reimburse the Contractor for required expenditures in preparing for and moving to and from the project site. Also, the Engineer will reimburse the Contractor for required expenditures not compensated for. The Contractor shall not submit claims for interest or loss of anticipated profits.

The Engineer will purchase the materials from the Contractor at actual cost per receipted bills. The Contractor shall get these material to the worksite at locations designated by the Engineer. The Engineer will inspect and test these materials for acceptance. The Contractor shall not have incorporated these materials in the work yet. Store and maintain these material properly.

END OF SECTION

SECTION 109 - MEASUREMENT AND PAYMENT

Make the following amendments to said Section:

(I) Amend **109.01 Measurement of Quantities** as follows:

Amend the twelfth paragraph by adding the following:

"In lieu of DOA certification, a manufacturer's truck calibration information with an accompanying dip stick calibrated for the truck is acceptable."

Amend the last sentence of the second to the last paragraph to read as follows:

"If the Engineer orders the Contractor to hold the equipment on the job, payment time for the equipment will be 'idle time' and/or 'stand-by time' as defined in Subsections 109.04(F)(9) - Rental Rates For Idle and Stand-By Time."

(II) Amend **109.02 Scope of Payment** by revising the first paragraph to read as follows:

"**109.02 Scope of Payment.** The Contractor shall receive and accept the compensation provided in the contract as full payment for:

(1) Furnishing materials, labor, equipment, tools and incidentals necessary for the completed work;

(2) Doing work contemplated and embraced in the contract;

(3) Loss or damage arising out of the nature of the work, from the action of the elements;

(4) Risks of descriptions connected with the prosecution of the work;

(5) Expenses incurred by the Contractor for the suspension or discontinuance of the work;

(6) Costs arising from claims of infringement of a patent, trademark or copyright;

(7) The completion of the work according to the contract; and

(8) All expenses incurred to restore areas affected by the Contractor's work back to original condition if not specified otherwise."

(III) Amend **109.03 Compensation for Altered Quantities** to read as follows:

109.03 Compensation for Altered Quantities.

(A) Contract Items with Unit Prices. The actual accepted quantities of work may vary from the estimated quantities in the proposal. The Department will not make allowance such as overruns or underruns except as provided in Subsection 104.02 - Alteration of Plans or Type of Work.

Where the altered quantity of such pay item varies more than 15% above or below the estimated quantity stated in this contract, an adjustment in the contract price shall be made upon demand of either party. The adjustment shall be based upon increases or decreases in costs due solely to the altered variation above 115% or below 85% of the estimated quantity. If the altered quantity variation is such as to cause an increase in the time necessary for completion, the Engineer shall, upon receipt of a timely written request or an extension of time, prior to the date of final settlement of the contract, ascertain the facts and make such adjustment for extending the completion date as in the judgement of the Engineer the findings justify.

Price adjustment will be made according to Subsection 104.09 - Price Adjustment.

(B) Contract Items with Lump Sum Price. The actual accepted Lump Sum work may vary from the estimated quantities shown in the proposal. The Contractor shall accept payment in full at the original contract Lump Sum price. The Engineer will not make any adjustment to the lump sum payment due to overruns or underruns in comparison with the estimated quantity shown in the proposal. The Engineer will make additional lump sum payment only if the Engineer specifies an alteration in the work according to Subsection 104.02 – Alteration of Plans or Type of work."

(IV) Amend **109.04 Extra and Force Account Work** to read as follows:

"**109.04 Payment for Additional and Force Account Work.** The Engineer will pay for work done according to Subsections 104.02 - Alterations of Plans or Type of Work and 104.03 - Extra Work at the unit prices or lump sum (L.S.) prices. Also, the Engineer may require the Contractor to do such work on a force account (F.A.) basis. The following provisions shall govern in determining the compensation to be paid to the Contractor for all work done on the F.A. method and the calculation of new unit prices or L.S. prices.

(A) Allowances for Overhead and Profit.

(1) In determining the cost or credit to the Department resulting from a change, the allowances for all overhead, including extended overhead resulting from adjustments to contract time (including home office, branch office and field overhead, and related delay impact costs) and profit combined, shall not exceed the percentages set forth below:

(a) For the Contractor, for any work performed by its own labor forces, 15% of the direct cost;

(b) For each subcontractor involved, for any work performed by its own forces, 15% of the direct cost;

(c) For the Contractor or any subcontractor, for work performed by their subcontractors, 7% of the amount due the performing subcontractor.

(2) Not more than three markup allowance line item additions each of which not exceeding the maximum percentage shown above will be allowed for profit and overhead, regardless of the number of tier subcontractors.

(3) The allowance percentages will be applied to all credits and to the net increase of direct costs where work is added and deleted by the changes.

(4) Allowances for overhead and profit set forth above shall not be used in the Calculation of Contractor or Subcontractor owned equipment costs.

(B) Labor. For all hourly workers, the Contractor will receive the rate of wage including fringe benefits when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed to that type of work.

All markups for overhead and profit shall be added subject to limitations established in Subsection 109.04(A) - Allowances for Overhead and Profit.

No allowance for overtime compensation will be given without the written approval of the Engineer prior to performance of such work.

The Engineer will allow for overtime compensation only if authorized by the Engineer in writing before performance of that work. For authorized overtime, the Engineer will pay 1.5 times the hourly wage rate plus the actual hours of overtime for fringe benefits, and/or as required by collective bargaining agreement.

(C) Insurance and Taxes. The Contractor will receive the projected average and/or actual rate for the required insurance and taxes including property damage, liability, workers' compensation insurance premiums, average tax rate, State unemployment contributions, Federal unemployment taxes, social security and Medicare taxes. The Engineer will add a markup of 6%.

(D) Materials. For materials accepted by the Engineer and used, the Contractor and subcontractor(s) will receive the actual cost of such materials delivered and incorporated into work. The Engineer will include transportation charges and taxes paid by the Contractor if such cost is not reflected in the prices of the materials. The Engineer will add a markup allowed under Subsection 109.04(A) - Allowances for Overhead and Profit.

For stock materials, used and/or incorporated the work, the Contractor shall receive the actual cost as certified by the Contractor to the cost paid by the Contractor. Provide to the satisfaction of the Engineer all data used to calculate the actual cost. The Engineer will include transportation charges and taxes paid by the Contractor if they were not included in the cost of the material. The Engineer will add a markup allowed under Subsection 109.04(A) - Allowances for Overhead and Profit.

(E) Subcontractors. Subcontractor costs shall be the actual costs of the Subcontractor calculated as defined in Subsection 109.04(B) - Labor, Subsection 109.04(C) - Insurance and Taxes, Subsection 109.04(D) - Materials, Subsection 109.04(F) - Equipment, plus a markup allowed under Subsection 109.04(A) - Allowances for Overhead and Profit.

(F) Equipment.

(1) For any machinery or special equipment (other than small tools as herein) owned by the Contractor or subcontractor(s) or a related entity, the use of which has been authorized by the Engineer, the Contractor will be paid at the per-hour rental rates based on the monthly rate divided by 176, established for said machinery or equipment in the then-current edition of the Rental Rate Blue Book for Construction Equipment including the estimated operating cost per hour and regional correction provided therein. The rental rate shall be calculated using the following formula:

Hourly Rental Rate = [(Blue Book Monthly Rate ÷176) X (Regional Adjustment Factor) X (Rate Adjustment Table Factor)] + Hourly Operating Cost

If no rate is listed for a particular kind, type or size of machinery or equipment, then the monthly rental rates and hourly operating costs shall be as agreed upon in writing by the Contractor and the Engineer prior to the use of said machinery or equipment. The hourly rental rate shall be determined as if the agreed upon monthly rate had been obtained from the Blue Book. If there is no agreement, the Engineer will set a rate. The Contractor may

contest the rate pursuant to Section 105.18 - Claims for Adjustment and Disputes.

(2) Rental rates which are higher than those specified in the aforesaid Rental Rate Blue Book publication may be allowed where such higher rates can be justified by job conditions such as work in water and work on lava. Request for such higher rates shall be submitted in writing to the Engineer for approval prior to the use of the machinery or equipment in question. The Contractor is responsible for justifying rental rates that are higher than those specified in the Rental Rate Blue Book. If the Contractor has not justified the request for higher rental rates before the equipment is needed or used, all rental rates for that equipment shall be paid for at the rental rate unadjusted for that job conditions of the work until the higher rental rate is approved by the Engineer. No adjustment will be made to the rental rate of work already done or paid for, unless the requested new rental rates are approved by the Engineer in writing.

(3) The rental rate for trucks not owned by the Contractor or subcontractor(s) or a related entity shall be those as established under the Hawaii State Public Utilities Commission, which will be paid for as a material item pursuant to Subsection 109.04(D) - Materials.

Rental rates for Contractor or subcontractor(s) or a related entity -owned trucks not listed in the Rental Rate Blue Book shall be agreed upon in writing by the Contractor and Engineer prior to the use of said trucks. If there is no agreement, the Engineer will set the rate. The Contractor may contest the rate pursuant to Section 105.18 - Claims for Adjustment and Disputes.

(4) All rental rates for machinery and equipment shall include the cost of fuel, oil lubricants, supplies, small tools, necessary attachments, repairs, maintenance, tire wear, depreciation, storage, and all other incidentals.

For equipment used with more than one attachment, the Engineer will pay only the attachment(s) being used. When the attachment(s) is part of the rental rate listed in the Blue Book, the Engineer will deduct the rental rate of the attachments(s) and replace them with the rental rate of the attachment(s) being used.

(5) All machinery and equipment shall be in good working condition and suitable for the purpose for which the machinery and equipment is to be used.

(6) Individual pieces of equipment or tools having a replacement value of $500 or less, whether or not consumed by use, shall be

considered to be small tools, and included in the allowed markup for overhead and profit, and no separate payment will be made therefor.

(7) The total of all force account rental charges accrued over the duration of the contract for a specific item of equipment will not exceed the replacement cost of that equipment. The Engineer will pay only the hourly operating cost.

The Contractor shall provide the cost of replacement to the Engineer prior to using the equipment. When the Engineer does not agree with or the Contractor does not provide the replacement cost, the Engineer shall set the replacement cost. The Contractor may contest the replacement cost pursuant to Section 105.18 - Claims for Adjustment and Disputes.

(8) Should the item of equipment be rented from an unrelated entity, the rental cost will be treated as a material cost under Subsection 109.04(D) - Materials.

(9) Rental rates for idle and Stand-by Time.

(a) The Contract defines idle time as the time period in which the machinery and/or equipment designated for a specific work is not in use for the work due to reasons beyond the control of the Contractor. The maximum amount of chargeable hours shall be 8 hours per working day.

(b) The Contract defines stand-by time as the time period in which the machinery and equipment are standing by for the specific work day due to reasons beyond the control of the Contractor. The maximum chargeable hours per work day shall not exceed 8 hours (stand-by time plus the time it operated) per working day unless the Engineer authorizes the overtime.

(c) The Engineer will pay, when the requirements of this Section are met, for equipment that is idle and\or on stand-by, 50% of the hourly rental rate excluding the estimated operational cost per hour per working day.

(d) Storage of equipment on the project site for the convenience of the Contractor shall not be paid for. Only when the Contractor complies with the following reporting requirements will the Engineer consider any compensation to the Contractor:

1. Notifies the Engineer in writing that compensation is expected for the individual piece of

equipment located on the project site at the beginning of the idle period and

2. Submits to the Engineer every week on Monday a list of the equipment that is expected to be idle and a list of the equipment that was idle the past week. On this list shall have all information necessary to determine the hourly rental rate and the date and time it became idle. The list shall also have when any maintenance was performed on the equipment during the period the equipment was idle.

(e) Only when the Contractor complies with the reporting requirements will the Engineer consider any compensation to the Contractor.

(10) The Engineer will pay for authorized overtime for each hour over the normal 8 hours shift work day, legal holidays, Saturdays, and Sundays if approved by the Engineer prior to the performance of the work. The Engineer will not pay for additional premium beyond the normal rates used for the equipment.

(11) Transportation and/or Mobilization. The location from which the equipment is to be moved or transported shall be approved by the Engineer.

The cost of transporting the equipment shall not exceed the rates established by the Hawaii State Public Utilities Commission. If such rates are nonexistent, then the Engineer will determine the rates based upon the prevailing rated charged by established haulers within the locale.

(a) Equipment on the Project Site.

(1) The rental time shall be the time the equipment is in operation on the F.A. work. Also, the rental includes the time required to move the equipment to the location of the F.A. work and to return the equipment to the original location or another location requiring the equipment to the original location. When using the equipment at the site of the F.A. work on other than F.A. work, the Engineer will not pay for moving time.

(2) When moving the equipment other than on its own power, the Engineer will allow loading and transporting cost instead of moving time. When using the equipment at the site of the F.A. work on other than F.A. work, the Engineer will pay for

loading and transportation cost only to the site of the F.A. work.

(b) Equipment Not on the Project Site.

(1) The Engineer will confirm the location from which the equipment is to be moved or transported.

(2) When transporting the equipment to the site for exclusive use of F.A. work, the Engineer will pay the cost of mobilizing and transporting the equipment from its original location to the site of the F.A. work. This includes loading and unloading. Also, the Engineer will pay the cost of demobilizing and transporting the equipment back to its original location or another location, whichever cost less.

(3) For self-propelled equipment, the Engineer will pay the cost of moving the equipment by its own power from its original location to the site of the F.A. work. Also, the Engineer will pay the cost of moving the equipment back to its original location or another location, whichever cost less.

(4) When the Contractor desires the return of the equipment to another location, the Engineer will pay the cost of transportation according to the above provisions, provided such payment does not exceed the cost of moving the equipment to the project site.

(5) When using the equipment on the project site in ways other than on F.A. work, the Engineer will pay the cost of transporting the equipment to the jobsite. Returning the equipment shall be at no cost to the State.

(12) Rental.

(a) The Engineer will begin the rental period at the time the equipment is unloaded at the site of work or at the time specified, whichever is later. After that, the Engineer will pay for the equipment for the time actually used unless the equipment is considered idle or on standby by the Engineer according to Subsection 109.04(F)(9).

(b) In the event the equipment must standby due to work being delayed or halted by reason of design, traffic, or other related problems uncontrollable by the Contractor, excluding Saturdays, Sundays and Legal Holidays, unless

the equipment is used to perform work on such days, the Engineer will pay for the rental according to Subsection 109.04(F)(9).

(c) When the equipment goes 'idle' from the event of the previous work day, the Engineer will make the rental rate and rental period under 'idle time' excluding Saturday, Sundays, and legal holidays until the Engineer orders the Contractor to discontinue or demobilize the machinery or equipment. The Engineer will pay for the rental rate according to Subsection 109.04(F)(9).

(d) Any hours of operation in excess of 8 hours in any one day must be approved by the Engineer prior to the performance of such work.

(e) The Engineer will not allow or credit the rental time for any day on which machinery or equipment is inoperative due to its breakdown or cannot work. On such days, the Engineer will pay only for the actual hours, If any, that the machinery or equipment was in operation.

(f) In the event the force account work is completed in less than 8 hours, equipment rental shall nevertheless be paid for a minimum 8 hours only if:

(1) the equipment had been mobilized from a location not on the project site for the specific work the equipment had performed that day and

(2) the equipment had a total rental period charged since its mobilization to the project site of less than 8 hours and the equipment will be removed by the end of the next business day.

(g) For the purpose of determining the rental period the continuous and consecutive days shall be the normal 8-hour shift work day, Monday through Friday excluding legal State of Hawaii holidays. Any work day to be paid less than 8 hours will not be considered as continuous, except for equipment removed from rental for fuel and lubrication.

(h) The Engineer will not pay additional premium beyond the normal rates used for equipment used over 8 hours per day or 40 hours per week or Saturdays or Sundays or Holidays.

(13) Pickup trucks, flatbed trucks, vans, storage trailers, and containers, unless specifically requested by the State for the F.A.

work, shall be considered incidental to the F.A. work and the costs therefor are included in the markup allowed under Section 109.04 (A) - Allowances for Overhead and Profit.

(G) State Excise (Gross Income) Tax and Bond. A sum equal to the current percentage rate for the State excise (Gross Income) tax on the total sum determined in Subsections B, C, D, E, and F, of Subsection 109.04, - Payment for Additional and Force Account Work and any required bond premium shall be added as compensation to the Contractor. The payment for the bond premium not to exceed 1% on the total sum determined in Subsections B, C, D, E, and F of Subsection 109.04 - Payment for Additional and Force Account Work, when applicable.

The compensation as determined in Subsections B, C, D, E, F, and G of Subsection 109.04 - Payment for Additional and Force Account Work shall be deemed to be payment in full for work paid on a F.A. basis or any calculation of new unit prices or L.S. prices.

(H) Records. The Contractor and the Engineer shall compare records of the labor, materials and equipment rentals paid by the F.A. basis at the end of each day. These daily records, if signed by both parties, shall be used as a reference to come to the agreed amount to be paid for work done under the F.A. method. The Contractor shall not be entitled to payment for F.A. records not signed by the Engineer.

(I) Statements. No payment will be made for work on a F.A. basis until the Contractor has submitted to the Engineer triplicate, itemized statements of the cost of such F.A. work detailed as follows:

(1) Laborers - Name, Identification Number (If available), classification, date, daily hours, total hours, rate, and extension for each laborer and foreman and also the amount of fringe benefits payable if any.

(2) Equipment - Designation, year of manufacture, attachments, dates, daily hours, total hours, rate, and extension for each unit of machinery and equipment.

(3) Materials -

a. Quantities of materials, prices and extensions

b. Costs of transporting materials, if such cost is not reflected in the prices of the materials

c. Statements shall be accompanied and supported by legible receipted invoices for all materials used and transportation charges if such cost is not reflected in the

prices of the materials. A detail description of all the material shall accompany the statement so that the Engineer may determine if proper material is on the invoice. However, if materials used on the F.A. work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall submit an affidavit certifying that such materials were taken from stock and that the amount claimed represents the actual cost to the Contractor according to Subsection 109.04(D) - Materials.

(4) Insurance - Cost of property damage, liability and workers' compensation insurance premiums, unemployment insurance contributions, and social security tax according to Subsection 109.04(C) - Insurance and Taxes.

(V) Amend **109.09 Progress Payments** to read as follows:

"**109.09 Progress Payments.** The Engineer will prepare a monthly estimate of the progress of the project based on the items of work done and materials incorporated in the work at the unit prices or lump sum prices set forth in the contract. Progress estimates and payments will be approximate only and shall be subject to correction before or in the final estimate and payment. Monthly shall mean the period between the sixteenth day of the month to the fifteenth day of the succeeding month. The Engineer and the Contractor may agree on a different monthly period.

The Engineer will not make progress payment if the total value of the work done since the last estimate is less than $1,000. If the progress payment includes work from Sections 617 - Planting Soil, 618 - Grassed Surfaces, 619 - Planting and Transplanting and 641 - Hydro-Mulch Seeding, the Engineer will not make progress payment if the total value of the work done since the last estimate is less than $500.

For Federal-Aid Project, the 'Monthly Report of DBE Participation" must be submitted with the progress payment. (A sample of the "Monthly Report of DBE Participation' is in the forms section of the contract.)

(A) Retainage. If the Engineer finds that the Contractor is progressing satisfactorily in completing the project work and:

(1) less than 50 percent of the whole contract cost is complete, the Engineer shall retain 5 percent of the value of the work done until the Engineer makes final payment;

(2) more than 50 percent of the whole contract cost is complete, the Engineer may make the remaining progress payments in full.

(3) After satisfactory completion of work other than landscaping items, the Engineer may adjust the amount of retainage to 15 percent of the landscaping items or 2-1/2 percent of the total contract amount whichever is less. Do not use this subsection if the contract is only landscaping.

(B) Additional Withholding. If the Contractor is progressing unsatisfactorily in completing the project work, the Engineer, upon written notice to the Contractor, may withhold an additional 5 percent of subsequent progress payments.

If the Contractor refuses or fails to comply with the equal employment opportunity, affirmative action, non-discrimination, labor compliance, training, and disadvantaged business enterprise requirements, the Engineer at its sole discretion and upon written notice to the Contractor may withhold the entire or portion of the monthly progress payments.

In accordance with Section 103-32.1, HRS, where a subcontractor has provided evidence to the Contractor that the Subcontractor has obtained:

(1) A valid performance and payment bond for the project that is acceptable to the Contractor and executed by a surety company authorized t do business in this State; or

(2) Any other bond acceptable to the Contractor; or

(3) Any other form of collateral acceptable to the Contractor,

the retention amount withheld by the Contractor from its Subcontractor shall be the same percentage of retainage as that of the Contractor. This section shall apply to all tiers of Subcontractors.

In accordance with Section 103-32.1, HRS where a subcontractor has provided evidence to the Contractor that the subcontractor has obtained:

(1) A valid performance and payment bond for the project that is acceptable to the Contractor and executed by a surety company authorized to do business in this State; or

(2) Any other bond acceptable to the Contractor; or

(3) Any other form of collateral acceptable to the Contractor,

the retention amount withheld by the Contractor from its Subcontractor shall be the same percentage of retainage as that of the Contractor. This section shall apply to all tiers of Subcontractors."

(VI) Amend **109.10 Acceptance and Final Payment** by revising the third paragraph to read as follows:

"The documents required before making final payment are:

(A) For State and Federal Projects.

(1) Consent of the surety to payment of the final estimate and certificate of release from the surety.

(2) Evidence by affidavit that the Contractor fully paid or received the debts resulting from the contract.

(3) Tax clearances from both the Hawaii Department of Taxation and the Internal Revenue Service.

(4) Certificate of release from each subcontractor.

(B) For County Projects.

(1) Tax clearance.

(a) Clearance Certificate (Income Assessment and Audit Division).

(b) Division of Taxation.

(2) Certificate of plumbing inspection, electrical inspection and building occupancy as required.

(3) Make guarantees required by the contract in writing.

(4) Evidence that the Contractor paid or secured claims for persons, firms or corporations who have done work or supplied materials, tools, equipment, machinery or other services.

(5) Certificate of release from each subcontractor.

(6) Certificate of release from surety or bonding company.

(7) Furnish as-built plans according to the contract.

(8) Other documents as required by the contract.

(VII) Add the following Section:

"109.13 Prompt Payment.

(1) In accordance with Section 103-10.5, HRS, any money, other than retainage, paid to a Contractor shall be dispersed to Subcontractors within 10 consecutive calendar days after receipt of the money according to the terms of the subcontract, provided that the Subcontractor has met all the terms and conditions of the subcontract and there are no bona fide disputes, and

(2) Upon final payment to the Contractor, full payment to the Subcontractor, including retainage, shall be made within 10 consecutive calendar days after receipt of the money, provided there are no bona fide disputes over the Subcontractor's performance under the subcontract.

(A) Definition.

(1) Subcontract - Any written agreement between the Contractor and its Subcontractors which contains the conditions under which the Subcontractor is to perform a portion of the work for the Contractor.

(2) Bona Fide Disputes. The following are examples of 'bona fide disputes':

(a) When a Subcontractor delays the project to the extent that liquidated damages may be imposed on the Contractor and the Subcontractor with written justification for such delay;

(b) When work done by a Subcontractor is paid for and later found to be non-conforming or unacceptable and the amount previously paid by the State is deducted from subsequent payment request;

(c) When the Subcontractor fails to promptly correct any and all deficiencies and/or non-conforming work cited by the State; or

(d) When the Subcontractor fails to fulfill any term, condition or requirement of its subcontract.

(B) Filing Of Complaint And Verification Of Its Validity. Complaints by Subcontractors of late or non-payment must be submitted in writing to the Director stating:

(1) the amount past due for work performed and already paid for by the State,

(2) that all the terms, conditions or requirements of its subcontract have been met, and

(3) that no bona fide dispute over its performance exists.

The Director or authorized representative will hear and receive evidence to determine the validity of the complaint and the Director's decision on the matter shall be final.

(C) Follow-Up Action. If the Director or authorized representative determines that the Contractor failed to make payment required under the subcontract to Subcontractor with whom the Contractor has no 'bona fide dispute' within the time period specified above, the Director shall inform the Contractor of the findings and request the Contractor make payment accordingly.

If the Contractor does not act promptly, the Director or authorized representative shall take appropriate action as allowed under this contract and/or refer the matter to the Contractor Licensing Board for appropriate action according to 444-17(15), HRS, regarding the Revocation, Suspension and Renewal of (Contractor) Licenses."

END OF SECTION

Amend **Section 201 - Clearing and Grubbing** to read as follows:

"SECTION 201 - CLEARING AND GRUBBING

201.01 Description. This section is for removing and disposing of vegetative and unwanted material from the right-of-way, easements, road approaches, project and borrow pit sites, and areas designated in the contract. Also, this section includes the preservation of vegetation and objects designated to remain from injury and defacement. The Contractor shall clear and grub before grading.

201.02 Materials. Paint required for cut and scarred surfaces of trees and shrubs selected for retention shall be an acceptable asphaltum base paint prepared especially for tree surgery.

201.03 Construction Requirements.

(A) Clearing and Grubbing. Clear the natural ground of vegetative and unwanted material interfering with the proposed work. Vegetative material include trees, logs, stumps, roots of downed trees, brush, residue of agricultural crops, grass and weeds. Unwanted material includes lumber, trash piles and other loose debris.

The following are the limits for clearing and grubbing:

(1) Highway Construction Area. This includes structures, frontage roads and streets, ramps, approaches, ditches and channels with a bottom width of 12 feet or more, and other constructed accessory roads and connections. Extend such areas to a width of 5 feet outside excavation and embankment slope lines. When slopes require rounding, extend the areas to the outside limits of slope rounding.

(2) Ditches And Channels With A Bottom Width Of Less Than 12 Feet. Such areas shall extend to a width of 2 feet outside the slope lines.

(3) Material sites within the right-of-way.

(4) Areas enclosed by interchange loops and ramps.

Grub the area below the natural ground surface within the limits specified above of vegetative and unwanted material interfering with the proposed work. The Engineer will not allow unsuitable materials to remain in or under embankments and dikes except those shown in this section.

When authorized, cut the undisturbed stumps and roots and nonperishable solid objects not more than 6 inches above the existing

ground. The Engineer will not require grubbing of the remaining stumps and large roots.

The undisturbed stumps and roots and non-degradable solid objects shall be a minimum of 3 feet below subgrade or slope of embankments. Exceptions are locations where constructing a structure, driving piles, excavating subdrainage trenches and removing unsuitable material.

Backfill stump holes and other holes with suitable material and compact according to Subsection 203.03(C) - Embankment Construction except in areas to be excavated.

Protect trees and shrubbery that are to remain from injury at no cost to the State. Cut the trees to be removed without injuring the trees and shrubbery that are to remain.

Cut off low hanging branches of trees extending over the roadway within 20 feet of finished grade close to the boles. Also, in removing such branches, remove other branches to present the tree with a balanced appearance. Treat cuts and scars with a heavy coat of acceptable tree paint.

The total area that the Contractor may expose shall not exceed the limits of Section 209 - Erosion Control.

(B) Removal and Disposal of Material. Dispose the material removed at an authorized land disposal site.

The Contractor may reduce degradable material to chips of a maximum thickness of 0.25 inch and may dispose the chips in areas enclosed by interchange loops and ramps or between the slope lines and right-of-way lines. Distribute the chips uniformly on the ground surface. Also, mix the chips with the underlying earth so that the chips do not support combustion.

Leave the roadway and adjacent areas with a neat and finished appearance. Dispose slashings, inflammable material, and other debris. The Engineer will not allow open burning of material.

201.04 Method of Measurement. The Engineer will not measure clearing and grubbing including removing large trees for payment.

201.05 Basis of Payment. The Engineer will not pay for clearing and grubbing including removing large trees separately. The Engineer will consider the cost for clearing and grubbing as included in the contract price of the various contract items.

The cost includes full compensation for watering, disposal of material, and furnishing equipment, tools, labor, materials, and incidentals necessary to complete the work."

END OF SECTION

Amend **SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS** to read as follows:

"SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS

202.01 Description. This section is for the removal and disposal of buildings, fences, structures, old pavements, abandoned pipelines, and other obstructions designated or not permitted to remain; salvaging of designated materials and backfilling the resulting trenches, holes, and pits; and rearranging of utility and non-highway facilities, existing highway improvements, and portland cement concrete to remain. Rearrangement includes installation, relocation, alteration, salvaging, removing and disposing of structures and obstructions.

When the proposal does not include pay items for this section, conduct that work under Section 203 - Excavation and Embankment.

202.02 Materials. None specified.

202.03 Construction Requirements. The Contractor shall exercise every precaution to preserve and protect structures, fences, and utilities to remain or removed by others according to Subsections:

(1) 107.16 - Protection and Restoration of Property and Landscape,

(2) 107.20 - Contractor's Responsibility for Work, and

(3) 107.21 - Contractor's Responsibility for Utility Property and Services.

(A) Obstructions. Remove obstructions that interfere with construction according to the contract including

(1) signs, posts, raised bars, guardrails, and structures placed for the information, safety, direction, or control of traffic;

(2) monuments, fences, and headers;

(3) curb and gutter, drainage and sewerage structures except those constructed of portland cement concrete;

(B) Removal Methods. Obliterate existing roads that are not to remain in place. Obliteration includes rooting, plowing, pulverizing or scarifying to a minimum depth of 6 inches or to the bottom of the underlying base,

whichever is less. Place an earth cover of not less than 6 inches in thickness. Submit an earth cover for acceptance.

Break up bituminous material into pieces not larger than 4 inches in greatest dimension. Mix the bituminous material with an equal quantity of underlying material. Shape the ground to provide a presentable and well-drained area.

Backfill trenches, holes, depressions and pits left by the removal of the obstruction with embankment material.

Remove abandoned utility lines, such as pipes and conduits, within the roadbed area to a depth of at least 24 inches below finished grade.

Seal the pipes that the contract calls to abandon with:

(1) a tight-fitting plug,

(2) a wall of Class A or Class B concrete not less than 6 inches thick, or

(3) a brick wall not less than 8 inches thick with cement mortar joints.

Demolish abandoned manholes to an elevation three feet below finished grade. Also, backfill the abandoned manholes as required by the contract. Salvage the manhole frame and cover according to Section 604 - Storm Drain Manholes, Drop Inlets and Catch Basins.

(C) Disposal. Dispose of the materials according to Subsection 201.03(B) - Removal and Disposal of Material.

(D) Removal of Concrete. Remove existing concrete slabs, foundations, and old pavements within the roadbed areas to a depth of at least three feet below finished grade.

Cut portions of concrete curbs, gutters, sidewalks, aprons, driveways and pavements to remain to a depth of one and a half inches with a power-drive abrasive saw. The saw cut shall be neat and true with no shattering or spilling of the portion of concrete remaining in place or joining with the new work.

Remove the concrete without damaging the concrete that is to remain in place. Repair damages at no cost to the State.

Clean the existing reinforcement thoroughly that is to be incorporated in the new work material before embedding reinforcement in new concrete

at no cost to the State.

The Contractor may break the removed concrete into pieces not larger than two feet in greatest dimension. Also, the Contractor may bury the removed concrete in adjacent embankments at a depth of not less than three feet below finished grade. Do not bury the removed concrete in areas where the contract calls for driving piles. Also, do not bury the removed concrete within 10 feet of trees, pipelines, poles, buildings or other permanent objects or structures. Submit in writing for acceptance by the Engineer the manner the removed concrete may be disposed of and at such locations. When the Contractor chooses to dispose of that material outside the highway right-of-way, make such disposal according to Subsection 201.03(B) - Removal and Disposal of Material.

Remove and dispose of reinforcing or other steel encountered in concrete according to Subsection 201.03(B) - Removal and Disposal of Material.

Break the concrete pavements and similar slabs upon which embankments are to be constructed into pieces not larger than two feet in greatest dimension. Leave them in place, provided the depth of the pieces shall be not less than three feet below finished grade.

(E) Removal of Bridges. Removal of bridges includes removing, salvaging, reconstructing and disposing of the entire or portions of the structures. Bridges may be constructed of timber, structural steel, or reinforced concrete.

Conduct partial removal operations causing the least interference to public traffic. Do not start complete removal operations until public traffic is no longer routed over the structure to be removed.

Carefully remove materials that the contract calls to salvage. Stockpile the salvaged material near the site as designated. Mark the steel members so they may be matched later. Carefully remove timber members and deliver them to a designated baseyard as specified by the Engineer.

When damaging or destroying the salvaged or used materials in the reconstructed work, repair or replace that material at no cost to the State.

When the contract does not call to salvage the materials, remove and dispose the materials according to Section 201 - Clearing and Grubbing.

Remove pilings, piers, abutments and pedestals to at least 12 inches

below ground line.

The Contractor may dispose broken concrete in adjacent embankments according to Subsection 202.03(D) - Removal of Concrete.

When the contract calls for removing portions of a bridge, conduct the work without damage to the portion that is to remain in place.

The Contractor shall protect from damage and thoroughly clean adhering material from the existing reinforcement incorporated in the new work before embedding in fresh concrete.

202.04 Method of Measurement. The Engineer will not measure the removal of structures and obstructions for payment.

202.05 Basis of Payment. The Engineer will not pay for the accepted removal of structures and obstruction separately. The Engineer will consider the cost for removing and disposing structures and obstructions as included in the contract price of the various contract items.

The cost is for removing and disposing of that item; excavating; backfilling; salvaging of materials removed including their custody, preservation, and storing on the right-of-way; and furnishing equipment, tools, labor, materials, and incidentals necessary to complete the work.

END OF SECTION

Amend **Section 203 - Excavation and Embankment** to read as follows:

"SECTION 203 - EXCAVATION AND EMBANKMENT

203.01 Description. This section is for roadway excavation, borrow excavation, embankment construction, and disposal of unsuitable or surplus excavated material.

(A) Roadway Excavation. Roadway excavation includes the use or disposal of materials of whatever character encountered in the work. Use the suitable material removed from excavation in the formation of embankment, subgrade, shoulders, slopes, bedding, and backfill for structures, and for other purposes shown on the plans or as specified by the Engineer.

(B) Borrow Excavation. Borrow excavation includes using material obtained from acceptable sources outside of the highway rights-of-way for the construction of embankments or for other portions of the work.

(C) Embankment Construction. Embankment construction includes:

(1) preparing the embankment area;

(2) constructing dikes within or outside the right-of-way;

(3) placing and compacting acceptable material within the project area where unsuitable material were removed; and

(4) placing and compacting of embankment material in holes, pits and other depressions within the project area.

203.02 Materials. None specified.

203.03 Construction Requirements. Clear and grub all areas requiring excavation, grading, and embankment according to Section 201 - Clearing and Grubbing. Excavate and embank roadways, intersections and entrances to a smooth and uniform surface. Excavate so as not to disturb the material outside the limits of slopes.

(A) Excavation.

(1) General. Obliterate old roadways according to Section 202 - Removal of Structures and Obstructions.

When encountering remains of prehistoric people's dwelling sites or artifacts of historical or archaeological significance, refer to Subsection 107.17(D) - Archaeological, Historic, and Burial Site Findings.

The Engineer will not allow blasting.

(2) Widening or Flattening and Steepening Cut Slopes. The Contractor may widen or flatten the planned cut slopes to obtain material required:

(a) for embankment construction;

(b) to preclude the opening of unsightly borrow pits;

(c) to increase the stability of cut slopes; or

(d) when specified by the Engineer.

The Contractor may submit the necessary data to steepen the cut slopes for acceptance by the Engineer, if:

(a) the material can stand at a slope steeper than shown in the contract and

(b) the Contractor does not need the planned material for roadway construction.

(3) Cut Slopes. Round the tops and ends of cut slopes according to the contract or as specified by the Engineer.

Finish cut slopes that are flatter than half horizontal to one vertical (0.5H:1V) true and straight according to the lines and grades of slope shown in the contract.

Finish cut slopes that are half horizontal to one vertical (0.5H:1V) or steeper and slopes in rock excavation in a rough condition with debris and loose material removed. When completed, the average plane of excavation slopes shall conform to the slopes shown on the plans. No points shall vary from the planned slopes by more than 6 inches measured at right angle to the slope.

(4) Maintaining Slopes. The above provisions do not relieve the Contractor of maintaining slopes true and smooth or requiring the

redesign of a sound slope.

(B) Excavated Material.

(1) Selected Material. Selected material is suitable excavated material from areas within the highway right-of-way.

Use the selected material:

(a) for finishing the top portion of the roadbed,

(b) for constructing roadbed shoulders,

(c) for structure backfill,

(d) for constructing berms,

(e) for erosion control,

(f) for landscaping,

(g) for other uses according to the plans, or

(h) as specified by the Engineer.

Place selected material on the roadbed according to Subsection 203.03(c) - Embankment Construction and selected topsoil for erosion control according to Section 209 - Erosion Control.

The selected material shall remain in place until the Contractor can haul, place, and compact it in final position. The Contractor may stockpile the material at specified locations for later placement in final position only if it is according to the contract. The stockpile locations shall be determined by the Contractor and accepted by the Engineer. The Engineer will not allow additional compensation for any delay or inconvenience in excavation caused by stockpiling the material.

The Engineer will not consider selected topsoil placed in windrows along the tops of roadway slopes for erosion control work as stockpiled material.

(2) Borrow Material. Borrow material shall conform to the size and quality requirements specified in the contract. When the contract does not specify size or quality, the material shall be of a quality suitable for the purpose intended. The sand equivalent (SE)

value as determined by AASHTO T 176 for the top three feet of the embankment, excluding the pavement structure, shall not be less than the filled area and less than two.

Arrange to obtain borrow material and pay the costs involved. Notify the Engineer 20 working days before opening borrow areas. Allow sufficient time for testing the borrow by the Engineer.

Control of borrow material shall be according to Section 106 - Control of Materials.

Do not excavate beyond the dimensions and elevations established for the borrow pit. Do not remove the borrow material until after the Engineer completes the staking out and cross sectioning of the site. Establish and specify the finished borrow areas approximately true to line and grade. Complete the finished borrow areas so no water may collect or stand therein. Blade and leave borrow areas in shape as to permit accurate measurements after completing the excavation.

Do not place borrow material until after placing the selected material in fill. When there is more borrow material than is required, the Engineer will deduct the excess quantity from the borrow volume as measured in the borrow area.

When necessary to remove an existing fence, replace it to as good condition as the existing fence. The Contractor shall be responsible for the confinement of livestock when removing part of the fence. Provide and maintain temporary fencing, when required for security purpose, at no cost to the State. Furnish and install permanent fencing after the temporary fence is no longer needed at no cost to the State.

(3) Surplus Selected Material. Use surplus excavated material to uniformly widen the embankments, flatten the slopes, or dispose along the locations specified by the Engineer. Do not dispose surplus material above the grade of the adjacent roadbed. Complete the embankments before arranging the disposal of surplus excavation. Do not dispose material unless authorized by the Engineer.

The quantity of surplus material, when shown, is only approximate. When disposing the surplus excavated material prematurely, replace the shortage of material at no cost to the State.

Unused surplus excavated material shall become the Contractor's property. Level or free the disposal area from depressions and humps upon completion of disposal operations.

(4) Unsuitable Material. Where excavation to the finished grade results in a subgrade or slopes of unsuitable soil, the Engineer will require:

(a) removing of the unsuitable material and

(b) backfilling to the finished grade with acceptable material according to Subsection 203.03(c) - Embankment Construction.

The Engineer may designate as unsuitable those soils that cannot be properly compacted in embankment. Unsuitable material may include vegetable matter, garbage and junk piles, on the surface or buried. Unsuitable material shall become the property of the Contractor.

Conduct the operations so that the Engineer can take the necessary cross-sectional measurement before placing the backfill.

When the relative compaction of the original ground is less than the compaction shown in Subsection 203.03(C)(2)- Compaction of Embankment with Moisture and Density Control and Subsection 203.03(C)(3) - Compaction of Embankment without Moisture and Density Control, compact the upper 6 inches of the exposed original ground according to the contract.

(5) Highly Sensitive Soil. When soil, having a high moisture content, loses its stability and becomes plastic or muddy, the Engineer will allow such equipment and methods in excavating the material that will result in the least possible manipulation or churning of this material. The Engineer will not permit cable operated scrapers of the Sauerman type.

(C) Embankment Construction.

(1) General. Use only acceptable material in the construction of embankments. Do not place rocks, broken concrete, or other solid materials in embankment areas where driving piles.

When:

(a) placing and compacting material for embankment on hillsides and existing embankments, or

(b) building embankment half width at a time,

the Contractor shall continuously bench the slopes that are steeper than four horizontal to one vertical (4H:1V) while bringing the work up in layers.

Benching shall be of sufficient width to permit construction equipment to operate. Begin each horizontal cut at the intersection of the original ground and the vertical sides of the previous cuts. Recompact the material thus cut along the new embankment material at no cost to the State unless the width of excavation required exceeds 6 feet. The Engineer will measure and pay the excavated material over 6 feet as roadway excavation.

When placing and compacting the embankment and the Engineer permits end dumping, plow or cut into the slope of the original ground or embankment before starting the end dumping. The Engineer will permit end dumping until the width of the embankment, including benching, becomes great enough to permit the use of compacting equipment. Place the remainder of the embankment in layers and compact as specified.

When embankments across low swampy ground cannot support the weight of trucks or other hauling equipment, the Contractor may construct the lower part of the fill by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the vehicle placing the layers. Construct the remainder of the embankment as specified.

When depositing embankment material on only one side of abutments, wingwalls, piers, or culvert headwalls, do not overcompact the area next to the structure. Do not place the fill next to the end bent of a bridge higher than the bottom of the backwall of the bent until after the superstructure is in place. Conduct operations so that the embankment is at approximately the same elevation on both sides of the structure when placing embankment material on both sides of a structure.

Finish the slope embankment true and straight from the shoulder line in conformity with the lines and grades established. Finish the slopes below an elevation 4 feet below the shoulder line to the approximate lines and grades established so that the slopes

contain no unsightly or undue irregularities.

The Contractor may place excess material outside the embankment slopes and within the right-of-way provided the Engineer accepts such material and its location. Place the material to maintain a distance below the finished shoulder elevation. The Engineer will consider not placing excess material as specified above as surplus material. Refer to Subsection 203.03(B)(3) - Surplus Selected Material.

Place embankment material in horizontal layers not exceeding 8 inches in loose thickness. Compact as specified before placing the next layer. Spread each lift to get uniform thickness before compacting. Level and manipulate continuously to assure uniform density as the compaction of each layer progresses. Add or remove water to get the required density. Route construction equipment uniformly over the entire surface of each layer.

When embankment material:

(a) consists predominantly of rock fragments, hardpan or cemented gravel that cannot be broken readily and

(b) includes 25% or more of materials larger than 6 inches in greatest dimension,

the Contractor may place such material in the embankment in layers not exceeding three feet and shall uniformly distribute such material throughout the embankment. Do not construct the lifts above an elevation two and a half feet below the finished grade. Compose the balance of the embankment of suitable material smoothed and placed in layers not exceeding 8 inches in loose thickness. Compact as specified for embankments.

While depositing the embankment material to fill the interstices, place sufficient earth or other fine material around the large material. Produce a dense compact embankment. When earth or other fine material to fill the interstices is not available in excavation, the furnishing of such material shall be at no cost to the State.

Processing of embankment material to reduce maximum size of particles so that the Contractor can place the material in the specified lifts shall be at no cost to the State.

Whenever possible, deposit embankment material having an SE value of less than 10 in the lower portions of embankments. Do not place such material within three feet of planned finished grade. Break up clods or hard lumps of earth over 6 inches in greatest dimension before compacting material in embankment except as provided above.

Construct the center of embankment layers higher than the sides. Construct sidehill embankments with the intersection with original ground as the high point of the layer. Uniformly slope the embankment to the outer side. Do not exceed the cross fall of layers one foot in 20 feet.

Caves are often present in lava formations. The Engineer will decide if the caves are too close to the road surface. If too close, the Contractor shall open their tops. Fill and compact the cave and the hole formed in the top as required.

Until the Engineer makes final acceptance of the contract, the Contractor shall be responsible for the stability of the constructed embankments. Maintain the embankments to the grade and cross section shown in the contract. Replace portions that become displaced or damaged at no cost to the State.

The Engineer will consider shutting down the operation during heavy rain.

(2) Compaction of Embankment With Moisture And Density Control. When the original ground surface in embankment sections is within three feet of the finished profile grade, the original ground contained in the prism within three feet of the finished grade and within the width of the traveled way plus three feet on each side, shall have a relative compaction of 95% or more.

When the original ground within the three feet depth does not conform to the compaction requirements specified, the Contractor shall excavate the material.

When the next 6 inches of material below this excavation does not have a relative compaction of at least 90%, compact the material until 90% or more relative compaction is attained. After compacting the lower 6 inches to a relative compaction of 90%, backfill the excavated material or other material designated in the excavated area. Place the backfill material in layers not exceeding 8 inches in loose thickness before compaction. Compact each layer to a

relative compaction of 95% or more.

Construct embankments in layers not to exceed 8 inches in loose thickness except as specified in Subsection 203.03(D)(3) - Compaction of Embankment Without Moisture and Density Control. Compact each layer within three feet of finished grade to 95% or more relative compaction. Compact material below a plane three feet below the finished grade to 90% or more relative compaction.

When the above conflicts with Subsection 203.03(D) - Subgrade Preparation, the requirements of that subsection shall apply.

Test methods to determine maximum densities and relative compaction shall be according to Subsection 106.03 - Samples, Tests, Cited Specifications.

When the Contractor cannot reduce the natural moisture content of the excavated material from the roadway sufficiently to obtain a relative compaction of 90% of maximum dry density, obtain a compaction equivalent to 100% of the dry density of that material at the equivalent moisture content. Use the wet method of sample preparation (Hawaii Test Method 5) in figuring out the maximum dry unit mass according to Section 106.09(A)(1) - Maximum Dry Unit Mass. Moisture increase due to rain and other external conditions or causes are not acceptable reasons for using this method in determining relative compaction.

Do not apply density requirements to the portions of embankments constructed which the Engineer cannot test according to the methods specified.

(3) Compaction Of Embankment Without Moisture And Density Control. Deposit embankment materials in layers not exceeding 8 inches in loose thickness before compaction except rock fills and the first layer of fills over swampy ground.

Compact rock embankments to the maximum compaction obtainable by routing the loaded hauling equipment over the entire width of the layer, supplemented by using acceptable rollers. Do not use rollers equipped with tamping studs or tamping rollers to compact rock fills.

Keep dumping and rolling areas separately. Do not cover the lift by another until securing compaction according to this subsection.

(4) Proof Rolling. When specified, the Contractor shall proof roll. The Engineer will pay according to the methods and equipment set forth.

(D) Subgrade Preparation. Subgrade preparation includes preparing the subgrade to the required density, cross section and grade.

(1) General. Prepare the subgrade after compacting the earthwork and completing and backfilling drainage facilities and structures. Compact the subgrade by power rollers equipped with smooth steel-tired wheels.

When choosing to remove rocks or lumps including filling of voids with acceptable materials, the Contractor may do such work at no cost to the State. The material shall conform to the requirements of the specified material to be placed on the subgrade.

(2) Density Requirement. The finished subgrade immediately before placing of subsequent material thereon shall have a relative compaction of 95% or more for a depth of 6 inches.

(3) Surface Tolerances of Subgrade. The finished subgrade upon which the subbase course is placed shall not vary more than 0.10 foot above or below the theoretical grade.

The finished subgrade upon which the base course is placed shall not vary more than 0.05 foot above or below the planned grade.

The finished subgrade upon which the final wearing surface is placed shall not vary more than 0.04 foot above or below the planned grade. Reshape, water, and recompact the subgrade that does not conform to the specified tolerances at no cost to the State.

When the Engineer pays the subbase or base course on a cubic yard basis, the Contractor may waive the lower finish surface tolerance if acceptable by the Engineer.

203.04 Method of Measurement.

(A) Roadway Excavation. The Engineer will measure roadway excavation per cubic yard.

The Engineer will compute the quantities of roadway excavation by the average end area method and centerline distances. The Engineer will not apply correction for curvature to the quantities within the roadway prism shown on the cross sections. The Engineer will make correction for curvature having a centerline radius of 1,000 feet or less in computing excavation quantities from outside the roadway prism where using the

roadway centerline as a base.

When the Engineer cannot measure the roadway excavation quantities by the average end area method due to the nature of a particular operation or changed conditions, the Engineer will determine the method to get an accurate quantity estimate.

The Engineer will not measure for payment excavation that is more than the planned or authorized cross section except as provided in Subsections 203.03(A)(4) - Potential Slide Area, 203.03(A)(2) - Widening or Flattening and Steepening Cut Slopes, and 203.03(B)(3) - Surplus Selected Material. Backfill and compact unauthorized excavated areas to the original ground elevation at no cost to the State.

The Engineer will not measure stockpiling of selected material for payment.

(B) Borrow Excavation. The Engineer will measure borrow excavation per cubic yard.

The Engineer will measure borrow material on a volume basis in excavation. The Engineer will compute by the average end area method from measurement taken before and after removal of the material at the borrow site. The Engineer will deduct material excavated at the borrow site and not incorporated into the work from the computed volume of excavation. The Engineer will not pay for the deducted material.

The Engineer will include binder material entering and becoming a part of the borrow excavation material placed on the roadbed in the pay quantities of borrow material.

The Engineer will determine the quantities of materials to be paid for by the cubic yard by converting the weight measurement to volume as provided in Subsection 109.01 - Measurement of Quantities. When the Engineer cannot exercise the control of measurements of pits as supplying the materials, the Engineer will decide the weight-volume ratio from the material in its natural state. The Engineer will use the maximum dry density of the material obtained by the method specified in Subsection 106.09(A)(1) - Maximum Dry Unit Weight when the Engineer cannot determine the weight-volume ratio of the material in its natural state.

When selecting the borrow pit, the Contractor shall be responsible for the weighing of the material loads.

When the Contractor chooses to use pits other than those designated, the Engineer will estimate the difference in the swell and shrinkage factors involved. When these factors increase or decrease by more than two

percentage points, the Engineer will apply a suitable correction to the measured quantities taken from the pit when calculating pay quantities.

(C) Overhaul. The Engineer will measure overhaul according to Section 205 - Overhaul.

(D) Embankment. The Engineer will not measure embankment for payment.

203.05 Basis of Payment.

(A) Roadway Excavation. The Engineer will pay for the accepted roadway excavation at the contract unit price per cubic yard.

The price includes full compensation for obliterating old roadways; preparing the subgrade; placing selected material in final position; disposing surplus excavation material; rounding of slopes; using water for compaction; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for stockpiling selected material or subsequently placing it in final position. The Engineer will consider payment for this work to be included in the contract unit price for roadway excavation.

The Engineer will pay for removing and disposing of slide material as roadway excavation:

(1) that slides from outside the planned roadway slopes and into the planned roadway prism, and

(2) the removal and disposal of unstable material in natural position outside the planned roadway slopes.

The Engineer will consider full compensation to be included in the contract price for roadway excavation within the authorized lines and elevations for removing and disposing of material that may come into excavations for structures and drainage facilities.

The Engineer will not include slide material quantities that slide across the roadway prism in the roadway excavation quantities unless the Contractor rehandles and reuses the material. The Engineer will only pay for the quantities rehandled.

When choosing to remove the rocks and lumps or break up hardened material and the contract specifies the source of the selected material, such work shall be at no cost to the State. When the contract does not specify the source of the selected material, the Engineer will pay this work as extra work as specified in Subsection 104.03 - Extra Work.

When specified, the Engineer will pay for:

(1) removing of the unsuitable material below the subgrade and
(2) backfilling and compacting to the finished grade with acceptable material.

The Engineer will pay the following excavation for unlined gutters as roadway excavation:

(1) within the median area of a divided highway; and
(2) between the roadbed shoulder and an adjacent cut slope.

(B) Borrow Excavation. The Engineer will pay for the accepted borrow excavation at the contract unit price per cubic yard complete in place.

The price includes full compensation for staking out and cross sectioning the site; establishing the borrow area; providing, replacing, and maintaining temporary and permanent fencing; confining livestock; watering; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for selected material from ditch and channel or structure excavations, when used, instead of borrow.

(C) Overhaul. The Engineer will pay for overhaul according to Section 205 - Overhaul.

(D) Embankment. The Engineer will not pay for embankments separately. The Engineer will consider the cost for constructing embankments included in the contract price for roadway excavation or borrow excavation.

The price includes full compensation for drying embankment material; constructing earth dikes for roadway protection within or outside the highway right-of-way; placing and compacting acceptable material within the roadway area where the Contractor removed unsuitable fill foundation material; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	Pay Unit
Roadway Excavation	Cubic Yard
Roadway Excavation for Temporary Pavement	Cubic Yard
Borrow Excavation	Cubic Yard"

END OF SECTION

Amend **Section 206 - Excavation and Backfill for Conduits and Structures** to read as follows:

"SECTION 206 - EXCAVATION AND BACKFILL FOR CONDUITS AND STRUCTURES

206.01 Description. This section is for:

(1) excavation to the depth and lines established for the foundations of bridges, and other structures;

(2) excavation and backfilling trenches for culverts, structural plate culverts, utility pipes (including water and sewer lines), concrete and cement rubble masonry headwalls, grouted rubble paving, hand-laid and dumped riprap;

(3) other excavation specifically designated in the contract as structure excavation;

(4) backfilling according to this section and Section 624 - Water System and Section 625 - Sewer System;

(5) disposal of surplus material from the structure excavation;

(6) bailing, draining, sheathing and the construction of cofferdams, if found necessary, and the subsequent removal of sheathing and cofferdams;

(7) work associated with dewatering activities and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) Permit for Dewatering Activities.

Excavation for structures does not include the excavation:

(1) of post holes for fences, gates, or similar items;

(2) necessary to properly set curbs, paved gutters, headers, pavement or base course forms.

206.02 Materials. Materials shall conform to the following:

Filter Material	703.18
Structure Backfill Material	703.20
Trench Backfill Material	703.21

The Contractor may use Section 313 - Controlled Low Strength Material (CLSM) in place of trench and structure backfill material subject to the Engineer's acceptance. Do not use CLSM as trench backfill when installing aluminum and aluminum coated pipe culverts. When using CLSM, the Engineer will consider CLSM as the required backfill.

206.03 Construction Requirements.

(A) General. Notify the Engineer 10 working days before excavation for structures, so that the Engineer can take cross-sectional elevations and measurements of the undisturbed ground.

Excavate foundations to the elevations according to the particular type of structure to be placed.

Do not disturb the ground below the elevations shown in the contract in structure excavation operations. When disturbing such ground below the required elevations, excavate the disturbed ground until the undisturbed ground is reached. Backfill this area with Class D concrete until the required foundation footing elevation is reached. This work shall be at no cost to the State.

Keep the foundation dry by draining, bailing, pumping, driving sheathings or constructing cofferdams and cribs.

When the material from excavation does not meet the quality requirements specified for the backfill, furnish such suitable material as required.

Use or dispose surplus and suitable material from structure excavation remaining after completing backfilling according to Section 203 - Excavation and Embankment.

(B) Cofferdams. Carry cofferdams for foundation construction well below the bottom of the footings. Brace well and as watertight as practicable. Provide the interior dimensions of cofferdams sufficient clearance for driving piles, constructing forms and, when placing no seal, to permit pumping outside the forms.

When the clearance provided in the contract between the outside line of the footing and piles or interior wall or surface is not sufficient to permit the driving of piles or building of forms, the Contractor may provide such clearance. The Engineer will consider such enlargement over one foot outside the dimensions of the footing shown in the contract for the sole purpose of expediting the work of the Contractor and is of no value to the State. The Engineer will not include such excavation and backfill for payment.

Correct or enlarge cofferdams that are tilted or moved out of position during the process of sinking. Such work shall be at no cost to the State.

In tidal waters or in streams at a time of probable flood, vent cofferdam walls at low water elevation to insure full hydrostatic head both inside and outside the cofferdam when pouring and setting of seals.

The Engineer will not permit shoring in cofferdams that will induce stress, shock, or vibration in the permanent structure.

When permitted, cross struts or bracing may extend through foundation concrete. The Engineer will permit such struts or bracing below low water to remain in place. Remove struts or bracing above low water. Fill the volume with concrete of the same mix as that specified for the surrounding concrete.

If requested by the Engineer, submit drawings and design calculations showing the proposed method of cofferdam construction and other details left open to its choice or not fully shown on the contract for substructure work. The type and clearance of cofferdams shall be subject to acceptance.

Remove the cofferdams with sheathing and bracing to the level one foot below the streambed at no cost to the State after the completion of the substructure. Remove the cofferdam so as not to disturb or mar the finished concrete or masonry.

(C) Foundation Treatment. Uncover the rock fully when footing concrete or masonry is to rest upon rock. Remove the surface to a depth sufficient to expose sound rock. Level off the rock roughly or cut and roughen to approximate horizontal and vertical steps.

Grout seams in rock under pressure. The Engineer will pay the cost as extra work according to Subsection 104.03 - Extra Work.

Do not disturb the bottom of the excavation when not using piles and footing concrete or masonry is to rest on an excavated surface other than rock. Do not make the final removal of the foundation material to grade until just before placing the concrete or masonry.

Complete the excavation for piers and abutments to the bottom of the footings before driving piles therein. Remove excess materials remaining in the excavation after pile driving to the elevation of the bottom of the footings.

The Engineer will permit excavating a sufficient distance below the bottom of the footing as shown on the contract at no cost to the State when using piles. When the ground has risen above plan grade after driving the piles, remove the surplus material at no cost to the State. When the surface of the ground is below plan grade after driving the piles, backfill and compact to the plan grade with acceptable material at no cost to the State.

(D) Inspection. When the Engineer needs to determine the character of the foundation material, dig test pits and make test borings and foundation bearing tests. The Engineer will pay the cost according to Subsection 104.03 - Extra Work.

Notify the Engineer for inspecting and accepting the elevation and character of the foundation before placing concrete or masonry in the footing whenever completing the structure excavation to the foundation grade of a footing.

(E) Structure and Trench Backfill. Do not deposit material in fills until the test samples imply that the concrete has developed a strength required in Subsection 503.03(E) - Loading against the back of:

(1) concrete abutments,

(2) piers,

(3) concrete retaining walls, or

(4) the outside walls of concrete box culverts

Cure the test samples under conditions similar to those affecting the structure. Continue backfilling so that excessive unbalanced loads are not introduced against the structure.

Place backfill material in uniform horizontal layers not exceeding 8 inches in loose thickness before compaction. Moisten and compact each layer of backfill until obtaining a relative compaction of not less than 95%. The Engineer may reduce compaction requirement of 95% in situations where such compaction is not feasible such as in footings located in running streams or in swampy areas. The Engineer will be the sole judge of the degree of reduction. Backfill the footings with rockfill instead of the 95% compaction requirement in stream beds subject to appreciable scour.

When the Engineer cannot use the field density test, compact each layer of backfill with vibratory or suitable equipment on granular

backfill material. Test methods to decide maximum densities and relative compaction according to Subsection 106.09 - Special Test Methods.

Do not use water containing an excessive quantity of salt or other deleterious substances for compaction of structure and trench backfill for metal pipes.

The Engineer will not permit compaction of backfill material by ponding or jetting.

When required, make sufficient fill at culverts and bridges ahead of other grading operations to permit public traffic to cross. Compact structure backfill at the following areas to a relative compaction of not less than 90%:

(1) Oversized drains not beneath surfacing;

(2) Footing for slope protection, slope paving, and aprons;

(3) Headwalls, endwalls, and culvert wingwalls;

(4) Retaining walls except portions under surfacing and crib wall;

(5) Inlets in median areas or in traffic interchange loops;

(6) Footings not beneath surfacing;

(7) Other locations where the plans show 90% relative compaction for structure backfill.

(F) Filter Material. Place filter material for backfill at bridge abutments, and retaining walls according to the contract.

Make the subgrade as impervious as possible by pneumatic tamping where the material is placed. Compact the filter material thoroughly in layers with the backfill.

(G) Dewatering Activities. If excavation or backfilling operations requires dewatering, and the Contractor elects to discharge dewatering effluent into Waters of the United States or existing drainage systems, the Contractor shall obtain a National Pollutant Discharge Elimination System (NPDES) Activity Dewatering Permit from the Department of Health, Clean Water Branch (DOH-CWB). Do not begin dewatering activities until the DOH-CWB has issued a Notice of General Permit Coverage (NGPC). Dewatering operations shall be according to the

conditions in the NGPC. Submit a copy of the NPDES Activity Dewatering Application and Permit to the Engineer.

206.04 Method of Measurement.

(A) Structure Excavation. The Engineer will measure structure excavation per cubic yard. The limits for payment shall be according to the contract or as specified by the Engineer.

In the case of excavation for bridge, retaining wall, culvert headwalls, and other structures, no deduction in pay quantities will be made where the Contractor does not choose, subject to the Engineer's acceptance, to excavate material that is outside the limits of the actual structure but within the limits of excavation shown in the contract.

The Engineer will not measure beyond the limits of concrete neat pour lines.

The lower limit for payment of structure excavation for foundations for bridges, retaining walls, culvert headwalls, and other structures shall be the bottom of the completed foundations.

When specified by the Engineer to increase the depth of structure excavation below the depth shown in the contract, the Engineer will measure the material removed to a depth of not more than three feet below said depth at the contract price per cubic yard for structure excavation.

The Engineer will measure for the removal of material from depths greater than three feet below said depth as extra work according to Subsection 104.03 - Extra Work. The Contractor has the option of measuring the material removed at the contract price per cubic yard for structure excavation before the excavation is made.

The Engineer will not make compensation for the:

(1) removal and disposal of material that may come into an excavation from outside the designated limits;

(2) the removal and disposal of swell material resulting from the driving of piles in an excavation;

(3) furnishing and placing backfill material in an excavation that is below the designated grade.

The Engineer will not include such quantities in the quantities of structure excavation to be paid for.

The upper limit for payment of structure excavation shall be the original ground surface before the start of construction operations with the following exceptions:

(1) When structure excavation is done within the roadway excavation area or ditch and channel excavation area, the upper limit shall be the planes of the bottom and side slopes of said areas excavated shown on the contract or as specified by the Engineer.

(2) When structure excavation is made in new embankments, the upper limit shall be the planes of the new embankment at the elevation shown in the contract or specified by the Engineer for construction ahead of doing the required structure excavation. The upper limit shall be the surface of the embankment at the time the excavation is made.

Except for culverts, the lateral limits for payment of structure excavation including cement rubble masonry and concrete headwalls shall be the vertical surfaces one foot outside the neat lines of the footings.

For culverts, except for structural plate culverts, the lateral limits for payment of structure excavation shall be 18 inches outside the external limits of the pipe. For structural plate culverts, the lateral limits for payment shall be three feet outside the external limits of the pipe.

The lateral limits for payment of structure excavation for a battery of two or more culverts (culverts placed next to each other and intended to serve as a unit), except for structural plate culverts, shall be 18 inches outside the external limits of the two outer pipes. The lateral limits for payment of structure excavation shall be three feet outside the external limits of the two outer pipes for structural plate culverts.

For culverts and structural plate culverts, the lower limits for payment shall be the bottom elevation of the bed course material, and the upper limits shall be the existing ground.

For culverts and structural plate culverts in embankment fill, the lateral, lower, and upper excavation limits shall be measured after the embankment is completed according to Section 603.03(A).

The Engineer will not apply these requirements where the spaces between the pipes permit the use of compacting equipment such as power rollers. Treat each pipe as a single culvert where using such equipment.

The Contractor shall remove soft, spongy, or unsuitable material from the width equal to the span or diameter of the culvert plus one

diameter outside the lateral limits of the culvert when encountering such material.

When using CLSM for backfill, the trench width may be reduced to the outside diameter or span of the culvert plus six inches on each side for culverts less than or equal to 42 inches in diameter or span, and 12 inches on each side for culverts greater than 42 inches in diameter or span.

(B) Structure Backfill. The Engineer will measure structure backfill for bridge abutments, wingwalls, retaining walls and structural plate culverts per cubic yard. Compute the quantities based on the following limits:

(1) Bridge Abutments, Wingwalls and Retaining Walls.

(a) The lower limit shall be the top of the completed footings.

(b) The upper limit for payment shall be the finished grade or the bottom of the pavement structure when under the roadway area.

(c) The lateral limits shall be one foot outside the neat line of the footings. The limits whichever is at a greater distance from the backface in a direction normal to the wall stems shall be the vertical plane:

1. one foot outside the heel of the footing, or

2. five feet from the backface measured at the top.

The Engineer will deduct the volume of filter material measured within the limits of payment for structure backfill for bridge abutments, wingwalls, and retaining walls from the pay quantities of structure backfill.

(2) Structural Plate Culverts.

(a) The lower limit shall be the grade line or elevation designated in the contract or ordered specified by the Engineer for the lower outside surface of the culverts.

(b) The upper limit shall be one foot above the top of the culverts.

(c) The lateral limits shall be the vertical surface one foot 36 inches outside the lateral limits of the culverts.

The Engineer will deduct the volume occupied by the structural plate culvert within the limits of payment for structure backfill for structural plate culvert from the pay quantities of structure backfill.

The lateral limits for payment for structure backfill for a battery of two or more culverts placed adjacent to each other and intended to serve as a unit, shall be 36 inches outside of the external limits of the two outer pipes. The Engineer will not apply these requirements where the spaces between the pipes permit the use of compacting equipment such as power rollers. The Engineer will treat each pipe as a single culvert where the Contractor uses such equipment is used.

The lateral limits shall be the vertical surface one diameter outside the lateral limits of the culverts for areas of soft, spongy or unsuitable material.

(C) Structure and Trench Backfill for Culverts. The Engineer will not measure structure and trench backfills for culverts other than structural plate culverts.

(D) Filter Material. The Engineer will measure filter material per cubic yard. The Engineer will compute the quantities from the dimensions shown in the contract or as specified by the Engineer.

(E) Structural Excavation and Structural Backfill for CMU Noise Barriers. The Engineer will not measure structural excavation and structural backfill for CMU Noise Barriers and Footings.

206.05 Basis of Payment.

(A) Structure Excavation. The Engineer will pay for the accepted structure excavation at the contract unit price per cubic yard complete in place.

The price includes full compensation for excavating for structures and culvert trenches; keeping the foundation dry, placing and compacting surplus structure excavation in roadway embankments or disposing of the material, providing cofferdams, notifying the Engineer for inspecting and accepting the elevation and character of the foundation; backfilling culvert trenches except for structural plate culverts; backfilling culvert trenches with CLSM except for structural plate culverts; furnishing and applying

water for the compaction of structure backfill; testing the samples; placing backfill material in uniform horizontal layers; moistening and compacting each layer of backfill; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

If required, the price includes preparing an NPDES Dewatering Activities Permit application; obtaining a NPDES Permit Application (CWB-NOI Form G) from the Department of Health, Clean Water Branch; installing, operating, monitoring, and maintaining the dewatering activities; removing all equipment and facilities from the site; restoring the site to its original condition; and furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will deduct the cost from the progress payment for citations received by the Department of Health for non-compliance with the NGPC.

(B) Structure Backfill for Bridge Abutments, Wingwalls, Retaining Walls, and Structural Plate Culverts. The Engineer will pay for the accepted structure backfill for bridge abutments, wingwalls, retaining walls, and structural plate culverts at the contract unit price per cubic yard complete in place.

The price includes full compensation for using suitable material for backfilling structures and trenches; furnishing and applying water for the compaction of structure backfill; testing the samples; placing backfill material in uniform horizontal layers; moistening and compacting each layer of backfill; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

(C) Structure and Trench Backfill for Culverts. The Engineer will not pay for structure and trench backfill for culverts other than structural plate culverts. The cost shall be incidental to Structure Excavation.

(D) Filter Material. The Engineer will pay for the accepted filter material at the contract unit price per cubic yard, complete in place. The price includes full compensation for tamping the subgrade; furnishing, and placing the backfill material in uniform horizontal layers; moistening and compacting each layer; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

(E) Structural Excavation and Structural Backfill for CMU Noise Barriers. Structural excavation and structural backfill above Footings shall be considered incidental to Item No. 513.4000, Type T1 CMU Noise Barrier and Item No. 513.5000, Type L1 CMU Noise Barrier, and will not be paid for separately. Structural excavation for CMU Noise Barrier

Footings shall be considered incidental to Item 503.1310 Concrete in Footings for CMU Noise Barriers, and will not be paid for separately.

The Engineer will make payment under:

Pay Item	Pay Unit
Structure Excavation for _____	Cubic Yard
Structure Backfill for _____	Cubic Yard
Filter Material _____	Cubic Yard

END OF SECTION

Amend **Section 207 - Ditch and Channel Excavation** to read as follows:

"SECTION 207 - DITCH AND CHANNEL EXCAVATION

207.01 Description. This work includes excavating highway ditches and water channels above and below culverts and bridges, including channels for changing the course of streams according to the contract. This work does not include ditches within the normal cross section of the roadway.

207.02 Materials. None specified.

207.03 Construction Requirements. Notify the Engineer 10 working days before excavating ditches and channels.

Use suitable materials from ditch and channel excavation in the construction of embankments and dikes. Unsuitable and surplus excavation material shall become the Contractor's property. Dispose the unsuitable and surplus material at no cost to the State.

Backfill and compact excavation below the required bottom grade of ditches and channels with suitable material according to the contract at no cost to the State.

Remove debris and unwanted material from the excavated ditches and channels before acceptance.

207.04 Method of Measurement. The Engineer will not measure ditch and channel excavation for payment.

207.05 Basis of Payment. The Engineer will not pay for the accepted ditch and channel excavation separately. The Engineer will consider the cost for ditch and channel excavation as included in the contract price of the various contract items.

The cost is for hauling; placing and compacting the excavated material; clearing and grubbing; disposal of surplus and unsuitable material; and furnishing labors, materials, equipment, and other incidentals necessary to complete the work.

END OF SECTION

Amend **Section 639 - Water Pollution Control** to read as follows:

"SECTION 209 - WATER POLLUTION AND EROSION CONTROL

209.01 Description. This section is for submitting detailed plans, diagrams, and written site-specific best management practices (BMP); constructing, maintaining, and repairing temporary and permanent water pollution and erosion control measures at the project site, including local material sources, work areas and haul roads; removing and disposing potential hazardous wastes; and complying with applicable State and Federal Permit conditions.

The requirements of this section also apply to borrow pit operations, haul roads and/or Contractor's storage sites located outside the State right-of-way.

209.02 Materials. Materials shall conform to the following:

(A) Slope Drains. The Contractor may construct slope drains of pipe, fiber, mats, erosion control fabric, geotextiles, rubble, portland cement concrete, bituminous concrete, plastic sheets, or other materials accepted by the Engineer.

(B) Mulches. Mulches may be bagasse, hay, straw, fiber mats, netting, wood cellulose, bark, wood chips, or other materials accepted by the Engineer. Mulches shall be clean and free of noxious weeds and deleterious materials. Spray mulches at a rate of 2000 pounds per acre. Add tackifier to the mix at a rate of 85 pounds per acre.

(C) Grass. Grass shall be a quick growing species such as rye grass, Italian rye grass, or cereal grasses. The grass shall be suitable to the area and provide a temporary cover that will not later compete with the permanent cover. Alternate grasses are allowable if accepted by the Engineer. Apply seeds at a rate of 125 pounds per acre.

(D) Fertilizer and Soil Conditioners. Fertilizer and soil conditioners shall be a standard commercial grade accepted by the Engineer. Fertilizer shall conform to Subsection 712.18(A) - Commercial Fertilizer. Apply fertilizer at a rate of 450 pounds an acre. Apply an additional 250 pounds per acre every 90 calendar days.

(E) Silt Fences. Silt fences shall be constructed with a synthetic filter fabric mounted on posts and embedded in the ground.

(F) Berms. Berms shall consist of gravel or sand wrapped with geotextile material. Alternate materials are allowable if accepted by the Engineer.

209.03 Water Pollution and Erosion Control Conference. Schedule a water pollution and erosion control conference with the Engineer at least 14 calendar days before the start of construction work to discuss the sequence of work, plans and proposals for water pollution and erosion control. Submit a water pollution and erosion control plan, as detailed in Subsection 209.04 a minimum of 10 calendar days before the scheduled conference.

209.04 Water Pollution and Erosion Control Submittals. Submit the following:

(A) a written site-specific BMP describing activities to minimize water pollution and soil erosion into State waters, drainage or sewer systems. The BMP shall include: an identification of potential pollutants and their sources, a list of all materials and heavy equipment to be used during construction; descriptions of the methods and devices used to minimize the discharge of pollutants into State waters, drainage or sewer systems; details of the procedures used for the maintenance and subsequent removal of any erosion or siltation control devices; methods of removing and disposing hazardous wastes encountered during construction; and methods of storing and handling of oils, paints and other products used for the project.

At minimum, show or address the following to the Engineer: material storage and handling areas, and other staging areas; concrete truck washouts; fueling and maintenance vehicles and other equipment; use of form oils, paints and other products on the job site; tracking of sediment offsite from project entries and exits; litter management; dust control; and spill control.

The BMP must be signed and a copy kept on site throughout the duration of the project. Any revisions to the BMP shall be included with the original BMP, and all drawings, documentations modified to reflect the revisions.

(B) plans indicating location of water pollution and erosion control devices; plans and details of BMPs to be installed or utilized; areas of soil disturbance in cut and fill, areas used for the storage of soil or waste, and areas where vegetative practices are to be implemented. The plans shall indicate the intended drainage pattern. Submit a separate drawing for each phase of construction which alters the drainage patterns;

(C) construction schedule;

(D) the name(s) of the specific individual(s) designated to be responsible for the water pollution and erosion controls on the project site along with the home and business telephone and fax numbers.

(E) description of the nature of fill material to be used on the project.

Follow the guidelines in the "Best Management Practices Manual for Construction Sites in Honolulu", dated May 1999 in developing, installing, and maintaining the BMPs for the project.

209.05 Construction Requirements. Do not begin work on the project until the submittals detailed in Subsection 209.04 - Water Pollution and Erosion Control Submittals are completed and accepted by the Engineer.

Address all comments subsequently received from the Engineer.

Modify and resubmit the plans and construction schedules to correct conditions that develop during construction which were unforeseen during the design and pre-construction stages.

Coordinate any temporary control provisions with the permanent control features throughout the construction and post-construction period.

The maximum surface area of earth material exposed at any time is 300,000 square feet. Do not expose earth material until the BMP are installed and accepted by the Engineer. Temporarily or permanently protect the disturbed soil surface from rainfall impact and runoff.

Install stabilized construction entrances to minimize tracking of dirt, and mud onto the roadways.

Do not expose erodible surfaces greater than 15 feet in height.

Apply accepted erosion control measures to all exposed erodible material within 15 calendar days of exposure. If after 15 days, the erosion control measures have not been applied, apply an accepted erosion control measure on the sixteenth day at no cost to the State. Failure to apply erosion control measures will result in the increase in the amount of retainage and/or the withholding of the monthly progress payment.

At the end of each workday, shape the earthwork to control and direct the runoff. If accepted by the Engineer, shaping the earthwork may include constructing earth berms along the top edges of embankments.

If accepted by the Engineer, chemicals may be used as soil stabilizers or erosion and/or dust control.

Use the materials listed in Subsection 209.02 - Materials unless the Engineer has reviewed and accepted to the use of a substitute.

Provide temporary slope drains of rigid or flexible conduits to carry runoff from cuts and embankments. Provide a portable flume at the entrance and shorten (or extend) the temporary slope drains as necessary to ensure proper function.

Protect ditches, channels, and other drainage ways leading away from cuts and fills at all times by hydro-mulching the lower region of embankments in the immediate area.

Provide for controlled discharge of waters impounded, directed, or controlled by project activities or erosion control measures.

Properly maintain all erosion control features. Inspect and make necessary repairs to all erosion control measures at the following intervals:

(1) weekly during dry periods;

(2) within 24 hours of any rainfall of 0.5 inch or greater which occurs in a 24-hour period;

(3) daily during periods of prolonged rainfall and;

(4) when existing erosion control measures are damaged or not operating properly as specified by the Engineer.

Maintain records of the inspections and repairs made. These records shall be continuous for the entire duration of the project. Submit a copy of the records to the Engineer weekly.

In addition to the weekly reports, submit to the Engineer all amounts spent initializing and maintaining the BMP during the previous week. The amount spent includes: purchases of erosion control material, construction of storage areas, and installation of water pollution, erosion and dust control measures. Record the amount on the same form as the force account item of work. Submit the report weekly along with the site inspection report.

Protect finished and previously seeded areas from damage and from spillover materials placed in the upper lifts of the embankment.

The Contractor's designated representative specified in Section 209.04(D) shall address any water pollution and erosion control concerns brought up by the Engineer within 24 hours of notification. If the Contractor fails to satisfactorily address these concerns, the Engineer reserves the right to employ outside assistance or use the Engineer's own labor forces to provide the necessary corrective measures. The Engineer will charge the Contractor such incurred costs plus any associated project engineering costs. The Engineer will make appropriate deductions from the Contractor's monthly progress estimate.

When there are conflicts between these requirements and laws, rules, or regulations of other Federal or State local agencies, the more restrictive laws, rules, or regulations shall apply.

Failure to conform with the above requirements and regulations of the Federal or State local agencies will be cause for temporary or permanent suspension of operations. If operations are suspended due to the Contractor's failure to conform, the Contractor shall maintain the project during the period of suspension at no cost to the State.

209.06 Method of Measurement The Engineer will measure water pollution and erosion control; installation, maintenance, and repair of site-specific BMP; installation, monitoring; removal and disposal of hazardous waste on a force account basis according to Subsection 109.04 - Extra and Force Account Work.

209.07 Basis of Payment The Engineer will pay for the accepted water pollution and erosion control; installation, maintenance, and repair of site-specific BMP; installation, monitoring; removal and disposal of hazardous waste on a force account basis according to Subsection 109.04- Extra and Force Account Work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Water Pollution and Erosion Control	Force Account

The Engineer will not pay for work required that is due to the Contractor's convenience, negligence, carelessness or failure to install permanent controls.

The Engineer will not pay for erosion control work that is not implemented within 15 days of exposure.

The Engineer will not pay for the development, submittals, or any additional modification of the Contractor's Water Pollution and Erosion Control Plan, BMP, sequence of operations, and methods of operations plan.

No progress payment will be authorized until the Engineer accepts the site-specific BMP or when the Contractor fails to maintain the project site according to the accepted BMP.

For all citations or fines received by the Department for non-compliance with the Notice of General Permit Coverage (NGPC), the Contractor shall reimburse the State within 30 calendar days for the full amount of the

outstanding cost the State has incurred, or the Engineer will deduct the cost from the progress payment.

The Engineer will assess liquidated damages up to $27,500.00 for non-compliance of each BMP requirement and all other requirements in this section. There is no maximum limit on the amount assessed per day."

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 210 - DRESSING OF SHOULDER

210.01 Description. This work includes shaping, grading, filling, and compacting the unpaved shoulders according to the contract, in conformity with the lines, grades, and cross-sections shown on the plans or as specified by the Engineer.

210.02 Materials. Use suitable materials from roadway excavation, including topsoil and base material salvaged from this project. Consider asphalt concrete removed from cold planning, reconstruction and roadway excavation as surplus excavation material. Dispose of them as specified in Section 203 – Roadway Excavation. Use additional materials from borrow or as specified by the Engineer at no cost to the State.

210.03 Construction Requirements. Immediately shape, grade, and compact the shoulders after the completion of or in conjunction with the resurfacing of the pavement.

Compact all shoulder material placed uniformly and thoroughly by a roller weighing no less than three tons. Finish the shoulders and slopes, including ditches where necessary, to a reasonably smooth and uniform surface. The Engineer will not permit excessive variations in the elevations or alignment of the shoulders from the plan. Correct such variations to preserve a neat and uniform appearance.

Correct the irregularities in the surface, if any, resulting from grading and other operations to prevent formation of depressions or water pockets. Similarly, repair any damage to the surface or pavement due to the Contractor's operations at no cost to the State according to the contract and as specified by the Engineer.

Provide the Engineer with a copy of the written agreement with any property owner from whose property the borrow material is to be obtained or on which the excess excavation is to be disposed.

210.04 Method of Measurement. The Engineer will not measure dressing of shoulders for payment.

210.05 Basis of Payment. The Engineer will not pay for dressing of shoulders separately. The Engineer will consider the cost for dressing of shoulders as included in the contract price of the various contract items.

The cost is for shaping, grading, filling and compacting the unpaved shoulders with a suitable material as shown in the plans or as specified by the Engineer; and furnishing labor, materials, equipment, and other incidentals necessary to complete the work."

END OF SECTION

Amend **Section 301 - Plant Mix Asphalt Concrete Base Course** to read as follows:

"**SECTION 301 - PLANT MIX ASPHALT CONCRETE BASE COURSE**

301.01 Description. This section is for furnishing and placing one or more courses of plant mix asphalt concrete base course (ACB) on a prepared subgrade according to the contract.

301.02 Materials.

(A) General. Materials shall conform to the following:

Asphalt Cement	702.01
Aggregate for Plant Mix Asphalt Concrete Base Course	703.03
Filler	703.15
Blending Sand	703.22
Hydrated Lime	712.03

Submit for acceptance, a job-mix formula for the mixture to be supplied. This work shall not start and the Engineer will not accept the mixtures until:

(1) the samples of the materials intended for use are submitted and

(2) the Engineer establishes an asphalt content.

Submit the samples no less than 15 working days before the work begins.

(B) Plant Mix Asphalt Concrete Base Course (ACB). The ACB includes a mixture of aggregate, filler or blending sand or both if accepted, and bituminous material. The Contractor shall size, uniformly grade, and combine the several aggregate fractions in such proportions that the resulting mixture conforms to Subsection 703.03 - Aggregate for Plant Mix Asphalt Concrete Base Course. The resulting mixture shall be of optimum cohesion at an air void content of 3% to 6%. Also, the resulting mixture shall have a minimum stability of 37 when tested according to AASHTO T 246 (ASTM D 1560).

When requested by the Engineer, submit the supporting data for review. Base the tests on AASHTO T 245 (ASTM D 1559). The

following table shows the design criteria:

TABLE 301.03-1 JOB MIX FORMULA DESIGN CRITERIA		
Number of compaction blows each end of specimen: 75		
Test Property	**Minimum**	**Maximum**
Stability, Pound	2,000	---
Flow, 0.01 inch	8	16
Percent Air Void	3	6
Voids In Mineral Aggregate (VMA), %	13	---

Add between 4% to 6% bituminous binder base on the dry weight of aggregate to the mixture as specified by the Engineer.

301.03 Construction Requirements.

(A) General. Work in this section shall conform to Subsection 401.05 - Construction Requirements except as modified herein.

Brooming off shall conform to Section 310 - Brooming Off.

Apply the tack coat to the layers of the mixture for multiple lift construction. Tack coat shall conform to Section 407 - Bituminous Tack Coat.

The criteria on mat thickness shall be as follows:

(1) Spread and compact the mixture in one layer where the required thickness is 6 inches or less.

(2) Spread and compact the mixture in two or more layers of approximate equal thickness where the required thickness is more than 6 inches. The maximum compacted thickness of one layer shall not exceed 6 inches.

Compact the mixture immediately upon completion of spreading operations to a density of more than 91% of the maximum theoretical specific gravity according to AASHTO T 209 (ASTM D 2041) modified by deletion of Section 8 supplemental procedure. Tamp places not accessible to the roller with mechanical tampers.

The combined thickness of the ACB and the asphaltic concrete

pavement shall be within 0.02 foot of the planned thickness.

Cut samples from the compacted pavement within 24 hours of lay down. The cut pavement samples shall be 12 inches by 12 inches or 4 inches diameter cores, minimum. Take samples of the mixture for the fulldepth at the location as specified by the Engineer. Place and compact new material to conform with the surrounding area after taking samples.

(B) Plant Mix Asphalt Concrete Base Course (ACB). When choosing to use a drier-drum mixing plant equipped with cold-feed control, separate the aggregate for the plant mix asphalt concrete base into three or more sizes.

301.04 Method of Measurement. The Engineer will measure ACB per ton under Section 312 - Plant Mix Glassphalt Concrete Base Course complete in place.

Weigh the quantity of ACB according to Section 109 - Measurement and Payment.

301.05 Basis of Payment. The Engineer will pay for the accepted ACB at the contract unit price per ton under Section 312 - Plant Mix Glassphalt Concrete Base Course complete in place. The price includes full compensation for furnishing, spreading, and compacting the ACB; sampling; restoring the area; and furnishing equipment, tools, labors, materials, and incidentals necessary to complete the work.

The Engineer will not pay for the bituminous tack coat separately. The Engineer will consider the price for the bituminous tack coat included in the bid price of the various contract items."

END OF SECTION

Amend **Section 302 - Recycled Plant Mix Asphalt Concrete Base Course** to read as follows:

SECTION 302 - RECYCLED PLANT MIX ASPHALT CONCRETE BASE COURSE

302.01 Description. This section is for furnishing and placing recycled plant mix asphalt concrete base (Recycled ACB) according to the contract.

302.02 Materials. The Recycled ACB includes a mixture of crushed reclaimed asphaltic concrete pavement (RAP), virgin aggregate, and asphalt cement. Select the exact proportion of crushed RAP to virgin aggregate in the mix. Do not exceed the proportion of crushed RAP to virgin aggregate:

Proportion	Type Of Mix Plant
30-70	Batch
40-60	Drier-Drum

The Contractor shall conform to the following requirements:

Asphalt Cement 702.01

Aggregate for Plant Mix Asphalt Concrete Base Course 703.03

Process the RAP to provide a uniform gradation from fine to coarse. 100% of the RAP shall pass the one and a half inch sieve. The extracted bitumen content for the crushed RAP shall be not less than 2% when tested according to AASHTO T 164 (ASTM D 2172). Handle and size the virgin aggregate material such that the blend of the crushed RAP material and the virgin aggregate material conforms to Subsection 703.03 - Aggregate for Plant Mix Asphalt Concrete Base Course.

Submit for acceptance a job-mix formula for the recycled mixture to be supplied. Confirm the job-mix formula, the source of aggregate, grade of bituminous material and the proportion of crushed RAP to be used in the mixture. Furnish only one grade of bituminous material and one recycle proportion for the product. Make grade or proportion changes only upon written permission by the Engineer.

The established recycled ACB mixture shall be of optimum cohesion at an air void content of 3% to 6% and have a minimum stability of 37 when tested according to AASHTO T 246 (ASTM D 1560). The Contractor shall submit for acceptance a job-mix formula based on tests according to AASHTO T 245 (ASTMD 1559) when requested by the Engineer. Subsection 301.02 - Materials specifies the job-mix

formula. The total amount of bituminous binder in the recycled ACB mixture shall be between 4% and 6%. The amount added shall be as specified by the Engineer.

This work shall not start and the Engineer will not accept the mixtures until:

(1) the samples of the materials intended for use are submitted and

(2) the Engineer establishes an asphalt content.

Submit the samples no less than 15 working days before the work begins.

302.03 Construction Requirements. Construction methods shall conform to Subsection 301.03 - Construction Requirements, except as specified herein.

(A) Compact the recycled ACB material thoroughly according to Subsection 401.05(E) - Compaction immediately upon completion of spreading operation.

(B) The equipment shall conform to Subsection 401.05 - Construction Requirements except as specified herein.

(1) Requirements for Batching Plants.

(a) The Engineer reserves the right to waive the three bin operation.

(b) Heat the virgin aggregate material to an approximate temperature of 450 ^{o}F. to result in a finished mix temperature of approximately 280 ^{o}F.. Control the mixing and weighing operations to optimize heat transfer from virgin aggregate material to the reclaimed aggregate material.

(c) Use an appropriate method to add the crushed RAP material to the heated virgin aggregate material. This method shall allow the crushed RAP material to be added after the virgin aggregate material has left the drier. The method shall provide a positive control on proportioning of the crushed RAP material into the mixture. The crushed RAP material shall:

1. feed directly into the weigh hopper or pugmill;

2. feed to an accuracy of 10% of the required weight;

3. Have a maximum moisture content of 3% when mixed with the heated virgin aggregate.

4. Retain the recycled ACB mixture in a single silo.

(2) Requirements for Drier-Drum Plants. Design the cold-feed system to prevent direct flame impingement on the recycled crushed RAP material. Conform to Subsection 401.04(F)(4) - Proportioning for Drier-Drum Mixing with Cold-Feed Control.

(3) Equip the paver with an accepted electronic screed control device. The electronic device includes a grade controlling sensor mounted on each side of the paver. Each sensor shall take its grade reference from a 10-foot ski for the first pass. The Contractor may substitute one adjacent pavement for subsequent passes.

(C) The criteria on mat thickness shall be as follows:

(1) Spread and compact the mixture in one layer where the required thickness of recycled ACB is 6 inches or less.

(2) Spread and compact the mixture in two or more layers of approximately equal thickness where the required thickness of recycled ACB is more than 6 inches. The maximum compacted thickness of one layer shall not exceed 6 inches.

(D) When necessary, furnish regular ACB conforming to Section 301 - Plant Mix Asphalt Concrete Base Course instead of recycled ACB. Notify the Engineer and obtain permission before doing such work.

(E) Brooming off shall conform to Section 310 - Brooming Off.

(F) Cut samples from the compacted pavement for testing within 24 hours of lay down. The cut pavement samples shall be 12 inches by 12 inches or four inches diameter cores, minimum. Take samples of the mixture for the full depth of the course at the location as specified by the Engineer. Place and compact new material to conform with the surrounding area after taking samples.

(G) Apply tack coat to layers of recycled ACB for multiple lift construction. Tack coat shall conform to Section 407 - Bituminous Tack Coat.

302.04 Method of Measurement. The Engineer will measure recycled ACB per ton under Section 312 - Plant Mix Glassphalt Concrete Base Course complete in place.

302.05 Basis of Payment. The Engineer will pay for the accepted recycled ACB at the contract unit price per ton under Section 312 - Plant Mix Glassphalt Concrete Base Course complete in place. The price includes full compensation for handling, salvaging, and reprocessing operations of the RAP; furnishing, spreading, and compacting the recycled ACB; sampling; restoring the area; and furnishing equipment, tools, labors, materials, and incidentals necessary to complete the work.

The Engineer will not pay for the bituminous tack coat separately. The Engineer will consider the cost for the bituminous tack coat as included in the contract price of the various contract items in Section 401 - Asphalt Concrete Pavement.

END OF SECTION

Amend **Section 305 - Aggregate Subbase Course** to read as follows:

"SECTION 305 - AGGREGATE SUBBASE COURSE

305.01 Description. This work includes furnishing and placing one or more courses of aggregate subbase on a prepared surface according to the contract.

305.02 Materials. Materials shall conform to the following:

Aggregate for Subbase	703.17
Water	712.01
Cullet and Cullet-Aggregate Mixtures as Construction Materials	717.01

305.03 Construction Requirements.

(A) Placing. Do not dump the aggregate subbase material in piles on the prepared subgrade. Place the material in uniform layers not exceeding 6 inches after compaction. Place and spread the material without segregation. Remix the segregated material. When using a vibratory roller weighing 9 tons or more, the Contractor may increase the lift thickness to 7 inches.

The Engineer will not permit the spreading of fine material over the surface of the compacted subgrade. Incorporate the additional material, if required, uniformly throughout the thickness of the compacted material by scarifying and blading. The combined material shall meet quality requirements as specified herein.

(B) Compacting. After spreading and compacting the aggregate subbase course, check the finished subbase for conformance with the required grade and cross-section. The finished subbase where not controlled by adjacent structures or features shall not vary more than 0.05 foot above or below the theoretical grade.

If the base course is paid on a theoretical cubic yard basis, the Engineer may waive the lower finish surface tolerance.

Compaction of each layer shall continue until a density of not less than 95% of the maximum density according to Subsection 106.09 - Special Test Methods is achieved.

The Engineer will make the field density determination according to Hawaii Test Methods HDOT TM 1, 2, and 3 . Maintain the surface of

each layer during the compaction operations so that a uniform texture is produced and the aggregate is firmly keyed.

305.04 Method of Measurement. The Engineer will measure aggregate subbase per cubic yard complete in place.

The Engineer will measure the aggregate subbase according to the dimensions shown in the contract or as specified by the Engineer.

305.05 Basis of Payment. The Engineer will pay for the accepted aggregate subbase at the contract unit price per cubic yard.

The price includes full compensation for preparing the surface for the subbase course material; furnishing, depositing, spreading, shaping, and compacting the base course; adding water for compaction; and furnishing labor, material, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Aggregate Subbase _____	Cubic Yard"

END OF SECTION

Make the following Section a part of the Standard Specification:

"SECTION 306 - UNTREATED PERMEABLE BASE COURSE

306.01 Description. This work includes furnishing and placing geotextile, and one or more courses of untreated permeable base on a prepared surface according to the contract.

306.02 Materials. Materials shall conform to the following:

Prime Coat for Untreated Permeable Base Course	420.02
Coarse Aggregate	703.04(A)
Filler	703.04(B)
Water	712.01
Geotextiles	716.03

306.03 Construction Requirements.

(A) Shoulder Preparation. Water, shape, and compact the adjacent shoulder for a width not less than five feet and to the proposed grade for the upper surface of the permeable base course.

Provide a form or choker to retain the untreated permeable base material, by cutting the edge of the shoulder as nearly vertical as possible with the toe of the cut located at the exterior bottom limit of the untreated permeable base material.

Dispose of the cut away material as specified by the Engineer.

(B) Placing. Place the geoxtiles as specified in section 605.03.

Place the coarse aggregate only upon an accepted surface.

Spread the coarse aggregate on the prepared surface to such a depth that when thoroughly compacted, the coarse aggregate shall be of the form and dimensions shown on the typical section.

When the required thickness is 9 inches or less, place the permeable base course on one layer.

When the required thickness is more than 9 inches, place the permeable base course in two or more layers of approximately equal thickness. Each layer shall have a compacted thickness of not more than 9 inches.

Dump the coarse aggregate in piles upon the surface and spread by bulldozing ahead from the previously spread coarse aggregate. When spreading, the coarse aggregate shall be free from segregation. Remix any segregated materials to conform to the contract.

(C) Compacting. Immediately after spreading a layer of coarse aggregate, use power rollers to compact the material thoroughly according to the contract. Roll the coarse aggregate to smooth out bumps or irregularities. The finished surface shall be within 0.04-foot of the required grade and cross-section.

Rolling shall be longitudinal to the roadway lanes. Start at the lower edge and progress toward the higher portion of the roadbed with an overlap of at least ½ of the wheel tracks on successive trips. Do not roll the center of the base material first. Proceed without interruption across the area to be compacted until a minimum of 8 complete coverage with the roller is attained on each lift.

After rolling the final lift of coarse aggregate, spread the filler in thin layers. The filler shall be sufficiently dry to choke the surface voids without caking or bridging. The layer of filler shall not exceed 30 pounds per square yard. Roll the filler with two complete coverage. Scatter the excess filler by light brooming. Apply the prime coat according to Section 408 - Prime Coat for Untreated Permeable Base Course soon thereafter. Keep all traffic, except construction equipment directly connected with the prime coat operation, off the permeable base.

(D) General. When disturbing or displacing the finished permeable base or when foreign matter enters into the base materials during storage, hauling, or placing operations, repair or replace such permeable materials with acceptable materials at no cost to the State.

When constructing untreated permeable base in more than one layer, construct each layer as specified above except apply the filler and the prime coat only on the top of the final layer.

The completed base shall have a firm, even surface free from bumps and irregularities. Provide sufficient filler, water, brooming, and rolling to thoroughly consolidate and compact the edges of the permeable base course to an unyielding condition.

(E) Equipment. Use static steel power rollers weighing not less than 10 tons.

Broom with long bristle brooms. Standard rattan street brooms may be used when acceptable by the Engineer.

306.04 Method of Measurement. The Engineer will measure the permeable base course per cubic yard complete in place according to the dimensions shown on the plans or specified by the Engineer.

306.05 Basis of Payment. The Engineer will pay for the accepted untreated permeable base course at the contract unit price per cubic yard.

The price includes full compensation for preparing the surface; furnishing, applying, and protecting the prime coat; spreading the material; furnishing and placing the geotextile; furnishing, depositing, and placing the coarse aggregate; disposing the excess material; rolling; compacting; water for compaction; filler for the permeable base; brooming; and furnishing labors, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Untreated Permeable Base Course	Cubic Yard"

END OF SECTION

Amend **Section 310 - Brooming Off** to read as follows:

"SECTION 310 - BROOMING OFF

310.01 Description. This work includes cleaning an existing surface or a pavement according to the contract.

310.02 Materials. None specified.

310.03 Construction Requirements. Remove earth, dust or other foreign material and existing raised pavement markers from the entire area in question. Remove raveled materials from pockets in the surface. Remove grass or other growth from edges of the area. Crop the adjacent growth closely to prevent interference with subsequent operations. Dispose of debris resulting from the cleaning operations.

Clean the edges of the existing surface so that their original thickness and width may be reconstructed.

Remove loose material and excess dust by mechanically operated broom or air pressure, supplemented by hand brooming where required. Apply air pressure through pipe nozzles operating from a compressor producing 100 psi pressure. Do this work while the surface is thoroughly dry.

310.04 Method of Measurement. The Engineer will not measure brooming off for payment.

310.05 Basis of Payment. The Engineer will not pay for brooming off separately. The Engineer will consider the cost for brooming off as included in the contract price of the various contract items.

The cost is for cleaning an existing surface or pavement according to the contract; and furnishing materials, labor, tools, equipment, and incidentals necessary to complete the work."

END OF SECTION

Amend **Section 312 - Plant Mix Glassphalt Concrete Base Course** to read as follows:

"SECTION 312 - PLANT MIX GLASSPHALT CONCRETE BASE COURSE

312.01 Description. This section is for one or more courses of plant mix glassphalt concrete base (GCB) course on a prepared subgrade according to the contract.

312.02 Materials. The GCB course includes a uniform mixture of aggregate, cullet (crushed glass), and asphalt binder conforming to the contract.

The asphalt cement, aggregate, and cullet materials shall conform to:

Asphalt Cement	702.01
Aggregate for Plant Mix Asphalt Concrete Base Course	703.03
Cullet and Cullet-Aggregate Mixtures on Construction Materials	717.01

Process cullet (crushed glass) to provide a uniform gradation from fine to coarse with 100% of the material passing the 3/8-inch sieve.

Produce a combined mixture of the construction-grade cullet and natural aggregate conforming with the cullet content and debris level in Table 717-I.

Submit for acceptance, a glassphalt job-mix formula to be supplied. The job-mix formula shall show the source of aggregate, grade of bituminous material, and the proportion of crushed glass used in the mixture. Furnish only one grade of bituminous material and one crushed glass proportion for the product. Make grade or proportion changes only upon written acceptance by the Engineer.

Design the asphaltic concrete job mix formula using the procedures contained in the current edition of the Asphalt Institute's Manual Series No. 2 (MS-2):

(1) Chapter III, Marshall Method of Mix Design or

(2) Chapter IV, HVEEM Method of Mix Design.

Submit test data used to develop the job-mix formula.

The total amount of bituminous binder in the GCB course mixture shall be between 4% and 6%.

The Contractor and the Engineer may determine the asphalt content of the GCB course mixture by the nuclear gage according to Hawaii Test Method 25.

Do not start GCB course work until the Contractor submits samples of the materials intended for use and the Engineer accepts the mixture. Submit the samples at least 15 working days before the GCB course work begins.

TABLE 312-IA - JOB MIX FORMULA DESIGN CRITERIA	
HVEEM Method Mix Criteria	**Binder And Surface Course**
Stability, minimum	37
Swell, maximum (inch)	0.030
Percent air voids	3 - 8
Marshall Method Mix Criteria	**Binder And Surface Course**
Compaction, number of blows each end of specimen	75
Stability, minimum pounds	2,000
Flow, 0.01 inch	8 - 16
Percent air voids	4 - 8

TABLE 312-IB - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES			
Nominal Maximum Particle size, Inches	1.5	1.0	0.75
VMA, Percent HVEEM Method	11	12	13
VMA, Percent Marshall Method	12	13	14

312.03 Construction Requirements. Work in this section shall conform to Subsection 301.03 - Construction Requirements except as modified herein.

Upon completion of spreading operation, immediately compact the GCB course material according to Subsection 401.05(E) - Compaction.

The equipment shall conform to Subsection 401.05 - Construction Requirements except as modified herein:

(1) Use an appropriate method to add the crushed glass to the virgin

material. The method shall provide a positive control on proportioning of the crushed glass material into the mixture. The Contractor may use the same system to add crushed glass for plants equipped to add crushed reclaimed asphaltic concrete pavement. The finished mix temperature shall be at least 280 ^{o}F.

(2) Equip the paver with an electronic screed control device accepted by the Engineer. The electronic device shall include a grade controlling sensor mounted on each side of the paver. Each sensor shall take its grade reference from a 30-foot ski for the first pass. The Contractor may substitute one ski with a joint shoe riding on the finished adjacent pavement for subsequent passes.

The criteria on mat thickness shall be as follows:

(1) Contractor may spread and compact the mixture in one layer where the required thickness of GCB course is 6 inches or less.

(2) The Contractor shall spread and compact the mixture in two or more layers of approximately equal thickness where the required thickness of GCB course is more than 6 inches. The maximum compacted thickness of a layer shall not exceed 6 inches.

When crushed glass is not produced on that island, replace the GCB course with plant mix asphalt concrete base or recycled plant mix asphalt concrete according to Section 301 - Plant Mix Asphalt Concrete Base Course or Section 302 - Recycled Plant Mix Asphalt Concrete Base Course, respectively.

When the material price of the equivalent aggregate is less than the material price of the crushed glass, replace the GCB course with plant mix asphalt concrete base or recycled plant mix asphalt concrete according to Section 301 - Plant Mix Asphalt Concrete Base Course or Section 302 - Recycled Plant Mix Asphalt Concrete Base Course, respectively.

Cut samples from the compacted pavement for testing within 24 hours of lay down. The core's diameter of the cut pavement shall have a minimum of four inches. Take samples of the mixture for the full depth of the course at the location specified by the Engineer. Place and compact new material to conform to the surrounding area where samples were taken.

Apply tack coat to layers of GCB course for multiple lift construction. Tack coat shall conform to Section 407 - Bituminous Tack Coat.

312.04 Method of Measurement. The Engineer will measure the GCB course per ton according to Section 109 - Measurement and Payment, except as modified herein. The Engineer will not require conversion to tonnage based on bulk (dry) specific gravity.

312.05 Basis of Payment. The Engineer will pay for the accepted GCB course at the contract unit price per ton.

The price includes full compensation for furnishing, spreading, and compacting the GCB; sampling; restoring the area; and furnishing materials, equipment, tools, labors, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	Pay Unit
Plant Mix Glassphalt Concrete Base Course	Ton
Plant Mix Glassphalt Concrete Base Course for Temporary Pavement	Ton"

END OF SECTION

Make this Section a part of the Standard Specifications:

"SECTION 313 - CONTROLLED LOW STRENGTH MATERIAL (CLSM) FOR UTILITIES AND STRUCTURES

313.01 Description. This work includes furnishing and placing a CLSM as backfill material in utility trenches and other works where firm support is needed for pavements and structural elements.

313.02 Materials. CLSM is a mixture of portland cement, aggregate, and water. The Contractor shall proportion the CLSM to produce a backfill material that is self-compacting and capable of being excavated later with hand tools. The proportions of the CLSM shall:

(a) produce a uniform, flowable mixture that is essentially self-leveling when placed;

(b) have a 28-day compressive strength of approximately 50 psi to 150 psi; and

(c) conform to Section 601 - Structural Concrete.

Aggregates shall be from a source acceptable to the Engineer and conform to Subsection 703.01 - Fine Aggregate for Concrete. The Contractor may use aggregates that are different from Subsection 703.01 - Fine Aggregates for Concrete subject to acceptance by the Engineer. Aggregate shall stay in suspension in the CLSM to the extent required for proper flow.

313.03 Construction Requirements.

(A) Placement. Before placing any CLSM, thoroughly check the trench sides and bottom for cracks, voids, or other defects that may cause the flowable backfill to flow away from the trench. Plug or repair these defects. Do not place any flowable fill until the Engineer inspects the trench.

Place the CLSM to the designated fill line or as specified by the Engineer without vibration or other means of compaction. Provide sufficient mixing capacity to allow the CLSM to be placed without interruption.

Backfill the trenches to full depth minus the pavement thickness as shown in the contract or as specified by the Engineer. In pavement trenches, fill the pavement trenches so that the top of the flowable fill will not be beyond or higher than the bottom of any treated pavement structure.

The mixture shall fill all voids during the backfill operation. When drainage layers such as permeable bases and permeable separators are present, restore the drainage layers as part of the pavement structure.

When backfilling pipe culverts, secure the pipes within the backfill area by means of straps, soil anchors, or other means of restraints. Inform the Engineer of the proposed method of holding the culvert at the plan grade.

Seal the conduits as necessary to prevent grout getting into the conduits.

Place the CLSM by chute, pumping, or other methods acceptable by the Engineer. During placement operations around manholes and in utility trenches, place the CLSM evenly to avoid dislocating any conduits due to fluid pressure from the flowable fill. Place in stages as necessary to prevent uplift of unanchored conduits.

Pave or restore the pavement section no earlier than 8 hours after backfilling unless otherwise allowed by the Engineer. Protect the backfill material from traffic during the period before restoration of the pavement' section.

Curing of the CLSM is not necessary.

(B) Acceptance. Proportion and place the CLSM as specified herein. In general, the strength desired is the maximum hardness that can be excavated at a later date using conventional excavating equipment. Submit a manufacturer's certification of the CLSM and include the unconfined 28 day compressive strengths. The material certification shall include the actual test data for each mixture used.

313.04 Method of Measurement. When using CLSM, the Engineer will measure CLSM under Section 206 - Excavation and Backfill for Conduits and Structures. The Engineer will measure the volume for CLSM according to the contract or as specified by the Engineer.

313.05 Basis of Payment. The Engineer will pay for the accepted CLSM under Section 206 - Excavation and Backfill for Conduits and Structures. The price includes full compensation for submitting a manufacturer's certification; securing the pipes; furnishing and placing the CLSM; protecting the CLSM from traffic; and furnishing labor, material, tools, equipment, and incidentals necessary to complete the work.

END OF SECTION

Amend **Section 401 - Asphalt Concrete Pavement** to read as follows:

"SECTION 401 - ASPHALT CONCRETE PAVEMENT

401.01 Description. This section applies to the construction of asphalt concrete pavement on a prepared surface according to the contract.

Include pavement wearing course mixture and a binder course mixture when specified herein.

401.02 Materials. The plant mixed asphalt concrete includes a mixture of aggregate, filler or blending sand, if acceptable, and asphalt cement. Size, uniformly grade, and combine aggregates so that the resulting mixture meets the grading requirements of the job-mix formula. Conform to the following:

Asphalt Cement	702.01
Emulsified Asphalt	702.04
Aggregate for Hot Plant Mix Bituminous Pavement	703.09
Filler	703.15
Blending Sand	703.22
Hydrated Lime	712.03

Asphalt cement shall be PG 64-16.

401.03 Job-Mix Formula and Tests.

(A) Job-Mix Formula. Submit for acceptance, a job-mix formula for each mixture to be supplied for this project. The job-mix formula shall show the grade of cement in the mixture. Furnish only one grade of asphalt cement for the project. The Engineer may change the grade of the asphalt cement one step at no change in unit price. Make grade change only upon written acceptance by the Engineer. Submit a Certificate of Compliance, with substantiating test data, before using each lot or batch of asphalt cement. The Engineer will not accept the asphalt cement without adequate documentation.

The job-mix formula with allowable tolerances shall be within the master range for the type of asphalt concrete. The job-mix formula for a mixture shall be in effect until modified by the Engineer. Submit for acceptance a new job-mix formula before using the new material.

The job-mix formula for each mixture shall establish:

(1) a percent of aggregate passing each required sieve size,

(2) a percent of asphalt cement added to the aggregate, and

(3) a temperature the mixture is delivered to the point of discharge.

The job-mix formula of the mixture furnished shall be within tolerances in Table 401-I:

TABLE 401-I - RANGE OF TOLERANCES FOR JOB-MIX FORMULA	
Passing No 4 and larger sieves (%)	± 7
Passing No. 8 to No. 100 sieves (inclusive) (%)	± 4
Passing No. 200 sieve (%)	± 2
Bitumen (%)	± 0.4
Temperature of mixture (^{O} F)	± 20

When changing the source of material, establish a new job-mix formula before using the new material. When the results or conditions are unsatisfactory, the Engineer will require the Contractor to establish a new job-mix formula.

The Engineer may allow use of a nominal quantity of blending sand not exceeding 5% of the total weight of aggregate.

The Engineer may allow the use of filler material to correct deficiencies in materials passing the No. 200 sieve. Filler added shall not exceed 3% by weight of the fine aggregates.

Table 401-II - Limits of Bituminous Binder Content specifies the limits for each type of mixture. In case of dispute as to the optimum asphalt content, discontinue plant operations and allow the Engineer sufficient time to do the necessary laboratory testing. The Contractor may exceed the bituminous binder limits for porous aggregate only if acceptable in writing by the Engineer.

TABLE 401-II - LIMITS OF BITUMINOUS BINDER CONTENT					
MIX NO.	**I**	**II**	**IV**	**V**	**VI**
Used For	Binder Course	Binder or Surface Course	Surface Course	Surface Course	County Surface Course (Extra Fine)
Compacted Thickness Individual Layers (Inches)	1.5 to 3	1.25 to 3	1.25 to 3	0.75 to 3.0	1 to 2.5

Bituminous Binder Content Limits (% of dry weight of total aggregate)	4.0 - 6.5	4.5 - 6.5	4.5 - 6.6	5.0 - 7.5	6.0 - 8.0

(B) Tests. Base asphalt concrete job-mix formula on tests according to AASHTO T 245 (ASTM D 1559) or AASHTO T 246 (ASTM D 1560). The mixture shall conform to Table 401-IIIA - Job Mix Formula Design Criteria and Table 401 IIIB - Minimum Percent Voids in Mineral Aggregates. Submit the test data used to develop the job mix formula.

TABLE 401-IIIA - JOB-MIX FORMULA DESIGN CRITERIA	
HVEEM Method Mix Criteria	**Binder and Surface Course**
Stability, minimum	37
Swell, maximum (inch)	0.030
Air voids (%)	3 – 5
Marshall Method Mix Criteria	**Binder and Surface Course**
Compaction, Number of Blows each end of specimen	75
Stability, minimum (pounds)	1,800
Flow, 0.01 inch	8 – 16
Flow, 0.01 inch	3 – 5

TABLE 401-IIIB - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES					
Nominal Maximum Particle Size, (Inches)	1.5	1.0	0.75	0.50	0.375
VMA, (%) HVEEM Method	11	12	13	14	15
VMA, (%) Marshall Method	12	13	14	15	16

401.04 Bituminous Mixing Plant Requirements and Process.

(A) Plant Operation.

(1) Preparation of Asphalt Cement. Heat the asphalt cement to the specified temperature to avoid local overheating. Provide a continuous supply of the asphalt cement to the mixer at a uniform temperature.

(2) Preparation of Aggregate. Dry and heat the aggregate for the mixture to the required temperature. Do not exceed 320 degrees F. Properly adjust the flames used for drying and heating to avoid damage to the aggregate and soot on the

aggregate. The aggregate, when dried, shall not contain more than 1 percent moisture by weight.

Immediately after heating and drying, screen the aggregates for batch plants into three or more fractions as specified. Convey the aggregates into separate compartments ready for batching and mixing with asphalt cement.

(3) Mixing. Combine the dried aggregates in the mixer in the quantity of each fraction of aggregates required to meet the job-mix formula. Measure or gage and introduce the asphalt cement into the mixer in the quantity specified by the job-mix formula.

After introducing the required quantities of aggregate and asphalt cement into the mixer, mix the materials until a complete and uniform coating of the particles and a thorough distribution of the asphalt cement throughout the aggregate is secured. The Engineer will determine wet mixing time for each plant and for each type of aggregate used.

For hot mix bituminous pavement, produce the mixture at the lowest temperature for a workable mix; however, do not exceed 325 degrees F. Introduce the asphalt cement and aggregate into the mixer within 25 degrees F. of each other's temperature.

(B) Storage of Aggregates. Provide sufficient storage space for each size aggregate. Keep the different aggregate sizes separated until the aggregate is delivered to the system feeding the drier. Maintain the storage yard neatly and orderly. The separate stockpiles shall be readily accessible for sampling.

(C) General Requirements for Mixing Plants. Mixing plants shall be capable of handling the proposed bituminous construction.

(1) Scales. The scale requirements shall apply only where proportioning by weight is used;

(a) Plant Scales. Plant scales shall be accurate to 0.5% throughout the range to be weighed by the Contractor. The poises shall be locked in positions to prevent unauthorized change of position. Instead of plant and truck scales, an acceptable automatic printer system may be provided that prints the weights of the material delivered. Use a system with an acceptable automatic batching and mixing control system. Show evidence of such weights by a weight ticket for each load.

(6) Bins. Storage bins shall be divided into at least three compartments to provide separate storage of appropriate fractions of the aggregate. Provide each bin with overflow pipes, of such sizes and at such locations to prevent material from backing up into other compartments or bins. Provide each compartment with an individual outlet gate. The outlet gate shall not leak when closed. The gates shall cut off quickly and completely. The bins shall have means to sample the aggregates.

(7) Bituminous Control Unit. Provide satisfactory means, either by weighing or metering, to obtain the proper quantity of asphalt cement in the mixer within the tolerance specified. Provide means for checking the quantity or rate of flow of asphalt cement into the mixer.

(8) Thermometric Equipment. An armored thermometer of adequate range shall be included in the bituminous feed line near the charging valve at the mixer unit.

Also, the plant shall be equipped with a dial-scale, mercury-actuated thermometer, or an electric pyrometer placed at the discharge chute of the drier to register automatically or show the temperature of the heated aggregate. The heat indicating device shall be accurate to the nearest 10 degrees F. Install the heat indicating device such that it will reflect a fluctuation of 10 degrees F on the aggregate temperature within one minute.

The Engineer may require replacement of thermometers by an acceptable temperature-recording apparatus for better regulation of the aggregate temperature at no cost to the State.

(9) Dust Collector. The plant shall be equipped with a dust collector constructed to waste or return uniformly to the hot elevator the material collected.

(10) Safety Requirements. Provide adequate and safe stairways to the mixer platform and sampling points. Place guarded ladders to other plant units at points where accessibility to plant operations is required. Provide accessibility to the top of truck bodies by a platform or other suitable device to enable the Engineer to obtain sampling and mixture temperature data. Provide a hoist or pulley system to raise scale calibration equipment, sampling equipment and other similar equipment from the ground to the mixer platform and return. Thoroughly guard and protect gears, pulleys, chains, sprockets and other dangerous moving parts. Provide ample and unobstructed space on the mixing platform. Maintain a clear and unobstructed passage in

Measurement Standards Division of the State Department of Agriculture or its authorized representatives will inspect and seal the scale as often as the Engineer may deem necessary to assure their continued accuracy. Have not less than ten 50 pound weights for testing the scales.

(b) Truck Scales. Weigh the bituminous mixture on acceptable scales furnished by the Contractor or on public scales at no cost to the State. The Measurement Standards Division of the State Department of Agriculture or its authorized representatives shall inspect and seal such scales as often as the Engineer deems necessary.

(2) Equipment for Preparation of Asphalt Cement. The storage tanks for the asphalt cement shall be equipped to heat and hold the material at the required temperature. The tanks shall be heated by steam coils, or electricity so no flame is in contact with the tank. The circulating system for the asphalt cement shall assure proper and continuous circulation during the operating period.

Equip storage tanks with provisions for measuring and sampling of material. Calibrate the asphalt storage tanks to an accuracy of tgwo percent of the actual amount stored its storage capacity. The storage tank shall be accessible for measuring. Install a sampling outlet including a valve in the bitumen feed lines connecting the plant storage tanks to the bitumen weighing system or spray bar, so samples from the line may be withdrawn slowly during plant operation. Install the sampling outlet between the pump and the return line discharge in such a location that the sampling outlet is readily accessible and free from obstruction. Provide a drainage receptacle for flushing the outlet before sampling.

(3) Feeder for Drier. Provide an accurate mechanical means for uniformly feeding the aggregate into the drier so a uniform production and uniform temperature can be obtained.

(4) Drier. Include driers that continuously agitate the aggregate during the heating and drying process.

(5) Screens. Provide plant screens, capable of screening aggregates to the specified sizes and proportions and having normal capacities greater than the full capacity of the mixer.

and around the truck loading area. Keep this area free of drippings from the mixing platform.

(11) Mineral Filler Feed. Feed the filler, when used, to an accuracy of 10 percent of the required weight. Thoroughly dry the filler. Do not feed the filler through the drier system. Feed the filler material directly into the mixer as near the center as possible for batch type operation.

(D) Requirements for Batching Plants.

(1) Weigh Box or Hopper. Include a means for accurately weighing each size of aggregate in a weigh box or hopper suspended on scales and ample in size to hold a full batch without hand raking or running over. The gate shall close tightly so that no material shall leak into the mixer while weighing a batch.

(2) Asphalt Cement Control. The equipment used to measure the asphalt cement shall be accurate to within ± 0.5 percent. The asphalt cement bucket shall be a non-tilting type with a loose sheet metal cover. Introduce the binder uniformly into the mixer along the center of the mixer parallel to the mixer shafts, or by pressure spraying. Heat the discharge valve or valves and spray bar of the asphalt cement bucket adequately. Drain the steam jackets efficiently, when used. The connections shall not interfere with the efficient operation of the bituminous scales. The capacity of the asphalt cement bucket shall be at least 15 percent greater than the weight of asphalt cement required in batches. The plant shall have an adequately heated, quick-acting, non-drip, charging valve located directly over the asphalt cement bucket.

The indicator dial shall have a capacity of at least 15 percent greater than the quantity of asphalt cement used in a batch. The dial shall be in full view of the mixer operator. Discharge the asphalt cement required for one batch in not more than 15 seconds after the flow has started. The size and spacing of the spray bar openings shall provide a uniform application of asphalt cement for the full length of the mixer. Provide the section of the bituminous line between the charging valve and the spray bar with a valve and outlet for checking the meter when a metering device is substituted for an asphalt cement bucket.

(3) Mixer. The batch mixer shall be capable of producing a uniform mixture within the job-mix tolerances. When not enclosed, equip the mixer box with a dust hood to prevent loss of dust. The mixer shall be leak-tight.

The clearance of blades from fixed and moving parts shall not exceed one inch unless the maximum diameter of the aggregate in the mix exceeds 1.25 inches, in which case the clearance shall not exceed 1.5 inches.

(4) Control of Mixing Time. The mixer shall have a timing device that shows by a definite audible or visual signal the expiration of the mixing period. The device shall accurately measure the time of mixing to within five seconds.

The dry mixing period is defined as the interval of time between the opening of the weigh box gate and the start of introduction of asphalt cement. The wet mixing period is the interval of time between the start of introduction of asphalt cement and the opening of the mixing gate.

(E) Requirements for Continuous Mixing Plants.

(1) Aggregate Proportioning. The plant shall include means for accurately proportioning each size of aggregate.

The plant shall have a feeder mounted under each compartment bin. Each compartment bin shall have an accurately controlled individual gate to form an orifice for volumetrically measuring the material drawn from each compartment. The feeding orifice shall be rectangular with one dimension adjusted by positive mechanical means provided with a lock.

Each gate shall have indicators to show the respective gate opening in inches.

The fine bin shall have a vibrating unit. Provide a positive system to show the level of material in each bin, and as the level of material in one bin approaches the strike-off capacity of the feed gate, the device shall automatically close down the plant instantly. The Engineer will not permit the plant to operate unless this automatic system is in good working condition.

(2) Weight Calibration of Aggregate Feed. Calibrate gate openings by weighing test samples. Make provisions so that the materials fed out of individual orifices may be bypassed to individual test boxes. Equip the plant to conveniently handle individual test samples weighing not less than 200 pounds. Provide accurate scales of adequate capacities to weigh such test samples.

(3) Synchronization of Aggregate Feed and Asphalt Cement Feed. Provide means to afford positive interlocking control between the flow of aggregate from the bins and the flow of asphalt cement from the meter or other proportioning device satisfactorily. Control this by interlocking mechanical means.

The mechanically driven aggregate feeders shall be connected directly with the drive on the asphalt binder pump. Equip the drive shaft on the feed with a revolution counter reading to 1/100 revolution and with sufficient capacity to register the total number of revolutions in a day's run.

(4) Mixer. Include a continuous mixer of an acceptable type, adequately heated and capable of producing a uniform mixture within the job-mix tolerances.

The mixer shall have a discharge hopper with dump gates that will permit rapid and complete discharge of the mixture. The paddles shall be adjustable for angular position on the shafts and reversible to retard the flow of the mix. The mixer shall have a manufacturer's plate giving the net volumetric contents of the mixer at the several heights inscribed on a permanent gage. Provide charts showing the rate of feed of aggregate per minute for the aggregate being used.

(F) Requirements for Drier-Drum Mixing Plant.

(1) Cold Storage for Plants Utilizing Cold-Feed Control. Drier-drum plants equipped with cold-feed control shall separate the virgin aggregate for Asphalt Concrete Mix No. II into three or more sizes. Separate the virgin aggregate for Asphalt Concrete Mix Nos. III, IV, V and VI into two or more sizes. Request written acceptance from the Engineer when separating the aggregate for Asphalt Concrete Mix No. II into less than three sizes.

After separating the aggregates, store each size separately. Each of the storage, except storage for filler material, shall contribute a minimum of 10 percent to the total weight of the aggregate.

(2) Drying. Feed the aggregates directly to a drier-drum mixer at a uniform rate.

The drier-drum mixer shall have a device that shows the temperature of the material leaving the drier-drum mixer. The temperature-indicating device shall be accurate to the nearest 10

^{O}F and show changes of 10 degrees F. in temperature of the material within one minute.

The drier-drum mixers shall have dust collectors. The dust shall be disposed of or returned to the aggregate.

(3) Proportioning for Continuous Mixing. Introduce the asphalt binder into the mixer at constant pressure through a meter. Install a gage for checking said pressure. The system shall be capable of varying the rate of delivery of binder. During production, the temperature of asphalt binder shall not vary more than 40 degrees F. Heat and insulate the meter and lines. Equip the binder storage with a device for automatic plant cut-off when the level of binder is lowered sufficiently to expose the pump suction line.

When using filler, proportion the filler by weight or volume by a method that uniformly feeds the material within ten percent of the required amount. Discharge the filler material from the proportioning device directly into the mixer.

(4) Proportioning for Drier-Drum Mixing with Cold-Feed Control. When using cold-feed control with drier-drum mixing, equip the asphalt feeder, the aggregate feeders, the filler material feeder, and the combined aggregate feeder with devices by which the rate of feed can be determined while the plant is in full operation.

Weigh the combined aggregate using a belt scale. The belt scale shall be of such accuracy that, when the plant is operating between 30% and 100% of belt capacity, the average difference between the shown weight of material delivered and the actual weight delivered shall not exceed one percent of the actual weight for three two-minute runs. For the three individual two-minute runs, the shown weight of material delivered shall not vary from the actual weight delivered by more than two percent of the actual weight. Determine the actual weight of material delivered by a vehicle platform scale that has been sealed. Equip the plant so that the this accuracy check can be made after each relocation and set-up, but before the first operation and at other times as required by the Engineer.

Interlock the belt scale for the combined aggregate, the proportioning devices for filler material, and the asphalt proportioning meter so that the rates of feed of the aggregates and asphalt shall be adjusted automatically to maintain the bitumen ratio (pounds of asphalt per 100 pounds of dry aggregate including filler if used) according to the approved mix design. Do not operate the plant unless this automatic system is operating.

Equip the asphalt meters and aggregate belt scales used for metering the aggregates and asphalt into the mixer with resettable totalizers, so that the actual asphalt and aggregate introduced into the mixer can be determined.

Equip the bin(s) containing the fine aggregate and filler with a vibrating unit. Before the quantity of material in one bin reaches the strike-off capacity of the feed gate, a device shall automatically close down the plant.

Determine the moisture content of the aggregate at least once during each production day. Adjust the moisture control equipment accordingly.

In the absence of an acceptable aggregate sampling device for the combined aggregate at a point before the aggregate enters the drum drier and while the plant is in full operation, provide other suitable sampling means acceptable to the Engineer.

When using filler, install a suitable, safe sampling device in each feed line or surge tank preceding the proportioning device for the filler.

(5) Drier-Drum Mixing. Mix the aggregate, filler and asphalt binder in a drier-drum mixer. Mixing shall continue for a sufficient time and at a sufficiently high temperature that, at discharge from the mixer, the sizes of aggregates are uniformly distributed through the completed mixture and particles are thoroughly and uniformly coated with asphalt binder.

Discharge the drier-drum mixer into a storage silo or into a surge bin. Provide a means of diverting the flow of asphalt concrete away from the silo or surge bin, when starting and stopping the plant production, to prevent incompletely mixed portions of the mixture from entering the silo.

When using a surge bin:

a. do not hold the mixture beyond one hour,

b. do not segregate the mixture,

c. the mixture shall not be lumpy, and

d. the mixture shall meet temperature and quality requirements of the contract.

The burner used for heating the aggregate in the drier-drum shall achieve complete combustion of the fuel.

(G) Asphalt Concrete Storage. Store the asphalt concrete only in silos. Do not stockpile the asphalt concrete. The minimum quantity of asphalt concrete in storage during mixing shall be 20 tons except for the period immediately following a shutdown of the plant of two hours or more. Provide a means to show that the storage into each silo as required is maintained.

Equip the storage silo to prevent segregation of the completed mixture as the mixture is discharged into the silo.

Do not use asphalt concrete with hardened lumps in the mixture. Do not use the storage facilities that contained the material with the hardened lumps for further storage until the cause of the lumps is corrected.

401.05 Construction Requirements.

(A) Weather Limitations. Do not place the bituminous plant mix:

(1) on wet surfaces, as determined by the Engineer, or

(2) when the air temperature is below 50 degrees F. or

(3) when weather conditions prevent the proper handling or finishing of the bituminous mixtures.

(B) Equipment.

(1) Hauling Equipment. Trucks hauling bituminous mixtures shall have tight, clean, smooth and metal beds that have been thinly coated with a minimum quantity of detergent, paraffin oil, or lime solution to prevent the mixture from adhering to the beds. The use of diesel or petroleum-based liquids, except for paraffin oil, to prevent the mixture from adhering to the beds is prohibited.

Each truck shall have a canvas cover to protect the mixture from the weather. Protect each load from the weather with covering securely fastened on all four sides of the truck bed.

Each truck shall raise their beds with tailgate closed before discharging to prevent segregation.

Do not refuel equipment over newly paved surfaces. Refuel equipment over a catch pan or a surface that will prevent

the fuel from coming in contact with the asphalt pavement. After the refueling operation is completed, remove the above devices until needed.

(2) **Bituminous Pavers.** Bituminous pavers shall be:

(a) self-contained, power-propelled units,

(b) provided with an activated screed or strike-off assembly, heated if necessary, and

(c) capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thicknesses shown in the contract.

Equip the paver with a receiving hopper having sufficient capacity for uniform spreading operation. Equip the hopper with a distribution system to place the mixture uniformly in front of the screed.

Prior to each days paving operation, check the screed or strike-off assembly surface with a straight edge to insure straightness. The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture. When the spreading equipment leaves ridges, indentations, or other marks in the surface that cannot be eliminated by rolling or prevented by adjustment in operation, discontinue its use and furnish other acceptable equipment.

Equip the paver with an acceptable electronic screed control device. The electronic device shall include a grade sensor mounted on each side of the paver. Each sensor shall take its grade reference from a 30-foot ski for the first pass. For subsequent passes, the Contractor may substitute one ski with a joint-matching shoe riding on the finished adjacent pavement.

Demonstrate the competence of personnel operating the grade and crown control device according to the contract before placing surface courses. When the automatic control system becomes inoperative during the day's work, the Engineer will permit the Contractor to finish the day's work using manual controls. Do not resume work thereafter until the automatic control system is made operative. The Engineer may waive the use of the electronic screed control device when paving gores, shoulders, or transitions and miscellaneous reconstruction areas.

When laying mixtures, the paver shall be capable of operating at forward speeds consistent with satisfactory laying of the mixture. Do not change the forward speed of the paver after start of paving operation. If necessary, the Engineer will limit the load of the haul vehicle such that the Contractor will get satisfactory spreading.

(3) Rollers. Rollers shall be the self-propelled, steel-tired tandem pneumatic-tired or vibratory type. Rollers shall be capable of reversing without backlash. The number and weight of rollers shall be sufficient to compact the mixture to the required density while the mixture is still in a workable condition. Do not use equipment that results in excessive crushing of the aggregate. Operate the rollers according to the manufacturer's recommendations.

(a) Steel-Tired Tandem Rollers. Check the steel-wheel rims for wear. When the rolling drum is grooved or pitted, do not use the roller. Excessively worn scrapers and wetting pads shall be replaced.

Steel-tired tandem rollers used for breakdown (initial) or intermediate rolling passes shall have a minimum gross weight of 12 tons. Steel-tired tandem rollers shall provide a minimum of 250 pound weight per linear inch of width on the compaction roller (drive wheel).

Steel-tired tandem rollers used for finish (final) rolling passes shall have a minimum gross weight of eight tons.

(b) Pneumatic-Tired Rollers. Pneumatic tire rollers shall be the oscillating type with smooth (tread) pneumatic tires of equal size and diameter. Inflate and maintain the tires to the designated pressure so that the air pressure will not vary more than five psi from the established pressure. Space the tires so that the gaps between adjacent tires are covered by the following tires.

The pneumatic-tired rollers used for breakdown or intermediate rolling passes shall have a total weight that can be varied to produce an operating weight per tire of not less than 3,000 pounds. The tires shall have a minimum wheel diameter of 20 inches. The tire inflation pressure shall be within 70 psi to 75 psi when cold and 90 psi when hot. During cold or windy weather condition, equip the rollers with

skirt-type devices (mounted around the tires) to maintain the temperature of the tires during rolling operations.

The pneumatic-tired rollers used for kneading a finished asphalt surface shall have a total weight that can be varied to produce an operating weight per tire of not less than 1,500 pounds. The tires shall have a minimum wheel diameter of 15 inches and a 50 psi to 60 psi tire inflation pressure.

(c) Vibratory Rollers. Vibratory rollers shall be steel-tired tandem rollers, having a minimum weight of 7 tons. The vibratory rollers shall have amplitude and frequency controls, speedometer, and be specifically designed to compact the material on which the vibratory roller is used. Operate the vibratory roller according to the manufacturer's recommendations.

(4) Hand Tools. Keep hand tools used in the production, hauling, or placement of asphalt concrete pavement clean and free of contaminants. Liquids, such as diesel or mineral spirits, may be used to clean the hand tools. Do not contaminate the asphalt concrete pavement with cleaning liquids. Clean hand tools over a catch pan with the capacity to hold all the cleaning liquid in the container should it spill. Dry the hand tools before using with the asphaltic material.

(5) Material Transfer Vehicle (MTV). The use of MTV's is only for paving projects on the island of Oahu.

Use a Material Transfer Vehicle when placing the surface course of the asphalt concrete pavement. Areas where the MTV is not required include auxiliary lanes less than 0.1 mile long, bridge deck approaches, ramps, shoulders, side streets, tapers and turning lanes. The MTV shall independently deliver mixtures from the hauling equipment to the paving equipment. A paver hopper insert with a minimum capacity of ten tons shall be installed in the hopper of conventional paving equipment when a MTV is used.

The MTV shall have a truck unloading system which receives mixture from the hauling equipment; a storage bin with a minimum capacity of 15 tons; an auger system in the storage bin to continuously blend the mixture prior to discharging it to a conveyor system;.

If the MTV exceeds legal axle or total weight limits for vehicles, see Subsection 105.13 - Load Restrictions for requirements when crossing bridges.

(C) Preparation of Surface. Before laying the asphalt concrete pavement, prepare the surface according to the contract. For resurfacing work, surface preparation shall include the removal of traffic tapes, and raised pavement markers, prior to application of the tack coat. The removal of thermoplastic line markings and epoxy adhesives are not required. When the prepared surface becomes damaged or unsatisfactory, repair the damaged or unsatisfactory surface at no cost to the State before work proceeds.

Paint the contact surfaces of curbs, gutters, manholes, and other structures with a thin, uniform coating of asphalt paint before placing the bituminous mixture against them.

For resurfacing work, bring irregular surfaces to uniform grade and cross section before paving the existing pavement. Fill and compact the holes, cracks and wheel ruts with Asphalt Concrete Pavement, Mix No. V, before resurfacing. Also, mark the location of existing manholes, valves, and handholes on the roadway so the location after paving can be determined. Unless otherwise noted, adjust all existing frame and cover to new finish pavement finish grade after finish pavement is completed.

(D) Spreading and Finishing. Lay, spread, and strike off the mixture upon an acceptable surface to the grade and elevation established. Use the bituminous pavers to distribute the mixture either over the entire width or over such partial width as may be practicable.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately 6 inches; however, the joint in the top layer shall be at the centerline of the pavement when the roadway comprises two lanes of width, or at lane lines when the roadway is more than two lanes in width.

The minimum temperature of the bituminous mixture as discharged to the paver shall not be less than 250 degrees F.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute the mixture by hand tools. For such areas, dump, spread, and screed the mixture to give the required compacted thickness.

When the production of the mixture can be maintained and when practicable, use the pavers in echelon to place the wearing course in adjacent lanes.

When the lanes are required to be opened to public traffic, pave the full travelway or total width of roadway each day. However, at the discretion of the Engineer, the Contractor may construct a transition taper at the longitudinal pavement drop so as not to leave a vertical face. The transition taper shall be along the lane line and formed by a one foot slope

shoe attached on the paving machine, that would produce a wedge with a maximum height of three inches down to zero inch. Remove the transition taper before placing adjacent lifts.

The minimum and maximum allowable laying thicknesses for the various types of mixture are specified in Table 401-II - Limits of Bituminous Binder Content.

(E) Compaction. Immediately after spreading and striking off the bituminous mixture and adjusting surface irregularities, thoroughly and uniformly compact the mixture by rolling.

Initiate the compaction of the mixture when the mix temperature is the highest at which the mixture can be compacted without excessive horizontal movement. The temperature shall not be less than 220 degrees F.

tUse pneumatic or steel-tired tandem rollers for initial or breakdown rolling. Do not use pneumatic tire rollers for initial or breakdown rolling on final lifts of a traveled way including auxiliary lanes.

Finish rolling using a tandem roller weighing not less than eight tons. Roll at or above 175 degrees F.

Rolling shall begin at the sides and proceed longitudinally parallel to the road centerline, each trip overlapping half the roller width, gradually progressing to the crown of the road. When using vibratory roller, the overlap shall be less than 6 inches. When paving in echelon or abutting a previously placed lane, roll the longitudinal joint first followed by the regular rolling procedures. On superelevated curves, the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the centerline.

Correct the displacements occurring as a result of the reversing direction of a roller, or from other causes, at once by the use of rakes and addition of fresh mixture when required. Roll so as not to displace the line and grade of the edges of the bituminous mixture.

To prevent adhesion of the mixture to the rollers, keep the wheels properly moistened with water or water mixed with very small quantities of detergent. The Engineer will not permit excess liquid. Do not use diesel or petroleum-based liquids on the rollers.

Along forms, curbs, headers, walls and other places not accessible to the rollers, thoroughly compact the mixture with hot hand tampers, smoothing irons or with mechanical tampers. On depressed areas, use a trench roller or cleated compression strips under the roller to transmit compression to the depressed areas.

When the mixture becomes loose and broken, mixed with dirt, or is defective, remove, replace, and compact the mixture with fresh hot mixture to conform with the surrounding area. Remove and replace areas showing an excess or deficiency of asphalt cement.

Rollers shall move at a slow but uniform speed with the drive wheels nearest the paver. Continue the rolling to attain the desired density and until the roller marks are eliminated.

(1) Courses Equal to or Greater Than 1.5 Inches Thick. The relative compaction requirement for pavement courses that have a nominal compacted thickness equal to or greater than 1.5 inches shall be not less than 91% nor greater than 96% based on AASHTO T 209 modified by deletion of supplemental procedure for Mixtures Containing Porous Aggregate. The type of rollers and their relative position in the compaction sequence shall generally be the Contractor's option.

(2) Courses Less Than 1.5 Inches Thick. Compaction to a specified density for pavement courses that have a nominal compacted thickness of less than 1.5 inches will not be required.

Initiate rolling by a non-vibratory steel-tired tandem roller.

Do intermediate rolling by a pneumatic tired roller. The rolling shall continue until after compacting the entire surface by a minimum of four coverages of the roller. Do additional coverages as necessary to obtain thorough compaction of the mixture.

Finish the rolling using a steel-tired tandem roller. Continue rolling until the entire surface has been compacted by a minimum of three coverages of the roller and the roller marks have been eliminated.

Do not use the vibratory roller.

(3) Special Areas Not Designed For Vehicular Traffic. The relative compaction of areas such as bikeways not shown as part of the roadway and other areas not subjected to vehicular traffic shall be not less than 90 percent based on AASHTO T 209 modified by deletion of supplemental procedure for mixture containing porous aggregate. The type of rollers and their relative position in the compaction sequence shall generally be the Contractor's option. However, the Contractor shall increase the asphalt content by at least 0.5 percent above that used for asphaltic concrete pavements.

(F) Joints. Placing of the bituminous paving shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture. Form the transverse and longitudinal joints by cutting back on the previous run to expose the full depth of the course. Use a brush coat of asphalt paint on contact surfaces of transverse and longitudinal joints before placing additional mixture against the previously rolled material.

(G) Pavement Samples. Cut samples from the compacted pavement for testing within 48 hours of lay down. The cut pavement samples shall be 12 inches by 12 inches or four inch diameter cores, minimum. Take samples of the mixture for the full depth of the course at the location shown by the Engineer. Place and compact the sampled area with new materials to conforming with the surrounding area.

(H) Surface Tolerances. The Engineer will test the surface using a ten- foot straightedge at selected locations. The variation of the surface from the testing edge of the straightedge between two contacts with the surface shall not exceed 3/16 inch.

The thickness of the finished pavement shall be within 0.02 foot of the planned thickness at points of the cross section.

When specified by the Engineer, correct irregularities of the pavement exceeding the above limits including removal and replacement at no cost to the State.

(I) Protection of Pavement. In multiple layer construction, the Engineer will not permit construction equipment except those directly connected with paving operations, on intermediate layers without written authorization by the Engineer. An intermediate layer is defined as layers other than the finished surface layer.

The Engineer will not permit traffic on courses of asphalt concrete until the asphalt concrete has cooled and set, except such traffic as may be necessary for construction purpose.

(J) Tack Coat. Apply tack coat to bituminous and concrete surfaces before placing the asphalt concrete pavement. The tack coat shall conform to Section 407 - Bituminous Tack Coat.

401.06 Method of Measurement. The Engineer will measure asphalt concrete pavement per ton.

401.07 Basis of Payment. The Engineer will pay for the accepted asphalt concrete pavement at the contract unit price per ton complete in place.

The price includes full compensation for preparing the surface; removing and disposing of all existing raised pavement markers and traffic tapes; furnishing the asphalt concrete pavement; spreading, furnishing, applying, and protecting the tack coat; compacting, and finishing the asphalt concrete pavement; sampling; protecting the pavement; and furnishing labor, material, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Asphalt Concrete Pavement, Mix No. _____	Ton"

The Engineer may, in lieu of requiring removal and replacement, use the sliding scale pay factor to accept asphalt concrete pavements compacted below 91% and above 96%. The Engineer will make payment for the material in that production day at a reduced price arrived at by multiplying the contract unit price by the pay factor as shown in Table IV.

TABLE IV - SLIDING SCALE PAY FACTOR	
Percent Compaction	**Percent Payment**
>97	Removal
97	95
91 – 96	100
90	90
<90	Removal

END OF SECTION

Delete **Section 402 - Bituminous (Four Application) Macadam Pavement (Emulsified Asphalt)** in its entirety and replace it with the following:

"SECTION 402 - SUPERPAVE ASPHALT CONCRETE PAVEMENT

402.01 Description. This section is for constructing one or more courses of superpave plant mixed asphalt concrete pavement on a prepared surface according to the contract. General requirements for all asphalt concrete pavements as specified in Section 401 are applicable to this section, subject to any exceptions contained herein.

402.02 Materials. Materials shall conform to the following:

(A) Performance Graded (PG) Binder. Performance graded binder shall conform to Performance Graded Asphalt Binder Specifications, AASHTO MP1. Submit, before usage, a Certificate of Compliance, accompanied by substantiating test data, showing conformance with Performance Graded Asphalt Binder Specification. The Engineer will not accept the PG binder without adequate documentation.

PERFORMANCE GRADED [illegible] FOR SUPERPAVE MIXES	
MIX	BINDER*
Superpave Hot Mix Asphalt for Surface Course (SHMA)	PG 64-16 or PG 70-16
* When necessary, neat asphalt with polymer modification shall be used to achieve the specified performance grading.	

(B) Aggregates. Make mineral aggregate by crushing and screening hard, tough, durable stone of uniform quality. Crushed aggregate shall be free from soft or disintegrated pieces, clay, dirt, or other deleterious substances.

Coarse aggregate shall be that portion of the mineral aggregate retained on the No. 4 sieve. Fine aggregate shall be that portion of the mineral aggregate passing the No. 4 sieve.

When tested according to the designated methods, the combined mineral aggregate shall meet the following requirements:

Test	Test Method	Requirement
Soundness	AASHTO T 104 (5 cycles using sodium sulfate)	9% Maximum
Clay Lumps & Friable Particles	AASHTO T 112	0.25% Maximum coarse aggregate 1.0% Maximum fine aggregate
Flat and Elongated Particles (Length to thickness ratio of 3:1)	ASTM D 4791 (by Weight)	20% Maximum
Los Angeles Abrasion	AASHTO T 96	40% Maximum
Sand Equivalent	AASHTO T 176	50% Minimum
Fine Aggregate Angularity	AASHTO T 304, Method A	45% Minimum
Stripping	AASHTO T 182	Above 95%
Gradation	AASHTO T 27 AASHTO T 11	See Table 402-1
Absorption	AASHTO T84 & T85	5% Maximum

At least 90% by weight of the material retained on the No. 4 sieve shall consist of crushed particles. At least 70% of the material passing the No. 4 sieve and retained on the No. 8 sieve shall consist of crushed particles. A crushed particle is one having at least one mechanically fractured face. A face is considered fractured if it has a projected area that is at least 0.25 of the maximum projected area of the particle.

(C) Aggregate Blend. Size, uniformly grade, and combine coarse and fine aggregate fractions to produce a job-mix formula that meets the gradation requirements of Table 402-1. Blended aggregate gradation curves shall not pass outside of the maximum and minimum control points.

Table 402-1 Aggregate Gradation Control Points 3/4 inch Nominal Maximum Size Mix		
SIEVE SIZE	General Power Percent Passing	
	LOWER	UPPER
1 inch	100.0	100.0
3/4 inch	90.0	100.0
1/2 inch	-	90.0
No. 8	23.0	49.0
No. 200	2.0	8.0

402.03 Job-Mix Formula. Design the job-mix formula according to AASHTO PP28 modified by deletion of Section 11 - Evaluating Moisture Susceptibility.

Table 402-2 Design Criteria	
$N_{initial}$, N_{design}, N_{max}	8, 100, 160
Air Voids at N_{design}	4%
Voids in Mineral Aggregate (VMA) at N_{design} (for 3/4 inch Nominal Maximum Particle Size)	13.0% Minimum
Voids Filled with Asphalt (VFA)	65 - 75 %
Density at $N_{initial}$ (% of Theoretical Maximum Specific Gravity)	Not more than 89.0 %
Density at N_{design} (% of Theoretical Maximum Specific Gravity)	96.0 %
Density at N_{max} (% of Theoretical Maximum Specific Gravity)	Not more than 98.0%
Dust to Binder Ratio	0.8 to 1.6

Submit the job-mix formula at least 15 working days before production. The job-mix formula shall include:

(1) Design percent of aggregate passing each required sieve size,

(2) Design percent of PG binder material added to the aggregate (expressed as % by weight of total mix), and

(3) Temperature at which the mixture is delivered to the point of discharge,

(4) Source of aggregate,

(5) Grade of PG binder,

(6) Test data used to develop job-mix formula.

Mixtures shall meet the requirements of Table 402-1 and Table 402-2 without exceeding allowable tolerances in Table 402-3.

Table 402-3 – Range of Tolerances for Job-Mix Formula

Passing No. 4 and larger sieves	± 6%
Passing No. 8 to No. 100 sieves (inclusive)	± 4%
Passing No. 200 sieve	± 2%
Binder Content (expressed as % by weight of total mix)	± 0.4%
Temperature of Mixture	± 20° F
Voids, total mix	± 1.0%

402.04 Bituminous Mixing Plant Requirements and Process. Construction requirements shall be as specified in Subsection 401.04, except as follows:

(A) Plant Operation.

(1) Preparation of Aggregate. Dry and heat the aggregate for the mixture to the required temperature. Do not exceed 340 degrees F. Properly adjust the flames used for drying and heating to avoid damage to and contamination of the aggregate. When dried, the aggregate shall not contain more than 1 percent moisture by weight.

Immediately after heating and drying, screen the aggregates for batch plants into three or more fractions as specified. Convey the aggregates into separate compartments ready for batching and mixing with asphalt binder.

(2) Mixing. Combine the dried aggregates in the mixer in the

quantity of each fraction of aggregates required to meet the job-mix formula. Measure or gage and introduce the asphalt binder into the mixer in the quantity specified by the job-mix formula.

After introducing the required quantities of aggregate and asphalt binder into the mixer, mix the materials until a complete and uniform coating of the particles and a thorough distribution of the asphalt binder throughout the aggregate is secured. The Engineer will determine wet mixing time for each plant and for each type of aggregate used.

For superpave hot mix asphalt pavement, produce the mixture within the temperature range determined from the Viscosity-Temperature graph. Introduce the asphalt binder and aggregate into the mixer within 25 F. degrees of each other's temperature.

(B) Requirements for Drier-Drum Mixing Plant.

(1) Cold Storage for Plants Utilizing Cold-Feed Control. Drier-drum plants equipped with cold-feed control shall separate the virgin aggregate for superpave mixes into three or more sizes.

After the aggregate is separated, store each size separately. Each of the storages, except storages for filler material, shall contribute a minimum of 10% to the total weight of the aggregate.

402.05 Construction Requirements. Construction requirements shall be as specified in Subsection 401.05, except as follows:

(A) Spreading and Finishing. Lay, spread, and strike off the mixture upon an acceptable surface to the grade and elevation established. Use the bituminous pavers to distribute the mixture either over the entire width or over such partial width as may be practicable.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately six inches; however, the joint in the top layer shall be at the centerline of the pavement when the roadway comprises two lanes of width, or at lane lines when the roadway is more than two lanes in width.

The minimum temperature of the bituminous mixture as discharged to the paver shall not be less than 250 degrees F.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute the mixture by hand tools. For such areas, dump, spread,

and screed the mixture to give the required compacted thickness.

When the production of the mixture can be maintained and when practicable, use the pavers in echelon to place the wearing course in adjacent lanes.

When the lanes are required to be opened to public traffic, pave the full travelway or total width of roadway each day. However, at the discretion of the Engineer, the Contractor may construct a transition taper at the longitudinal pavement drop so as not to leave a vertical face. The transition taper shall be along the lane line and formed by a one-foot slope shoe attached on the paving machine, that would produce a wedge with a maximum height of three inches down to zero inch. Remove the transition taper before placing adjacent lifts.

The minimum and maximum allowable laying thicknesses for the superpave mixture shall be two inch minimum thickness and three and three fourths inch maximum thickness.

(B) Compaction. Immediately after spreading, striking off the bituminous mixture, and adjusting surface irregularities, thoroughly and uniformly compact the mixture by rolling.

Initiate compaction of the mixture within the temperature range determined from the Temperature-Viscosity graph that does not produce excessive horizontal movement.

Use pneumatic or steel-tired tandem rollers for initial or breakdown rolling.

Finish rolling using a tandem roller weighing at least eight tons.

Rolling shall begin at the sides and proceed longitudinally parallel to the road centerline, each trip overlapping half the roller width, gradually progressing to the crown of the road. When using a vibratory roller, the overlap shall be less than six inches. When paving in echelon or abutting a previously placed lane, roll the longitudinal joint first; follow with the regular rolling procedures. On superelevated curves, the rolling shall begin at the low side and progress to the high side by overlapping longitudinal trips parallel to the centerline.

Correct displacements resulting from the reversing direction of a roller, or from other causes by use of rakes and addition of fresh mixture when required. Roll so as not to displace the line and grade of the edges of the bituminous mixture.

To prevent adhesion of the mixture to the rollers, keep the wheels

properly moistened with water, water mixed with very small quantities of detergent. The Engineer will not permit excess liquid. Do not use diesel or petroleum-based liquids on the rollers.

Along forms, curbs, headers, walls and other places not accessible to the rollers, thoroughly compact the mixture with hot hand tampers, smoothing irons or with mechanical tampers. On depressed areas, use a trench roller or cleated compression strips under the roller to transmit compression to the depressed areas.

When the bituminous mixture becomes loose and broken, contaminated, or defective as determined by the Engineer, remove, replace and compact with fresh, hot mixture. Remove and replace areas showing an excess or deficiency of bituminous material.

Rollers shall move at a slow but uniform speed with the drive wheels nearest the paver. Continue the rolling to attain the desired density and eliminate roller marks.

The relative compaction requirement for superpave courses that have a nominal compacted thickness of two inches or greater shall not be less than 93 percent nor greater than 97 percent based on AASHTO T 209 modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. The type of rollers and their relative position in the compaction sequence shall be the Contractor's option.

(C) Pavement Smoothness.

(1) Description. This specification is to provide an incentive for contractors to construct the smoothest riding pavements possible. Smoothness of the pavement will be determined on the final pavement surface.

(2) Pavement Smoothness Requirements. Place the asphalt concrete surface course on the traveled way lanes to an average International Roughness Index (IRI) of 60.0 inches per lane-mile and not greater than 90.0 inches per lane-mile, with no individual areas of the surface having a deviation (bump or dip) exceeding 0.4 inches in 25 feet. Profile requirements will end 25 feet from the end of each bridge deck approach slab, cold planed transition, existing pavement, or other areas specified by the Engineer. For areas excluded from profile testing see Section 402.05 (C)(5) below.

(3) Longitudinal Profiler. The longitudinal profiler consists of a vehicle equipped with transducers and profile computing and recording equipment. The data collected is used to calculate the IRI which is used to rate the surface roughness. Also, the information is

used to produce the computed profile of the traveled surface and generate a profilograph-type plot at 1 inch to 25 feet horizontal scale and 1 inch to 1 inch vertical scale.

(4) Pavement Testing. The Contractor shall test the asphalt concrete pavement surface with Contractor-furnished and operated pavement profile testing equipment. All pavement profile testing and the necessary traffic control measures shall be done at the Contractor's expense.

a. **Existing Pavement.** The Contractor may profile the existing pavement surface prior to any cold planing or paving operations with a longitudinal profiler.

When the contract requires pavement cold planing, establish a pavement cold plane profile which will reduce or eliminate bumps and dips in the existing pavement to the greatest extent possible while following the existing roadway grade profile. Any adjustment to or deviation from the existing roadway grade profile shall be done with care so as not to adversely affect the existing roadway surface drainage patterns.

b. **Final Pavement.** Profile the final asphalt concrete pavement surface in both wheel paths with a properly calibrated longitudinal profiler, and generate a graph or trace of the pavement profile according to ASTM E 950-98: Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference. Drive the test apparatus in the wheel paths over the section of traveled surface to be profiled. The wheel path is located parallel to the lane edge and approximately 3 feet inside of both lane edges for a standard 12-foot travel lane, or approximately 2 feet inside of both lane edges for a 10-foot travel lane. The test apparatus shall be capable of producing a plot of the profile and a readout which will give the following data: bump or dip height and length as specified in the contract, total ride indexes in inches per mile for the measurement, total length of the measurement and the ride index in inches per mile for each tenth mile segment.

Test results of each day's paving shall be furnished to the Engineer within two working days. The result of each day's paving is evaluated separately. A day's paving is defined as a minimum of 0.1 mile per lane of pavement placed in a day. Partial sections will be prorated or added to an abutting section.

The finished pavement surface roughness is determined by averaging the test results of both wheel paths for each lane. Use test method ASTM E 950-98, to determine the IRI and to detect any area with pavement deviations greater than 0.4 inch in 25 feet.

(5) Excluded Profile Testing Areas. The excluded areas include auxiliary lanes less than 0.1 mile long, ramps, tapers, bridge deck approaches, side streets, curves 1000 feet or less in radius, turning lanes and intersections. The Engineer will test areas excluded from profile testing using a 10-foot straightedge.

The Contractor shall provide the State with a 10-foot straightedge constructed out of metal or other durable material and reinforced as necessary to provide a rigid member. Hand holds shall be provided and the weight of the unit must be suitable for handling by a single person. The 10-foot straightedge unit must be accepted for use by the Engineer. No paving work can commence without an acceptable 10-foot straightedge at the project site. The variation of the surface from the testing edge of the straightedge shall not exceed 0.25 inch between any two (2) contacts with the pavement surface, when measured longitudinally or transversely.

402.06 Method of Measurement. The Engineer will measure superpave asphalt concrete pavement per ton.

For tack coat, see Section 407 - Tack Coat.

402.07 Basis of Payment. The Engineer will pay for the accepted superpave asphalt concrete pavement at the contract unit price per ton complete in place.

The price includes full compensation for preparing the surface; removing and disposing of all existing raised pavement markers and traffic tapes; furnishing the asphalt concrete pavement; spreading, furnishing, applying, and protecting the tack coat; compacting, and finishing the asphalt concrete pavement; sampling; protecting the pavement; and furnishing labor, material, tools, equipment, and incidentals necessary to complete the work.

(A) Pavement Smoothness Incentives or Pavement Roughness Disincentives. The Engineer will pay for incentives or assess pavement roughness disincentives in accordance with the pay schedule below.

The day's average IRI will be determined by the Engineer using IRI from all asphalt pavement sections completed in a day. Partial sections will

be prorated or added to an abutting section. The measurement shall include the construction joint formed between the previous day's work and the section being measured for pavement smoothness.

When the day's average IRI is less than 60.0 inches per lane-mile, the Engineer will make incentive payment using Table 402-4 below. Incentives will be paid for under Items No. 402.0600 - Pavement Smoothness Incentives. When the day's average IRI is greater than 90.0 inches per lane-mile, the Engineer will assess pavement roughness disincentives as shown in Table 402-4. The Engineer will deduct pavement roughness disincentives from monies due or that may become due under the contract, such as the contract monthly progress payment to the Contractor.

TABLE 402-4 - PAVEMENT SMOOTHNESS INCENTIVES AND PAVEMENT ROUGHNESS DISINCENTIVES PAY SCHEDULE

Average International Roughness Index (Inches per lane-mile)	Payment *	Payment Type
Less than 20.0	+ $800	Incentives
20.0 to 29.9	+ $600	
30.0 to 39.9	+ $400	
40.0 to 49.9	+ $200	
50.0 to 59.9	+ $100	
60.0 to 90.0	0	None
90.1 to 100.0	- $100	Disincentives
100.1 to 110.0	- $200	
110.1 to 120.0	- $400	
Greater than 120.0	- $600	
Bump or Dip	- $150	

*Pavement smoothness incentives and pavement roughness disincentives are dollars per 0.1 lane-mile section. Bump or dip exceeding 0.4 inches in 25 feet is dollars for each bump or dip.

To compute daily paving incentives and disincentives, IRI from all pavement sections completed in a day will be used in the calculation of the

average IRI. Partial sections will be prorated or added to an abutting section.

Example 1:

Day's Paving 0.1 mile Sections	Final IRI
1 (bumps less than 0.4 inch)	35.0
2 (2 bumps greater than 0.4 inch)	95.0
3 (bumps less than 0.4 inch)	45.0
	175.0/3 = 58.3 ave.

Payment for these sections based on an average IRI of 58.3, will include an incentive. Also, a disincentive is included for the 2 bumps in section 2.

Incentive payment for these sections based on an average IRI of 58.3 is:

3 x $100 = $300.00

Disincentive for 2 bumps is:

2 x (-$150) = -$300.00

Example 2:

Day's Paving 0.1 mile Sections	Final IRI
1 (1 bump greater than 0.4 inch)	115.0
2 (bumps less than 0.4 inch)	90.0
3 (1 bump greater than 0.4 inch)	140.0
	345.0/3 = 115.0 ave.

Payment for these sections based on an average IRI of 115.0, will include a disincentive. Also, disincentive is included for bump in sections 1 and 3.

Pavement roughness disincentives for these three (3) sections based on an average IRI of 115.0 is:

3 x (-$400) = -$1,200.00

Disincentive for 2 bumps is:
2 x (-$150) = -$300.00

The Engineer will not pay for furnishing, calibrating and operating the longitudinal profiler, cleaning surfaces for testing, any pavement corrective work required, and all necessary traffic control as they are considered incidental to the various pavement contract items.

The Engineer will not pay for the use of a 10-foot straightedge that will be provided to the State. The Engineer will consider the 10-foot straightedge incidental to the various bid items.

All traffic control and survey stationing shall be the Contractor's responsibility and no additional payment shall be made for these items.

The cost of all labor, equipment, and materials to meet this specification shall be included in the contract unit prices for the applicable pavement items.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Superpave Asphalt Concrete Pavement	Ton
Pavement Smoothness Incentive	Allowance

The Engineer may, in lieu of requiring removal and replacement, use the sliding scale factor to accept superpave asphalt concrete pavements compacted to 92 percent or 98 percent. The Engineer will make payment for the material in that production day at a reduced price arrived at by multiplying the contract unit price by the pay factor shown in Table 402-5.

Table 402-5 - Sliding Scale Pay Factor

Percent Compaction	Percentage Payment
> 98	Removal
98	95
93-97	100
92	90
<92	Removal

For tack coat, see Section 407 - Tack Coat."

END OF SECTION

Amend **Section 407 - Bituminous Tack Coat** to read as follows:

SECTION 407 - TACK COAT

407.01 Description. This work includes preparing and treating an existing bituminous or concrete surface with tack coat according to the contract.

407.02 Materials. Materials shall conform to the following:

Emulsified Asphalt (Type SS-1, SS-1h, CSS-1 or CSS-1h)	702.04
Water	712.01

407.03 Construction Requirements.

(A) Weather Limitations. Do not apply tack coat on a wet surface or when weather conditions prevent proper construction.

(B) Equipment. Provide equipment for heating and applying the tack coat. This equipment shall conform to Subsection 405.03(B) - Equipment.

(C) Preparation of Surface. Immediately before applying the tack coat, sweep the surface clean of loose material, dirt, excess dust or other objectionable matter according to Section 310 - Brooming Off. Use a power broom or power blower, supplemented by hand methods, if necessary.

Before applying the tack coat, remove the raised pavement markers by such methods that will cause the least possible damage to the pavement.

(D) Application of Tack Coat. Dilute the emulsified asphalt with water at a rate of one part emulsion to one part of water by volume. Submit the quantity, rate of application, temperature, and areas to be treated for acceptance before applying the tack coat.

Place the tack coat only as needed for the surface to cure to the proper condition for placement of such surface course.

The time between the placement of the tack coat and the subsequent paving shall not exceed four hours. In multiple lift construction, the Engineer may waive the application of the tack coat. Placement of the upper lift shall be within 12 hours of the placement of the lower lift.

Apply tack coat at the rate of 0.05 - 0.10 gallon per square yard on an existing surface or intermediate layer in multiple layer construction.

(E) Protection of Tack Coat. Keep traffic except construction equipment directly connected with paving operations off the tack coat. Protect the tack coat from damage until after placing the surface course.

407.04 Method of Measurement. The Engineer will not measure bituminous material for tack coat for payment.

407.05 Basis of Payment. The Engineer will not pay for tack coat separately. The Engineer will consider the price for tack coat included in the bid price of the various contract items in Section 402 - Superpave Asphalt Concrete Pavement.

The price includes full compensation for sweeping the surface clean; removing the raised pavement markers and temporary tapes; furnishing, applying, and protecting the tack coat; and furnishing labors, materials, equipment, tools, and incidentals necessary to complete the work.

END OF SECTION

Amend **Section 411 - Portland Cement Concrete Pavement** to read as follows:

"SECTION 411 - PORTLAND CEMENT CONCRETE PAVEMENT

411.01 Description. This section is for constructing pavement composed of portland cement concrete (PCC) with or without reinforcement, on a prepared subgrade or base course according to the contract or as specified by the Engineer.

At the option of the Contractor, the Contractor may construct the pavement with equipment using stationary side forms or slip form paving.

411.02 Materials. Concrete shall have a minimum flexural strength, f'_r of 650 psi and shall conform to Section 601 - Structural Concrete. Other materials shall conform to:

Joint Filler	705.01
Joint Sealer	705.04
Reinforcing Steel	709.01
Curing Materials	711.01

411.03 Construction Requirements.

(A) Proportioning. Base the proportioning on the predetermined cement content or designed for minimum flexural strength as specified in the contract. Submit the proportions of the materials for acceptance by the Engineer.

Determine the slump according to AASHTO T 119 (ASTM C 143) and air content according to AASHTO T 152 (ASTM C 231). Make, cure, and test the test specimens according to AASHTO T 23 (ASTM C 31), AASHTO T 22 (ASTM C 39) and AASHTO T 97 (ASTM C 78), and the cement content according to AASHTO T 121 (ASTM C 138).

State the proportions in terms of aggregates in a saturated surface-dry condition. Adjust the batch weights periodically to take into account the actual moisture of the aggregates at the time of use. The designated proportions govern during the progress of the work except in the following:

(1) Do not make changes in the sources or character of the materials without due notice to the Engineer. Do not use the new materials until the Engineer designates and accepts the new proportions based upon laboratory tests and trial mixes.

(2) When concrete having the required consistency cannot be produced without exceeding the maximum allowable water-cement

ratio specified, increase the cement content as specified by the Engineer.

(3) When concrete of the desired plasticity and workability cannot be obtained with the proportions originally accepted, the Engineer will make such changes in aggregate weights as required provided the original designated cement content does not change except as specified in items (1) and (2) above.

(B) Equipment. The Engineer will examine the equipment and tools necessary for handling materials and doing the work for acceptance as to the design, capacity, and mechanical condition. The equipment shall be at the work site sufficiently ahead of the start of this activity for examination. The Contractor shall comply with the following:

(1) **Batching Plant and Mixers.** The batching plant and mixers shall conform to Section 601 - Structural Concrete.

(2) **Hauling Equipment.** Equipment for hauling concrete shall conform to Section 601 - Structural Concrete.

(3) **Finishing Equipment.**

(a) Finishing Machine. The finishing machine shall be self-propelled. When in operation, equip the finishing machine with at least two oscillating type transverse screeds supported by the forms. The finishing machine shall handle and finish the mixes required for this type of construction. The finishing machine shall not displace the reinforcement, side forms, or joints.

(b) Vibrators. Vibrators, for full width vibration of the concrete, may be either the surface pan type or the internal type with immersed tube or multiple spuds. The vibrators may be attached to the spreader or the finishing machine or mounted on a separate carriage. The vibrators shall not come in contact with the reinforcement, load transfer devices, subgrade, or side forms. Operate the vibrating equipment according to the manufacturer's recommended frequency. However, the frequency of the surface vibrators shall not be less than 3,500 impulses per minute and the frequency of the internal type shall not be less than 5,000 impulses per minute. Hand vibrators shall have a frequency of not less than 5,000 impulses per minute. Furnish a tachometer for measuring and indicating the frequency of vibration.

(c) Machine Floats. Mechanical floats shall be self-propelled. Use mechanical floats designed to finish pavement smoothly and true to grade. Mechanical floats shall run either on side forms or on adjacent lanes of concrete.

Use floats constructed of hardwood, steel, or steel-shod and equipped with devices to permit adjusting the underside of a true flat surface.

(d) Slip-Form Pavers. Slip-form pavers shall be self-propelled. Use slip-form pavers equipped with traveling side forms of sufficient dimensions, shape, and strength to produce pavement of the required cross section. Slip-form paving equipment shall spread, consolidate and screed freshly placed concrete so a minimum of handwork is required to produce a dense homogeneous pavement true to the cross section and profile within the specified tolerances.

Use slip-form pavers equipped with high frequency internal vibrators for the full width. The vibrators may be mounted with their axis parallel or normal to pavement alignment. When mounting the vibrators with their axis parallel with the pavement alignment, space the vibrators at an interval not to exceed 2.5 feet measured center to center.

When mounting vibrators with their axis normal to the pavement alignment, space the vibrators so that the lateral clearance between individual vibrating units does not exceed 0.5 feet.

Use slip-form pavers designed so that the longitudinal axis at the center of each vibrating unit is not more than 0.5 feet above the pavement grade while spreading, compacting, and shaping the pavement.

The vibration rate of each vibrating unit shall be not less than 5000 cycles per minute. Furnish a tachometer to measure the frequency of vibration.

The Contractor may use the equipment designed to complete the paving operations with one machine or may consist of a mechanical spreader followed by a separator power unit.

(4) Concrete Saw. When sawing joints are elected or specified, provide sawing equipment adequate in number of units and power to complete the sawing with a water-cooled diamond edge saw blade or an abrasive wheel to the required dimensions and at the required rate. Provide at least one standby saw in good working order. Maintain an ample supply of saw blades at the work site during sawing operations. Provide adequate artificial lighting facilities for night sawing. This equipment shall be on the work site both before and continuously during concrete placement.

(5) Forms. Use straight side forms made of a metal having a thickness of not less than 7/32 inch, furnished in sections not less than 10 feet in length. Forms shall have a depth equal to the prescribed edge thickness of the concrete and a base width equal to at least 80 percent of the specified pavement thickness. The Engineer will not allow horizontal joint unless accepted by the Engineer as a built-up form. Each form section shall be straight and free from bends and warps. No section shall show a variation greater than 1/8 inch in 10 feet from the true plane on the top and 1/4 inch in 10 feet along the face of the form. The method of connecting form sections shall insure tight, neat joint. Side forms shall be of sufficient rigidity in the form and in the interlocking connection with adjoining forms such that springing will not occur under the weight of the subgrading and paving equipment or from pressure of concrete. The Contractor may use built-up metal forms by rigidly attaching a wood or metal section of suitable width and thickness to the bottom of the form providing an increase in depth of not more than 20%.

Use the flexible or curved forms of proper radius for curves of 100-foot radius or less. The Contractor may use the straight steel forms in sections of 10 feet or less in length for form lines having a radius greater than 200 feet. The Engineer will permit special forms of wood or steel for curved form lines having a radius of 200 feet or less. Where the use of standard pavement forms are impracticable, submit working drawings for acceptance. Five feet long straight steel form section will be acceptable for curved form lines having a radius of not less than 100 feet.

Forms shall be of sufficient rigidity to prevent distortion in edge alignment due to pressure of concrete. Do not use the wood forms as a track for operating paving and finishing equipment.

(C) Preparation of Grade. After grading and compacting the roadbed, trim the grade to the approximate correct elevation, extending

the work at least two feet beyond each edge of the proposed concrete pavement.

Grade and maintain the track path in a smooth compacted condition until after constructing the pavement.

(D) Setting Forms.

(1) Base Support. The foundation under the forms shall be hard and true to grade so that the form, when set, shall be firmly in contact for its whole length and at the specified grade. Fill the grades found below established grade with granular material in lifts of 0.5 inch or less for a distance of 18 inches on each side of the base of the form, and thoroughly compacted. Correct the above grade imperfections or variations by tamping or trimming as necessary.

(2) Form Setting. Set the forms sufficiently ahead of concrete placement to provide time to check the line and grade and provide a continuous concrete placement operation. After setting the forms to the correct grade, tamp the grade thoroughly, mechanically or by hand, at both the inside and outside edges of the base of the forms. Stake the forms into place with not less than three pins for each 10-foot section. Place a pin at each side of every joint. Lock the form sections tightly from play or movements. The forms shall not deviate from true line by more than 1/4 inch. Set the forms so that the forms will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Clean and coat the forms with a form release agent or oiled before placing the concrete.

(3) Grade and Alignment. Check and correct the alignment and grade elevations of the forms immediately before placing the concrete. When the forms are disturbed or grades become unstable, reset and recheck the forms.

(E) Conditioning of Subgrade or Base Course. Bring the subgrade or base course to proper cross section. Trim the high areas to proper elevation. The low areas may be filled and compacted to a condition similar to that of surrounding grade, or fill the low areas with concrete integral with the pavement. Maintain the finished grade in a smooth and compacted condition until placing the pavement.

If waterproof subgrade or base course cover material is not specified, moisten the subgrade or base course uniformly and remove excess water standing in pools or flowing on the surface before placing the concrete.

(F) Handling, Measuring, and Batching Materials. Handling, measuring, and batching materials shall be according to Section 601 - Structural Concrete.

(G) Mixing Concrete. Mixing concrete shall be according to Section 601 - Structural Concrete.

(H) Limitations of Mixing. Do not mix, place, or finish the concrete when the natural light is insufficient, unless an adequate and acceptable artificial lighting system is operated.

Before placing concrete pavement, have a good and sufficient supply of water available throughout the work. An inadequate water supply will be cause for delaying or shutting down the concrete mixer. In case of a deficiency of water, use the water available for curing the concrete already placed.

Make advance arrangements to prevent delay in delivery and placing of the concrete. An interval of more than 30 minutes between placing of two consecutive batches or loads of concrete shall constitute cause for stopping paving operations. When suspending concrete operations for such cause, make a joint at the location and of the type specified by the Engineer in the concrete already placed and according to Subsection 411.03(L) - Joints at no cost to the State.

(I) Placing Concrete. Make adequate advance arrangements for preventing delay in delivery and placing of the concrete. An interval of more than 45 minutes between placing of any two consecutive batches or loads shall constitute cause for stopping paving operations. When stopping paving operations, make a construction joint at the location and of the type specified by the Engineer at no cost to the State.

Slip-form paving and finishing machines shall be in satisfactory adjustment and operational condition. Before placing concrete, demonstrate proper adjustment of the screeds and floats on slip-form pavers by measurements from grade stakes driven to known elevations. Demonstrate satisfactory operation and adjustments of the propulsion and control equipment, including pre-erected grade and alignment lines by moving the slip-form pavers and finishing machines over a 500-foot length of prepared subgrade with the propulsion and control equipment fully operational.

Either construct the pavement in 12-foot widths separated by longitudinal weakened joints or monolithically in multiples of 12-foot widths with a longitudinal weakened plane joint at each traffic lane line.

Place the concrete while fresh. Do not use water for re-tempering concrete. Deposit the concrete on grade so as to require as little rehandling as possible. Unless truck mixers, truck agitators, or

non-agitating hauling equipment are equipped with means for discharge of concrete without segregation of the materials, unload the concrete into an accepted spreading device and mechanically spread on the grade so as to prevent segregation of the materials. Placing shall be continuous between transverse joints without use of intermediate bulkheads. Use shovels for hand spreading, not rakes. Do not allow the workers to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

Do not use concrete showing improper proportions of materials, including water, in the pavement. Remove and dispose such unsatisfactory concrete at no cost to the State.

Spread, shape, and consolidate the concrete so that the completed pavement will conform to the thickness and cross section requirements of the contract. The sides of pavement may be constructed on a batter not to exceed one horizontal to six vertical (1H:6V), provided the top of the pavement is maintained at the specified width.

When constructing portland cement concrete pavement adjacent to an existing parallel concrete pavement not constructed as part of the contract, spread, compact, and shape the concrete so that:

(1) the completed pavement will conform to the thickness and cross section requirements of the contract;

(2) the water does not pond on either side of the longitudinal joint with the existing pavement;

(3) the new pavement surface at the longitudinal joint conforms as close as possible to the elevation of the existing concrete pavement. Eliminate any differences in elevation between the new pavement and the existing pavement by finishing the new pavement within one foot of the existing pavement by hand methods, adding or removing concrete as necessary;

(4) the transverse straightedge, longitudinal straightedge, and Profile Index requirements specified in Subsection 411.03(M) - Final Strike-Off, Consolidation and Subsection 411.03(N) - Surface Test will not apply to the pavement surface within one foot of the existing concrete pavement;

(5) the profiles of the completed pavement surface specified in Subsection 411.03(N) - Surface Test are not required within four feet of the longitudinal construction joint with the existing concrete pavement;

(6) the thickness measurements specified in Subsection 411.03(T) - Tolerance in Pavement Thickness are not made in pavement within one foot of the existing concrete pavement; and

(7) the transverse weakened plane joints are constructed in pavement widening to match the spacing and skew of the weakened plane joints in the existing pavement.

When placing concrete adjacent to a previously constructed lane of pavement, do not operate the mechanical equipment on the existing lane of pavement until the existing concrete pavement has obtained a strength of not less than 550 pounds per square inch when tested according to AASHTO T 97 - Flexural Strength of Concrete (using Simple Beam with Three Point Loading).

Construct the pavement using only that paving equipment that produces a finished surface meeting straightedge and profile index according to Subsection 411.03(M) - Final Strike-Off, Consolidation, and Finishing and Subsection 411.03(N) - Surface Test. Failure of equipment to produce pavement that conforms to said requirements will constitute cause for stopping placement of concrete until the deficiency or malfunction is corrected.

When placing concrete adjacent to an existing pavement, equip that part of the equipment supported on existing pavement with protective pads on crawler tracks or rubber tired wheels with the bearing surface offset to run a sufficient distance from the pavement edge to avoid breaking or cracking that edge.

Spreading, compacting, and shaping shall also conform to:

(1) Stationary Side Form Construction. Spread, shape, and consolidate the concrete by one or more machines. These machines shall uniformly distribute and consolidate concrete without segregation so that the completed pavement conforms to required cross section with a minimum of handwork.

The number and capacity of machines furnished shall be adequate to finish the work required at a rate equal to that of concrete delivery.

Effectively consolidate the concrete for the full paving width by means of surface or internal vibrators.

When using vibrators to consolidate concrete, the rate of vibration shall not be less 3,500 cycles per minute for surface vibrators and shall not be less than 5,000 cycles per minute for internal vibrators.

Amplitude of vibration shall be sufficient to be perceptive on the surface of concrete more than one foot from the vibrating element. Furnish a tachometer for measuring and indicating frequency of vibration.

Vibrators shall not rest on new pavement or side forms. Connect the power to vibrators so that vibration ceases when forward or backward motion of the machine is stopped.

Spread and shape the concrete for exit ramp termini, truck weigh stations, ramps and connectors with steep grades and high rates of superelevation, short sections of City and County streets and roads, and concrete required to be placed in short lengths or in widths other than multiples of 12-foot traffic lanes by acceptable powered finishing machines supplemented by hand work as necessary. Consolidation of such concrete shall be by high-frequency internal vibrators within 15 minutes after depositing the concrete on the subgrade. Vibrate with care so to assure adequate consolidation adjacent to forms and uniformly across the full paving width. The Engineer will not permit use of vibrators for extensive shifting of the mass of concrete. Discontinue the methods of spreading, shaping, and compacting that result in segregation, voids, or rock pockets. Adopt methods that will produce dense homogeneous pavement conforming to required cross section.

(2) Slip Form Construction. Slip form paving equipment shall spread, consolidate, and screed freshly placed concrete so that a minimum of handwork is required to produce a dense homogeneous pavement true to cross section and profile. The Engineer will not permit abrupt changes in longitudinal deviation of the pavement. The horizontal deviation shall not exceed 1/10 of a foot from the alignment established by the contract.

Effectively consolidate the concrete for the full paving width by high frequency vibrators. Operate the slip-form paver with as nearly a continuous forward movement as possible. Coordinate the operations of mixing, delivering, and spreading the concrete to provide a uniform progress with stopping and starting of the paver held to a minimum. When stopping the forward movement of the paver, the vibratory and tamping elements shall also cease immediately. Do not apply tractive force to the machine except those tractive force controlled by the machine.

(J) Test Specimens. Furnish the concrete necessary for casting test beams and cylinders at no cost to the State. Cure the beams as specified for pavement according to AASHTO T 23 (ASTM C 31).

(K) Strike-Off of Concrete and Placement of Reinforcement. After placing the concrete, strike off the concrete to conform to the cross section shown in the contract and to an elevation such that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown in the contract.

When placing reinforced pavement in two layers, strike off the entire width of the bottom layer to such length and depth that the sheet of fabric or bar mat may be laid full length on the concrete in final position without further manipulation.

Place the reinforcement directly upon the concrete, place, strike off, and screed the top layer of the concrete. Remove and replace the portions of the bottom layer of concrete at no cost to the State when more than 30 minutes have elapsed after placement without covering the bottom layer with freshly mixed concrete.

When placing reinforced concrete in one layer, the reinforcement may be positioned ahead of concrete placement or may be placed in plastic concrete, after spreading by mechanical or vibratory means.

For the reinforcing steel, Subsection 602.04 - Storage, Surface Condition and Protection of Reinforcement, shall apply.

(L) Joints. Construct the joints normal to the pavement surface of the type, dimensions, and at locations required by the contract.

(1) Longitudinal Joints. The width of the joint shall be as required with a depth of $d = t/4$ where:

d = minimum depth rounded up to the nearest 0.01-foot

t = thickness of pavement in each lane

When paving lanes are poured separately and a sawed longitudinal joint is required, the longitudinal joints shall be as required by the contract.

Place the deformed steel tie bars of the specified length, size, spacing and material perpendicular to the longitudinal joint at a target depth of $d = t/2$. Place the deformed steel tie bars by mechanical equipment or secure the deformed steel tie bars rigidly by chairs or other supports to prevent displacement. Use 30 inches long No. 5 rebars and space 30 inches center to center. Tie bars which are to be bent and later straightened shall be grade 40. The Engineer may require other sizes, grades, lengths, and spacing base on slab width, thickness and the type of underlying

base. Do not paint or coat the tie bars with asphalt or other material not enclosed in tubes or sleeves.

(a) Longitudinal Construction Joints. When constructing adjacent paving lanes separately, the tie bars may be bent with keyways at right angles against the forms of the first lane constructed and straightened into final position before placing concrete in the adjacent lane or an acceptable two-piece tie bar connectors may be used. When inserting a two-piece tie bar connector mechanically during slip form paving, maintain the proper alignment and adequate bond with the plastic concrete.

(b) Sawed Joint. Complete the sawing of longitudinal joints within 12 hours of paving and before concrete is placed in subsequent adjacent lanes and before equipments or vehicles are allowed on the pavement.

(2) Transverse Expansion Joints. The expansion joint filler shall be continuous from form to form. Shape the expansion joint to the subgrade and to the keyway, if any, along the form. Furnish the preformed joint filler in lengths equal to the pavement width or equal to the width of one lane. Do not use damaged or repaired joint filler.

Hold the expansion joint filler in a vertical position to secure the preformed expansion joint filler at the proper grade and alignment during placing and finishing of the concrete. Finished joints shall not deviate more than 0.25 inch in the horizontal alignment from a straight line. When assembling joint fillers in sections, do not use the offsets between units. The Engineer will not permit plugs of concrete anywhere within the expansion space.

(3) Transverse Contraction Joints. Transverse contraction joints include planes of weakness created by forming or cutting grooves in the surface of the pavement and, when shown on the plans, shall include load transfer assemblies.

(a) Formed Joints. The Contractor may use the formed joints made by depressing a tool or device into the plastic concrete, regardless whether the joints are to remain in or removed from the finished pavement, only with the written acceptance of the Engineer.

(b) Sawed Joints. Saw contraction joints by cutting grooves in the pavement with an acceptable power saw.

The width shall be the minimum width possible with the type of saw being used not exceeding 1/4 inch.

After sawing each joint, clean the sawed cut and adjacent concrete surface thoroughly.

The Engineer will designate the first joint immediately after separation or transverse contact joint and every second planned transverse contraction joint as control joints. Saw them from 4 to 12 hours after placing the concrete. The Engineer will determine the exact time of sawing. If necessary and regardless of weather conditions, continue the sawing operations day and night. Complete the sawing of transverse contraction joints before placing the concrete in adjacent lanes and before permitting traffic on the pavement.

In succeeding lanes of concrete pavement, saw the transverse joints within 24 hours after pouring the concrete. The Engineer will determine the exact time. Omit not more than three consecutive planned transverse contraction joints.

Saw the remaining transverse contraction joints after 24 hours. Complete the transverse contraction joints before pouring the concrete in adjacent lanes and before permitting traffic on the pavement.

When a crack occurs within 5 feet of a planned transverse contraction joint, omit sawing of that joint. Discontinue sawing when a crack develops in front of the saw. The Engineer will not pay for the joints sawed in violation of these provisions.

When curing the pavement by curing seal, restore the portions of the seal that are disturbed by sawing operations by spraying the area with additional curing seal.

(c) Transverse Construction Joints. Construct a transverse construction joint when an interruption of more than 30 minutes in the concrete operations occurs. Do not construct the transverse joint within 10 feet of any expansion joint, contraction joint, or plane of weakness. When the Contractor has not mixed sufficient concrete at the time of interruption to form a slab at least 10 feet long, remove and dispose of any excess concrete back to the last preceding joint as specified by the Engineer at no cost to the State.

(4) Load Transfer Devices. Install the load transfer units, when required, at transverse joints. The load transfer units include dowel bars of a grade and size required by the contract spaced on one foot centers and held in position with a wire basket or mechanically implanted. Place the dowels at a depth of d = t/2 where:

d = minimum depth rounded up to the nearest 0.01 foot

t = thickness of pavement of each lane

Place the dowels at this depth in the pavement parallel to the surface and pavement edge with a tolerance for such alignment of ± 1/4 inch per dowel. Vibrate the concrete around dowel bars without disrupting the alignment of the load transfer devices. Demonstrate that the method of dowel placement will have the bars in the proper location after the paving train has made its final pass over the joint.

Mark the center of the dowel assembly properly on both sides of the pavement slab for reference in forming or sawing the contraction joint.

Use wire baskets that remain in the pavement to hold the dowels and preformed material for load transfer units. Furnish a metal dowel cap or sleeve on each dowel bar to accommodate the expansion. Equip the cap with a stop to prevent closing during pavement operation. Maintain a clearance of one inch between the closed end of the cap and the end of the dowel to accommodate future movement of the concrete slab.

(M) Final Strike-Off, Consolidation and Finishing.

(1) Sequence. The sequence of operations shall be the strike-off and consolidation, floating and removal of laitance, straight-edging, and final surface finish.

In general, the Engineer will not permit the application of additional water to the surface of the concrete to assist in finishing operations. When permitting the application of water to the surface apply the water as a fog spray by an acceptable spray equipment.

(2) Finishing at Joints. Compact or firmly place the concrete adjacent to joints without voids or segregation against the joint material, under and around load transfer devices, joint assembly units, and other features designed to extend into the pavement.

Vibrate the concrete adjacent to joints mechanically as required in Subsection 411.03(I) - Placing Concrete.

After placing and vibrating the concrete adjacent to the joint as required in Subsection 411.03(I) - Placing Concrete, bring the finishing machine forward, operating to avoid damage or misalignment of the joints. When operation of the finishing machine, to, over, and beyond the joints causes segregation of concrete and damage to or misalignment of the joints, stop the finishing machine when the front screed is approximately 8 inches from the joint. Remove the segregated concrete from in front of and off the joint; lift the front screed and set directly on top of the joint; and resume the forward motion of the finishing machine. When the second screed is close enough to permit the excess mortar in front of the screed to flow over the joint, lift the screed and carry it over the joint. Thereafter, the Contractor may run the finishing machine over the joint without lifting the screeds, provided there is no segregated concrete immediately between the joint and the screed or on top of the joint.

(3) Machine Finishing.

(a) Nonvibratory Method. Distribute or spread the concrete as soon as placed. Soon after placing the concrete, strike off and screed the concrete by a finishing machine. The machine shall go over each area of pavement as many times and at such intervals as necessary to give the proper compaction and to leave a surface of uniform texture. Avoid excessive operation over a given area. Keep the tops of the forms clean by an effective device attached to the machine and maintain the travel of the machine on the forms true without lift, wobbling, or other variation tending to affect the precision finish.

During the first pass of the finishing machine, maintain the a uniform ridge of concrete ahead of the front screed for its entire length.

(b) Vibratory Method. Vibrators for full width vibration of concrete paving slabs shall conform to Subsection 411.03(B)(3)(b) - Vibrators. When uniform and satisfactory density of the concrete is not obtained by the vibratory method, furnish equipment and methods that produce pavement conforming to the contract. The provisions in Subsection 411.03(M)(3)(a) - Nonvibratory Method, not in conflict with the provisions for the vibratory method shall govern.

(4) Nonvibratory Method, Hand Finishing. The Engineer will not permit hand finishing methods except the following:

(a) When the mechanical equipment breaks down, hand methods may be used to finish the concrete already deposited on the grade when the breakdown occurs, or

(b) Where operations of the mechanical equipment is impractical such as narrow widths or areas of irregular dimensions, hand methods may be used to finish the concrete.

Strike off and screed the concrete, as soon as placed. Provide a second screed to strike-off the bottom layer of concrete if reinforcement is used.

The screed for the surface shall be at least two feet longer than the maximum width of the slab to be struck off. The screed shall be an acceptable design and sufficiently rigid to retain its shape. Use a screed constructed either of metal or of other suitable material shod with metal.

Attain consolidation by using a vibrator.

In operation, move the screed forward on the forms with a combined longitudinal and transverse shearing motion, moving always in the direction in which the work is progressing and so manipulated that neither end is raised from the side forms during the strike-off process. When necessary, repeat this operation until the surface is of uniform texture, true to grade and cross section and free from porous areas.

(5) Floating. After striking off and consolidating the concrete, smooth, true, and consolidate the concrete further by a longitudinal float, using one of the following methods:

(a) Hand Method. The hand-operated longitudinal float shall not be less than 12 feet in length and 6 inches in width, stiffened properly to prevent the float from flexing and warping. Work the longitudinal float with a sawing motion while the float is held in a floating position parallel to the road centerline and passing gradually from one side of the pavement to the other. Operate the float from the foot bridges, rest on the side forms, and span without touching the concrete.

Movement ahead along the centerline of the pavement shall be in successive advances of not more than 1/2 the length of the float. Waste excess water or soupy material over the side forms on each pass.

(b) Mechanical Method. Adjust the tracks and float accurately to the required crown. Coordinate the float with the adjustments of the transverse finishing machine so that a small quantity of mortar is carried ahead of the float. Adjust the forward speed so that the float laps the distance specified on each transverse trip. The float shall pass over each area of pavement at least two times. The Engineer will not permit excessive operation over a given area. Waste the excess water or soupy material over the side forms on each pass.

(c) Alternate Mechanical Method. As an alternative to Subsection 411.03(M)(5)(b) - Mechanical Method, a machine composed of a cutting and smoothing float or floats, suspended from and guided by a rigid frame may be used. Use a frame that is carried by four or more visible wheels riding on and constantly in contact with the side forms.

When necessary, the long-handled floats may be used to smooth and fill in open-textured areas in the pavement. The floats shall have blades not less than five feet in length and 6 inches in width. Do not use the long-handled floats to float the entire surface of the pavement in lieu of, one of the preceding methods of floating.

When striking-off and consolidating by the hand method and the crown of the pavement does not permit the use of the longitudinal float, float the surface transversely by the long-handled float. Do not work the crown out of the pavement during the operation. After floating, remove the excess water and laitance from the surface of the pavement by a straightedge 10 feet or more in length. Lap the successive drags 1/2 the length of the blade.

(d) Slip-Form Finishing. Construct the pavement with a preliminary float finish with devices incorporated in the slip-form paver. The Contractor may supplement these with suitable machine floats.

Correct the edge slump of pavement, exclusive of edge rounding, over 0.02 foot before concrete has hardened.

(6) Straightedge Testing and Surface Correction. After completing the floating and removing the excess water removed, but while the concrete is still plastic, test the surface of the concrete for trueness with a 10-foot straightedge. For this purpose, furnish and use an accurate 10-foot straightedge swung from a handle three feet longer than 1/2 the width of the slab. Hold the straightedge in contact with the surface in successive positions parallel to the road centerline and the whole area gone over from one side of the slab to the other as necessary. Advance along the road shall be in successive stages of not more than 1/2 the length of the straightedge. Immediately fill with freshly mixed concrete, strike off, consolidate, and refinish all depressions. Cut down and refinish high areas. Construct the surface across joints to meet the requirements for smoothness. Continue straightedge testing and surface corrections until the entire surface is found to be free from observable departures from the straightedge and the slab conforms to the required grade and cross section.

(7) Final Finish. After completing straight-edging and surface corrections and as soon as the water sheen has practically disappeared, texture the pavement surface uniformly. Apply the final finish or texture by the use of an artificial turf drag followed immediately by a metal comb transverse grooving device.

Use an artificial turf made of molded polyethylene with synthetic turn blades approximately 0.85 inches long and contain approximately 7,200 individual blades per square foot. Submit the artificial turf for acceptance by the Engineer.

Attach the artificial turf suitably to a device that will permit control of the time and rate of texturing. Do not attach this device to other pieces of equipment in the paving train. The device shall be a separate piece of equipment to be used exclusively for the texturing operation. The artificial turf shall be full pavement width and of sufficient size that during the finishing operation, approximately two feet of turf parallel to the pavement centerline is contacting the pavement surface so as to produce a uniform appearing surface according to the contract. When necessary for maintaining intimate contact with the pavement surface, the Contractor may down the turf.

The metal comb includes a single line of tempered spring steel spaced at 3/4 inch on centers. Mount the metal comb securely in a suitable head. The tines shall be of the size and stiffness sufficient to produce a groove of the specified dimension in the plastic concrete without slumping of the edge or severe tearing of the surface. Attach the metal comb to a mechanical device capable of transversing the entire pavement width in a single pass at a uniform speed. Operate the grooving device so as to produce a relatively uniform pattern of grooves perpendicular to the pavement centerline, spaced approximately 3/4 inch on centers, 1/8 inch to 3/16 inch deep, and 1/10 inch to 1/8 inch wide. Hand combs with steel tines shall be available for the purpose of providing a surface texture in event of breakdown of the mechanical comb. The Engineer may allow deviations from the stated dimensions providing a finish texture is produced according to the contract.

(8) Edging at Forms and Joints. After the final finish, but before the concrete has taken its initial set, round the edges of the pavement along each side of each slab, on each side of the transverse expansion joints, and construction (contact) joints to a radius of 1/4 inch. Produce a well-defined and continuous radius and a smooth, dense mortar finish. Do not unduly disturb the surface of the slab by tilting the tool during use.

At joints, eliminate the tool marks appearing on the slab adjacent to the joints by brooming the surface. In doing this, do not disturb the rounding of the corner of the slab. Remove the concrete on top of the joint filler completely.

When one side of the joint is higher than the other or when the joint are higher or lower than the adjacent slabs, test the joints with a straightedge before the concrete has set and correction made.

(N) Surface Test. The finished pavement shall conform to the following requirements when tested by the Engineer not more than 14 days following the placement of concrete:

(1) Straightedge the pavement surface at locations determined by the Engineer with a straightedge 12 feet long. When laying the straightedge on a finished pavement in a direction parallel with centerline or normal to centerline, the surface shall not vary more than 0.25 inch from the lower edge.

(2) The Engineer will determine the profile of the pavement surface using a profilograph according to Hawaii Test Method HDOT TM 6 and these provisions. The Engineer will take the profiles three feet from and parallel to each edge of pavement and at the approximate location of each longitudinal joint.

Make the request to the Engineer for profile testing at least 7 calendar days before testing the pavement surface. Clean and clear the area to be tested of obstructions. The Engineer will do the profilograph test up to two times per pavement surface test at no cost to the Contractor. Submit the total area to be tested at any time the request for testing is made for acceptance by the Engineer. The Engineer will do additional required profilograph testing at a cost to the Contractor at a rate of $750 per test per day.

During the initial paving operations, either startup or after a long shutdown, furnish, operate, and test the pavement surface using a California type profilograph when the concrete has cured sufficiently to allow testing.

Repair the membrane curing film damaged during the testing operations as specified by the Engineer. The Contractor and the Engineer will use the initial profile testing to aid and evaluate the paving methods and equipment. When an average profile index exceeds 15 inches per mile, suspend the paving operations. The Engineer will not allow the Contractor to resume until corrective action is taken. Test the subsequent paving operation according to the initial testing procedures.

Furnish paving equipment and employ methods that produce a riding surface having a profile index of 10 or less, except as provided herein. The Engineer may accept the initial profiles up to 15 with applicable price adjustments. The Engineer will not profile the pavements within 15 feet from each bridge approach slab or existing pavement that is joined by the new pavement. The Engineer will apply the surface requirement of Subsection 503.03(M)(3)(a) - Finishing Bridge Decks to these areas.

The Engineer will not require profile testing to the areas of pavement:

(1) on horizontal curves having a centerline radius of curve less than 1,000 feet and pavement within the superelevation transition of such curves.

(2) for exit ramp termini, ramps and connectors with steep grades and high rates of superelevation and short sections of roadway.

Reduce individual high points over 0.3 inch, as determined by measurements of the profilogram according to Hawaii Test

Method 10, by grinding until such high points as shown by reruns of the profilograph do not exceed 0.3 inch.

After completing the grinding, do additional grinding as necessary to reduce the Profile Index to values specified in any 0.1 mile section along any line parallel with the pavement edge.

Do additional grinding as necessary to extend the area ground in each lateral direction so the lateral limits of grinding are at a constant offset from and parallel to, the nearest lane line or pavement edge. Also, do additional grinding as necessary to extend the area ground in each longitudinal direction so the grinding begins and ends at lines normal to the pavement centerline, within any one ground area. Ground areas shall be neat rectangular areas of uniform surface appearance.

When grinding pavement, do not finish the pavement to a smooth or polish texture. Grind the pavement to have a texture with uniformly spaced grooves, and in the direction specified by the Engineer.

The Engineer will not permit bush hammers or other impact devices.

Complete the corrective work before determining pavement thickness.

(O) Curing. When completing the finishing operations and when marring of the concrete does not occur, cover and cure the entire surface of the newly placed concrete according to one of the following methods shown below. When curing requires the use of water, the curing shall have priority to water supplies. Failure to provide sufficient cover material or lack of water to take care of both curing and other requirements shall be cause for immediate suspension of the concrete operations. Do not leave the concrete exposed for more than 1/2 hour between stages of curing or during the curing period. Maintain the covering in place for 72 hours after pouring the concrete.

(1) Cotton or Burlap Mats. Cover the entire surface of the pavement with mats. The mats used shall be of such length or width that as laid they extend at least twice the thickness of the pavement beyond the edges of the slab. Place the mats so that the entire surface and both edges of the slab are completely covered. Before placement, saturate the mats thoroughly with water. Place and weigh down the mats as to cause them to remain in intimate contact with the surface covered. Maintain the covering fully wetted and in position for the required period.

(2) Waterproof Paper. Cover the entire top surface and sides of the pavement with waterproofed paper. Lap the units at least 18 inches. Place and weigh down the paper as to cause the paper to remain in intimate contact with the surface covered. The paper shall have such dimensions that each unit laid shall extend beyond the edges of the slab at least twice the thickness of the pavement or of pavement width and two foot strips of paper for the edges. When laid longitudinally, securely seal the paper not manufactured in sizes which shall provide this width so that they do not open up or separate during the curing period. Thoroughly wet the surface of the pavement before placing the paper.

(3) Impervious Membrane Method. Spray the entire surface of the pavement uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. When initially curing the pavement with jute or cotton mats, the white pigment curing compound may be applied upon removal of the mats. Do not apply the curing compound during rainfall.

Apply the curing compound under pressure at the rate of one gallon to not more than 150 square feet by mechanical sprayers. The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application, stir the compound continuously by effective mechanical means. The Engineer will permit hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms. Do not apply the curing compound to the inside faces of joints to be sealed.

When the curing film becomes damaged from causes within the required curing period, repair the damaged portions immediately with additional compound. Upon removal of side forms, protect the sides of the slabs exposed immediately to provide a curing treatment equal to that provided for the surface.

(4) White Polyethylene Sheeting. Cover the top surface and sides of the pavement entirely with polyethylene sheeting. Overlap the units at least 18 inches. Place and weigh down the sheeting as to cause the sheeting to remain in intimate contact with the surface covered. The sheeting as prepared for use shall have a dimension that each unit as laid shall extend beyond the edges of the slab at least twice the thickness of the pavement.

(P) Removing Forms. Remove the forms from freshly placed concrete after the concrete has set for at least 12 hours, except auxiliary forms used temporarily in widened areas. Remove the forms carefully so as to avoid damage to the pavement. After removing the forms, cure the sides of the slab as outlined in one of the methods indicated above. The Engineer will consider major honeycombed areas as defective work. Remove and replace the major honeycomb areas. Areas or sections removed shall not be less than 10 feet in length nor less than full width of the lane involved. When the removal and replacement of a section of pavement is necessary, also remove and replace remaining portion of the slab adjacent to the joints that is less than 10 feet in length.

(Q) Sealing Joints. When required by the contract, fill the joints with joint sealing material before the pavement is opened to traffic, and as soon after completion of the curing period is feasible. Clean each joint thoroughly of foreign matters including membrane curing compound and clean the joint faces and dry the surface before sealing. Stir the material during heating so that localized overheating does not occur.

Apply the sealer as required by the contract or as specified by the Engineer. Pour the sealer without spilling the material on the exposed surfaces of the concrete. Immediately remove and clean the material on the surface of the concrete pavement. The Engineer will not permit the use of sand or similar material as a cover for the seal.

(R) Protection of Pavement. Protect the pavement and its appurtenances against both public traffic and traffic caused by its own employees and agents. This shall include flaggers to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, or crossover.

When by the Engineer, construct pavement crossings for the convenience of public traffic according to Subsection 104.04 - Maintenance of Traffic. The Engineer will not make additional compensation for the work involved.

Repair or replace damages to the pavement before final acceptance.

The Engineer will require the Contractor to have available materials for the protection of the edges and surface of the unhardened concrete. The protective materials include standard metal form or wood plank having a nominal thickness of not less than two inches and a nominal width of not less than the thickness of the pavement at its edges. The surface protective material includes burlap or cotton mats, curing paper, or plastic sheeting. When rain appears imminent, paving operations shall stop. Place the forms against the sides of the pavement and cover the surface of the unhardened concrete with the protective covering.

(S) Opening to Traffic. Do not open the pavement to traffic until the specimen beams conforming to Subsection 411.03(J) - Test Specimens attain a flexural strength of 550 pounds per square inch when tested according to AASHTO T 97. Do not open the pavement to traffic before 7 days regardless of strength attainment.

Clean, sign, and mark the pavement properly and clear the pavement of obstructions before opening the roadway to public traffic.

The Engineer will not allow construction traffic, equipment, or materials on the pavement while the pavement is attaining the strength.

(T) Tolerance in Pavement Thickness. The Engineer will check the thickness of the pavement by cores taken by the Contractor according to AASHTO T 24. The Engineer will inform the Contractor to take core samples and observe the Contractor taking core samples. The Engineer will test the cores according to AASHTO T 148. Cores are to be taken to determine thickness acceptability after completion of corrective work.

When cores are taken to determine the thickness of PCC pavement, a layer of material may adhere to the bottom of the core. Before determining the thickness of the PCC pavement, the Engineer will remove non-PCC pavement materials from the bottom of the core.

The Engineer will evaluate the pavement on the basis of primary and secondary unit. The primary unit of pavement will be the area of mainline pavement placed during one day's paving operations. Additionally, the Engineer will consider each ramp including tapers, each intersection, each crossover as a separate primary unit.

A secondary unit of pavement includes 1,000 linear feet or fraction thereof, of each mainline traffic lane and each shoulder in each primary unit. Also, each 1,300 square yards of pavement in ramps, tapers, intersections, and crossroads will be a secondary unit regardless of when the concrete was placed.

Drill one core in each secondary unit. When the length of that core is not deficient by more than 0.2 inch from the planned thickness, the Engineer will pay for that secondary unit at 100% of the contract unit price.

When the length of that core is deficient by more than 0.2 inch but less than 0.6 inch, drill two additional cores within the secondary unit and the Engineer will average the length of the three cores.

When the core in a secondary unit is deficient by more than 0.6 inch, the Engineer will not use the core to determine the average thickness of the secondary unit.

Drill additional cores at intervals not exceeding 10 feet in each direction from the deficient core, measured parallel to the centerline, until one core is obtained in each direction which is not deficient by more than 0.6 inch.

The Engineer will evaluate the pavement between these two cores separately from the balance of the pavement in that secondary unit. The limits for the evaluation will be between the longitudinal weakened plane or construction joint on each side of the core and between the next transverse weakened plane, construction, or expansion joint beyond each of the last two cores. Unless the Engineer allows the pavement to remain, remove and replace the pavement with pavement of the specified thickness. The Engineer will not pay for the removal of the deficient pavement. When the deficient pavement is allowed to remain, the Engineer will not make payment for the deficient pavement. Drill one additional core in the remaining portion of the secondary unit. The Engineer will evaluate this portion separately for payment as hereinbefore specified.

When removing deficient pavement, remove and replace the deficient pavement within the evaluation limits. After replacing the deficient pavement, drill one core at random in the secondary unit outside of the limits of the replaced pavement and drill one core in the new pavement. The Engineer will evaluate the pavement represented by the drilled core taken outside of the limits of the replaced pavement for payment as hereinbefore specified. When the core drilled in the replaced pavement is less than the specified thickness, the Engineer will not make payment for the replaced pavement.

Fill the core holes completely with concrete of the same quality as used to construct the pavement.

411.04 Method of Measurement. The Engineer will measure the concrete pavement per cubic yard complete in place. The width for measurement will be the width of the pavement shown on the typical cross section of the plans, additional widening where called for, or as specified in writing by the Engineer. The Engineer will measure the length horizontally along the centerline of each roadway or ramp. The thickness for cubic yard measurement will be the thickness of the pavement shown on the typical cross section of the plans or as specified in writing by the Engineer.

The Engineer will not measure transverse contraction joints, other than transverse construction joint, per linear foot.

411.05 Basis of Payment. The Engineer will pay for the accepted PCC pavement at the contract unit price per cubic yard. The price includes full compensation for furnishing reinforcements, dowels, tie bars, other joint materials; furnishing, placing, and removing of forms, protection devices; furnishing and placing curing materials, furnishing and installing longitudinal joints, transverse expansion joints, and transverse construction joints; grinding and grooving; obtaining cores; backfilling holes with concrete; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

When the average length of cores indicates pavement thickness is deficient by more than 0.2 inch but not more than 0.6 inch, only the reduced price stipulated below will be paid. The Engineer will not make additional payment over the unit contract bid price for pavements having an average thickness over that shown in the contract.

The Engineer will not pay for the accepted transverse contraction joints, other than transverse construction joints, for payment. The Engineer will consider the cost for the accepted transverse contraction joints as included in the contract price of the various contract items. The cost is for furnishing and placing the joints; and furnishing materials, equipment, tools, labor, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
_____-inch Reinforce Concrete Pavement _____	Cubic Yard

(A) Price Adjustments. When the average thickness of pavement is deficient in thickness by more than 0.2 inch, but not more than 0.6 inch, the Engineer will make payment at an adjusted price as specified in Table 411-I - Concrete Pavement Deficiency. Contract unit price in Table 411-I shall be the final adjusted unit price after adjustments for other deficiencies, if applicable.

TABLE 411-I - CONCRETE PAVEMENT DEFICIENCY

Core Thickness, Less Than Specified Thickness, inch	Percent Of Contract Unit Price Allowed
0.00 to 0.20	100
0.21 to 0.40	75
0.41 to 0.60	40

When the thickness of pavement is deficient by more than one inch and the Engineer determines that the area of such deficiency should not

be removed and replaced, the Engineer will not make payment for the area retained.

When the Engineer determines that the deficient areas warrant removal, remove and replace the deficient areas with concrete of the thickness shown in the contract. The Engineer will pay for the replacement according to the above.

When the profile index does not exceed ten, the Engineer will make payment at the contract unit price for the completed pavement. When the profile index exceeds ten, the Contractor may elect to accept a contract unit price adjustment in lieu of reducing the profile index. The Engineer will make the contract unit price adjustment according to the following schedule:

PROFILE INDEX	PRICE ADJUSTMENT (Percent of pavement unit bid price)
10 or less	100
Over 10 but less than 11	98
Over 11 but less than 12	96
Over 12 but less than 13	94
Over 13 but less than 14	92
Over 14 but less than 15	90
Over 15	Corrective work required

The Engineer will compute the unit bid adjusted price using the planned thickness of PCC pavement. This unit bid adjusted price will apply to the total area of the 0.1 mile section for the lane width represented by the profilogram."

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 420 - PRIME COAT FOR UNTREATED PERMEABLE BASE COURSE

420.01 Description. This work includes treating the surface of a prepared untreated permeable base course with prime coat according to the contract.

420.02 Materials. Materials shall conform to the following:

Emulsified Asphalt (Type CSS-1h or SS-1h)	702.04
Water	712.01

420.03 Construction Requirements.

(A) Weather Limitations. Do not apply the prime coat when the temperature is below 60 °F or on wet surfaces. Also, do not apply the prime coat when weather conditions prevents the proper construction.

(B) Equipment. Provide equipment for heating and applying the prime coat. This equipment shall conform to Subsection 405.03(B) - Equipment.

(C) Priming. Prime the surface immediately after the surface has been accepted by the Engineer. The preservation of the prepared surface is the Contractor's responsibility. Preserve, reprocess, or reshape the surface as required at no cost to the State.

(D) Application of Prime Coat. Dilute the emulsified asphalt (Type CSS-1h or SS-1h) with water at the rate of one part emulsion to one part of water by volume. Submit to the Engineer the quantity, rate of application, temperature, and areas to be treated for acceptance before applying the prime coat. Apply the prime coat with a pressure distributor in a uniform, continuous spread.

After applying, allow the prime coat to cure before paving. The time interval between the placement of the prime coat and the subsequent paving shall be 16 hours or more.

Apply prime coat at the rate of 0.30 to 0.40 gallon per square yard.

(E) Protection of Prime Coat. Keep all traffic except construction equipment directly connected with the paving operations off the prime coat. Protect the prime coat from damage until placement of the subsequent bituminous or concrete layer.

420.04 Method of Measurement. The Engineer will not measure prime coat for payment.

420.05 Basis of Payment. The Engineer will not pay for the prime coat separately. The Engineer will consider the cost for prime coat as included in the price of Section 306 - Untreated Permeable Base Course.

The cost includes preparing the surface; and furnishing, applying, and protecting the prime coat; and furnishing labors, materials, equipment, tools, and incidentals necessary to complete the work."

END OF SECTION

SECTION 503 - CONCRETE STRUCTURES

Make the following amendments to said Section:

(I) Add to end of **503.02(A) Materials - Portland Cement Concrete**

"Concrete for retaining walls and concrete in footings for CMU walls shall be 4,000 psi and shall conform to Section 601 - Structural Concrete. Concrete used for retaining wall portions above the footing shall be colored by adding integral concrete colorant from one of the following companies or approved by the Engineer:

(a) Davis Color-Premium Brick Red (Davis Color #160@4lbs per sack of cement)

(b) Butterfield Color - Premium Brick Red (Uni-Mix U34 Color)

(c) Fabcrete Color System - Premium Brick Red (Fab-Deep Concrete Colorant).

All exposed wall faces shall be Striated textured (PCI/APA texture 506) or equal using form liners and as approved by the Engineer."

(II) Add to the end of 503.03 Construction Requirements

"(K) Submit to the Engineer for approval prior to ordering any concrete colorant the name of the manufacturer and color catalog showing the material proposed for use. The catalog shall contain a sample chip showing the color of the concrete with the proposed colorant. Colorants which only color the surface of the concrete shall not be approved.

(L) Submit to the Engineer for approval prior to ordering of any concrete form liners, the name of the manufacture, catalog showing the form liner and a 1'x1' sample of the form liner proposed for use."

(III) Amend **503.04 Method of Measurement** to read as follows:

"503.04 Method of Measurement. The Engineer will not measure concrete in retaining walls and concrete in footings for CMU walls for payment.

The Engineer will not measure coloring of the concrete and texturing of exposed wall faces for payment.

The Engineer will measure the driveway culverts and reinforced concrete jacket for culvert and waterline per linear foot.

The Engineer will not measure grouted rubble paving in Driveway Culverts.

The Engineer will not make deductions for the volume occupied by the reinforcing steel, piles, floor drains, weepholes, timber bumpers, pipes less than 8 inches, conduits, or expansion joint materials.

The Engineer will consider the wingwalls to be a part of the structure.

The Engineer will measure reinforcing steel in retaining walls, in type L1 CMU wall, in type T1 CMU wall, footings for CMU walls and driveway culverts according to Section 602 - Reinforcing Steel.

The Engineer will not measure reinforcing steel for the reinforced concrete jacket.

The Engineer will measure bearing and expansion plates according to Section 506 - Bearing and Expansion Plates."

(IV) Amend **503.05 Basis of Payment** to read as follows:

"**503.05 Basis of Payment.** The Engineer will pay for the accepted concrete in retaining walls and concrete in footings for CMU wall at the contract lump sum price complete in place.

The price includes full compensation for the concrete; for placing, curing and finishing; for furnishing materials including admixtures and cement (including extra cement added to concrete deposited under water); for furnishing and installing drains, scuppers, premolded joint fillers, joint seals, waterproofing at construction joints, waterstops, pipes, and conduits; for furnishing and installing metal rockers, anchor bolts, structural shapes for expansion joints and other similar items; for timber bumpers, forms, form lining and falsework or centering, bearing pads, structural steel bearing plates; for coloring and texturing exposed wall faces; and for equipments, tools, labor, materials, and incidentals necessary to complete the work.

The Engineer will pay for the accepted driveways culverts at the contract unit price per linear foot complete in place.

The price includes full compensation for the concrete; for placing, curing and finishing; for furnishing materials including admixtures and cement (including extra cement added to concrete deposited under water); for furnishing and installing steel frame and grates, grate connectors; constructing grouted rubble paving; premolded joint fillers, joint seals, waterproofing at construction joints, waterstops; for furnishing and installing, structural shapes for expansion joints and

other similar items; for timber bumpers, forms, form lining and falsework or centering; installing grouted rubble paving at Driveway Culvert Inlet and Outlet Structures; and for equipments, tools, labor, materials, and incidentals necessary to complete the work.

The Engineer will pay for the accepted reinforced concrete jacket for culvert and waterline at the contract unit price per linear foot complete in place.

The price includes full compensation for furnishing and placing reinforcing steel, the concrete; for placing, curing and finishing; for furnishing materials including admixtures and cement (including extra cement added to concrete deposited under water); for furnishing and installing premolded joint fillers, joint seals, waterproofing at construction joints, and other similar items; for timber bumpers, forms, form lining and falsework or centering; and for equipments, tools, labor, materials, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Concrete in Retaining Walls_____	Lump Sum
Concrete in Footings in CMU walls (_____)	Lump Sum
Concrete _____ (Class _____)	Linear Foot
Driveway Culverts	Linear Foot
Reinforced Concrete Jacket for _____	Linear Foot

The Engineer will not make additional lump sum payment due to overruns or underruns in comparison with the estimated quantity shown in the proposal. The Engineer will make additional lump sum payment only if the Engineer specifies an alteration in the work.

The Engineer will pay for reinforcing steel for retaining walls and driveway culverts according to Section 602 - Reinforcing Steel.

The Engineer will not pay for reinforcing steel for the reinforced concrete jacket for culvert and waterline. The cost shall be incidental to the reinforced concrete jacket for culvert and waterline.

The Engineer will pay for bearing and expansion plates according to Section 506 - Bearing and Expansion Plates."

Make the following a part of the Standard Specifications:

"SECTION 513 - CONCRETE MASONRY UNIT

513.01 Description. This work includes constructing concrete masonry unit walls according to the contract.

513.02 Materials. Materials shall conform to the following:

Portland Cement	701.01
Hollow Concrete Masonry Units	704.03
Reinforcing Steel	709.01
Curing Materials	711.01
Water	712.01
Hydrated Lime	712.03

Aggregates for use in mortar shall conform to ASTM C 144.

Aggregates for use in grout shall be 3/8 inch pea gravel conforming to ASTM C404 and grades according to ASTM D 448, No. 10.

Admixture, if used, shall conform to ASTM C 494, Type A or D and shall be mixed in proper amounts according to the directions of the manufacturer.

Horizontal joint reinforcement shall be trussed of ladder design with No. 9 gage, deformed side rods and welded No.12 gage or larger cross rods, or as indicted on the plans.

Masonry cement shall be of such quality that one part masonry cement to 2-1/2 parts masonry aggregate mix tested according to ASTM C 270 shall have minimum 28 day compressive strength of 2,000 psi.

513.03 Construction Requirements.

(A) Foundation, form work, removal of forms, placing of concrete, curing and jointing shall conform to the applicable subsections of Section 503 - Concrete Structures.

(B) Fabricate concrete masonry units by adding integral concrete colorant from one of the following companies or approved by the Engineer:

Davis Color - Premium Brick Red (Davis Color #160 @ 4 lbs per sack of

cement)
Butterfield Color - Premium Brick Red (Uni-Mix U34 Color)
Fabcrete Color System - Premium Brick Red (Fabcrete Deep Concrete Colorant)

The contractor shall employ Curing Compound during curing colored Concrete Masonry Unit. Curing compound shall complied with ASTM C309 and be approved by pigment manufacturer for use with colored Concrete Masonry Unit. The finished color shall be Premium Brick Red.

Submit to the Engineer for approval prior to ordering any CMU/Mortar colorant the name of the manufacturer and color catalog showing the material proposed for use. The catalog shall contain a sample chip showing the color of the CMU/Mortar with the proposed colorants. Colorants which only color the surface of the CMU/Mortar shall not be approved.

Submit to the Engineer for approval prior to ordering of any Concrete Masonry Unit proposed for use, one Concrete Masonry Unit at no cost to the State.

Carefully stack masonry units prior to use and protect from physical damage. Handle units with reasonable care to prevent marring or damage of faces, edges and corners. Do not dump units from hand truck or wheelbarrows.

Beds on which masonry is to be laid shall be clean and truly level. Construct masonry units plumb, level and true. Masonry units in walls shall be constructed so that the exposed face is laid true and flat. All cutting and fitting as may be required for maintaining wall profiles and necessary to accommodate other trades shall be done neatly using power driven carborundum saw. The Contractor is responsible for controlling any dust pollution caused by the cutting operation. Do not wet masonry unit before use.

Lay mortar units in the first course with mortar beds not exceeding 3/8 inch in thickness. Webs adjoining cells containing reinforcements shall also be bedded in mortar to prevent escape of grout. Butter vertical head joints well for a thickness equal to face shell of block. These joints shall be shoved tightly so that mortar bonds well to both blocks. Fill joints solidly from face of block to depth of face shell.

The allowable tolerance from plumb for walls shall be 1/4 inch for every 10 foot height or a proportion thereof. The allowable tolerance from level shall be 1/4 inch for any 20 foot length or a proportion thereof.

Mortar joints shall be straight, clean and in thickness of 3/8 inch plus or minus 1/8 inch. Tool all exposed horizontal and vertical joints with ½ inch to 5/8 inch round bar at least 14 inches long to produce a dense, slightly concave

surface well bonded to block at edges. Tooling shall compact mortar, pressing excess mortar out of joint rather than gouging it out.

Build all hollow masonry units to preserve unobstructed vertical continuity of cells to be filled. Walls and cross webs forming such cells shall be full-bedded in mortar to prevent leakage of grout.

Place joint reinforcement in horizontal joints so that longitudinal wires are fully embedded in face shell mortar for their entire length. Reinforce horizontal masonry unit bond beam and fill solid with grout.

Fill all cells containing vertical reinforcements with grout in lifts not exceeding 8 feet unless otherwise shown on the plans. When grouting is stopped for one hour or longer, form construction joints by stopping pour of grout 1-1/2 inches below the top of the uppermost unit. Do not place grout until mortar joints have set a minimum of 24 hours.

Care shall be taken to prevent mortar splotches. Wash off mortar spilled on wall immediately before it can set up. Protect finished walls against stains and mortar spills as work progresses. After the wall is constructed, do not saturate it with water for curing, cleaning, etc.

Point all holes or defective mortar joints in exposed masonry and where necessary, cut out defective joints and repoint. Smoothing of walls which produces 'bright spots' will not be accepted. Protect adjoining work from damage.

(C) Mortar and Grout. Store Portland cement, masonry cement, lime and admixtures in such a manner as to prevent deterioration or contamination with foreign matter. Cement which has become caked, partially set or otherwise deteriorated or any material which becomes damaged or contaminated shall be rejected.

Proportion materials for mortar and grout by volume and in such manner that specified proportions can be controlled and accurately maintained. Fine aggregates shall be measured in damp loose condition. Mixing shall be by mechanical batch mixer for at least 3 minutes for mortar and 5 minutes for grout. Hand mixing shall be permitted only for small batches of 3 cubic feet or less. Mortar used for CMU wall shall be colored by adding integral concrete colorant from one of the following companies or approved by the Engineer:

Davis Color - Premium Brick Red (Davis Color #160 @ 4 lbs per sack of cement)
Butterfield Color - Premium Brick Red (Uni-Mix U34 Color)
Fabcrete Color System - Premium Brick Red (Fabcrete Deep Concrete Colorant)

(1) Mortar shall be freshly prepared and uniformly mixed in one of the following proportions:

(a) 1 part masonry cement
1 part Portland Cement
4-1/2 to 6 parts sand

(b) 1 part masonry cement
2-1/2 parts sand

Admixtures may be added in accordance with the manufacturer's specifications. Add sufficient water to provide workable consistency.

Place mortar in final position within 1-1/2 hours after mixing. In any event, mortar shall attain not less than 2,000 psi, 28 day compressive strength.

(2) Grout shall be freshly prepared and uniformly mixed in the following proportion:

1 part Portland Cement
2 parts sand
1 part pea gravel
1/10 part lime to one part Portland Cement

Add sufficient water to produce consistency just fluid enough for pouring without segregation. Slump shall be between 9 and 11 inches. Place grout in final position within 90 minutes after mixing. Do not use grout after initial set has occurred. In any event, grout shall attain not less than 2,500 psi, 28 day compressive strength.

(D) Reinforcements. Reinforcements shall be free from scale, loose flaky rust or other coatings that will destroy the bond. Reinforcements shall be straight except for bends around corners or where bends or hooks are detailed. Size and spacing shall be accurate and shall be as indicated on the plans.

Place and tie vertical reinforcements at top and bottom. Lap dowels and splices as indicated but not less than 40 diameters or 40 inches, whichever is longer.

513.04 Method of Measurement. The Engineer will measure concrete masonry wall per square yard.

513.05 Basis of Payment. The Engineer will pay for the accepted quantities of concrete in footings for CMU walls at the contract lump sum complete in place under Section 503 - Concrete Structures. The Engineer will pay for the accepted CMU wall at the contract unit price per square yard. The price includes full compensation for

structural excavation and structural backfill for CMU walls, dowels, water, mortar and grout, colorant, dust and silt control and furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Type _____ CMU walls	Square Yard"

Amend **Section 601 - Structural Concrete** to read as follows:

"SECTION 601 - STRUCTURAL CONCRETE

601.01 Description. Structural concrete shall consist of portland cement, fine aggregate, coarse aggregate, and water. Proportion and mix the structural concrete according to the contract. Admixtures for entraining air, retarding or accelerating the set, tinting and other purposes as required or permitted may be added.

601.02 Materials. Materials shall conform to the following:

Portland Cement	701.01
Fine Aggregate for Concrete	703.01
Coarse Aggregate for Concrete	703.02
Admixtures	711.03
Water	712.01

Coarse aggregates for lightweight concrete shall conform to ASTM C 330 except the contract waives Sections 5, 7, and 9.

601.03 Quality Control. In portland cement concrete production, the Contractor shall be responsible for the quality control of materials during the handling, blending, mixing, curing, and placement operations. The person responsible for concrete production control and sampling and testing for quality control shall be proficient in concrete technology and shall have a sound knowledge of the contract. The person responsible shall be able to adjust concrete mix designs for improving workability and contract compliance.

Sample, test, and inspect the concrete necessary to assure quality control of the component materials and the concrete. Sampling and testing for quality control shall be according to the standard methods prescribed in this contract. Do the quality control tests for slump, air content, temperature, and unit weight during the production of structural concrete other than concrete for incidental construction. Notify the Engineer of the test results.

601.04 Design and Designation of Concrete. The Contractor shall be responsible for the design of concrete mixture for the concrete work specified. When requested by the Engineer, the Contractor shall submit the mix designs using State Highways Division form DOT 4-151. Work shall not start until the Engineer accepts the mix design. The Engineer will accept the concrete mix design using information given in Table 601-I - Design of Concrete and other pertinent requirements of the contract. This acceptance will not relieve the Contractor from obligations to furnish a workable mixture.

Whenever the 28-day compressive strength, f'_c, is 4,000 psi or greater, consider the concrete to be designated by compressive strength and shall be the minimum required at 28 days.

The class of concrete for 28-day compressive strengths, f'_c, that are less than 4,000 psi are designated in Table 601-I - Design of Concrete. They are not a requirement for acceptance of concrete.

Proportion the concrete designated by compressive strength such that the concrete will conform to the strength specified in this contract.

Concrete deposited in water shall be seal concrete.

Design concrete placed in bridge decks and pavements exposed to the wearing of traffic with an air content of 3% which includes entrapped and entrained air. Maintain the air content for plastic concrete within a tolerance of ± 1% during the work. Unless the contract designates the concrete by compressive strength, the concrete shall be Class BD.

When placing concrete in bridge decks, incorporate a water-reducing and set-retarding admixture into the concrete. The water-reducing and set-retarding admixture shall have the capability of varying the degree of retardation without adversely affecting the other characteristics of the concrete. Submit a design dosage for the admixture to the Engineer for acceptance.

Unless specified in other parts of the contract, the concrete shall be Class A.

The design of concrete shall be as required in Table 601-I.

TABLE 601-I - DESIGN OF CONCRETE

Class of Concrete	28-Day Strength f'_c, psi	Minimum Cement Content 100 lbs./c.y. (8.0 Maximum)	Maximum Water-Cement Ratio, lb./lb.
A	3000	5.6	0.55
B	2500	5.0	0.62
C	2000	4.4	0.71
D	1500	4.0	0.80
BD	3750	6.1	0.49
SEAL	3000	6.1	0.55
Designated by Strength f'_c or $^*f'_r$	As Specified	6.1	0.49

$^*f'_r$ = Specified Modulus of Rupture

Proportion the concrete materials according to the requirements for each concrete designated by class, cement content in pounds per cubic yards, or 28-

day compressive strength specified in the contract using the absolute volume method. Use the volumetric proportioning methods as outlined in:

(1) the American Concrete Institute (ACI) Standard 211.1-89, "Recommended Practices for Selecting Proportions for Normal and Heavyweight Concrete."

The coarse aggregate size for concrete shall be No. 57 (one inch to No. 4) or No. 67 (3/4 inch to No. 4). For concrete placed in the bottom slab and stems of box girders, use the No. 67 size aggregate. When accepted by the Engineer in writing, the Contractor may use smaller size aggregates where encountering limited spacing between forms and reinforcement.

When called for in the contract, lightweight concrete shall have a minimum compressive strength of 3,000 psi at 28 days. The lightweight concrete shall contain not less than 560 pounds of portland cement per cubic yard. Make, cure, and determine the compressive strength of lightweight concrete cylinders according to AASHTO T 22 and T 23. Lightweight concrete shall have a maximum wet plastic unit weight of 135 pcf and a nominal slump of 3.5 inches.

Determination of compliance with the requirements shown in this subsection shall be according to the following standard methods:

STANDARD METHODS	
Sampling Fresh Concrete	AASHTO T 141
Weight Per Cubic Foot Yield and Air Content of Concrete	AASHTO T 121
Slump of Portland Cement Concrete	AASHTO T 119
Air Content of Freshly Mixed Concrete by the Pressure Method	AASHTO T 152
Specific Gravity and Absorption of Fine Aggregate	AASHTO T 84
Specific Gravity and Absorption of Coarse Aggregate	AASHTO T 85
Temperature of Freshly Mixed Concrete	ASTM C 1064

Test for strength shall be according to the following:

TEST FOR STRENGTH	
Making and Curing Concrete Compressive and Flexural Test Specimens in the Field	AASHTO T 23

Compressive Strength of Molded Concrete Cylinders	AASHTO T 22 (6 inch by 12 inch cylinders only)
Flexural Strength of Molded Beams	AASHTO T 97

When concrete is designated by compressive strength, f'_c, or flexural strength, f'_r, the Engineer will require prequalification of materials and mix proportions proposed for use before placing such concrete. The Engineer will prequalify the concrete on past performance records using statistical computations of the population sizes and (n-1) weighting, or trial batch test reports according to the computed minimum average strength for the material and mix proportions. The Engineer will resolve the minimum average strength on a probability of not more than one in 20 tests falling below the specified strength for the following conditions:

(1) When past performance records are available, the documented performance records shall include:

(a) a minimum of 15 consecutive 28-day strength tests from projects having the same materials and mix proportions or

(b) two groups totaling 30 or more test results representing similar materials in which the mix proportion strengths are within 20% of the specified strength from within the last one year.

The Engineer will analyze the performance records to establish a standard deviation. The Engineer will resolve the minimum average strength on the computed standard deviation.

(2) When no sufficient past performance records are available, the Engineer will assume the current standard deviation to be 500 psi for compressive strength, f'_c, and 50 psi for flexural strength, f'_r.

Unless sufficient performance records are available from other projects at the DOT Materials Testing and Research Branch, submit test performance records or trial test reports for prequalifications of concrete provided:

(1) such data shall be the most recent tests made on concrete of the proposed mix design and

(2) the Contractor has obtained such data within one year of the proposed use.

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

(1) Date of mixing.

(2) Mixing equipment and procedures used.

(3) The size of batch in cubic yards and the weight, type, and source of ingredients used.

(4) Slump of concrete.

(5) The air content of the concrete when using an air entraining agent.

(6) The age and strength of concrete cylinders tested.

Trial batch test reports shall show that the concrete equals or exceeds the minimum average strength. The test is the average 28-day test results of five consecutive concrete cylinders or concrete beams taken from a single batch. No cylinder or beam shall have a strength less than 85% of the minimum average strength.

An official of the firm that did the tests shall sign the test data and trial test reports.

The Engineer reserves the right to stop the work when the mix properties are sufficiently out of control and a series of excessively low strength tests are occurring. Do not continue concrete work until after establishing the cause and informing the Engineer the necessary corrective action taken. The corrective action may range from a minor adjustment of proportions to the establishment of a new mix design.

601.05 Batching. Measure and batch the materials according to the following provisions:

(A) Portland Cement. Sacked or bulk cement may be used. Do not use fraction of a sack of cement in a batch of concrete unless the cement is weighed.

Weigh bulk cement on an accepted weighing device. Seal and vent the bulk cement weighing hopper properly to preclude dusting during operation. Do not suspend the discharge chute from the weighing hopper. Also, arrange the discharge chute so that cement will not lodge in the hopper or leak from the hopper.

Accuracy of batching shall be ± 1% of the required mass.

(B) Water. Measure water by volume or by mass. The device for measurement of water shall be readily adjustable and shall have an accuracy within 1% of the quantity of water required for the batch. Arrange the device so that variable pressures in the water supply line does not affect the measurements. Equip the measuring tanks with

outside taps and valves or other accepted means to provide for checking their calibration. Water, as measured, shall be within 1% of the required quantity.

(C) Aggregates. Store and stockpile the aggregates so that the Contractor avoids separation of coarse and fine particles within each size and does not intermix the various sizes before proportioning. Protect the stored or stockpiled aggregates from dust or other foreign matter. Do not stockpile the aggregates from different sources and of different gradings together.

Handle aggregates from stockpiles or other sources to the batching plant by maintaining a uniform grading of the material. Do not use aggregates that have become segregated or mixed with earth or foreign matter. Stockpile or bin the aggregates at least 12 hours for draining before batching the aggregate when producing or handling the aggregates by hydraulic methods and washing the aggregates for draining. When the aggregates contain a high or non-uniform moisture content, the Engineer will require storage or stockpile over 12 hours.

Proportion the aggregates by weight. The exception is that the aggregates in concrete for minor structures, curbs, and sidewalks may be proportioned by volume or weight. For volume proportioning, use the measuring boxes of known capacity to measure the quantity of each size of aggregate.

Use the batch weight based on dry materials plus the total weight of moisture (both absorbed and surface) contained in the aggregate. The individual aggregates shall be within ± 2% of the required weight. The total mass of the aggregates shall be within ± 1% of the required weight.

(D) Admixtures. Store, proportion, and dispense admixtures according to the following provisions:

> **(1) Liquid Admixtures.** Dispense chemical admixtures, air entraining admixtures, and calcium chloride in liquid form. Dispense such liquid admixture by automatic dispensing equipment. Dispensers for liquid admixtures shall have sufficient capacity to measure the prescribed quantity for each batch of concrete. Each dispenser shall include a graduated measuring unit into which liquid admixtures can be measured to within ± 5% of the prescribed quantity for each batch. Locate and maintain the dispenser where the graduations can be read accurately from the point at which proportioning operations are controlled to permit a visual check of batch accuracy before discharging. Mark each measuring unit clearly for the type and quantity of admixture.

Arrange with the supplier to provide safe and suitable facilities for sampling admixtures.

When using more than one liquid admixture for the concrete mix, provide a separate measuring unit for each liquid admixture. Dispense the liquid admixture by injecting so that the admixture is not mixed at high concentrations and not interfere with the effectiveness of each other.

When using liquid admixtures in concrete, the dispensers shall operate automatically with the batching control equipment. Equip such dispensers with an automatic warning system in good operating condition that will provide a visible or audible signal at the point that the proportioning operations are controlled:

(a) when the quantity of admixture measured for each batch of concrete varies from the pre-selected dosage by more than 5% or

(b) when not emptying the entire contents of the measuring unit from the dispenser into each batch of concrete.

Unless liquid admixtures are added to the pre-measured water in the batch, arrange their liquid discharges into the batch of concrete to flow into the stream of water that will disperse the admixture throughout the batch.

Measure and disperse special admixtures as recommended by the admixture manufacturer and as accepted by the Engineer. Special admixtures shall include "high range" water reducers requiring dosages greater than the capacity of conventional dispensing equipment.

(2) Mineral Admixtures. Protect mineral admixtures from exposure to moisture until used. Pile the sacked material to permit access for tally, inspection and identification for each shipment.

Provide adequate facilities to keep the mineral admixtures separated and to assure inserting only the specified mineral admixtures in the work. Provide safe and suitable facilities for sampling mineral admixtures.

Incorporate the mineral admixtures into concrete using equipment conforming to Subsection 601.05(A) - Portland Cement.

When completely mixing the concrete in paving or continuous mixers, weigh the mineral admixture in a separate weigh hopper. Introduce the mineral admixture and cement simultaneously into the mixer proportionately with the aggregate.

When requiring interlocks for cement charging mechanisms and weighing the cement and mineral admixtures cumulatively, interlock their charging mechanisms to prevent the introduction of mineral admixture until the weight of cement in the weigh hopper is within the tolerances specified in Subsection 601.05(A) - Portland Cement.

In determining the maximum amount of free water that may be used in the concrete, consider the mineral admixture to be cement.

(E) Bins and Scales. The batching plant shall include separate and adequate bins for each size of aggregate. When using cement in bulk, include a separate and adequate bin and weighing hopper for the cement.

Attach the cement weighing hopper to a separate scale for individual weighing or to the aggregate scale for cumulative weighing. When weighing the cement cumulatively, weigh the cement before the other ingredients.

Scales for batching shall be of the springless-dial or beam-type. When using beam-type scales, make provisions to show the operator that the required load in the weighing hopper is approaching. The device shall make the indication within the last 200 pounds of load and within 50 pounds of overload.

Scales shall be accurate to 0.5% throughout the range of use. Design poises to lock thus preventing unauthorized change of position. Use scales inspected the State Measurement Standards Branch of the Department of Agriculture to assure their continued accuracy. Provide not less than ten 50 pounds weight for testing scales.

Batching plants may be equipped with automatic weighing devices of accepted types to proportion aggregates and bulk cement.

(F) Batching and Hauling. To check the accuracy of batch mass, resolve the gross and tare mass of batch trucks, truck mixers, and truck agitators when specified by the Engineer. Weigh the equipment on certified scales at no cost to the State.

When mixing is at the work site, transport the aggregates in batch boxes, vehicle bodies, or other containers of adequate capacity and construction. Partitions separating batches shall be adequate and effectively prevent spilling from one compartment to another while in transit or dumping. When using bulk cement, use a suitable method for handling the cement from weighing hopper to transporting container or into the batch itself for transportation to the mixer. Arrange batching and hauling to provide positive assurance of the actual presence in each batch of the entire cement content specified.

Transport bulk cement to the mixer in tight compartments carrying the full quantity of cement required for the batch. When placing cement in contact with the aggregates, the Engineer may reject the batches unless they are mixed and placed within 1.5 hours from contact. The Contractor may transport cement in original shipping packages on top of the aggregates, provided each batch contains the number of sacks required by the job mix.

Deliver the batches to the mixer intact. Dump each batch into the mixer without loss of cement. Also, when carrying more than one batch on the truck, dump the batch into the mixer without spilling the material from one batch compartment into another.

601.06 Mixing. Mix the concrete in mechanically operated mixers. When the Engineer permits, mix batches by hand methods according to the last paragraph of this section.

Mixers may be stationary or truck mixers. The mixer shall produce concrete uniform in color, appearance and distribution of the materials throughout the mass. Variation in the mixed concrete attributable to worn pickup or throw over blades will be just cause for inspection. When such inspection reveals the blades to be worn down more than one inch below the original height of the manufacturer's design, repair or replace the blades. Make a copy of the manufacturer's design, showing dimensions and arrangement of blades upon request.

Charge the batches into central or truck mixers so that part of the mixing water enters ahead of the cement and aggregates. The flow of water shall be uniform. The total water of each batch shall be in the mixer by the end of the first quarter of the mixing period. When using mixers having multiple compartment drums, the Engineer will consider the time required to transfer material between compartments mixing time. The speed at which the drum shall rotate shall be as designated by the manufacturer. If such mixing does not provide concrete of uniform and smooth texture, perform additional revolutions at the same speed until each batch of concrete is thoroughly mixed. The Engineer will consider the mixing time from the time cement, aggregates, and 60% of the water are in the drum. Concrete mixed in each batch shall not

exceed the manufacturer's guaranteed capacity. The Engineer will consider the guaranteed capacity of a mixer to be the manufacturer's rated capacity.

Equip central or truck mixers with an attachment for automatically timing the mixing of each batch of concrete. The timing device includes an automatic arrangement for locking the discharge chute and a device for warning the operator when the materials have been mixed the required length of time. When the timing or locking device becomes broken or fail to operate, immediately place before the mixer operator a clock or watch having a second hand. When failing to make repairs within three days after the timing or locking device becomes unserviceable, shut down and make the proper repairs.

The required mixing time in stationary mixers shall be between 50 seconds and five minutes. The mixing time shall be as necessary to produce concrete that meets the uniformity criteria when tested according to Section 11.3.3 of ASTM C 94. The Contractor may designate the mixing time between 50 seconds and five minutes to do the uniformity tests. The mixed concrete shall meet the uniformity requirements specified before using concrete for pavements or structures. The Engineer may allow the use of test concrete for appropriate incidental construction. Furnish labor, sampling equipment, and materials required for uniformity tests of the concrete mixture. The Engineer will furnish required testing equipment including scales, cubic measure, and air meter. The Engineer will do the test. The Engineer will not make payment for the labor, equipment, materials, or testing. The Engineer will consider them incidental to the concrete. After establishing operational procedures of batching and mixing, the Engineer will not permit changes in procedure without re-establishing procedures by uniformity tests. Repeat the mixer performance tests whenever the appearance of the concrete or the coarse aggregate content of samples is not according to ASTM C 94. For paving mixers, add four seconds to the specified mixing time when timing starts as soon as the skip reaches its maximum raised position.

Mix the truck mixed concrete at the proportioning plant. The mixer shall operate at agitating speed while in transit. The Contractor may mix the truck mixed concrete at the point of delivery provided the cement, or cement and mixing water, is added at that point. Mixing of truck mixed concrete shall begin immediately after the introduction of the mixing water to the cement and aggregates, or introduction of the cement to the aggregates.

A truck mixer includes a water tight revolving drum suitably mounted and fitted with adequate blades, and equipped with electrically or mechanically actuated revolution counters. Truck mixers shall produce a thoroughly mixed and uniform mass of concrete and shall discharge concrete without segregation.

Attach a metal manufacturer's standard rating place to each truck mixer permanently. The rating plate shall state the truck mixer's maximum volume of mixed concrete for the various uses. Also attach a manufacturer's data plate stating the maximum and minimum mixing speeds and other data needed by the manufacturer to each truck mixer. When using the truck mixers for mixing,

concrete in each batch shall not exceed the maximum capacity shown on the metal rating plate. When the equipment does not have a rating plate, an attested copy of the manufacturer's rating shall suffice or the batch volume shall not exceed 63% of the gross interior volume.

Operate truck mixers at the speed of rotation designated by the manufacturer. The mixing speeds for the revolving drum type shall be not less than 6 nor more than 18 revolutions per minute.

Initially mix each batch of truck mixed concrete not less than 70 nor more than 100 revolutions of the drum after all the ingredients including water are in the mixer. When the batch volume is less than 63% of the gross volume of the drum or less than 91% of the rated maximum capacity, the number of revolutions required for mixing shall be not less than 50 nor more than 100 revolutions per minute.

Water may be added to the mixture not more than two times after the completion the initial mixing. Each time water is added, turn the drum an additional 30 revolutions or more if necessary at mixing speed until the concrete is uniformly mixed.

When furnishing shrink-mixed concrete, transfer the concrete that has been partially mixed at a central plant to a truck mixer. Requirements for transit-mixed concrete shall apply. The Engineer will not allow credit in the number of revolutions at mixing speed for partial mixing in a central plant.

When the Engineer permits hand mixing, use hand mixing in batches not more than 0.33 cubic yard and mix on a watertight, level platform. Measure the proper amount of coarse aggregate in measuring boxes and spread on the platform. Spread the fine aggregate on this layer. The coarse aggregate and fine aggregate layers shall not be more than one foot in total depth. Spread dry cement on this mixture. Turn the whole mass not less than two times dry. Then add and distribute evenly sufficient clean water. Turn the whole mass again not less than three times not including placing in the carriers or forms.

601.07 Transporting Mixed Concrete. The Contractor may transport mixed concrete to the delivery point in:

(1) truck agitators, or

(2) truck mixers operating at the speed designated by the manufacturer of the equipment as agitating speed, or

(3) non-agitating hauling equipment, provided the:

(a) consistency and workability of the mixed concrete upon discharge at the delivery point is suitable for adequate placement and consolidation in place and

(b) mixed concrete after hauling to the delivery point conforms to the uniformity criteria when tested as specified in Section 11.5.1 of ASTM C 94.

A truck agitator includes a watertight revolving drum or a watertight container suitably mounted and fitted with adequate revolving blades and a removable cover. Operate truck mixers or truck agitators within the limits of capacity and speed of rotation designated by the manufacturer for agitating. Agitators shall not exceed 80% of gross drum volume. Agitating speed for both the revolving drum mixers and revolving blade type agitators shall be between two and six revolutions per minute of the drum or of the mixing blades. Truck mixers or truck agitators shall have electrically or mechanically actuated counters. Actuate the counters after introducing the cement to aggregates.

Bodies of non-agitating hauling equipment shall be smooth and watertight metal containers equipped with gates that will permit control of discharge of the concrete. Provide accepted covers for protection against weather. When hauling concrete in non-agitating trucks, complete the discharge within 30 minutes after introducing the mixing water to the cement and aggregates.

When using a truck mixer or agitator for transporting concrete to the delivery point, complete the discharge:

(1) within 1.5 hours or

(2) before 250 revolutions of the drum or blades for central mixed concrete, or 300 revolutions of the drum or blades for truck mixed concrete, whichever comes first after introducing the mixing water to the cement and aggregates, or cement to the aggregates.

In hot weather or under conditions contributing to quick stiffening of the concrete, the Engineer will reduce the time.

The manufacturer of truck mixed concrete and of central mixed concrete shall furnish the Engineer a delivery ticket with each truck load of concrete before unloading at the jobsite. The delivery ticket shall have the following information, printed, stamped, or written:

(1) Name of concrete plants,

(2) Serial number of ticket,

(3) Date and truck number,

(4) Name of Contractor,

(5) Specific project, route, or designation of job (name and location),

(6) Specific class or designation of concrete according to the contract,

(7) Quantity of concrete in cubic yards,

(8) The time the Contractor loads the batch or first mixing of cement and aggregates occurs,

(9) Name and quantity of admixture, if any,

(10) Readings of non-resettable revolution counters of truck mixers after the introduction of the cement to aggregates, or the introduction of the mixing water to the cement and aggregates,

(11) "Central Mixed" or "Premixed" when mixing the concrete completely in a central mixer.

Furnish additional information designated by the Engineer and required by the job specification upon request.

601.08 Consistency. Regulate the water used in concrete mixes so that the consistency of the concrete as determined according to AASHTO T 119 is within the nominal slump range shown in Table 601-II. When the slump of the concrete is found to exceed the nominal slump, adjust the mixture of subsequent batches.

The ability of the equipment to properly place the concrete gages the consistency of the concrete. The difficulty in mixing, transporting, or pumping does not gage the consistency of the concrete. The Engineer will reject harsh or unworkable concrete that cannot be placed properly. Remove them at no cost to the State.

The slump for concrete shall be as specified in Table 601 -II.

TABLE 601-II - SLUMP FOR CONCRETE

Type of Work	Nominal Slump Inches	Maximum Slump Inches
Concrete Pavements	0 - 3	3-1/2
Reinforced Concrete Structures:		
Sections Over 12 Inches	0 - 4	5
Sections 12 Inches Thick or Less	2 - 5	6
Non-Reinforced Concrete Facilities	1 - 3	4
Concrete Placed Underwater	6 - 8	9
Bridge Decks	0 - 3	3-1/2

When adverse or difficult conditions exist, the Contractor may exceed the above specified slump limitation if permitted by the Engineer in writing and maintains the water-cement ratio before placement. The cost of additional cement and water, or admixture shall be at no cost to the State. The Engineer will not allow additional compensation.

601.09 Forms. Construct forms according to the applicable sections of the contract.

601.10 Placing Concrete. Place concrete according to the applicable sections of the contract.

601.11 Finishing Concrete Surfaces. Finish concrete surfaces according to the applicable sections of the contract.

601.12 Curing Concrete. Cure the concrete according to the applicable sections of the contract.

601.13 Method of Measurement. The Engineer will measure concrete according to the applicable sections of the contract.

601.14 Basis of Payment. The Engineer will pay for the accepted concrete according to the applicable sections of the contract."

END OF SECTION

SECTION 602 - REINFORCING STEEL

Make the following amendments to said Section:

(I) Amend **602.07 Method of Measurement** and **602.08 Basis of Payment** to read as follows:

"**602.07 Method of Measurement.** The Engineer will measure reinforcing steel for payment.

The Engineer will base the weights calculated according to Table 602-III.

TABLE 602-III BAR DESIGNATION, WEIGHT AND AREA

Bar No.	Weight Per Linear Foot (Pounds)	Area (Square Inches)
3	0.376	0.11
4	0.668	0.20
5	1.043	0.31
6	1.502	0.44
7	2.044	0.60
8	2.670	0.79
9	3.400	1.00
10	4.303	1.27
11	5.313	1.56
14S	7.650	2.25
18S	13.600	4.00

The Engineer will not make allowance for clips, wire or other material used for fastening reinforcement in place.

The Engineer will not measure mesh reinforcement.

602.08 Basis of Payment. The Engineer will pay for the accepted reinforcing steel at the contract lump sum price complete in place. The price includes full compensation for furnishing and testing sample splices and completed splices cut from rebars placed in the work, including replacing or resplicing rebars to the length shown in the contract; furnishing access facilities to permit the Engineer to do the tests, and for losses or delays to the Contractor resulting from

the sampling and testing specified herein; and furnishing labor, equipment, materials, tools and incidentals necessary to complete the work.

The Engineer will not pay for mesh reinforcement separately. The Engineer will consider the cost for mesh reinforcement as included in the bid price of the various contract items."

Pay Item	**Pay Unit**
Reinforcing Steel _____ (____ Lbs.)	Lump Sum

END OF SECTION

Amend **Section 603 - Culverts and Storm Drains** to read as follows:

"SECTION 603 - CULVERTS AND STORM DRAINS

603.01 Description. This section is for constructing or reconstructing culverts and storm drains referred as "culvert", according to the contract.

603.02 Materials. Materials shall conform to the following:

Bed Course Material for Pipe	703.16(B)
Structure Backfill Material	703.20
Trench Backfill Material	703.21
Joint Mortar	705.02
Flexible Watertight Gaskets	705.03
Reinforced Concrete Pipe	706.02
High Density Polyethylene Pipe	706.10
Corrugated Metal Pipe and Pipe Arch	707.02
Corrugated Metal Pipe Coupling Bands	707.05
Spiral Rib Metal Pipe	707.12
Spiral Rib Metal Pipe Coupling Band	707.13
Asphalt Paint	708.05
Cullet Materials for Utility Structures	717.03
Cullet Materials for Drainage Systems	717.04

When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The Engineer may get samples of materials for laboratory testing for compliance with material quality requirements. This may be the basis for acceptance of manufacturing lots as to quality.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

If specified in the contract, the Contractor shall have the option of furnishing

and installing corrugated metal pipe, spiral rib metal pipe, reinforced concrete pipe, or high density polyethylene pipe for culvert. Do not mix the type of pipe within the inlet and outlet points of installation.

603.03 Construction Requirements. The Contractor shall provide, as may be necessary, for the temporary diversion of water to install the culvert on a dry bed.

(A) Excavation. Excavate the trenches according to Section 206 - Excavation and Backfill for Conduits and Structures and as set forth herein.

Trench widths shall be sufficient to allow:

(1) proper jointing of the culverts,

(2) thorough compaction of the bed course, and

(3) backfill material under and around the culvert.

If feasible, trench walls shall be vertical.

The completed trench bottom shall be firm for its full length and width.

Remove solid rock met in excavation below invert grade. Backfill and compact the trench up to the culvert invert. Backfill and compact the trench to a relative compaction of not less than 95% in maximum 6 inch lifts with bed course material. The test method to establish maximum densities and relative compaction shall be according to Subsection 106.09(A) - Relative Compaction Test.

For pipes and culverts, except structural plate culverts, the bed course material under the culvert shall have a thickness of 0.5 inch for each foot of fill over the culvert with a minimum thickness of 12 inches. They need not exceed 0.75 of the nominal culvert diameter or rise. The width of the bed course shall be equal to the span or diameter of the culvert plus 18 inches on each side.

When meeting soft, spongy, or unsuitable material, remove such material from a width equal to the span or diameter of the culvert plus one foot on each side and to a depth specified.

When the contract shows bed course material without thickness specified, resolve the thickness as specified above for solid rock excavation.

When shown in the contract, excavate the trench below grade. Backfill the resulting space with compacted bed course material.

(1) Corrugated Metal, Reinforced Concrete, Concrete Cylinder, Spiral Rib Metal, and High Density Polyethylene Culvert. When placing Corrugated Metal, Reinforced Concrete, Spiral Rib Metal Culvert, and High Density Polyethylene pipes for culverts in embankment fill, excavate after completing the embankment. Embank on each side of the culvert for a distance of:

(a) not less than five times the outside diameter or

(b) span to an elevation:

1. 0.5 the outside diameter of the culvert or

2. 0.5 the rise above the top of the culvert or

3. to the required elevation shown in the contract, whichever is less.

This work shall conform to Section 203 - Excavation and Embankment. Then excavate the trench through the constructed embankment.

If portions of an installed culvert projects above the existing ground, the Engineer will consider the entire culvert placed in embankment fill.

(B) Bedding. The culvert bedding shall conform to the classes specified. When the contract does not specify bedding class, the requirements for Class C Bedding shall apply.

(1) Class A Bedding. Class A bedding includes a continuous cradle conforming to the details shown in the contract.

(2) Class B Bedding. Class B bedding includes bedding the culvert in bed course material to a depth of not less than 15% of its total vertical height. The thickness of the bed course material under the culvert shall have a minimum thickness of 12 inches. Shape the bed course material to fit the culvert. Shape the recesses in the trench bottom to ease the bell or collar when using such culvert.

(3) Class C Bedding. Class C bedding includes bedding the culvert to a depth of not less than 10% of its total vertical height. Shape the foundation material to fit the culvert. Shape the recesses

in the trench bottom to ease the bell or collar when using such culvert.

(C) Laying Culvert. Remove and replace the culverts that the Contractor breaks, bends, or damages by its operations at no cost to the State.

(1) Corrugated Metal, Reinforced Concrete, Spiral Rib Metal, and High Density Polyethylene Culvert. The culvert laying shall begin at the downstream end of the culvert line. The lower end of the culvert shall be in contact with the shaped bedding throughout its full length. Place the bell or groove ends of rigid culverts and outside circumferential laps of flexible culverts facing upstream. Place the flexible culverts with longitudinal laps or seams at the sides.

Lay the paved or partially lined culverts so that the longitudinal centerline of the paved segment coincides with the flow line. Place the elliptical and elliptically reinforced culverts with the vertical axis within 5^{o} of a vertical plane through the longitudinal axis of the culvert. Place the elongated circular corrugated culverts with the major axis vertical.

(D) Joining Culverts. Rigid culverts may be of bell and spigot or tongue and groove design. The method of joining culvert sections shall be such that the Contractor enters the ends fully and the inner surfaces are flush and even.

Make joints with joint mortar or flexible watertight gaskets.

When using mortar to join culvert sections 30 inch or less in diameter, apply mortar to the ends of each section of culvert before joining. Make mortar joints with an excess of mortar to form a bead around the outside of the culvert and finish smooth on the inside.

When using mortar to joint culvert sections greater than 30 inch in diameter, apply the mortar to the joint's inside only. Mortar the joints only after installing the culvert sections and after placing sufficient backfill to assure that the culvert does not move. Finish the joint's inside smooth with the inside culvert surface.

When using collared joints, center the collar carefully over the joint. Pack the entire space between the collar and culvert tightly with mortar.

When using portland cement mixtures, protect the completed joints against rapid drying by suitable covering material.

When using preformed plastic sealing compounds, clean and dry the

joint surfaces. Apply an accepted primer coat to surface. Allow the primer coat to dry completely. Apply the flat side of the preformed plastic sealing adhesive strips to the dry primed surface. The outside wrapper remains for protection.

In the ditch before jointing, remove the outside wrapper. Install the jointing by a pushing or pulling force applied in a straight line to bring the opposing joint surface tightly closed. The jointing pressure shall result in squeezing the plastic gasket to a solid pack. The Engineer will allow only whole pieces and one cut pieces. Do not use the short, fragmented pieces to complete the circumference.

Table 603-I and Table 603-II lists the gasket sizes for dry and wet trench (double head application) conditions.

TABLE 603-I : DRY TRENCH CONDITION EXTRUDED ROPE SIZE

Pipe Size Inch	Rope Diameter Inch	Cross Sectional Area Square Inch	Minimum Delivery Length Foot-Inch
18 and below	1	0.80	2 - 5
24 - 42	1-1/2	1.75	3 - 5
48 - 66	1-3/4	2.50	3 - 5
72 - 96	2	3.25	3 - 5

TABLE 603-II : WET TRENCH CONDITION EXTRUDED ROPE SIZE
DOUBLE HEAD APPLICATION

Pipe Size Inch	Rope Diameter Inch	Cross Sectional Area Square Inch	Minimum Delivery Length Foot-Inch
30 and below	1	0.80	2 - 5
36 - 48	1-1/2	1.75	3 - 5
54 - 72	1-3/4	2.50	3 - 5
78 - 96	2	3.25	3 - 5

Install rubber ring gaskets to form a flexible watertight seal. Clean and dry the surfaces to receive lubricants, cements, or adhesives. Affix the gaskets and jointing materials to the culvert not more than 24 hours before the installation. Protect the gaskets and jointing materials from the sun, dust, and other deleterious substances. Inspect the gaskets and jointing materials before installation of the culvert. Remove and replace loose or improperly affixed gaskets and jointing materials. If, the Contractor can see through the exterior joint recess when pulling the joint up to one inch of closure, remove the culvert and remake the joint.

Join the flexible culverts firmly to coupling bands. Submit a joint detail and joining method to the Engineer for acceptance before installing flexible culvert.

The Engineer will inspect the culvert before the Contractor places backfill. Take up and re-lay or replace culverts out of alignment and unduly settled at no cost to the State.

(E) Elongation of Corrugated Metal Culverts. When using corrugated metal culvert and the contract specifies elongation, elongate the vertical diameter 5% from a full circular cross section before placing fills.

The Contractor may so elongation at the fabricating shop or in the field.

The Contractor may elongate the culverts at the fabricating shop by the following methods:

(1) Fabricating the plates so that the Contractor gets elongation after assembly;

(2) Mechanical pressure sufficient to introduce a permanent elongation in the culvert;

(3) Elongating the assembled culvert and retaining the elongation by rods and turnbuckles, wires, or struts.

When elongating the culverts in the field, the method of elongation shall conform to the details in the contract.

When using rods and turnbuckles, wires, or struts to maintain culvert elongation, do not remove them before the completion of the embankment. Remove them before the installing headwalls or other structures at the ends of culverts.

Remove the rods and turnbuckles, wires, or struts used for elongation at no cost to the State. If they are to be left in place for a longer period, the Engineer will remove them at no cost to the Contractor.

(F) Strutting for Support. When shown in the contract or specified by the Engineer, place timber struts and sills for the full length of the culvert ahead of backfilling under certain load conditions. Place the strutting to retain the original cross section of the culvert.

(G) Repairing Damaged Zinc-Coated Surfaces. Repairs to damaged zinc-coated surfaces shall be according to Subsection 501.03(G)(2) - Repairing of Damaged Zinc-Coated Surfaces.

(H) Backfilling. After installing the culvert, backfilling shall be according to Section 206 - Excavation and Backfill for Conduits and Structures. The Contractor may use Section 313 - Controlled Low Strength Material (CLSM) instead of Subsection 206.02(C) - Trench Backfill Material as backfill material subject to the Engineer's acceptance. Do not use CLSM as trench backfill when installing aluminum and aluminum coated pipe culverts. When using CLSM, the Engineer will consider CLSM as the required backfill.

Trench backfill material placed below a horizontal plane 12 inches above the top of the pipe or culvert shall conform to Subsection 703.21(A) - Trench Backfill Material A or Section 313 - Controlled Low Strength Material (CLSM).

When using CLSM for trench backfill, the Contractor may reduce the width of the excavation shown on the plans so that the clear distance between the outside of the pipe and the side of the excavation on each side of the pipe is a minimum of 6 inches for pipes less than or equal to 42 inches in diameter or span or 12 inches for pipes more than 42 inches in diameter or span.

Except for structural plate culvert, backfill the remainder of the trench with structural backfill material according to Section 703.20(B) - Structure Backfill Material B or with trench backfill material according to Section

703.21(B) - Trench Backfill Material B or with CLSM according to Section 313 - Controlled Low Strength Material (CLSM).

Place CLSM only for that portion of the trench backfill below the original ground, the grading plane, or top of embankment placed before excavating for the culvert pipe. Where necessary, compact the earth plugs at each end of the pipe before placing backfill so that the CLSM is completely contained in the pipe trench.

When using CLSM, the Engineer will not require compaction of the backfill.

When operating earth moving equipment over culverts, the Engineer will require a compacted cushion of earth at least:

(1) four feet above the top of the culvert and

(2) extending five diameters on each side of the culvert.

Remove and replace broken culverts or damaged by its operation, with acceptable culverts at no cost to the State.

603.04 Method of Measurement. The Engineer will measure the bed course material per cubic yard.

The Engineer will measure culverts per linear foot complete in place. The Engineer will measure culvert with sloped or skewed ends along its invert. The Engineer will include branch connections and elbows in the length measurement for the culvert.

603.05 Basis of Payment. The Engineer will pay for the accepted bed course material at the contract unit price per cubic yard. The price includes full compensation for furnishing, placing, and compacting the bed course material; and furnishing labor, material, tools, equipment, and incidental necessary to complete the work.

The Engineer will pay for the accepted culvert at the contract unit price per linear foot complete in place. The price includes full compensation for diverting the water temporarily; removing solid rock; backfilling and compacting the trench; furnishing, laying, and joining the pipe; furnishing labor, material, tools, equipment, and incidental necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Bed Course Material for Culvert	Cubic Yard

_____ - Inch Reinforced Concrete Pipe, Class _____, or
_____ - Inch High Density Polyethylene Pipe (Type S), or
_____ - Inch Aluminum Spiral Rib Pipe, thickness=____ Linear Foot

The Engineer will pay for the accepted excavation including excavation below flow line grade, bedding, and backfill for culverts and storm drains under Section 206 - Excavation and Backfill for Conduits and Structures.

END OF SECTION

Amend **Section 604 - Manholes, Inlets and Catch Basins** to read as follows:

"SECTION 604 - MANHOLES, INLETS AND CATCH BASINS

604.01 Description. This work includes constructing and/or adjusting manholes, inlets, catch basins, and/or standard valve boxes and relocation of water meter, water meter box frame and cover according to the contract.

604.02 Materials. Concrete for structures shall be of the class specified. Concrete shall conform to Section 601 - Structural Concrete. If concrete in structures is to come in direct contact with sewage or sewage gases, the Contractor shall modify the proportioning of concrete according to Section 625 - Sewer System.

Brick for water valve manhole shall be concrete brick. Brick for water valve manhole shall conform to Subsection 704.02 - Concrete Brick.

Other materials shall conform to the following:

Asphalt Filler	702.07
Structural Backfill Material	703.20
Trench Backfill Material	703.21
Asphalt (Filler) Type C Asphalt	705.06(C)
Clay or Shale Brick	704.01
Mortar for Manholes	705.08
Reinforcing Steel	709.01
Precast Concrete Units	712.06
Frames, Grates, Covers and Ladder Rungs	712.07
Pipe Collar for Valve Box	712.22
Cullet Materials for Utility Structures	717.03
Cullet Materials for Drainage Systems	717.04

When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The Engineer may get material samples to verify compliance with the contract. This may be the basis for acceptance of manufacturing lots regarding quality.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

604.03 Construction Requirements.

(A) General. Concrete construction shall conform to Section 503 - Concrete Structures.

Reinforcing steel work shall conform to Section 602 - Reinforcing Steel.

A certified welder shall do the shop and field welding according to Section 501 - Steel Structures.

Dip or soak the brick in water before laying the bricks. Joints shall be full mortar joints. Joints shall not be more than 0.5-inch wide. Joints in the brick work on the inside portion of the brick manhole shall be neatly struck.

The Contractor may furnish and install storm drain manholes, inlets, and catch basins as precast units or combined precast and cast-in-place units. Units completed in place shall conform to cast-in-place construction specified in the contract. If the Contractor uses precast units or combination of precast and cast-in-place units, the Contractor shall submit shop drawings to the Engineer for acceptance before construction.

(B) Manholes, Inlets, and Catch Basins. Construct the concrete base according to the contract. Allow the concrete to set for at least 24 hours before constructing additional material on this base. Do not remove the forms for at least 24 hours after placing the concrete. Finish the concrete while the concrete is still fresh.

(1) Sewer Manholes. The Contractor may make the sanitary sewer manholes entirely of bricks from the concrete base upwards if:

(a) the invert to the top of the frame is 10 feet deep or less,

(b) the invert is not below the ground water table, and

(c) the Contractor locates the manhole in a relatively dry area.

Make the manhole walls below the 10-foot depth of concrete.

Construct precast concrete sewer manhole sections according to the contract and ASTM C 478.

Place the reinforcing steel for precast sections according to ASTM C 478.

Construct cast-in-place sewer manhole walls according to the contract.

Place the reinforcing steel for cast-in-place manhole walls according to the contract.

An expert cement finisher shall shape and finish the sanitary sewer manhole inverts using accepted mortar.

Plaster the outer portion of the sewer manhole bricks with a one inch thickness of accepted mortar. Plaster the interior brick work to present a smooth surface.

(2) Water Valve Manholes. If portion of the brick manhole is below the four-foot elevation, USGS datum, or ground water table, waterproof the depth of the manhole below such elevation. Apply an interior and exterior coat of accepted mortar. The mortar coat shall have a thickness of not less than five-eighths inch on each face. Extend the waterproof from the four-foot elevation or ground water table:

(a) down to the bottom of the floor slab on the outside portion of the manhole and

(b) to the top of the floor slab on the inside portion of the manhole.

Leave a space of at least two inches between the brick and the upper half of the barrel of the pipe. Fill that space with a specified asphalt filler. Install reinforced concrete lintels, made from Class B Concrete, in the Type A Manholes shown in the contract.

Upon completion, clean the manhole thoroughly of debris and paint the frame and cover with one coat of accepted asphaltum paint.

(3) Storm Drain Manholes, Inlets, and Catch Basins. The contract requires rungs at 12 inches on centers when the height of the structure is greater than 4.5 feet. Measure the height of the structure from the invert to the top of the structure.

Install one rung 16 inches from the bottom or as specified by the Engineer if the height of the structure is 4.5 feet or less. Install additional rungs when specified by the Engineer.

Construct precast concrete storm drain manhole sections according to the contract and ASTM C 478.

Place reinforcing steel for precast sections according to ASTM C 478.

(C) Setting Frames. Place the frames in the concrete according to the contract. Carefully tamp the concrete around the frame.

Set the frame in full mortar beds. Bring the mortar up around the bottom of the frame.

(D) Excavation and Backfill. Excavate and backfill according to Section 206 - Excavation and Backfill for Conduits and Structures.

(E) Reconstructing Manholes. Reconstruct the existing manholes to the required elevations according to the contract and as ordered by the Engineer. Adjust the manhole frame to the required grade using the same type of material used in its original construction. Carefully remove, clean, and paint the existing frame and cover with accepted asphaltum paint before reinstallation.

(F) Constructing and/or Adjusting Valve Boxes. Construct or adjust the valve boxes to the required elevations according to the contract and as ordered by the Engineer.

Set and center the 8-inch pipe collar plumb over the valve stem. Ends of the pipe collar shall have smooth, machined edges. Backfill around the gate valve and pipe collar with trench backfill by hand. Backfill 8 inches below the surface of the ground.

Upon completion of installation, clean and paint the valve box frames and covers with one coat of accepted asphaltum paint.

Adjust the existing valve boxes to the required grade using the same type of material used in its original construction. Carefully remove, clean, and paint the existing cast iron frame and cover with accepted asphaltum paint Cut the existing pipe collar or install a new pipe collar. Reinstall the frame and cover and pour the four inch thick concrete.

(G) Relocation of Water Meter, Water Meter Box Frame and Cover Relocation of water meter, water meter box frame and cover shall be done in accordance to Board of Water Supply standards.

604.04 Method of Measurement. The Engineer will measure manholes,

inlets, and catch basins per each according to the various depths specified.

The Engineer will measure valve boxes per each complete in place.

The depth measurement for new structures shall be the vertical measurement from the invert elevation to the top of the deck slab, grating, or manhole cover.

For reconstructed structures, the depth measurement shall be the vertical measurement from the beginning of reconstruction shown in the contract to the top of the deck slab, grating, or manhole cover.

The Engineer will measure relocation of water meter, water meter box frame and cover per each complete in place.

604.05 Basis of Payment. The Engineer will pay for the accepted manholes, inlets, catch basins, and valve boxes at the contract unit price per each complete in place.

The contract unit price paid shall be full compensation for furnishing and installing frames and grates, frames and covers, and rungs; adjusting or demolishing; excavating and backfilling; placing concrete; furnishing and installing reinforcing steel, brick, precast concrete, precast reinforced concrete walls, including the cone or tapered sections and cast-in-place walls vertically ; furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will pay for the relocation of water meter, water meter box frame and cover at the contract unit price per each complete in place.

The contract unit price paid shall be full compensation for furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
(_____) Standard Valve Box	Each
Type ____ Manholes, ____ feet to ____ feet	Each
Type ____ Inlet, ____ feet to ____ feet	Each
Type ____ Catch Basins, ____ feet to ____ feet	Each

Adjusting _____ Manhole, _____ feet to _____ feet	Each
Adjusting _____ Frame and Cover	Each
Relocation of _____	Each
_____ Water Valve ____ Frame and Cover	Each
Special Type ____ Inlet, ____ feet to ____ feet	Each"

END OF SECTION

Amend **Section 605 - Underdrains** to read as follows:

"SECTION 605 - UNDERDRAINS

605.01 Description. This section is for installing underdrains according to the Contract.

605.02 Materials.

(A) Geotextile. Geotextiles shall conform to Subsection 716.03 - Geotextiles for Underdrain.

(B) Perforated Plastic Pipe. The perforated corrugated polyethylene pipe shall conform to AASHTO M 252 or AASHTO M 294.

The perforated corrugated polyethylene pipe shall be either Type CP corrugated surface outside and smooth inner liner or Type SP corrugated wall outside and smooth inner liner.

The perforated PVC pipe shall conform to ASTM D 2729.

Submit a Certificate of Compliance to the Engineer before using the plastic pipes.

(C) Non-Perforated Pipe. Non-perforated drain pipe shall conform to the requirements of perforated pipes except that the provisions for perforation shall not apply.

(D) Concrete. Concrete for cleanouts shall be Class B and shall conform to Section 601 - Structural Concrete.

(E) Steel Plate. Steel plate for cleanouts shall conform to AASHTO M 183/M183M (ASTM A 36/A 36M).

605.03 Construction Requirements. Excavate to the dimensions and grade shown in the contract or as specified by the Engineer.

Protect the geotextiles from sunlight and temperatures over 140 ^{o}F during transport and storage. The information on the packaging shall warn against exposing the geotextile to sunlight.

Place the geotextile as shown in the Contract. Overlap successive sheets a minimum of 18 inches.

Fold the geotextile over the top of the permeable base course to produce a minimum overlap of 12 inches after compaction of the permeable base course. Do

not leave geotextile exposed more than five days without being covered by backfill.

Remove and replace geotextile that becomes torn or damaged observing the 18 inches overlap requirement in all directions.

Place perforated pipe with the perforations down. Join the pipe sections securely with the appropriate couplings or bands.

Install non-perforated drain pipe of the type and size specified according to the contract or as specified by the Engineer.

605.04 Method of Measurement. The Engineer will measure the perforated and non-perforated underdrain pipe per linear foot complete in place.

The Engineer will measure the cleanouts per each complete in place.

The Engineer will not measure the geotextile.

The Engineer will not measure underdrain connections to drainage structures.

605.05 Basis of Payment. The Engineer will pay for the accepted underdrain pipe at the contract unit price per linear foot. The price includes full compensation for furnishing and installing the perforated and non-perforated underdrain pipe; and furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will pay for the accepted cleanouts at the contract unit price per each. The price includes full compensation for furnishing and installing the cleanouts; and furnishing materials, equipment, tools, labor and other incidentals necessary to complete the work.

The Engineer will not pay for underdrain connections to drainage structures separately. The cost shall be considered incidental to Non-Perforated Underdrain Pipe.

The Engineer will not pay for the geotextile. The cost shall be considered incidental to the Untreated Permeable Base Course as specified in Subsection 306.05.

The Engineer will make payment under:

Pay Item	Pay Unit

Perforated Underdrain Pipe	Linear Foot
Non-perforated Underdrain Pipe	Linear Foot
Cleanout	Each"

END OF SECTION

Amend **Section 606 - Guardrail** to read as follows:

"SECTION 606 - GUARDRAIL

606.01 Description. This work includes installing guardrails and Triton Barriers according to the contract.

The contract designates the types of guardrails as follows:

(1) Type 1 (Unassigned)

(2) Type 2 Cable-Chain Link Barrier Guardrail

(3) Type 3 Beam Type Guardrail

(4) Type 4 Rigid Barrier Type Guardrail

The construction of guardrails includes the assembly and erection of component parts at the locations shown in the contract or as specified by the Engineer.

606.02 Materials. Materials shall conform to the following:

Joint Fillers	705.01
Reinforcing Steel	709.01
Wire Rope or Wire Cable	709.02
Chain Link Fencing	710.03
Metal Beam Rail	710.04
Guardrail Posts	710.07
Guardrail Hardware	710.08

Concrete for Type 4 Rigid Barrier Type Guardrail shall be Class A. Concrete for Type 4 Rigid Barrier Type Guardrail shall conform to Section 601 - Structural Concrete.

Furnish zinc-coated steel post and zinc-coated steel rail beam for the Type 3 Beam Type Guard Rail. Do not mix the type of steel posts within the project.

When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The

Engineer may get samples of materials for laboratory testing for compliance with material quality requirements. This may be the basis for acceptance of manufacturing lots regarding quality.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

606.03 Construction Requirements. Repair zinc-coated base metal surfaces that the Contractor exposes, drills, threads, cuts according to 501.03(G)(2) - Repairing of Damaged Zinc-coated Surfaces.

Preserve and protect existing facilities that the Contractor may affect by the guardrail installation. Replace the guardrails that the Contractor damages due to its operation at no cost to the State.

(A) Beam Type Guard Rail.

(1) Posts. When using a suitable method, the Contractor may drive only steel posts, except those with anchors, into the ground. Maintain an accurate vertical alignment and shall not deform the steel post.

Set the wood and steel posts with anchors plumb in hand or mechanically dug holes. Backfill post holes with acceptable material placed in layers and compact thoroughly.

Set the posts vertically in the ground to the approximate depth shown in the contract. The posts, after backfilling or driving, shall be in accurate alignment with their tops at the required grade.

The Contractor may vary the guardrail post locations shown in the contract to ease clearing utility lines or to produce smooth transitions. Request such variance for acceptance by the Engineer. The Contractor may not vary the guardrail post locations of terminal sections.

When the contract requires additional bolts and holes on posts, drill the additional bolt holes and furnish the bolts for proper installation. Drill, furnish, and install this additional bolts at no cost to the State.

Do not make the additional bolt holes in posts by burning with a torch or other method or device. Manufacture or drill the holes in the posts.

Apply a preservation treatment to the wood posts and blocks according to Section 714 - Structural Timber and Related Materials.

Where field cutting or boring is done after treatment, thoroughly swab, spray, or brush the cuts and holes with two applications of preservatives accepted by the Engineer.

(2) Rail Elements. Install the rail elements that results in a smooth, continuous installation. Draw the bolts, except adjustment bolt, tight. Bolts shall be of sufficient length to extend beyond the nuts.

When the contract requires setting the guardrail posts at non-standard spacing, cut the rail elements and drill bolt holes as necessary for proper installation.

Do not make the additional bolt holes by burning with a torch or other method or device.

The Contractor does not require paint on zinc-coated steel railing.

(3) Existing Guardrail. The Contractor shall be responsible for verifying underground facilities such as utilities ducts, cables, and pipes in locations where the Contractor will drive guardrail posts. Repair damages done to the facilities despite the location or if shown in the contract at no cost to the State.

When removing the existing guardrails, backfill and compact the holes with suitable material. Grade and compact the shoulder area before installing the new guardrails and posts.

Reinstallation of guardrail shall be according to Subsection 606.03(A).

When replacing the existing guardrails with new guardrails and posts, do not leave an unprotected opening in the guardrail system of more than 500 linear feet. Also, after each work day, protect the areas not yet completed with physical barriers according to the latest MUTCD.

(4) Reset Guardrail Post. Adjust the height of existing guardrail post such that the guardrail element will be at the required height according to the contract.

Spacer blocks bolted to the existing post are to remain intact. When required or specified by the Engineer, excavate or fill and

compact around the post to be adjusted. Replace the guardrails that are damaged by the Contractor due to its operation at no cost to the State and according to the contract.

(B) Cable-Chain Link Barrier Guardrail.

(1) Post. Place the post at equal intervals. The Contractor may space the end post closer to adjacent posts, if specified by the Engineer. Set the posts vertical. Crown the concrete portion of the post footing at the top to shed water.

(2) Chain Link and Tension Cable or Top Rail. Fasten the chain link fabric to the tension cable, top tension wires or top rail, and posts with tie wires. Space the tie wires at approximately:

(a) 24 inch intervals to the tension cable, top tension wires or top rail and

(b) 15 inch intervals to the posts.

The tie wires shall start two inches from the top of the fabric with tie wires. Give the tie wire at least one complete twist.

Install the chain link fabric on the outer portion of the cables after clamping the cables in place and torque the u-bolts properly. The chain link fabric shall be on the "U" side of the cable clamps.

Stretch the tension wire tight with the turnbuckles. Install the turnbuckles at the beginning and end of each continuous section of chain link fabric and at such intermediate points as may be necessary for tightness.

Provide turnbuckles between 500 feet and 600 feet intervals for each tension cable.

Stagger the turnbuckle connections for tension cables so that the Contractor may locate not more than one turnbuckle in one panel. When a turnbuckle assembly falls at or within six inches of a post, clamp only the cable on the side of the post opposite the turnbuckle assembly to the post. At these locations, fasten the turnbuckle assembly or the cable on the turnbuckle side to the post with a No. 9 gage tie wire.

When connecting tension cables to pipe-type turnbuckles by factory swaged steel pulls, the complete turnbuckle assembly shall develop 100% of the breaking strength of the cable.

Furnish one test sample of cable to the Engineer for each 10,000 feet or less of cable the Contractor will install. The test sample shall be three feet in total length. Fit the test sample properly with right-hand thread swaged pulls at both ends as specified in the above paragraph.

When connecting the tension cables to drop forged steel closed sockets, the complete turnbuckle assembly shall develop 100% of the breaking strength of the cable. Fill the sockets with pure zinc.

Furnish one test sample of cable to the Engineer for each 10,000 feet or less of cable the Contractor will install. The test sample shall be three feet in total length. Fit the test sample properly socketed at both ends as specified in the above paragraph.

The Contractor may use preformed zinc-coated cable dead ends as an alternative method of connecting the tension cables to the turnbuckles at anchor blocks only. The installed dead ends shall develop 100% of the breaking strength of the cable.

At structures where constructing two barrier fences, bound or weld the exposed ends of the connecting tension cables.

Do not overtighten the tension cables. Position the tension cables firmly so that between 0.25 inch and 0.5 inch sag in the cables between posts occurs.

Place the u-bolts of the cable clamp assemblies across the lay of the tension cables. Tighten the nuts on the u-bolts by applying between 30 and 35 foot-pounds of torque.

When installing barrier on existing structures, anchor the posts to the deck shown in the contract.

Drill anchor bolt holes in the deck without spalling or damaging the concrete surrounding the hole. Set the anchor bolts with a mixture of commercial quality, modified epoxy adhesive and sand. The proportions of modified epoxy shall be between one adhesive to four sand and one adhesive to six sand. The Engineer will establish the exact proportions. The cementing agent includes two component mixture of modified epoxy adhesive manufactured especially for the making of epoxy-sand grouts. Mix two components according to the manufacturer's directions for use.

(C) Rigid Barrier Type Guardrail.

(1) Preparation. Shape and compact the foundation to a firm even surface according to the contract. Remove and replace soft and yielding material with acceptable material according to Section 305 - Aggregate Subbase Course.

(2) Forms. Forms shall be according to Section 503 - Concrete Structures.

(3) Placing Concrete. Moisten the foundation thoroughly immediately before placing the concrete. Concrete shall be cast-in-place. Place the concrete according to Section 503 - Concrete Structures.

On new and existing concrete bridge deck, dowel the barrier into the deck shown in the contract.

(4) Finishing. Finish the surface to a smooth, even surface according to Subsection 503.03(M)(2) - Class 2 Rubbed Finish.

(5) Joints. Construct expansion joint shown in the contract or at existing expansion joints of structures. Expansion joint filler shall be 0.5 inch thick.

Provide the construction joints with keys and at intervals shown in the contract.

(6) Transition Sections. At the end of the barrier, adjust or construct new and/or existing guardrail or chain link fence as specified by the Engineer or shown in the contract.

(D) Triton Barrier.

(1) Preparation. Shape and compact the foundation to a firm even surface according to the contract. Remove and replace soft and yielding material with acceptable material according to Section 305 - Aggregate Subbase Course.

(2) Installation and Maintenance. Installation and maintenance of Triton barriers shall be as specified by themanufacturer's specifications and as specified according to the contract.

(3) Removal. Removal and transporting of each Triton barrier shall be as specified according to the contract. Each Triton

barrier shall be clean, repaired if necessary and hauled after completion of the project to locations on the island of Oahu as directed by the Engineer. Each Triton barrier shall become the property of the State upon completion of the project.

606.04 Method of Measurement. The Engineer will measure guardrail per linear foot.

The Engineer will measure from center to center of end posts. When making end connections to masonry or steel structures, the Engineer will measure to the face of such structures.

The Engineer will measure Triton Barriers per each.

606.05 Basis of Payment. The Engineer will pay for the accepted guardrail at the contract unit price per linear foot complete in place. The price includes full compensation for removing existing guardrails and posts; filling of post holes; grading and compacting the shoulder area; installing the Asphalt Pavement area under the guardrail post; installing physical barrier; furnishing and installing the guardrails; connecting to existing; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted Triton Barrier at the contract unit price per each. The payments shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to furnish, prepare beds, set barriers, maintain barriers as specified by the manufacturer. The payments also shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to relocate barriers during construction, and to clean and haul the barriers after completion of the project to locations on the island of Oahu as directed by the Engineer

The Engineer will make payment under:

Pay Item	**Pay Unit**
Triton Barrier	Each
Guardrail Type _____	Linear Foot"

END OF SECTION

Amend **Section 607 - Fences** to read as follows:

"SECTION 607 - FENCES

607.01 Description. This work includes constructing fences and gates according to the contract.

607.02 Materials. Materials shall conform the following:

Barbed Wire	710.01
Woven Wire	710.02
Chain Link Fencing	710.03
Fence Posts	710.06

Concrete for fence footings shall be Class D and shall conform to Section 601 - Structural Concrete.

When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The Engineer may get samples of materials for laboratory testing for compliance with material quality requirements. This may be the basis for acceptance of manufacturing lots regarding quality.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

607.03 Construction Requirements.

(A) General. Clear, grade and grub as may be necessary to construct the fence to the required grade and alignment.

Make appropriate adjustment in post spacing to conform to the type of closure shown at locations requiring breaks in a run of fencing or at intersections with existing fences.

Install temporary guys or braces until the concrete has set sufficiently to hold the posts when the contract requires embedding posts, braces, or anchors in concrete. Do not install materials on posts or strain placed on guys and bracing set in concrete until 7 days have elapsed from the time of placing of the concrete.

Crown concrete fence footings at the top to shed water.

Set the tops of posts to the required grade and alignment. The Engineer will allow cutting of the tops of the posts only under the written request and the conditions specified.

Firmly attach wire or fencing of the size and type required to the posts and braces according to the contract. Stretch the wires taut and install the wires to the required elevations.

Furnish and install a ground conforming to Section 9 of the National Electric Safety Code at each location where an electric transmission, distribution, or secondary line crosses the fences covered by the contract.

(B) Chain Link Fence. Fabricate posts from pipes conforming to Table 607-I. Space line posts at not more than 10-foot intervals, measured from center to center of posts. In general, make measurement parallel to the slope of the natural ground in determining the post spacing. Place posts in a vertical position.

The depths of footing are as follows:

Type of Post	Fabric Height, Inch	Footing Depth, (Minimum) Foot
Line Post	36	2
End, Corner, and Gate Post	36	2-1/2
Line Post	48	2-1/2
Other Post	--	3

In cross section, the minimum dimension of footings shall not be less than three times the maximum cross-sectional dimension of the post. Also the minimum dimension of footings shall not be less than 8 inches.

Brace end, corner, and gate posts for fencing of a height of 6 feet or more to the nearest line post with horizontal braces used as compression members and truss rods with turnbuckles used as tension members. Brace and truss pull post shall be at intervals of 300 feet in both directions as specified above.

Install corner posts when the fence line changes 30° or more.

TABLE 607-I – SCHEDULE OF CHAIN LINK FENCE POSTS

ZINC-COATED PIPE - NOMINAL								
Ht. of Fence (Feet)	Line Posts		End, Corner & Pull Posts		Braces		Top Rails	
	OD Inch	Wt #/ft	OD Inch	Wt #/ft	OD Inch	Wt #/ft	OD Inch	Wt #/ft
3	1-7/8	2.72	1-7/8	2.72	1-5/8	2.57	1-3/8	1.68
4	1-7/8	2.72	1-7/8	3.65	1-5/8	2.57	1-3/8	1.68
5	1-7/8	2.72	2-3/8	3.65	1-5/8	2.57	1-5/8	2.27
6	2-3/8	3.65	3	5.79	1-5/8	2.57	1-5/8	2.27
ALUMINUM PIPE - NOMINAL								
Ht. of Fence (Feet)	Line Posts		End, Corner & Pull Posts		Braces		Top Rails	
	OD Inch	Wt #/ft	OD Inch	Wt #/ft	OD Inch	Wt #/ft	OD Inch	Wt #/ft
3	2	1.264	3	2.621	1-1/4	0.786	1-1/4	0.786

The top rail or top tension wire shall pass through the base of line post tops or extension arms and form a continuous brace from end to end of each stretch of fence.

Furnish top rails in approximately 20-foot lengths. Provide with accepted outside couplings or expansion sleeves. Fasten the top rail or top tension wire securely to terminal posts by rail ends and brace bands.

Furnish brace rails in the required lengths.

Fasten chain link fabric on the designated side of the posts. Also, mount chain link fabric on the posts so that the bottom of the fabric is two inches above ground.

Chain link fences shall have knuckled finish on the bottom edge. Chain link fences with fabric width over 60 inches shall have a twisted and barbed finish on the top edge projecting over the top rail or top tension wire of the fence. Chain link fences with fabric widths 60 inches or less shall have knuckled finish on the top edge.

Weave chain link fence fabric into approximately two inch mesh except around tennis courts. Weave chain link fence fabric into approximately 1.75 inches mesh around tennis courts.

Fasten between posts, the top edge of the fabric to a top rail or top tension wire and the lower edge fastened to a tension wire. Install the tension wire on a straight grade between posts by excavating the high points of ground. The Engineer will not permit filling of depressions.

Fasten the fabric to end, corner, and gate posts with stretcher bars and stretcher bar bands spaced at one-foot intervals; and to line posts and tension wires with tie wires or metal bands. Space tie wires or metal bands on line posts at intervals of approximately 14 inches, and on top rails and tension wires at approximately 24 inches.

Drive gates shall be of the widths designated in the contract. Walk gates shall be four-foot wide.

Fabricate gate frames and posts from pipes conforming to of Table 607-II, or if accepted, from shapes of equivalent structural strength. Drive gate shall be cross-trussed with accepted adjustable truss rods. Assemble by the use of properly designed fittings or by accepted welding techniques.

Fabric for the gate shall be the same as that used for the fence. Attach the fabric for the gate to the gate frame by stretcher bars and tie wires as specified for fence construction, and suitable tension connectors spaced at approximately one-foot intervals.

Hang the gates by at least two hinges designed to clamp securely to the gate post and permit the gate to swing back against the fence.

Provide gates with a combination catch and locking attachment of acceptable design. Provide stops to hold gates open and a center rest with catch where required.

TABLE 607-I GATES [illegible] FEET TO 6 FEET HEIGHT

ZINC-COATED PIPE

GATE FRAMES		GATE OPENING	GATE POSTS	
O.D. Inch	Nominal Weight lbs/ft		O.D. Inch	Nominal Weight lbs/ft
1.875	2.72	Single to 6' or Double to 12'	3	5.79
1.875	2.72	Single over 6' to 13' or Double over 12' to 26' inclusive	4	9.11

1.875	2.72	Single over 13' to 18' or Double over 26' to 36' inclusive	6.625	18.97
1.875	2.72	Single over 18' or Double over 36'	8.625	24.70

ALUMINUM PIPE

GATE FRAMES			GATE OPENING	GATE POSTS		
Nominal Size Inch	Nominal O.D. Inch	Wt. lbs/ft		Nominal Size Inch	Nominal O.D. Inch	Wt. lbs/ft
1.50	1.9	0.94	Single to 6' or Double to 12'	3	3-1/2	2.621
1.50	1.9	0.94	Single over 6' to 13' or Double over 12' to 26' inclusive	3.50	4	3.151
1.50	1.9	0.94	Single over 13' to 18' or Double over 26' to 36'inclusive	6	6.625	6.564
1.50	1.9	0.94	Single over 18' or Double over 36'	8	8.625	9.878

(C) Wire Fences. Stretch the wires tightly with an accepted fence wire stretcher and stapled to each wooden post with zinc-coated staples or wired to each concrete post with several turns of tie wire. Staple or wire wood spreaders, if required by the contract, to each strand of the fence wires. The wire shall always be on the side of the fence that faces this pasturage when the fence impounds animals.

Brace the fence at corners and angles and anchor against pull according to details shown in the contract.

Dip wood posts before use in creosote as required on the plans. Set posts vertically in the ground to the approximate depth shown on the plans. Tamp posts thoroughly into place.

607.04 Method of Measurement. The Engineer will measure the fence per linear foot complete in place. Measurement will be along the top of the fence from outside to outside of end post for each continuous run of fence.

The Engineer will measure the gate per each complete in place.

607.05 Basis of Payment. The Engineer will pay for the accepted fence at the contract unit price per linear foot complete in place. The price includes full compensation for clearing, grading, and grubbing; placing and crowning the concrete footing; installing temporary bracing; setting the tops of post; furnishing and installing the fence, wires, posts, top rail or top tension wires, grounds and its accessories; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted gate at the contract unit price per each complete in place. The price includes full compensation for clearing, grading, and grubbing; placing and crowning the concrete footing; installing temporary bracing; furnishing and installing the gate and its accessories; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
_____ - Feet, _____ Fence _____	Linear Foot
_____ Gate, _____ Feet High And _____ Feet Wide	Each
_____ Fence With _____	Linear Foot"

END OF SECTION

Amend **Section 608 - Sidewalks** to read as follows:

"SECTION 608 - SIDEWALKS

608.01 Description. This work includes constructing bituminous or concrete sidewalks and walkways according to the contract.

608.02 Materials. Materials shall conform to the following:

Bed Course Material for Sidewalks, walkways and Curbing	703.16(A)
Joint Fillers	705.01
Reinforcing Steel	709.01

Concrete for sidewalks shall conform to Section 601 - Structural Concrete and shall be Class B unless otherwise noted.

Concrete for item 608.1400 Modified Reinforce Concrete Sidewalk shall conform to Section 601 - Structural Concrete and shall be Class A.

Bituminous concrete for sidewalks shall conform to Section 401 - Asphalt Concrete Pavement and shall be Type V.

Concrete and bituminous mixes will be subject to inspection and tests at the mixing plants for compliance with quality requirements.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

608.03 Construction Requirements

(A) Concrete Sidewalks and Walkways. Place concrete sidewalks four inches thick either reinforced or unreinforced as shown in the contract.

(1) Preparation. Shape and compact the foundation to a firm even surface conforming to the section shown in the contract. Remove and replace soft and yielding materials with acceptable material.

(2) Forms. Forms shall be of wood or metal and shall extend for the full depth of the concrete. Forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.

(3) Placing Concrete. Moisten the foundation thoroughly immediately before placing the concrete. Place the concrete according to Section 503 - Concrete Structures.

(4) Finishing. Work the surface with a wooden float and broom finished. The Engineer will not permit plastering of the surface.

Edge the outside edges of the slab and joints with a 0.25 inch radius edging tool.

The surface of the sidewalk shall be a true plane with a 0.25 to 12 slope toward the roadway.

(5) Joints. Form the construction joints around appurtenances such as manholes and utility poles extending into and through the sidewalk. Install 0.25-inch thick premolded expansion joint filler in these joints. Install 0.5-inch thick premolded expansion joint fillers between concrete sidewalks and any fixed structure such as a building or bridge. Extend the expansion joint material from the bottom of the slab to approximately 0.25 inch below the top surface of the concrete construction.

Divide the slab between expansion or construction joints into sections approximately five feet in length by transverse weakened plane joints formed by a jointing tool. Also, provide transverse weakened plane joints when the time period between consecutive concrete placements is more than 45 minutes. Form the weakened plane joints into the concrete to a depth of 0.25 of the thickness and approximately 0.125 inch in width with a scoring tool which will leave the edges round. Where slabs are more than 7 feet in width, form weakened plane joints longitudinally to obtain secure uniform blocks that are approximately square. Install weakened plane joints where the corners of drop inlets project into the sidewalk.

Match joints with the curb or pavement joints.

(6) Curing. Cure the concrete for at least 72 hours. Curing shall be by moist burlap or mats or by other accepted methods. During the curing period, exclude pedestrian and vehicular traffic. Exclude the vehicular traffic for such additional time as the Engineer may specify.

(B) Bituminous Sidewalks.

(1) Preparation and Forms. Preparation and forms shall conform to Subsections 608.03(A)(1) - Preparation and 608.03(A)(2) - Forms.

(2) Bed Course. Place the bed course material in layers not exceeding four inches in depth. Compact each layer thoroughly.

(3) Placing Bituminous Sidewalk Material. Place bituminous sidewalk material on the compacted bed course in one or more courses shown in the contract to give the required depth when rolled. Compact by a hand operated or power roller of a type and weight acceptable. In areas inaccessible to the roller, the Engineer will permit hand tamping. Compact bituminous sidewalk material uniformly.

The compaction requirement shall be 90% of the maximum theoretical density using AASHTO T 209. The Contractor shall increase the asphalt content at least 0.5% above that used for asphaltic concrete pavements.

608.04 Method of Measurement. The Engineer will measure concrete sidewalk and walkways per square yard.

608.05 Basis of Payment. The Engineer will pay for the accepted concrete sidewalk and walkways at the contract unit price per square yard complete in place. The price includes full compensation for excavating; backfilling; installing reinforcing steel; placing and compacting bed course material; furnishing and placing the concrete; installing expansion joint material, weakened plane joint, and ramps; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will pay for the accepted bituminous sidewalk at the contract unit price per square yard complete in place. The price includes full compensation for excavating; backfilling and compacting the sub-surface or bed course; furnishing and placing the bituminous sidewalk and ramp; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Concrete Sidewalk	Square Yard
_____ Concrete _____	Square Yard"

END OF SECTION

Amend **Section 609 - Curb and/or Gutter** to read as follows:

"SECTION 609 - CURB AND/OR GUTTER

609.01 Description. This work includes constructing or resetting curb and/or gutter according to the contract.

The contract designates the types of curb and/or gutter as follows:

(1) Type 1 - (Unassigned)

(2) Type 2 - Cast-in-place concrete curb and/or gutter

(3) Type 3 - Precast concrete curb and/or gutter

(4) Type 4 - Dowelled concrete curb

(5) Type 5 - (Unassigned)

(6) Type 6 - Bituminous curb

(7) Type 7 - Bituminous gutter

609.02 Materials. Materials shall conform to following:

Emulsified Asphalt	702.04
Bed Course Material for Sidewalks & Curbing	703.16(A)
Joint Fillers	705.01
Joint Mortar	705.02
Reinforcing Steel	709.01
Precast Concrete Curb and/or Gutter	712.05

Concrete for curb and/or gutter shall conform to Section 601 - Structural Concrete and shall be Class A.

Bituminous material for curb shall conform to Section 401 - Asphalt Concrete Pavement and shall be Type V.

Bituminous mixture for Type 7 - Bituminous Gutter shall conform to Section 401 - Asphalt Concrete Pavement and as modified below. Bituminous mixture for

Type 7 - Bituminous Gutter shall be Mix No. V. The Contractor shall increase the asphalt content of the mixture by at least 0.5% above that normally used for asphalt concrete pavement.

Weed killer shall be a nonemergent and nonselective type, EPA approved for highway application, and suitable for use under the designed thickness of pavements. The materials shall be free of solvents or other substancesdeleterious to the pavement. Application rates shall be at the highest recommended dosage stated on the label. The Contractor shall submit a sampler label containing the pertinent data for acceptance by the Engineer before use.

Concrete, bituminous mixes and manufactured curb and/or gutter materials will be subject to inspection and tests at the plants for compliance with the quality requirements.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

609.03 Construction Requirements.

(A) Precast Concrete Curb and/or Gutter.

(1) Excavation. Excavate to the required depth and compact the base to a firm, even surface. Remove and replace soft and unsuitable material with suitable material so that the Contractor can compact thoroughly.

(2) Installation. Set the curb so that the front top arris line conforms to the line and grade required. Fill the spaces under the curb and/or gutter with bed course material. Tamp this material thoroughly.

(3) Joints. Set the precast blocks approximately 0.5 inch apart. Fill these joints with mortar as specified.

When constructing portland cement concrete pavement abutting the curb and/or gutter, construct the joints in the curb and/or gutter directly in line with pavement expansion joints. The joint in curb and/or gutter shall be 0.75 inch in width. Fill the joint in curb and/or gutter with an expansion joint filler of the same nominal thickness as the pavement joint. Fill the voids between the joint filler and the curb and/or gutter with mortar.

(4) Backfilling. After setting the curb and/or gutter, fill the remaining excavated areas with accepted material. Place and tamp this material thoroughly in layers not exceeding 6 inches in depth.

(B) Cast-in-Place Concrete Curb and/or Gutter.

(1) Excavation. Excavation and bedding shall conform to Subsection 609.03(A)(1) - Excavation.

(2) Forms. Forms shall be of wood or metal, straight, free from warp and of construction that there shall be no interference with the inspection of grade or alignment.

Forms shall extend for the entire depth of the curb and/or gutter. Brace and secure the forms sufficiently so that no deflection from alignment or grade shall occur during the placing of the concrete.

(3) Placing of Concrete. Place the concrete according to Section 503 - Concrete Structures. Moisten the subgrade and forms thoroughly ahead of placing concrete.

Work the surfaces of concrete gutters with proper floats and round the exposed edges with an edging tool. Before the concrete has fully set, remove and finish the face form of the curb with a float and steel trowel to a uniform finish. Broom finish other exposed surfaces longitudinally. The Contractor may require special trowels to shape curbs and/or gutters.

To match adjacent concrete finishes, the Engineer may permit other methods of finishing. The Engineer will not permit plastering.

(4) Sections. Construct curb and/or gutter in sections having a uniform length of 15 feet. Separate the sections by weakened plane joints approximately one-eight inch wide and cut to a depth of one-fourth the gutter thickness. When curb and/or gutter abut portland cement concrete pavement, install weakened plane joints in the curb and/or gutter continuously with the weakened plane joints in the abutting pavement.

(5) Expansion Joints. Form the expansion joints at the intervals shown in the contract using a preformed expansion joint filler having a thickness of 0.5 inch. When constructing curb and/or gutter next to or on concrete pavement, locate the expansion joints opposite to or at expansion joints in the pavement.

Construct expansion joints in curb and/or gutter at structure abutments and at the ends of returns. Do not construct expansion joints within 20 feet of a traffic island nose.

Shape expansion joints filler to the cross section of the curb

and/or gutter.

(6) Curing. Immediately upon completion of the finishing, the Contractor shall:

(a) moisten and keep the curb and/or gutter moist for three days or

(b) cure the curb and/or gutter by using membrane forming material.

The method and details of curing will be subject to acceptance.

(7) Backfilling. After the concrete has set sufficiently, refill the spaces in front and back of the curb and/or gutter to the required elevation with suitable material. Tamp the material thoroughly in layers of not more than 6 inches.

(8) Curb Machine. With the acceptance of the Engineer, the Contractor may construct the curb and/or gutter by using a curb and/or gutter forming machine.

(9) Construction Joints. Build construction joints in cast-in-place curbs and/or gutters:

(a) when the delays are greater than 45 minutes between two consecutive batches in concrete operations,

(b) at the end of each day of pouring, or

(c) when specified by the Engineer.

Build the construction joints according to the details shown in the contract and shall coincide with the spacing of weakened plane joints. Coat the dowels for the joints uniformly with a thin film of heavy lubricating oil immediately before placement of concrete at the joint. Support the dowels firmly during concrete placement. The forms shall remain in place until the Contractor resumes concrete operations on the other side of the joint.

(C) Bituminous Curb.

(1) Preparation of Bed. When constructing bituminous curb on a fresh laid bituminous surface, the Contractor may lay the curb only after cleaning the surface.

When constructing the curb on a cured or aged portland

cement concrete base, bituminous pavement or bituminous treated base, sweep and clean the bed thoroughly by compressed air. Dry the surface thoroughly. Immediately before placing the bituminous mixture, place tack coat of bituminous material of the type and grade accepted. The rate of application of the tack coat material shall be between 0.05 to 0.15 gallon per square yard of surface. In the application of this tack coat, prevent the spread of the tack coat to areas outside of the area of the curb.

(2) Placing. Construct bituminous curb by use of self-propelled automatic curber or curb machine or a paver with curbing attachments.

The automatic curber or machine shall conform to following and accepted before its use:

(a) The weight of the machine shall be such that the Contractor gets the required compaction without the machine riding above the bed.

(b) The machine shall form curb that is uniform in texture, shape, and density.

(c) The Engineer may permit the construction of curb other than the automatic curb machine, when the contract requires short sections or sections with short radii or as warranted. The resulting curb shall conform to the curb produced by using the machine.

(3) Painting and Sealing. If the contract requires painting or sealing, paint or seal only on a curb that is clean and dry and reaches the ambient temperature.

(D) Resetting Curb and/or Gutter.

(1) Salvage. Carefully remove, store, and clean curb and/or gutter specified for resetting. Replace the existing curb and/or gutter that the Contractor:

(a) will reset and

(b) loses, damages, or destroys due to its operations or its failure to store and protect the existing curb and/or gutter.

(2) Excavation. Excavation and bedding shall conform to Subsection 609.03(A)(1) - Excavation.

(3) Resetting. Set the curb and/or gutter on a firm bed with the front top arris line conforming to the required line and grade. Set the sections of curb and/or gutter. The maximum opening between adjacent section shall be not more than 0.75 inch wide for the entire exposed top and face. Dress the ends of the curb and/or gutter necessary to meet this requirement at no cost to the State.

After setting the curb and/or gutter, fill the joints completely with mortar as specified.

(4) Backfilling. Refill the spaces in front and back of the curb and/or gutter to the required elevation with suitable material. Tamp this material thoroughly in layers of not over 6 inches in depth.

(5) Cutting and Fitting. Cutting and fitting may be necessary to install the curb and/or gutter at the locations ordered.

(E) Bituminous Gutter.

(1) Excavation. Excavate to the required depth and compact to a firm, even surface. Remove and replace soft and unsuitable material with suitable material. Compact the material thoroughly.

(2) Weed Killer. After completing the grading and compacting operations, spray the subgrade thoroughly with the non-emergent weed killer. The application shall be according to the manufacturer's recommendations.

(3) Base Course. Place and compact the base course material according to Section 304 - Aggregate Base Course.

(4) Prime Coat. Apply and protect the prime coat according to Section 408 - Prime Coat.

(5) Bituminous Material. Place and compact the bituminous material according to Section 401 - Asphalt Concrete Pavement and below. The equipment, lift thickness and compaction requirements will not apply to material placed on a 2:1 slope. Compact the mixture to a relative density of not less than 80% of the laboratory-compacted density using ASTM D 1561. The finished surface of the 2:1 slope shall be uniform in texture, without ruts, corrugations or other irregularities.

609.04 Method of Measurement. The Engineer will measure curb and/or

gutter per linear foot. The Engineer will measure along the front face of the curb at the finished grade elevation. If the Engineer measures gutter separately, the Engineer will measure gutter along the front face of the gutter. The Engineer will not make deduction in gutter length for drainage appurtenances installed such as catch basins and drop inlets.

The Engineer will measure curb and/or gutter transition for payment as follows:

From	To	Measurement for Payment
Cast-In-Place Curb or Precast Curb	Cast-In-Place Curb and Gutter	Cast-In-Place Curb and Gutter
Cast-In-Place Curb and Gutter	Precast Curb and Cast-In-Place Gutter	Cast-In-Place Curb and Gutter
Cast-In-Place Curb and Gutter Type _____	Cast-In-Place Curb and Gutter Type _____	Cast-In-Place Curb and Gutter 1/2 of Transition to Each Type
Cast-In-Place Curb Type _____	Cast-In-Place Curb Type _____	Cast-In-Place Curb 1/2 of Transition to Each Type
Bridge Abutments	Cast-In-Place Curb and/or Gutter or Precast Curb or Lava Rock Curb	Cast-In-Place Curb and/or Gutter or Precast Curb or Lava Rock Curb
Bituminous Gutter	Cast-In-Place Curb and/or Gutter	Cast-In-Place Curb and/or Gutter
Bituminous Gutter Type _____	Bituminous Gutter Type _____	Bituminous Gutter 1/2 of Transition to Each Type

The Engineer will measure precast concrete drop curb and driveway curb or cast-in-place integral driveway curb and gutter under the adjacent normal curb and/or gutter.

609.05 Basis of Payment. The Engineer will pay for the accepted curb and/or gutter at the contract unit price per linear foot.

The price includes full compensation for removing and disposing the existing curb and/or gutter; excavating; backfilling; installing reinforcing steel; furnishing, placing and compacting the bed course material; installing expansion joint material and weakened plane joint; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item **Pay Unit**

Curb, Type _____	Linear Foot
Thru Gutter	Linear Foot
_____ Curb and Gutter, Type _____	Linear Foot"

END OF SECTION

SECTION 610 - REINFORCED CONCRETE DRIVEWAYS

Make the following amendments to said Section:

(I) Amend **610.04** **Method of Measurement** to read as follows:

"610.04 Method of Measurement. The Engineer will measure reinforced concrete driveways per square yard complete in place."

(II) Amend **610.05** **Basis of Payment** to read as follows:

"610.05 Basis of Payment. The Engineer will pay for the accepted reinforced concrete driveways at the contract unit price per square yard.

The price includes full compensation for removing unsuitable material; installing wire mesh; excavating and backfilling; furnishing, placing and compacting bed course material ;furnishing and placing reinforced concrete driveway as specified in the contract or by the Engineer; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
_____ - Inch Reinforced Concrete Driveway	Square Yard

The Engineer will not pay for the accepted excavation and backfill. These items of work shall be considered incidental to the various contract items.

END OF SECTION

Amend **Section 611 - Hand-Laid Riprap** to read as follows:

"SECTION 611 - HAND-LAID RIPRAP

656.01 Description. This Section is for constructing hand-laid riprap according to the Contract.

656.02 Materials. Stones used for the hand-laid riprap shall be clean, sound, durable, angular in shape, free from organic material and have a minimum unit weight of 155 pounds per cubic foot.

Permeable Separator shall conform to subsection 716.02 - Geotextiles for Permeable Separator Applications.

656.03 Construction Requirements. Excavation work and backfill materials shall conform to Section 206 - Structure Excavation and Backfill for Conduits and Structures.

The foundation where stones are to be placed shall be free of brush, trees, stumps, litter, debris, and dressed to a smooth surface. Notify the Engineer three days prior to placing the stones for acceptance of the foundation. Begin placing stones only after the Engineer has accepted the foundation.

Install permeable separator according to Section 648 - Permeable Separator.

Stone sizes shall conform to the gradation specified on the plans.

Place the stones so that they will produce a well-graded mass with minimum practicable percentage of voids. Distribute the stones so that there will be no large accumulations of either the larger or smaller sizes. Fill spaces between larger stones with spalls securely rammed into place.

Maintain the hand-laid riprap until the Engineer has accepted the work. Restore the stones displaced by any cause to the details shown on the plans as part of the required maintenance at no additional cost to the State.

656.04 Measurement for Payment. The Engineer will measure hand-laid riprap per cubic yard.

The Engineer will make computation from the dimensions shown in the contract.

The Engineer will not measure for permeable separator.

656.05 Basis of Payment. The Engineer will pay for the accepted hand-laid riprap at the contract unit price per cubic yard.

The price includes full compensation for excavating; preparing the foundation; installing permeable separator, placing the stones; filling the spaces with spalls; backfilling; maintaining the hand-laid riprap until accepted; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Hand-laid Riprap	Cubic Yard"

SECTION 612 - GROUTED RUBBLE PAVING

Make the following amendments to said Section:

(I) Amend **612.04 Method of Measurement** to read as follows:

"612.04 Method of Measurement. The Engineer will not measure grouted rubble paving for driveway culverts. "

(II) Amend **612.05 Basis of Payment** to read as follows:

"612.05 Basis of Payment. The Engineer will not pay for grouted rubble paving for driveway culverts. The cost of installing the grouted rubble paving at the inlet and outlet section of the driveway culverts shall be considered incidental to the Driveway Culverts."

END OF PROJECT

Amend **Section 621 - Traffic Control Signs** to read as follows:

"SECTION 621 - TRAFFIC CONTROL SIGNS

621.01 Description. This work includes furnishing and installing sign posts and foundations, reflector markers, signs, construction signs, removing sign supports; and incidental work necessary to complete the work.

621.02 Materials. Concrete for sign structures shall be of the class specified in the contract and shall conform to Section 601 - Structural Concrete. Other materials shall conform to the following:

Zinc Paints	708.02
Dark Green Enamel Paint	708.03
Paint Thinner	708.04
Signs	712.20
Reflector Marker	712.21
Flexible Delineator Post	712.51
Sign Posts	713.11

Retroreflective sheeting type shall conform to ASTM Designation D 4956-89 or as amended according to Subsection 712.20.

621.03 Construction Requirements.

(A) Miscellaneous Sign Supports. Install permanent signs on posts as specified in the contract. Set the posts plumb at the required locations.

(1) Sign Posts. The Contractor shall use flange channel posts or twelve (12) or fourteen (14) gauge square tube posts of the size specified in the plans for:

(a) Regulatory, warning, and construction signs,

(b) Bikeway signs,

(c) School area signs,

(d) Route marker assemblies,

(e) Civil Defense signs, or

(f) Conventional motorist services signs.

(2) Reflector Marker, Milepost Marker, And Type II Object Marker Posts. Reflector marker, milepost marker, and Type II object marker posts shall be either metal posts or flexible delineator posts as specified in the contract. Zinc-coat the metal posts. The metal post shall be 1.12 pounds per foot flanged channel posts or one and a half inch, 12 or 14 gauge square tube posts.

(B) Reflector Marker. Make the reflector marker according to the dimensions and notes shown in the contract:

(1) Reflector markers RM-1, RM-2, and RM-3 shall be either:

(a) Type III or IV retroreflective sheeting markers,

(b) Glass sphere reflector markers with four inch by five inch reflector units, or

(c) Plastic prismatic reflector markers with three inch diameter reflector units.

(2) Reflector marker RM-4 shall be a Type III or IV retroreflective sheeting marker.

(3) Reflector marker RM-9 shall be either:

(a) Nine three inch round amber plastic prismatic reflectors fastened with blind rivets to a yellow Type III or IV retroreflective sheeting marker, or

(b) A yellow Type III or IV retroreflective sheeting marker of the dimensions shown in the contract.

(F) Type II Object Marker. Make Type II object markers according to the dimensions and notes shown in the contract. Reflective sheeting material shall conform to Subsection 712.20(C)(4) - Type III or IV Retroreflective Sheeting.

(G) Splicing of Sheet Reflecting Material. When using reflecting material as a background or signs with sheet aluminum backing, the Engineer will not allow splicing on legends. The reflecting material shall be of one piece whenever the sign dimensions are four feet by six feet or less.

(C) Removal of Existing Signs. Remove, clean, and store the existing regulatory, warning, expressway, destination and directional signs and markers that the Contractor will not incorporate in the completed project at a location as ordered by the Engineer. The Engineer will decide which items are for disposal or storage.

(D) Labeling of Signs. Label the back of each new sign installed with the following information:

(1) Route Number,

(2) Mile Post (same as the existing sign), and

(3) Date (date the Contractor installs the sign).

The labeling shall be one inch high numbers using a black permanent felt-tipped marker.

(E) Construction Signs. Erect construction signs at the beginning of project and at the end of project at the location indicated by the Engineer. These signs shall remain for the duration of the highway project. Maintain these signs. Place these signs besides the required traffic control signs called for in Section 645 - Traffic Control.

The construction signs shall be new and become the property of the State. The Contractor shall remove, clean, and deliver the signs as specified by the Engineer upon the project completion

(F) Relocation of Existing Signs. Remove, clean, and fasten existing regulatory or warning signs to be relocated to new posts or supports according to the Standard Plans. Materials such as posts, nuts, bolts, washers, base support, brackets, and necessary hardware to install the existing sign shall be new. Submit the relocated sign location for acceptance.

621.04 Method of Measurement. The Engineer will measure the number of traffic control signs and street name signs as complete units of the type and design specified in the proposal.

The Engineer will measure construction signs per each complete in place.

The Engineer will not measure the street name sign mounting assembly for payment.

The Engineer will not measure for removal and delivery of existing signs and markers that will not be incorporated in the completed highway separately.

The Engineer will not measure for labeling of the new signs separately.

The Engineer will measure the relocation of existing regulatory and warning signs per each complete in place. The Engineer will not measure the removal and salvaging or storing of existing post.

The Engineer will not measure for removing, cleaning, stacking, and delivering of existing signs, markers, and posts that will not be incorporated in the completed highway for payment.

621.05 Basis of Payment. The Engineer will pay for the accepted regulatory and warning signs at the contract unit price per each complete units of the type and design specified in the proposal. The price shall be full compensation for excavating and backfilling, furnishing and installing materials, furnishing equipment, tools, labors and incidentals necessary to complete the work.

The Engineer will pay for the accepted construction signs at the contract unit price per each, complete in place. The price includes full compensation for sign panels, posts, nuts, bolts, washers, base support, brackets and necessary hardware, labors, tools, equipment and incidentals necessary for the installation, maintenance, removal, cleaning, delivering, and storing of the signs with posts.

The Engineer will not pay for removal and delivery of existing signs and markers that will not be incorporated in the completed highway separately. The Engineer will consider them incidental to the various contract items.

The Engineer will pay for the accepted relocating of the existing regulatory and warning signs at the contract unit price per each complete in place. The price includes full compensation for cleaning the existing sign, providing new posts, nuts, bolts, washers, base support, brackets, necessary hardware, and furnishing labors, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for the street name sign mounting assembly separately. The Engineer will consider them incidental to the various contract items.

The Engineer will pay for the accepted installation of the Street Name Sign on Traffic Signal Mast Arm at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the street name sign including accessories such as the street name sign mounting assembly, nuts, bolts, washers, and furnishing labors, tools, equipment, materials, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**

Regulatory and Warning Sign _____ Each

Street Name Sign on Mast Arm with New Brackets Each

Relocation of Existing _____ Each

Construction Sign _____ Each

When the Engineer accepts an alternate design, the total amount paid shall be full compensation for furnishing and installing materials and furnishing equipment, tools, labors, and incidentals necessary to complete the work. The Engineer will not make payment for additional materials, equipment, tools, labor and other incidentals that might become necessary to complete the installation due to the alternate design.

END OF SECTION

Amend Section 622 - Roadway Lighting System to read as follows:

"SECTION 622 - EXTERIOR ELECTRICAL SYSTEM"

622.01 General Conditions.

(A) Electrical characteristics for this project shall be 120/240 volts secondary, single phase, three wire. Final connections to the HECO secondary overhead conductors shall be made by HECO as indicated.

622.02 Related Work Specified in Other Sections. This section applies to all sections of this project specifications unless specified otherwise in the individual sections.

622.03 References Specifications

(A) The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C2	(1997) National Electrical Safety Code

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 153/A 153M	(1995) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B 3	(1995) Soft or Annealed Copper Wire
ASTM B 8	(1995) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS	(1995) Electrical Power Distribution Equipment and Systems

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	1997 National Electrical Safety Code
IEEE 100	1996 Dictionary of Electrical and Electronics Terms

ILLUMINATING ENGINEERING SOCIETY (IES)

IES LHBK	Lighting Handbook, Reference (1984) and Application (1981) Volumes

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	1999 National Electrical Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA TC2	1990 Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA WC7	1993 Cross-Linked Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
NEMA WC8	1993 (Rev. 1) Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

UNDERWRITERS LABORATORIES, INC. (UL)

UL 44	(1991; Bul. 1993, 1994, 1995 & 1996 R 1996) Rubber-Insulated Wires and Cables
UL 83	(1991; Bul. 1991, 1993, 1994 & 1995, R 1996) Thermoplastic-Insulated Wires and Cables
UL 510	(1994 R 1998) Polyvinyl Chloride Polyethylene and Rubber Insulating Tape

(B) Comply with ordinances of the City and County of Honolulu.

(C) Installation of the aerial and underground distribution systems shall comply with provisions of the State of Hawaii Public Utilities Commission General Order No. 6 and 10, respectively.

(D) Obtain and comply with all utility company standards and drawings related to this project.

(E) This section applies to all sections of this project specification unless specified otherwise in the individual sections.

(F) In the text of this section, the words conduit and duct are used interchangeably and have the same meaning.

622.04 Shop Drawings

(A) Submittals required in the sections which refer to this section shall conform to

the following additional requirements. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and technical paragraph reference. Submittals shall also include applicable industry and technical society publication references, and years of satisfactory service, and other information necessary to establish contract compliance of each item to be provided. Photographs of existing installations are unacceptable and will be returned without approval. Transmittal letter shall include a listing of all items by manufacturer and catalog number which are included in the submittal package and shall clearly identify the submittal with this project.

(B) Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Handwritten and typed modifications and other notations not part of the manufacturer's preprinted data will result in the rejection of the submittal. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for certificates of compliance.

(C) Submit drawings a minimum of 14 inches by 20 inches in size using a minimum scale of 1/8 inch per foot. Include wiring diagrams and installation details of equipment indicating proposed layout and arrangement, wiring and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.

(D) Where installation procedures or part of the installation procedures are required to be in accordance with manufacturer's instructions, submit printed copies of those instructions prior to installation. Installation of the item shall not proceed until manufacturer's instructions are received. Failure to submit manufacturer's instructions shall be cause for rejection of the equipment or material.

(E) Submit manufacturer's certifications as required for products, materials, finishes, and equipment as specified in the technical sections. Certificates from material suppliers are not acceptable. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material." Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance.

(F) Where equipment or materials are specified to conform to industry and

technical society reference standards of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.

(G) In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

(H) Submit text of posted operating instructions for each system and principal item of equipment as specified in the technical sections.

622.05 Definitions

(A) Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE 100.

(B) The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.

(C) The technical paragraphs referred to herein are those paragraphs that describe products, systems, installation procedures, equipment, and test methods.

622.06 Quality Assurance

(A) Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period.

(B) Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

(C) Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

(D) The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer

unless stated in the technical section.

(E) Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

(F) In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the State of Hawaii - Department of Transportation, Highways Division.

622.07 Submittals

(A) Submit the following to the Engineer for approval.

(1) Conduit

(2) Handhole, cover and frame

(3) Sealing material for precast handhole joints

(4) Luminaires

(5) Luminaire arms

(6) Photo-cell switch

(7) Conductors

(8) Computerized Lighting Calculations - submit photometric data, computerized point-to-point footcandle level calculations, average lighting levels, uniformity ratios and aiming diagrams. Computerized iso-foot-candlepower distribution curve data shall accompany drawings.

622.08 Products

(A) Materials and equipment shall be new, and equipment satisfying the requirements of NEC Articles 90-6 and 110-3 shall be listed or labeled by a nationally recognized electrical testing laboratory.

(B) Brand names and catalog numbers indicate standards of design and quality required. In case of obsolescence, supersedure, or error in catalog number, the associated description and intent implied by the application shall govern. Requests for substitutions shall comply with applicable sections of the GENERAL CONDITIONS.

622.09 Materials

(A) Plastic Conduit and Tubing. NEMA TC2, Type EPC-40-PVC or EPC-80-PVC as indicated.

(B) Tape. UL 510, plastic insulating tape, capable of performing in a continuous temperature environment of 80 degrees C.

(C) Wires and Cables. As designated by American Wire Gauge AWG). Conductors shall be copper. Insulated conductors shall bear the date of manufacture imprinted on the wire insulation with other identification. Do not use wire and cable manufactured more than 6 months before delivery to the job site. Provide conductor identification within each enclosure where a tap, splice or termination is made.

(1) 600 Volt Wires and Cables. UL 44 XHHW-2 or RHW-2. Only use wires with "W" type designation in wet or damp locations. Use No. 12 minimum sized conductors, unless otherwise noted.

(D) Pull Wire. Plastic rope having a minimum tensile strength of 200 pounds in each empty duct. Provide minimum of 24 inches of slack at each end of the pull wires.

(E) Hardware. Hot-dip galvanized conforming to ASTM A 153/A 153M.

(F) Handholes.

(1) Provide type indicated. Top, walls, and bottom shall consist of reinforced concrete. Locate duct entrances and windows near the corners of structures to facilitate cable racking. Covers shall fit the frames without undue play. Form steel and iron to shape and size with sharp lines and angles. Castings shall be free from warp and blow holes that may impair strength or appearance. Exposed metal shall have a smooth finish and sharp lines and arises. Provide necessary lugs, rabbets, and brackets. Set pulling-in irons and other built-in items in place before depositing concrete. Install a pulling-in iron in the wall opposite each duct line entrance. Cast the words "TELEPHONE", or as indicated on the drawings, in the top face of telephone handhole covers.

(2) Provide cast iron and steel frames, covers and gratings per Verizon Hawaii standard details and drawings as noted.

(G) Luminaires. Provide luminaires as indicated. Standard street lighting luminaires shall comply with the requirements as specified on the drawings. Provide luminaires complete with lamps of the number, type, and wattage indicated. The details, shapes, and dimensions indicate the type desired. Luminaires of similar designs and equipment, light distribution and brightness characteristics, and of equal finish and quality will be acceptable as approved by the Engineer.

(1) Lamps. Provide the type and wattage as specified on the drawings.

(2) Ballasts for High-Intensity-Discharge (HID) Luminaires. Ballasts for

street light luminaires shall constant wattage auto-transformer type as specified on the drawings.

(H) Photocell Switch. Photocell switches for street lighting luminaires shall comply with the requirements as specified on the drawings.

(I) Luminaire Arms. Luminaire arms for street lighting luminaires shall comply with the requirements as specified on the drawings.

(J) Caulking Compound. Compound for sealing of conduit risers shall be of a putty like consistency workable with hands at temperatures as low as 35 degrees F, shall not slump at a temperature of 300 degrees F, and shall not harden materially when exposed to air. Compound shall readily caulk or adhere to clean surfaces of the materials with which it is designed to be used. Compound shall have no injurious effects upon the workmen or upon the materials.

622.10 Asbestos Prohibition.

No asbestos containing materials or equipment shall be used under this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos free.

622.11 Installation and Workmanship

(A) These specifications are accompanied by diagrammatic electrical plans showing approximate locations of handholes, ductlines, luminaires and associated equipment. Contractor shall study adjacent civil and structural details and make installation in most logical manner. Verify all dimensions on drawings and sizes of equipment at job site before proceeding with the work. Any device may be relocated within 10 feet before installation at the direction of the Engineer without additional cost to the State of Hawaii.

(B) Construction Methods. Program the work and coordinate with other facets of this project. Construction shall conform to accepted industry practices and to the recommendations of the American Electricians Handbook by Croft (latest edition), National Electrical Code and applicable instructions of manufacturers of equipment and materials supplied for this project.

(C) Concrete. Concrete work for electrical requirements shall conform to the requirements of Section 601.

(D) Earthwork. Excavation, backfilling, and pavement repairs for electrical requirements shall conform to the requirements of the applicable sections in the Standard Specifications. Contact Verizon Hawaii and Oceanic Cablevision to locate existing direct buried cables. Tone, probe and carefully hand dig to locate existing direct buried cables prior to excavation.

(E) Underground Duct without Concrete Encasement. The conduit shall be EPC-80-PVC. The top of the duct shall be not less than 24 inches below grade, and

shall have a minimum slope of 3 inches in each 100 feet away from buildings and toward handholes and other necessary drainage points. Run duct in straight lines except where a change of direction is necessary. As each conduit run is completed, draw a nonflexible testing mandrel not less than 12 inches long with a diameter 1/4 inch less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs. Provide not less than 3 inches clearance from the conduit to each side of the trench. Grade bottom of trench smooth; where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches, fill and tamp level with original bottom with sand or earth free from particles, that would be retained on a 1/4-inch sieve.

(F) Underground Duct with Concrete Encasement

(1) Construct underground duct lines of individual conduits encased in concrete. Except where rigid galvanized steel conduit is indicated or specified, the conduit shall be EPC-40-PVC. Duct risers up joint-use poles shall be EPC-80-PVC. Ducts shall not be smaller than 5 inches in diameter for HECO unless otherwise indicated. The concrete encasement surrounding the bank shall be rectangular in cross-section and shall provide at least 3 inches of concrete cover for ducts. Separate conduits by a minimum concrete thickness of 2 inches.

(2) Encase all ducts in concrete. Where conduit runs under existing roads, cut and patch the pavement as indicated.

(3) The top of the concrete encasement shall not be less than 18 inches below grade except that under roads and pavement it shall be not less than 24 inches below grade.

(G) Duct and Conduit Placement. Duct lines shall have a continuous slope downward toward handholes, manholes and away from risers with a pitch of not less than 3 inches in 100 feet. Except at conduit risers, accomplish changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, by long sweep bends having a minimum radius of curvature of 25 feet. Sweep bends may be made up of one or more curved or straight sections or combinations thereof. Manufactured bends shall have a minimum radius of 18 inches for use with conduits of less than 3 inches in diameter and a minimum radius of 36 inches for ducts of 3 inches in diameter and larger.

(H) Termination and Cleaning of Conduit. Terminate conduits in end-bells where duct lines enter handholes and manholes. Coordinate work with HECO and Verizon Hawaii when working on structures for their use and when entering existing HECO and Verizon Hawaii manholes and handholes. Separators shall be of precast concrete or high impact polystyrene or a combination of these. Stagger conduit joints by rows and layers to provide a duct line having the maximum strength. During construction, protect partially completed duct lines from the entrance of debris such as mud, sand, and dirt with suitable conduit plugs. As each section of a duct line is completed from underground structure to structure, draw a stiff bristle

brush having the same diameter of the duct through the duct, until duct is clear of particles of earth, sand, and gravel; draw a mandrel of type and size required by utility companies through the ducts to prove they are clear and round; install pull-line; then immediately install end plugs.

(I) Connections to new Handholes. Construct concrete-encased duct lines connecting to underground structures to have a flared section adjacent to the handhole to provide shear strength. Construct underground structures to provide for keying the concrete encasement of the duct line into the wall of the structure. Use vibrators when this portion of the encasement is poured to ensure a seal between the encasement and the wall of the structure.

(J) Precast Handholes. Provide complete with accessories, sumps, drains facilities, and strengths as indicated for cast-in-place handholes. Identify each casting by having the manufacturers' name and address cast into an interior face or permanently attached thereto. Rate the complete assembly, including neck, collar, frame, and cover for traffic wheel loading.

(K) Cast-in-Place Handholes. Provide cast-in-place reinforced concrete handholes indicated. Rate the complete handholes for traffic loading.

(L) Pullwire. Provide empty conduits with a plastic rope having a breaking strength of at least 200 lbs. Leave 24 inches of spare at each end of the pull.

622.12 Field Quality Control.

(A) Test 600 volt class conductors to verify that no short circuits or accidental grounds exist. Make tests using an instrument which applies a voltage of approximately 500 volts to provide a direct reading in resistance; minimum resistance shall be 250,000 ohms.

622.13 Field Tests

(A) Provide electric power required for field tests.

(B) Operating Test. Upon completion of installation, conduct an test to show that the equipment operates in accordance with the requirements of this specification section.

622.14 Payment of Fees. Obtain and pay for all electrical permits and HECO charges levied for service connections and power consumption for testing.

622.15 Inspection. Arrange for periodic inspection by the local authorities and deliver certificate of final inspection to the Engineer. Arrange for periodic inspection by the utility companies of work over which they have jurisdiction and obtain their approval therefor.

622.16 Measurement and Payment.

(A) The Engineer will measure the street lighting luminaire, street Lighting Luminaire with House Side Shield, and 2' x 4' Handhole per each.

(B) The Engineer will measure all ductlines per linear foot.

(C) The Engineer will not measure removal of existing luminaires, wiring and demolition work of existing underground Utility company structures for payment.

622.17 Basis of Payment.

(A) The Engineer will pay for the accepted street lighting bracket arms, luminaires, waterproof connectors and wiring on a contract unit price per each. The price includes full compensation for furnishing and installing bracket arms, luminaires, waterproof connectors and wiring on new joint use poles (to be installed by the Utility companies), coordinating service connections by HECO, making required tests, removing and disposing of existing highway lighting bracket arms, existing luminaires and existing wiring, furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(B) The Engineer will pay for the accepted handhole for use by Verizon Hawaii and Oceanic Cablevision on a contract unit price per each. The price includes full compensation for toning and locating existing direct buried underground cables, furnishing and installing handholes, excavating, backfilling, restoring sidewalks, restoring landscaped areas, coordinating inspection services by Verizon Hawaii and Oceanic Cablevision, coordinating work to be completed by Verizon Hawaii and Oceanic Cablevision, furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(C) The Engineer will pay for the accepted underground ductline and pole riser work for use by Verizon Hawaii and Oceanic Cablevision on a contract unit price per linear feet. The price includes full compensation for toning and locating existing direct buried underground cables, furnishing and installing direct buried ductlines, furnishing and installing pole risers, excavating, backfilling, restoring sidewalks, restoring landscaped areas, making tests, coordinating inspection services by Verizon Hawaii and Oceanic Cablevision, coordinating work to be completed by Verizon Hawaii and Oceanic Cablevision, furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(D) The Engineer will pay for the accepted underground ductline and pole riser work for use by HECO on a contract unit price per linear feet. The price includes full compensation for furnishing and installing concrete encased ductlines, furnishing and installing pole risers, excavating, shoring, dewatering, backfilling, paving asphalt concrete pavement, restoring sidewalks, restoring landscaped areas, making required tests, coordinating inspection services by HECO, coordinating work to be completed by HECO, furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(E) The Engineer will pay for the HECO service connection charge for the street

lighting system on a contract lump sum price. The price includes full compensation for charges levied by HECO for service connections and testing of highway lighting.

The Engineer will make payment under:

Pay Item	Pay Unit
Street Lighting Luminaire	Each
Street Lighting Luminaire with House Side Shield	Each
2' x 4' Handhole	Each
2-3"C Ductline	Linear Feet
4-5"C Ductline	Linear Feet
8-5"C Ductline	Linear Feet
2-5"C Ductline	Linear Feet
HECO service charge	Lump Sum

END OF SECTION

Amend **Section 623 - Traffic Signal System** to read as follows:

"SECTION 623 - TRAFFIC SIGNAL SYSTEM

623.01 Description. This work includes furnishing labor, materials, tools, machinery, and equipment necessary to install and construct an operating traffic signal system complete in place according to the contract.

The traffic signal system includes:

(1) installing the electrical service and metering facilities and paying for the electric company's charges;

(2) trenching, structural excavating, backfilling, restoring work, and installing pullboxes;

(3) providing a complete and operating traffic signal system with controller, cabinet, auxiliary and support equipment, vehicle detectors, signal standards, traffic signals and appurtenances, signal head mounting, concrete foundations, cables, wiring, cleaning and adjusting signal heads, painting and restoration work.

(4) coordinating work and arranging for inspection of work with the Engineer and other agencies as required.

(5) turning over to the Department a complete and operating traffic signal system according to the contract.

Furnish and install the incidental parts that the contract does not show and that are necessary to complete the traffic signal system as though such parts were in the contract.

Electrical equipment shall conform to the NEMA Standards and this contract. Material and workmanship shall conform to the "National Electric Code", (the Code); General Order Nos. 6 and 10 of the Hawaii Public Utilities Commission; the standards of the ASTM; the ANSI; Local Joint Pole Agreement; local power company rules; and local ordinances that may apply.

The following definitions apply:

(1) **Actuation** - The operation of types of detector.

(2) **Clearance Interval** - The length of time of display of the signal indication following the right-of-way interval.

(3) **Detector for Traffic Actuation** - A device that pedestrians or vehicles can register their presence with a traffic-actuated controller.

(4) **Extendible Portion** - That part of the green interval that follows the initial portion.

(5) **Extension Limit** - The maximum time that a traffic phase may retain the right-of-way after actuation on another traffic phase, after timimg out the initial portion.

(6) **Flashing Feature** - That feature incorporated to stop normal signal operation and cause the flashing of any predetermined combination of signal lights.

(7) **Initial Portion** - That part of the green interval that is timed-out or separately controlled by a traffic-actuated controller before the extendible portion of the interval takes effect.

(8) **Interval** - Several divisions of the time cycle during which signal indications do not change.

(9) **Interval Sequence** - The order of appearance of the signal indications during successive intervals of a time cycle.

(10) **Magnetic Vehicle Detector** - A detector actuated by the movement of a vehicle passing through its magnetic field.

(11) **Major Street** - The roadway approach or approaches at an intersection normally carrying the greater volume of vehicular traffic.

(12) **Manual Operation** - The operation of a signal controller by a hand-operated switch.

(13) **Minimum Period** - In semi-traffic-actuated controllers, the shortest time for which the right-of-way will be given to the approaches not having detectors.

(14) **Minor Movement Interval** - An auxiliary phase added to a controllerphase (parent phase) and modified by an auxiliary movement controller.

(15) **Minor Street** - The roadway approach or approaches at an intersection normally carrying the smaller volume of vehicular traffic.

(16) **Non-Parent Phase** - A controller phase not modified by an auxiliary control unit.

(17) **Parent Phase** - A controller phase modified by an auxiliary control unit.

(18) Passage Period - The time allowed for a vehicle to travel at a selected speed from the detector to the nearest point of conflicting traffic.

(19) Pedestrian Detector - A detector, usually of the push-button type, installed near the roadway and operated by hand.

(20) Pressure-Sensitive Vehicle Detector - A detector installed in the roadway, actuated by the pressure of a vehicle passing over its surface.

(21) Pre-Timed Controller - An automatic control device for supervising the operation of traffic control signals according to a pre-timed cycle and divisions.

(22) Recall Switch - A manually operated switch in an actuated controller to provide for the automatic return of the right-of-way to a street.

(23) Right-of-Way - The privilege of the immediate use of the highway.

(24) Signal Indication - The illumination of a traffic signal lens or equivalent device, or of a combination of several lenses or equivalent devices.

(25) Time Cycle - The number of seconds required for one complete revolution of the timing dial or complete sequence of signal indications.

(26) Traffic-Actuated Controller - A digital control device for supervising the operation of traffic control signals according to the varying demands of traffic as registered with the controller by loop detectors or pedestrian push buttons.

(27) Traffic Phase - A part of the cycle allocated to traffic movements receiving the right-of-way or to combinations of traffic movements receiving the right-of-way simultaneously during one or more intervals.

(28) Unit Extension - The minimum time, during the extendible portion, for which the right-of-way must remain on traffic phases following an actuation on that phase, subject to the extension limit.

623.02 Materials. Concrete shall conform to Section 601 - Structural Concrete.

Reinforcing steel shall conform to Section 602 - Reinforcing Steel.

Steel plate covers and anchor bolts shall conform to ASTM A 36 and A 307 respectively. The Contractor shall zinc-coat the anchor bolts if exposed.

Other materials shall conform to the following:

Dark Green Enamel Paint	708.03
Paint Thinner	708.04
Pullboxes	712.06(B)
Conduits	712.27
Conductors and Cables for Traffic Signal System	712.34(B)
Traffic Signal Standards	712.38
Traffic Signals and Appurtenances	712.39
Epoxy Sealer	712.54
Hot Applied Rubberized Sealant	712.57

Materials will be subject to inspection after delivery to the work site and during installation. Failure of the Engineer to note faulty material or workmanship during construction will not relieve the Contractor of the responsibility for removing or replacing materials at no cost to the State.

The Engineer may make inspection or sampling of certain materials at the factory or warehouse before delivery to the work site, when required.

623.03 Construction Requirements.

(A) Equipment List and Drawings. The bidder shall submit the equipment list according to Subsection 106.13 - Ordering of Certain Materials.

Upon completion of the work, submit an 'As Built' or corrected plan showing in detail the construction changes.

(B) Excavation and Backfill. Excavation and backfill shall conform to Section 206 - Excavation and Backfill for Conduits and Structures.

Do the necessary excavation to modify an existing traffic signal system to prevent damage to pavements, sidewalks and other improvements. Place the material from the excavation to prevent damage and obstruction to vehicular and pedestrian traffic and interference with surface drainage.

(C) Installation.

(1) Standards. Install each traffic signal and controller standard with its shaft precisely vertical on a concrete foundation.

Locations of standards shown in the contract are approximate. The Engineer will decide the exact locations in the field.

(2) Signal Heads. Assemble the signal heads to give the signal arrangement shown in the contract. Plumb or level the members, arrange the members symmetrically, and assemble the members securely. Installation shall be such that the Contractor conceals the conductors within the standards and mounting assemblies as much as possible.

Do not install signal heads at the intersections until the other signal equipments, including the controller, are in place and ready for operation at that intersection. The Contractor may mount the signal heads when covering the faces or not directing the faces toward traffic.

Before final acceptance of the traffic signal system, adjust the direction of signal heads as specified by the Engineer.

(3) Vehicle Detectors. Vehicle detectors shall be inductive loop detectors installed according to details shown in the contract. The saw cut groove shall be air blown to remove debris before inserting the loop cable. The loop cable shall be continuous within the roadway. Splice in the pullbox. Fill the saw cut groove with epoxy sealer or hot applied rubberized sealant. As accepted by the Engineer, the Contractor may use a sealant designed for use as a protective seal for traffic inductive loop detectors installed in asphalt concrete or concrete pavements.

(4) Traffic Signal Standard and Pullboxes. Construct the foundations and boxes required carefully at the locations designated. Pour the foundations and boxes in areas that the Contractor has carefully excavated to receive the foundations and boxes. Construct each unit as detailed in the contract and connect each unit properly with the facilities of which each unit is a component part.

Mix, place, and cure the concrete according to Section 601 - Structural Concrete, and Section 503 - Concrete Structures. The Engineer will allow hand mixing.

Set the anchor bolts for the foundations to fit the bases of the standards to be installed.

Give the pullbox frames and covers two coats of asphaltic base paint after installation.

(6) Conduits. Conduits shall be direct burial shown in the contract. Conduits under paved areas subject to vehicular traffic shall be PVC Schedule 80.

Install the ducts to drain towards either one or both pullboxes, manholes, or signal standard foundation.

Make directional changes in the conduits, such as bends and changes to clear obstructions with curved segments using accepted deflection couplings or with short lengths of straight ducts and couplings. The deflection angle between two adjacent lengths of ducts shall not exceed 6°. The bends shall not have a radius of less than 12 times the nominal size of the conduit. The Contractor may use factory-made ells.

Cut the rigid PVC conduits with a hacksaw. Square and trim the ends after cutting to remove rough edges. The connections shall be of the solvent weld type. Make the solvent weld joints according to the conduit manufacturer's recommendations and as accepted.

Use the rigid PVC conduit for drilling or jacking.

Thread the PVC fittings for connecting PVC conduit to rigid metal conduit on the metal conduit side.

Seal the ends of the duct with plugs at the end of each day of work, whenever problems interrupt the duct installation work and whenever ducts are subject to submergence in water.

Keep the conduits clean during construction.

Use only hand shovels in compacting concrete encasements. Cure the concrete for at least 72 hours before permitting vehicular traffic to run over the concrete.

Provide each conduit run with a No. 10 gage flexible, zinc-coated pull wire extending through its entire length. Double an additional two feet back into the conduit at each end of the run. Conduits and sleeves entering pullboxes shall end flush in the wall with ends ground smooth. Plug the conduits and sleeves temporarily.

Ends of conduit runs shall extend at least 24 inches past the face of curb or edge of pavement unless the ends end in the pullboxes. Locate the ends accurately by special markers, markings on curb, or as specified by the Engineer. Show these locations on the 'As Built' plans required under Subsection 623.03(A) - Equipment List and Drawings.

Give the exterior portions of the direct burial steel conduits not encased in concrete two coats of asphaltic base paint.

The entire length of a conduit run between pullboxes or standards shall be of one type of material.

The completed duct lines shall be subject to a field test. Pass a bullet-shaped test mandrel about 14 inches long with a diameter 0.5 inch less than the inside diameter of the ducts through the entire length of each duct run. The Engineer will consider scouring found on the mandrel deeper than one thirty-second inch an indication of burrs and/or obstructions in the duct run. Normal abrasion between the duct line and bottom of mandrel is not an indication of burrs and/or obstructions in the duct run. Remove such burrs and/or obstructions. Pass the test mandrel through again. Repeat the process until the Contractor gets a satisfactory result.

Use steel or Schedule 80 PVC conduits for all exposed construction except risers for communications cables. Use only Schedule 80 PVC conduits for risers for communication cables.

(7) Wiring. Wiring shall conform to the appropriate articles of the Code. Arrange the wiring within cabinets, signal heads, standards and pullboxes neatly. Encase the wiring installed underground in conduits. Before installing the wires and cables in conduits, pull a wire brush, swab and mandrel through each conduit for the removal of extraneous matter and verification of the absence of obstructions and debris from the conduit system.

Pull the cables directly from their cores or reels into the conduits. Do not pull off and lay the cables on the ground before installation. Make the pulls in one direction only. Lubricants used shall be as recommended by the cable manufacturer or accepted by the Engineer. Leave the wires or cables under tension nor tight against bushings or fittings.

Remove the damaged ends resulting from the use of pulling grips soon after pulling the cable. Maintain the cable end seals. Do not pull the open ended cables through the conduits. Cables shall

be continuous from pulling point to pulling point. The Engineer will not permit splices. Make the splices, taps and terminations with pressure-indented connectors or lugs as appropriate or as specified herein. Tape or seal the ends of the spare conductors as accepted.

Run the signal light conductors continuously from the terminal block located in a cabinet or signal head to a similarly located terminal block without splices. The Contractor may splice the branch signal light neutrals at pullboxes. Leave at least five feet of slack in each conductor at each standard and at least two feet of slack at each pullbox.

Join the conductors by a 'western union' type splice. Use the connectors for splicing conductors No. 8 AWG, or larger. Solder the splices by the pouring or dipping method.

Pencil the conductor insulation well, trim the conductor insulation to conical shape, and roughen the conductor insulation before applying splice insulation.

Splice insulation includes layers of thermoplastic electrical insulating tape not over 0.007-inch thick applied to a thickness equal to and well lapped over the original insulation. The splice insulation shall conform to Federal Specifications MIL-I-7798. On high voltage and multiple lighting conductor splices, apply two layers of synthetic oil resistant rubber tape conforming to ASTM D 119 over each conductor before placing the thermoplastic tape. Then cover the splice well with at least two layers of asphaltic impregnated open mesh fabric tape and a coating of high grade insulating paint or similar material. Leave at least two feet of slack for each conductor at each splice.

Furnish the cables on reels and handle the cables with great care to avoid damage to the conductors or the jacket.

Install the communications cable, connect the communication cable to terminals, and wire the communication cable to the proper equipment to produce a closed loop network suitable for operating within the traffic signal control system. Cable runs shall be continuous between controller cabinets without splices.

Tape the cable ends to exclude moisture and shall remain so until the Contractor attaches the terminal equipment. For cable connections in terminal cabinets, use Bell Telephone System or equivalent connectors accepted for outside use.

Pull the cable in the conduit with a cable grip designed to provide a firm hold on the exterior covering of the cable. Pull the cable with a minimum dragging on the ground or pavement. Use powdered soapstone, talc, or other accepted lubricants to ease the pulling of the cable.

(8) Bonding and Grounding. Make the metallic cable sheaths, conduits and standards mechanically and electrically secure to form a continuous system. Ground the system effectively. Bonding and grounding jumpers shall be No. 8 AWG copper wire or equivalent copper strap of the same cross-sectional area.

Bond the standards by a bonding strap attached to an anchor bolt or a three-sixteenth inch or larger, brass or bronze bolt installed in the lower portion of the shaft.

Ground the conduits and the neutral wires at the service points as required under the Code, except that grounding conductors shall be No. 6 AWG or equal.

Install a copper-clad steel or pure copper ground rod five-eighth inch diameter by eight feet long alongside each traffic signal standard and controller concrete base.

The Contractor shall connect them with No. 6 AWG wire to the No. 8 AWG ground wire loop and power system neutral.

On wood poles, ground all equipment mounted less than 8 feet above ground surface.

(9) Continuity of Service. During relocation, reconstruction or other improvements of existing traffic signal systems, keep the existing system operational until the reconstructed or new traffic signal system can be started and put into service. Arrange the work accordingly and shall provide temporary relocations and wiring as necessary.

(10) Salvaging Electrical Equipment. Remove and salvage the controller and electrical equipment not needed in the new system. Stockpile the salvaged equipment neatly and deliver the stockpile in a designated locations or as specified by the Engineer.

The Engineer will consider salvaging of existing electrical equipment as incidental to the various items of work.

(D) Painting. Supply the steel traffic signal standards including mast

arms with a natural, zinc-coated finish. The standards require no painting.

Paint the signal head mountings with two coats of weatherproof dark enamel. The enamel shall conform to Subsection 708.03 - Dark Green Enamel Paint.

Paint the controller cabinet, if of metal other than aluminum, with one coat of accepted metal primer and two coats of aluminum paint conforming to AASHTO M 69.

Supply the aluminum signal standard and controller cabinet with polished natural aluminum finish. They shall not require painting.

(E) Field Test. Before the acceptance of the work, do the following tests on traffic signals and circuits, in the presence of the Engineer:

(1) Test for continuity of each circuit.

(2) Test for grounds in each circuit.

(3) A megger test on each circuit between the circuit ground. The insulation resistance shall not be less than the values specified in Table 622-I - Insulation Resistance when measured with an instrument having a voltage rating of 500 volts.

(4) A functional test to show that the system functions as specified or as intended herein.

Replace or repair the fault in material or the installation revealed by these tests according to the contract. Repeat the same tests until no fault appears.

(F) Services Provided By The Counties On Their Respective Projects.

(1) Department of Transportation Services (DTS), City and County of Honolulu will be responsible for the following:

(a) making all splices and connections in the pullboxes and cabinet locations pertaining to signal heads, pedestrian buttons, vehicle detectors, preemption detectors, and intertie circuits.

(b) installing and programming the Controller Timings and Conflict Monitor Cards.

(c) aligning and taping the Programmed Visibility Heads.

(c) aligning and taping the Programmed Visibility Heads.

(d) inspecting the traffic signal construction.

(4) With the above work, the Contractor shall be responsible for the following:

(a) Arrange for phases of work with the appropriate County agency or as specified by the Engineer.

(b) give at least three days of advance notice to the appropriate County agency when phases of the work requires the services of that agency.

(H) Restoring Pavements and Other Improvements. Restore the existing pavements and other improvements such as driveways, sidewalks, curbs and gutters disturbed by excavation to their original condition according to the contract. Materials used for restoration work shall be equal to or better in quality than the materials the Contractor will replace, and matching in thickness, texture, and color whenever applicable. The grades of the restored surfaces shall conform to the existing grades.

(I) Warranty. Materials and equipment installed for permanent construction shall be new. The contract contemplates the use of first-class material and equipment throughout the performance of the contract.

Secure from the manufacturer(s), a warranty or warranties guaranteeing equipments from defects in materials, design and workmanship for not less than 12 months from the date of acceptance.

When requiring adjustments or repairs during the warranty period, adjust or repair the existing unit within 24 hours from the time of notification.

When requiring repairs that need factory corrections during the warranty period, replace the existing unit with an accepted temporary operational replacement unit within 24 hours from the time of notification until the Contractor can install the new unit. Install the new, identical non-defective unit within 30 days from the time of notification.

623.05 Method of Measurement. The Engineer will measure the traffic signal standard, relocation of existing solar powered flashing beacon, foundation for traffic signal standard, traffic signal assembly, pedestrian pushbutton, pullbox, and loop detector sensing unit, per each complete in place.

The Engineer will not measure traffic signal ductline and cable for payment.

623.06 Basis of Payment. The Engineer will pay for the accepted traffic signal

standard at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the traffic signal standard; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted foundation for traffic signal standard and the accepted relocation of existing Solar Powered Flashing Beacon with foundation at the contract unit price per each complete in place. The price includes full compensation for excavating and backfilling; forming; furnishing and placing the reinforcing steel; mixing, placing, and curing the concrete; furnishing and setting the anchor bolts; restoring the pavement; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted traffic signal assembly at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; assembling the signal heads; wiring; bonding and grounding; painting the signal head mounting; testing; providing turn-on service; submitting warranty; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted pedestrian pushbutton with instruction sign at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the pedestrian pushbutton with the instruction sign; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; removing, disposing and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted pullbox at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the pullbox at the designated locations; coating the fames and covers; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted loop detector sensing unit at the contract unit price per each complete in place. The price includes full compensation for saw cutting; cleaning and blowing the saw cut area; furnishing and inserting the loop cable; splicing in the pullbox; filling the saw cut groove with epoxy sealer or hot applied rubberized sealant; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted traffic signal ductline on a contract lump sum basis complete in place. The price includes full compensation for saw cutting; excavating and backfilling; furnishing, installing, bonding, and grounding

the conduits; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the accepted traffic signal cables on a contract lump sum basis complete in place. The price includes full compensation for furnishing, installing, splicing, and taping the cable; making the connections; providing turn-on service; and furnishing equipments, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will consider full compensation for additional materials and labor not specifically shown or called for that are necessary to complete the work incidental to the various contract items in the proposal.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Type _____ Signal Standard _____	Each
Foundation for _____	Each
_____ Signal Assembly _____	Each
Pedestrian Pushbutton with Sign _____	Each
Type _____ Pullbox	Each
Loop Detector Sensing Unit (6 Ft. x 6 Ft.) _____ Loops	Each
Traffic Signal Ductline _____ (_____ LF)	Lump Sum
Relocate _____	Each
Type _____, _____ Cable _____ (_____ LF)	Lump Sum"

END OF SECTION

SECTION 624 - WATER SYSTEM

624.01 Description. This work includes installing a new water system or adjusting an existing water system or both according to the contract.

The terms "County Water Works System" or "Board of Water Supply (BWS)" will be interchangeable and mean the organization of the respective County where the Contractor does the work.

Items of work or materials required but are not specifically covered by the contract shall conform to the appropriate County Water Works System requirements.

624.02 Materials. The Contractor shall furnish jointing materials required to complete the water system work under the contract.

Concrete for reaction beams, reaction test blocks, and jackets shall be at least Class B and shall conform to Section 601 - Structural Concrete.

Material shall be new and free of defects from manufacture. The Contractor shall handle the material carefully during storage or handling.

The Contractor shall inspect and test the pipes, fittings, special castings, gate valves and butterfly valves.

The Contractor shall furnish two (2) copies of a manufacturer's Certificate of Test for the pipes, fittings, special castings and valves. The manufacturer shall sign the Certificate of Test properly. The manufacturer shall certify that the manufacturer made the pipes, fittings, special castings and gate valves according to the Water System Standards. If a Certificate of Test is not available, the Engineer will accept a written letter of guarantee for the materials.

The Contractor shall furnish the materials required to complete the water system work.

Materials shall conform to the following:

Aggregate for Untreated Base	703.06
Structure Backfill Material	703.20
Trench Backfill Material	703.21
Concrete Bricks	704.02
Lead	705.09
Packing for Lead Joint	705.10
Cast Iron Pipes, Fittings and Special Castings for Water System	707.01(B)

Copper Service Pipe and Appurtenances	707.11
Reinforcing Steel	709.01
Frames, Grates, Covers & Ladder Rungs	712.07
Pipe Collar for Valve Box	712.22
Precast Concrete Meter and Valve Boxes and Covers	712.23
Valves and Appurtenances	712.24
Fire Hydrant and Appurtenances	712.26

624.03 Construction Requirements.

(A) General. The Contractor shall arrange the work so that no unnecessary or extended interruption in water service or damage to the existing water system and appurtenances occurs. The Contractor shall repair damages to the existing water system and appurtenances at no cost to the State.

Locations of existing water system and appurtenances shown in the contract are approximate. If the Engineer requires changes in alignment, grade or location due to unforeseen conflict with the proposed highway project, the Engineer will be responsible for such alterations and cost.

Existing fire hydrants within the project site shall be accessible to the Fire Department. The Contractor shall install the relocated fire hydrants before removing the existing fire hydrants.

The Contractor shall notify the County Water Works System in writing at least one (1) week before commencement of work on the water system.

The Contractor shall arrange with the County Water Works System to cut off unused water mains and service laterals, meter boxes and other appurtenances before commencement of clearing and grubbing and grading operations. The Contractor shall excavate for the "cut off" work.

If a corporation stop shown tapping into a new main is larger than that allowed by the County Water Works System, the Contractor shall install a double hub fitting with boss tapped for appropriate size corporation stop.

Invert grades of water mains and service laterals shall provide the following minimum cover requirements from top of pipe to finished grade:

(1) Three (3) feet for six (6) inch or larger water mains;

(2) Two and a half (2-1/2) feet for four (4) inch water mains;

(3) One and a half (1-1/2) feet for copper service laterals.

Concrete work shall conform to Section 601 - Structural Concrete.

The Contractor shall construct or reconstruct water manholes accordance to Section 604 - Manholes, Inlets and Catch Basins.

The Contractor shall install reinforcing steel according to Section 602 - Reinforcing Steel.

(B) Trench Excavation

(1) General. The Contractor shall store excavated material long side the trench so as not to obstruct traffic.

If the Contractor cannot store the excavated material properly alongside the trench, the Contractor shall haul the excavated material away from the work. The Contractor shall stockpile the excavated material at convenient locations for later use at no cost to the State.

In fill areas, the Contractor shall compact the fill to the subbase or to an elevation four (4) feet above the top of the barrel of the pipe whichever is less before the Contractor excavates the trench.

The Contractor shall expose existing mains by hand to verify their locations and depths.

The Contractor shall excavate trenches according to Section 206 - Excavation and Backfill for Conduits and Structures and as modified below.

Trenches necessary for the removal of the existing water system and appurtenances shall be sufficient in size and depth to permit their removal without damage. The Contractor shall remove the materials that the Contractor will salvage carefully. The Contractor shall replace the materials damaged at no cost to the State.

The Contractor shall not open the trench more than seven hundred fifty (750) feet ahead of the installed and tested pipe. The Engineer will not permit jumps or spaces unless accepted. The Contractor shall maintain the excavation according to the contract during installation of water systems and placing of backfill.

Trench widths for the various size pipes not encased in concrete shall be as specified in Table 624-I.

TABLE 624-1 - TRENCH WIDTHS FOR WATER SYSTEMS	
Diameter of Pipes inches	**Width of Trenches inches**
42	66
36	54
30	48
24	42
20	36
16	30
12	24
8	24
6	24
4	24
Below 4	12

Trench widths shall not be less than twelve (12) inches. The Contractor may increase the trench widths at no cost to the State.

Trench widths for water mains that the Contractor will encase in concrete shall be the width of the concrete jacket plus twenty (20) inches. If the contract requires no form for the jacket, the trench width shall be equal to the width of the concrete jacket. The depth of the trench shall be to the bottom of the concrete jacket.

The Contractor shall excavate the trenches to a depth of six (6) inches below the invert grade shown in the contract, provided above for concrete encased mains. The Engineer reserves the right to eliminate the six (6) inches of excavation below the invert grade and the right to raise or lower the invert grade or to change the alignment.

The Contractor shall correct the trench excavated below invert grade with trench backfill material and compact thoroughly at no cost to the State.

(2) Bell Holes. The Contractor shall enlarge the bell holes at pipe joints to provide proper room completing the joints.

(3) Reaction Blocks. The Contractor shall excavate properly to place reaction and test blocks.

(4) Removal of Mud and Other Unsuitable Material from Trench Bottom. If the Contractor encounters soft, spongy, or other suitable

material, the Contractor shall remove material under the pipe to a maximum depth of thirty (30) inches below the invert grade of the pipe. The Contractor shall backfill the space to six (6) inches below the invert grade of the pipe with untreated base. The untreated base shall have a maximum size of one and a half (1-1/2) inch. The Contractor shall compact the untreated base properly to provide adequate support for the pipe. The Contractor shall continue the compaction until the relative compaction is not less than ninety-five percent (95%).

(5) Sheathing. If necessary, the Contractor shall properly sheath and brace excavation to render the excavation secure. The Contractor shall remove such sheathing and bracing before completing the backfill. When sheathing is necessary, the Contractor shall widen the width of the trench beyond those specified in Subsection 624.03(B)(1) - General.

(6) Dewatering. The Contractor shall keep the trenches free from water while installing and testing of the pipe and backfilling of the trench. The Contractor shall arrange with the respective County, State and private individuals or corporations for the proper disposal of water pumped from the trenches. If such water, due to the Contractor's work, flows across the road, the Contractor shall provide a bridge or other means to prevent this water from contacting passing traffic. The Engineer will not pay extra compensation for difficulties the Contractor may encounter in properly disposal of this water from the trenches.

(7) Service Laterals and Service Connections and Meter Boxes. The Contractor shall do the necessary excavation and backfill.

(8) Blasting. If explosives are necessary, the Contractor shall use the utmost care not to endanger life or property. The Contractor shall use only electric detonators for blasting. The Contractor shall not use common fuses. The Contractor shall store and use explosives according to Subsection 107.15 - Use of Explosives or Combustibles.

(9) Connections and Adjustments of Water Mains. If the Contractor requires connections to or adjustment of existing water mains, the Contractor shall do the necessary excavation, and placing of untreated base, and backfilling.

Before trenching for new main, the Contractor shall expose the existing main by hand to detect the actual location and grade that the Contractor will connect. The length, width and depth of trenches for exposing the existing main shall be as ordered by the Engineer.

The Contractor shall furnish and install the materials, excavate, backfill and do the work required to connect new or relocated meters to house services.

(10) Excavation for Manholes. Excavation and backfill for manholes shall conform to Section 206 - Excavation and Backfill for Conduits and

Structures. Excavation for manholes shall be to the dimensions shown in the contract plus an additional twelve (12) inches beyond the dimension lines shown, and to a depth twelve (12) inches below the invert of the valve or as required.

(C) Trench Backfill.

(1) General. The Contractor shall not use adobe, clay or material of similar nature for backfill. When the removal of unsuitable excavated materials from the project creates a shortage of backfill material, the Contractor shall furnish suitable material according to the contract. The Contractor may use material from roadway or other excavation according to the contract.

(2) Preparation of Trench Bottom. After the Contractor excavates the trench to the proper depth below invert grade, the Contractor shall backfill the trench bottom to the required invert grade with trench backfill material.

(3) Backfilling. Upon completion of testing of mains and appurtenances, the Contractor shall observe the following steps:

(a) For mains twelve (12) inches and smaller, copper pipes, service laterals, services connections and appurtenances, backfilling may commence with pipe cushion material to six (6) inches above the top of pipe.

For pipe inverts below four (4) foot elevation, City or County Datum or where the Contractor meets water, backfilling with pipe cushion material shall continue to twelve (12) inches above the top of pipe.

Pipe cushion material shall conform to Subsection 703.21(A) -Trench Backfill Material A.

(b) For mains sixteen (16) inches and larger, the Contractor shall place pipe cushion material to twelve (12) inches above the top of pipe.

(c) While backfilling to the heights specified above the pipe, the Contractor shall compact the cushion material with water. The Contractor shall use a one and a half (1-1/2) inch nozzle curved to the circumference of the installed pipe and of sufficient length to reach the invert of the pipe. The Contractor shall conduct the compaction along the entire length of pipe on alternate sides with each side compacted four (4) times. Settlement greater than

one-sixth (1/6) the diameter of pipe will require additional material and compaction.

The Contractor shall deposit the remaining backfill material evenly by hand in the pipe trench in layers not exceeding eight (8) inches in loose thickness. The Contractor shall compact each layer thoroughly to not less than ninety-five percent (95%) relative compaction. The Contractor shall complete the layer to the top of the trench according to the contract.

Upon completion of the disinfection work, the Contractor shall remove the risers. The Contractor shall then backfill these areas with trench backfill material to the required degree of compaction.

(D) Laying Pipe. The Contractor shall inspect and test the pipes and appurtenances thoroughly before installation. The Contractor shall mark the circumference of the spigot ends of the pipe showing the depth of the bell before installation.

The Contractor shall lay each pipe so that the barrel of the pipe shall have bearing along its laying length with the bell end properly set to grade and alignment. The Contractor shall then center the spigot end of the pipe and embed firmly against the bell end of the pipe previously laid with uniform clearance around the bell. The Contractor shall hold the pipe firmly in place by proper blocking on each side of the pipe. The Contractor shall not lay the pipe on blocks.

The Engineer will not allow "springing" or "buckling" of pipe lengths into place between installed pipe or special castings. The Contractor shall clean and scrape the pipes and appurtenances thoroughly of foreign matter and protuberances. The Contractor shall keep the pipes and appurtenances clean until the Contractor completes assembling of the joint.

If water, mud, or other foreign matter enter the joints before the assembly of the joint and after the Contractor installs the pipe or appurtenances, the Contractor shall open the joint affected. The Contractor shall clean the joints thoroughly before the Contractor replace and reset the pipe or appurtenance.

The Contractor shall keep the trench and pipe free of water. If water enters the pipe, the Contractor shall thoroughly clean the inner portion the pipe before continuing with the installation of the pipe.

If cutting twelve (12) inch and smaller cast iron pipes are necessary, the Engineer will permit "cold cutting" with cold chisel and hammer. The Contractor shall trim the cut edges even and be free from projections.

Pipes sixteen (16) inch and larger shall be "machine cut,". The Engineer will not permit "cold cutting".

If the installation of sleeves is necessary in the pipelines, the Contractor shall contact the space between the ends of the adjoining pipes by welding in place

not less than four (4) filler pieces of the same material as the pipe. The filler pieces shall be four (4) inch wide, of suitable length and equally spaced around the circumference of the pipe.

If the Contractor stops laying pipes, the Contractor shall close the openings tightly with cast iron removable plugs held securely in place.

The Contractor shall not use pipes and appurtenances for water mains for other purposes before installation.

(E) Gate Valves. The Contractor shall inspect the valves thoroughly to insure their proper working order before installation. If valves under pressure tests show leakage, the Contractor shall stop the leaks. The Contractor shall use proper, standardized tools for operating the valves. The Contractor shall install proper size corporation stops on the sides of the valves shown in the contract. If the Contractor backfills the valves, the Contractor shall remove and replace the corporation stops with brass plugs. The Contractor shall support the valves with blocks as required in the contract. After the Contractor completes the manhole or before the construction of valve boxes, the Contractor shall clean every valve thoroughly of rusts and foreign matters. The Contractor shall give the valve one (1) coat of an accepted corrosion preventive paint.

(F) Joints for Cast Iron Pipe and Appurtenances.

(1) Lead Joints. To insure proper embedding of the spigot end of the pipe against the bell, the Contractor shall "jack" the pipe "home" after the installation of not more than twelve (12) pieces of pipe. If the Contractor installs valves, the Contractor shall "jack" the valves and pipe "home". The Contractor shall complete the "jacking" of pipe before yarning the joints.

After the Contractor:

(a) centers the pipes or their appurtenances or both properly,

(b) brings to grade and alignment, and

(c) embeds thoroughly against one another,

The Contractor shall clean and caulk each joint thoroughly and tightly so to leave two (2) inches for lead. The Contractor shall run the molten lead in sufficient quantity to fill each joint in one (1) pouring and to provide for a completely filled joint after final caulking.

After the Contractor cools the lead, the Contractor shall caulk each lead joint carefully. The Contractor shall caulk so that the joints are tight but the bell is not over stress when the Contractor drives the lead up flush with the face of the bell. The Contractor shall caulk the lead gates as the pipe joint. The Contractor shall not cut off the lead gates.

If the Contractor heats the lead used insufficiently and fill the joint unsatisfactorily, the Contractor shall melt and remove the lead from such joints so as not to overheat the bell of the pipe. The Contractor shall replace the pipes damaged during this removal at no cost to the State. The Contractor shall clean the joint of existing lead before pouring new lead.

(2) Mechanical Joints. The Contractor shall clean the bell and the spigot end of the pipe and the rubber gasket thoroughly before assembly. The Contractor shall place the gland, followed by the gasket, over the spigot end of the pipe that the Contractor inserts into the bell. The small side of the gasket and the lip side of the gland shall face the bell. The Contractor shall then push the gasket into position so that the Contractor seats the gasket evenly in the bell as the Contractor moves the gland against the face of the gasket.

The Contractor shall dip the threaded ends of the bolt in fuel oil for lubrication before assembly.

The Contractor shall insert the bolts with threaded ends on the gland side. The Contractor shall screw the nuts by hand and make the nuts hand-tight in pairs (180 degrees apart). The Contractor shall then tighten the bolts alternately (180 degrees apart) to the desired tension with an accepted ratchet wrench, beginning at the bottom, then the top and so on. The normal range of bolt torques that the Contractor will apply to standard cast iron bolts in the joint is as follows:

Bolt Size Inches	Range of Torque Foot-Pounds
5/8	40 - 60
3/4	60 - 90
1	70 - 100
1-1/4	90 - 120

The following lengths of wrenches should satisfactorily produce the above range of torques when used by the average worker:

Bolt Size Inches	Length of Wrench Inches
5/8	8
3/4	10
1	12
1-1/4	14

When the Contractor assembles the joint properly, the distance between the face of the bell and face of the gland shall be uniform around the pipe.

After completion of the joint, the Contractor shall give the bolts one (1) coat of accepted asphalt paint.

(3) Slip Joint. The Contractor shall wipe the gasket seat in the socket of the pipe and gasket with a cloth. The Contractor shall place the gasket in the socket with the large, round end entering first. The Contractor may then spring the gasket into the gasket seat so that the groove shall fit over the bead in the seat.

The Contractor shall then apply a thin film of non-toxic lubricant, as supplied by the manufacturer, to the inner diameter of the gasket for easier insertion of the pipe. Applying a thin film of lubricant may be desirable to the outer portion of the plain end of the pipe for about one (1) inch back from the end.

The Contractor makes the joint by exerting sufficient force on the entering pipe so that the Contractor moves its plain end past the gasket until the pipe makes contact with the base of the socket.

When the Contractor cuts the pipes in the field, the Contractor shall taper the outer portion of the cut end about one-eighth (1/8) inch at an angle of thirty (30) degrees to the centerline of the pipe with a coarse file or portable grinder.

(4) Flanged Ends Joint. The face of the flange shall be true and free of projection. The Contractor shall clean the face of the flange of rust and foreign matter. Gaskets shall be "full face". The Contractor shall cut the gaskets carefully to fit flanges and bolt holes. The Contractor shall bring up the flanges to true alignment and fit the flanges with uniform tension on the bolts. The Contractor shall tighten the bolts specified for mechanical joints. The Contractor shall paint the bolt threads with graphite before tightening.

(G) Installation of Pipes, Service Laterals and Service Connections, Including Appurtenances.

(1) General. This work includes furnishing and installing pipes, service laterals, service connections and its appurtenances at the locations shown in the contract.

"Service lateral" is that portion of the pipe from the water main up to and including the stop cock end of the lateral shown in the contract.

"Service connection" is that portion of the installation from the stop cock end of the service lateral up to and including the stop cock at the meter box shown in the contract.

"Appurtenances" used with "Pipes, Service Laterals and Service

Connections" shall mean fittings, corporation stops, valves, bushings, and stop cocks that the Contractor will install in the service lateral and service connections.

(2) Installation. The Contractor shall thoroughly inspect and test the pipes and its appurtenances before installation. The Contractor shall install the service laterals and service connections at the locations and of the sizes and types shown in the contract.

The contract recommends the following procedure for solder joints:

(a) The Contractor shall cut the pipe or tube to the desired length with a tube cutter or fine hack saw (32-teeth to the inch). The Contractor shall remove the burrs with a file or scraper.

(b) The Contractor shall clean the outer portion of the tube end that fits into the solder cup of the fitting with sand cloth or sand paper. The Contractor shall remove the dark spots.

(c) The Contractor shall clean the solder cup of the fitting carefully with a wire brush, sand cloth or sand paper. The Contractor shall remove the dark spots.

(d) The Contractor shall use only accepted soldering flux. The Contractor shall brush a light, even coating of flux half way inside the fitting and outer portion of the tube. The Contractor shall not use acid or zinc chloride for flux.

(e) The Contractor shall insert the tube into the fittings as far as the tube shall go. The Contractor shall turn the tube back and forth a few times to distribute the flux evenly. The Contractor shall not wipe the joints before the Contractor inserts the tube in place.

(f) The Contractor shall heat the fitting uniformly with a torch until solder melts on contact with the heated fitting. The Contractor shall remove the flame from the joint that the Contractor will solder. Using only accepted solders, the Contractor shall feed the solder to the joint at one (1) or two (2) points. The Contractor shall not feed the solder around the full circumference of the tube. When a ring of solder appears around the tube at the fitting, the Contractor shall stop solder feeding and the Contractor shall wipe the excess off with a cloth.

(g) If the Contractor makes connections to tubes of one and a quarter (1-1/4) inch diameter and larger, the Contractor shall move the fitting on the tube or tap with a tool handle or mallet as the Contractor feeds the solder.

(H) Pipe Sleeves Through Retaining Walls. If the Contractor constructs cement rubble masonry walls or concrete retaining walls with later installation of service connections through the retaining walls, the Contractor shall insert suitable

pipe sleeves, (2-inch minimum diameter) at locations shown in the contract or ordered.

(I) Fire Hydrants. The Contractor shall install fire hydrant and appurtenant pipe fittings and valves according to the contract. The Contractor shall install the fire hydrants with the four and a half (4-1/2) inch steamer nozzle faced no more than fifteen (15) degrees to the left or right of the line running from the center of the hydrant and perpendicular to the street curb. The Contractor shall install the fire hydrants with the barrel vertical. After the Contractor has checked the hydrant for alignment and grade, the Contractor shall wedge the barrel tightly against the side of the trench. The Contractor may remove the wedges after the concrete anchor block poured at the bottom elbow has set.

The Contractor shall place the concrete thrust block around the bottom elbow to at least twelve (12) inches above the invert of the elbow. The Contractor shall not disturb the concrete thrust block for a minimum of three (3) days or as ordered by the Engineer.

The Contractor shall use standard tools to operate fire hydrants.

If there is no standard curbing, the Contractor shall protect the fire hydrants by the installation of curb guards shown in the contract.

Before final inspection, the Contractor shall clean the fire hydrants of oil, grease, dirt or other foreign matter. The Contractor shall paint the fire hydrant according to Section 712.26 - Fire Hydrants and Appurtenances.

(J) Concrete Reaction and Test Blocks, Concrete Jacket, and Reaction Beams. If the pipeline appurtenances are subject to unbalanced thrust, the Contractor shall brace them properly with plain or reinforced concrete reaction blocks.

Before pouring concrete for concrete reaction and test blocks, concrete jackets, and reaction beams, the Contractor shall fill the pipelines and appurtenances with water. The Contractor shall not place the pipelines and appurtenances under pressure.

For testing purposes, the Contractor shall provide adequate reinforced concrete blocks.

The Contractor shall allow concrete reaction and test blocks, concrete jackets, and reaction beams to cure for seven (7) days before applying pressure in the pipes.

Due to the various types of vertical bends and surrounding ground conditions, the design of the reaction blocks will vary.

The Contractor shall install reinforced concrete jackets around ductile iron pipe at the locations and to the sizes and dimensions shown in the contract.

(K) Tests. The pipe and appurtenances shall be subject to a pressure test in the presence of the Engineer.

If the Contractor can isolate sections as a unit, the Contractor shall make a separate test on each section of the pipeline with its appurtenances. If valves are available at each end of the section, the Contractor shall make the test between valves. If valves are not available, the Contractor shall install necessary plugs or caps, properly braced to withstand the required test pressure. When a section of the pipeline is ready for testing, the Contractor shall tap the test holes into the pipe and connect the test holes to the test pump by suitable piping. Between the tap and pump, the Contractor shall install a stop cock. Between the stop cock and the tap, the Contractor shall install a pressure gage.

The Contractor shall fill the section of pipeline that the Contractor will test completely with water. The Contractor shall insure that there are no air pockets. The Contractor shall open the stop cock and raise the hydrostatic pressure to the required pressure as follows:

Class of Pipe	Test Pressure
150	150 psi
250	250 psi
above 250	50 psi above the static pressure of the system

The Contractor shall then shut the stop cock and observe the pressure gage for thirty (30) minutes. During this period the pressure shall not drop more than ten (10) pounds per square inch.

The Engineer may require tests to cover sections or combination of sections and make additional tests.

The Contractor shall furnish and install equipment and material necessary for the tests. After the Contractor stops the visible leaks and completes the test, the Contractor shall install brass plugs in the holes made for testing purposes.

(L) Connections To and/or Adjusting Existing Mains. If the Contractor connects to and/or adjusts existing mains, the Contractor shall install the work shown in the contract or as ordered.

The Contractor shall notify the Engineer in writing that the Contractor is ready for such work. The Contractor shall deliver this notice not less than seventy-two (72) hours, exclusive of Saturdays, Sundays and holidays of such work.

The Contractor shall furnish and have at the work site the necessary materials required for the work. The Contractor shall have completed the necessary excavation or as ordered.

If requested by the Engineer, the Contractor shall get the services of a uniform police officer or flagger to direct traffic.

The Contractor shall furnish and install the necessary concrete reaction blocks, manholes and complete the backfill and other incidental items of work and material required.

The Contractor shall not operate the valves or hydrants unless authorized. The County Water Works System will operate the valves sixteen (16) inches and larger.

The Contractor shall furnish and install the material, excavate, backfill and connect new or relocated meters to house services.

(M) Disinfection. The Contractor shall disinfect and flush the water mains, service laterals, and appurtenances before acceptance.

The Contractor shall notify the Engineer and the County Water Works System seventy-two (72) hours before the time for disinfection. The Contractor shall provide connections for disinfection and adequate drainage for disposal of water used in disinfection and flushing.

The Contractor shall furnish and install temporary cleanouts shown in the contract or ordered by the Engineer to ease disinfection of the water mains. After the Contractor disinfects the mains and gets a certification for the disinfection, the Contractor shall remove the temporary cleanout. The Contractor shall furnish a brass plug to replace the corporation stop.

(N) Meter Boxes and Cast Iron Frames and Covers.

(1) General. This work includes furnishing and installing meter boxes and cast iron frames and covers according to the contract.

(2) Installation. The Contractor shall construct meter boxes of:

(a) sound bricks firmly set in full mortar beds according to standard brick construction, or

(b) of concrete (preferably precast) with necessary reinforcing steel to the sizes and dimensions as required.

The Contractor shall install meter boxes at the locations shown in the contract or as ordered by the Engineer.

The Contractor shall install cast iron frames and covers of the proper size and dimension in full mortar beds at each meter box. The Contractor shall give the cast iron frames and covers one (1) coat of high grade asphaltum paint after installation.

(O) Installation of Air Relief Valves and Appurtenances. The Contractor

shall furnish and install air relief valves and appurtenances according to the contract or as ordered by the Engineer.

"Appurtenances" include pipes, fittings, corporation stops, unions and vertical check valves. The Contractor shall clean the air relief valves thoroughly of rust and foreign matter. The Contractor shall give the air relief valves one (1) coat of an accepted corrosion preventive paint.

(P) Water Supply. The County Water Works System will measure the quantity of water used for construction. The County Water Works System will furnish, install, and disconnect the meter. The Contractor shall arrange with the County Water Works System and shall assume the costs for such installations and disconnections. The County Water Works System will furnish the Contractor invoices for the cost of installation and disconnection of meters. The Contractor shall also pay for the cost of replacements or repairs resulting from damage to the meter, hydrant and other property used by the Contractor.

The Contractor shall provide and install at no cost to the State water supply equipment and materials necessary to provide an adequate water supply for the proper construction of the water mains. The equipment and materials may include temporary pipe and fittings and pumping and storage facilities.

(Q) Existing Water System and Appurtenances. The Contractor shall maintain the existing water system and appurtenances in service during the construction period until the Contractor places the new water system service and transfers the existing services to the new system.

The Contractor shall notify the Engineer and the County Water Works System immediately of damages to the existing system. The County Water Works System will do the necessary repairs. The Contractor shall be responsible for costs incurred in this work.

If the Contractor desires to relocate the existing system during the construction period, the Contractor shall do the work if accepted by the Engineer.

After the Contractor installs the new system or portions of the new system, the Contractor shall remove the existing meters and reconnect the existing meters to the new system. The new system includes its appurtenances, service laterals, service connections, and boxes. The County Water Works System will send the invoices for work ordered by the State and done by the County Water Works System directly to the State. The County Water Works System will not send invoices of repairs damaged by the Contractor to the existing system. The County Water Works System will not charge or pay the cost of this work to the Contractor.

(R) Removing, Reinstalling or Returning Existing Pipe. The Contractor shall clean the existing pipe that the Contractor removes and reinstalls in new locations thoroughly before installing.

The existing pipe includes its appurtenances, fire hydrants, gate valves, and manhole frames and covers. The Contractor shall give the manhole frames

and covers one (1) coat of asphalt paint before installing.

The Contractor shall clean thoroughly and return the existing pipe removed and not reinstalled to the County Water Works Storage Yard as ordered by the Engineer.

The Contractor shall be responsible for removing, reinstalling, or returning these existing pipes. The Contractor shall pay for damages to the materials during these operations.

(S) Abandoning Existing Pipe. If ordered by the Engineer, the Contractor shall expose portions of the abandoned pipe. If the Contractor finds the top of the pipe less than twenty-four (24) inches below the finished grade, the Contractor shall remove the existing pipe and dispose the existing pipe off the right-of-way. If abandoning the pipe in place, the Contractor shall plug the ends of the abandoned pipe with Class C Concrete. The required backfill shall conform to Subsection 206 - Excavation and Backfill for Conduits and Structures.

(T) Adjusting Existing Manholes. The Contractor shall reset or adjust the existing manhole frames and covers, if required, according to Section 604 - Manholes, Inlets and Catch Basins.

(U) Corrosion Protection. The Contractor shall apply corrosion protection to the pipes, valves and fittings shown in the contract. The type of materials and methods of application shall be as specified in the contract.

(V) Temporary Cleanouts. The Contractor shall install temporary cleanouts at the locations shown in the contract or as required to ease disinfection of water mains. After disinfecting and certifying the mains, the Contractor shall remove the temporary cleanouts and plug the taps with brass plugs.

(W) Valve Markers. The Contractor shall install valve markers for establishing the location of gate valves and air relief valves at locations shown in the contract or as ordered.

The Contractor shall fill the markers with concrete and set the markers plumb in Class B Concrete footing. The Contractor shall paint the pipe yellow. The Contractor shall paint the top four (4) inches of the markers for air relief valves red.

(X) Restoration of Existing City and/or County Street and Other Improvements. Restoration of existing city and/or county streets and other improvements shall conform to Section 627 - Restoration of Existing City and/or County Streets and Other Improvements.

624.04 Method of Measurement.

(A) Excavation and Backfill. The Engineer will not measure excavation and backfill for pipe and appurtenances and manholes per cubic yard according to

Section 206 - Excavation and Backfill for Conduits and Structures, except as modified below.

The Engineer will base the quantity of excavation on in-place measurements as follows:

(1) The quantity of excavation for removal, connections and adjusting of existing water systems and appurtenances will be the actual quantity excavated based on the widths, lengths and depths of trenches as ordered.

(2) The quantity of excavation for the removal of existing pipes and appurtenances other than manholes will be the actual quantity excavated as accepted, including the volume of the pipe or appurtenances or portion thereof removed.

(3) The quantity of trench excavation for pipe and appurtenances including fire hydrants will be the actual quantity computed on the basis of trench widths given in Subsection 624.03(B) - Trench Excavation, and the depth specified hereinafter:

(a) If the contract requires no grading in that area, the Engineer will measure the depths of trenches for pipes from the existing ground line to six (6) inches below the invert grade.

If the contract requires grading in that area, the Engineer will measure the depths from the finished grade to six (6) inches below the invert grade or as ordered.

(b) The Engineer will measure the depths of trenches located in fill area from the bottom of the subbase or four (4) feet above the barrel of the pipe whichever is less to six (6) inches below the invert of the pipe or as directed.

(c) If the contract at locations eliminates excavation to six (6) inches below the pipe invert, measurement for trench excavation will be to the invert grade of the pipe.

(4) The quantity of excavation for concrete reaction beams and reaction or test blocks will be the actual quantity excavated based on the dimensions shown in the contract or as set by the Engineer, exclusive of trench excavation.

The quantity of excavation for trenches for concrete jacketed water mains will be the actual quantity excavated based on the bottom of the jacket and width of the jacket plus twelve (12) inches beyond the jacket width shown or only to the width of the jacket according to the contract.

(5) The quantity of excavation for removal of mud or other suitable material from below the trench grade lines will be the actual quantity

removed to the depth as ordered and to the widths specified elsewhere herein under trench excavation.

(6) The quantity of excavation required to expose existing water mains for verifying their locations and depths will be the actual quantity removed, as ordered.

(7) The quantity of excavation for new manholes will be the volume computed from the dimensions shown in the contract plus twelve (12) inches beyond the dimension lines shown and to a depth twelve (12) inches below the invert grade of the valve or as ordered by the Engineer.

(8) The quantity of trench excavation for service laterals will be the actual quantity removed computed on the basis of a trench twelve (12) inches wide and depth as specified in Subsection 624.04(A) - General.

The Engineer will not measure excavation and backfill for service connections for payment. The Engineer will consider them incidental to service laterals.

Excavation for connecting new or relocated meters to existing house services will be the actual quantity removed computed on the basis of a trench twelve (12) inches wide and depth as ordered by the Engineer.

(B) **Pipe and Appurtenances.**

(1) **Cast Iron Pipe.** The Engineer will measure cast iron pipe by the linear feet.

(2) **Pipe Hangers.** The Engineer will measure pipe hangers by the actual number of units installed per each.

(3) **Cast Iron Fittings and Special Castings.** The Engineer will compute the total weight of fittings installed from the weights shown in the "Handbook of Cast Iron Pipe" by the Cast Iron Pipe Research Association. If the "Handbook of Cast Iron Pipe" does not show the weight of fitting or special casting, the weight will be the actual weight as marked on the fitting or special casting.

The Engineer will not measure jointing materials such as lead, packing, gland, gasket, bolts and nuts for payment.

(4) **Gate Valves and Butterfly Valves (Hub Ends, Mechanical Joints and Flanged).** The Engineer will measure gate valves and butterfly valves by the actual number of units installed per each.

The Engineer will not measure corporation stops and brass plugs for payment.

(5) **Copper Pipes and Appurtenances.** The Engineer will measure

the copper pipe including appurtenances by the linear feet.

(6) **Service Laterals and Service Connections.** The Engineer will measure service laterals and service connections by the actual number installed per each type.

The Engineer will not measure pipe sleeves installed through retaining walls to ease later installation of service connections for payment. The Engineer will consider them incidental to the pipeline work.

(7) **Zinc-coated Steel or Wrought Iron Pipe.** The Engineer will measure zinc-coated steel or wrought iron pipe including appurtenances for payment at the contract unit price per each type installed.

(8) **Meter Boxes.** The Engineer will measure the meter boxes by the actual number of meter box installed per each size.

(9) **Air Relief Valves.** The Engineer will measure the air relief valves and appurtenances by the actual number of air relief valves installed per each.

(10) **Removal, Cleaning and Reinstallation.** The Engineer will not measure the removal, cleaning and reinstallation of the materials from the existing water system. The Engineer will consider them incidental to such items for reinstallation shown in the contract.

The Engineer will measure the removing, cleaning, painting (if required) and returning pipes, fittings and appurtenances and gate valve either by the linear foot, or pound, or each shown in the proposal.

(11) **Fire Hydrants and Concrete Curb Guard.** The Engineer will measure fire hydrants and concrete curb guards by the actual numbers installed per each.

The Engineer will not measure the excavation for concrete curb guards for payment.

(12) **Concrete Reaction and Test Blocks, Concrete Jacket and Reaction Beam.** The Engineer will measure the concrete in reaction blocks, test blocks, jackets and reaction beams by the cubic yard computed on the dimensions shown in the contract or as set by the Engineer before placing.

(13) **Reinforcing Steel.** The Engineer will measure reinforcing steel according to Section 602 - Reinforcing Steel.

(14) **Corrosion Protection.** The Engineer will not measure the corrosion protection applied to pipes, valves and fittings for payment.

(15) **Pipe Test.** The Engineer will not measure the labor, materials and

equipment necessary for pipe test including service laterals and service connections for payment.

(16) Valve Markers. The Engineer will measure the valve markers by the actual numbers installed in place complete.

(C) Fire Hydrant Relocation. The Engineer will measure fire hydrant relocation including all appurtenances per each.

(D) Waterline Relocaton. The Engineer will not measure the relocation of existing waterline.

624.05 Basis of Payment.

(A) Trench Excavation. The Engineer will pay for the accepted quantities of trench excavation according to Section 206 - Excavation Backfill for Conduits and Structures and modified in Subsection 624.04(A) - Excavation and Backfill.

The Engineer will not make payment for additional excavation required for sheathing and bell holes. The price shall be full compensation for additional excavation for sheathing and bell holes and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

(B) Pipe and Appurtenances.

(1) Cast Iron Pipe. The Engineer will pay for the accepted quantities for the various size cast iron pipes at the contract unit price per linear foot, complete in place.

(2) Pipe Hangers. The Engineer will pay for the accepted quantities for furnishing and installing pipe hangers, including hanger rods, nuts, inserts, lateral bracings, with bronze bolts and nuts at the contract unit price per each, complete in place.

(3) Cast Iron Fittings and Special Castings. The Engineer will pay for the accepted quantities for furnishing and installing cast iron fittings and special castings for at the contract unit price per pound, complete in place.

The price shall be full compensation for furnishing and installing jointing materials such as lead, packing, gland, gasket, bolts, nuts, and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

(4) Gate Valves and Butterfly Valves. The Engineer will pay for the accepted quantities for furnishing and installing the various types and sizes of gate valves and butterfly valves at the contract unit price per each, complete in place.

The price shall be full compensation for furnishing and installing

corporation stops and brass plugs, and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

(5) Copper Pipes. The Engineer will pay for the accepted quantities for furnishing and installing the various size copper pipes at the contract unit price per linear foot, complete in place.

The price shall be full compensation for furnishing and installing the copper pipes and its appurtenances and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(6) Service Laterals and Service Connections. The Engineer will pay for the accepted quantities for various size service laterals and various types service connections at the contract unit prices per each, complete in place.

The price includes full compensation for furnishing and installing the service laterals, service connections, pipe sleeves installed through retaining walls to ease later installations of service connections, corporation stops; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

(7) Zinc-coated Steel or Wrought Iron Pipe. The Engineer will pay for the accepted quantities for various size zinc-coated steel or wrought iron pipe including appurtenances at the contract unit prices per linear foot, complete in place.

(8) Meter Boxes. The Engineer will pay for the accepted quantities for furnishing and installing the various types of meter boxes, including excavation and backfill at the contract unit price per each, complete in place.

(9) Air Relief Valves. The Engineer will pay for the accepted quantities for furnishing and installing the various size air relief valves at the contract unit price per each, complete in place.

(10) Removing, Cleaning and Returning of Existing Water System. The Engineer will pay for the accepted quantities for removing, cleaning and returning of existing water system of the various sizes of pipe, fittings and appurtenances and valves at the contract unit price per linear foot, per each, or per pound specified in the proposal.

(11) Fire Hydrants and Concrete Curb Guard. The Engineer will pay for the accepted quantities for furnishing and installing various heights of fire hydrants and concrete curb guards at the contract unit prices per each, complete in place.

The price shall be full compensation for excavating and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted quantities for removing, cleaning, painting, and reinstalling or returning fire hydrants at the contract unit price per each.

(12) Concrete Reaction and Test Blocks, Concrete Jacket, and Reaction Beams. The Engineer will pay for the accepted quantities for concrete reaction and test blocks, concrete jacket and reaction beams at the contract unit price per cubic yard for Class B Concrete according to Section 503 - Concrete Structures, for the quantity placed.

If the Contractor requires a redesign of the reaction blocks and jackets because of unauthorized excavation, the Contractor shall pay for the additional cost involved for the redesigned blocks and jackets.

(13) Reinforcing Steel. The Engineer will pay for the accepted quantities for reinforcing steel according to under Section 602 - Reinforcing Steel.

(14) Corrosion Protection. The Engineer will not pay for the corrosion protection applied to pipes, valves and fittings separately. The Engineer will consider them incidental to the pipeline work.

(15) Pipe Test. The Engineer will not pay for the labor, materials, tools, equipment necessary for pipe test including service laterals and service connections separately. The Engineer will consider them incidental to the various contract items in the proposal.

(16) Work to be Done by the County Water Works System. The County Water Works System will render invoices for work done directly to the State. Such work includes connecting to and cutting of existing water system, installing materials furnished by the contractor under the appropriate contract items, relocating fire hydrants, relocating or extending service laterals, chlorinating, and other miscellaneous work.

The Contractor will pay for work damaged by the Contractor.

For Oahu projects, the Engineer will pay for the BWS water development charge.

(17) Services of the Uniform Police Officer. The Engineer will not pay for cost of the services rendered by the uniform police officer for directing traffic during connections to and adjusting of existing mains separately. The Engineer will consider them incidental to the various contract items.

(18) Abandoning Existing Cast Iron Pipe. The Engineer will not pay for removing the abandoned portion of the existing mains and appurtenances, exclusive of excavation, and other related work and materials separately. The Engineer will consider them incidental to the various contract items.

The Engineer will not pay for Class C Concrete for plugging the open ends of abandoned pipes separately. The Engineer will consider them incidental to the various contract items.

(19) Adjusting Existing Manholes. The Engineer will pay for the accepted quantities for adjusting existing manholes to new grades according to Section 604 - Manholes, Inlets and Catch Basins.

(20) Water Supply for Construction. The Engineer will not pay for the cost for the installation and disconnection of the meters, used for water supply, and replacement and repairs separately. The Engineer will consider them incidental to the various contract items in the proposal.

(21) Temporary Cleanout. The Engineer will not pay for furnishing and installing temporary cleanouts separately. The Engineer will consider them incidental to the various contract items.

(22) Valve Markers. The Engineer will pay for the accepted quantities for furnishing and installing valve markers at the contract unit price per each, complete in place.

(23) Furnishing Material. The Engineer will pay for the accepted quantities for "furnishing only" of materials that the Board of Water Supply will install at the respective contract unit prices in the proposal.

The prices shall include the cost of furnishing jointing materials and other accessories and furnishing labor, material, equipment, tools and incidentals necessary to complete the work.

(24) Manufacturer's Certificate of Test. The Engineer will not pay for the cost of the Manufacturer's Certificate of Test according to Subsection 624.02 - Materials. The Engineer will consider them incidental to the various contract items.

(25) Fire Hydrant Relocation. The Engineer will pay for the accepted quantities of fire hydrant relocation including all appurtenances at the contract unit price per each, complete in place.

The price shall be full compensation for removing, cleaning and returning the existing fire hydrant to BWS, Kalihi Yard; excavating, backfilling and compacting; furnishing and installing ductile iron pipe and fittings; installing concrete block with structural struts and/or concrete reaction block; furnishing and installing new fire hydrant with concrete slab and furnishing all labor, materials, equipment, tools and incidentals to complete the work.

(26) Waterline Relocation. The Engineer will pay for the accepted waterline relocation including all appurtenances at the contract lump sum price complete and in place.

The price shall includes full compensation for excavation, removal

of the existing waterline as specified in the plans, installation of the new waterline and concrete jacket, installing all the necessary fittings, chlorinating the new line, backfilling, restoration, and furnishing all labor, materials, equipment, tools and incidentals to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
_____ _____ - Inch Cast Iron Pipe (Class _____) (_____)	Linear Foot
_____ _____ - Inch Concrete Cylinder Pipe (Class _____)	Linear Foot
_____ _____ - Inch Gate Valve (Class _____) (_____)	Each
_____ _____ - Inch Bevel Geared Gate Valve (Class _____) (_____)	Each
_____ _____ - Inch Spur Geared Gate Valve (Class _____) (_____)	Each
_____ _____ - Inch Butterfly Valve (Class _____)	Each
_____ _____ - Inch Air Relief Valve (_____ psi Minimum working pressure)	Each
_____ _____ - Inch Split Butt Strap	Each
_____ Hub Clamp for _____ - Inch Cast Iron Pipe including Strong Back, Bolts, and Nuts	Each
_____ _____ - Inch Service Clamp with Tap for Appropriate Size Corporation Stop	Each
_____ _____ - Inch x _____ - Inch Tapping Sleeve including _____ - Inch Tapping Valve (Class _____)	Each
_____ _____ - Inch x _____ - Inch Tapping Sleeve including _____ - Inch Bevel Geared Tapping Valve (Class _____)	Each
_____ _____ - Inch Concrete Cylinder Bend (_____ Deg to _____Deg Inclusive) (Class _____)	Each
_____ _____ - Inch Concrete Cylinder Pipe Nipple (Class _____) Spigot and Plain End (_____) long	Each
_____ Cast Iron Fittings (_____)	Pound
_____(_____ - Feet) Height Fire Hydrant (_____)	Each
Fire Hydrant Curb Guard	Each
_____ - Inch _____ Pipe	Linear Foot

___ - Inch x ___ - Inch Blow-off Tee, ___ - Inch to fit Cast Iron Pipe	Each
_____ - Inch Removable ____ Tapped for _____ - Inch Pipe Thread	Each
_____ - Inch x _____ - Inch Concrete Cylinder Eccentric Reducer (_____ - Inch Bell and _____ - Inch Reducer)	Each
_____ Valve Marker	Each
Type _____ Meter Box including Cast Iron Frame and Cover	Each
Steel Pipe Hanger for _____ - Inch Cast Iron Pipe	Each
_____ - Inch Copper Service Laterals with Type _____ Copper Service Connections and All Appurtenances	Each
Steel Pipe Hanger and Lateral Bracing for _____ - Inch Cast Iron Pipe	Each
_____ - Inch Copper Service Lateral with Type _____ Copper Service Connection and All Appurtenances off (_____ Main) (_____)	Each
Removing, Cleaning and Reinstalling _____ - Inch Cast Iron Plug	Each
Removing, Cleaning and Reinstalling _____ - Inch Cast Iron Cap	Each
Fire Hydrant Relocation Including All Appurtenances at _____	Each
_____ -Inch Waterline relocation at station _____	Lump Sum"

Amend **Section 629 - Pavement Markings** to read as follows:

"SECTION 629 - PAVEMENT MARKINGS

629.01 Description. This work includes installing and removing pavement markings according to the contract.

629.02 Materials. Materials shall conform to the following requirements:

White and Yellow Traffic Paint	708.06
Pavement Markers	712.40
Adhesives for Pavement Markers	712.41
Preformed Pavement Marking Tape	712.53
Reflective Thermoplastic Compound Pavement Markings	712.55

Materials installed shall be new, best of their respective grades and as specified below.

629.03 Construction Requirements.

(A) General. Pavement markings shall conform to the latest edition of:

(1) FHWA publication, "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD), and

(2) Traffic Standard Manual for City and County of Honolulu or governing counties.

Apply the pavement markings according to the contract. Pavement markings shall be clean cut, uniform, and neat. Correct the pavement markings according to the contract and at no cost to the State that:

(1) fail the requirements specified or

(2) the traffic damages or

(3) other causes.

Establish control points throughout the project for the layout of pavement markings. Do the layout and the Engineer will accept the layout before installing the work.

Longitudinal pavement markings shall not deviate more than one inch from the intended alignment on tangents and curves with radii greater than 5,000 feet. On curves with radii of 5,000 feet or less, the longitudinal pavement markings shall not deviate more than two inches from the intended alignment. Immediately correct misalignments when specified by the Engineer. Remove and reinstall the misaligned portion(s) plus an additional 25 feet segment from each end according to the contract.

Before applying the pavement markings, the surface shall be free of moisture and foreign or other material that may adversely affect bonding. Thoroughly blast clean the existing surfaces. Clean, newly placed surfaces need not be blast clean. Clean a prepared surface that becomes contaminated with moisture, dust, or other foreign matter before installing the pavement markings.

The Contractor may place pavement marking tape and pavement markers installed with bituminous adhesive immediately after completion of asphalt concrete pavement or within 14 days hence. Apply other pavement markings between 7 days and 14 days after completion of the pavement.

(B) Temporary Pavement Markings. Immediately install temporary pavement markings according to Table 629-I when:

(1) the Contractor does not install permanent pavement markings after completion of each day's final paving;

(2) the Contractor needs to open the roadway to public traffic for guidance through the area and as ordered by the Engineer; or

(3) the Engineer needs the temporary pavement markings for special traffic patterns.

Install flexible delineator posts with Reflector Markers or Type I Barricades spaced at 80-foot intervals or temporary solid four inch pavement marking tapes on the edge of the travelway for newly paved surfaces, scarified, or cold planed surfaces, reconstructed areas, and unmarked areas for guidance of motorists.

Maintain and replace temporary pavement markings, flexible delineators and barricades and as specified by the Engineer.

Remove temporary markings before installing permanent pavement markings.

Permanently installed PASS WITH CARE, DO NOT PASS, NO

PASSING ZONE, or other signs designated by the Engineer are to be covered or temporarily removed unless they are in agreement with the temporary striping.

When failing to install pavement markings according to the contract herein immediately after completion of the construction operations for each day, the Engineer will suspend the work and progress payment according to Subsection 105.01 - Authority of the Engineer.

TABLE 629-1 TEMPORARY PAVEMENT MARKINGS

TYPE	PAVEMENT MARKINGS
Passing Permitted - Both Sides	Single 4-inch yellow stripe 5 feet in length spaced 20 feet on centers with Type D markers spaced 40 feet on centers and located on the center of the 5 foot length of stripe.
Passing Prohibited - Both Sides	Double solid 4-inch yellows stripe with Type D markers placed 20 feet on centers on one of the 4-inch yellow stripes selected by the Engineer.
Passing Permitted - One Side Only	Single continuous 4-inch yellow stripe with Type D markers placed on the stripe 20 feet on centers on the no-passing side and single 4-inch yellow stripes 5 feet in length spaced 20 feet on centers on the passing side.
Lane Lines - Lane Changing Permitted	Single 4-inch yellow or white stripe 5 feet in length spaced 20 feet on centers with Type C or Type D markers spaced 40 feet on centers
Lane Lines - Lane Changing Prohibited	Double solid 4-inch white stripes with Type C markers placed 20 feet on centers on one of the 4-inch white stripes selected by the Engineer.
Crosswalk	Two 4-inch white traverse lines spaced 8 feet on centers or as specified by the Engineer.
Stop Line	Single 4-inch white traverse line.

Notes:

a. The Contractor may use paint for temporary markings in areas where the Contractor has not completed final paving.

b. The temporary striping schedule shall be designated by the Engineer.

(C) Permanent Pavement Markings

(1) Pavement Markers. Pavement Markers shall be:

(a) of uniform composition,

(b) free from surface irregularities and

(c) free from other physical damage or defects that affect appearance and/or performance.

The shape, dimensions, tolerances, types, uses, and layout shall be according to the contract.

Submit samples of the pavement markers and bituminous adhesives and/or epoxy adhesives to the Engineer for testing and acceptance before 10 days before usage. Sampling and testing of the pavement markers shall be according to Subsection 712.40.

Use Bituminous Adhesive for Pavement Markers according to Subsection 712.41 to cement markers to the pavement. When accepted by the Engineer, the Contractor may use Standard Set epoxy adhesive according to Subsection 712.41 at no additional cost to the State.

Heat and dispense the bituminous adhesive from an acceptable equipment that can maintain the required temperature. Placement of markers using bituminous adhesive shall be similar to placement of markers using epoxy adhesive.

When using epoxy adhesive, mix the components by a two-component type automatic mixing and extruding apparatus for use on the project. Automatic mixing equipment shall use positive displacement pumps and shall properly meter the components in the ratio of one to one ± 5% by volume. Check the ratio in the presence of the Engineer at the beginning of each day or as ordered.

The Contractor may mix only Standard Set Type adhesive manually and shall not mix more than one quart by volume.

When using two component adhesives, carry out the work quickly and efficiently due to the short pot life of the adhesive. Place the pavement markers within 60 seconds after mixing and extruding the adhesive. The Engineer will

not allow further movement of the marker. Use up each mixed batch of adhesive within five minutes completely after the start of mixing. Place the adhesive on the pavement surface or on the bottom of the marker in complete coverage of the area of contact, without voids and with a uniform and adequate thickness to produce a slight excess after pressing the marker in place. Place the marker in position and apply pressure with a slight twisting motion until making firm contact with the pavement. If the Contractor cannot extrude the adhesive from under the marker applying pressure, discard the remaining batch of adhesive. Immediately remove the excess adhesive:

(a) around the edge of the marker,

(b) on the pavement, and

(c) on the exposed surfaces of the markers.

The Contractor may use soft rags moisten with mineral spirits conforming to Federal Specification TT-T-291 or kerosene to remove adhesive from the exposed faces of the markers. Do not use other solvents.

Protect the pavement markers against impact until the adhesive has hardened sufficiently. The Contractor may use the following table as a guide for the determination of sufficient hardening:

Temperature (°F)	Standard Set Type (Hours)	Rapid Set Type (Minutes)
100	1.5	15
90	2	20
80	3	25
70	4	30
60	5	35
50	7	45

40	No application below 50° F	65
30		85
20		No application below 30° F.
10		
*The temperature is either pavement surfaces or air temperature whichever is lower.		

Do not use the hardness of the rim of epoxy around the marker as an indication of the degree of cure.

Immediately reset the pavement markers implanted with improperly mixed adhesives requiring unusually long curing time as specified by the Engineer.

Do not install pavement markers when:

(a) the relative humidity is greater than 80% or

(b) the pavement surface is not dry.

Install the pavement markers according to contract as specified by the Engineer. When using Types A and J pavement markers for delineating 10-foot lane stripes, install them in sets of four with no fractional sets allowed. The Contractor may adjust the lengths of each 10-foot stripe and each 30-foot gap for skip striping ± one foot to present a uniform and balanced arrangement.

Do not install the pavement markers over longitudinal or transverse joints of the pavement surface, pavement marking tape, and thermoplastic extrusion markings.

(2) Traffic Paint. Use a wheeled applicator machine that is manually or machine propelled to apply at a nominal thickness of 0.015 inch or at a rate of 300 linear feet of single four inch stripe for one gallon paint. The applicator shall have appropriate shields around the nozzles to permit sharp stripe definition. The applicator shall have a separate nozzle to direct an air stream immediately ahead of paint application for clearing away debris, dust and other foreign matter. Immediately remove misted, dripped and spattered paint on pavements as specified by the Engineer.

The Contractor may manually paint pavement arrows, symbols, words, and curb markings upon acceptance by the Engineer.

Protect freshly painted pavement markings from traffic until the paint is sufficiently dry and will not transfer to tires or other devices. The Contractor may use cones or other acceptable traffic control devices for this purpose.

Repair or correct pavement markings damaged by traffic and paint marks on the pavement caused by traffic crossing wet paint according to Subsection 629.03(D).

(3) Thermoplastic Extrusion Pavement Marking.

(a) Equipment. Apply the material to the pavement by an extrusion method. One side of the shaping die is the pavement and the other three sides are part of the equipment.

The equipment shall provide continuous mixing and agitation of the material. Construct conveying parts of the equipment to prevent accumulation and clogging. Parts of the equipment that come in contact with the material shall easily be accessible and exposable for cleaning and maintenance.

Mixing and conveying parts, including the shaping die, shall maintain the material at the plastic temperature.

The equipment shall assure continuous uniformity in the dimensions of the stripe.

The applicator shall cleanly cut off square stripe ends and apply "skip" lines. The Engineer will not permit the use of pans, aprons or similar appliances that the die overruns.

Apply beads to the surface of the completed stripe over the entire surface of the stripe and by an automatic bead dispenser attached to the liner.

Equip the bead dispenser with an automatic cutoff control synchronized with the cutoff of the thermoplastic material.

Construct the equipment to provide for varying die widths to produce varying widths of traffic markings.

Provide a special kettle for melting and heating the composition. Equip the kettle with an automatic thermoplastic control device so that the Contractor can do the heating by controlled heat transfer liquid than direct flame.

Equip and arrange the applicator and the kettle according to the Nation Fire Underwriters requirements.

The applicator shall be mobile and maneuverable so that the Contractor can follow straight lines and make normal curves in a true arc.

The applicator shall contain a minimum of 125 pounds of molten material.

(b) Application. Clean off dirt, blaze, paint, tape and grease and ordered by the Engineer.

The Contractor may apply the material in variable widths from two inches to twelve inches. Apply the material for the full width of stripe in one application or pass. For example, form an 8 inch stripe with an 8 inch die.

On concrete pavements and pavements containing less than 6% bituminous asphalt, pre-stripe the application area with a binder material, primer or prime seal coat recommended by the manufacturer.

The minimum installed thickness of the line as viewed from a lateral cross section shall be:

(a) not less than three thirty-secondth inch at the edges, and

(b) not less than one-eighth inch in the center.

Take the measurements as an average throughout 36 inch sections of the line. Two thousand pounds of thermoplastic materials supplied in granular or block form will yield approximately 6,600 feet of four

inch striping with a 90-mil thickness.

The new line, when applied over an old line of compatible material, shall bond itself to the old line so that no splitting or separation takes place during its useful life.

The finished lines shall have well defined edges and be free of waviness.

(4) Preformed Pavement Marking Tape. The Contractor may apply the preformed pavement marking tape manually or with the tape applicators acceptable by the tape manufacturer. Apply the markings according to the tape manufacturer's recommendations and according to the contract.

Install either temporary or permanent preformed pavement marking tape according to the contract or specified by the Engineer.

Do not apply the preformed pavement marking tape over other markings. Remove the old markings and prepare the surface for tape application according to Subsection 629.03(A).

The minimum temperatures for the applications of preformed pavement marking tape shall be 60 ^{O}F. for air and 70 ^{O}F. for roadway surfaces, with both temperatures rising. The maximum temperature shall be 150 ^{O}F. for surfaces.

Before applying the permanent preformed pavement marking tape, prime the existing roadway surfaces with an acceptable primer as recommended by the tape manufacturer and ordered by the Engineer.

Apply the primer in one thin coat extending at least one inch beyond the tape edges. Allow the primer to dry until the primer feels tacky and will not lift or string.

The Contractor may use tapes of different widths to form a specified stripe width. For example, the Contractor may use two four-inch wide tapes to form an 8-inch wide stripe). The Engineer will make payment

for the specified stripe width according to the contract.

Use butt splices only and shall not overlap the tape material.

Tamp the markings thoroughly with an acceptable mechanical tampers. Also, slowly drive a truck on the newly applied markings several times.

Areas marked with preformed pavement marking tape shall be ready for traffic immediately after application.

(D) Removal of Existing Pavement Markings. Remove the existing pavement markings according to the contract and as specified by the Engineer. Resolve the conflicts between existing and new markings by removing the existing as specified by the Engineer and according to the following:

(1) remove the existing pavement markings before applying the traffic paint, thermoplastic extrusion or preformed pavement marking tape;

(2) remove the existing markings so that the Contractor can make a smooth transition between existing and new markings; and

(3) remove the unnecessary markings before making changes in the traffic pattern.

Use removal methods that will cause the least possible damage to the pavement and its surface. Do not cause impressions of old markings to remain after the removal operations. Repair the damage to the pavement or its surface caused by removal operations including impressions of old markings at no cost to the State. Make the reparations as specified and accepted by the Engineer.

The Engineer will not permit eradication of existing markings by painting over them. The Engineer will permit burning off existing paint markings provided the Contractor uses an acceptable method using excess oxygen. Do not burn nor ground off the preformed pavement marking tape.

Remove the preformed pavement marking tape and thermoplastic extrusion markings by methods recommended by the manufacturer and acceptable by the Engineer.

The Engineer will permit sandblasting for paint removal. Remove

the sand or other material deposited on the pavement due to removal operations as work progresses. The Engineer will not permit accumulation.

Immediately remove excess sand or other material deemed hazardous to traffic when specified by the Engineer.

629.04 Method of Measurement. The Engineer will not measure for furnishing and installing pavement striping, pavement markers, detour pavement striping, curb markings, temporary pavement markings, flexible delineators posts with reflector markers, Type I Barricades, and temporary signs and removing pavement markings for payment.

The Engineer will measure the crosswalk marking per lane.

The Engineer will measure the pavement arrow, pavement word, and pavement symbol per each.

The Engineer will measure the detour pavement striping per linear foot.

The Engineer will measure the detour pavement markers per each.

629.05 Basis of Payment. The Engineer will pay for the accepted pavement striping at the contract lump sum price complete in place. The price includes full compensation for establishing control points, laying out, cleaning the existing surface, furnishing and applying the pavement stripings, and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted detour pavement striping at the contract unit price per linear foot. The price include full compensation for establishing control points, laying out, cleaning the existing surface, furnishing and applying the detour pavement striping, and furnishing labors, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted crosswalk marking at the contract unit price per lane. The price includes full compensation for establishing control points, laying out, cleaning the existing surface, furnishing and applying the crosswalk markings, and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted pavement arrow, pavement word, and pavement symbol at the contract unit price per each. The price includes full compensation for establishing control points; laying out; cleaning the existing surface; furnishing and applying the pavement arrow, pavement word, and pavement symbol; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the pavement markers including adhesives at the contract lump sum price. The price includes full compensation for submitting samples; applying adhesives; furnishing, installing, and protecting the pavement markers; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the detour pavement markers including adhesives at the contract lump sum price. The price includes full compensation for submitting samples; applying adhesives; furnishing, installing, and protecting the pavement markers; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will not pay for the accepted temporary pavement markings, flexible delineators posts with reflector markers, Type I Barricades, and temporary signs. The Engineer will consider the price for them included in the bid price of the various contract items. The price includes full compensation for maintaining, replacing, and eventually removing the temporary pavement markings, flexible delineators and barricades; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will not pay for the accepted removal of existing pavement markings. The Engineer will consider the price for them included in the bid price of the various contract items. The price includes full compensation for removing the existing pavement markings; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay under:

Pay Item	**Pay Unit**
_____-Inch Pavement Striping Tape, Type _____ or Thermoplastic Extrusion (_____ L.F.)	Lump Sum
Crosswalk Marking (Tape, Type III or Thermoplastic Extrusion)	Lane
Pavement Arrow (Tape, Type _____ or Thermoplastic Extrusion)	Each
Pavement Word (Tape, Type _____ or Thermoplastic Extrusion)	Each
Pavement Symbol - Paint	Each
Type _____ Pavement Marker	Each

Detour_____-Inch Pavement Striping - Tape	Linear Foot
Detour_____Pavement Marker	Each"

END OF SECTION

Make the following Section a part of the Standard Specification:

"SECTION 636 - MAINTENANCE OF MOBILE TRAILER FIELD OFFICE AND PROJECT SITE LABORATORY

636.01 Description. This work includes maintaining an existing field offices and project site laboratory used exclusively by the Engineer according to the contract.

636.02 Materials. The Contractor shall furnish and install new materials necessary to complete this work as specified by the Engineer.

636.03 Construction Requirements. Maintain the field office and project site laboratory, surrounding ground, furnishings, appliances, and other equipment in good order and provide rubbish pickup service twice a week for a period not to exceed 90 calendar days beyond the date of final inspection of the completed project by the state.

636.04 Method of Measurement. The Engineer will measure the work to maintain the field office and project site laboratory on a force account basis according to Subsection 109.04 - Extra and Force Account Work.

636.05 Basis of Payment. The Engineer will pay for the accepted maintenance of the field office and project site laboratory on a force account basis. An estimated amount for the force account is allocated in the proposal under 'Maintenance of Field Office and Project Site Laboratory', but the actual amount paid will be the sum shown on the accepted force account records whether this sum is more or less than the estimated amount allocated in this proposal.

The Engineer will make payment under:

Pay Item	Pay Unit
Maintenance of Field Office and Project Site Laboratory	Force Account"

Make the following Section a part of the Standard Specification:

"SECTION 638 - CELLULAR PHONE

638.01 Description. This work includes furnishing cellular phone service for the Engineer.

638.02 General Requirements.

The Contractor shall:

(A) Furnish and establish service for three(3) cellular phone for use by the Engineer. Each phone shall meet the following specifications:

(1) Include two batteries, each rated by the manufacturer as providing a minimum of two hours continuous talk time or 20 hours of stand-by time;

(2) Maximum weight of 10 ounces;

(3) Include desktop rapid charger; and car adapter

(4) The phone shall be capable of being attached to a belt or shall include a carrying case;

(5) Obtain phone service from a cellular phone company that provides the strongest signal within the project area for the particular phone provided;

(6) Phone service shall include a 500 minimum, anytime minutes/month; and

(7) Phone service shall provide an itemized billing.

(B) Provide a replacement cellular phone at no additional cost to the State within two working days whenever the cellular phone provided to the Engineer is damaged or inoperable due to an accident, or other causes.

Provide the cellular phone and phone service for the period beginning one week prior to the Notice to Proceed date and ending 30 days after final acceptance of the project. At that time, the cellular phone shall become the property of the Contractor.

638.03 Method of Measurement. The Engineer will not measure furnishing of cellular phone for payment.

638.04 Basis of Payment. The Engineer will pay for furnishing cellular phone on a contract lump sum basis.

The price includes full compensation for furnishing, replacing equipment, and obtaining phone service. All initial utility costs and monthly utility charges shall be

included in the contract lump sum amount. The contract lump sum amount shall also include any costs for the disconnection of the phone service.

The maximum bid allowable for the cellular phone is $4,800.00. If the proposal submitted by the bidder indicates an amount over the allowable maximum, the indicated amount shall be reduced to the allowable maximum and the 'Sum of All Items' in the proposal schedule shall be adjusted to reflect any such reduction. For the purposes of comparing bids and determining the contract price to be inserted in the contract awarded to the bidder, if any is so awarded, the 'Sum of All Items' adjusted according to the foregoing shall be used and the bidder's proposal shall be deemed to have been submitted for the amounts as reduced and adjusted as per contract.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Cellular Phone (Not to Exceed $4,800.00 for 3 phones)	Lump Sum"

END OF SECTION

Amend **Section 640 - Lined Drainage Ditch** to read as follows:

SECTION 640 - GRASS SWALE

640.01 Description. This work includes constructing grass swale according to the Contract.

640.02 Materials. None specified.

640.03 Construction Requirements. Excavation work shall conform to Section 207 - Ditch and Channel Excavation. Borrow excavation shall conform to Section 203 - Excavation and Embankment.

640.04 Method of Measurement. The Engineer will measure the grass swale per linear foot along the invert of the swale at the finish grade elevation.

The Engineer will not measure ditch and channel excavation for payment.

The Engineer will not measure borrow excavation for payment.

640.05 Basis of Payment. The Engineer will pay for the accepted grass swale at the contract unit price per linear foot complete in place.

The price includes full compensation for excavating; preparing the foundation; backfilling with borrow excavation; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Grass Swale	Linear Foot

Hydromulching the grass swale shall be paid for under Section 641 Hydro-Mulch Seeding"

END OF SECTION

SECTION 645 - TRAFFIC CONTROL DEVICES

Make the following amendments to said Section:

(I) Amend the title to read as **"SECTION 645 - WORK ZONE TRAFFIC CONTROL"**

(II) Amend **Table 645-I - For Traffic Control Plan** to read as follows:

TABLE 645-1 - FOR TRAFFIC CONTROL PLAN

POSTED SPEED LIMIT (M.P.H.)	SIGN SPACING (D) (FEET)	TAPER LENGTH (T) (FEET)		LONGI-TUDINAL BUFFER SPACE (B) (FEET)	SPACING OF CONES OR DELINEATORS (FEET)		
		W = 12' OR LESS	W = GREATER THAN 12'		TAPER	TANGENT	WORK AREA
20	250	200	W x 17	35	20	20	10
25	250	200	W x 17	55	25	25	10
30	250	250	W x 20	85	30	30	10
35	250	250	W x 20	120	35	35	10
40	500	350	W x 30	170	40	40	10
45	500	550	W x 45	220	45	45	10
50	1000	600	W x 50	280	50	50	10
55	1000	700	W x 55	335	55	55	10

* W = width of lane or shoulder

(III) Amend **645.03 Construction Requirements** by adding the following:

"The Contractor shall furnish two Police Officer as part of their traffic control work.

"Traffic control devices including cones, barricades, warning signs with supports, lights, and temporary signals shall conform to 'The Hawaii Administrative Rules, Title 19, Subtitle 5, Chapters 127, 128 and 129', the MUTCD and Section 104 - Scope of Work. Reflectorization for protective devices such as cones, barricades, delineators, and signs, shall conform to Subsection 712.20 - Signs.

Do not use steel drums and steel barrels for traffic controls in construction and maintenance work zones.

As of 10/01/2000, all new barricades, signs with sign supports and vertical panels without lights shall require an FHWA approval letter certifying that the device is NCHRP Report 350 compliant. Do not use barricades, signs with sign supports, and other traffic control devices purchased before 10/01/2000 that are not certified to be NCHRP Report 350 compliant after 10/01/2003.

Upon request of the Engineer, furnish a self-certified NCHRP Report 350 compliant letter from the vendor for each type of single-piece traffic cone, single-piece drum, tubular marker and delineator.

(A) Signs

(1) General. Install signs ahead of the place where operations may interfere with the use of the road by traffic and at intermediate points where the new work crosses or coincides with an existing road.

Place such signs as specified by the contract and as specified and accepted by the Engineer.

Submit to the Engineer 8 sets of FHWA approval letter certifying that the signs and sign supports are NCHRP Report 350 compliant.

(B) Barricades

(1) General. Apply and install the barricades according to the contract.

Provide, erect, and maintain necessary barricades, suitable and sufficient lighting devices, signs and other traffic control devices, and precautions for the protection of the work and safety of the public

Protect roadways closed to traffic, illuminate obstructions during hours of darkness, and provide warning signs to control and direct traffic according to the contract.

Submit to the Engineer 8 sets of FHWA approval letter certifying that the barricades are NCHRP Report 350 compliant.

Barricades shall be in good condition. Submit barricades for acceptance by the Engineer for use within the project limits according to this section. Barricade application and installation shall be according to the contract and as specified by the Engineer.

Provide sand bags if required or specified by the Engineer. All sand bags and their method of installation shall comply with the MUTCD and be accepted by the Engineer prior to use. Do not place sand bags on the striped barricade rail.

Install steady burn and/or flashing lamps on selected barricades used during hours of darkness. Locations shall be according to the contract and specified by the Engineer. Attach the lamps on the barricade ends closest to the traveled way. Lamps shall be visible to the motorist.

Do not install signs on barricades unless the sign on barricade system has been crash tested, accepted under NCHRP Report 350, and accepted by the Engineer.

The Contractor may use the accepted barricades for temporary detours, construction phasing, or other temporary traffic control work.

The Contractor may use the accepted barricades used in temporary detours or construction phasing for permanent locations according to the contract.

Upon completion of the construction work, leave the barricades in place, relocate the barricades, or remove and dispose the barricades according to the contract or as specified by the Engineer. Barricades left in place or relocated to new permanent locations shall become the property of the State. Barricades removed and disposed of shall become the property of the Contractor.

(2) Reflectorization. Reflectorize barricade rails and the attachment with reflective sheeting according to Subsection 712.20(C)(4) - Type III or IV Retroreflective Sheeting (High or specified and accepted by the Engineer.

Reflectorize both vertical faces of each barricade rail according to the contract.

(3) Color. Rails, frames and braces shall be white. The front and back faces of barricade rails shall have 6 inch wide alternate colored and white stripes sloping downward toward the traveled way at an angle of 45 ^{o} with the vertical. The colored stripes shall be either orange or red according to the following requirements:

(a) Use orange and white stripes for construction, detour

or maintenance work.

(b) Use red and white stripes on roadways with no outlet such as dead-ends and cul-de- sacs, ramps or lanes closed for operational purposes, or permanent or semi-permanent closure or termination of a roadway.

(4) Maintenance. Keep the barricades in good condition throughout their usage during construction.

(a) To maintain their effectiveness and appearance, repair, clean or replace the required barricades as specified by the manufacturer guidelines and as specified by the Engineer.

(b) Immediately replace lost, stolen or damaged barricades, lamps and sand bags.

Clean and repair the barricades used during construction phasing, temporary detours or other temporary traffic control work before relocating to permanent locations according to the contract or as specified by the Engineer.

The Engineer will not make payment for repair work or cleaning of barricades. The Engineer shall decide the suitable condition of each barricade and when each barricade needs repairing or cleaning.

(C) Traffic Delineators. Install traffic delineators to show the temporary alignment of detour roads according to the contract or as specified by the Engineer.

Upon request of the Engineer, submit to the Engineer an FHWA approval letter certifying that the device is NCHRP Report 350 compliant.

Maintain the traffic delineators and keep the traffic delineators clean and in good repair. Replace lost, stolen or damaged traffic delineators immediately.

At the end of a detour phase, relocate the traffic delineators and keep the traffic delineators clean and in good condition to the next detour phase. At the end of the construction period, leave in place or remove the traffic delineators according to the contract or as specified by the Engineer. The traffic delineators will become the property of the Contractor when no longer required on the project.

(D) Cones. Install traffic cones according to the contract or as specified by the Engineer.

Upon request of the Engineer, submit to the Engineer an FHWA approval letter certifying that the cones are NCHRP Report 350 compliant.

Maintain the traffic cones and keep the traffic cones clean and in good repair. Replace lost, stolen or damaged traffic cones as needed."

(IV) Amend **645.04 Method of Measurement** to read as follows:

"645.04 Method of Measurement. The Engineer will measure Additional Police Officers And/Or Additional Traffic Control Devices such as hiring the services of additional Police Officers that the Engineer requested; furnishing, installing, maintaining and removing the additional devices; and inserting the legal notices required by the Engineer on a force account basis according to the contract and as specified by the Engineer.

The Engineer will not measure the two Police Officer, traffic control, barricade or barricade with lamp, traffic delineator, and construction and maintenance of detours for payment."

(V) Amend **645.05 Basis of Payment** to read as follows:

"645.05 Basis of Payment. The Engineer will pay for the accepted Additional Police Officers And/Or Additional Traffic Control Devices on a force account basis according to Subsection 109.04 - Extra and Force Account Work. The Engineer will compute the actual amount paid for force account work according to Subsection 109.04 - Extra and Force Account Work. The amount may be more or less than the estimated amount shown in the proposal. The force account work includes hiring the services of additional Police Officers beyond the two minimum required that the Engineer requested; furnishing, installing, maintaining and removing the additional devices; inserting the legal notices; furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work. The Contractor shall submit a paid invoice for the legal notice.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Additional Police Officers And/Or Additional Traffic Control Devices	Force Account

"

The Engineer will not pay for the first two Police Officer separately. The Engineer will consider the cost for the first two Police Officer as included in the contract price of the various contract item. The cost includes hiring the services of the Police Officers.

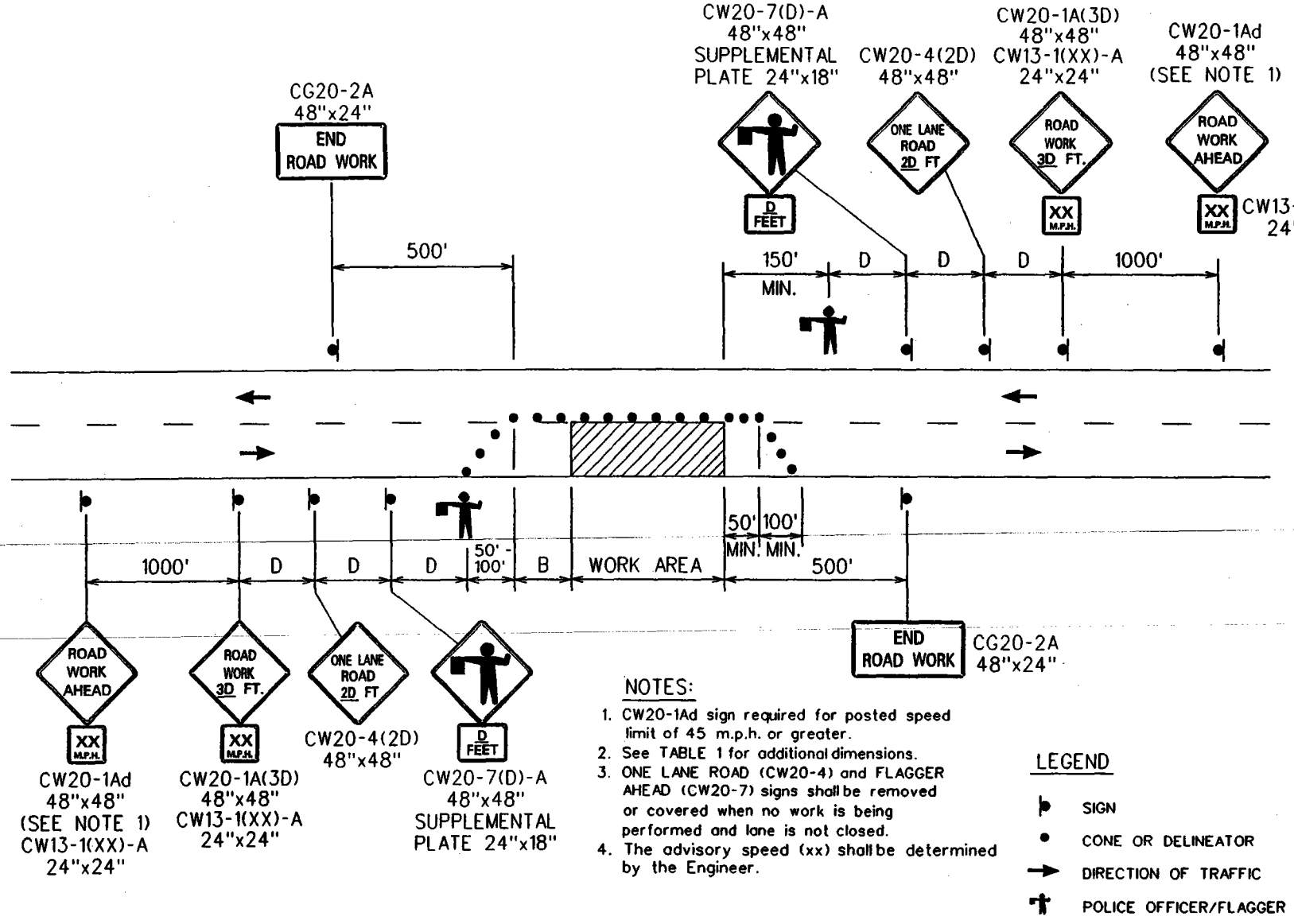
The Engineer will not pay for Traffic Control separately. The Engineer will consider the cost for Traffic Control as included in the contract price of the various contract items. The cost is for hiring the services of the flaggers and/or police officers; furnishing, installing, maintaining and removing all traffic controls shown in the traffic control plans; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for Barricade or Barricade With Lamp separately. The Engineer will consider the cost for Barricade or Barricade With Lamp as included in the contract price of the various contract items. The cost is for furnishing, delivering, installing, maintaining, relocating, and removing the barricade and furnishing and installing sand bags and other accepted weights; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for delineators separately. The Engineer will consider the cost for delineators as included in the contract price of the various contract items. The cost is for furnishing; installing; cleaning; maintaining correct placement; removing when required; and furnishing and installing sand bags or other accepted weights; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for construction and maintenance of detours separately. The Engineer will consider the cost for construction and maintenance of detours as included in the contract price of the various contract items. The cost is for replacing installed traffic delineators that are lost, stolen, or damaged and not due to the Contractor's negligence; relocating of traffic delineators to the next detour phase; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work."

(V) Replace Figures 1 through 6 dated 5/01/93 with the attached Figures 1 and 2 dated 9/00 and r2/97 and Figures 3 through 7 dated 2/97 and 11/96.



NOTES:

1. CW20-1Ad sign required for posted speed limit of 45 m.p.h. or greater.
2. See TABLE 1 for additional dimensions.
3. ONE LANE ROAD (CW20-4) and FLAGGER AHEAD (CW20-7) signs shall be removed or covered when no work is being performed and lane is not closed.
4. The advisory speed (xx) shall be determined by the Engineer.

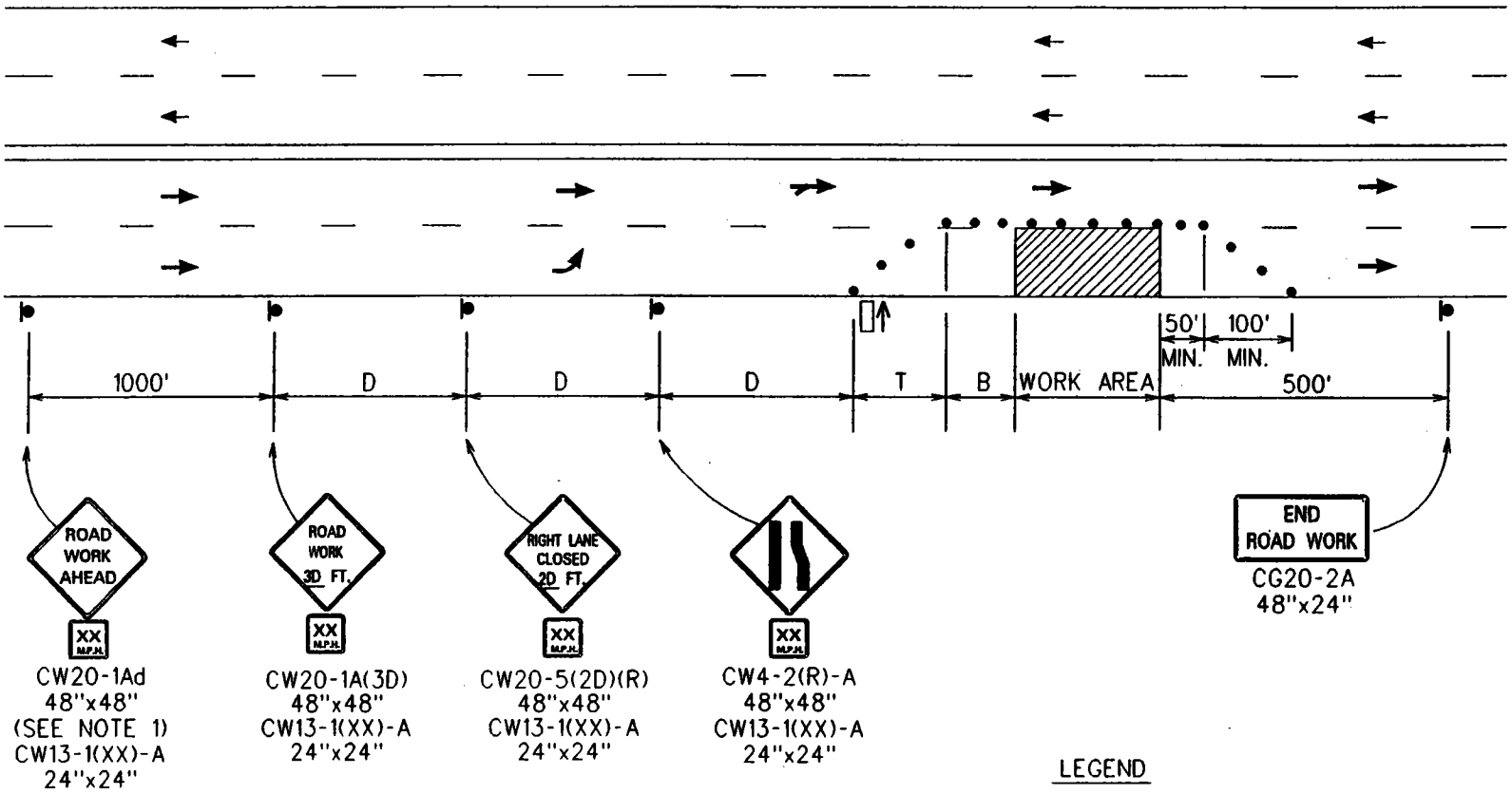
LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- POLICE OFFICER/FLAGGER

TWO-LANE HIGHWAY - ONE LANE CLOSED

FIGURE 1 - TRAFFIC CONTROL PLAN

R2/97



NOTES:

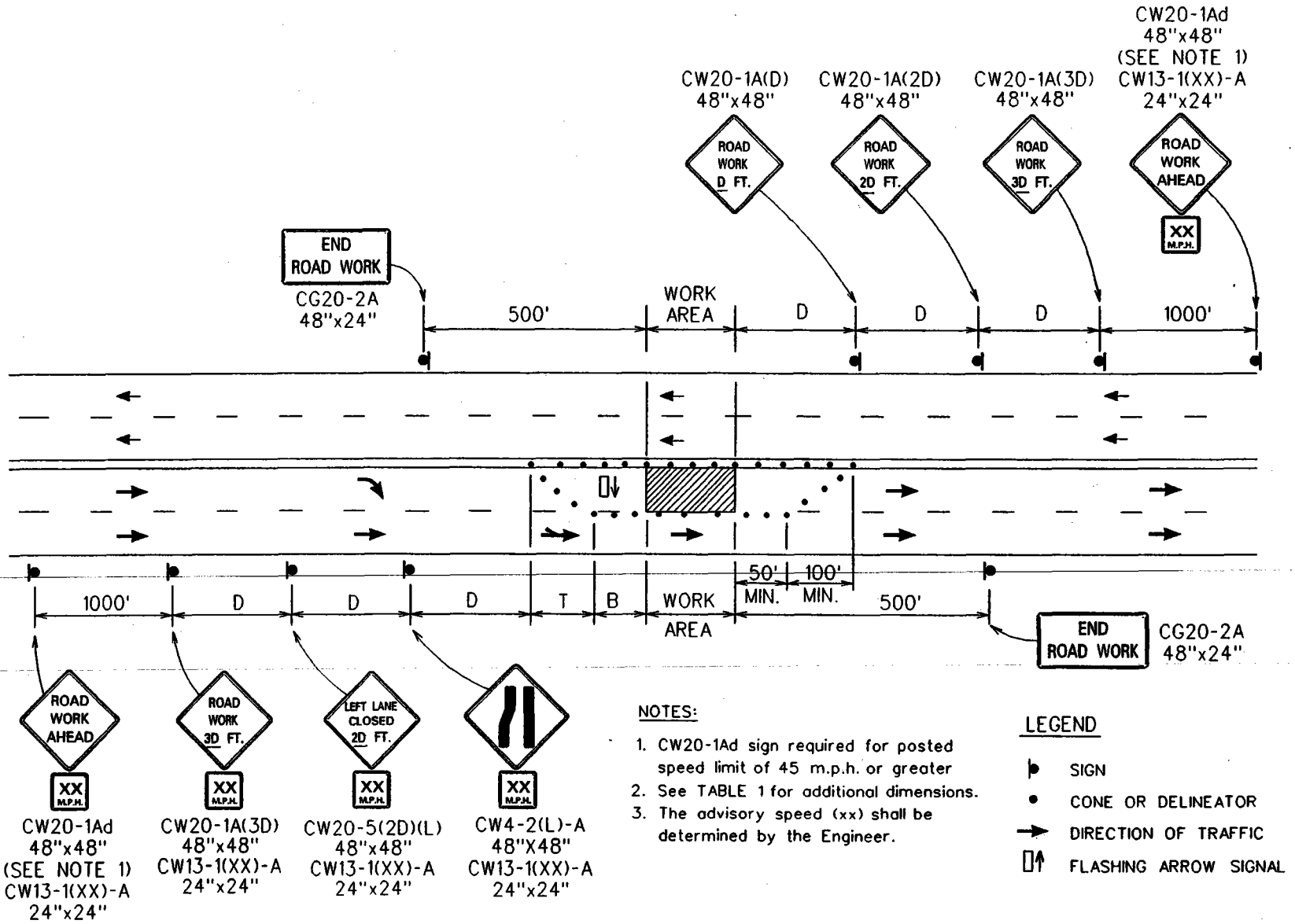
1. CW20-1Ad sign required for posted speed limit of 45 m.p.h. or greater
2. See TABLE 1 for additional dimensions.
3. The advisory speed (xx) shall be determined by the Engineer.

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLASHING ARROW SIGNAL

MULTILANE UNDIVIDED HIGHWAY - RIGHT LANE CLOSED

FIGURE 2 - TRAFFIC CONTROL PLAN



NOTES:

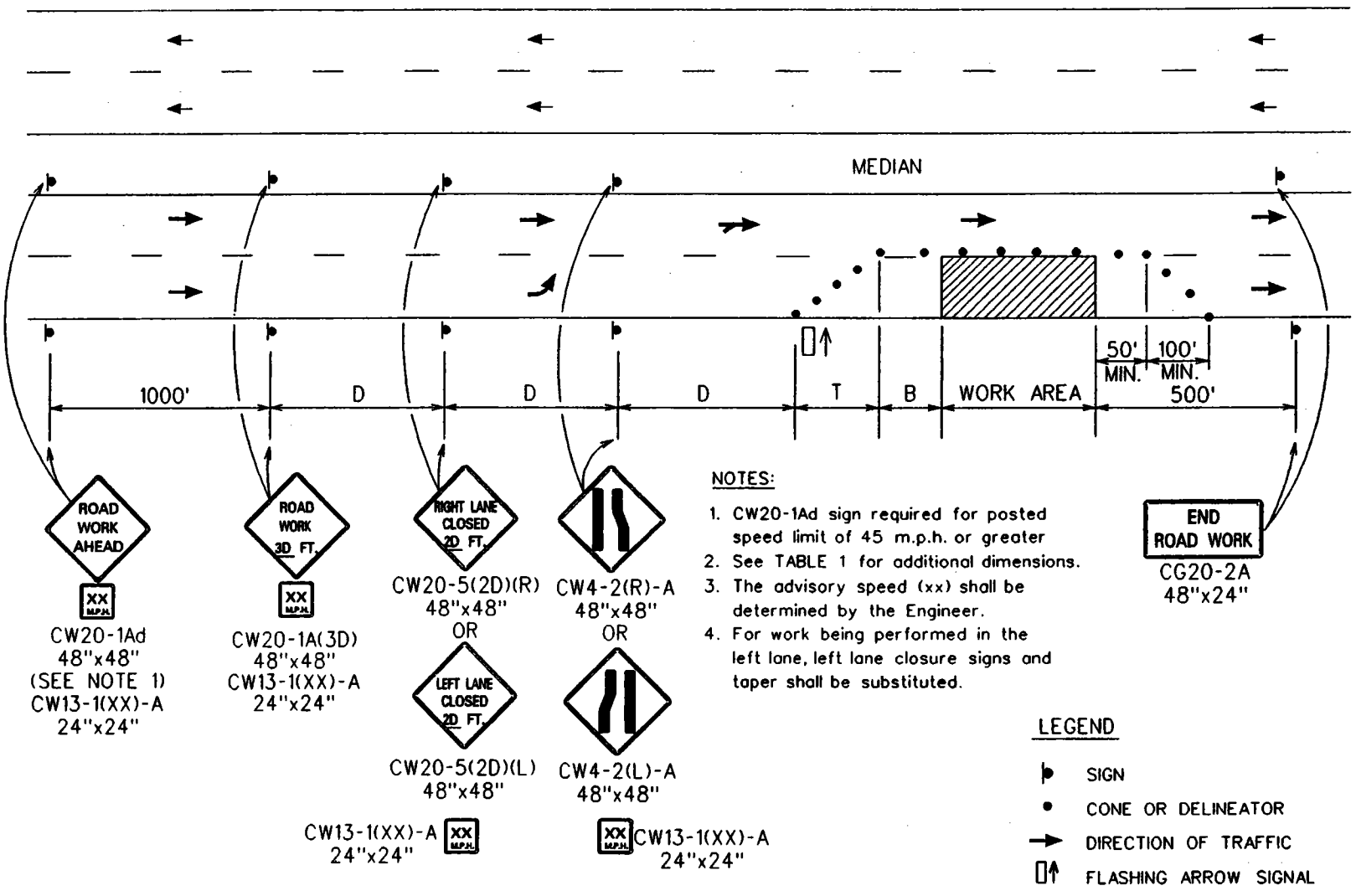
1. CW20-1Ad sign required for posted speed limit of 45 m.p.h. or greater
2. See TABLE 1 for additional dimensions.
3. The advisory speed (xx) shall be determined by the Engineer.

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLASHING ARROW SIGNAL

MULTILANE UNDIVIDED HIGHWAY - LEFT LANE CLOSED

FIGURE 3 - TRAFFIC CONTROL PLAN



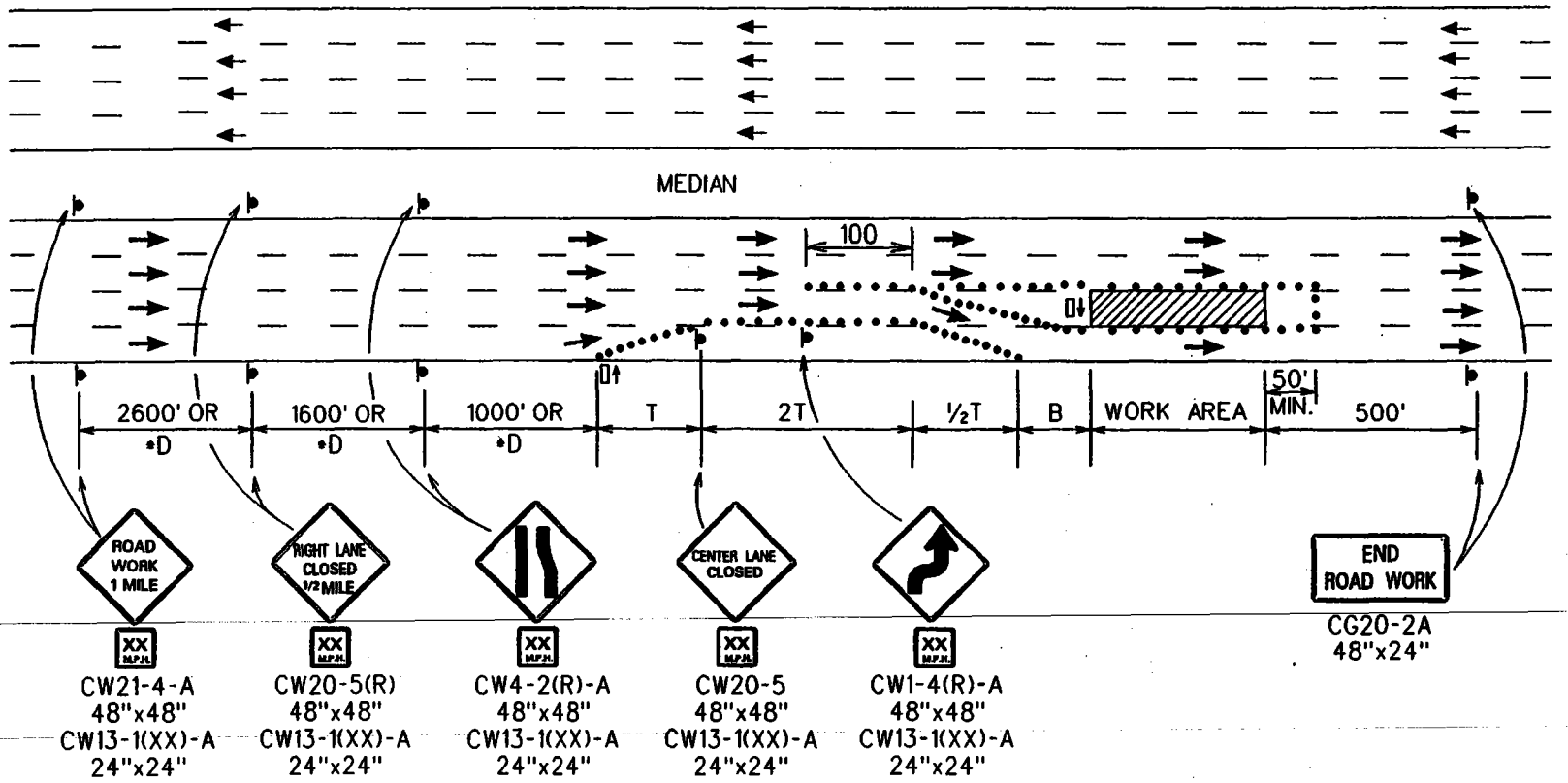
MULTILANE DIVIDED HIGHWAY - ONE LANE CLOSED

FIGURE 4 - TRAFFIC CONTROL PLAN

STP-065-1(9)
645-10a

11/06/96

R10/96



NOTES:

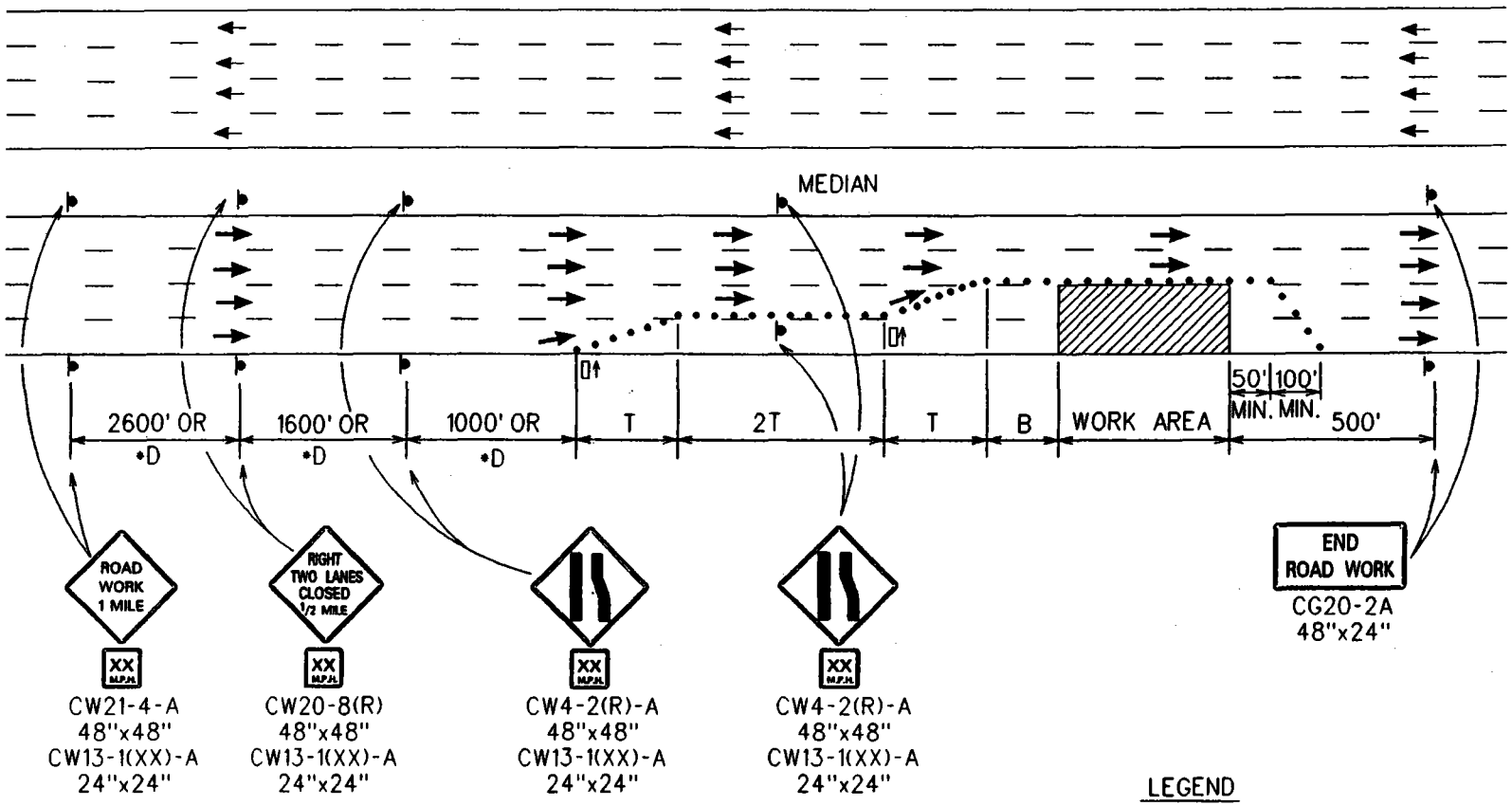
1. For work being performed in the left center lane, use mirror image of above with appropriate left lane closure signs and taper.
2. For undivided highways, delete advance warning signs shown posted in median area.
3. The advisory speed (xx) shall be determined by the Engineer.
4. See TABLE 1 for additional dimensions.
*5. For posted speeds of 40 m.p.h. or less, use sign spacings and taper lengths from TABLE 1 and change signs CW21-4-A and CW20-5(R) to CW20-1A(3D) and CW20-5(2D)(R) as shown in Figure 4.

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLASHING ARROW SIGNAL

MULTILANE HIGHWAY - CENTER LANE CLOSED

FIGURE 5 - TRAFFIC CONTROL PLAN



NOTES:

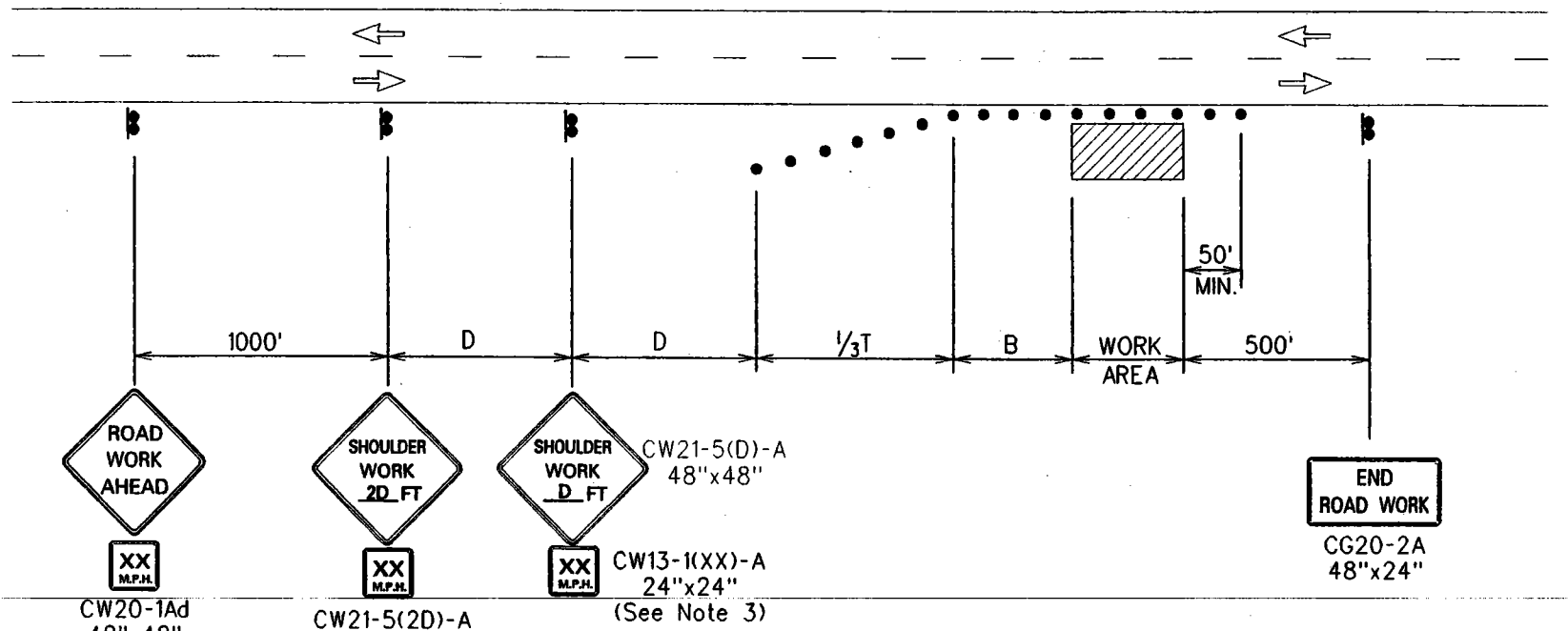
1. For work being performed in the left center lane, use mirror image of above with appropriate left lane closure signs and taper.
2. For undivided highways, delete advance warning signs shown posted in median area.
3. The advisory speed (xx) shall be determined by the Engineer.
4. See TABLE 1 for additional dimensions.
•5. For posted speeds of 40 m.p.h. or less, use sign spacings and taper lengths from TABLE 1 and change signs CW21-4-A and CW20-8(R) to CW20-1A(3D) and CW20-8(2D)(R) respectively.

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLASHING ARROW SIGNAL

MULTILANE HIGHWAY - MULTIPLE LANE CLOSED

FIGURE 6 - TRAFFIC CONTROL PLAN



LEGEND

- Cone or Delineator
- Direction of traffic
- Sign

NOTES:

1. This plan may be used only if all road work, including equipment and workers are off the travel way.
2. See TABLE 1 for additional dimensions.
3. Engineer will determine if Advisory speed sign is necessary.
4. Contractor will provide necessary adjustments to accomodate Bicyclists and Pedestrians.
5. CW20-1Ad sign required for posted speed limit of 45 MPH or greater.
6. Signing is not required if the work area including equipment and workers, is outside the clear zone distance, as specified in the latest AASHTO Roadside Design Guide.

WORKING ON SHOULDER OR ROADSIDE

FIGURE 7 - TRAFFIC CONTROL PLAN

Amend **Section 650 - Wheelchair Ramps** to read as follows:

"SECTION 650 - CURB RAMPS

650.01 Description. This section is for constructing curb ramps for the physically handicapped at existing or new sidewalk locations according to the contract.

650.02 Materials. Materials shall conform to the following:

Bed Course Material for Sidewalks and Curbing	703.16(A)
Joint Fillers	705.01
Reinforcing Steel	709.01

Concrete shall conform to Section 601 - Structural Concrete and shall be Class B.

Materials will be subject to inspection for acceptance as to condition at the latest practicable time the Engineer has the opportunity to check for compliance before or during incorporation of materials in the work.

650.03 Construction Requirements. Subsection 608.03(A) - Concrete Sidewalk and below shall apply to curb ramp construction requirements.

If the abutting sidewalk shows reinforcement, the Contractor shall similarly reinforce the curb ramp.

The Contractor shall require construction joint if the curb ramps join existing or new sidewalks and if curb ramp aprons abut drop curbs or gutters.

Demolition of existing curb and sidewalk shall conform to Section 202 - Removal of Structures and Obstructions.

Special drop curbs for curb ramps shall conform to Section 609 - Curb and/or Gutter.

The face of special drop curbs shall conform to the face of abutting curbs.

The profiles of curb ramps shall be such that their lower points conform to the grade of abutting edge of pavement or inverts of adjacent gutters, as applicable.

650.04 Method of Measurement. The Engineer will measure curb ramps per each complete in place.

650.05 Basis of Payment. The Engineer will pay for the accepted curb ramps at the contract unit price per each.

The price includes full compensation for demolishing; excavating; backfilling; installing reinforcing steel, concrete expansion joint materials, construction joints, special drop curbs, and bed course material; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Curb Ramp, Type _____	Each"

END OF SECTION

.Amend **Section 652 - COLD PLANING OF EXISTING PAVEMENT** to read as follows:

" **SECTION 652 - COLD PLANING OF EXISTING PAVEMENT**

652.01 Description. This section is for removing specified thicknesses of existing pavement by cold planing according to the contract.

652.02 Materials. None specified.

652.03 Construction Requirement.

(A) Equipment. The planing machine shall be power operated self-propelled type with nonpneumatic tires. Design and build the planing machine for planing and cutting flexible and rigid pavements. The machine shall plane without tearing or gouging the underlying surface and blade material into a windrow. The machine includes a cutting drum totally enclosed in a shroud to prevent discharge of loosened material into adjacent work areas. The machine shall operate at speeds from 5 to 50 feet per minute. Design the machine so that the operator can observe the work without leaving the control area. The Contractor may require a zero to three inch deep cut to predetermine grade on one pass. The machine shall be adjustable as to crown and depth by tilting the drum axis and a guidance system furnished to control grade and match adjacent pavements or cuts. The machine shall also have a height control device to regulate the cutting depth and required grade. A dust suppression system with adequate water storage tanks and high pressure spray bar with spray nozzles shall be standard equipment.

Furnish one or more planing machines operated by experienced workers.

(B) Saw Cutting. Saw cut the existing pavement areas before cold planing.

(C) Planed Surface and Removed Material. The surface produced after cold planing shall be such that a 10-foot straight edge laid longitudinally and laterally shall have variances of less than 0.375 inch (except in crown area). Adjust the blades for the planing machine such obstacles such as the base, monuments, manholes, pipes, or pavement that is to remain will not be cut or disturbed by the planing operation. Replace the Contractor-damaged base, monuments, manholes, pipes, or pavement according to the contract at no cost to the State. The finished surface shall be free of loosened material.

When cold planing is required on roadways open to traffic, cold plane the full travelway width of roadway each day so as not to leave a hazardous

longitudinal pavement drop between lane passes of the cold planes. The Engineer may allow the Contractor to construct a transition taper at the longitudinal pavement drop so as not to leave a vertical face. The transition taper shall be along the lane line and should produce a wedge with a minimum slope of 6:1. Submit the type of materials and construction of the transition taper for acceptance by the Engineer.

Dispose of the removed material.

(D) Vacuum Sweeping. Vacuum sweep cold planed areas immediately after cold planing. The vacuum sweep shall remove gravel-sized materials and dusts not picked up by the cold planing operation. The vacuum sweep shall not preclude the dust control operation during cold planing.

Begin paving not later than three working days after cold planing begins. Do not expose the cold planed areas to public traffic for more than three working days and/or over non-working days, Saturdays, Sundays and holidays. Also, vacuum sweep cold planed surface immediately before paving. The Engineer will consider non-compliance with the above as unsatisfactory performance.

652.04 Method of Measurement. The Engineer will measure cold planing per square yard.

652.05 Basis of Payment. The Engineer will pay for the accepted cold planing at the contract unit price per square yard.

The price includes full compensation for saw cutting; vacuum sweeping; controlling dust; disposing the cold-plane material; and furnishing equipment, materials, tools, labor, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
2 Inch Cold Planing	Square Yard"

END OF SECTION

Add **Section 656 - Mailbox** to the Special Provisions:

"SECTION 656 - MAILBOX

656.01 Description. This work includes installing a mailbox according to the contract.

656.02 Materials. Materials shall conform to the following:

All materials necessary to erect the mailbox complete in place shall conform to the standards of the United States Postal Service.

656.03 Construction Requirements

Mailbox. Place the new mailbox as shown in the plans. Construction requirements shall follow the latest version of the AASHTO Roadside design guide

656.04 Method of Measurement. The engineer will measure mailbox each complete in place.

656.05 Basis of Payment.

The Engineer will pay for the mailbox at the contract unit price per each complete in place. The price shall be full compensation for excavating; furnishing and placing the mailbox complete in place as specified on the plans, backfilling, removing existing mailboxes and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	Pay Unit
Mailbox	Each "

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 693 - QUADGUARD SYSTEM TERMINAL IMPACT ATTENUATOR

693.01 Description. This section is for furnishing and installing a Quadguard System terminal impact attenuators at the prepared sites according to the contract.

693.02 Materials. Materials shall conform to the following:

Concrete Structures	503.02
Reinforcing Steel	602.02

The Quadguard System terminal impact attenuator shall consist of crushable cartridge assemblies surrounded by a framework of steel Quad-beam guardrail which can telescope rearward during head-on impacts. The Quadguard System shall have a center monorail which resist lateral movement during side angle impacts. The nose shall consist of a formed plastic nose wrap.

Concrete shall conform to Section 601 - Structural Concrete. Compressive strength shall be 4000 psi at 28 days.

693.03 Construction Requirements.

(A) Equipment List and Drawings. Within 10 working days following the Award of Contract, submit to the Engineer for acceptance 6 copies of a list of materials and equipment to be incorporated in the work. The list shall include the name of the manufacturer, dimensions and catalog number of the unit, detailed scale drawings of special equipment, shop drawings for fabrication and proposed deviations.

(B) Site Preparation. Before installing the Quadguard System terminal impact attenuator, prepare the site as shown in the contract or specified by the Engineer. Excavate and backfill according to the Section 206 - Excavation and Backfill for Conduits and Structures. Exercise extreme care so as not to damage underground facilities. Repair damages by the Contractor immediately at no cost to the State.

The placing and curing of the concrete shall conform to Section 503 - Concrete Structures.

The placing of reinforcing steel shall conform to Section 602 - Reinforcing Steel and the manufacturer's recommendations.

(C) Quadguard System Terminal Impact Attenuator. Install Quadguard System terminal impact attenuator according to the

recommendations of the manufacturer. Provide training for the installation of the system in the field for a period not to exceed three hours. Also provide a minimum of 8 hours of training at the District Office for the installation and maintenance of the system. Furnish five copies of specially prepared manual on the installation and maintenance of the system.

(D) Replacement Cartridge Cells. Furnish and deliver one set of replacement cartridge cells for each installation to locations designated by the Engineer and stored as specified.

(E) Replacement Nose Section Cover and Cartridge Cells. Furnish and deliver one set of replacement nose section cover and cartridge cell for each installation to locations designated by the Engineer and stored as ordered.

693.04 Method of Measurement. The Engineer will measure Quadguard System terminal impact attenuator per each.

693.05 Basis of Payment. The Engineer will pay for the accepted quadguard terminal impact attenuator at the contract unit price per each. The price includes full compensation for doing work necessary for installing the quadguard system terminal impact attenuator complete in place including site preparation, excavation, backfill, reinforced concrete foundation, and services for training and furnishing labor, materials, tools, and equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Quadguard System Terminal Impact Attenuator _____	Each"

END OF SECTION

Amend **Section 699 Mobilization** to read as follows:

"SECTION 699 - MOBILIZATION

699.01 Description. Mobilization includes preparatory work and operations necessary for the :

(1) movement of personnel, equipment, and supplies to the project site;

(2) acquisition of falsework materials;

(3) establishment of offices, buildings and other facilities excluding field office and project site laboratories, necessary for work on the project; and

(4) costs incurred on operations that must be performed before starting work on the various items on the project site.

699.02 Material. None specified.

699.03 Applicability. The maximum bid allowed for this item is an amount not to exceed 10% of the sum of all items excluding the bid price of this item, cellular phone, and force account items.

The Engineer will reduce the indicated amount to the allowable maximum if the proposal shows an amount over the allowable maximum. The Engineer will adjust the "Sum Of Contract Items" to reflect such reduction. The Engineer will use the "Sum Of Contract Items" adjusted as if the bidder submitted its proposal in the amounts as reduced and adjusted.

699.04 Method of Measurement. The Engineer will not measure mobilization for payment.

699.05 Basis of Payment. The Engineer will pay for mobilization on a lump sum basis.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Mobilization (Not to exceed 10% of the sum of all items excluding the bid price of this item, cellular phone, allowances, and force account items)	Lump Sum

The Engineer will make partial payments as follows:

(1) ` Pay 10% of the amount bid for mobilization when earning 1% of the original contract amount.

(2) Pay 50% of the amount bid for mobilization when earning 2.5% of the original contract amount.

(3) Pay 75% of the amount bid for mobilization when earning 5% of the original contract amount.

(4) Pay 100% of the amount bid for mobilization when earning 10% of the original contract amount."

END OF SECTION

SECTION 702 - BITUMINOUS MATERIAL

Make the following amendments to said Section:

(I) Amend **702.01 Asphalt Cement** to read as follows:

"702.01 Asphalt Cement. Performance graded asphalt binder shall conform to AASHTO Provisional Standard MP1."

(Table deleted.)

(II) Amend **702.04 Emulsified Asphalts** to read as follows:

"702.04 Emulsified Asphalt. Anionic emulsified asphalt shall conform to AASHTO M 140, except that the penetration on residue for Type SS-1 and Type RS-1 shall be 50-120 in lieu of the 100-200 specified.

Cationic emulsified asphalt shall conform to AASHTO M 208, except that the penetration on residue for Type CSS-1 and Type CRS-2 shall be 50-150 in lieu of the 100-250 specified."

END OF SECTION

SECTION 703 - AGGREGATES

Make the following amendments to said Section:

(I) Amend **703.01 Fine Aggregate for Concrete** to read as follows:

"**703.01 Fine Aggregate for Concrete.** Fine aggregate for portland cement concrete may be a combination of calcareous sand and lava rock crusher screenings or lava rock crusher screenings alone. Fine aggregate shall be free from sticks, dirt, organic matter, and other impurities. Take coral beach sand from that part of the beach that has not been in recent contact with salt water.

When using a combination of calcareous sand and lava rock crusher screenings, the absolute volume of calcareous sand shall be less than 50% of the absolute volume of the combined fine aggregate. The Contractor may increase the usage of calcareous sand to 70% of the absolute volume of the fine aggregate provided that the fine aggregate meets a minimum insoluble residue of 30% and the processing or manufacturing of calcareous sand removes deleterious coatings and unsound materials. Insoluble residue content shall be determined according to ASTM D 3042 - Insoluble Residues in Carbonate Aggregates.

When tested according to the designated methods, the fine aggregate shall conform to the following:

Test	Method	Requirements
Sand Equivalent	AASHTO T 176	70% Minimum
Soundness	AASHTO T 104 (5 cycles using sodium sulfate)	10% Maximum
Organic Impurities	AASHTO T 21	Not darker than the reference standard color
Clay Lumps and Friable Particles	AASHTO T 112	1% Maximum
Coal and Lignite	AASHTO T 113	1% Maximum
Grading	AASHTO T 27	Refer to Table 703-I

"TABLE 703-I - FINE AGGREGATE GRADING REQUIREMENTS	
Sieve Sizes	**% Passing by Weight**
0.375 Inch	100
No. 4	95 –100
No. 8	80 –100
No. 16	50 - 85
No. 30	25 - 60
No. 50	10 - 30
No.100	2 - 12

When the material had a satisfactory service record of at least five years, the Contractor may waive the soundness test.

The Engineer may accept materials that fail to meet the organic impurity color test provided the relative strength at 7 and 28 days is more than 95% when tested according to AASHTO T 71.

The parent material of fine aggregate manufactured by crushing shall have a loss by abrasion of less than 40% when tested according to AASHTO T 96.

The Engineer may waive the sand equivalent (SE) requirement provided the material finer than No. 200 sieve does not exceed 5% when tested according to AASHTO T 11.

Besides the above requirements, furnish the Engineer for acceptance a Quality Control Plan (QCP). The QCP shall detail process control procedures and the type and frequency of sampling and testing to ensure that the aggregate complies with the contract.

For aggregates used for structural concrete other than concrete for incidental construction, the minimum frequency of testing for sieve analysis and SE shall be once a day. Provide the Engineer free access to plant production records. When requested, provide the Engineer informational copies of sampling and testing reports.

When using a blend of calcareous sand from the Waiehu area and crushed lava rock fines, the Engineer may grant waiver of the gradation requirement for fine aggregate for concrete. Provide sufficient and acceptable data to show that the concrete made with the fine aggregate will have relevant properties equal to those of concrete made with the same ingredients. The exception is that the Contractor shall use a reference fine aggregate selected from a source having an acceptable performance record in similar concrete construction.

Grade the fine aggregate within the following limits:

Sieve Size	% Passing by Weight
0.375 Inch	100
No. 4	95 - 100
No. 8	65 - 95
No. 16	x ± 10
No. 30	x ± 9
No. 50	x ± 6
No. 100	2 - 14

In the above gradation limits, the symbol x is the gradation that the Contractor proposes to furnish for the specific sieve size.

Before beginning concrete work, submit a typical gradation of the calcareous sand and the crushed lava rock fines. Specify the proportion of the blend that the Contractor proposes to furnish. The resulting gradation shall have less than 45% retained between two consecutive sieves to be specified in the control of fineness modulus.

Also specify a target fineness modulus that shall be between 2.4 and 3.1. Compute the fineness modulus using the No. 4, 8, 16, 30, 50, and 100 sieves. Do not vary by more than 0.2 from the target.

Meet the other specified requirements."

(II) Amend **703.02 Coarse Aggregates for Portland Cement Concrete** by revising the fourth paragraph to read as follows:

"The coarse aggregate shall not contain deleterious substances over the following limits:

Test	Test Method	Requirement
Clay Lumps and Friable Particles	AASHTO T 112	2.0%
Materials Passing the No. 200 Sieve	AASHTO T 11	1.5%
Coal and Lignite	AASHTO T 113 using liquid of 2.0 specific gravity. Consider only brownish-black or black material as coal or lignite. Do not class coke as coal or lignite	0.5%"

(III) Add the following:

"703.04 Aggregate for Permeable Base. Furnish the aggregate for permeable base in the fractions specified herein:

(A) Coarse Aggregate. Manufacture the coarse aggregate by crushing and screening hard, tough, durable rock of uniform quality. The coarse aggregate shall be free from soft or disintegrated pieces, clay, dirt, or other deleterious substances.

When manufacturing the coarse aggregate from gravel, use only gravel particles retained on a grizzly or screen having five-inch openings in the manufacturing process.

When tested according to the designated methods, the coarse aggregate shall conform to the requirements as set forth herein.

Test	Test Method	Requirement
Los Angeles Abrasion	ASTM C 535	40% Maximum
Grading	AASHTO T 27	Refer to Table 703-IIIA

(B) Filler. The filler includes that portion of the material crushed from the coarse aggregate. The filler shall pass a 0.5-inch screen. When not producing sufficient filler in the manufacture of the coarse aggregate, the deficiency may be supplied by the addition of other suitable materials having the same properties to that of the crushed product.

The filler may also be manufactured separately from the manufacture of the coarse aggregate. Material for separately manufactured filler shall also be of a suitable material having the same properties as that of the filler produced from the manufacture of the coarse aggregate.

When tested according to AASHTO T 27, the filler shall meet the grading requirements shown in Table 703-IIIA.

TABLE 703-IIIA - GRADING REQUIREMENTS		
Screen Size	Coarse Aggregate (% Passing By Weight)	Filler, Size 8 (% Passing By Weight)
2 inch	100	-
1.5 inch	75-100	-
1 inch	15-55	-
0.75 inch	0-15	-
0.5 inch	-	100
0.375 inch	0-5	85-100
No. 4	-	10-30
No. 8	-	0-10
No.16	-	0-5"

(IV) Delete **703.05 Aggregate for Waterbound Macadam Base** in its entirety.

(V) Amend **703.06 Aggregate for Untreated Base** to read as follows:

"**703.06 Aggregate for Untreated Base.** Aggregate for untreated base includes a crushed product of stone or coral. The aggregate shall be free of vegetable matter and other deleterious substances. The aggregate shall be of such nature that the aggregate can readily be compacted under watering and rolling to form a firm, stable base.

When the mineral aggregate does not contain sufficient natural cementing material, add to and mix a binder material including rock screenings or other accepted cementaceous material uniformly into the aggregate before compaction.

Regulate the crushing so that at least 80% by weight of the material retained on the No. 4 sieve is crushed. A crushed particle is one having at least one mechanically fractured face.

When tested according to the designated methods, the aggregate base in combination with the binder material, if used, shall meet the requirements below.

Test	Test Method	Requirement
Los Angeles Abrasion	AASHTO T 96	40% Maximum
Sand Equivalent	AASHTO T 176	35% Minimum
Plasticity Index	AASHTO T 90	6 Maximum
Grading	AASHTO T 27	Refer to Table 703-IV

TABLE 703-IV - GRADING REQUIREMENTS

Screen Size	% Passing by Weight		
	2.5" Maximum	1.5" Maximum	0.75" Maximum
3"	100	-	-
2.5"	90 - 100	-	-
2"	-	100	-
1.5"	65 - 90	90 - 100	-
1"	-	-	100
0.75"	45 - 70	50 - 90	90 - 100
No.4	25 - 45	25 - 50	35 - 55
No. 200	3 - 9	3 - 9	3 - 9

When the portion passing the No. 4 sieve consists entirely of crushed coralline limestone, the SE requirement shall be 20% or more and the grading requirement on the No. 200 sieve shall be 3% to 12% instead of that specified in Table 703-IV.

Furnish 1.5 inch maximum size aggregate."

(VI) Amend **703.09 Aggregate for Hot Plant Mix Bituminous Pavement** to read as follows:

703.09 Aggregate for Hot Plant Mix Bituminous Pavement. Make mineral aggregate by crushing and screening hard, tough, durable stone of uniform quality. The crushed aggregate shall be free from soft or disintegrated pieces, clay, dirt, or other deleterious substances.

Coarse aggregate shall be that portion of the mineral aggregate retained on a No. 4 sieve. Fine aggregate shall be that portion of the mineral aggregate passing a No 4 sieve.

At least 90% by weight of the material retained on the No. 4 sieve shall consist of crushed particles. At least 70% of the material passing the No. 4 sieve and retained on the No. 8 sieve shall consist of crushed particles. A crushed particle is one having at least one mechanically fractured face.

When tested according to the designated methods, the combined mineral aggregate including blending sand or filler, if any, shall meet the requirements below.

Test	Test Method	Requirement
Sand Equivalent	AASHTO T 176	50% Minimum
Los Angeles Abrasion	AASHTO T 96	30% Maximum
Stripping	AASHTO T 182	Above 95%
K-factor	AASHTO T 270	Kc-2.0 Maximum Km-1.7 Maximum
Flat and elongated pieces (Length to width or width to thickness ratio of 3)	ASTM D 4791 (By Weight)	25% Maximum
Grading	AASHTO T 27	Job-mix formula based on Table 703-V
Soundness	AASHTO T 104 (5 cycles using sodium sulfate)	9% Maximum
Absorption	AASHTO T84 and T85	5% Maximum

The Contractor may use aggregates not meeting the requirements of the stripping test for bituminous pavement provided a chemical additive is use resulting in bituminous film retention above 95%.

TABLE 703-V - GRADING COMPOSITION				
MIX NO.	**II**	**III**	**IV**	**V**
Sieve Sizes	**Combined Aggregate % Passing by Weight**			
1.25 Inch	100	-	-	
1 Inch	85 - 100	100	-	
0.75 Inch	-	90 – 100	100	
1/2 Inch	60 - 85	70 – 90	85 - 100	100
0.375 Inch	-	-	72 - 88	80 - 100
No. 4	36 - 55	40 – 57	48 - 66	55 - 75
No. 8	26 - 41	30 – 47	32 - 48	35 - 52
No. 16	17 - 32	20 – 36	21 - 37	22 - 38
No. 30	12 - 25	16 – 28	15 - 27	14 - 26
No. 50	8 - 18	10 – 22	9 - 21	8 - 20
No. 100	5 - 14	8 – 17	6 - 16	6 - 15
No. 200	1 - 8	4 – 10	4 - 10	4 - 10

With prior acceptance by the Engineer, the Contractor may lower the sand equivalent requirement from 50% to 40% minimum provided the material finer than the No. 200 sieve does not exceed 8% and the ratio of dust (minus No. 200 sieve material) to asphalt cement is between 1.2 and 0.6."

(VII) Amend **703.12 Aggregate for Roadway Construction** by revising the second paragraph to read as follows:

"When tested according to the designated methods, the aggregate shall meet the requirements below:

Test	Test Method	Requirement
Flat and elongated pieces (Length to width to width to thickness ratio of 3)	ASTM D 4791 (By Weight)	25% Maximum
Los Angeles Abrasion	AASHTO T 96	40% Maximum
Stripping	AASHTO T 182	Above 95%
Grading	AASHTO T 27	AASHTO M 43"

(VIII) Amend **703.16 Bed Course Material** to read as follows:

703.16 Bed Course Material.

(A) Bed Course Material for Sidewalks and Curbing. Bed course material for sidewalks and curbing includes 1-1/2 inch maximum size untreated base material conforming to Subsection 703.06 - Aggregate for Untreated Base.

(B) Bed Course Material for Pipe. Bed course material for pipe foundation includes 1-1/2 inch maximum size untreated base material conforming to Subsection 703.06 - Aggregate for Untreated Base.

If used as a foundation for pipe culvert and tested according to Hawaii Test Method HDOT TM 4, the material shall have a field resistivity and pH value resulting in a service life of 50 years or more.

If used as a foundation for aluminum pipe and tested according to Hawaii Test Method HDOT TM 4, the material shall have a field resistivity of more than 500 ohm-centimeters and pH value within the range of 5.5 and 9.0

(C) Bed Course Material for Crushed Rock Cradle. Bed course material for crushed rock cradle shall be crushed durable lava rock. The bed course material shall be free from vegetable matter and other deleterious substances. The wear shall not exceed 40 percent at 500 revolutions if tested under AASHTO T 96.

Bed course material shall be coarse aggregate size No. 67 and the percent composition by weight shall fall within the limits shown in Table 1 of AASHTO M 43."

(IX) Amend **703.20 Structure Backfill Material** to read as follows:

"703.20 Structure Backfill Material. Structure backfill material shall be free of vegetable matter and other deleterious substance and shall conform to the grading requirements in Table 703-VII.

(A) Structure Backfill Material A. When tested according to AASHTO T 176, the sand equivalent value shall be 20 or greater.

(B) Structure Backfill Material B. When tested according to AASHTO T 176, the sand equivalent value of the backfill material shall be equal to or greater than the surrounding soil.

Structure fill or backfill material placed behind bridge abutments, wingwalls and retaining walls shall be structure backfill material A. The contract shall show the other areas requiring material with a sand equivalent value of 20 or greater.

TABLE 703-VII - GRADING REQUIREMENTS		
Sieve Size	**% Passing by Weight**	
	Structural Backfill Mat'l A	**Structural Backfill Mat'l B**
3"	100	100
#4	20 - 75	20 – 100
#200	0-15	--"

(X) Amend **703.21 Trench Backfill Material** to read as follows:

"**703.21 Trench Backfill Material.** Trench backfill material shall be black sand-soil mixture, finely graded coral or sandy materials. The trench backfill material shall pass a one inch square mesh screen or crusher screening S4C that shall pass a 0.5 inch square mesh screen. The material shall be free from deleterious substances. For water system trench backfill, do not use crusher screening S4C in areas where the invert of the pipe is at or lower than the four-foot elevation, USGS Datum, or in swampy area or in area where the ground is continuously wet.

(A) Trench Backfill Material A. When tested according to AASHTO T 176, the sand equivalent value shall be 20 or greater.

(B) Trench Backfill Material B. When tested according to AASHTO T 176, the sand equivalent value of the backfill material shall be equal to or greater than the surrounding soil.

Prepare the sand equivalent test sample according to Hawaii Test Method HDOT TM 5 when the in-situ moisture content of the sample is greater than 40%.

When tested according to Hawaii Test Method HDOT TM 4, the trench backfill material placed against metal pipe shall have a field resistivity and pH value that shall result in a service life of 50 years or more.

When tested according to the Hawaii Test Method HDOT TM 4, the trench backfill material placed against aluminum pipe shall have a field resistivity of more than 500 ohm-centimeters and pH value within the range of 5.5 and 9.0."

END OF SECTION

Add the following:

SECTION 704 - MASONRY UNIT

"704.03 Hollow Concrete Masonry Units. Hollow concrete masonry units shall conform to the requirements of ASTM C90, Grade N-II, 'Load Bearing Concrete Masonry Units'.

Units shall be Vee Three Flute Split with 2 core type, both face, 8 inch normal height, 16 inch normal length, and 8 inch normal width as indicated on the plan, and provide end blocks with matching split fluted face. All units shall be sound, free of cracks, straight and true. Units shall be either steam-cured or cured under atmospheric conditions for a minimum of 30 days. Linear drying shrinkage shall not exceed 0.065% in accordance with ASTM C426 and ASTM C90."

SECTION 706 - CONCRETE, CLAY, AND PLASTIC (PVC) PIPE

Make the following amendment to said Section:

(I) Amend the title to read as follows:

"SECTION 706 - CONCRETE, CLAY, AND PLASTIC PIPE"

(II) Add the following:

"706.10 High Density Polyethylene Pipe.

(A) High Density Polyethylene Pipe for Drainage System. This pipe shall conform to AASHTO M 252 or M 294 Type C or Type S. Submit a certificate of compliance to the Engineer before using any plastic pipe.

(B) Couplings. Couplings shall be of the same composition as the pipe."

END OF SECTION

SECTION 709 - REINFORCING STEEL, WIRE ROPE AND PRESTRESSING STEEL

Make the following amendment to said Section:

(I) Amend **709.03 Prestressing Steel** by revising the first paragraph to read as follows:

"709.03 Prestressing Steel. Prestressing steel shall be:

(1) uncoated stress-relieved wire conforming to ASTM A 421, or

(2) uncoated 7 wire low-relaxation steel strand conforming to ASTM A 416 Grade 270, or

(3) high-tensile alloy bars conforming to the requirements below."

END OF SECTION

SECTION 710 - FENCE AND GUARDRAIL

Make the following amendments to said Section:

(I) Amend **710.04(A) Steel Rail** to read as follows:

"**(A) Steel Rail.** The corrugated sheet steel beams shall conform to AASHTO M 180 and according to the contract. Furnish Class A, Type II."

(II) Amend **710.07 Guardrail Post** to read as follows:

"**710.07 Guardrail Posts.** Guardrail posts shall be as specified in the contract.

Steel posts shall be of the section and length specified in the contract. Steel shall conform to ASTM A 36. Zinc-coat steel posts after fabrication.

Fabricate wood posts and blocks of timber with a stress graade of 1200 psi or more. Grading shall be according to the 'American Lumber Standard'. Timber for posts and blocks shall be either rough sawn (unplaned) or S4S with nominal dimensions shown. The size tolerance of rough sawn blocks in the direction of the bolt holes shall not be more than ± 0.25 inch. Use only one combination of post and block finish for any one continuous length of guardrail.

Dimensional tolerances not shown or implied are intended to be those consistent with proper functioning of the part including appearance and accepted manufacturing practices."

(III) Amend **710.08(A) Offset Brackets** by adding the following:

"**(3) Recycled Plastic Offset Brackets.** Recycled plastic offset brackets (or spacer blocks) shall consist of minimum 70% by weight of recycled plastic and shall be uniform In composition throughout the product. The product shall exhibit good workmanship and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability. The Engineer will permit only chemicals, including fillers and colorants, designed to inhibit ultraviolet degradation, biological/biochemical decomposition, insect infestation, or burning to enhance durability for a minimum life of 35 years. The basic material used in the construction shall contain at least 2.5% and not more than 3.5% of carbon black when tested according to ASTM D 1603, and shall have not more than 0.03% of absorption when tested according to ASTM D 570, Section 7.1. Each block shall have the manufacturer's name and the date that the block was manufactured, branded on the block."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.04(B) Epoxy Grout** by revising the last paragraph to read as follows:

"Furnish notarized certification to the Engineer that the material proposed for use conforms with the above requirements and those of ASTM C 881, Type IV, Grade 2, Class C. The Contractor may use low viscosity for a deep vertical dowel application."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.07(C)(3) Storm Drain Manholes** to read as follows:

"**(3) Storm Drain Manholes.** Fabricate the rungs for storm drain manholes either from:

(1) 1.0-inch round wrought iron or steel bars; or

(2) 0.5-inch round steel reinforced copolymer polypropylene plastic bars.

The 1.0-inch round wrought iron or steel bars shall conform to 712.07(C)(1) - Water Valve Manholes.

The 0.5-inch round steel reinforced copolymer polypropylene plastic shall conform to ASTM C478 and C497, except that the minimum horizontal pullout load shall be 1500 pounds; ASTM A615 grade 60 (deformed reinforcing steel bars); ASTM D4101; and AASHTO M 199. Provide the steps with foot-safe end lugs permanently molded into the step and safety foot thread designed for excellent grip. An independent certified laboratory shall prepare the Certification of compliance with the above requirements. Submit the Certification of compliance with the request for acceptance by the Engineer."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.29 Luminaires** to read as follows:

"**712.29 Luminaires for Roadway, Underpass, and Sign Lighting.** The type and style of luminaires and lamps shall be according to the contract.

(A) Luminaires for Roadway Lighting. Luminaires shall be for high-pressure sodium lamps.

(1) Housing. The luminaire shall have a rear entry cast aluminum housing with a 2.0-inch slipfitter for inner wiring, a polished aluminum reflector of snap-in design and a pressed glass refractor optical assembly.

(2) Ballast. The ballast shall start and operate the high pressure sodium lamp from the 240/480 volt 60Hz power source. The ballast, including starting aid, shall protect itself against normal lamp failure modes. The ballast shall operate with the lamp in an open circuit or short circuit condition for 6 months without significant loss of ballast life.

Submit a statement that the ballast furnished is in full compliance with the lamp-ballast specifications available to the fixture manufacturer from the lamp manufacturers.

For nominal line voltage and nominal lamp voltage, the ballast design center will vary less than 5% from rated lamp wattage.

At any lamp voltage, from nominal through life, lamp wattage regulation spread at that lamp voltage shall not exceed 8% for ± 10% line voltage variation.

Provide ballast electrical data and lamp operating volt-watt traces for nominal and ± 10% rated line voltage to verify ballast performance and compliance with lamp specifications, for the rated life of the lamp.

The ballast shall reliably start and operate the lamp in ambient temperatures down to -34 °C. for the rated life of the lamp. Ballast primary current during starting may not exceed normal operating current.

The lamp current crest factor shall not exceed 1.8 for ± 10%

line voltage variation at any lamp voltage, from nominal through life.

The ballast design shall be such that the normal manufacturing tolerance for capacitors of ± 6% will not cause more than a ± 5% variation in regulation throughout rated lamp life for nominal line voltage.

(3) Lamp. Lamps shall be clear, mogul base, high pressure sodium type. Lamp wattage shall be as specified in the contract.

(4) Illumination. The luminaires shall provide the roadway a minimum average maintained illumination values according to the manufacturer's specifications. Submit photometric data with certification of conformance.

(5) Glare Shield. Provide internal or external glare shield that eliminates stray light above the 90° nadir line for luminaires according to the contract. External shield shall be aluminum or zinc-coated steel.

(6) Photoelectric Control Receptacle. Luminaires shall be with or without photoelectric control receptacles as specified in the contract plans. When a photoelectric control receptacle is included but not used, a raintight shorting cap is required.

(B) Luminaires for Underpass Lighting. Luminaires shall be for high pressure sodium lamps.

(1) Housing. The luminaire shall have a die-cast housing that encloses the ballast, lamp socket, specular aluminum reflector, and a refractor of molded, prismatic thermal, shock-resistant glass with polycarbonate vandal shield. The lens assembly shall be fastened by concealed hinges and a single point, positive acting latch. Fittings shall be non-ferrous. The unit shall be of the size and provide the light distribution according to the contract.

(2) Ballast. The ballast shall be regulator-type, 480 volts ± 10% for multiple circuits and high pressure sodium lamps. Each luminaire shall be fused individually.

(3) Lamps. Lamps shall be clear, mogul base, high pressure sodium type. Lamp wattage shall be as specified in the contract.

(C) Luminaires for Sign Lighting. Luminaires shall be for metal halide lamps.

(1) Housing. The housing shall be aluminum, alzac reflector, with high-impact resistant glass covers with hinge and latch, and of watertight construction. A bracket raceway shall be provided with the luminaire.

(2) Ballast. The ballast shall be for metal halide lamps, self-regulating at specified voltage ± 13%, single phase, 60 hertz. The ballast shall be water-proof and mounted integral to the unit.

(3) Lamps. Lamps shall be clear, mogul base, metal halide type. Lamp wattage shall be as specified in the contract."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.32(A) Light Source for Roadway Lighting Luminaires** to read as follows:

"**(A) Light Source for Roadway Lighting Luminaires.** All light sources of installation in roadway lighting luminaires shall be Low Pressure Sodium. minimum 18,000 hours, non-metallic bayonet base, sodium retaining reservoirs, insulation at the 'U' bend, an arc support system and a fuse coil in lamp base for ballast protection."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.34(B) Conductors and Cables for Traffic Signal System** to read as follows:

"**(B) Conductors and Cables.** All Cables with IMSA Specification Reference shall be certified in writing by IPSA as meeting the requirements.

(1) Type 1 - Signal-Loop Cable for Load Circuits from the Cabinet Looped to Field Pullboxes. Polyethylene Insulated, Stranded, 14 AWG Copper; 26 Conductor Cable; Polyethylene Jacketed; Color-Coded; IMSA Specification No. 20-1 Certified.

(Note: Use One - 26C #14 Cable for 5 phases or less.
Use Two - 26C #14 Cable for 6 or more phases.)

(2) Type 2 - Home-Run Cable Tie-In Loop Detector Stubs or Ped Push Buttons to the Cabinet. Polyethylene Insulated, Stranded-Tinned-Copper 14 AWG; 2 Conductor Cable; Polyethylene Jacketed; 600 Volts Rated; IMSA Specification No. 50-2 Certified.

(3) Type 3 - Inter-Connect Cable Tie-In One Signalized Intersection to Another. Polyethylene Insulated, Solid Copper, 19 AWG; 24 Conductor (12 Twisted Pairs) Cable; Copper Shielded with Polyethylene Jacketed; 300 Volts Rated; Color-Coded; IMSA Specification No. 40-2 Certified.

(Note: Use One - 12 pairs, #19 continuous run from one controller to the next controller. Splicing between controllers is prohibited.)

(4) Type 4 - Detector-Loop Cable for Installation into the Roadway Sawcut. 12 AWG Stranded THHN Conductor; 600 Volts; Inserted into a Polyethylene Tube, 0.25 Inch Maximum Diameter; IMSA Specification No. 51-5 Certified. Cable inclusive in the Detector Loop Bid.

(5) Type 5 - Signal-Drop Cable from 3-Section, RYG Traffic Signal Heads and FDW-W (Pedestrian Signal Head) Dropped from Signal Head on Traffic Signal Standard to Pullbox for Splicing. The Cable shall be Polyethylene Insulated, Stranded; Copper 14 AWG; 4 - Conductor Cable; 600 Volts, Color-Coded; IMSA Specification No. 20-1 Certified. Cable incidental to the Traffic Signal Head bid.

(Note: Use One - 4C #14 Cable for 3-Section Traffic Signal Head, Programmable Signal Head, and Pedestrian Signal Head.

Use Two - 4C #14 Cable for Fiber Optic Signal Head)

(6) Type 6 - Electrical Service Cable from Electrical Company Secondary Lines to Traffic Signal Meter to Controller Cabinet. RHW-USE; Neoprene Insulated; Three Conductors each; Size as shown on plans; BRW Color Coded.

(7) Type 7 - Preemption Detector (Opticom) Cables. Preemption Detector (Opticom) Cables are the specific cables which run continuously from the Optical Detectors mounted on the traffic signal standards to the terminal blocks for the M562 Phase Module located in the controller cabinet. Each detector shall have their own cable running back to the Controller Cabinet. The detector cable shall be 3M's M138 Optical Detector Cable compatible and consistent with the requirements for the Opticom Preemption System. The M138 Cable shall be BerkTek Type B, Shield Jacket, Three - Insulated Conductor Cable, 20 AWG, One - 20 AWG Bare Stranded Ground, 600 Volts, Orange-Blue-Yellow Color Coded and 5/16 inch diameter.

(8) Ground Wire. Ground wire shall be single conductor No. 8 AWG as shown on plans, solid electrolytic bare copper medium-hard-drawn and suitable for grounding wire. The conductor shall conform to ASTM B 2. The wire shall weigh approximately 49.9 pounds per 1,000 feet.

(9) Overhead Construction. Messenger for overhead interconnect system shall be o.25 inch 7-wire strand conforming to ASTM A 475, extra galvanized Siemens-Martin grade with breaking strength of 6,000 pounds. Conductor shall be as specified on the project drawings. Messenger Hangar shall be of the universal type suitable for 0.25 inch bolts. Lashing wire shall be of 0.045-inch diameter stainless steel wire."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendments to said Section:

(I) Amend **712.37 Controller Equipment** to read as follows:

"712.37 Controller Equipment.

(A) Controller Assembly. Controller Assembly shall consist of a Model 170 Controller, Cabinet, and Auxiliary Equipment. Except where noted, only manufacturers and products listed on the current State of California, 'Qualified Products List (QPL) for Model 170 Controller Assembly,' from the California Department of Transportation (CALTRANS) shall be acceptable. A copy of the latest QPL is available from the City & County of Honolulu, DTS, Phone (808) 527-6988.

The Contractor should review Section 623.03(G)(2)(a) concerning quality control and testing prior to field installation.

For this project, Controller Assemblies are described and supplied as follows:

(1) Type '170' Controller Assembly and Model 332 Controller Cabinet shall mean the latest Model 170 Controller Assembly and Model 332 Controller Cabinet on the most current CALTRANS Qualified Products List (QPL).

(2) Each Controller Assembly shall contain the sufficient amount of items listed below for a full 8 vehicle, 4 pedestrian and 4 preemption phase intersection, even though the plans does not reflect it.

Item	Quantity
Model 170 Controller	1
Model 412C Prom Module	1
Model 400 Modem	1
332A Aluminum Cabinet	1
Model 200 Load Switches	12
Model 204 Flasher	All
Model 242 Isolators	2
Model FS/ST Isolator	All
Flash Transfer Relays	All
Model 210 Conflict Monitor	1
Model 262C Detector Amplifiers (Rotary Sw Type)	8
Model M752 Preempt. Car (Non-QPL)	2
Model UTS (Non-QPL)	1

(B) Model 170 Controller. Each Model 170 Controller shall meet the following additional requirements:

(1) Model 412C Prom Module includes a 27256 EPROM Chip

(2) A Supercap replaces the battery as the standby power supply to keep the DTA and RAM on the CPU board powered for at least 8 hours during ac power loss.

(3) Dual ACIAs, C2 and C20, serial communication ports.

(4) All Controller Boards mounted vertically.

(5) One Manual with each controller.

(6) Documented Validation Testing according to CALTRANS test specifications.

(C) Cabinet. Each 332A Cabinet shall meet the following additional requirements:

(1) Minimum Wired for 8 vehicle phases, 4 pedestrian phases, and 4 preemption phases.

(2) Cabinets fabricated from 0.125 anodized Aluminum.

(3) Cabinet's Main Breakers shall be rated as 50 amps.

(4) Entire Output File copper hard-wire of sufficient gauge to withstand current surges before circuit breakers or surge protectors trip.

(5) A LED Display for Modem Transmit, Receive, and Carrier Detect status will be clearly visible after opening the cabinet's front door. Indicators mounted on a 0.75 Inch x 2 Inch aluminum assembly will be attached to the top center of the cabinet's rack. Indicators will derive their signals from the C2 ACIA and wiring will be bundled with a protective jacket.

(6) C2 Terminal Blocks protected from current surges by EDCO PC642 or equal.

(7) Input File and Field Terminal Blocks wired for 3M M752 Opticom Priority Module EVA, EVB, EVC, and EVD.

(8) Front and back fluorescent lights activated upon opening any door.

(9) Convenience GFI Receptacles.

(10) Door locks of solid brass rim Best Lock Series 516RL3XA7559-606 and include 2 keys.

(11) Labeling by Silk-Screening only.

(12) Output File Terminal Blocks labeled in reference to its assigned phase and signal indications.

(13) Attach One Each 24-Inch x 36-Inch Cabinet Print in a weatherproof plastic jacket to front and back cabinet doors.

(14) Documented validation testing of cabinet and conflict monitor according to CALTRANS test specifications.

(D) Auxiliary Equipment. Deliver the controller unit supplied with the following auxiliary equipment:

Auxiliary equipment not on the QPL shall meet the following pertinent requirements:

(1) Model M752 Optical Preemption Module. The M752 will be card-type and will interface with the Model 170 cabinet preemption slots of the input file. Each M752 Module will have 2 channels of preemption. The M752 will include firmware to discriminate between the two valid priority signals, to prioritize valid same priority signals on a first come basis, and to override the low priority signal if a high priority is received. The M752 Module will receive input signals (9.639 and 14.035 hz) to permit priority preemption operation within the 170 local intersection program. M752 will optically isolate output signals and will trigger an active low signal to the controller for high priority and a pulsed active low signal for low priority. Since Honolulu's preemption system already employs the 3M Opticom System, all new preemption equipment will be by this manufacturer.

(2) Universal Time Standard (UTS) Module. The UTS Module will be a stand alone precision clock located in the Controller Cabinet which shall update the internal clock of the Model 170 controller by decoding Five Broadcast Frequencies (2.5, 5, 10, 15, 20 Mhz) transmitted by WWVH of the U.S. National Institute of Standards and Technology. All hardware and software of the UTS equipment will be compatible without any modification to the Model 170 Hardware or Software. The UTS Module shall have the following specifications:

1.5 ms Time Accuracy; 2 - 4 Minutes Time to Acquire; Minimum 5 - Frequency, AM, Crystal-Controllered, Dual Conversion, Superheterodyne Receiver; Automatic Scan 5 Frequencies; Data Output RS-232C, 1200 & 2400 Baud rate, No Parity, 8 Data Bits, 1 Stop Bit; One Hour Selectable Time Zones: Daylight Saving Time Option; 24 Hour Time Format; Month, Day, and Year Date; DB25-RS232 and BNC Antenna Connector; DB25 to Model 170 C2 Cable and Connectors; 2-foot outdoor Whip Antenna with Pole Adapter Bracket; 100 linear feet of RG-58 Coaxial Cable with Connectors; Approximate Size 1.5 Inch H x 8 Inch W x 9 Inch D and Weight 1.5 Lbs.; 24 VDC; Traconex / Multisonics UTS Model 1010 or equal. All UTS equipment and antennas will be installed by the Contractor and included in the controller assembly bid."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendments to said Section:

(I) Amend **712.39 (A)(1) - Optical Units** as follows:

(1) Optical Units. Each optical unit includes a lens, reflector, a lampholder, and a clear traffic signal lamp visible to traffic.

Standard lenses shall be of the color shown, circular in shape, and a diameter of about 12 inches. Each lens shall be true to color, free from imperfections and of high luminous transmission. The manufacturer may make the lens of glass or of polycarbonate resin. Glass lens shall conform to the latest ANSI standard for glass lens. Mold polycarbonate lens of ultraviolet, pre-tinted transparent polycarbonate.

Each reflector includes a one piece, clear glass parabolic reflector, free from bubbles and striae or Alzak processed aluminum alloy. Silver the convex surface of the clear glass by chemical deposition. The thickness shall be such that the lighted filament of a 150-watt incandescent lamp shall not be visible through the silver layer. Protect the silvered surface by an additional coating of electrolytically deposited copper. The opening in the back of the reflector for the lampholder shall have no dark spots cast on the lens.

The lampholder shall be of weatherproof, molded construction, immune to the operating temperatures in the unit, of the vibration-proof type, and shall be substantially supported. Provide the lampholder with two wires of sufficient length so that the lampholder may be connected to the terminal block specified. These socket leads shall be directly soldered to the socket. The lampholder contacts and screwshell shall be made of corrosion-resistant metal. The reflector and lampholder assembly shall position the lamp filament at the focal center of the reflector.

Design each reflector, lens and hood to minimize sun phantom.

Lamps for 12-inch units shall be 100 watts, 120 volt, 5000 hour rated life, clear, traffic signal lamps, conforming to the latest edition of the Institute of Transportation Engineers, 'Standard for Traffic Signal Lamps', or as otherwise accepted.

The following pertains to the incandescent vehicle non-programmable signal only:

Replace the incandescent signal of the vehicle signal head with a LED signal assembly comprised of a high-out LED light source protected by an impact-resistant polycarbonate lens. The LED head assembly shall replace the standard 12-inch incandescent polycarbonate signal head. Operating at 60 - 135 volts and with a maximum power consumption of 22 watts.

To ensure quality and performance, the LED head shall have a prior history of testing and use by CALTRANS, exceeds ITE standards, failure of one LED shall not affect any other LED, fully-encapsulated electronic circuitry, and configuration for 12-inch ball. McCain Traffic Supply 12-inch LED Traffic Head or equal."

(II) Amend **712.39(E) Pedestrian Signal Push Button with Integral Sign** to read as follows:

"**(E) Pedestrian Signal Push Button With Integral Sign.** The pedestrian push button unit shall consist of a one-piece assembly that can be secured to traffic poles with standard banding straps, tamper proof, weatherproof, and constructed so that electrical shocks are impossible to receive..

The one-piece assembly shall consist of a raised walking person, a raised arrow indication, and a pushbutton. Paint the unit black and paint the raised walking person, arrow, and pushbutton white. The pushbutton shall extend from the sign faceplate approximately three inches. The pushbutton actuator shall be of the mushroom plunger type, ADA acceptable, two inches in diameter, and have a tension of less than five pounds when pressed. The raised walking person and arrows shall be directional and match the directional indication as shown on the plans. All wire connections shall be accessible from the back of the assembly."

(III) Amend **712.39 Traffic Signals and Appurtenances** by adding the following:

"**(G) Preemption Detectors.**

(1) Description. Preemption Detectors are located on traffic signal standards to convert optical signals emitted from an emergency vehicle to electrical pulses for emergency preemption of the traffic signals. Electrical signals from the optical detector are transmitted by a 4 conductor cable to the preemption module M752 located in an input slot of the controller cabinet. The M752 preemption module will direct and hold the controller in a preemption mode until the signal disappears. A preprogrammed selection of phases and signal displays are controlled by the Local Intersection Program. Since

Honolulu's preemption system already employs the 3M Opticom System, all new preemption equipment will be by this manufacturer. All astro-mini brackets or similar for attaching preemption detector to poles shall be included as part of the detector bid.

(2) Materials.

(a) Type 7 Cable. The Type Preemption Detector (Opticom) Cables are the specific cables which run continuously from the Optical Detectors mounted on the traffic signal standards to the terminal blocks for the M752 Phase Module in the controller cabinet. The Type Preemption Detector cable shall be 3M's M138 Optical Detector Cable compatible and consistent with the requirements for the Opticom Preemption System. The M138 Cable shall be BerkTek Type B, Shield Jacket, 3-Insulated Conductor, 20AWG Stranded Copper, 1-20AWG Bare Stranded Ground, 600 Volts, Orange-Blue-Yellow Color Coded, and 5/16 diameter.

(b) M752 Optical Preemption Module. The M752 Module is part of Section 712.37(D) Controller Equipment-Auxiliary Equipment.

(c) Model 711 Preemption Detector. This Optical Detector is designed and installed for uni-direction signal reception and single channel-phase operation. Signal reception will be adjustable and up to 2500 ft. Detector will be constructed from high-impact polycarbonate.

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.53(E)(1) Composition** to read as follows:

"**(l) Composition.** The tape shall be a highly reflective, conformable, material intended for marking applications where removability is required.

The tape includes a mixture of high quality polymeric materials and pigments and shall not contain metallic foil. DIstribute the glass beads throughout the pigmented area and in a reflective layer bonded to the top surface. The performance of the glass beads shall meet the durability and reflectance criteria according to the contract. Precoat the tape with a pressure sensitive adhesive to reinforce the tape. The tape shall adhere to roadway surfaces under climatic and traffic conditions normally met in the construction work zone. Expose the newly applied tape immediately to traffic without pickup or distortion by vehicles."

(II) Amend **712.53(F)(3) Type III** by adding the following:

"**(l) Skid Resistance.** The surface of the retroreflective films shall provide an initial minimum average skid resistance value of 55 BPN when tested according to ASTM E 303.

(j) Retained Skid Resistance. The surface of the retroreflective film shall retain an average skid resistance value of 45 BPN, when tested according to ASTM E 303, for one year when installed in non-snow removal areas. The 45 BPN minimum value shall be an average of several readings taken in both the wheel track and non-wheel track areas."

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following amendment to said Section:

(I) Amend **712.55(A)(2) General** to read as follows:

"**(2) General.** All hydrocarbon based reflective thermoplastic compound pavement markings shall be prohibited for use on the project. The compound shall not deteriorate by contact with sodium chloride, calcium chloride, oil content of pavement materials, or from oil droppings from traffic."

SECTION 712 - MISCELLANEOUS

Make the following Subsection a part of said Section:

Amend **712.57 Hot Applied Rubberized Sealant** by revising the table to read as follows:

TESTS	SPECIFICATIONS LIMITS
Brookfield Viscosity at 400°F. (ASTM D 3236)	75 poise maximum
Penetration, 125°F., 50g. 5 seconds (ASTM D 5)	50 maximum
Penetration, 77°F., 100g. 5 seconds (ASTM D 5)	10 - 25
Softening Point (ASTM D 36)	210°F.
Ductility, 77°F. (ASTM D 113)	15 cm minimum
Flexibility, 0°F. Crafco Procedure	Pass
Recommended Pour Temperature	380°F.
Safe Heating Temperature	420°F.
Specific Gravity at 60°F. (material purity)	1.05 maximum"

END OF SECTION

SECTION 712 - MISCELLANEOUS

Make the following Subsection a part of said Section:

"712.62 Luminaire and Conductor Identification. Affix tags of rigid, non-ferrous material, with machine embossed legend on two sides with non-ferrous wire to feeder, branch feeders, and sub-branch conductors in pullboxes and light standard bases. Legend shall indicate feeder designation and be in letter quarter inch high."

END OF SECTION

SECTION 713 - STRUCTURAL STEEL AND RELATED MATERIALS

Make the following amendment to said Section:

(I) Amend **713.04 High-Strength Bolts** to read as follows:

"713.04 High-Strength Bolts and Studs.

(A) Bolts, Studs, Nuts, and Washers. Bolts, nuts, and washers shall conform to AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS Section 6.4.3 Bolts, Nuts, and Washers under the Standard Specification for Structural Bolts, Steel, Heat-Treated, 120/105 KSI Minimum Tensile Strength with a required minimum tensile strength of 120 KSI for diameters 0.5-inch through 1.0-inch and 105 KSI for diameters 1.125-inches through 1.5 inches AASHTO M 164 (ASTM A 325 as modified), Type 1. Anchor bolts shown on the plans in the form of studs with no bolt heads and bolts in the diameters 1.75-inches to 3.0-inches designated as high-strength studs or bolts shall conform to ASTM A 449, Type 1. Hot-dip zinc-coat the bolts, studs, nuts, and washers.

(B) Installation. AASHTO LRFD Bridge Construction Specifications, Section 11.5.6.4 and as modified herein applies when installing high-strength bolts in the field or shop. Install the bolts according to AASHTO LRFD Bridge Construction Specifications - Section 11.5.6.4.7 Direct Tension Indicator Installation Method. Anchor bolts for railing posts base plates may also be installed using the Turn-of-Nut Method and the Calibrated 'Wrench Method."

(II) Amend **713.11(C) Square Tube Posts** to read as follows:

"(C) Square Tube Posts. Square tube posts shall conform to ASTM A 446 for Cold-Rolled Carbon Steel Sheet, commercial quality or ASTM A 570-90 for Hot-Rolled Carbon Steel Sheet, structural quality. The tube shall have a hot-dip zinc-coating according to ASTM A 525, Designation D-90.

Make the corner welds by high frequency resistance welding, externally scarfed, and zinc-coated after scarfing. Four sides of the square tube post shall have seven-sixteenths inch diameter holes spaced one inch on centers along the entire length of the post. Permissible tolerances are shown in Table 713-IV. Square tube posts shall be crash-worthy and acceptable to FHWA for use in both strong soil (S-1) and weak soil (S-2) as defined in NCHRP Report 230.

Single square tube post used to support signs shall have an accepted device to resist turning after installation. Attach this device to the post and embed this device below finish grade.

TABLE 713-1 GALVANIZED SQUARE TUBE POST TOLERANCE

Physical Property	Nominal Outside Size, Inch		
	1.75 Square	2 Square	2.25 Square
U.S. Standard Gage	14		
Wall Thickness - Inch	0.083, +0.002, -0.008		
Minimum Yield Strength - Psi	60,000		
Minimum Weight - Pounds/Foot	1.8	2.1	2.4
Outside Dimension - Inch	±0.010	±0.010	±0.010
Side Squareness - Inch	±0.010	±0.012	±0.014
Twist Permitted - Inch/Foot	0.062/3	0.062/3	0.062/3
Straightness	1/16 Inch in 3 Feet		
Telescoping	Consecutive Size Tubes Shall Telescope Freely For 10 Feet		
Hole Size - Inch	±1/64		
Hole Spacing	±1/8 in 20 Feet		

TABLE 713-2 VB SQUARE TUBE POST TOLERANCE

Physical Property	Nominal Outside Size, Inch				
	1.5 Square	1.25 Square	2 Square	2.25 Square	2.5 Square
U.S. Standard	12				
Wall Thickness, Inch	0.105, +0.011, -0.008				
Minimum Yield Strength, Psi	40,000				
Minimum Weight, Pounds/Foot	1.7	2.0	2.4	2.7	3.1
Outside Dimension, Inch	±0.008	±0.008	±0.008	±0.010	±0.010
Side Squareness, Inch	±0.008	±0.010	±0.012	±0.014	±0.016
Twist Permitted, Inch/Foot	0.062/3	0.062/3	0.062/3	0.062/3	0.062/3
Straightness	1/16 Inch in 3 Feet				
Telescoping	Consecutive Size Tubes Shall Telescope Freely For 10 Feet				
Hole Size, Inch	±1/64				
Hole Spacing, Inch	±1/8 in 20 Feet				

TABLE 713-IV.C SQUARE TUBE POST TOLERANCE		
Physical Property	**Nominal Outside Size, Inch**	
	2.187 Square	**2.5 Square**
U.S. Standard	10	
Wall Thickness, Inch	0.135, +0.011, -0.008	
Minimum Yield Strength, Psi	40,000	
Minimum Weight, Pounds/Foot	3.4	4.0
Outside Dimension, Inch	±0.010	±0.010
Side Squareness, Inch	±0.014	±0.015
Twist Permitted, Inch/Foot	0.062/3	0.075/3
Straightness	1/16 Inch in 3 Feet	
Telescoping	Consecutive Size Tubes Shall Telescope Freely For 10 Feet	
Hole size, Inch	±1/64	
Hole Spacing, Inch	±1/8 In 20 Feet	

(III) Amend **713.12(A)** to read as follows:

"**(A)** Secure the regulatory signs, warning signs, and route marker assemblies, mounted on pipe posts, in position by using zinc-coated flat washer with nylon washer. Install them between the post and sign and under the bolt head on the sign surface. Bolts and other metal washers shall be wrought iron zinc-coated by the hot-dip process according to ASTM A 153."

(IV) Amend **713.14(A)(1) Tapered Posts And Cross Arms** by revising the sixth paragraph to read as follows:

"Gages shall be of the following thicknesses:

No. 7 gage	0.1793 inch
No. 3 gage	0.2500 inch
No. 0 gage	0.3125 inch"

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 717 - CULLET AND CULLET-MADE MATERIALS

717.01 Cullet and Cullet-Aggregate Mixtures as Construction Materials. When available, process recycled glass into construction-grade cullet (crushed glass) using methods accepted by the Engineer. Construction-Grade cullet shall have a uniform gradation from fine to coarse. 100% of the material shall pass the 0.375 inch sieve. Blend the processed cullet with the natural aggregates according to Subsections 717.02 - Cullet Materials for Roadway, 717.03 - Cullet Materials for Utility Structures, or 717.04 - Cullet Materials for Drainage Systems.

Cullet content is the percentage at which the Contractor uses the construction-grade cullet with or without the addition of natural aggregates depending on its application(s). The mixture of the materials produced shall be of acceptable gradation as specified for the finished product.

Debris include plastics, papers, and non-ceramic constituents of the cullet. The contract considers debris as deleterious material. Debris shall not exceed values specified for various applications of the processed cullet. Also, the Engineer will not allow hazardous material in the cullet.

Compaction shall comply with the minimum levels, as specified for each particular application, to attain the desired engineering properties in the field.

717.02 Cullet Materials for Roadways. Roadway applications include the use of cullet and cullet-aggregate mixtures in base course (untreated or glassphalt concrete base course mix), subbase, and embankments. Use of construction-grade cullet is appropriate depending on cullet percentage. Table 717-I lists the limits of cullet content and debris levels allowed for cullet use in roadway applications.

TABLE 717-I CULLET IN ROADWAY APPLICATIONS

Roadway Applications	Cullet Content (% By Weight)	Maximum Debris Level (% By Weight Of Cullet)
Base Course	10 to 15	0.2
Subbase	10 to 25	0.2
Embankments	10 to 25	0.3

717.03 Cullet Material for Utility Structures. Utility applications involve the use of cullet for trench bedding and backfill for utility structures. Process the cullet

into construction grade according to Subsection 717.01 - Cullet and Cullet - Aggregate Mixtures as Construction Materials before use in these applications. Table 717-II lists the limits of cullet content and debris level for utility fill applications. The cullet contents listed shall apply to backfill that is not subjected to surcharge loading such as from a roadway. If the trench backfill lies within five feet of a road surface, then use the values given in Table 717-I, as applicable.

TABLE 717-II - CULLET IN UTILITY APPLICATIONS

Utility Trench Bedding and Backfill Applications	Maximum Cullet Content (% By Weight	Maximum Debris Level (% By Weight Of Cullet
Sewer Pipes	100	0.3
Electrical Conduits	100	0.3
Fiber Optic Lines	100	0.3

717.04 Cullet Materials for Drainage Systems. Drainage fill applications include retaining walls, foundation drains, drainage blankets, and french drains. For use in these applications, cullet shall be of construction grade according to Subsection 717.01 - Cullet and Cullet-Aggregate Mixtures as Construction Materials. Table 717-III lists the limits of cullet content and debris levels for drainage fill applications. These values assume that the cullet is not subjected to surcharge loading as from a roadway. If the fill is subject to surcharge loads, then use the values set forth in Table 717-I, as applicable.

TABLE 717-III - CULLET IN DRAINAGE APPLICATIONS

Drainage Fill Applications	Maximum Cullet Content (% By Weight)	Maximum Debris Level (% By Weight Of Cullet)
Retaining Walls	100	0.2
Foundation Drainage	100	0.2
Drainage Blankets	100	0.2
French Drains	100	0.2"

END OF SECTION

Requirement of Chapter 104, HRS
Wages and Hours of Employees on Public Works Law

Chapter 104, HRS, applies to every public works construction project over $2,000, regardless of the method of procurement or financing (purchase order, voucher, bid, contract, lease arrangement, warranty).

Rate of Wages for Laborers and Mechanics

- Minimum prevailing wages (basic hourly rate plus fringe benefits), as determined by the Director of Labor and Industrial Relations and published in wage rate schedules, shall be paid to the various classes of laborers and mechanics working on the job site. [§104-2(a), (b), Hawaii Revised Statutes (HRS)]

- If the Director of Labor determines that prevailing wages have increased during the performance of a public works contract, the rate of pay of laborers and mechanics shall be raised accordingly. [§104-2(a) and (b), HRS;§12-22-3(d) Hawaii Administrative Rules (HAR)]

Overtime

- Laborers and mechanics working on a Saturday, Sunday, or a legal holiday of the State or more than eight hours a day on any other day shall be paid overtime compensation at one and one-half times the basic hourly rate plus the cost of fringe benefits for all hours worked. [§§104-1(5), 104-2(c), HRS]

Weekly Pay

- Laborers and mechanics employed on the job site shall be paid their full wages at least once a week, without deduction or rebate, except for legal deductions, within five working days after the cutoff date. [§104-2(d), HRS]

Posting of Wage Rate Schedules

- Wage rate schedules shall be posted by the contractor in a prominent and easily accessible place at the job site. A copy of the entire wage rate schedule shall be given to each laborer and mechanic employed under the contract, except when the employee is covered by a collective bargaining agreement. [§104-2(d), HRS]

Withholding of Accrued Payments

- If necessary, the contracting agency may withhold accrued payments to the contractor to pay to laborers and mechanics employed by the contractor or subcontractor on the job site any difference between the wages required by the public works contract or specifications and the wages received. [§104-2(e), HRS]

Certified Weekly Payrolls and Payroll Records

- A certified copy of all payrolls shall be submitted weekly to the contracting agency.

- The contractor is responsible for the submission of certified copies of the payrolls of all subcontractors. The certification shall affirm that the payrolls are correct and complete, that the wage rates listed are not less than the applicable rates contained in the applicable wage rate schedule, and that the classifications for each laborer or mechanic conform with the work the laborer or mechanic performed. [§104-3(a), HRS]

- Payroll records shall be maintained by the contractor and subcontractors for three years after completion of construction. The records shall contain:
  - the name and home address of each employee
  - the employee's correct classification
  - rate of pay (basic hourly rate + fringe benefits)
  - daily and weekly hours worked
  - weekly straight time and overtime earnings
  - amount and type of deductions
  - actual wages paid
  - date of payment

- Records shall be made available for inspection by the contracting agency, the Department of Labor and Industrial Relations, and any of its authorized representatives, who may also interview employees during working hours on the job. [§104-3(b), HRS]

Termination of Work on Failure to Pay Wages

- If the contracting agency finds that any laborer or mechanic employed on the job site by the contractor or any subcontractor has not been paid prevailing wages or overtime, the contracting agency may, by written notice to the contractor, terminate the contractor's or subcontractor's right to proceed with the work or with the part of the work in which the required wages or overtime compensation have not been paid. The contracting agency may complete this work by contract or otherwise, and the contractor or contractor's sureties shall be liable to the contracting agency for any excess costs incurred. [§104-4, HRS]

Apprentices and Trainees

- In order to be paid apprentice or trainee rates, apprentices and trainees must be parties to an agreement either registered with or recognized as a USDOL nationally approved apprenticeship program by the Department of Labor and Industrial Relations, Workforce Development Division. [§12-22-6(1), HAR]

- The number of apprentices or trainees on any public work in relation to the number of journey workers in the same craft classification as the apprentices or trainees employed by the same employer on the same public work may not exceed the ratio allowed under the apprenticeship or trainee standards registered with or recognized by the Department of Labor and Industrial Relations. A registered or recognized apprentice receiving the journey worker rate will not be considered a journeyworker for the purpose of meeting the ratio requirement. [§12-22-6(2), HAR]

Enforcement

- To ensure compliance with the law, DLIR and the contracting agency will conduct investigations of contractors and subcontractors. If a contractor or subcontractor violates the law, the penalties are:

■**First Violation:**	Equal to 10% of back wages found due or $25 per offense, whichever is greater.
■**Second Violation**	Equal to amount of back wages found due or $100 per each offense, whichever is greater.
■**Third Violation**	Equal to two times the amount of back wages found due or $200 for each offense, whichever is greater; and Suspension from doing any new work on any public work of a governmental contracting agency for three years.

■A violation would be deemed a second violation if it occurs within two years of the **first notification of violation**, and a third violation if it occurs within two years of **the second notification of violation**.

■Suspension. For a first or second violation, the department shall immediately suspend a contractor who fails to pay wages or penalties until all wages and penalties are paid in full. For a third violation, the department shall penalize and suspend the contractor as described above, **except that if the contractor continues to violate the law, then the department shall immediately suspend the contractor for a mandatory three years. The contractor shall remain suspended until all wages and penalties are paid in full.** [§§104-24, 104-25]

- Any contractor who fails to make payroll records accessible or provide requested information within 10 days, or fails to keep or falsifies any required record, shall be assessed a penalty as provided in Section 104-22(b),HRS. [§104-3(c)]

- If any contractor interferes with or delays any investigation, the contracting agency shall withhold further payments until the delay has ceased. Interference or delay includes failure to provide requested records or information within ten days, failure to allow employees to be interviewed during working hours on the job, and falsification of payroll records. The department shall assess a penalty of $1,000 per project, and $100 per day thereafter, for interference or delay. [§104-22(b)]

For additional information, contact any of the following DLIR offices:

Oahu (Enforcement Division)	586-8777
Maui	243-5322
Hilo	974-6464
West Hawaii	322-4808
Kauai	274-3351

GENERAL DECISION HI020001 01/10/2003 HI1

Date: January 10, 2003
General Decision Number HI020001

Superseded General Decision No. HI010001

State: Hawaii

Construction Type:
BUILDING
DREDGING
HEAVY
HIGHWAY
RESIDENTIAL

County(ies):
STATEWIDE

BUILDING CONSTRUCTION PROJECTS; RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories); HEAVY AND HIGHWAY CONSTRUCTION PROJECTS AND DREDGING

Modification Number	Publication Date
0	03/01/2002
1	03/08/2002
2	04/19/2002
3	05/03/2002
4	07/05/2002
5	08/02/2002
6	08/16/2002
7	09/06/2002
8	09/27/2002
9	10/04/2002
10	11/08/2002
11	11/15/2002
12	11/22/2002
13	01/03/2003
14	01/10/2003

COUNTY(ies):
STATEWIDE

ASBE0132A 08/30/1998

	Rates	Fringes
ASBESTOS WORKERS/INSULATORS Includes application of all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems. Also the application of firestopping material for wall openings and penetrations in walls, floors, ceilings and curtain walls.	26.50	14.89

BOIL0204A 10/01/1998

	Rates	Fringes
BOILERMAKERS	26.25	13.76

BRHI0001A 09/02/2002

	Rates	Fringes
BRICKLAYERS; Caulkers; Cement Block Layers; Cleaners; Pointers; and Stonemasons	25.92	16.72

BRHI0001B 09/02/2002

	Rates	Fringes
TERRAZZO WORKERS:		
Terrazzo Workers	26.17	16.72
Terrazzo Base Grinders	24.36	16.72
Terrazzo Floor Grinders and Tenders	22.81	16.72

BRHI0001C 09/03/2001

	Rates	Fringes
MARBLE MASONS	25.77	15.76

BRHI0001D 09/03/2001

	Rates	Fringes
TILE LAYERS (CERAMIC)	25.77	15.76
TILE LAYER FINISHERS (CERAMIC)	22.41	15.76

CARP0745A 03/04/2002

	Rates	Fringes
CARPENTERS:		
Carpenters; Hardwood Floor Layers; Patent Scaffold Erectors (14 ft. and over); Piledrivers; Pneumatic Nailers; Wood Shinglers; and Transit and/or Layout Man	30.90	15.45
Millwrights and Machine Erectors	31.15	15.45
Power Saw Operators (2 H.P. and over)	31.05	15.45

CARP0745B 03/04/2002

	Rates	Fringes
DRYWALL HANGERS	31.15	15.42
LATHERS	31.15	15.42

* ELEC1186A 08/18/2002

	Rates	Fringes
ELECTRICIANS:		
Electricians	31.70	6.54+30.6%
Technicians	32.65	6.54+30.6%
Cable Splicers	34.87	6.54+30.6%

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* ELEC1186B 08/18/2002

	Rates	Fringes
LINE CONSTRUCTION:		
Linemen	31.70	6.54+30.6%
Technicians	32.65	6.54+30.6%
Heavy Equipment Operators	28.53	6.54+30.6%
Cable Splicers	34.87	6.54+30.6%
Groundmen; Truck Drivers	23.78	6.54+30.6%

ELEV0126A 10/04/1999

	Rates	Fringes
ELEVATOR MECHANICS	34.65	6.935+a+b

a. VACATION: Employer contributes 8% of basic hourly rate for 5 years service and 6% of basic hourly rate for 6 months to 5 years service as vacation pay credit.
b. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day after Thanksgiving Day and Christmas Day.

ENGI0003I 09/01/2002

	Rates	Fringes
POWER EQUIPMENT OPERATORS (Includes All Types of Paving):		
GROUP 1	28.59	16.53
GROUP 2	28.70	16.53
GROUP 3	28.87	16.53
GROUP 4	29.14	16.53
GROUP 5	29.45	16.53
GROUP 6	30.10	16.53
GROUP 7	30.42	16.53
GROUP 8	30.53	16.53
GROUP 9	30.64	16.53
GROUP 9A	30.87	16.53
GROUP 10	30.93	16.53
GROUP 10A	31.08	16.53
GROUP 11	31.25	16.53
GROUP 12	31.58	16.53
GROUP 12A	31.95	16.53
WAGE RATES FOR TUNNEL WORK:		
GROUP 1	28.89	16.53
GROUP 2	29.00	16.53
GROUP 3	29.17	16.53
GROUP 4	29.44	16.53
GROUP 5	29.75	16.53
GROUP 6	30.40	16.53
GROUP 7	30.72	16.53
GROUP 8	30.83	16.53
GROUP 9	30.94	16.53
GROUP 9A	31.17	16.53
GROUP 10	31.23	16.53
GROUP 10A	31.38	16.53

GROUP 11	31.53	16.53
GROUP 12	31.89	16.53
GROUP 12A	32.25	16.53

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Fork Lift (up to and including 10 tons); Partsman (heavy duty repair shop parts room when needed).

GROUP 2: Conveyor Operator (Handling building material); Hydraulic Monitor; Mixer Box Operator (Concrete Plant).

GROUP 3: Brakeman; Deckhand; Fireman; Oiler; Oiler/Gradechecker; Signalman; Switchman; Highline Cableway Signalman; Bargeman; Bunkerman; Concrete Curing Machine (self-propelled, automatically applied unit on streets, highways, airports and canals); Leveeman; Roller (5 tons and under); Tugger Hoist.

GROUP 4: Boom Truck or dual purpose "A" Frame Truck (5 tons or less); Concrete Placing Boom (Building Construction); Dinky Operator; Elevator Operator; Hoist and/or Winch (one drum); Straddle Truck (Ross Carrier, Hyster and similar).

GROUP 5: Asphalt Plant Fireman; Compressors, Pumps, Generators and Welding Machines ("Bank" of 9 or more, individually or collectively); Concrete Pumps or Pumpcrete Guns; Lubrication and

Service Engineer (Grease Rack); Screedman.

GROUP 6: Boom Truck or Dual Purpose "A"Frame Truck (over 5 tons); Combination Loader/Backhoe (up to and including 3/4 cu. yd.); Concrete Batch Plants (wet or dry); Concrete Cutter, Groover and/or Grinder (self-propelled unit on streets, highways, airports, and canals); Conveyor or Concrete Pump (Truck or Equipment Mounted); Drilling Machinery (not to apply to waterliners, wagon drills or jack hammers); Fork Lift (over 10 tons); Loader (up to and including 3 and 1/2 cu. yds); Lull High Lift (under 40 feet); Lubrication and Service Engineer (Mobile); Maginnis Internal Full Slab Vibrator (on airports, highways, canals and warehouses); Man or Material Hoist; Mechanical Concrete Finisher (Large Clary, Johnson Bidwell, Bridge Deck and similar); Mobile Truck Crane Driver; Portable Shotblast Concrete Cleaning Machine; Portable Boring Machine (under streets, highways, etc.); Portable Crusher; Power Jumbo Operator (setting slip forms, etc., in tunnels); Rollers (over 5 tons); Self-propelled Compactor (single engine); Self-propelled Pavement Breaker; Skidsteer Loader with attachments; Slip Form Pumps (Power driven by hydraulic, electric, air, gas, etc., lifting device for concrete forms); Small Rubber Tired Tractors; Trencher (up to and including 6 feet); Underbridge Personnel Aerial Platform (50 feet of platform or less).

GROUP 7: Crusher Plant Engineer, Dozer (D-4, Case 450, John Deere 450, and similar); Dual Drum Mixer, Extend Lift; Hoist and/or Winch (2 drums); Loader (over 3 and 1/2 cu. yds. up to and including 6 yards.); Mechanical Finisher or Spreader Machine (asphalt), (Barber Greene and similar) (Screedman required); Mine or Shaft Hoist; Mobile Concrete Mixer (over 5 tons); Pipe Bending Machine (pipelines only); Pipe Cleaning Machine (tractor propelled and supported); Pipe Wrapping Machine

(tractor propelled and supported); Roller Operator (Asphalt); Self-Propelled Elevating Grade Plane; Slusher Operator; Tractor (with boom) (D-6, or similar); Trencher (over 6 feet and less than 200 h.p.); Water Tanker (pulled by Euclids, T-Pulls, DW-10, 20 or 21, or similar); Winchman (Stern Winch on Dredge).

GROUP 8: Asphalt Plant Operator; Barge Mate (Seagoing); Cast-in-Place Pipe Laying Machine; Concrete Batch Plant (multiple units); Conveyor Operator (tunnel); Deckmate; Dozer (D-6 and similar); Finishing Machine Operator (airports and highways); Gradesetter; Kolman Loader (and similar); Mucking Machine (Crawler-type); Mucking Machine (Conveyor-type); No-Joint Pipe Laying Machine; Portable Crushing and Screening Plant; Power Blade Operator (under 12); Saurman Type Dragline (up to and including 5 yds.); Stationary Pipe Wrapping, Cleaning and Bending Machine; Surface Heater and Planer Operator, Tractor (D-6 and similar); Tri-Batch Paver; Tunnel Badger; Tunnel Mole and/or Boring Machine Operator Underbridge Personnel Aerial Platform (over 50 feet of platform).

GROUP 9: Combination Mixer and Compressor (gunite); Do-Mor Loader and Adams Elegrader; Dozer (D-7 or equal); Wheel and/or Ladder Trencher (over 6 feet and 200 to 749 h.p.).

GROUP 9A: Dozer (D-8 and similar); Gradesetter (when required by the Contractor to work from drawings, plans or specifications without the direct supervision of a foreman or superintendent); Push Cat; Scrapers (up to and including 20 cu. yds); Self-propelled Compactor with Dozer; Self-Propelled, Rubber-Tired Earthmoving Equipment (up to and including 20 cu. yds) (621 Band and similar); Sheep's Foot; Tractor (D-8 and similar); Tractors with boom (larger than D-6, and similar).

GROUP 10: Chicago Boom; Cold Planers; Heavy Duty Repairman or Welder; Hoist and/or Winch (3 drums); Hydraulic Skooper (Koehring and similar); Loader (over 6 cu. yds. up to and including 12 cu. yds.); Saurman type Dragline (over 5 cu. yds.); Self-propelled, rubber-tired Earthmoving Equipment (over 20 cu. yds. up to and including 31 cu. yds.) (637D and similar); Soil Stabilizer (P & H or equal); Sub-Grader (Gurries or other automatic type); Tractors (D-9 or equivalent, all attachments); Tractor (Tandem Scraper); Watch Engineer.

GROUP 10A: Boat Operator; Cable-operated Crawler Crane (up to and including 25 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (up to and including 1 cu. yd.); Dozer D9-L; Dozer (D-10, HD41 and similar) (all attachments); Gradall (up to and including 1 cu. yd.); Hydraulic Backhoe (over 3/4 cu. yds. up to and including 2 cu. yds.); Mobile Truck Crane Operator (up to and including 25 tons) (Mobile Truck Crane Driver Required); Self-propelled Boom Type Lifting Device (Center Mount) (up to and including 25 tons) (Grove, Drott, P&H, Pettibone and similar; Trencher (over 6 feet and 750 h.p. or more); Watch Engineer (steam or electric).

GROUP 11: Automatic Slip Form Paver (concrete or asphalt); Band Wagon (in conjunction with Wheel Excavator); Cable-operated Crawler Cranes (over 25 tons but less than 50 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (over 1 cu. yd. up to 7 cu. yds.); Gradall (over 1 cu. yds. up to 7 cu. yds.); DW-10, 20, etc. (Tandem); Earthmoving Machines (multiple

propulsion power units and 2 or more Scrapers) (up to and including 35 cu. yds.," struck" m.r.c.); Highline Cableway; Hydraulic Backhoe (over 2 cu. yds. up to and including 4 cu. yds.); Leverman; Lift Slab Machine; Loader (over 12 cu. yds); Master Boat Operator; Mobile Truck Crane Operator (over 25 tons but less than 50 tons); (Mobile Truck Crane Driver required); Pre-stress Wire Wrapping Machine; Self-propelled Boom-type Lifting Device (Center Mount) (over 25 tons m.r.c); Self-propelled Compactor (with multiple-propulsion power units); Single Engine Rubber Tired Earthmoving Machine (with Tandem Scraper); Tandem Cats; Trencher (pulling attached shield).

GROUP 12: Clamshell or Dipper Operator; Derricks; Drill Rigs; Multi-Propulsion Earthmoving Machines (2 or more Scrapers) (over 35 cu. yds "struck"m.r.c.); Operators (Derricks, Piledrivers and Cranes); Power Shovels and Draglines (7 cu. yds. m.r.c. and over); Self-propelled rubber-tired Earthmoving equipment (over 31 cu. yds.) (657B and similar); Wheel Excavator (up to and including 750 cu. yds. per hour); Wheel Excavator (over 750 cu.

yds. per hour).

GROUP 12A: Dozer (D-11 or similar or larger); Hydraulic Excavators (over 4 cu. yds.); Lifting cranes (50 tons and over); Pioneering Dozer/Backhoe (initial clearing and excavation for the purpose of providing access for other equipment where the terrain worked involves 1-to-1 slopes that are 50 feet in height or depth, the scope of this work does not include normal clearing and grubbing on usual hilly terrain nor the excavation work once the access is provided); Power Blade Operator (Cat 12 or equivalent or over); Straddle Lifts (over 50 tons); Tower Crane, Mobile; Traveling Truss Cranes; Universal, Liebher, Linden, and similar types of Tower Cranes (in the erection, dismantling, and moving of equipment there shall be an additional Operating Engineer or Heavy Duty Repairman); Yo-Yo Cat or Dozer.

HELICOPTER WORK:		
Pilot of Helicopter	32.76	16.53
Co-Pilot of Helicopter	32.59	16.53
Airborne Hoist Operator for Helicopter	32.45	16.53
DIVERS (AQUA LUNG) (SCUBA):		
Diver (Aqua Lung) (Scuba) (up to a depth of 30 feet)	43.28	16.53
Diver (Aqua Lung) (Scuba) (over a depth of 30 feet)	52.65	16.53
Stand-by Diver (Aqua Lung) (Scuba)	33.90	16.53
DIVERS (OTHER THAN AQUA LUNG):		
Diver (Other than Aqua Lung)	52.65	16.53
Stand-By Diver (Other than Aqua Lung)	33.90	16.53
Diver Tender (Other than Aqua Lung)	30.87	16.53

BOOMS AND/OR LEADS (HOURLY PREMIUMS):
The Operator of a crane (under 50 tons) with a boom of 80

feet or more (including jib), or of a crane (under 50 tons) with leads of 100 feet or more, shall receive a per hour premium for each hour worked on said crane (under 50 tons) in accordance with the following schedule:

Booms of 80 feet up to but not including 130 feet or Leads of 100 feet up to but not including 130 feet	0.50
Booms and/or Leads of 130 feet up to but not including 180 feet	0.75
Booms and/or Leads of 180 feet up to and including 250 feet	1.15
Booms and/or Leads over 250 feet	1.50

The Operator of a crane (50 tons and over) with a boom of 180 feet or more (including jib) shall receive a per hour premium for each hour worked on said crane (50 tons and over) in accordance with the following schedule:

Booms of 180 feet up to and including 250 feet	1.25
Booms over 250 feet	1.75

ENGI0003K 09/01/2002

	Rates	Fringes
TRUCK DRIVERS:		
GROUP 1	28.87	16.53+a
GROUP 2	29.14	16.53+a
GROUP 3	29.45	16.53+a
GROUP 4	30.10	16.53+a
GROUP 5	30.42	16.53+a
GROUP 6	30.53	16.53+a

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Utility, flatbed, or similar.
GROUP 2: Dump, 8 yards, and under (water level); water truck, up to and including 2,000 gallons.
GROUP 3: Tandem Dump, over 8 yards (water level); water truck (over 2,000 gallons).
GROUP 4: Semi-trailer, rock cans, or semi-dump.
GROUP 5: Slip-in or pup.
GROUP 6: End dumps (unlicensed); tractor trailer (hauling equipment).

a. An employee who has completed 1 but less than 2 years service- 1 week's paid vacation; 2 but less than 10 years service - 2 weeks paid vacation; 10 but less than 15 years service - 3 weeks paid vacation; and 15 or more years service - 4 weeks paid vacation.

ENGI0003L 09/01/2002

	Rates	Fringes
DREDGING:		
CLAMSHELL OR DIPPER DREDGES:		

GROUP 1	31.59	16.53
GROUP 2	30.93	16.53
GROUP 3	30.53	16.53
GROUP 4	28.87	16.53

DREDGING CLASSIFICATIONS

GROUP 1: Clamshell or Dipper Operator.
GROUP 2: Mechanic or Welder; Watch Engineer.

GROUP 3: Barge Mate; Deckmate.
GROUP 4: Bargeman; Deckhand; Fireman; Oiler.

HYDRAULIC SUCTION DREDGES:

GROUP 1	31.23	16.53
GROUP 2	31.08	16.53
GROUP 3	30.93	16.53
GROUP 4	30.87	16.53
GROUP 5	30.53	16.53
GROUP 6	30.42	16.53
GROUP 7	28.87	16.53

DREDGING CLASSIFICATIONS

GROUP 1: Leverman.
GROUP 2: Watch Engineer (steam or electric).
GROUP 3: Mechanic or Welder.
GROUP 4: Dozer Operator.
GROUP 5: Deckmate.
GROUP 6: Winchman (Stern Winch on Dredge).
GROUP 7: Deckhand (can operate anchor scow under direction of Deckmate); Fireman; Leveeman; Oiler.

DERRICKS:

GROUP 1	31.59	16.53
GROUP 2	30.93	16.53
GROUP 3	30.53	16.53
GROUP 4	28.87	16.53

DERRICK CLASSIFICATIONS

GROUP 1: Operators (Derricks, Piledrivers and Cranes).
GROUP 2: Saurman Type Dragline (over 5 cubic yards).
GROUP 3: Deckmate; Saurman Type Dragline (up to and including 5 yards).
GROUP 4: Deckhand, Fireman, Oiler.

BOAT OPERATORS:

Master Boat Operator	31.23	16.53
Boat Operator	31.08	16.53
Boat Deckhand	28.87	16.53

IRON0625A 09/02/2002

	Rates	Fringes

IRONWORKERS	27.00+a	20.81

a. Employees will be paid $.50 per hour more while working in tunnels and coffer dams; $1.00 per hour more when required to work under or are covered with water (submerged) and when they are required to work on the summit of Mauna Kea, Mauna Loa or Haleakala.

LABO0368A 09/03/2001

	Rates	Fringes
LABORERS:		
GROUP 1	22.85	11.20
GROUP 2	21.25	11.20
GROUP 3	23.85	11.20
GROUP 4	23.35	11.20
GROUP 5	22.35	11.20
GROUP 6	15.25	6.95
MASON TENDERS	23.10	11.20

LABORERS CLASSIFICATIONS

GROUP 1: Asbestos Removal Worker (EPA certified workers); Asphalt Ironer, Raker, Luteman, and Handroller, and all types of Asphalt Spreader Boxes; Asphalt Shoveler; Assembly and Installation of Multiplates, Liner Plates, Rings, Mesh, Mats; Batching Plant (portable and temporary); Boring Machine Operator (under streets and sidewalks); Buggymobile; Burning, Welding, Signalling, Choke Setting, and Rigging in connection with Laborers' work (except demolition); Chainsaw, Faller, Logloader, and Bucker; Compactors (Jackson and similar); Concrete Bucket Dumpman; Concrete Chipping; Concrete Chuteman/Hoseman (pouring concrete) (the handling of the chute from ready-mix trucks for such jobs as walls, slabs, decks, floors, foundations, footings, curbs, gutters, and sidewalks); Concrete Core Cutter (Walls, Floors, and Ceiling); Concrete Curer (impervious membrane and form oiler); Concrete Grinding or Sanding; Concrete: Hooking on, signaling, dumping of concrete for treme work over water on caissons, pilings, abutments, etc.; Concrete: Mixing, handling, conveying, pouring, vibrating, otherwise placing of concrete or aggregates or by any other process; Concrete: Operation of motorized wheelbarrows or buggies or machines of similar character, whether run by gas, diesel, or electric power; Concrete Pump Machine (laying, coupling, uncoupling of all connections and cleaning of equipment); Concrete and/or Asphalt Saw (Walking or Handtype) (cutting walls or flatwork) (scoring old or new concrete and/or asphalt) (cutting for expansion joints) (streets and ways for laying of pipe, cable or conduit for all purposes); Concrete Shovelers/Laborers (Wet or Dry); Concrete Screeding for Rough Strike-Off; Rodding or striking-off, by hand or mechanical means prior to finishing; Concrete Vibrator Operator; Coring Holes: Walls, footings, piers or other obstructions for passage of pipes or conduits for any purpose and the pouring of concrete to secure the hole; Curbing, Concreting, and Asphalt; Curing of Concrete, mortar, and other materials by any mode or method; Cut Granite Curb Setter (setting, leveling and grouting of all precast concrete or stone curbs); Cutting and

Burning Torch (demolition); Dri Pak-It Machine; Driller (Track, Diamond Core, and Wagon); Driller (Joydrill Model TWM-2A, Gardner Denver DH-143 and similar type drills); Driller (Mechanical) (not

covered elsewhere) (including multiple unit); (Ingersoll-Rand DM45E/DM50E/LM-100/LM-600C, Gardner-Denver SCH2500/SCH3500BV, Furukawa HCR-C300, Tamrock Drilltech CHA800/DHH 850 Tamrock Commando) (similar and replacement equipment thereof); Drilling for blasting; Operation of all rock and concrete drills and Jack Hammers, including handling, carrying, laying out of hose; (Ingersoll-Rand DM45E/DM50E/LM-100/LM-600C), Gardner-Denver SCH2500/SCH3500 BV, Furukawa HCR-C300, Tamrock Drilltech CHA 800/DHH 850/Tamrock Commando) (similar and replacement equipment thereof); Drilling (Mechanical) on the site or along the right-of-way as well as access roads, reservoirs, including areas adjacent or pertinent to construction sites); Falling, bucking, yarding, loading or burning of all trees or timber on construction site; Fence and/or Guardrail Erector; Forklift (9 ft. and under); Grating and Grill work for drains or other purposes; Green Cutter of concrete or aggregate in any form, by hand, mechanical means, grindstone or air and/or water; Grout: Spreading for any purpose; Guinea Chaser (Grade Checker) for general utility trenches, sitework, and excavation; Headerboard Man (Asphalt or Concrete); Heat Welder of Plastic (Laborers' AGC certified workers) (when work involves waterproofing for waterponds, artificial lakes and reservoir, or heat welding for sewer pipes); Heavy Highway Laborer (Rigging, signaling, handling, and installation of pre-cast catch basins, manholes, curbs and gutters); High Pressure Nozzleman - Hydraulic Monitor (over 100# pressure); Installation of Gilsulate 500XR; Jackhammer Operator; Jacking of slip forms; All semi and unskilled work connected therewithin; Laying of all multi-cell conduit or multi-purpose pipe; Magnesite and Mastic Workers (Wet or Dry)(including mixer operator); Mortar Man; Mortar Mixer (Block, Brick, Masonry, and Plastering); Nozzleman (Sandblasting and/or Water Blasting); Operation, Manual or Hydraulic jacking of shields and the use of such other mechanical equipment as may be necessary; Pavement Breakers; Paving, curbing and surfacing of streets, ways, courts, under and overpasses, bridges, approaches, slope walls, and all other labor connected therewith; Pilecutters; Pipe Accessment in place, bolting and lining up of sectional metal or other pipe including corrugated pipe; Pipelayer performing all services in the laying and installation of pipe from the point of receiving pipe in the ditch until completion of operation, including any and all forms of tubular material, whether pipe, metallic or non-metallic, conduit, and any other stationary-type of tubular device used for conveying of any substance or element, whether water, sewage, solid, gas, air, or other product whatsoever and without regard to the nature of material from which tubular material is fabricated; No-joint pipe and stripping of same, Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, treating Creosote and similar-type materials (6-inch) pipe and over); Piping: resurfacing and paving of all ditches in preparation for laying of all pipes; Pipe laying of lateral sewer pipe from main or side sewer to buildings or structure (except Contactor may direct work be done under proper supervision); Pipe laying, leveling and marking of the joint used for main or side sewers and storm sewers; Laying of all clay, terra cotta, ironstone, vitrified concrete or other pipe for drainage; Placing and setting of water mains, gas mains

and all pipe including removal of skids; Plaster Mortar Mixer/ Pump; Pneumatic Impact Wrench; Portable Sawmill Operation: Choker setters, off bearers, and lumber handlers connected with clearing; Posthole Digger (Hand Held, Gas, Air and Electric); Power Broom Sweepers (Small); Preparation and Compaction of roadbeds for railroad track laying, highway construction, and the preparation of trenches, footings, etc., for cross-country transmission by pipelines, electrical transmission or underground lines or cables (by mechanical means); Raising of structure by manual or hydraulic jacks or other methods and resetting of structure in new locations, including all concrete work; Ramming or compaction; Riprap, Stonepaver, and Rock Slinger (includes placement of stacked concrete, wet or dry and loading, unloading, signaling, slinging and setting of other similar materials); Rotary Scarifier (including multiple head concrete chipping Scarifier); Salamander Heater, Drying of plaster, concrete mortar or other aggregate; Sandblaster (Nozzleman) handling, placing and operation of nozzle; Scaffold Erector; Scaffolds: (Swing and hanging) including maintenance thereof; Scaler; Septic Tank/Cesspool and Drain Fields Digger and Installer; Shredder/Chipper (tree branches, brush, etc.); Stripping and Setting Forms; Stripping of Forms: Other than panel forms which are to be re-used in their original form, and stripping of forms on all flat arch work; Tampers (Barko, Wacker, and similar type); Tank Scaler and Cleaners; Tarman; Tree Climbers and Trimmers; Trencher (includes hand-held, Davis T-66 and similar type); Trucks (flatbed up to and including 2 1/2 tons when used in connection with on-site Laborers'work; Trucks (Refuse and Garbage Disposal) (from job site to dump); Vibra-Screed (Bull Float in connection with Laborers' work); Well Points, Installation of or any other dewatering system.

GROUP 2: Air Blasting; Appliance Handling (job site) (after delivery and unloading in storage area); Asphalt Laborer; Asphalt Plant Laborer; Backfill work connected with the installation of Gilsulate 500XR; Backfilling, Grading and all other labor connected therewith; Boring Machine; Bridge Laborer; Burning of all debris (crates, boxes, packaging waste materials); Cemetary Laborers; Chainman, Rodmen, and Grade Markers; Cleaning and Clearing of all debris; Cleaning, clearing, grading and/or removal for streets, highways, roadways, aprons, runways, sidewalks, parking areas, airports, approaches, and other similar installations; Cleaning or reconditioning of streets, ways, sewers and waterlines, all maintenance work and work of an unskilled and semi-skilled nature; Cleanup of Grounds and Buildings (other than "Light Clean-Up") (Janitorial Laborer); Clean-up of right-of-way; Clearing and slashing of brush or trees by hand or mechanical cutting; Concrete Bucket Tender (Groundman) hooking and unhooking of bucket; Concrete Forms; moving, cleaning, oiling and carrying to the next point of erection of all forms; Concrete Products Plant Laborers; Conveyor Tender (conveying of building materials); Cribbers, Shorer, Lagging, Sheeting, and Trench Jacking and Bracing, Hand-Guided Lagging Hammer Whaling Bracing; Crushed Stone Yards and Gravel and Sand Pit Laborers and all other similar plants; Demolition, Wrecking and Salvage Laborers: Wrecking and dismantling of buildings and

all structures, with use of cutting or wrecking tools, burning or cutting, breaking away, cleaning and removal of all masonry, wood

or metal fixtures for salvage or scrap, All hooking, unhooking, signaling of materials for salvage or scrap removed by crane or derrick; Digging under streets, roadways, aprons or other paved surfaces; Driller, Chuck Tender, Outside Nipper; Dry-packing of concrete (plugging and filling of she-bolt holes); Excavation, Preparation of street ways and bridges; Fence and/or Guardrail Erector; Dismantling and/or re-installation of all fence; Finegrader; Firewatcher; Flagman (Coning, preparing, establishing and removing portable roadway barricade devices); Signal Men on all construction work defined herein, including Traffic Control Signal Men at construction site; Garbage and Debris Handlers and Cleaners; Gas, Pneumatic, and Electric Tools, not listed Group 1 (except Rototiller); General Clean-up: sweeeping, cleaning, washdown, wiping of construction facility, and equipment (other than "Light Clean-up" [Janitorial] Laborer); General Excavation and Grading (all labor connected therewith); Digging of trenches, ditches and manholes and the leveling, grading and other preparation prior to laying pipe or conduit for any purpose; Excavations and foundations for buildings, piers, foundations and holes, and all other construction; General Laborer; Gunite Operator; Junk Yard Laborers (same as Salvage Yard); Landscape Nursery Laborers; Laser Beam "Target Man" in connection with Laborers' work; Layout Person for Plastic (when work involves waterproofing for waterponds, artificial lakes and reservoirs); Limbers, Brush Loaders, and Pilers; Loading, Unloading, carrying, distributing and handling of all rods and material for use in reinforcing concrete construction (except when a derrick or outrigger operated by other than hand power is used); Loading, unloading, sorting, stockpiling, handling and distribution of water mains, gas mains and all pipes; Loading and unloading of all materials, fixtures, furnishings and appliances from point of delivery to stockkpile to point of installation; hooking and signalling from truck, conveyance or stockpile; Material Yard Laborers; Parks and Sports arenas and all recreational center employees; Pipelayer Tender; Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, Creosote, and similar-type materials (pipe under 6 inches); Plasterer Laborer (including Hod Carrier); Preparation, construction and maintenance of roadbeds and sub-grade for all paving, including excavation, dumping, and spreading of sub-grade material; Prestressed or prescast concrete slabs, walls, or sections: all loading, unloading, stockpiling, hooking on of such slabs, walls or sections; Quarry Laborers; Railroad, Streetcar, and Rail Transit Maintenance and Repair; Removal of surplus material; Roustabout; Rubbish Trucks in connection with Building Construction Projects (excluding clearing, grubbing, and excavating); Salvage Yard: All work connected with cutting, cleaning, storing, stockpiling or handling of materials, all cleanup, removal of debris, burning, back-filling and landscaping of the site; Scaffolds: Erection, planking and removal of all scaffolds used for support for lathers, plasters, brick layers, masons, and other construction trades crafts; Scaffolds: (Specially designed by carpenters) laborers shall tend said carpenter on erection and dismantling therof, preparation for

foundation or mudsills, maintenance; Scraping of floors; Screeds: Handling of all screeds to be reused; handling, dismantling and conveyance of screeds; Setting, leveling and securing or bracing of metal or other road forms and expansion joints; Sheeting Piling/trench shoring (handling and placing of skip sheet or

wood plank trench shoring); Ship Scalers; Shipwright; Sign Erector (subdivision traffic, regulatory, and street-name signs); Sloper; Slurry Seal Crews (Mixer Operator, Applicator, Squeegee Man, Shuttle Man, Top Man); Snapping of wall ties and removal of tie rods; Soil Test operations of semi and unskilled labor such as filling sand bags; Striper (Asphalt, Concrete or other Paved Surfaces); Tagging and Signaling of all building materials into high-rise units; Tool Room Attendant (Job Site); Traffic Delineating Device Applicator; Underpinning, lagging, bracing, propping and shoring, loading, signaling, right-of-way clearance along the route of movement, The clearance of new site, excavation of foundation when moving a house or structure from old site to new site; Utilities employees; Water Man; Waterscape/Hardscape Laborers; Wire Mesh Pulling (all concrete pouring operations); Wrecking, stripping, dismantling and handling concrete forms an false work.

GROUP 3: Licensed Powdermen.

GROUP 4: Gunnite Operator; High Scaler (working suspended), Pipelaying.

GROUP 5: Window Washer (Outside) (Working from bosun's chair and/or cable-suspended scaffold or work platform).

GROUP 6: Light Clean-Up.

LABO0368B 09/30/2002

	Rates	Fringes
LANDSCAPE AND IRRIGATION LABORERS:		
Group 1	17.66	5.47
Group 2	18.16	5.47
Group 3	14.51	5.47

LABORERS CLASSIFICATIONS

GROUP 1: Installation of non-potable permanent or temporary irrigation water systems performed for the purposes of Landscaping and Irrigation architectural horticultural work; the installation of drinking fountains and permanent or temporary irrigation systems using potable water for Landscaping and Irrigation architectural horticultural purposes only. This work includes (a) the installation of all heads, risers, valves, valve boxes, vacuum breakers (pressure and non-pressure), low voltage electrical lines and, provided such work involves electrical wiring that will carry 24 volts or less, the installation of sensors, master control panels, display boards, junction boxes, conductors, including all other components for controllers, (b) and metallic (copper, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe including all work incidental thereto, i.e., unloading, handling and distribution of all pipes fittings, tools, materials and equipment, (c) all soldering work in connection with the above whether done by torch, soldering iron, or other means; (d) tie-in to main lines, thrust blocks (both precast and poured in place), pipe hangers and supports incidental to installation of the entire irrigation system, (e) making of pressure tests, start-up testing, flushing, purging, water balancing, placing into operation all irrigation

equipment, fixtures and appurtenances installed under this agreement, and (f) the fabrication, replacement, repair and servicing oflandscaping and irrigation systems. Operation of hand-held gas, air, electric, or self-powered tools and equipment used in the performance of Landscape and Irrigation work in connection with architectural horticulture; Choke-setting, signaling, and rigging for equipment operators on job-site in the performance of such Landscaping and Irrigation work; Concrete work (wet or dry) performed in connection with such Landscaping and Irrigation work. This work shall also include the setting of rock, stone, or riprap in connection with such Landscape, Waterscape, Rockscape, and Irrigation work; Grubbing, pick and shovel excavation, and hand rolling or tamping in connection with the performance of such Landscaping and Irrigation work; Sprigging, handseeding, and planting of trees, shrubs, ground covers, and other plantings and the performance of all types of gardening and horticultural work relating to said planting; Operation of flat bed trucks (up to and including 2 1/2 tons).

GROUP 2: Layout of irrigation and other non-potable irrigation water systems and the layout of drinking fountains and other potable irrigation water systems in connection with such Landscaping and Irrigation work. This includes the layout of all heads, risers, valves, valve boxes, vacuum breakers, low voltage electrical lines, hydraulic and electrical controllers, and metallic (coppers, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe. This work also includes the reading and interpretation of plans and specifications in connection with the layout of Landscaping, Rockscape, Waterscape, and Irrigation work; Operation of Hydro-Mulching machines (sprayman and driver), Drillers, Trenchers (riding type, Davis T-66, and similar) and fork lifts used in connection with the performance of such Landscaping and Irrigation work; Tree climbers and chain saw tree trimmers, Sporadic operation (when used in connection with Landscaping, Rockscape, Waterscape, and Irrigation work) of Skid-Steer Loaders (Bobcat and similar), Cranes (Bantam, Grove, and similar), Hoptos, Backhoes, Loaders, Rollers, and Dozers (Case, John Deere, and similar), Water Trucks, Trucks requiring a State of Hawaii Public Utilities Commission Type 5 and/or type 7 license, sit-down type and "gang" mowers, and other self-propelled, sit-down operated machines not listed under Landscape & Irrigation Maintenance Laborer; Chemical spraying using self-propelled power spraying equipment (200 gallon capacity or more).

GROUP 3: Maintenance of trees, shrubs, ground covers, lawns and

other planted areas, including the replanting of trees, shrubs, ground covers, and other plantings that did not "take" or which are damaged; provided, however, that re-planting that requires the use of equipment, machinery, or power tools shall be paid for at the rate of pay specified under Landscape and Irrigation Laborer, Group 1; Raking, mowing, trimming, and pruning, including the use of "weed eaters", hedge trimmers, vacuums, blowers, and other hand-held gas, air, electric, or self-powered tools, and the operation of lawn mowers (Note: The operation of sit-down type and "gang" mowers shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer, Group 2); Guywiring, staking, propping, and supporting trees;

Fertilizing, Chemical spraying using spray equipment with less than 200 gallon capacity, Maintaining irrigation and sprinkler systems, including the staking, clamping, and adjustment of risers, and the adjustment and/or replacement of sprinkler heads, (Note: the cleaning and gluing of pipe and fittings shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer(Group 1); Watering by hand or sprinkler system and the peformance of other types of gardening, yardman, and horticultural-related work.

LABO0368C 09/04/2000

	Rates	Fringes
UNDERGROUND LABORERS:		
GROUP 1	21.45	10.74
GROUP 2	22.95	10.74
GROUP 3	23.45	10.74
GROUP 4	24.45	10.74
GROUP 5	24.80	10.74
GROUP 6	25.05	10.74
GROUP 7	25.50	10.74

GROUP 1: Watchmen; Change House Attendant
GROUP 2: Swamper; Brakeman; Bull Gang-Muckers, Trackmen; Dumpmen (any method); Concrete Crew (includes rodding and spreading); Grout Crew; Reboundmen
GROUP 3: Chucktenders and Cabletenders; Powderman (Prime House); Vibratorman, Pavement Breakers
GROUP 4: Miners - Tunnel (including top and bottom man on shaft and raise work); Timberman, Retimberman (wood or steel or substitute materials thereof); Blasters, Drillers, Powderman (in heading); Headman; Cherry Pickerman (where car is lifted); Nipper; Grout Gunmen; Grout Pumpman & Potman; Gunite, Shotcrete Gunmen & Potmen; Concrete Finisher (in tunnel); Concrete Screed Man; Bit Grinder; Steel Form Raisers & Setters; High Pressure Nozzleman; Nozzleman (on slick line); Sandblater-Potman (combination work assignment interchangeable); Tugger
GROUP 5: Shaft Work & Raise (below actual or excavated ground level); Diamond Driller; Gunite or Shotcrete Nozzleman

GROUP 6: Shifter
GROUP 7: Shifter (Shaft Work & Raiser)

PAIN1791A 07/01/2002

	Rates	Fringes
PAINTERS:		
Brush	26.55	19.35
Sandblaster; Spray	27.05	19.35

PAIN1889A 01/01/2001

	Rates	Fringes
GLAZIERS	23.07	17.30

PAIN1926B 02/25/2001

	Rates	Fringes
SOFT FLOOR LAYERS	22.90	15.50

PAIN1944A 01/01/2003

	Rates	Fringes
TAPERS	32.75	13.05

PLAS0630A 09/02/2002

	Rates	Fringes
PLASTERERS	26.71	16.72

PLAS0630B 09/02/2002

	Rates	Fringes
CEMENT MASONS:		
Cement Masons	25.87	16.72
Trowel Machine Operators	26.02	16.72

PLUM0675A 07/07/2002

	Rates	Fringes
PLUMBERS, PIPEFITTERS, STEAMFITTERS & SPRINKLER FITTERS	30.30	16.80

ROOF0221A 04/28/2002

	Rates	Fringes
ROOFERS	28.10	12.83

SHEE0293A 09/01/2002

	Rates	Fringes
SHEET METAL WORKERS	33.47	14.12

SUHI1001A 09/15/1997

	Rates	Fringes
DRAPERY INSTALLERS	13.60	1.20

SUHI2001A 09/15/1997

	Rates	Fringes
FENCE ERECTORS (Chain Link)	9.33	1.65

RIGGERS; WELDERS - Receive rate prescribed for craft performing operation to which rigging or welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.

Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.
END OF GENERAL DECISION

Classification	Current			2003			2004			2005			Remarks See Pg 6-7
	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	
* **ASBESTOS WORKER (Note: 2 increases per year)**	**2/17/03**			**8/31/03**			**2/29/04**			**2/27/05**			
	$46.94	$30.20	$16.74	$47.79	$30.45	$17.34	$48.19	$30.75	$17.44	$49.39	$31.35	$18.04	1
							8/29/04			**9/4/05**			
	-	-	-	-	-	-	$48.79	$31.05	$17.74	$49.94	$31.65	$18.29	
* **ASPHALT PAVING GROUP:**	**2/17/03**												
Asphalt Raker	$43.66	$31.08	$12.58	-	-	-	-	-	-	-	-	-	2
Asphalt Spreader Operator	$44.94	$32.36	$12.58	-	-	-	-	-	-	-	-	-	2
Laborer, Hand Roller	$43.16	$30.58	$12.58	-	-	-	-	-	-	-	-	-	2
Roller Operator (5 tons and under)	$43.39	$30.81	$12.58	-	-	-	-	-	-	-	-	-	2
Roller Operator (over 5 tons)	$44.62	$32.04	$12.58	-	-	-	-	-	-	-	-	-	2
Screed Person	$43.97	$31.39	$12.58	-	-	-	-	-	-	-	-	-	2
EQUIPMENT OPERATOR:													
Concrete saws and/or Grinder (self-propelled unit on streets, highways, airports and canals)	$44.62	$32.04	$12.58	-	-	-	-	-	-	-	-	-	2
Grader, Soil Stabilizer, Cold Planer	$45.45	$32.87	$12.58	-	-	-	-	-	-	-	-	-	2
Loader (2-1/2 cu. yds. and under)	$44.62	$32.04	$12.58	-	-	-	-	-	-	-	-	-	2
Loader (over 2-1/2 cu. yds. to and including 5 cu. yds.)	$44.94	$32.36	$12.58	-	-	-	-	-	-	-	-	-	2
TRUCK DRIVER:													
Assistant to Engineer	$43.39	$30.81	$12.58	-	-	-	-	-	-	-	-	-	2
Oil Tanker (double)	$44.94	$32.36	$12.58	-	-	-	-	-	-	-	-	-	2
Semi-Trailer, Semi-Dump, Asphalt Distributor, Oil Tanker	$44.62	$32.04	$12.58	-	-	-	-	-	-	-	-	-	2
Slip-in or Pup	$44.94	$32.36	$12.58	-	-	-	-	-	-	-	-	-	2
Single or Rock Cans Tandem Dump Truck (8 cu. yds. & under, water level)	$43.66	$31.08	$12.58	-	-	-	-	-	-	-	-	-	2
Single or Rock Cans Tandem Dump Truck (over 8 cu. yds., water level)	$43.97	$31.39	$12.58	-	-	-	-	-	-	-	-	-	2
Tractor Trailer (hauling equipment, assistant to engineer required)	$45.05	$32.47	$12.58	-	-	-	-	-	-	-	-	-	2
Utility, Flatbed	$43.39	$30.81	$12.58	-	-	-	-	-	-	-	-	-	2
BOILERMAKER	**9/16/02**												
	$42.16	$26.25	$15.91	-	-	-	-	-	-	-	-	-	
* **CARPENTER: (Note: 2 increases in 2003)**	**2/17/03**			**9/1/03**			**8/30/04**			**8/29/05**			
Carpenter; Patent Scaffold Erector (Over 14 feet); Piledriver; Pneumatic Nailer	$46.65	$30.90	$15.75	$47.55	$31.55	$16.00	$48.45	$31.95	$16.50	$49.45	$32.70	$16.75	3
Millwright	$46.90	$31.15	$15.75	$47.80	$31.80	$16.00	$48.70	$32.20	$16.50	$49.70	$32.95	$16.75	3
Power Saw Operator (2 h.p. & above)	$46.80	$31.05	$15.75	$47.70	$31.70	$16.00	$48.60	$32.10	$16.50	$49.60	$32.85	$16.75	3
CEMENT FINISHER:	**9/16/02**			**3/1/03**									
Cement Finisher; Curb Setter; Precast Panel Setter; Manhole Builder	$42.59	$25.87	$16.72	$43.02	$26.30	$16.72	-	-	-	-	-	-	3
Trowel Machine Operator	$42.74	$26.02	$16.72	$43.17	$26.45	$16.72	-	-	-	-	-	-	3
CHLORINATOR	**9/16/02**												
	$29.45	$23.85	$5.60	-	-	-	-	-	-	-	-	-	

Classification	Current			2003			2004			2005			Remarks See Pg 6-7
	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	
* **DIVER:**	**2/17/03**												
Diver (Aqua Lung)(Scuba)-Up to a depth of 30 feet	$59.91	$43.28	$16.63	-	-	-	-	-	-	-	-	-	
Diver (Aqua Lung)(Scuba)-Over a depth of 30 feet	$69.28	$52.65	$16.63	-	-	-	-	-	-	-	-	-	
Stand-by Diver (Aqua Lung)(Scuba)	$50.53	$33.90	$16.63	-	-	-	-	-	-	-	-	-	
Diver (Other than Aqua Lung)	$69.28	$52.65	$16.63	-	-	-	-	-	-	-	-	-	4
Stand-by Diver (Other than Aqua Lung)	$50.53	$33.90	$16.63	-	-	-	-	-	-	-	-	-	4
Tender (Other than Aqua Lung)	$47.50	$30.87	$16.63	-	-	-	-	-	-	-	-	-	
DRAPERY INSTALLER	**9/16/02**												
	$15.31	$14.13	$1.18	-	-	-	-	-	-	-	-	-	
* **DRYWALL INSTALLER (Note: 2 increases in 2003)**	**2/17/03**			**9/1/03**			**8/30/04**			**8/29/05**			
	$46.87	$31.15	$15.72	$47.77	$31.80	$15.97	$48.67	$32.20	$16.47	$49.67	$32.95	$16.72	5
ELECTRICIAN: (Note: 2 increases per year)	**2/16/03**			**8/17/03**			**2/15/04**			**2/13/05**			
Cable Splicer (inside/outside)	$52.67	$35.26	$17.41	$53.48	$35.70	$17.78	$54.28	$36.14	$18.14	$56.21	$37.24	$18.97	6
Ground Worker (outside)	$38.01	$24.04	$13.97	$38.64	$24.34	$14.30	$39.27	$24.64	$14.63	$40.74	$25.39	$15.35	6
Heavy Equipment Operator (outside)	$44.30	$28.85	$15.45	$45.02	$29.21	$15.81	$45.70	$29.57	$16.13	$47.36	$30.47	$16.89	6
Line Installer (outside); Wire Installer (inside)	$48.48	$32.05	$16.43	$49.23	$32.45	$16.78	$49.98	$32.85	$17.13	$51.78	$33.85	$17.93	6
Technician (inside/outside)	$49.73	$33.01	$16.72	$50.51	$33.42	$17.09	$51.28	$33.84	$17.44	$53.10	$34.87	$18.23	6
							8/15/04						
Cable Splicer (inside/outside)	-	-	-	-	-	-	$55.25	$36.69	$18.56	-	-	-	6
Ground Worker (outside)	-	-	-	-	-	-	$39.99	$25.01	$14.98	-	-	-	6
Heavy Equipment Operator (outside)	-	-	-	-	-	-	$46.53	$30.02	$16.51	-	-	-	6
Line Installer (outside); Wire Installer (inside)	-	-	-	-	-	-	$50.88	$33.35	$17.53	-	-	-	6
Technician (inside/outside)	-	-	-	-	-	-	$52.18	$34.35	$17.83	-	-	-	6
* **ELEVATOR CONSTRUCTOR:**	**2/17/03**												
Elevator Constructor Mechanic	$46.565	$37.61	$8.955	-	-	-	-	-	-	-	-	-	
Elevator Constructor Helper	$35.285	$26.33	$8.955	-	-	-	-	-	-	-	-	-	
* **EQUIPMENT OPERATOR:**	**2/17/03**												
Corresponding equipment by group available on Internet.													
Group 1	$45.22	$28.59	$16.63	-	-	-	-	-	-	-	-	-	7
Group 2	$45.33	$28.70	$16.63	-	-	-	-	-	-	-	-	-	7
Group 3	$45.50	$28.87	$16.63	-	-	-	-	-	-	-	-	-	7
Group 4	$45.77	$29.14	$16.63	-	-	-	-	-	-	-	-	-	7
Group 5	$46.08	$29.45	$16.63	-	-	-	-	-	-	-	-	-	7
Group 6	$46.73	$30.10	$16.63	-	-	-	-	-	-	-	-	-	7
Group 7	$47.05	$30.42	$16.63	-	-	-	-	-	-	-	-	-	7
Group 8	$47.16	$30.53	$16.63	-	-	-	-	-	-	-	-	-	7
Group 9	$47.27	$30.64	$16.63	-	-	-	-	-	-	-	-	-	7
Group 9A	$47.50	$30.87	$16.63	-	-	-	-	-	-	-	-	-	7
Group 10	$47.56	$30.93	$16.63	-	-	-	-	-	-	-	-	-	7
Group 10A	$47.71	$31.08	$16.63	-	-	-	-	-	-	-	-	-	7
Group 11	$47.86	$31.23	$16.63	-	-	-	-	-	-	-	-	-	7
Group 12	$48.22	$31.59	$16.63	-	-	-	-	-	-	-	-	-	7
Group 12A	$48.58	$31.95	$16.63	-	-	-	-	-	-	-	-	-	7

Classification	Current			2003			2004			2005			Remarks See Pg 6-7
	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	
FENCE ERECTOR (CHAIN-LINK TYPE)	**9/16/02**												
	$13.29	$11.96	$1.33	-	-	-	-	-	-	-	-	-	
FLOOR LAYER (CARPET, LINOLEUM & SOFT TILE)	**9/16/02**												
	$38.75	$22.90	$15.85	-	-	-	-	-	-	-	-	-	
GLAZIER	**9/16/02**												
	$42.99	$24.39	$18.60	-	-	-	-	-	-	-	-	-	8
* **HELICOPTER WORK:**	**2/17/03**												
Airborne Hoist Operator	$49.08	$32.45	$16.63	-	-	-	-	-	-	-	-	-	
Co-Pilot	$49.22	$32.59	$16.63	-	-	-	-	-	-	-	-	-	
Pilot	$49.39	$32.76	$16.63	-	-	-	-	-	-	-	-	-	
* **IRONWORKER: (Note: 2 increases in 2003)**	**2/17/03**			**9/1/03**			**8/30/04**						
Reinforcing, Structural	$47.81	$27.00	$20.81	$49.36	$28.00	$21.36	$51.36	$29.00	$22.36	-	-	-	9
* **LABORER: (Note: 2 increases in 2003)**	**2/17/03**			**9/1/03**			**8/30/04**			**8/29/05**			
Gunite Operator	$35.80	$23.75	$12.05	$36.50	$24.15	$12.35	$37.25	$24.65	$12.60	$38.05	$25.15	$12.90	3
High Scaler (Working Suspended)	$35.80	$23.75	$12.05	$36.50	$24.15	$12.35	$37.25	$24.65	$12.60	$38.05	$25.15	$12.90	
Laborer I	$35.30	$23.25	$12.05	$36.00	$23.65	$12.35	$36.75	$24.15	$12.60	$37.55	$24.65	$12.90	3
Laborer II	$33.55	$21.50	$12.05	$34.05	$21.70	$12.35	$34.55	$21.95	$12.60	$35.15	$22.25	$12.90	3
Light Clean-up (Janitorial) Laborer	$23.40	$15.50	$7.90	$23.90	$15.70	$8.20	$24.40	$15.95	$8.45	$25.00	$16.25	$8.75	3
Powder Blaster	$36.30	$24.25	$12.05	$37.00	$24.65	$12.35	$37.75	$25.15	$12.60	$38.55	$25.65	$12.90	3
Window Washer (Outside) (On bosun's chair, cable-suspended scaffold or work platform)	$34.80	$22.75	$12.05	$35.50	$23.15	$12.35	$36.25	$23.65	$12.60	$37.05	$24.15	$12.90	
LANDSCAPER:	**9/30/02**			**9/29/03**			**10/4/04**						
Landscape & Irrigation Laborer A	$23.13	$17.66	$5.47	$23.48	$18.01	$5.47	$24.03	$18.36	$5.67	-	-	-	
Landscape & Irrigation Laborer B	$23.63	$18.16	$5.47	$23.98	$18.51	$5.47	$24.53	$18.86	$5.67	-	-	-	
Landscape & Irrigation Maintenance Laborer	$19.98	$14.51	$5.47	$20.28	$14.81	$5.47	$20.78	$15.11	$5.67	-	-	-	
* **LATHER (Note: 2 increases in 2003)**	**2/17/03**			**9/1/03**			**8/30/04**			**8/29/05**			
	$46.87	$31.15	$15.72	$47.77	$31.80	$15.97	$48.67	$32.20	$16.47	$49.67	$32.95	$16.72	5
MASON; Bricklayer;	**9/16/02**			**3/1/03**									
Cement Blocklayer; Stone Mason; Precast Sill Setter	$42.64	$25.92	$16.72	$43.07	$26.35	$16.72	-	-	-	-	-	-	3
PAINTER:	**7/1/02**												
Painter	$45.90	$26.55	$19.35	-	-	-	-	-	-	-	-	-	10
Spray Painter; Sandblaster or Waterblaster	$46.40	$27.05	$19.35	-	-	-	-	-	-	-	-	-	10
PLASTERER	**9/16/02**			**3/1/03**									
	$43.43	$26.71	$16.72	$43.86	$27.14	$16.72	-	-	-	-	-	-	3
* **PLUMBER:**	**2/17/03**												
Plumber; Pipefitter; Refrigeration Fitter; Heating & Air Conditioning Fitter; Sprinkler Fitter; Steamfitter	$47.00	$30.30	$16.70	-	-	-	-	-	-	-	-	-	11

Classification	Current			2003			2004			2005			Remarks See Pg 6-7
	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	
ROOFER:	4/28/02												
Shingle, Tile, Built-up Roofing	$40.93	$28.10	$12.83	-	-	-	-	-	-	-	-	-	
Coal Tar Pitch	$69.03	$56.20	$12.83	-	-	-	-	-	-	-	-	-	
SANDBLASTER OR WATERBLASTER:													
Use wages of craft to which sand or water blasting is incidental.													
SEWER LINE TELE-REPAIRER	9/16/02												
	$27.91	$22.57	$5.34	-	-	-	-	-	-	-	-	-	
* **SHEETMETAL WORKER**	9/1/02												
- For overtime rate, see remark 12A - For hourly fringe, see remark 12B	$47.53	$31.32	$16.21	-	-	-	-	-	-	-	-	-	12
TAPER	1/1/03												
	$45.80	$32.75	$13.05	-	-	-	-	-	-	-	-	-	
TERMITE TREATER	9/16/02												
	$11.33	$10.07	$1.26	-	-	-	-	-	-	-	-	-	
TERRAZZO:	~~9/16/02~~			~~3/1/03~~									
Terrazzo Setter	$42.89	$26.17	$16.72	$43.32	$26.60	$16.72	-	-	-	-	-	-	3
Terrazzo Base Grinder	$41.08	$24.36	$16.72	$41.51	$24.79	$16.72	-	-	-	-	-	-	3
Certified Terrazzo Floor Grinder and Tender	$39.53	$22.81	$16.72	$39.96	$23.24	$16.72	-	-	-	-	-	-	3
Terrazzo Floor Grinder	$38.03	$21.31	$16.72	$38.46	$21.74	$16.72	-	-	-	-	-	-	3
TILE SETTER:	9/16/02			3/1/03									
Ceramic Hard Tile; Marble Setter	$42.89	$26.17	$16.72	$43.32	$26.60	$16.72	-	-	-	-	-	-	3
Pointer-Caulker-Weatherproofer	$42.89	$26.17	$16.72	$43.32	$26.60	$16.72	-	-	-	-	-	-	3
Certified Ceramic Tile & Marble Helpers	$39.53	$22.81	$16.72	$39.96	$23.24	$16.72	-	-	-	-	-	-	3
TRUCK DRIVER:	2/17/03												
* Concrete Mixer	$19.92	$15.92	$4.00	-	-	-	-	-	-	-	-	-	
	1/1/03												
Concrete Mixer/Booster	$34.02	$26.33	$7.69	-	-	-	-	-	-	-	-	-	
	2/17/03												
* Dump Truck, 8 cu. yds. & under (water level); Water Truck (up to & including 2,000 gallons)	$45.77	$29.14	$16.63	-	-	-	-	-	-	-	-	-	
* Flatbed, Utility, etc.	$45.50	$28.87	$16.63	-	-	-	-	-	-	-	-	-	
* End Dump, Unlicensed (Euclid, Mack, Caterpillar, or similar); Tractor Trailer (hauling equipment) (helper required when hydraulic ramp is not being used)	$47.16	$30.53	$16.63	-	-	-	-	-	-	-	-	-	
* Semi-Trailer, Rock Cans, or Semi-Dump	$46.73	$30.10	$16.63	-	-	-	-	-	-	-	-	-	
* Slip-in or Pup	$47.05	$30.42	$16.63	-	-	-	-	-	-	-	-	-	
* Tandem Dump Truck, over 8 cu. yds. (water level); Water Truck (over 2,000 gallons)	$46.08	$29.45	$16.63	-	-	-	-	-	-	-	-	-	

Classification	Current			2003			2004			2005			Remarks See Pg 6-7
	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	Prevailing Wage Total	Basic Hourly Rate	Fringe Hourly Rate	
* **UNDERGROUND LABORER: (Note: 2 increases in 2003)**	**2/17/03**			**9/1/03**			**8/30/04**			**8/29/05**			
Worker in a raise, shaft, or tunnel.													
Group 1	$35.90	$23.85	$12.05	$36.60	$24.25	$12.35	$37.35	$24.75	$12.60	$38.15	$25.25	$12.90	
Group 2	$37.40	$25.35	$12.05	$38.10	$25.75	$12.35	$38.85	$26.25	$12.60	$39.65	$26.75	$12.90	
Group 3	$37.90	$25.85	$12.05	$38.60	$26.25	$12.35	$39.35	$26.75	$12.60	$40.15	$27.25	$12.90	
Group 4	$38.90	$26.85	$12.05	$39.60	$27.25	$12.35	$40.35	$27.75	$12.60	$41.15	$28.25	$12.90	
Group 5	$39.15	$27.10	$12.05	$39.85	$27.50	$12.35	$40.60	$28.00	$12.60	$41.40	$28.50	$12.90	
Group 6	$39.25	$27.20	$12.05	$39.95	$27.60	$12.35	$40.70	$28.10	$12.60	$41.50	$28.60	$12.90	
Group 7	$39.50	$27.45	$12.05	$40.20	$27.85	$12.35	$40.95	$28.35	$12.60	$41.75	$28.85	$12.90	
Group 8	$39.95	$27.90	$12.05	$40.65	$28.30	$12.35	$41.40	$28.80	$12.60	$42.20	$29.30	$12.90	
* **WATER FRONT CONSTRUCTION (DREDGING):**	**2/17/03**												
CLAMSHELL OR DIPPER DREDGES:													
Clamshell or Dipper Operator	$48.22	$31.59	$16.63	-	-	-	-	-	-	-	-	-	13
Mechanic; Welder; Watch Engineer	$47.56	$30.93	$16.63	-	-	-	-	-	-	-	-	-	
Deckmate; Bargemate	$47.16	$30.53	$16.63	-	-	-	-	-	-	-	-	-	
Fire Person; Oiler; Deckhand; Barge Worker	$45.50	$28.87	$16.63	-	-	-	-	-	-	-	-	-	
HYDRAULIC SUCTION DREDGES:													
Lever Operator	$47.86	$31.23	$16.63	-	-	-	-	-	-	-	-	-	
Mechanic; Welder	$47.71	$31.08	$16.63	-	-	-	-	-	-	-	-	-	
Watch Engineer (steam or electric)	$47.56	$30.93	$16.63	-	-	-	-	-	-	-	-	-	
Dozer Operator	$47.50	$30.87	$16.63	-	-	-	-	-	-	-	-	-	
Deckmate	$47.16	$30.53	$16.63	-	-	-	-	-	-	-	-	-	
Winch Operator (stern winch on dredge)	$47.05	$30.42	$16.63	-	-	-	-	-	-	-	-	-	
Fire Person; Oiler; Deckhand (can operate anchor scow under direction of deckmate); Levee Operator	$45.50	$28.87	$16.63	-	-	-	-	-	-	-	-	-	
DERRICKS:													
Operator: Derrick, Piledriver, Crane	$48.22	$31.59	$16.63	-	-	-	-	-	-	-	-	-	
Deckmate; Saurman Type Dragline (up to & including 5 yds.) (Assistant to Engineer required; see Equipment Operator Group 3)	$47.16	$30.53	$16.63	-	-	-	-	-	-	-	-	-	
Saurman Type Dragline (over 5 cu. yds.) (Assistant to Engineer required; see Equipment Operator Group 3)	$47.56	$30.93	$16.63	-	-	-	-	-	-	-	-	-	
Fire Person; Oiler; Deckhand	$45.50	$28.87	$16.63	-	-	-	-	-	-	-	-	-	
BOAT OPERATORS:													
Master Boat Operator	$47.86	$31.23	$16.63	-	-	-	-	-	-	-	-	-	
Boat Operator	$47.71	$31.08	$16.63	-	-	-	-	-	-	-	-	-	
Boat Deckhand	$45.50	$28.87	$16.63	-	-	-	-	-	-	-	-	-	
WELDER:													
Use wages of craft to which welding is incidental.													
WATER WELL DRILLER:	**9/16/02**												
Water Well Driller	$24.66	$22.38	$2.28	-	-	-	-	-	-	-	-	-	
Water Well Driller Helper	$17.80	$15.89	$1.91	-	-	-	-	-	-	-	-	-	

Comments: Overtime must be paid at one and one-half times the basic hourly rate plus the hourly cost of required fringe benefits.
*** Indicates a wage, fringe benefit, or title change from the previous bulletin.**

REMARKS

1. Asbestos Worker: Six percent per hour shall be added to the hourly wage for hazardous pay while working from a boatswain chair, staging or free standing scaffolding erected from the ground up or mezzanine floor subject to a free fall and skyclimber suspended from a permanent structure and when working above 40 feet.

2. Asphalt Paving: $.75 per hour shall be added to the hourly wage while working to scale the quarry face.

3. Carpenter, Cement Finisher, Laborer (excluding High Scaler, Window Washer), Mason, Plasterer, Terrazzo, Tile Setter: $.50 per hour shall be added to the regular straight-time rate for height pay for each hour while working from a bosun's chair and/or from a cable-suspended scaffold or work platform which is free swinging (not attached to building) for each hour worked on said rig.

4. Diver:
   A. On any dive exceeding 50 feet, the diver shall in addition be paid the following amount of "depth money":

50 feet to 100 feet	$1.50 per foot in excess of 50 feet
100 feet to 150 feet	$100.00 plus $2.00 per foot in excess of 100 feet
150 feet to 200 feet	$200.00 plus $3.00 per foot in excess of 150 feet

   B. When it is necessary for a Diver to enter any pipe, tunnel or other enclosure, the said Diver shall in addition to the hourly rate, receive a premium in accordance with the following schedule for distance traveled from the entrance of the pipe, tunnel or other enclosure:
      1). When able to stand erect, but in which there is no vertical ascent:

5 feet to 50 feet	$5.00 per day
50 feet to 100 feet	$7.50 per day
100 feet to 150 feet	$12.50 per day
Greater than 150 feet	The premium shall be increased an additional $7.50 for each succeeding 50 feet.

      2). When unable to stand erect and in which there is no vertical ascent:

5 feet to 50 feet	$5.00 per day
50 feet to 100 feet	$7.50 per day
100 feet to 150 feet	$12.50 per day
150 feet to 200 feet	$36.75 per day
200 feet to 300 feet	$1.00 per foot
300 feet to 450 feet	$1.50 per foot
450 feet to 600 feet	$2.50 per foot

5. Drywall Installer, Lather: $.25 per hour shall be added to the hourly wage for height pay when working from bosun's chairs or swinging scaffolding. $.25 per hour shall be added to the hourly wage for height pay when working from any scaffolding over 12 feet in height.

6. Electrician:
   A. One and one-half times the straight-time rate while working in a tunnel under construction; under water with aqualung equipment; in a completed tunnel which has only one entrance or exit providing access to safety and where no other personnel are working; or in an underground structure having no access to safety or where no other personnel are working.
   B. Double the straight-time rate shall be paid for the following types of hazardous work:
      1). While working from trusses, stacks, towers, tanks, bosun's chairs, swinging or rolling scaffolds, supporting structures, and open platforms, over 70 feet from the ground where the employee is subject to a free fall; provided, however, that when work is performed on stacks, towers or permanent platforms where the employees are on a firm footing within an enclosure, a hazardous condition does not exist regardless of height;
      2). While working outside of a railing or enclosure, or temporary platforms extending outside of a building, or from scaffolding or ladder within an enclosure where an employee's footing is within one foot of the top of such railing, and the employee is subject to a free fall of over 70 feet;
      3). Working on buildings while leaning over the railing or edge of the building, and is subject to a free fall of 70 feet; or
      4). Two hours' minimum hazardous pay per day shall be paid while climbing to a stack, tower or permanent platform which exceeds 70 feet from the ground but where the employee is on a firm footing within an enclosure.
   C. Five percent per hour shall be added to the hourly wage for height pay while working above 9,000 feet elevation.

7. Equipment Operator:
   A. Operators and Assistants to Engineer (climbing a boom) of cranes (under 50 tons) with booms of eighty feet or more (including jib) or of cranes (under 50 tons) with leads of one hundred feet or more, shall receive additional premium according to the following schedule:

	Per Hour
Booms of 80 feet up to, or leads of 100 feet up to, but not including 130 feet	$0.50
Booms and/or leads of 130 feet up to, but not including 180 feet	$0.75
Booms and/or leads of 180 feet up to and including 250 feet	$1.15
Booms and/or leads over 250 feet	$1.50

   Operators and Assistants to Engineer (climbing a boom) of cranes (50 tons and over) with booms of 180 feet or more (including jib) shall receive additional premium according to the following schedule:

	Per Hour
Booms of 180 feet up to and including 250 feet	$1.25
Booms over 250 feet	$1.75

   Note: The boom shall be measured from the center of the heel pin to the center of the boom or jib point sheave.
   B. $1.25 per hour shall be added to the hourly wage while operating a rig suspended by ropes or cables or to perform work on a Yo-Yo Cat.
   C. In a raise or shaft, a premium of $.40 per hour will be paid in addition to the regular straight time wage.
   A raise is defined to be an underground excavation (lined or unlined) whose length exceeds its width and the inclination of the grade from the excavation is greater than 20 degrees from the horizontal.
   A shaft is defined to be an excavation (lined or unlined) made from the surface of the earth, generally vertical in nature, but may decline up to 75 degrees from the vertical, and whose depth is greater than 15 feet and its largest horizontal dimension. Includes an underground silo.
   D. In a tunnel, a premium of $.30 per hour will be paid in addition to the regular straight time wages.
   A tunnel is defined to be an underground excavation (lined or unlined) whose length exceeds its width and the inclination of the grade from the excavation is no greater than 20 degrees from the horizontal.

8. Glazier: $.50 per hour shall be added to the hourly wage for height pay for exterior glazing work performed from a scaffold or rigging 25 feet or more above the ground level.

9. Ironworker: $.50 per hour shall be added to the hourly wage while working in tunnels or coffer dams. $1.00 per hour shall be added to the hourly wage while working under or covered with water (submerged), or on the summits of Mauna Kea, Mauna Loa or Haleakala.

10. Painter: $.50 per hour shall be added to the hourly wage for painting on surfaces over 40 feet in height while using staging or scaffolding.

11. Plumber: One and one-half times the straight-time rate for height pay while working from OSHA approved trusses, stacks, towers, tanks, bosun's chair, swinging or rolling scaffolding, supporting structures or on open platforms where the employee is subject to a direct fall of 40 feet or more. Provided, however, that when said work is performed where the employee is on a firm footing within an enclosure, a hazardous condition does not exist regardless of height. $1.00 per hour shall be added to the straight-time rate while working with flame cutting or any type of welding equipment on any galvanized material or product for at least an hour.

12. Sheetmetal Worker:
   A. For overtime purposes: ((Basic hourly rate less $2.77) multiplied by 1.5) + $2.77 + Fringe total.
   B. 2/17/03: Add $.06 to the total fringe benefit hourly rate per Hawaii Revised Statutes, Section 104-2 (b)(2).

13. Clamshell or Dipper Operator: $.50 per hour shall be added to the straight-time rate while working with boom (including jib) over 130 feet.

State of Hawaii
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
830 Punchbowl Street
Honolulu, Hawaii 96813

February 17, 2003

BULLETIN NO. 456

This schedule of wage rates contained herein is recognized by the Director of Labor and Industrial Relations to be prevailing on public construction work for the purposes of Chapter 104, Hawaii Revised Statutes.

As required by law, future wage rates for laborers and mechanics are incorporated into this bulletin based on available information and are subject to change.

~~The Apprentice Schedule is available on the Internet or upon~~ request from the Research and Statistics Office. Pursuant to Section 12-22-6 (1), Hawaii Administrative Rules, the Apprentice Schedule is applicable only to apprentices who are parties to apprenticeship agreements registered with or recognized by the Department of Labor and Industrial Relations.

Questions on the schedule should be referred to the Research and Statistics Office at (808) 586-9017.

The next regular schedule will be issued on or about September 15, 2003.

NELSON B. BEFITEL

LO'IHI

Wage Rate Schedule on the Internet
www.loihi.state.hi.us

State of Hawaii
DEPARTMENT OF
LABOR AND INDUSTRIAL RELATION
Research and Statistics Office
830 Punchbowl Street
Honolulu, Hawaii 96813

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

HONOLULU, HAWAII

P R O P O S A L

6/02/98

PROPOSAL TO THE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

PROJECT: **Kaneohe Bay Drive Improvements**
Vicinity of Puohala Street to Kawa Bridge
District of Koolaupoko, Island of Oahu

PROJECT NO.: **STP-065-1(9)**

COMPLETION TIME: 460 Working Days from the date indicated in the Notice to Proceed from the Department.

Note: Completion time does not include plant establishment period

DBE GOAL: None specified

DESIGN PROJECT MANAGER:

NAME: **Todd Nishioka**

ADDRESS: **601 Kamokila Blvd Rm. 688**
Kapolei, Hawaii 96707

PHONE NO.: **(808) 692-7547**

FAX NO. **(808) 692-7555**

Director of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Sir:

The undersigned bidder declares the following:

1. It 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 this proposal.

2. It has not been assisted or represented on this matter by any individual who has, in a State capacity, been involved in the subject matter of this contract within the past two years.

3. It has not and will not, either directly or indirectly offered or given a gratuity (i.e.. an entertainment or gift) to any State or County employee to obtain a contract or favorable treatment under a contract.

4. It will not maintain for its employees any segregated facilities at any of its establishments.

5. Does not and will not permit its employees to perform their services at any location under its control, where segregated facilities are maintained.

The undersigned bidder further agrees to the following:

1. If this proposal is accepted, it shall execute a contract with the Department to provide all necessary labor, machinery, tools, equipment, apparatus and any other means of construction, to do all the work and to furnish all the materials specified in the contract in the manner and within the time therein prescribed in the contract, and that it shall accept in full payment therefore the sum of the unit and/or lump sum prices as set forth in the attached proposal schedule for the actual quantities of work performed and materials furnished and furnish satisfactory security in accordance with Section 103D-324, Hawaii Revised Statutes, within 10 days after the award of the contract or within such time as the Director of Transportation may allow after the undersigned has received the contract documents for execution, and is fully aware that non-compliance with the aforementioned terms will result in the forfeiture of the full amount of the bid guarantee required under Section 1032D-323, Hawaii Revised Statutes.

2. That the quantities given in the attached proposal schedule are approximate only and are intended principally to serve as a guide in determining and comparing the bids.

3. That the Department does not either expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Director of Transportation, and that all increased or decreased quantities of work shall be performed at the unit prices set forth in the attached proposal schedule except as provided for in the specifications.

4. In case of a discrepancy between unit prices and the totals in said Proposal Schedule, the unit prices shall prevail.

5. Agrees to begin work within 10 working days after the date of notification to commence with the work, which date is in the notice to proceed, and shall finish the entire project within the time prescribed.

6. The Director of Transportation reserves the right to reject any or all bids and to waive any defects when in the Director's opinion such rejections or waiver will be for the best interest of the public.

The bidder acknowledges receipt of and certifies that it has completely examined the following listed items: Hawaii Standard Specifications for Road, Bridge, and Public Works Construction, 1994, or such other standard specifications as provided for by the Department, the Notice to Bidders, Instruction to Bidders, Special Provisions, the amendments to special provisions, if any, the Proposal, the Contract and Bond Forms, and the Project Plans.

In accordance with Section 103D-323, Hawaii Revised Statutes, this proposal is accompanied with a bid security in the amount of 5% of the total amount bid, in the form checked below. (Check applicable bid security submitted with bid.)

xxx Surety Bid Bond (Use standard form),

_____ Cash,

_____ Cashier's Check,

_____ Certified Check, or

_____ _____.
(Fill in other acceptable security.)

The undersigned bidder acknowledges receipt of any addendum issued by the Department by recording in the space below the date of receipt.

Addendum No. 1 2/19/03 Addendum No. 3 _____

Addendum No. 2 _____ Addendum No. 4 _____

In accordance with Section 103D-302, Hawaii Revised Statutes, the undersigned as bidder has listed the name of each person or firm, who will be engaged by the bidder on the project as Joint Contractor or Subcontractor and the nature of work to be done by each on the following page. It is understood that failure to comply with the aforementioned requirements may be cause for rejection of the bid submitted.

The undersigned bidder asserts that affirmative action has been taken to seek out and consider Disadvantaged Business Enterprises (DBE) for portions of the work which can be subcontracted, and the affirmative actions of the bidder are fully documented in it's records and are available upon request by the Department. It is also understood that it must meet or exceed the DBE contract goal listed on page P-1, or demonstrate that it made good faith efforts to meet the DBE project goal. The undersigned as bidder, together with the joint contractors, subcontractors, suppliers and manufacturers listed on the following pages P-5 and P-6 will have a DBE contract goal of 24.6 % for 23+ % (percentage to be completed by bidder) DBE participation if the contract is awarded to it, and shall maintain such DBE participation during the construction of this project.

SUBCONTRACTOR LISTING

(Attach additional sheets if necessary.)

	NAME OF FIRM	NATURE OF WORK	DBE (Y/N)
1.	ALOHA STEEL	REBAR	Y
1a.		~~LANDSCAPING~~ JS	
2.	GRACE PACIFIC	AC PAVING	N
2a.		STRIPING	
3.	ONO CONSTRUCTION	CMU/GRP	N
3a.		~~ELECTRICAL~~ JS	
4.	SUN INDUSTRIES	INSTALL GUARDRAILS & SIGNS	N
4a.			
5.	HAWAIIAN WATER & CHLORINATION	CHLORINATE PIPE	N
5a.			
6.	FINISH EDGE CONCRETE CONSTRUCTION	CONCRETE FLATWORK	N
6a.			
7.	GREEN THUMB	LANDSCAPE	N
7a.			

INFORMATION IN THIS COLUMN IS CONFIDENTIAL AND IS ON FILE AT D.O.T. IT IS AVAILABLE ONLY FOR AUTHORIZED USE.

NOTES:

Firms claiming DBE Status must be certified with HDOT prior to the bid opening date reasonably assure itself that the listed firms claiming DBE status are certified with HI date.

The Name of Firm, Nature of Work and Dollar Amount of Work shall be indicated for Amount of Work shall be the amount estimated to be paid to the firm.

SUBCONTRACTOR LISTING

(Attach additional sheets if necessary.)

	NAME OF FIRM	NATURE OF WORK	DBE (Y/N)
1.	HARRY ASATO PAINTING	STRIPING	Y
1a.			
2.	STANDARD ELECTRIC	ELECTRICAL	N
2a.			
3.	C.S. PETERSON SERVICES, INC	EARTHWORK	Y
3a.			
4.			
4a.			
5.			
5a.			
6.			
6a.			
7.			
7a.			

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NOTES:

Firms claiming DBE Status must be certified with HDOT prior to the bid opening date reasonably assure itself that the listed firms claiming DBE status are certified with HDOT as of the bid opening date.

The Name of Firm, Nature of Work and Dollar Amount of Work shall be indicated for all firms. The Dollar Amount of Work shall be the amount estimated to be paid to the firm.

JOINT CONTRACTOR, SUPPLIER AND MANUFACTURER LISTING

(Attach additional sheets if necessary.)

NAME OF FIRM	NATURE OF WORK	DBE (Y/N)
JOINT CONTRACTOR:		
1.		
1a.		
SUPPLIER:		
1. JG ASSOCIATES	FRAMES & GRATES	~~Y~~ N
1a. ~~RAMTEK~~	~~PRECAST MH'S/CB~~	Y
2. SUN INDUSTRIES	SUPPLY GUARDRAIL	Y
2a.		
MANUFACTURER:		
1. SUN INDUSTRIES	SUPPLY SIGNAL POLES	Y
1a.		
2. RAMTEK	PRECAST MH & CB	Y
2a.		

INFORMATION IN THIS COLUMN IS CONFIDENTIAL AND IS ON FILE AT D.O.T. IT IS AVAILABLE ONLY FOR AUTHORIZED USE.

NOTE:

Firms claiming DBE Status must be certified with HDOT prior to the bid opening da
reasonably assure itself that the listed firms claiming DBE status are certified with H
date.

The Name of Firm, Nature of Work and Dollar Amount of Work shall be indicated f
Amount of Work shall be the amount estimated to be paid to the firm.

The undersigned hereby certifies that the bid prices contained in the attached proposal schedule have been carefully checked and are submitted as correct and final.

This declaration is made with the understanding that the undersigned is subject to the penalty of perjury under the laws of the United States and is in violation of the Hawaii Penal Code, Section 710-1063, unsworn falsification to authorities, of the Hawaii Revised Statues, for knowingly rendering a false declaration.

Kaikor Construction Associates, Inc.
Bidder

By Garrett J. Sullivan
Authorized Signature

Garrett J. Sullivan
President
Title

P. O. BOX 30162

Honolulu, HI 96820

841-3110
Business Telephone

3/6/03
Date

Contact Person and Phone Number
(If different from above.)

NOTE:

If bidder is a CORPORATION, the legal name of the corporation shall be set forth above, the corporate seal affixed, together with the signature(s) of the officer(s) authorized to sign contracts for the corporation. Please attach to this page current (not more than six months old) evidence of the authority of the officer(s) to sign for the corporation.

If bidder is a PARTNERSHIP, the true name of the partnership shall be set forth above, with the signature(s) of the general partner(s). Please attach to this page current (not more than six months old) evidence of the authority of the partner authorized to sign for the partnership.

If bidder is an INDIVIDUAL, the bidder's signature shall be placed above.

If signature is by an agent, other than an officer of a corporation or a partner of the partnership, a POWER OF ATTORNEY must be on file with the Department before opening bids or submitted with the bid. Otherwise, the Department may reject the bid as irregular and unauthorized.

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
203.0010	Roadway Excavation for Temporary Pavement	230	Cu. Yd.	$ 56	$ 12,880 -
203.0100	Roadway Excavation	4,100	Cu. Yd.	$ 55	$ 225,500 -
203.0110	Borrow Excavation	1,010	Cu. Yd.	$ 22	$ 22,220 -
206.2020	Structure Excavation for Drainage Systems	2,369	Cu.Yd.	$ 25	$ 59,225
206.7001	Structural Excavation for Retaining Walls	2,146	Cu.Yd.	$ 80	$ 171,680
206.7002	Structural Backfill for Retaining Walls	1,629	Cu. Yd.	$ 40	$ 65,160 -
206.7003	Filter Material for Retaining Walls	98	Cu. Yd.	$ 57	$ ~~5587~~ 5586
209.1000	Water Pollution and Erosion Control	F.A.	F.A.	F.A.	$50,000.00
305.1000	Aggregate Subbase for Temporary Pavement	115	Cu. Yd.	$ 30	$ 3450 -
305.1110	Aggregate Subbase	1,640	Cu. Yd.	$ 42	$ 68,880
306.1000	Untreated Permeable Base Course	690	Cu. Yd.	$ 55	$ 37,950
312.0001	Plant Mix Glassphalt Concrete Base Course for Temporary Pavement	160	Tons	$ 113	$ 18,080
312.1000	Plant Mix Glassphalt Concrete Base Course	2,950	Tons	$ 83	$ 244,850

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
401.1000	Asphalt Concrete Pavement, Mix No. IV for Temporary Pavement	80	Tons	$ 124	$ 9920
402.0001	Superpave Asphalt Concrete Pavement	1,840	Tons	$ 123	$ 226,320
402.0600	Pavement Smoothness Incentive	allowance	allowance	allowance	$12,000.00
411.1212	13-Inch Reinforced Concrete Pavement for bus bay	58	Cu. Yd.	$ 255	$ 14,790
503.0001	Reinforced Concrete Jacket for 8 inch waterline	452	Lin. Ft.	$ 100	$ 45,200
503.1200	Driveway Culverts	156	Lin. Ft.	$ 425	$ 66,300
503.1210	Reinforced Concrete Jacket for culvert	173	Lin. Ft.	$ 88	$ 15,224
503.1310	Concrete in Footings in CMU Wall (38 Cu. Yd.)	L.S.	L.S.	L.S.	$ 14,000
503.2010	Concrete in Retaining Walls (554 Cu. Yd.)	L.S.	L.S.	L.S.	$ 325,000-
513.4000	Type "L2" CMU Wall	150	Sq. Yd.	$ 340	$ 51,000
513.5000	Type "L1" CMU Wall	96	Sq. Yd.	$ 320	$ 30,720
602.1002	Reinforcing Steel in Retaining Walls (136,023 Lbs.)	L.S.	L.S.	L.S.	$ 105,000
602.1003	Reinforcing Steel in CMU Wall Concrete Footings (12,573 Lbs.)	L.S.	L.S.	L.S.	$ 5500

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
603.0010	Bed Course Material for Culverts	468	Cu. Yd.	$ 48	$ 22,464
603.1008	18-Inch Reinforced Concrete Pipe, Class III or 18-Inch High Density Polyethylene Pipe (Type S), or 18-Inch Aluminum Spiral Rib Pipe, thickness = 0.105"	73	Lin. Ft.	$ 53	$ 3869 -
603.1010	24-Inch Reinforced Concrete Pipe, Class III or 24-Inch High Density Polyethylene Pipe (Type S), or 24-Inch Aluminum Spiral Rib Pipe, thickness = 0.105"	2,048	Lin. Ft.	$ 44	$ 90,112
604.1000	Adjusting Water Valve Box Frame and Cover	1	Each	$ 200	$ 200
604.1010	Relocation of Water Meter, Water Meter Box Frame and Cover	3	Each	$ 2000	$ 6000
604.2000	Adjusting Water Valve Manhole Frame and Cover	13	Each	$ 300	$ 3900
604.5104	Type "A" Storm Drain Manhole 4.00 to 4.99 Feet	5	Each	$ 3000	$ 15,000
604.5105	Type "A" Storm Drain Manhole 5.00 to 5.99 Feet	3	Each	$ 3000	$ 9000
604.5125	Type "B-1" Catch Basin, 6.00 to 6.99 Feet	1	Each	$ 6500	$ 6500
604.5126	Type "C" Catch Basin, 4.00 to 4.99 Feet	1	Each	$ 6500	$ 6500
604.5254	Type "A-9P" Grated Drop Inlet, 4.00 to 4.99 Feet	8	Each	$ 3500	$ 28,000

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.5255	Type "A-9P" Grated Drop Inlet, 5.00 to 5.99 Feet	2	Each	$ 4000	$ 8000
604.5262	Type "61614P" Grated Drop Inlet, 2.00 to 2.99 Feet	2	Each	$ 3000	$ 6000
604.5274	Type "2A-9P" Grated Drop Inlet, 4.00 to 4.99 Feet	1	Each	$ 4700	$ 4700
604.5284	Special Type "A-9P" Grated Drop Inlet, 4.00 to 4.99 Feet	3	Each	$ 3500	$ 10,500
605.1000	Perforated Underdrain Pipe	1,117	Lin. Ft.	$ 7	$ 7819
605.2000	Non-Perforated Underdrain Pipe	60	Lin. Ft.	$ 26	$ 1560
606.1000	Guardrail Type 3 Single w/Steel Post	327	Lin. Ft.	$ 29	$ 9483
606.1001	Triton Barrier	150	Each	$ 720	$ 108000
607.1001	4.0 Feet Chain Link Fence Without Top Rail	391	Lin. Ft.	$ 20	$ 7820
608.1200	4-Inch Reinforced Concrete Sidewalk	1,620	Sq. Yd.	$ 41	$ 66,420
608.1300	4-Inch Reinforced Concrete Walkway	30	Sq. Yd.	$ 56	$ 1680
608.1400	4-Inch Modified Reinforced Concrete Sidewalk	38	Sq. Yd.	$ 81	$ 3078
609.2020	Curb, Type 2D	1,200	Lin. Ft.	$ 9	$ 10800
609.2720	Curb and Gutter, Type 2DG	1,740	Lin. Ft.	$ 13	$ 22,620

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
609.2740	Thru Gutter	144	Lin. Ft.	$ 12	$ 1728
610.0300	8-Inch Reinforced Concrete Driveway	110	Sq. Yd.	$ 60	$ 6600
610.0400	6-Inch Reinforced Concrete Driveway	700	Sq. Yd.	$ 50	$ 35,000
611.1000	Hand Laid Riprap	12	Cu. Yd.	$ 260	$ 3120
612.6410	Grouted Rubble Paving for Outlet Structures	27	Cu. Yd.	$ 310	$ 8370
621.5000	Regulatory and Warning Signs (10 Sq. Ft. or Less)	5	Each	$ 101	$ 505
621.5100	Regulatory and Warning Signs (10 Sq. Ft. or Less) with Post	25	Each	$ 207	$ 5175
621.5600	Relocation of Existing Regulatory and Warning Signs (10 Sq. Ft. or Less) with Posts	2	Each	$ 143	$ 286
621.7100	Construction Signs with Posts	5	Each	$ 467	$ 2335
621.8100	Street Name Sign on Mast Arm with New Brackets	2	Each	$ 998	$ 1996
622.1001	Street Lighting Luminaire	9	Each	$ 701	$ 6309
622.2001	Street Lighting Luminaire with House Side Shield	7	Each	$ 849	$ 5943
622.3001	2' x 4' Handhole	2	Each	$ ~~1482~~ 1482 ℄	$ ~~3~~ 2964 ℄

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.4001	2 - 3" C Ductline	100	Lin. Ft.	$ 74	$ 7400
622.5001	4 - 5" C Ductline	125	Lin. Ft.	$ 308	$ 38,500
622.6001	8 - 5" C Ductline	125	Lin. Ft.	$ 422	$ 52,750
622.7001	HECO Service Charges	L.S.	L.S.	L.S.	$ ~~12,345.00~~
622.8001	2-5" C Ductline	125	Lin. Ft.	$ 159	$ 19875
623.2011	Type I Signal Standard	1	Each	$ 704	$ 704
623.2021	Type II Signal Standard with 40' - 0" Mast Arm	1	Each	$ 4978	$ 4978
623.2031	Foundation for Type I Signal Standard	1	Each	$ 181	$ 181
623.2041	Foundation For Type II Signal Standard with 40' - 0" Mast Arm	1	Each	$ 1444	$ 1444
623.2061	Relocate Existing Solar Power Flashing Beacon with Foundation	1	Each	$ 2185	$ 2185
623.3001	Traffic Signal Assembly (One-way, 12-Inch, 1-3 Section with Slip Fitter Mounting)	1	Each	$ 930	$ 930
623.3055	Traffic Signal Assembly (Two-way, 12-Inch, 2-3 Section Vertical with Bracket Mounting)	1	Each	$ 1571	$ 1571

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.3060	Traffic Signal Assembly (One-way, 12-Inch, 1-3 Section Vertical with Mast Arm Mounting)	2	Each	$ 953	$ 1906
623.4040	Pedestrian Push Button with Sign	4	Each	$ 236	$ ~~934~~ 944
623.5000	Traffic Signal Ductline, One 2-Inch Conduit, Schedule 80 (110 Lin. Ft.)	L.S.	L.S.	L.S.	$ 5772
623.5010	Traffic Signal Ductline, Two 2-Inch Conduit, Schedule 80 (20 Lin. Ft.)	L.S.	L.S.	L.S.	$ 1267
623.5050	Traffic Signal Ductline, Four 2-Inch Conduit, Schedule 40 (100 Lin. Ft.)	L.S.	L.S.	L.S.	$ 8207
623.6000	Type A Pullbox	1	Each	$ 792	$ 792
623.6010	Type B Pullbox	3	Each	$ 1182	$ 3546
623.7040	Type 1 Traffic Control Cable (110 Lin. Ft.)	L.S.	L.S.	L.S.	$ 315
623.7042	Type 2 Loop Detector Lead-In Cable (505 Lin. Ft.)	L.S.	L.S.	L.S.	$ 430
623.7046	Type 6 Power Cable (110 Lin. Ft.)	L.S.	L.S.	L.S.	$ 664
623.7051	Loop Detector Sensing Unit (6' x 6') One Loop	12	Each	$ 548	$ 6574
624.0020	12-Inch waterline relocation at sta 23+11	L.S.	L.S.	L.S.	$ 12,000

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
624.0030	8-Inch waterline relocation at sta 23+23	L.S.	L.S.	L.S.	$ 10,000
624.0040	12-Inch waterline relocation at sta 25+09	L.S.	L.S.	L.S.	$ 12,000
624.0050	8-Inch waterline relocation at sta 30+20	L.S.	L.S.	L.S.	$ 10,000
624.0060	8-Inch waterline relocation at sta 34+36	L.S.	L.S.	L.S.	$ 10,000
624.0070	20-Inch waterline relocation at sta 34+36	L.S.	L.S.	L.S.	$ 25,000
624.0090	Fire Hydrant Relocation Including All Appurtenances at Station 27+33	1	Each	$ 10,000	$ 10,000
629.0110	4-Inch Pavement Striping - Tape, Type I or Thermoplastic Extrusion (170 Lin. Ft.)	L.S.	L.S.	L.S.	$ 157
629.0120	8-Inch Pavement Striping - Tape, Type I or Thermoplastic Extrusion (320 Lin. Ft.)	L.S.	L.S.	L.S.	$ 593
629.0130	Double 4-Inch Pavement Striping - Tape, Type I or Thermoplastic Extrusion (420 Lin. Ft.)	L.S.	L.S.	L.S.	$ 778
629.0210	4-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (3080 Lin. Ft.)	L.S.	L.S.	L.S.	$ 2852
629.0220	6-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (2400 Lin. Ft.)	L.S.	L.S.	L.S.	$ 3457

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.0230	8-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (80 Lin. Ft.)	L.S.	L.S.	L.S.	$ 142
629.0240	12-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (120 Lin. Ft.)	L.S.	L.S.	L.S.	$ 333
629.0250	Double 4-Inch Pavement Striping - Tape, Type II or Thermoplastic Extrusion (1500 Lin. Ft.)	L.S.	L.S.	L.S.	$ 2972
629.1010	4-Inch Pavement Striping - Tape, Type III or Thermoplastic Extrusion (680 Lin. Ft.)	L.S.	L.S.	L.S.	$ 630
629.1017	12-Inch Pavement Striping - Tape, Type III or Thermoplastic Extrusion (90 Lin. Ft.)	L.S.	L.S.	L.S.	$ 250
629.1021	Crosswalk Marking - Tape, Type III or Thermoplastic Extrusion	10	Lane	$ 231	$ 2310
629.1031	Pavement Arrows - Tape, Type III or Thermoplastic Extrusion	12	Each	$ 154	$ 1848
629.1041	Pavement Words - Tape, Type III or Thermoplastic Extrusion	6	Each	$ 283	$ 1698
629.1051	Pavement Symbol - Paint	12	Each	$ 129	$ 1548
629.1061	Detour 4-Inch Pavement Striping - Tape	10,100	Lin. Ft.	$ 0	$ 20,200

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.1062	Detour Double 4-Inch Pavement Striping - Tape	5,740	Lin. Ft.	$ 2-	$ 11,480
629.2030	Type A Pavement Marker	108	Each	$ 7-	$ 756
629.2040	Type C Pavement Marker	112	Each	$ 8-	$ 896
629.2041	Detour Type C Pavement Marker	250	Each	$ 8-	$ 2000
629.2050	Type D Pavement Marker	21	Each	$ 8-	$ 168
629.2051	Detour Type D Pavement Marker	200	Each	$ 8-	$ 1600
629.2060	Type H Pavement Marker	81	Each	$ 8	$ 648
629.2061	Detour Type H Pavement Marker	120	Each	$ 8	$ 960
629.2070	Type DB Pavement Marker	1	Each	$ 8	$ 8
636.1001	Maintenance of Field Office and Project Site Laboratory	F.A.	F.A.	F.A.	$24,000.00
638.1000	Cellular phone (Not to exceed $4,800 for 3 phones)	L.S.	L.S.	L.S.	$ 4800
640.1000	Grass Swale	710	Lin. Ft.	$ 22	$ 15,620
641.0100	Hydro-Mulch Seeding	28,600	Sq. Ft.	$ 1	$ 28600

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
645.0200	Additional Police Officers and/or Additional Traffic Control Devices	F.A.	F.A.	F.A.	$100,000.00
650.0001	Curb Ramp Type D	10	Each	$ 900	$ 9000
650.0002	Curb Ramp Type D-1	1	Each	$ 950	$ 950
650.0004	Curb Ramp Type C	1	Each	$ 1350	$ 1350
650.0005	Curb Ramp Type B Modified	2	Each	$ 1350	$ 2700
652.0150	2 Inch Cold Planing	4,900	Sq. Yd.	$ 8	$ 39.200
656.1000	Mailbox	14	Each	$ 500	$ 7000
693.1000	Terminal Impact Attenuator	2	Each	$ 12500	$ 25,000
693.1100	Replacement Cartridge Cell (Unassembled)	12	Cell	$ 650	$ 7800
693.1200	Replacement Nose Section Cover and Replacment Cartridge Cell (Unassembled)	4	Each	$ 1100	$ 4400
699.1000	Mobilization (Not to Exceed 10% of the Sum of All Items Excluding the Bid Price of this Item, cellular phones, allowances, and force account items)	L.S.	L.S.	L.S.	$ 195,867

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
A.	SUM OF ALL ITEMS				$3,221,311
B.	EITHER FURNISH FOREIGN STEEL NOT TO EXCEED AMOUNT (INSERT "0") OR FURNISH FOREIGN STEEL IN EXCESS OF MINIMAL AMOUNT (INSERT 25% X A)				$ 0
C.	AMOUNT FOR COMPARISON OF BIDS (A+B)				$3,221,311
	ALL BIDDERS MUST FILL IN B AND COMPLETE C				
NOTE:	BIDDERS MUST COMPLETE ALL UNIT PRICES AND AMOUNTS. FAILURE TO DO SO MAY BE GROUNDS FOR REJECTION OF BID.				

PROPOSAL SCHEDULE

The bidder is directed to Subsection 108.01 - Subletting of Contract.

The bidder's attention is directed to Sections 638 - Cellular Phone, and 699 - Mobilization for the limitation of the amount bidders are allowed to bid.

If the bid price for any proposal item having a maximum allowable bid indicated therefor in any of the contract documents is in excess of such a maximum amount, the bid price for such proposal item shall be adjusted to reflect the limitation thereon. The comparison of bids to determine the successful bidder and the amount of contract to be awarded shall be determined after such adjustments are made, and such adjustments shall be binding upon the bidder.

The bidder is directed to Subsections 106.12 - Recycling of Waste Glass and 106.13 - Ordering of Certain Material.

INSTRUCTIONS TO COMPUTE THE AMOUNT FOR COMPARISON OF BIDS FOR FOREIGN STEEL

Each bidder shall indicate its intention to furnish foreign steel on this project by initialing after the AMOUNT for each of the items the bidder intends to use such foreign steel including lump sum items. A bidder not indicating such usage certifies that the bidder will furnish and use only domestic steel on this project. Also, the bidder shall add an additional 25% to the SUM OF ALL ITEMS if the bid submitted is based on furnishing foreign steel in excess of the minimal use specified in Subsection 106.11 - Domestic Materials.

SUPPLEMENT TO PROPOSAL SCHEDULE

The Department recognizes that certain items of material to be incorporated into the project and/or consumed in the prosecution of the project are temporarily in short supply and beyond the control and without the fault of the Contractor. The effect of such shortages has, among other things, resulted in periodic fluctuations in the posted prices of such short supply materials, thereby making the proposal difficult for the Contractor to bid with confidence.

For this project, the only materials considered to be in short supply and Sections involved herewith are tabulated below (See Proposal Schedule in regards to the Contract Items involved):

Section	Description	Short Supply Material
301	Plant Mix Asphalt Concrete Base Course	Asphalt Cement
302	Recycled Plant Mix Asphalt Concrete Base	Asphalt Cement
312	Plant Mix Glassphalt Concrete Base Course	Asphalt Cement
401	Asphalt Concrete Pavement	Asphalt Cement
407	Bituminous Tack Coat	Asphalt Cement
408	Prime Coat	Asphalt Cement
503	Concrete Structures	Portland Cement
602	Reinforcing Steel	Reinforcing Steel
603	Culverts and Storm Drains	Portland Cement Reinforcing Steel
604	Manholes, Inlets and Catch Basins	Portland Cement Reinforcing Steel
608	Sidewalks	Portland Cement Asphalt Cement
609	Curb and/or Gutter	Portland Cement Asphalt Cement
610	Reinforced Concrete Driveway	Portland Cement

Each bidder shall submit with the proposal a written statement from the supplier of each short supply material indicating the supplier's current posted price, effective date of that price and the location of the material at that posted price (by island).

If the price of such short supply material is increased or decreased by more than 5% by the supplier prior to the completion of that contract item requiring the short supply material, the Contractor shall submit to the Department a written statement from the supplier indicating the effective date and changed price the Contractor will thereafter be charged for such short supply material. The Contractor shall also obtain whenever possible, quotations for furnishing the material from other available local suppliers. The quotations shall be obtained sufficiently in advance of the need for the material to allow review by the Department so as not to delay the work. The Contractor's request to the Department for adjusted compensation due to such changed prices will be computed only with prices in effect at the time of delivery. Only the lowest quotation obtained will be accepted by the Department. Transportation, handling, loading, processing and other similar costs will not be subject to adjusted compensation.

No adjustment to the unit bid prices will be made when the increase or decrease in the price of the short material is less than 5% of the original posted price.

If the adjustment to the unit bid price is decreased in the price of the short supply material by more than 5% of the original posted price, the State will be credited.

If an increase in the price of any short supply material exceeds or is scheduled to exceed 35% of the original posted price, the Contractor must notify the State within five working days before using the short supply material. Upon receipt of such notification from the Contractor, the State will direct the Contractor to either (1) authorize work to proceed as usual with the assurance that the indicated incremental price increase above the 35% will be compensable, (2) issue such change orders as the State may deem necessary to reduce further requirements of the short supply material which is to be paid at the increased price, or (3) if the material is considered to have priced itself beyond reason or beyond what the State can pay, the State may order cessation of further use of such short supply material on the project. Such notification by the Contractor will be required at each instance of incremental price increase above the 35% limit. If the Contractor fails to notify the State of any such incremental price increase within five working days before using the short supply material and continues to utilize the short supply material on the project, the State will not be responsible for payment for the incremental cost increase of which the State was not forewarned.

Computation for the adjusted compensation will be as follows:

(A) Portland Cement

If X = Adjustment per cubic yard of concrete,

P = Portland cement content of the approved mix design expressed in hundredweight per cubic yard of concrete,

Q = Increase or decrease in the price of portland cement in dollars per hundredweight,

Then X = QP

Example: Posted price of portland cement increases from $1.40 to $1.70 per cwt. and the hundredweight (cwt) of concrete is 5.6 cwt per c.y., then the adjustment shall be:

$1.70 - $1.40 = $0.30
($1.40)(5%) = $0.07
$0.30 - $0.07 = $0.23
X = ($0.23)(5.6) = $1.29 per c.y. of concrete

(B) Asphalt Cement

If X = adjustment per ton of mix,

P = asphalt cement content, expressed in percent of dry weight of the aggregates, as determined and accepted by the Department for each of the design plant mixes,

Q = increase or decrease in the price of asphalt cement, in dollars per ton,

Then $X = \frac{Q(P)}{100+P}$

Example: Posted price of asphalt cement increases from $70 to $80 per ton and the asphalt content of the A.C. mix was accepted at 6.0%, then the adjustment shall be:

$80.00 - $70.00 = $10.00
($70.00)(5%) = $3.50
$10.00 - $3.50 = $6.50
$X = \$6.50 \left(\frac{6}{100+6}\right) = \$0.37$ per ton A.C. mix

(C) Reinforcing Steel

If X = Adjustment for reinforcing steel,

P = Weight of reinforcing steel, expressed in hundredweight

Q = Increase or decrease in the price of reinforcing steel in dollars per hundred weight,

Then X = QP

Example: Posted price of grade 40 reinforcing steel increases from $14.00 to $15.00 per cwt and the weight of the grade 40 reinforcing steel is 80,000 pounds, then the adjustment shall be:

$15.00 - $14.00 = $1.00
($14.00)(5%) = $0.70
$1.00 - $0.70 = $0.30
X = ($0.30)(800) = $240 for grade 40 reinforcing steel

The Contractor shall submit to the Department original receipted bills covering the short supply material used on the project as soon as practicable after shipments are completed. The bills shall be accompanied by a tabulation on which the bills are listed in chronological order showing for each bill the quantity, the date shipped from the supplier's terminal and the price per unit at the place indicated in the posted price (reflecting any deduction for quantity shipments). These bills shall be subject to audit verification.

The Department reserves the right to alter the quantities of material to be furnished in accordance with the provisions of Subsection 104.02.

The Department also reserves the right, during construction, to decrease or increase the scope of work, because of limitations of funds, with no adjustment in unit prices other than that specified hereinabove.

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☐ Licensed Subcontractor ☐ Vendor ☐ Trucker ☐ Manufacturer

☐ Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

_____

(Project Name or Number)

_____

(Name of Prime Contractor)

_____

Signature of DBE Representative

_____

Title

_____

Name of DBE Firm

_____

Date

*** Only 60% of the cost of supplies may be credited towards the DBE goal.**

Revised 2/02

STATEMENT OF AFFIRMATION AND ACKNOWLEDGMENT OF DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

The undersigned hereby affirms and acknowledges that he/she/it has read and fully understands the DBE requirements of this contract, and that full compliance with the DBE program requirements (49 CFR Part 26), is a requirement and condition for award of this project.

The undersigned also affirms and acknowledges that he/she/it is bound by the requirements of the DBE program in connection with the proposal submitted for the construction of **KANEOHE BAY DRIVE IMPROVEMENTS VICINITY OF PUOHALA ST. TO KAWA BRIDGE DISTRICT OF KOOLAUPOKO, ISLAND OF OAHU, PROJECT NO. STP-065-1(9)**

The undersigned is also fully aware of the project's DBE goal, certification requirements, awarding procedures, and the requirements and documentation necessary to substantiate "good faith effort."

Kaikor Construction Associates, Inc.
(Name of Person or Firm)

By Garrett J. Sullivan
(Signature)

Garrett J. Sullivan, President
(Name and Title)

P.O. BOX 30162
(Street Address or P.O. Box No.)

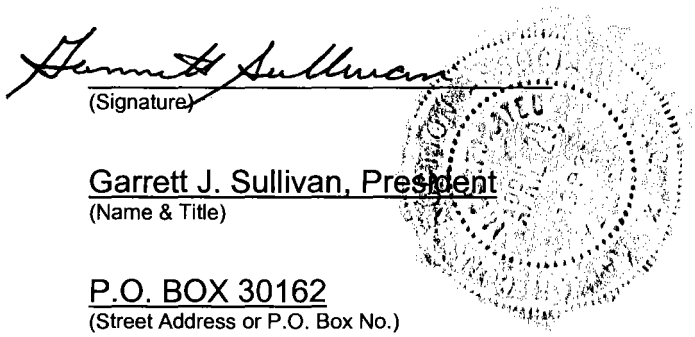
Honolulu, HI 96820
(City, State, Zip Code)

Dated 3/6/03

DECLARATION OF NON-COLLUSION

The undersigned hereby certifies that **KAIKOR CONSTRUCTION ASSOCIATES, INC.** 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 proposal submitted for the construction of **KANEOHE BAY DRIVE IMPROVEMENTS VICINITY OF PUOHALA STREET TO KAWA BRIDGE DISTRICT OF KOOLAUPOKO, ISLAND OF OAHU, PROJECT NO. STP-065-1(9)**

This declaration is made with the understanding that the undersigned is subject to the penalty of perjury under the laws of the United States and is in violation of the Hawaii Penal Code, Section 710-1063, Unsworn falsification to authorities, of the Hawaii Revised Statues, for knowingly rendering a false declaration.



(Signature)

Garrett J. Sullivan, President
(Name & Title)

P.O. BOX 30162
(Street Address or P.O. Box No.)

Honolulu, HI 96820
(City, State, Zip Code)

Dated: March 6, 2003

KAIKOR

KAIKOR CONSTRUCTION ASSOCIATES, INC.

GENERAL ENGINEERING CONTRACTOR
LICENSE #ABC 17504

P.O. BOX 30162
HONOLULU, HI 96820
Ph 808.841.3110
Fax 808.841.9511
www.kaikor.com

March 6, 2003

State of Hawaii
Dept. of Transportation
869 Punchbowl St.
Honolulu, HI 96813

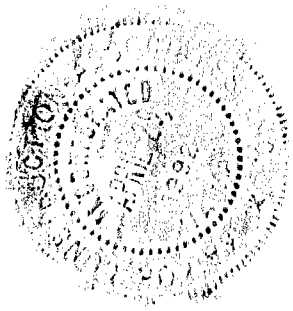
SUBJECT: CERTIFICATION OF COMPLIANCE WITH HRS 396-18, SAFETY AND HEALTH PROGRAMS

This is to inform you that **KAIKOR CONSTRUCTION ASSOCIATES, INC.** will provide a written safety and health plan, to be available and implemented by the notice to proceed date of the awarded project.

Sincerely,

KAIKOR CONSTRUCTION ASSOCIATES, INC.

Garrett J. Sullivan
President



HAWAIIAN CEMENT

Cement Division

March 6, 2003

Attn: Rowena
Kaikor Construction Associates, Inc.
P.O. Box 30162
Honolulu, Hawaii 96820
FAX: 841-9511

Dear Rowena:

PROJECT: KANEOHE BAY DRIVE IMPROVEMENTS
VICINITY OF PUOHALA STREET, KAWA BRIDGE
JOB NO. STP-065-1 (9)
ISLAND OF OAHU

This is in response to your request for a short supply letter. The present Oahu base price (f.o.b. our Campbell Industrial Park facility) for bulk portland cement Type I/II is $113.50 per ton. Our delivered price will vary depending upon location.

This price became effective April 1, 2000 and, in accordance with our "Terms and Conditions of Sale," is subject to change without notice.

Sincerely,

George Stewart
Manager, Cement Marketing and Sales

February 11, 2003

Chevron Products Company
Asphalt Division
20555 Richmond Beach Dr.
Seattle, WA 98177

J.C. Jones
Asphalt Sales Manager
Northwest Region
206.542.9751
JECJ@ChevronTexaco.com

Grace Pacific
Attention: Val Sato
P. O. Box 78
Honolulu, HI 96810

Gentlemen:

This is to inform you that effective 3/1/03 Chevron's posted prices FOB our refinery at Barber's Point will increase to the following:

PG64-16	$195.00 per ton
SS1-H	$1.00 per gallon

You may refer to this letter for bidding purposes until notified of any changes in price or product availability.

Please call Keith Takekawa at 808-682-3141 if your require additional information.

Very truly yours,

J.C. Jones

J.C. Jones

TESORO

Tesoro Hawaii Corporation
733 Bishop Street, Suite 2800
P.O Box 3379
Honolulu, Hawaii 96842-0001
808 547 3111
808 547 3145 Fax

January 15, 2003

Via facsimile: (808) 842-3203

Mr. Bob Wilkinson
President
Grace Pacific Corporation
P.O. Box 78
Honolulu, Hawaii 96810

Dear Bob:

Effective February 1, 2003, our posted price for PG 64-16 graded asphalt FOB refinery load rack will increase $5.00/ST from 170.00/ST to 175.00/ST.

Aloha,

Leinani J. Shak
Commercial Marketing Sales Manager
Tesoro Hawaii Corporation
Ph: (808) 547-3201
Fax: (808) 547-3274
e-mail: Lshak@tesoropetroleum.com

Cc: Randy Christian

Kaikor Construction Associates, Inc. (G)
phone: 808-839-8033 fax: ~~808-839-2787~~ 841-9611

Cascade steel rolling mills, inc.

3200 N. Highway 99W
P.O. Box 687
McMinnville, OR 97128-9399

EFFECTIVE JANUARY, 1 2002

Base Prices F.O.B. Honolulu Dock***

#3	Grade 60	$20.40/cwt
#4 - #6	Grade 60	$19.75/cwt
#7 - #11	Grade 60	$19.75/cwt

Add $10.00 per ton June – December 2002

*** + 1.00 via Sause Bros.
*** + 2.50 via Matson 24' Flat Rack
*** + 2.75 via Matson 40' Flat Rack

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☒ Licensed Subcontractor ☐ Vendor ☐ Trucker ☐ Manufacturer

☐ Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

Kaukonahua Bay Dewe Improvement
(Project Name or Number)

Kaikor Construction
(Name of Prime Contractor)

Signature of DBE Representative

Title

C.J. Peterson Services, Inc.
P. O. Box 971056
Waipahu, HI 96797

C.J. Peterson Services, Inc.
Name of DBE Firm
~~P.O. Box~~ 971056
Waipahu, HI 96797

3/06/03
Date

*** Only 60% of the cost of supplies may be credited towards the DBE goal.**

Revised 2/02

STATEMENT OF AFFIRMATION AND ACKNOWLEDGMENT OF DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

The undersigned hereby affirms and acknowledges that he/she/it has read and fully understands the DBE requirements of this contract, and that full compliance with the DBE program requirements (49 CFR Part 26), is a requirement and condition for award of this project.

The undersigned also affirms and acknowledges that he/she/it is bound by the requirements of the DBE program in connection with the proposal submitted for the construction of

Kaikoo Rd Drive Improvement
(Project Title and Number)

The undersigned is also fully aware of the project's DBE goal, certification requirements, awarding procedures, and the requirements and documentation necessary to substantiate "good faith effort."

C.J. Peterson Services, Inc.
P. O. Box 971056
Waipahu, HI 96797
(Name of Person or Firm)

By _____
(Signature)

Office Mgr.
(Name and Title)

C.J. Peterson Services, Inc.
P. O. Box 971056
Waipahu, HI 96797
(City, State, Zip Code)

Dated: 3/06/03

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☐ Licensed Subcontractor ☐ Vendor ☐ Trucker ☒ Manufacturer

☐ Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

Kaneohe Bay Drive Improvements - Vicinity of Puohala Rd to Kawa Bridge

(Project Name or Number)

(Name of Prime Contractor)

Ryan G. Ramos

Signature of DBE Representative

President

Title

Ramtek Fabrication Co., Inc.

Name of DBE Firm

3-5-03

Date

*** Only 60% of the cost of supplies may be credited towards the DBE goal.**

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☒ Licensed Subcontractor ☐ Vendor ☐ Trucker ☐ Manufacturer

☐ Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

Kaneohe Bay Drive Improvements Vicinity of Puohala St to Kawa Bridge

(Project Name or Number)

(Name of Prime Contractor)

Signature of DBE Representative

President

Title

Aloha Steel Corp.

Name of DBE Firm

3-6-03

Date

*** Only 60% of the cost of supplies may be credited towards the DBE goal.**

Revised 2/02

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☑ Licensed Subcontractor ☐ Vendor ☐ Trucker ☐ Manufacturer

☐ Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

Kaneohe Bay Drive Improvements #STP-065-1(9)

(Project Name or Number)

Kanlon Construction

(Name of Prime Contractor)

Signature of DBE Representative

VP

Title

HARRY ASATO PAINTING
P.O. Box 17596
Honolulu, HI 96817
Ph: 841-7055 Fax: 848-7055

Name of DBE Firm

3-6-03

Date

Only 60% of the cost of supplies may be credited towards the DBE goal.

Revised 2/02

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☐ Licensed Subcontractor ☐ Vendor ☐ Trucker ☐ Manufacturer

XXX Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

KANEOHE BAY DRIVE IMPROVEMENTS
VICINITY OF PUOHALA STREET TO KAWA BRIDGE
FEDERAL AID PROJECT NO. STP-065-1(9)

_____
(Name of Prime Contractor)

_____
Signature of DBE Representative

Maxine Lee, Owner
Title

JG Associates
Name of DBE Firm

03/04/03
Date

*** Only 60% of the cost of supplies may be credited towards the DBE goal.**

Revised 2/02

CONFIRMATION BY DBE

The undersigned confirms that it is currently certified by the State Department of Transportation (DOT) as a DBE and therefore considered, as a registered bidder with the DOT. in the undersigned DBE intends to perform in this contract as (Check one):

☒ Licensed Subcontractor ☐ Vendor ☐ Trucker ☐ Manufacturer

☐ Supplier * ☐ Consultant ☐ Broker ☐ Other, please specify _____

The undersigned submitted a bid proposal for:

Kaneohe Bay Drive Improvements vicinity of Puohala Street to Kawa Bridge, Kaneohe, Oahu, Hawaii, Federal-Aid Project No. STP-065-1(9)

(Project Name or Number)

(Name of Prime Contractor)

Signature of DBE Representative

Estimator

Title

SUN Industries, Inc.

Name of DBE Firm

3/6/03

Date

*** Only 60% of the cost of supplies may be credited towards the DBE goal.**

Revised 2/02

IN THE MATTER OF
NOTICE TO BIDDERS SEALED PRO

AFFIDAVIT OF PUBLICATION

STATE OF HAWAII)
) SS.
City and County of Honolulu)

Carrie-Ann Asuncion being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of MidWeek Printing, Inc., publisher of MidWeek and the Honolulu Star-Bulletin, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the aforementioned newspapers as follows:

MidWeek _____ times on _____

Honolulu Star-Bulletin 1 times on _____
01/31/2003

And that affiant is not a party to or in any way interested in the above entitled matter.

C Asuncion

Subscribed to and sworn before me this 31ST day of JANUARY A.D. 2003

Patricia K. Reese

Notary Public of the First Judicial Circuit
State of Hawaii

My commission expires October 07, 2006

Ad# 05509838

NOTICE TO BIDDERS

SEALED PROPOSALS for Kaneohe Bay Drive Improvements, Vicinity of Puohala Street to Kawa Bridge, Federal-Aid Project No. STP-065-1(9), District of Koolaupoko, Island of Oahu, will be received at the Contracts Office, Department of Transportation, 869 Punchbowl Street, Honolulu, Hawaii 96813, until 2:00 P.M., March 6, 2003, at which time and place they will be publicly opened and read.

The project includes widening of Kaneohe Bay Drive including excavation, grading, asphalt concrete pavement, building a bus bay, metal guardrail, concrete barriers, retaining walls, CMU walls, highway lighting, drainage improvements, sidewalks, traffic signal, building driveways and pavement striping marking and signing.

Plans and specifications may be examined and borrowed at the appropriate above offices. Borrowed plans and specifications shall be returned in good condition within 30 calendar days after the bid opening date.

To be eligible to bid, bidders must possess a valid State of Hawaii General Engineering Contractor's "A" license prior to the award of the contract.

Bidder's notice of intention to bid must be received at said Contracts Office no later than 4:30 P.M., 10 calendar days prior to the bid opening date. If the tenth day is on a Saturday, Sunday or State holiday, the notice of intention is due on the last working day prior to the due date. Fax notice is acceptable provided the Contracts Office receives the faxed notice within the time stated above. The fax number is (808) 587-2132. It is the bidder's responsibility to ensure that the Contracts Office receives the notice of intent on time and in a legible condition.

The Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the U.S. Department of Transportation (Title 49, Code of Federal Regulations Part 21) issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the grounds of race, color, religion, sex, national origin, age, or disability.

The Equal Employment Opportunity Regulations of the Secretary of Labor implementing Executive Order 11246, as amended shall be complied with on this project.

The U.S. Department of Transportation Regulations entitled "Participation by Disadvantaged Business Enterprise in Department of Transportation Programs", Title 49, Code of Federal Regulations, Part 26 is applicable to this project.

The contract Disadvantaged Business Enterprise (DBE) goal for this project is indicated in the Proposal. The bidder is directed to the Supplemental Notice - Disadvantaged Business Enterprise (DBE) Program contained herein and made an integral part of this bid.

Each proposal shall be on a form furnished by said Department.

Estimated construction cost is between $1,000,000 and $5,000,000.

The State reserves the right to reject any or all proposals and to waive any defects in said proposals for the best interest of the public.

RODNEY K. HARAGA
Director of Transportation

(SB05509838 1/31/03)

PATRICIA K. REESE
Notary Public
State of Hawaii

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HONOLULU, HAWAII

FORMS

Contents:

Contract
Bond
Certificate of Compliance with Chapter 104, HRS

CONTRACT

THIS AGREEMENT, made this 20th day of May, 2003, by and between the STATE OF HAWAII, by its Director of Transportation, hereinafter referred to as "STATE", and KAIKOR CONSTRUCTION ASSOCIATES, INC. whose business/post office address is P. O. Box 30162, Honolulu, Hawaii 96820 hereinafter referred to as "CONTRACTOR";

WITNESSETH: That for and in consideration of the payments hereinafter mentioned, the CONTRACTOR hereby covenants and agrees with the STATE to complete in place, furnish and pay for all labor and materials necessary for "KANEOHE BAY DRIVE IMPROVEMENTS, VICINITY OF PUOHALA STREET TO KAWA BRIDGE, OAHU, FEDERAL-AID PROJECT NO. STP-065-1(9)", or such a part thereof as shall be required by the STATE, the total amount of which labor, material and construction shall be computed at the unit and/or lump sum prices set forth in the attached proposal schedule and shall be the sum of THREE MILLION TWO HUNDRED TWENTY ONE THOUSAND THREE HUNDRED ELEVEN AND NO/100 DOLLARS ($3,221,311.00) as follows:

AMOUNT FOR COMPARISON OF BIDS.....$3,221,311.00

which sum shall be provided from the following funds:

Federal Funds	$2,555,447.00
State Funds	638,865.86
HECO Funds	25,555.38
Oceanic Cable Funds	1,442.76
Total	$3,221,311.00

all in accordance with the Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 1994, or such other standard specifications as may be provided for specifically herein, the special provisions, the amendments to special provisions , if any, all of which are hereinafter referred to as "specifications", the notice to bidders, the instructions to bidders, the proposal and plans for Project No. STP-065-1(9), and any supplements thereto, on file in the office of the Director of Transportation. These documents, together with all alterations, amendments, additions and deductions thereto or therefrom, are attached hereto and/or incorporated herein by reference and made a part of this contract.

The CONTRACTOR hereby covenants and agrees to complete such work within__ FOUR HUNDRED SIXTY (460) working days from the date indicated in the notice to proceed from the STATE subject, however, to such extensions as may be provided for in writing under the specifications.

For and in consideration of the covenants, undertakings and agreements of the CONTRACTOR herein set forth and upon the full and faithful performance thereof by the CONTRACTOR, the STATE hereby agrees to pay the CONTRACTOR the sum of THREE MILLION TWO HUNDRED TWENTY ONE THOUSAND THREE HUNDRED ELEVEN AND NO/100 DOLLARS ($3,221,311.00) in lawful money, but not more than such part of the same as is actually earned according to the STATE's determination of the actual quantities of work performed and materials furnished by the CONTRACTOR at the unit or lump sum prices set forth in the attached proposal schedule. Such payment,

including any extras, shall be made, subject to such additions or deductions hereto or hereafter made in the manner and at the time prescribed in the specifications and this contract. In any event, extras shall not exceed ONE HUNDRED FORTY THOUSAND EIGHTY NINE AND NO/100 DOLLARS ($140,089.00) in lawful money and shall be provided from the following fund(s):

Federal Funds	$110,988.00
State Funds	27,751.09
HECO Funds	1,277.77
Oceanic Cable Funds	72.14
Total	$140,089.00

Where Federal funds are involved, it is covenanted and agreed by and between the parties hereto that the sums of TWO MILLION FIVE HUNDRED FIFTY FIVE THOUSAND FOUR HUNDRED FORTY SEVEN AND NO/100 DOLLARS ($2,555,447.00) and ONE HUNDRED TEN THOUSAND NINE HUNDRED EIGHTY EIGHT AND NO/100 DOLLAS ($110,988.00), portions of the contract price and extras, respectively, shall be paid out of the applicable Federal funds, and that this contract shall be construed to be an agreement to pay said sums to the Contractor only out of the aforesaid Federal funds if and when such Federal funds shall be received from the Federal Government, and that this contract shall not be construed to be a general agreement to pay said portions at all events out of any funds other than those which may be so received from the Federal Government; provided, that if the Federal share of the cost of the project is not immediately forthcoming from the Federal Government, the STATE may advance the CONTRACTOR the anticipated Federal reimbursement of the cost of the completed portions of the work from funds which have been appropriated by the STATE for its pro rata share.

All words used herein in the singular shall extend to and include the plural. All words used in the plural shall extend to and include the singular. The use of any gender shall extend to and include all genders.

CONTRACT CERTIFICATION

I hereby certify that there is an appropriation balance in the account(s) named below for this Contract No. 50918

with KAIKOR CONSTRUCTION ASSOCIATES, INC.

APPROPRIATION		(*)	AMOUNT
631 S 02 400 D	Kaneohe Bay Dr,Aumoku/Mokulele, Oahu-Cons		363,000.00
631 S 02 114 D	Kaneohe Bay Dr,Aumoku/Mokulele, Oahu-Cons	*	2,666,435.00
631 B 02 472 D	Kaneohe Bay Dr,Aumoku/Mokulele, Oahu-Cons		303,616.95
631 T 04 921 D	Special Deposits-Highways		28,348.05
			3,361,400.00

103D-309

* Federal funds, as received. Sec. 103-32, H.R.S.

Dated August 11, 2003

[redacted] Comptroller
State of Hawaii

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed the day and year first above written.

STATE OF HAWAII

BY _____
Its Director of Transportation

KAIKOR CONSTRUCTION ASSOCIATES, INC.

BY _____
Its PRESIDENT

By _____
Its

CONTRACTOR ACKNOWLEDGMENT

(CORPORATION)

STATE OF HAWAII)
ss
CITY & COUNTY OF HONOLULU)

On this 20TH of MAY 2003, before me, Linda M. Elder, personally appeared GARRETT J. SULLIVAN, to me personally known, who being by me duly sworn, did say the he is the PRESIDENT OF KAIKOR CONSTRUCTION ASSOCIATES, INC., and that the seal affixed to the foregoing instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said HE acknowledged the foregoing instrument to be the free act and deed of said corporation.

Linda M. Elder

Linda M. Elder, Notary Public
State of Hawaii, First Judicial Circuit
My Commission Expires: April 19, 2004

KAIKOR

KAIKOR CONSTRUCTION ASSOCIATES, INC.

GENERAL ENGINEERING CONTRACTOR
LICENSE #ABC 17504

P.O. BOX 30162
HONOLULU, HI 96820
Ph 808.841.3110
Fax 808.841.9511
www.kaikor.com

CORPORATE RESOLUTION

Following is a copy of the resolution of the Board of Directors of Kaikor Construction Associates, Inc., at a meeting held on December 2, 2002, covering the authorization of employees to sign legal documents.

> RESOLVED: That any one of the following employees of this Corporation be and hereby is authorized on behalf of this Corporation to execute any bid documents, surety bond applications, surety bonds, contracts, change orders, contract modifications, purchase orders, subcontracts, and any other documents such individual deems as necessary or appropriate in carrying out the corporation's contract construction business. Said authorized employees are: Garrett J. Sullivan, President and Treasurer; Stephen Baginski, Vice President; and Janis Loo, Secretary.

I hereby certify that the foregoing is a full, true, and correct copy of the resolution duly and regularly adopted by the Board of Kaikor Construction Associates, Inc., this 2nd day of December, 2002.

Janis Loo
Secretary
3059 Woolsey Pl.
Honolulu, HI 96822

President and Treasurer	Secretary	Vice President
Garrett J. Sullivan	Janis Loo	Stephen Baginski
3059 Woolsey Pl.	3059 Woolsey Pl.	536 Uluhala St.
Honolulu, HI 96822	Honolulu, HI 96822	Kailua HI 96734

FORM A-6
(REV. 2001)

STATE OF HAWAII — DEPARTMENT OF TAXATION

TAX CLEARANCE APPLICATION

PLEASE TYPE OR PRINT CLEARLY

FOR OFFICE USE ONLY
BUSINESS START DATE IN HAWAII IF APPLICABLE 04/29/92
HAWAII RETURNS FILED IF APPLICABLE 19____ 19____ 19____

STATE APPROVAL STAMP
APPROVED
DEC - 3 2002
per
Department of Taxation

IRS APPROVAL STAMP
INTERNAL REVENUE SERVICE
APPROVED
99-000320
W & I Area 6 Terr. 1

CERTIFIED COPY STAMP
This copy is acceptable as a substitute for the original tax clearance certificate issued.
Internal Revenue Service

1. APPLICANT INFORMATION: (PLEASE PRINT CLEARLY)

Applicant's Name: KAIKOR CONSTRUCTION ASSOCIATES, INC.

Address: PO BOX 30162

City/State/Zip Code: HONOLULU, HI 96820

DBA/Trade Name:

2. TAX IDENTIFICATION NUMBER(S): (Complete applicable ID numbers)

HAWAII GENERAL EXCISE ID #: 10462828

FEDERAL EMPLOYER ID # (FEIN): 99-0295416

SOCIAL SECURITY #(SSN):

3. APPLICANT IS A/AN: (CHECK ONLY ONE BOX)

- ☐ CORPORATION
- ☒ S CORPORATION
- ☐ TAX EXEMPT ORGANIZATION
- ☐ INDIVIDUAL
- ☐ PARTNERSHIP
- ☐ ESTATE
- ☐ TRUST
- ☐ LIMITED LIABILITY COMPANY
- ☐ LIMITED LIABILITY PARTNERSHIP
- ☐ Single Member LLC disregarded as separate from owner; enter owner's FEIN/SSN

4. THE TAX CLEARANCE IS REQUIRED FOR:

- ☒ CITY, COUNTY, OR STATE GOVERNMENT CONTRACT IN HAWAII *
- ☐ LIQUOR LICENSE *
- ☐ REAL ESTATE LICENSE
- ☐ CONTRACTOR LICENSE
- ☐ BULK SALES
- ☐ FINANCIAL CLOSING
- ☐ PROGRESS PAYMENT
- ☐ PERSONAL
- ☐ HAWAII STATE RESIDENCY
- ☐ FEDERAL CONTRACT
- ☐ LOAN
- ☐ SUBCONTRACT
- ☐ OTHER

* IRS APPROVAL STAMP IS ONLY FOR PURPOSES INDICATED BY ASTERISK.

5. NO. OF CERTIFIED COPIES REQUESTED: 20

6. SIGNATURE:

JANIS LOO	CORPORATE SECRETARY		
PRINT NAME	PRINT TITLE: Corporate Officer, General Partner or Member, Individual (Sole Proprietor), Trustee, Executor		
SIGNATURE	DATE 12/2/02	TELEPHONE (808) 841-3110	FAX (808) 841-9511

POWER OF ATTORNEY. If submitted by someone other than a Corporate Officer, General Partner or Member, Individual (Sole Proprietor), Trustee, or Executor, a power of attorney (State of Hawaii, Department of Taxation, Form N-848) must be submitted with this application. If a Tax Clearance is required from the Internal Revenue Service, IRS Form 8821, or IRS Form 2848 is also required. Applications submitted without proper authorization will be sent to the address of record with the taxing authority. UNSIGNED APPLICATIONS WILL NOT BE PROCESSED.

PLEASE TYPE OR PRINT CLEARLY — THE FRONT PAGE OF THIS APPLICATION BECOMES THE CERTIFICATE UPON APPROVAL.

SEE PAGE 2 ON REVERSE & SEPARATE INSTRUCTIONS. Failure to provide required information on page 2 of this application or as required in the separate instructions to this application will result in a denial of the Tax Clearance request.

BOND NO: CSB-23671

SURETY PERFORMANCE BOND

KNOW ALL BY THESE PRESENTS:

That KAIKOR CONSTRUCTION ASSOCIATES, INC. as Contractor, hereinafter called Principal, and ISLAND INSURANCE COMPANY, LIMITED as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a surety in the State of Hawaii, are held and firmly bound unto the State of Hawaii, its successors and assigns, hereinafter called Obligee, in the amount of THREE MILLION THREE HUNDRED SIXTY ONE THOUSAND FOUR HUNDRED AND NO/100 DOLLARS ($3,361,400.00), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a Contract with Obligee dated May 20, 2003 for "KANEOHE BAY DRIVE IMPROVEMENTS, VICINITY OF PUOHALA STREET TO KAWA BRIDGE, OAHU, FEDERAL-AID PROJECT NO. STP-065-1(9) ", hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time to time; then this obligation shall be void; otherwise to remain in full force and effect.

Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Obligee to the Surety and the Principal and subject to the limitation of the penal sum of this bond, Surety shall remedy the Default, or take over the work to be performed under the Contract and complete such work, or pay moneys to the Obligee in satisfaction of the surety's performance obligation on this bond.

Signed this 20th day of May, 2003.

KAIKOR CONSTRUCTION ASSOCIATES, INC. (Seal)

Name of Principal

*Garrett J. Sullivan

Signature

GARRETT J. SULLIVAN

PRESIDENT

Title

ISLAND INSURANCE COMPANY, LIMITED (Seal)

Name of Surety

*

Signature Lawrence B. Stubblefield

Attorney-In-Fact

Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

CONTRACTOR ACKNOWLEDGMENT

(CORPORATION)

STATE OF HAWAII)
ss
CITY & COUNTY OF HONOLULU)

On this 20TH of MAY 2003, before me, Linda M. Elder, personally appeared GARRETT J. SULLIVAN, to me personally known, who being by me duly sworn, did say the he is the PRESIDENT OF KAIKOR CONSTRUCTION ASSOCIATES, INC., and that the seal affixed to the foregoing instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said HE acknowledged the foregoing instrument to be the free act and deed of said corporation.

LS

Linda M. Elder, Notary Public
State of Hawaii, First Judicial Circuit
My Commission Expires: April 19, 2004

SURETY ACKNOWLEDGMENT

[FOR USE WITH SURETY PERFORMANCE AND PAYMENT BONDS]

SURETY ACKNOWLEDGMENT:

STATE OF HAWAII)

: SS.

CITY & COUNTY OF HONOLULU)

On this 20th day of May, 2003, before me personally came Lawrence B. Stubblefield to me known to be the person described in and, who, being by me duly sworn, did depose and say that he resides in Kailua, HI; that he is the Attorney-in-Fact of Island Insurance Company, Limited the corporation described in and which executed the attached instrument; that he knows corporate seal of the said corporation; that the seal affixed to the said instrument is such corporate seal; and that it was so affixed by order of the Board of Directors of the said corporation; and that he signed his name thereto by like order.

(Notary Seal)

R. Alexis Stubblefield

Notary Public
R. Alexis Stubblefield
State of Hawaii

My commission expires:
February 23, 2007

BOND NO: CSB-23671

SURETY LABOR AND MATERIAL PAYMENT BOND

KNOW ALL BY THESE PRESENTS:

That KAIKOR CONSTRUCTION ASSOCIATES, INC. as Contractor, hereinafter called Principal, and ISLAND INSURANCE COMPANY, LIMITED as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a surety in the State of Hawaii, are held and firmly bound unto the State of Hawaii, its successors and assigns, hereinafter called Obligee, in the amount of THREE MILLION THREE HUNDRED SIXTY ONE THOUSAND FOUR HUNDRED AND NO/100 Dollars ($3,361,400.00), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a Contract with Obligee dated May 20, 2003 for "KANEOHE BAY DRIVE IMPROVEMENTS, VICINITY OF PUOHALA STREET TO KAWA BRIDGE, OAHU, FEDERAL-AID PROJECT NO. STP-065-1(9) " hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor and materials supplied to the Principal for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

1. Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

2. A "Claimant" shall be defined herein as any person who has furnished labor or materials to the Principal for the work provided in the Contract.

Every Claimant who has not been paid amounts due for labor and materials furnished for work provided in the Contract may institute an action against the Principal and its Surety on this bond at the time and in the manner prescribed in Section 103D-324, Hawaii Revised Statutes, and have the rights and claims adjudicated in the action, and judgment rendered thereon; subject to the Obligee's priority on this bond. If the full amount of the liability of the Surety on this bond is insufficient to pay the full amount of the claims, then after paying the full amount due the Obligee, the remainder shall be distributed pro rata among the claimants.

Signed this 20th day of May, 2003.

KAIKOR CONSTRUCTION ASSOCIATES, INC. (Seal)

Name of Principal (Contractor)

* Garrett J. Sullivan

Signature

GARRETT J. SULLIVAN

PRESIDENT

Title

ISLAND INSURANCE COMPANY, LIMITED (Seal)

Name of Surety

*

Signature Lawrence B. Stubblefield

Attorney-In-Fact

Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

CONTRACTOR ACKNOWLEDGMENT

(CORPORATION)

STATE OF HAWAII)
ss
CITY & COUNTY OF HONOLULU)

On this 20TH of MAY 2003, before me, Linda M. Elder, personally appeared GARRETT J. SULLIVAN, to me personally known, who being by me duly sworn, did say the he is the PRESIDENT OF KAIKOR CONSTRUCTION ASSOCIATES, INC., and that the seal affixed to the foregoing instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said HE acknowledged the foregoing instrument to be the free act and deed of said corporation.

LS

Linda M. Elder, Notary Public
State of Hawaii, First Judicial Circuit
My Commission Expires: April 19, 2004

SURETY ACKNOWLEDGMENT

[FOR USE WITH SURETY PERFORMANCE AND PAYMENT BONDS]

SURETY ACKNOWLEDGMENT:

STATE OF HAWAII)

: SS.

CITY & COUNTY OF HONOLULU)

On this 20th day of May, 2003, before me personally came Lawrence B. Stubblefield to me known to be the person described in and, who, being by me duly sworn, did depose and say that he resides in Kailua, HI; that he is the Attorney-in-Fact of Island Insurance Company, Limited the corporation described in and which executed the attached instrument; that he knows corporate seal of the said corporation; that the seal affixed to the said instrument is such corporate seal; and that it was so affixed by order of the Board of Directors of the said corporation; and that he signed his name thereto by like order.

(Notary Seal)

R. Alexis Stubblefield

Notary Public
R. Alexis Stubblefield
State of Hawaii

My commission expires:
February 23, 2007

ISLAND INSURANCE COMPANY, LIMITED

1022 Bethel Street, Honolulu, Hawaii 96813

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That ISLAND INSURANCE COMPANY, LIMITED, a corporation of the State of Hawaii, has made, constituted and appointed and by these presents does make, constitute and appoint

LAWRENCE B. STUBBLEFIELD, JOHN F. JUNK AND ERNEST L. JERVES

of Honolulu, Hawaii
its true and lawful Attorney-in-Fact, to make, execute and deliver, on its behalf as Surety, bonds, undertaking and other obligatory instruments of similar nature as follows:

WITHOUT LIMITATIONS

Such bonds, undertakings and obligatory instruments for said purposes when duly executed by the aforesaid Attorney-in-Fact, shall be binding upon the said Company as fully and to the same extent as if such bonds, undertakings and obligatory instruments were signed by the duly authorized officers in the Company and sealed with its corporate seal and all the acts of said Attorney-in-Fact, pursuant to the authority hereby given, are hereby ratified and confirmed.
This appointment is made pursuant to the following Resolution adopted by the Board of Directors of the said Company on the 23rd day of August, 1988.

"RESOLVED that the Chairman of the Board, the President, an Executive Vice President or a Senior Vice President or a Vice President of the Company be, and that each or any of them is authorized to execute Powers of Attorney qualifying the Attorney-in-Fact named in the given Power of Attorney to execute in behalf of the Company, bonds, undertakings and all contracts of suretyship; and that an Assistant Vice President, a Secretary or an Assistant Secretary be and that each of any of them hereby is authorized to attest the execution of any such Power of Attorney, and to attach thereto the seal of the Company.

FURTHER RESOLVED that the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company when so affixed and in the future with respect to any bond undertaking or contract of suretyship to which it is attached."

In Witness Whereof, ISLAND INSURANCE COMPANY, LIMITED, has caused these presents to be signed by its President and Secretary, and its corporate seal to be hereunto affixed and duly attested by this 15th day of August, 2001.

Attest:
By _____
(Seal) Secretary

ISLAND INSURANCE COMPANY, LIMITED
By _____
President

State of Hawaii)
) ss.
City & County of Honolulu)

On this 15th day of August , 2001 before me appeared Linda Gilchrist to me personally know, who, being by me duly sworn, did say that she is the President of ISLAND INSURANCE COMPANY, LIMITED, and that the seal affixed to the foregoing instruments is the corporate seal of said corporation and that said instrument was signed and sealed on behalf of said corporation by authority of its Board of Directors and the said Linda Gilchrist acknowledged said instrument to be the free act and deed of said corporation.

LIZ NISHIMURA NOTARY PUBLIC STATE OF HAWAII

_____
Liz Nishimura, Notary Public, State of Hawaii

My commission expires: May 22, 2004

CITY AND COUNTY OF HONOLULU
STATE OF HAWAII

I, Franklin M. Tokioka, Secretary of ISLAND INSURANCE COMPANY, LIMITED, do hereby certify that the above and foregoing is a true and correct copy of a power of attorney executed by said ISLAND INSURANCE COMPANY, LIMITED, which is still in full force and effect.

In Witness Whereof, I have signed and affixed the seal of said Company to this certificate at Honolulu, Hawaii, this 20th day of May, 2003.

_____
Franklin M. Tokioka

CHAPTER 104, HRS COMPLIANCE CERTIFICATE

The undersigned bidder does hereby certify to the following:

1. Individuals engaged in the performance of the contract on the job site shall be paid:

   A. Not less than the wages that the director of labor and industrial relations shall have determined to be prevailing for corresponding classes of laborers and mechanics employed on public works projects; and

   B. Overtime compensation at one and one-half times the basic hourly rate plus fringe benefits for hours worked on Saturday, Sunday, or a legal holiday of the State or in excess of eight hours on any other day.

2. All applicable laws of the federal and state governments relating to workers' compensation, unemployment compensation, payment of wages, and safety shall be fully complied with.

DATED at Honolulu, Hawaii, this 20TH day of MAY 2003.

KAIKOR CONSTRUCTION ASSOCIATES, INC.
Name of Corporation, Partnership, or Individual

Garrett J. Sullivan
Signature and Title of Signer
GARRETT J. SULLIVAN, PRESIDENT

LS

Subscribed and sworn before me
this 20TH day of MAY 2003.

Notary Public, FIRST Judicial Circuit, State of Hawaii
My Commission Expires: 4/19/04