STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 2

for

INTERSTATE ROUTE H-1 ADDITION AND MODIFICATION OF FREEWAY ACCESS (KAPOLEI INTERCHANGE COMPLEX), PHASE 3

FEDERAL-AID PROJECT NO. NH-H1-1(271)

The following amendments shall be made to the Bid Documents:

A. NOTICE TO BIDDERS

Prospective bidders are hereby notified that receiving of sealed proposals scheduled for 2:00 P.M. HST, November 7, 2022, is hereby POSTPONED until 2:00 P.M. HST, FRIDAY, December 16, 2022. The attached NOTICE TO BIDDERS dated r10/28/22 shall be incorporated and made a part of the NOTICE TO BIDDERS.

B. SPECIFICATIONS

1. Replace Special Provision Section 411 dated 8/29/22 with the attached Special Provision Section 411 dated r10/28/22.

2. Replace Special Provision Section 603 dated 7/1/18 with the attached Special Provision Section 603 dated r10/28/22.

3. Replace Special Provision Section 605 dated 7/1/18 with the attached Special Provision Section 605 dated r10/28/22.

C. PROPOSAL SCHEDULE

1. Replace Proposal Schedule page P-8 to P-23 dated 9/13/22 with the attached revised Proposal Schedule page P-8 to P-23 dated r10/28/22.

D. PLANS

1. Replace Plan Sheets No. 8, 9, 23, 24, 26, 27, 28, 29, 34, 44, 47, 49, 50, 52, 53, 56, 61, 62, 73, 74, 81, 82, 84, 85, 87, 88, 89, 91, 92, 97, 99, 122, 124, 126, and 130 with the attached revised Plan Sheets No. ADD. 8, ADD. 9, ADD. 23, ADD. 24, ADD. 26, ADD. 27, ADD. 28, ADD. 29, ADD. 34, ADD. 44, ADD. 47, ADD. 49, ADD. 50, ADD. 52,

ADD. 53, ADD. 56, ADD. 61, ADD. 62, ADD. 73, ADD. 74, ADD. 81, ADD. 82, ADD. 84, ADD. 85, ADD. 87, ADD. 88, ADD. 89, ADD. 91, ADD. 92, ADD. 97, ADD. 99, ADD. 122, ADD. 124, ADD. 126, and ADD. 130.

2. Include Plan Sheet No. ADD. 156 which is intentionally left blank.

The following is provided for information.

E. ANSWERS TO QUESTIONS FROM PROSPECTIVE BIDDER

1. Attached are RFI's and responses for your information.

Please acknowledge receipt of this Addendum No. 2 by recording the date of its receipt in the space provided on page P-4 of the Proposal.

JADE T. BUTAY
Director of Transportation

NOTICE TO BIDDERS
(Chapter 103D, HRS)
Disadvantaged Business Enterprise

The receiving of SEALED BIDS for INTERSTATE ROUTE H-1 ADDITION AND MODIFICATION OF FREEWAY ACCESS (KAPOLEI INTERCHANGE COMPLEX), PHASE 3, FEDERAL-AID PROJECT NO. NH-H1-1(271), through HIePRO, scheduled for 2:00 P.M. Hawaii Standard Time (HST), November 7, 2022, is hereby POSTPONED UNTIL 2:00 P.M. HST, FRIDAY, December 16, 2022.

The submission of the Disadvantaged Business Enterprise (DBE) Contract Goal Verification and Good Faith Efforts (GFE) Documentation for Construction, Disadvantaged Business Enterprise (DBE) Confirmation and Commitment Agreement – Trucking Company and Disadvantaged Business Enterprise (DBE) Confirmation and Commitment Agreement –Subcontractor, Manufacturer, or Supplier for INTERSTATE ROUTE H-1 ADDITION AND MODIFICATION OF FREEWAY ACCESS (KAPOLEI INTERCHANGE COMPLEX), PHASE 3, FEDERAL-AID PROJECT NO. NH-H1-1(271), scheduled for 2:00 P.M. HST, November 14, 2022, is hereby POSTPONED UNTIL 2:00 P.M. HST, WEDNESDAY, December 21, 2022.

JADE T. BUTAY
Director of Transportation

Amend **Section 411 – Portland Cement Concrete Pavement** to read as follows:

SECTION 411 - PORTLAND CEMENT CONCRETE PAVEMENT

411.01 Description. This section describes constructing portland cement concrete (PCC) pavement, with or without reinforcement, on a prepared surface.

411.02 Materials.

Structural Concrete (minimum 14-day flexural strength, f_r = 650 psi)	601
Joint Filler	705.01
Joint Sealer	705.04
Reinforcing Steel	709.01
Curing Materials	711.01
Macro-Synthetic Fibers for Concrete Reinforcement	719

All concrete must comply with the concrete CO_2 footprint reduction requirements of Section 601 – Structural Concrete.

411.03 Construction.

(A) Jointing Plan. Submit the jointing plan for approval which includes types of joints, joint spacings, and location of joints.

(B) Paving Plan. Submit the paving plan no later than 30 days after the contract certification date. The paving plan must be complete and provide all information required. No partial submittal, except as noted, will be accepted. Partial submittals will be returned without review. The Engineer will review the paving plan in accordance with Subsection 105.04 – Review and Acceptance Process. Obtain acceptance of the paving plan from the Engineer before starting the test strip or any paving work including but not limited to any roadway excavation and subbase preparation and installation. The paving plan must include but not be limited to the following:

(1) Type, make, model, and the number of all equipment to be used for placing, finishing, curing, saw cutting, and diamond grinding of concrete pavement. Include a list of the equipment to be used and the number of equipment to be held in reserve in anticipation of breakdown. Provide the number of finishing bridges that will be used for thickness checking, finishing, and touch-up curing.

(2) Provide details of:

(a) Traffic control, methods to protect the public, workers, and work.

(b) Grade control methods for each operation. If low slump concrete is to be used list the method as to how required grades will be maintained.

(c) Repair of non-compliant areas

(d) PCC concrete placement, including but not limited to, proposed operational procedures, e.g., subgrade protection, delivery, or pumping, leveling, finishing methods, thickness checking, and texturing equipment. Dowel and tie bar placement method and equipment.

(e) How weather conditions detrimental to the PCC will be addressed. Rain, hot weather, wind, humidity, etc. must be monitored and addressed. Include the assumed temperature of concrete to be used in the initial calculation of the evaporation rate. Include action plans that are to be used should bad weather conditions, e.g., high wind, rain, high temperature, occur or will occur during pour and under what condition weather conditions must cause a cancellation or delay of the concrete placement. List make and model of weather monitoring instruments, to be used at the location of concrete placement, to measure the ambient air temperature, relative humidity, and wind velocity to determine the on-site real-time evaporation rate. All-in-one meters that utilize the ACI 305 chart or other accepted method for determining evaporation rate may be used if found acceptable by the Engineer.

(f) Curing means and methods, equipment, and curing materials. Method to be used to determine the application rate of the curing compound. The method of continuous agitation is used to keep the uniform distribution of pigment solids in the curing compound. Method to be used to maintain uniform and even paint-like finish spray pattern

(g) Saw cutting of PCC, list equipment, e.g., what brand and model of early-entry concrete saw will be used, the number of equipment, manpower. How it will be determined when to start cutting, how the proper saw blade will be chosen that will minimize raveling of the concrete during sawing of the joint, and the anticipated joint saw cutting rate.

(h) If applicable diamond grinding and grooving, equipment list, control of slurry, and debris. Slurry and debris pick up, disposal method, and disposal location.

(i) Construction operation sequence and location of panels/blocks and order they will be constructed.

(j) How block-outs for handholes, pull boxes, manhole frames, and covers, drain inlets, etc., in the PCC will be addressed including how the backfill around them will be accomplished the and dowel tie bar or reinforcing steel patterns.

(k) The saw cutting pattern plan. Indicate the location of areas where panels will be irregular in shape. The size of the plan sheet must be a minimum of 24" X 36". The Engineer may require larger or more detailed plans at no additional cost.

(l) List of ACI Certified Flatwork Finishers and Technicians and a copy of their certification. Refer to Section 411.03(U) Certified Concrete Flatwork Finisher Requirement below.

(m) List of material certifications, submittals, and required reports to be submitted and their tentative submittal schedule.

(n) AASHTO re:source (formally AMRL) certified material testing laboratory, must be used for all testing. Submit a list of testing methods to be provided, certifications for each test method of technicians, and the accreditation of the materials testing laboratory. If a commercial AASHTO re:source accredited material testing laboratory is not readily available on the island where the work is taking place the Engineer may allow a non-accredited AASHTO re:source material testing laboratory to perform the tests. Provide documentation that an accredited AASHTO re:source laboratory does not exist on the island and submit qualifications of the testing laboratory, calibration of test equipment documentation which will be used to perform the tests. The Engineer is not under any obligation to grant a waiver from using a non-accredited material testing laboratory or accept or consider valid any results from a non-accredited testing laboratory or non-certified technician. There will be no waiver granted by the Engineer for the use of non-certified technicians performing material tests. The Contractor is required to use due diligence in obtaining an accredited laboratory. Any delay or cost incurred by the Contractor in obtaining an AASHTO re:source accredited laboratory or certified technician must be borne by the Contractor. If the Contractor chooses to ship the samples to another island for testing, submit how the chain of custody of the samples will be maintained and how the samples will be protected from damage.

(o) Proposed concrete mix design, including expected strengths at 24 hours, 3, 7, 14, and 28 days. If the opening of pavement is to be

scheduled for a period other than the period stated in this paragraph, submit a test for that period to ensure the concrete will meet Contract requirements. The 24-hour break may be waived upon application for a waiver from the Engineer, however, no opening will be allowed at 24-hours if there are no tests performed. Submit test results of both a trial mix conducted by State-accepted testing laboratory using methods specified in Subsection 601.03(B) – Design and Designation of Concrete. Submit the ready-mix supplier's certification with the mix design that the concrete mix to be used for the slip-form placement had acceptable results for the Box Test as shown in Subsection 601.03.

(p) Other pertinent information or information requested by the Engineer

The Engineer will review the paving plan for compliance with the Contract Documents. Within 30 days after the paving plan receipt, the Engineer will notify the Contractor if the paving plan is acceptable or if additional information is required, or if there is a need for clarification, or a combination thereof. If applicable, make changes necessary to meet the requirements of the Contract Documents. The Engineer may reject parts of or the entire paving plan if found unacceptable. Resubmit the entire paving plan with changes and required explanations for re-evaluation within 30 days. The Engineer will have the same amount of time for the review of each resubmitted paving plan as it did for the original submittal. Submit the revised paving plan to the Engineer until it is acceptable. Any delay due to the paving plan not being acceptable is solely a Contractor's delay and no additional compensation or contract time will be granted. However, if the Engineer's review and response to the paving plan exceeds the 30 days allowed for the review of each version of the paving plan, additional time and compensation may be claimed. Additional time and compensation will be considered by the Engineer only if the activity is on the critical path. Procedural acceptance given by the Engineer is subject to trial in the field.

A meeting must be held a minimum of 10 working days before the anticipated date of the first pour of the Portland cement concrete pavement (PCCP). This pre-pour meeting must be attended by the contractor. Also, subcontractors, vendors, that are involved with PCCP work, and other personnel may be needed to answer questions about the PCCP work. The Engineer will attend and participate in the pre-pour meeting. This pre-pour meeting must not occur before the paving plan is accepted by the Engineer. No placement of the production PCCP or test strip must occur before the pre-pour meeting is held.

It is recommended that a post-pour meeting be held after the first production PCCP or test strip pour, to discuss what went right and what went wrong. This meeting is to improve the quality of the poured PCCP through

the discussion of lessons learned.

The meetings intend to clarify specifications, or the paving plan, or discuss potential problem areas, areas of concern, etc. The meetings are not to be used to modify or change the contract requirements. While this can be discussed at the meetings, changing the contract requirements will require a contract change order or field order.

All testing must be performed by an Engineer accepted laboratory and technician. All samples must be collected and performed by personnel certified in that test method. For samples that will be used to determine compliance and acceptance of the material; the Engineer will transport the Department's samples to the laboratory from the project site for testing. Provide help, e.g., labor, equipment, material, to Department personnel when requested. Provide storage, transport facility, or both for the samples for use in the Department vehicle. No sample of material taken without HDOT personnel being present and having full custody of the sample must be used to determine compliance with the Contract Documents and acceptance by the Department.

(B) Equipment.

(1) Batching Plant and Mixers. Batching plant and mixers must conform to Section 601 - Structural Concrete.

(2) Hauling Equipment. Hauling equipment must conform to Section 601 - Structural Concrete.

(3) Finishing Equipment.

(a) Finishing Machine. The finishing machine must be self-propelled and equipped with at least two oscillating-type, transverse screeds that must finish the surface to meet requirements specified in Subsection 411.03(N) - Surface Test and Subsection 411.03(T) - Pavement Thickness. Finishing equipment must not displace reinforcement, side forms, or joints.

(b) Vibrators. Vibrators for full-width concrete consolidation may be either internal-type, with an immersed tube or multiple spuds, or surface pan type. Vibrators must be attached to the spreader or finishing machine and must be mounted on a separate carriage. Vibrators must not come in contact with reinforcement, load transfer devices, subgrade, and side forms.

Furnish vibrators that operate at frequencies not less

than the following: 3,500 impulses per minute for surface vibrators; and 5,000 impulses per minute for internal and hand vibrators. Furnish tachometer for measuring and indicating vibration frequencies.

(c) Mechanical Floats. Mechanical floats must be self-propelled and designed to finish pavement surface uniformly smooth and true to grade. Run mechanical floats either on side forms or on adjacent lanes of concrete.

Floats must be constructed of hardwood, steel, or steel-shod wood and must be equipped with devices to permit adjusting the underside to a truly flat surface.

(d) Slip-Form Pavers. Slip-form pavers must be self-propelled and equipped with traveling side forms of sufficient dimensions, shape, and strength to spread, consolidate, and screed freshly placed concrete in one complete pass, with minimum hand finishing. Pavers must produce dense and homogeneous pavement, true to the cross-section and profile indicated in the Contract Documents.

Slip-form pavers must be equipped with high-frequency internal vibrators that vibrate concrete for full paving width and depth.

Vibrators may be mounted with their axes either parallel or normal to pavement alignment. Where vibrators are mounted with their axes parallel to pavement alignment, space vibrators at intervals not to exceed 2.5 feet, measured center to center. Where vibrators are mounted with their axes normal to pavement alignment, space vibrators such that lateral clearance between individual vibrating units does not exceed 0.5 feet.

While pavement is being spread, compacted, and shaped, operate vibrating units such that the longitudinal axis, at the center of each unit, is not more than 0.5 feet above the existing paving surface.

Paving operations may be conducted using either one machine or mechanical spreader followed by a separate finishing unit.

(4) Concrete Saw. If sawed joints are specified or elected by the Contractor, furnish power-driven concrete saws sufficient in number, power, and type of blade to cut joints. Provide at least one backup saw and replacement blades during concrete sawing operations.

Equip saws with blade guards and guides or devices to control alignment and depth. Remove all cuttings, slurry, and other by-products of the sawing operations from the work site.

(5) Forms. Use 10-foot-long straight side forms made of metal having a thickness not less than 7/32 inch, with a depth equal to prescribed pavement edge thickness, and base width not less than 80 percent of prescribed pavement thickness. Horizontal form joints will not be allowed unless built-up forms, as specified in this subsection, are accepted by the Engineer. Forms must be sufficiently rigid to prevent edge alignment distortion under subgrading and equipment loads or concrete pressure, or a combination thereof. Furnish form sections that are straight, free from bends, warps, indentations, and other defects. Sections that deviate from the true plane along the top of form more than 1/8 inch in 10 feet or along the face of form more than 1/4 inch in 10 feet will be rejected.

Join form lengths in a manner that ensures tight, leak-proof, neat joints at form connections and prevents springing from occurring under subgrading and paving equipment loads or concrete pressure, or a combination thereof. Built-up forms may be used by rigidly attaching sections of suitable width and thickness to either top or bottom of the form. If built-up is attached to the top of the form, use metal built-up.

For curves of a 100-foot radius or less, use flexible forms or curved forms having a proper radius. Special forms of wood or metal may be used for curved form lines having a radius of 200 feet or less. Five-foot-long, straight metal form sections may be used for curved form lines having a radius greater than 100 feet. Straight metal forms in sections 10 feet or less in length may be used for form lines having a radius greater than 200 feet.

Special forms of wood or metal may be used for curved form lines having a radius of 200 feet or less. Where use of standard pavement forms is not feasible, submit working drawings at least 10 working days before production. Five-foot-long, straight metal form sections may be used for curved form lines having a radius greater than 100 feet.

Use of wood forms as a track for operating paving and finishing equipment will not be allowed.

(C) Preparing the Proper Grade. Trim beyond edges of proposed concrete pavement to accommodate forms and slip-form paving equipment. Fill and compact areas that are below established grade with subgrade or base course material, in lifts up to 1/2 inch, for widths of 18 inches on both

sides of form base. Tamp and trim areas above-established grade, as necessary.

(D) Setting Forms. Before placing forms, compact foundation to ensure continuous contact with forms. Set forms and check for correct line and grade before placing concrete. Tamp inside and outside edges of form base. Use three pins for each 10-foot section to stake forms in place. Place pins on each side of every joint. Lock form sections to prevent play or movement in any direction. Forms must withstand impact and vibration due to consolidation operations and must remain true to within 1/4 inch. Before placing concrete, clean and coat forms with form release agent or oil, accepted by the Engineer. At least one working day before placing concrete, notify the Engineer that the forms are ready for inspection. Check for compliant thickness by doing a test run using all the equipment that will be used to place and finish the concrete for the pavement.

(E) Conditioning of Subgrade or Base Course. Unless waterproof cover material is indicated in the Contract Documents, keep subgrade and base course uniformly moist before placing concrete.

(F) Handling, Measuring, and Batching Materials. Handle, measure, and batch materials in accordance with Section 601 - Structural Concrete.

(G) Mixing Concrete. Mix concrete in accordance with Section 601 - Structural Concrete.

(H) Mixing Limitations and Water Supply. Provide adequate natural or artificial lighting when mixing, placing, finishing, and sawing concrete.

Place mixed concrete only when the concrete temperature is between 50 and 90 degrees F. Use Plastic Shrinkage Evaporation Chart ACI 305 and Section 503 as the method to determine if additional precautions should be taken to prevent shrinkage cracks.

Before placing concrete pavement, provide an adequate supply of water for the entire work period. Inadequate water supply will be sufficient cause for delaying or stopping mixing operations. If there is a water supply deficiency, give first water-use priority to curing concrete already placed before using water for mixing concrete.

(I) Placing, Consolidating, and Shaping Concrete.

(1) General. Make advance arrangements for preventing a delay in concrete delivery and placement. An interval of more than 30 minutes between the placement of two consecutive batches or loads must constitute a cause for stopping paving operations and requiring a construction joint to be placed. Such a construction join must be

installed at no increase in the contract price or contract time, at the location and of the type ordered by the Engineer.

Conditioning of Subgrade or Base Course. Unless waterproof cover material is indicated in the Contract Documents, keep subgrade and base course uniformly moist before placing concrete i.e., leave aggregate surfaces used as the subgrade or base course in a cool, nearly saturated surface dry (SSD) condition. The subgrade or base course must be kept within 15 degrees of the anticipated concrete temperature to minimize thermal shock and cracking. For placement surfaces that are formed, e.g., bridge deck, keep form temperature within 15 degrees of the anticipated concrete temperature.

Before placing concrete, demonstrate proper adjustment of screeds and floats on slip-form pavers by measurements from grade stakes driven to known elevations. Placement of concrete must not start until this is done. Demonstrate satisfactory operation and adjustments of propulsion and control equipment, including pre-erected grade and alignment lines, by running slip-form pavers and finishing machines over the entire length of prepared subgrade or base course with propulsion and control equipment fully operational and loaded.

Unless otherwise indicated in the Contract Documents, construct pavement in full-lane widths separated by longitudinal weakened plane joints, or monolithically in multiples of full-lane widths, with longitudinal weakened plane joints at each traffic lane line.

Deposit concrete with minimum handling. Spread concrete uniformly over the entire area between forms, without segregation, using a mechanical spreader. Where hand methods are necessary due to pavement design, equipment breakdown, or other factors, use shovels, not rakes, for hand spreading. Place concrete continuously between transverse joints without using intermediate bulkheads. Prohibit workers from walking in concrete with boots or shoes coated with earth or foreign substances.

Improperly proportioned concrete will be rejected. Remove and dispose of concrete rejected by the Engineer in accordance with Subsection 201.03(E) - Removal and Disposal of Material, at no increase in the contract price or contract time.

Spread, consolidate, and shape concrete so that the completed pavement will comply with the thickness and cross-sectional requirements indicated in the Contract Documents. Sides of

pavement may be constructed with batter not exceeding one horizontal to six vertical, provided that pavement top width is maintained as indicated in the Contract Documents.

Where widening PCC pavement contiguous with existing parallel concrete pavement not constructed as part of the contract, spread, consolidate, and shape concrete so that completed pavement will comply with the thickness and cross-sectional requirements indicated in the Contract Documents and to the following:

(a) Elevation of completed pavement surface must be such that water will not pond on either side of the longitudinal joint with the existing pavement.

(b) New pavement surface at longitudinal joint must conform to the elevation of the existing concrete pavement. If necessary, provide a smooth transition between new and existing pavement by hand-finishing new pavement within one foot of existing pavement, adding or removing concrete, as necessary.

(c) Transverse straightedge, longitudinal straightedge, and Profile Index requirements specified in Subsection 411.03(M) - Final Strike-Off, Consolidation, and Finishing and Subsection 411.03(N) - Surface Test will not apply to pavement surface within 1-foot of existing concrete pavement unless in the opinion of the Engineer the surface finish of the installed concrete pavement exhibits poor workmanship, e.g., the finished surface is rougher than the existing surface, the roughness of the surface cannot be attributed to the existing concrete pavement.

(d) Profiles of completed pavement surface specified in Subsection 411.03(N) - Surface Test will not be required within one foot of a longitudinal construction joint with existing concrete pavement unless, in the opinion of the Engineer, the surface finish of the installed concrete pavement exhibits poor workmanship, e.g., the finished surface is rougher than the existing surface, the roughness of the surface cannot be attributed to the existing concrete pavement.

(e) Thickness measurements specified in Subsection 411.03(T) - Pavement Thickness will not be made in pavement within one foot of existing concrete pavement.

(f) Transverse weakened plane joints must be constructed in pavement widening to match the spacing and skew of

weakened plane joints in the existing pavement.

Where concrete is to be placed adjacent to previously constructed pavement, keep mechanical equipment off previously constructed pavement until that concrete pavement has attained flexural strength of not less than 550 pounds per square inch when tested in accordance with AASHTO T 97.

Where concrete is being placed adjacent to existing pavement, provide that part of equipment supported on existing pavement, with protective pads on crawler tracks or rubber-tired wheels; and offset bearing surface to run a sufficient distance from pavement edge to avoid breaking or cracking that edge.

(2) Stationary Side Form Construction. Provide enough forms so that no delay occurs due to the lack of forms. Spread, consolidate, and shape concrete by one or more machines. Use machines that uniformly distribute and consolidate concrete without segregation, so that completed pavement conforms to the cross-section indicated in the Contract Document, with minimum handwork.

Furnish paving machines in sufficient number and capacity to finish work at a rate equal to that of concrete delivery.

Consolidate concrete for full paving width using surface or internal vibrators, or by another method of consolidation that produces equivalent results without segregation.

Operate vibrators at the manufacturer's recommended frequencies based on compatibility with pertinent factors, including the following: mix design, concrete slump, paver speed, and vibrator spacing. Vibration amplitude must be sufficient to be perceptible on the concrete surface more than one foot from the vibrating element.

Do not rest vibrators on new pavement or side forms. Connect power to vibrators so that vibration ceases when the forward or backward motion of the machine is stopped.

(3) Slip Form Construction. Slip form paving equipment must spread, consolidate, and screed freshly placed concrete to produce dense, homogeneous pavement, true to cross-section and profile, with minimum handwork.

Use reference lines outside the finished concrete limits to regulate paver alignment and elevation during concrete placing and finishing operations. Abrupt changes in longitudinal alignment will not be allowed. Limit horizontal deviation to no more than 0.1 foot from

alignment established by the Contract Documents.

Coordinate operations of mixing, delivering, and spreading concrete to allow slip-form paving equipment to operate in continuous forward movement, with minimal stopping and starting. When paver forward movement is stopped, immediately cease vibrating and tamping operations. Do not apply tractive force to the paving machine except that which is controlled by the machine.

Consolidate concrete for full paving width using high-frequency vibrators. Operate vibrators at the manufacturer's recommended frequencies based on compatibility with pertinent factors, including the following: mix design, concrete slump, paver speed, and vibrator spacing. Vibration amplitude must be sufficient to be perceptible on the concrete surface along the entire length of vibrating units and for a distance of at least one foot therefrom.

(J) Test Specimens. Furnish concrete necessary for casting test beams and cylinders and for testing air and slump. Unless otherwise indicated in the Contract Documents, furnish, maintain, and clean beams or cylinder molds, or both. Beams or cylinder molds, or both must conform to AASHTO R 100, Standard Practice for Making and Curing Concrete Test Specimens in the Field.

Cure beams, as specified for pavement, in accordance with AASHTO R 100 For early opening to traffic, cure flexural test specimens at the same time and in the same manner as pavement.

Additional flexural strength test specimens will be required due to concrete placement conditions or to determine concrete strength where the early opening of pavement to traffic is dependent on concrete strength test results.

(K) Striking-Off Concrete and Placing Reinforcing Steel. After placement, strike off concrete to the cross-section indicated in the Contract Documents.

Where pavement is placed in two layers, strike off and consolidate the bottom layer to a depth necessary to place fabric or reinforcing steel mat directly on concrete. Support reinforcing steel as needed to maintain its correct position.

Place the top layer within 30 minutes of the first layer, or remove and replace the lower layer with freshly mixed concrete.

Where pavement is placed in one layer, position reinforcing steel before placing concrete.

For reinforcing steel, Subsection 602.03(B) - Storage, Surface Condition, and Protection of Reinforcement must apply.

(L) Joints. Construct joint faces normal to the pavement surface, as indicated in the Contract Documents. Use chalk line, string line, sawing template, or other methods to provide true joint alignment. Before contract acceptance, maintain joints free of soil, gravel, concrete or asphalt mix, and other foreign material except for filler material.

Where sawing method is used to cut pavement grooves, use a saw complying with Subsection 411.03(B)(4) - Concrete Saw. Saw joints before uncontrolled shrinkage cracking occurs, but only after concrete has hardened sufficiently to prevent excessive tearing or raveling, or both during sawing operations. Determining concrete readiness for sawing transverse contraction and longitudinal joints in accordance with requirements specified herein must be the Contractor's responsibility. Cut grooves to the minimum width possible for the type of saw used, but limit groove width to 0.02 feet.

Once sawing has commenced for any day's concrete placement, continue sawing for 12 hours after placement. Should sawing fail to be completed within 12 hours of concrete placement, limit subsequent concrete placements to quantities that can be sawed in 12 hours. Restore curing membrane disturbed during sawing operations by spraying disturbed areas with additional curing compound.

(1) Longitudinal Joints. Place deformed tie bars, two-piece connectors accepted by the Engineer, and smooth dowels, as indicated in the Contract Documents, perpendicular to the longitudinal joint. Deformed tie bars and two-piece connectors must be 30 inches long, Grade 60 No. 5 bars, placed 30 inches apart at mid-depth of the slab. Where deformed tie bars are to be bent and later straightened, use Grade 40 bars. Place bars using mechanical equipment, or secure bars with chairs or other supports in accordance with Section 602 - Reinforcing Steel. Use other required sizes, grades, lengths, and spacings, based on slab width, thickness, and type of underlying base.

Unless otherwise indicated in the Contract Documents, tie bars may be inserted into plastic concrete. If this method results in tie bar misalignment, poor consolidation around tie bars, concrete surface or edge slumping, or a combination thereof, discontinue using this method and complete work using other methods accepted by the Engineer.

Construct longitudinal joints by sawing method at traffic lane lines in multilane, monolithic concrete pavement. Cut longitudinal joint

to minimum depth d = t/3, where:

d = minimum depth of cut rounded up to nearest 0.01 feet.
t = greatest pavement thickness (feet) in each lane.

Where adjacent lanes are constructed separately, use deformed tie bars or smooth dowels, as indicated in the Contract Documents. Two-piece connectors accepted by the Engineer may be used.

Clean all joint faces of any curing compound, primer or any material that may be deleterious to the bonding of the new concrete to the existing or previously poured concrete.

(2) Transverse Expansion Joints. Extend transverse expansion joint to the full cross-section of PCC pavement and install a continuous piece of preformed joint material. When installing a joint filler, depress filler 1/2 inch below the pavement surface.

Hold expansion joint filer in a vertical position and limit deviation to not more than 1/4 inch from a straight line along the centerline of the joint. Hold filler on line with metal channel. Remove channel after initial concrete set.

(3) Transverse Contraction Joints. Construct transverse contraction joints by forming or sawing grooves on the pavement surface. Where indicated in the Contract Documents, include dowel bars and assemblies.

Transverse contraction joints may be formed by depressing a tool or device into plastic concrete before the initial concrete set.

If uncontrolled shrinkage cracking occurs during or before joint sawing, modify sawing sequence accordingly or use other methods accepted by the Engineer. If necessary to eliminate uncontrolled shrinkage cracking, add more sawing units or use early entry concrete cutting machines with special blades that cut through relatively fresh concrete without needing water. Where transverse crack occurs before sawing and any point on crack is within 5 feet of planned transverse contraction joint, omit sawing the planned joint.

Unless otherwise indicated in the Contract Documents, construct groove between depths of 1/3 to 1/4 of pavement thickness.

(4) Construction Joints. When concrete placement is interrupted for more than 30 minutes, construct longitudinal and transverse construction joints in accordance with the Contract Documents.

Placement of a construction joint within 10 feet of another transverse joint will not be allowed. At the time of interruption, if sufficient concrete has not been mixed to form a slab greater than 10 feet long, remove and dispose of concrete back to the preceding joint, at no increase in the contract price or contract time. When concrete placement is stopped, provide a bulkhead having sufficient cross-sectional area to prevent deflection, notched to receive dowels, and shaped to pavement cross-section. The bulkhead must be placed perpendicular to the baseline and must also be one straight across the entire width of the pavement.

(5) Dowels for Longitudinal, Transverse, Expansion, and Contraction Joints. As indicated in the Contract Documents, provide smooth, straight dowels, conforming to Subsection 709.01(E) - Dowels; and deformed dowels conforming to Subsection 709.01(F) - Tie Bars.

At transverse joints, space dowels in the pavement at one-foot centers, parallel to the pavement surface and traffic direction.

Use joint assemblies or wire baskets that remain in the pavement to hold dowels in place during concrete placement and finishing. For referencing, properly mark the center of dowel assembly on both sides of the pavement slab.

For expansion joints, unless otherwise indicated in the Contract Documents, use dowels with one end of each coated dowel encased in a cap conforming to Subsection 709.01(E)(2) - Joint Dowels.

Place dowels in the pavement with alignment tolerance of ±1/4 inch per dowel and depth d = t/2, where:

d = minimum depth, rounded up to the nearest 0.01 feet.

t = pavement thickness (feet) in each lane.

Maintain dowel position and arrangement when placing and consolidating concrete around dowels.

Unless otherwise indicated in the Contract Documents, coat the entire length of each dowel with de-bonding material accepted by the Engineer. At the Contractor's option, dowels may be lightly coated with grease accepted by the Engineer. Use of cutback asphalts, emulsions, or oils will not be allowed for coatings.

(M) Final Strike-Off, Consolidation, and Finishing.

(1) Sequence. Sequenced operations are as follows: strike-off,

consolidate, float, remove laitance, straightedge, and perform final surface finish. Provide work bridges and other equipment necessary to reach pavement surface to inspect, straightedge, finish, and perform corrective work as necessary.

Finish concrete surface without adding water to the surface.

(2) Finishing at Joints. Strike-off, consolidate, and finish, in a manner that does not damage or misalign, or both, joint assemblies, load transfer devices, and other embedded items. Vibrate concrete mechanically next to joints without creating voids or segregation, or both.

If finishing operation causes segregation, damage, joint misalignment, or a combination thereof, stop finishing equipment when the screed is approximately 8 inches from the joint. Remove segregated concrete surrounding the joint. Lift front screed and set it directly over joint before continuing forward motion. Lift and carry a second screed over the joint when it is close enough to force excess mortar over a joint. If segregation is prevented, subsequent finishing over the joint without lifting screeds will be allowed.

(3) Machine Finishing.

(a) Nonvibratory Method. Use finishing equipment to strike off, screed, and texture concrete immediately after it is distributed or spread. Avoid excessive finishing. Keep top of forms free of concrete and debris.

Maintain uniform ridge of concrete along entire paving width and ahead of screed during the first pass of finishing machine.

(b) Vibratory Method. Vibrators for full-width vibration of concrete paving slabs must comply with Subsection 411.03(B)(3)(b) - Vibrators. When uniform and satisfactory concrete density is not obtained by the vibratory method, furnish other equipment and methods that produce pavement conforming to the contract. Where not in conflict with provisions in Subsection 411.03(M)(3)(a) – Nonvibratory Method, provisions for vibratory method, must govern.

(4) Hand Finishing. Use hand-finishing methods only under the following conditions and locations:

(a) When mechanical equipment breaks down, stop concrete placement and hand-finish concrete already in place.

(b) In areas of narrow widths or irregular shapes, hand-finish those areas that cannot be finished by mechanical equipment.

(c) Hand floating in other portions of the Contract Documents must be performed.

Use portable screed to strike-off and screed concrete. Provide a second portable screed to strike off the bottom concrete layer when placing reinforcing steel during two-layer concrete placement.

Use metal screed or metal-reinforced screed, which is at least 2 feet longer than the widest part of the slab to be placed.

Consolidate concrete with a hand-operated vibrator.

Move screed along forms in forwarding motion that combines longitudinal and transverse shearing motion without raising either end from side forms. Repeat this strike-off process until pavement is true to grade and cross-section, and surface texture is uniform and free of porous areas.

(5) Floating. After striking off and consolidating concrete, use float to finish the surface to specified grade and smoothness. Use one of the following methods:

(a) Hand Method. Use hand-operated, longitudinal float at least 12 feet long and 6 inches wide and sufficiently rigid to retain its shape. Operate longitudinal float from footbridges. Work float in a sawing motion while holding it in a position parallel to the road's centerline and passing it gradually from one side of the pavement to the other.

Move ahead along the pavement centerline, advancing not more than one-half of float length. Waste excess water and laitance over side forms on each pass.

(b) Mechanical Method. Adjust tracks and float to the required crown. Coordinate float with adjustments of transverse finishing machine so that a small quantity of mortar is maintained ahead of the float. Operate float over the pavement a few times and at such intervals as is necessary to produce a surface of uniform texture. Excessive operation over a given area will not be allowed. Waste excess water and laitance over side forms on each pass.

(c) Alternate Mechanical Method. Use equipment with cutting and smoothing float or floats, suspended from and guided by a rigid frame mounted on four or more visible wheels. Maintain constant contact of all four wheels with forms.

After mechanical floating, use the hand method to fill open-textured areas in the pavement or if the method does not provide an acceptable finish.

(d) Slip-Form Finishing. Construct pavement with preliminary float finish using devices incorporated in slip-form paver. Suitable machine floats may be used to supplement the finish achieved by the slip-form paver.

Before concrete has hardened, correct pavement edge slump, exclusive of edge rounding, over 0.02 feet.

(6) Evaporation Retarders and Finishing Aids – See Subsection 503.03(F)(8).

(7) Addition of Water at the Project Site – See Subsection 503.03(F)(1).

(8) Straightedge Testing and Surface Correction. After completing floating and removing excess water and laitance, correct surface irregularities while concrete is plastic. Fill, strike-off, consolidate, and refinish depressions. Cut down and refinish high areas. Smooth surface across joints to tolerances indicated in the Contract Documents.

Test concrete surface for trueness using a 12-foot straightedge swung from a handle that is 3 feet longer than one-half of slab width. Hold straightedge in contact with the surface in successive positions parallel to the road's centerline. Test entire pavement width, moving from one side of the slab to the other, as necessary. Advance testing operation along the road, in successive stages of not more than one-half straightedge length.

(9) Final Finish. After the surface sheen has disappeared, texture the pavement surface without tearing it. Texture final surface using artificial turf drag followed immediately by metal comb grooving device (tining). The use of the metal comb is not needed if the surface requires mechanical texturing, e.g., grooving, Next Generation Concrete Surface (NGCS).

Use artificial turf made of molded polyethylene with synthetic turn blades measuring approximately 3/4 inches long and containing

approximately 5760 individual blades per square foot. Submit a sample of artificial turf at least five working days before production.

Attach artificial turf to self-propelled equipment having external alignment control. The device must be a separate piece of equipment to be used exclusively for texturing operation and must not be attached to other paving-train equipment. Artificial turf must be full pavement width and of sufficient size that during finishing operation, approximately 2 feet of turf, parallel to pavement centerline, is in contact with the pavement surface across the width of the pavement. Maintain downward pressure on pavement surface with turf, to achieve uniform texturing without measurable variations in pavement profile.

Grooving (tining) with a metal comb must include a single line of randomly spaced, tempered spring steel tines of size and stiffness sufficient to produce grooves of specified dimensions in plastic concrete without edge slumping and severe surface tearing. Attach a metal comb to a mechanical device capable of grooving the entire pavement width in a single pass at a uniform speed. Operate grooving device to produce a uniform pattern of grooves parallel to pavement centerline. Evenly spaced grooves must have in the hardened pavement surface a uniform tine spacing of 0.75 inches between centers. Grooves must be 1/8 inch to 3/16 inch deep, and 1/10 inch to 1/8 inch wide. Provide hand combs with steel tines to use in event of mechanical comb breakdown.

Ramps, tapers, and miscellaneous (i.e. small and irregular areas) may be textured manually. The Engineer will determine at what point the pavement will not be allowed to be textured manually.

(10) Edging at Forms and Joints. After final finish, tool pavement edges to a radius of 1/4 inch, along both sides of each slab; and on both sides of transverse expansion joints, formed joints, and construction joints. Produce a smooth, dense mortar finish.

Eliminate tool marks on the slab, next to joints. Avoid disturbing rounding of slab corners. Remove concrete from joint filler top.

Before concrete sets, test joints with a straightedge and correct unevenness between joints and adjacent slabs.

(N) Surface Test. The request date for acceptance profile testing must not be less than 30 days following concrete placement. The request for an acceptance profile test must be made only when the Contractor has determined, using HDOT TM 6 California Type Profilograph, that the

pavement profile complies with the requirements of the Contract Documents. If the Engineer does not test the surface until after 30 days, the results must be considered valid. The finished pavement must comply with the following requirements when tested by the Engineer:

(1) Conduct surface test using a 12-foot straightedge at locations determined by the Engineer. When the straightedge is laid on the finished pavement in a direction parallel or normal to the centerline, the surface must not vary more than 1/4 inch from the lower edge.

(2) California Type Profilograph.

Provide a California Type Profilograph, labor, material, and other ancillary equipment to be used under the Engineer's supervision or for the Engineer's designated representative, e.g., third-party QA entity, consultant to do pavement profile testing, e.g., initial and any needed follow-up tests, when requested by the Engineer. The Contractor's means and methods of taking the pavement profile must be using a California-type profilograph in accordance with HDOT TM 6 Standard Practice for Operation of the California Type Profilograph and Evaluation of Profiles and these Contract Documents. The Contractor's equipment, e.g., profilograph must be certified as well as the personnel operating it. Certification must be by an entity accepted by the Engineer.

The Engineer will determine the profile of the pavement surface using a profilograph in accordance with HDOT TM 6 and these specifications. Take two profiles 3 feet from and parallel to each pavement edge and at the approximate location of each longitudinal joint for a total of four profiles. The Engineer may make changes to the location of the test path so that the test path is within the anticipated wheel path. Shoulders must be regarded as lanes. Shoulders over 12 feet wide must be regarded as multiple lanes. The Engineer will determine where the profile test paths will be located for the shoulders. Make an acceptance profile test request to the Engineer at least seven days before the desired testing date. When a request for acceptance profile testing is made, submit the total area to be tested, and indicate the limit of the testing on a copy of the Contract plans. Clean the pavement and clear obstructions from the area to be tested. The area 100 feet or more before and after the area to be tested must be clean and clear of obstructions. The Contractor must provide traffic control for profile testing. If in the sole opinion of the Engineer the pavement is not clean enough or obstacles are in the way or traffic control is not sufficiently safe the Engineer may cancel the acceptance profile test and count it as one acceptance profile test.

Any delay that occurs due to equipment not being available or certified or a lack of certified personnel will be regarded as a Contractor's delay.

The Engineer will perform an initial acceptance profile test set, at no cost to the Contractor.

If the pavement profile is found non-compliant the Contractor must do remedial repairs. Based on the Engineer's initial acceptance profile test set, the Contractor must perform remedial work before requesting a follow-up acceptance profile test. Re-profile test the area to ensure compliance with requirements before requesting another acceptance profile test. Perform additional remedial work and perform follow-up acceptance profile testing until an acceptable surface is obtained.

Additional testing, beyond the initial acceptance test, will be performed at a cost to the Contractor of $1,500 per test set per lane or $3,500 per day whichever is greater to pay for HDOT's personnel expenses for testing beyond the initial acceptance test plus any additional charges the Engineer deems are applicable. Payment may be made to the Material Testing and Research Branch or any State of Hawaii entity as directed by the Engineer or it may be deducted from any payment due to the Contractor.

During initial paving operations or after a long shutdown, when the concrete has cured sufficiently to allow profile testing, furnish, operate, and profile test the pavement to ensure that the means and methods being used will produce a pavement profile compliant with the requirements of the Contract Documents.

The Contractor and the Engineer will use the profile testing results to aid in evaluating paving methods and equipment. When the average profile index exceeds 15 inches per mile, suspend paving operations. Resumption of paving operations will not be allowed until corrective action is taken to the means and methods and accepted by the Engineer. Subsequent paving operations will be tested in accordance with the current profile testing procedures.

Use paving equipment and methods that produce riding surfaces having a profile index of 10 or less, except as provided herein.

Profile testing with a straight edge must be performed for the following pavement areas:

(a) Within superelevation transition on horizontal curves

having a centerline curve radius less than 1,000 feet.

(b) Within 15 feet of transverse joint that separates pavement from existing pavement not constructed under the Contract or from structural deck or approach slab.

These areas must be checked with a 12-foot straight edge.

For all areas reduce individual high points over 0.3 inches, as determined by profilogram measurements in accordance with HDOT TM 6, by diamond grinding until such high points shown by profilograph reruns do not exceed 0.3 inches. Diamond grinding refers to a process where closely spaced gang-mounted diamond saw blades are used to shave off a thin, top layer of a hardened concrete surface.

After completing the diamond grinding of high points, perform additional diamond grinding as necessary to a pavement profile in compliance with the requirements specified.

1. Perform additional diamond grinding as necessary so that lateral limits of grinding are at a constant offset from and parallel to the nearest lane line or pavement edge.

2. Perform additional diamond grinding, as necessary, to extend the area ground within any one surface area, in each longitudinal direction so that the diamond grinding begins and ends at lines normal to the pavement's centerline.

3. Ground areas must be neat, rectangular areas having a uniform surface appearance.

Do not diamond grind pavement to a smooth or polished finish unless otherwise indicated in the Contract Documents.

Diamond grinding must provide a line-type texture that contains parallel, longitudinal corrugations with ridge peaks approximately 1/16 inch higher than groove bottoms; and with 55 to 60 evenly spaced grooves per foot.

After diamond grinding is complete, mechanical texture, i.e., diamond grind grooves into the previously diamond ground surface. The grooves must align and match with the tine grooves or the diamond blade mechanically installed grooves of the unground surfaces. The grooves must produce a uniform pattern of grooves parallel to the pavement's centerline. Evenly spaced grooves must

have in the hardened concrete pavement surface a spacing of 0.75 inches between centers. Grooves must be 1/8 inch to 3/16 inch deep, and 1/10 inch to 1/8 inch wide. If the mechanical texturing is Next Generation Concrete Surface (NGCS) for the area surrounding the diamond ground surface follow the Next Generation Concrete Surface's pattern.

Pick up all grinding-operation residue using a vacuum attached to the grinding machine. Prevent residue from flowing across the pavement or from being left on the pavement surface or being tracked to the surrounding areas. Dispose of grinding residue at an Engineer and Department of Health accepted dump site.

The use of bush hammers, other impact devices, cold milling, and other methods that may, in the sole opinion of the Engineer, cause micro-cracking must not be used for pavement surface remediation.

Repair curing membrane damaged during surface remediation and testing operations if curing is still required.

The Contractor may dispute the results of the acceptance profile test and request a retest. In the request, the Contractor must state specifically why the test profile is in error and should be redone. If the retest results show a compliant profile there will be no charge for the retest and will be the sole remedy for this dispute. However, if the retest shows a non-compliant profile charges for additional profile tests will apply. The Contractor may also request a re-evaluation of the data, specifically indicating why the test profile evaluation by the Engineer is in error.

Complete corrective work before determining pavement thickness in accordance with Subsection 411.03(T) - Pavement Thickness.

(O) Curing. After finishing operations have been completed and as soon as marring of concrete will not occur, cure the entire newly placed concrete surface and edges in accordance with one of the methods described in this subsection. If forms are used, spray curing compound on the surface that was covered by the forms immediately after striping the form from the concrete. When curing requires the use of water, assign the highest priority for project water supply allocation to curing operations. Suspend concrete operations if there is insufficient cover material or water supply for curing and other project requirements. Do not leave concrete exposed for more than 30 minutes between stages of curing or during the curing period. Use atomized fog spray to place water into the air to increase the humidity as an interim cure or other methods accepted by the Engineer until the final curing medium

is in place. Cure concrete for at least 72 hours immediately after finishing the operation.

(1) Cotton or Burlap Mats. Cover surfaces to be cured with cotton or burlap mats having dimensions that when placed, extend at least 2 feet beyond the edges of the concrete strip placed. Overlap mats at least 6 inches. Place and maintain mats in complete contact with the surface being cured, throughout the curing period. Keep the cotton or burlap mats fully moist and in position for the entire length of the required curing period.

(2) Waterproof Paper. Thoroughly wet pavement surface and edges before placing paper. Cover surfaces to be cured with waterproof paper sized to extend when sheets are placed, at least 2 feet beyond edges of concrete strip; or sized to match pavement width and supplemented with 2-foot paper edge strips. Overlap sheets at least 18 inches. Place and maintain paper in complete contact with the surface being cured, throughout the curing period. When sheets are laid longitudinally, seal the paper so that it does not open up or separate during the curing period.

(3) White-Pigmented Curing Compound. Immediately after the finishing surface and before the concrete set has taken place, spray uniformly surfaces to be cured with a white-pigmented curing compound. There must be no holidays or streaking in the coat of the curing compound. Also, the white-pigmented curing compound must remain white and not allow the concrete's color to show through for the duration of the curing period. If it does show through reapply the white-pigmented curing compound/. When cotton or burlap mats are used to initially cure pavement, apply the white-pigmented curing compound upon removal of mats. Do not apply curing compound during and immediately after rainfall.

Use a fully atomized mechanical sprayer equipped with a tank agitator and wind guard to apply the two coats of curing compound, under pressure, at a rate of at least one gallon per 100 square feet per coat. Before spaying, the compound it must be in a thoroughly mixed uniform condition with pigment uniformly dispersed throughout the tank. Mechanically agitate the curing compound continuously during application. Hand-pump sprayers will be allowed only for spraying irregular widths and shapes and concrete surfaces exposed by form removal. Do not apply curing compound to the inside faces of joints to be sealed. However, if the curing period is not over, use other methods to continue the curing, e.g., wet burlap mats or lithium curing compound. Provide a means to verify the application rate of the curing compound being applied.

If curing film is damaged during the required curing period, immediately repair damaged portions with additional curing compound. Upon removal of side forms, immediately protect exposed slab edges with curing treatment equivalent to that provided for pavement surface.

(4) White Polyethylene Sheeting. Cover surfaces to be cured with polyethylene sheeting sized to extend when sheets are placed, at least 2 feet beyond the edges of the concrete strip. Overlap sheets at least 18 inches. Place and maintain sheeting in complete contact with the surface covered, throughout the curing period.

(5) If the construction joint requires that it bonds with the concrete poured against it a lithium curing compound will be acceptable as a curing compound. Lithium curing compound must not be used on the horizontal surface in place of other aforementioned curing methods unless specifically called for by the Contract Document, or a waiver is granted by the Engineer. A lithium sealer will not be accepted as a curing compound. The lithium curing compound must meet or exceed the requirements of ASTM C-309, and ASTM C-1315 and be a 28-day water cure equivalent. All work shall conform with the manufacturer's recommendations.

(P) Removing Forms. Keep forms in place for at least 12 hours. Protect pavement from damage during form removal. After removing forms, immediately cure exposed surfaces in accordance with Subsection 411.03(O) - Curing. Pavement areas containing major honeycombed areas will be rejected. Remove and replace rejected pavement areas that are full-lane-wide sections and at least 10 feet long; and in those areas where removal and replacement are necessary, remove remaining portions of the slab that are less than 10 feet long and adjacent to joints.

(Q) Sealing Joints. Clean and seal joints after completion of the curing period and before the pavement is opened to traffic. Clean each joint thoroughly of foreign matter, including debris, dirt, dust, concrete, saw cuttings, and curing material. Collect and dispose of all removed material.

Dry joint surfaces before sealing joint. Apply sealing material as indicated in the Contract Documents. If a hot sealer is used, stir the material during heating to prevent localized overheating. Pour sealing material without spilling on exposed concrete pavement surfaces. Immediately remove and clean excess material from the pavement surface. Use of sand or similar material as a cover for sealing material will not be allowed.

(R) Protection of Pavement. Protect pavement and its appurtenances from public and construction traffic. Protection must include using flaggers to direct traffic; and erecting and maintaining warning signs, lights, pavement

bridges, and crossovers.

Where indicated in the Contract Documents, construct pavement crossings for convenience of public traffic in accordance with Subsection 104.09 - Maintenance of Traffic.

Furnish and install materials for edge and surface protection of unhardened concrete. Edge protection materials include standard metal forms and wood planks having nominal thicknesses of not less than 2 inches and a nominal width of not less than pavement-edge thickness. Surface protection materials include burlap or cotton mats, curing paper, and plastic sheeting. Stop paving operations when rain appears imminent.

Repair or replace damaged pavement before final acceptance.

(S) Opening to Traffic. Allow traffic on the pavement when test specimens comply with Subsection 411.03(J) - Test Specimens have attained flexural strength of 550 pounds per square inch when tested in accordance with AASHTO T 97. Traffic will not be allowed on pavement sooner than seven days after concrete placement, regardless of strength attainment.

Clean, sign, mark pavement properly, and clear pavement of obstructions before opening the roadway to public traffic.

Construction traffic, equipment, and materials will not be allowed on the pavement during the curing period.

(T) Pavement Thickness. The Engineer will determine coring locations and observe the coring operation. The Engineer will check the thickness of the pavement by cores obtained by the Contractor in accordance with AASHTO T 24. The Engineer will measure cores in accordance with AASHTO T 148, except that measurement will be taken to the nearest one-thousandth of an inch; and the average of such measurements will be taken to the nearest one-hundredth of an inch. Take thickness core samples after completion of corrective work.

The Engineer will remove non-PCC pavement materials from the bottom of the core before determining pavement thickness.

Thickness core samples will be evaluated on basis of primary and secondary units. A primary pavement unit is defined as that area of mainline pavement placed in each day's paving operations, but not to exceed 1,300 square yards. Each ramp, including tapers, each intersection, and each crossover will be considered separate primary units. Drill one core for each primary unit.

A secondary pavement unit is defined as 1,000 linear feet, or fraction thereof, of each mainline traffic lane and each shoulder in each primary unit. Additionally, every 1,300 square yards of pavement in ramps, tapers, intersections, and crossroads will be considered secondary units, regardless of when concrete was placed. Drill one core for each secondary unit.

When the primary or secondary unit core is deficient by more than 0.2 inches but less than 0.6 inches, drill two additional cores within the same secondary unit. The length of the initial and two additional cores will be averaged.

When the primary of the secondary unit core is deficient by more than 0.6 inches, that core will not be used to determine the average thickness of the primary or 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 inches. Pavement thickness between these two additional cores will be evaluated separately from the balance of pavement in that lot.

Pavement limits for separate evaluation will be longitudinal weakened plane or construction joint on each side of the core and next transverse weakened plane, construction, or expansion joint, beyond each of the last two cores. Unless the Engineer allows pavement within evaluation limits to remain, remove and replace with a pavement of specified thickness, at no increase in the contract price or contract time. Drill one additional core in the remaining portion of the primary or secondary unit. That portion will be evaluated separately for payment in accordance with provisions specified in Subsection 411.05 - Payment.

After replacing deficient pavement, drill one core at random in the primary or secondary unit beyond the limits of replaced pavement and drill one core in the replaced pavement. The Engineer will evaluate for payment, pavement represented by core taken beyond limits of replaced pavement in accordance with provisions specified in Subsection 411.05 - Payment.

Before filling, apply epoxy grout conforming to Subsection 712.04(B) - Epoxy Grout to core holes. Fill core holes completely with concrete accepted by the Engineer.

(U) Certified Concrete Flatwork Finisher Requirement. Perform the placement and finishing operations of concrete flatwork with a minimum ratio of one certified ACI Concrete Flatwork Finisher and Technician with 4,500 hours of acceptable work experience (certified craftsman) per three concrete finishers (concrete finishers without ACI Concrete Flatwork Finisher and Technician certification and 4,500 hours of acceptable work experience) at each location on the project site having flatwork done. The concrete flatwork

must be under the direct supervision of a certified craftsman. Designate the certified craftsman who will be supervising and responsible for determining the quality of the finish of the concrete flatwork being performed. No flatwork must be performed without the required amount of certified craftsmen present.

(1) Flatwork concrete is defined as any concrete work that requires tools or machines to be used during the placement and finishing operations of concrete. Concrete flatwork includes concrete work that requires a specified finishing, smoothness, or rigid surface tolerances such as sidewalks, walkways, portland cement concrete pavement, concrete white-topping, girder seats, pier caps, bridge decks, on-grade concrete slabs, approach slabs, concrete overlays, and concrete repairs which exceed one square foot per day.

(2) Areas that are not considered flatwork concrete are the top of foundations or structures that will have backfill material placed directly on the concrete surface.

(3) Submit copies of the craftsman's current ACI certification 30 days before concrete flatwork begins for the Engineer's review and acceptance. The Engineer has the right to require the removal, replacement, retraining, and re-certification of a certified craftsman if that person does not, in the opinion of the Engineer, demonstrate the ability to place and finish concrete in accordance with the practices recommended in the ACI Concrete Flatwork Finisher Certification Program and to meet the finishing standards required by the Contract Documents.

(4) Any cost or impact to the contractor in providing, training, certification, retraining, replacement, or re-certification is incidental to the contract items that require concrete flatwork.

411.04 Measurement.

(A) Concrete pavement will be paid for per square yard.

(B) The Engineer will not measure longitudinal joints, transverse expansion joints, transverse contraction joints, or construction joints separately and will consider the cost for those items as included in the contract price for the concrete pavement.

411.05 Payment. The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the Contract Documents.

The Engineer will pay for each of the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
_____ Concrete Pavement	Square Yard

The Engineer will pay for:

(A) 80 percent of the contract bid price upon completion of furnishing and placing formed joints or cutting grooves in the pavement.

(B) 20 percent of the contract bid price upon completion of cleaning up, including removal of saw-cutting residue.

When the primary or secondary unit core thickness is deficient by not more than 0.2 inches from the planned thickness, the Engineer will pay for that primary or secondary unit at 100 percent.

When the primary or average secondary unit core thickness indicates pavement thickness is deficient by more than 0.2 inches but not more than 0.6 inches, the Engineer will determine pay for that the primary or secondary unit an adjusted price that will be the final adjusted price after adjustments have been made for other deficiencies if any are applicable.

The Engineer will not pay for pavement allowed to remain with thickness deficiency greater than 0.6 inches.

When the Engineer determines that thickness-deficient areas warrant removal, remove and replace those areas with concrete having the thickness indicated in the Contract Documents. Replacement pavement will be in accordance with requirements of Subsection 411.03(T) - Pavement Thickness and this subsection.

When the profile index does not exceed 10, the Engineer will pay for the accepted pavement. When the profile index exceeds 10 the Contractor must diamond grind the surface to a profile index of 10 or less and then mechanically groove the ground pavement surface. It will not be acceptable to leave the diamond ground pavement surface without it being mechanically grooved.

The Engineer at its sole digression determines an adjusted price using the planned thickness of PCC pavement. The adjusted price will apply to the total area of the 0.1-mile section for lane width represented by the acceptance profile test.

1364
1365

END OF SECTION 411

SECTION 603 – CULVERTS AND STORM DRAINS

Make the following amendments to said Section:

(I) Amend **603.03(C)(1) - Culverts** by revising lines 106 to 108 to read as follows:

"Spacing between multi-barrel culverts shall be a minimum of 18 inches or 0.5 the culvert width, whichever is greater. The minimum spacing shall be 1 foot when placing controlled low strength material (CLSM) as backfill. Anchor the culverts in such a manner that the horizontal and vertical alignment of the culverts does not change."

(II) Amend **603.04 – Measurement** by revising lines 282 to 292 to read as follows:

"**603.04 Measurement.**

(A) The Engineer will measure bed course material for culverts per cubic yard in accordance with contract documents.

(B) The Engineer will measure cleaning of existing culverts on a force account basis in accordance with Subsection 109.06 - Force Account Provisions and Compensation and as ordered by the Engineer."

(III) Amend **603.05 – Payment** by revising lines 294 to 349 to read as follows:

"**603.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and contract documents.

The Engineer will pay for each of the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
Bed Course Material for Culvert	Cubic Yard
_____ - Inch Reinforced Concrete Pipe, Class _____	Linear Foot
Clean Existing Culverts	Force Account

END OF SECTION 603

SECTION 605 — UNDERDRAINS

Make the following amendments to said Section:

(I) Amend **605.04 - Measurement** lines 60 to 61 to read as follows:

"605.04 Measurement. The Engineer will measure underdrains per linear feet in accordance with the contract documents."

(II) Amend 605.05 - Payment lines 63 to 76 to read as follows:

"605.05 Payment. The Engineer will pay for the accepted pay item listed below at contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for the following pay item when included in the proposal schedule:

Pay Item	**Pay Unit**
_____ Inch Perforated Underdrain Pipe	Linear Foot

(1) 40% of the contract unit price upon completion of excavating to the required dimensions and grade.

(2) 20% of the contract unit price upon completion of installing geotextile fabric.

(3) 40% of the contract unit price upon completion of placing untreated permeable base and perforated pipe and wrapping geotextile fabric.

END OF SECTION 605

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
201.0100	Clearing and Grubbing	L.S.	L.S.	L.S.	$_____
202.0100	Removal of Existing Hot Mix Asphalt (HMA) Pavement	3,400	S.Y.	$_____	$_____
202.0200	Removal of Existing Pavement Markings	1,460	L.F.	$_____	$_____
202.0300	Removal of Existing Guardrail	3,450	L.F.	$_____	$_____
202.0400	Removal of Existing Signs, Sign Posts, and Foundations	13	Each	$_____	$_____
202.0500	Removal of Existing Cantilever Overhead Sign w/ 28' Wide Guide Sign, Sign Post, and Foundations	1	Each	$_____	$_____
202.0600	Removal of Existing Emergency Call Box, Post and Foundation	1	Each	$_____	$_____
202.0700	Removal of Existing Trees	6	Each	$_____	$_____
202.0800	Removal of Existing Concrete, Rock, and Debris	L.S.	L.S.	L.S.	$_____
202.0900	Removal of Existing Drainage Structure, Drain Line, Salvage Frame and Manhole Cover	L.S.	L.S.	L.S.	$_____
202.1000	Removal of Existing Headwall	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
203.0100	Roadway Excavation	4,870	C.Y.	$_____	$_____
203.0200	Borrow Excavated Material	51,400	C.Y.	$_____	$_____
204.0100	Trench Excavation for Water Line	700	C.Y.	$_____	$_____
204.0200	Trench Backfill for Water Line	1,000	C.Y.	$_____	$_____
205.0100	Structure Excavation for Concrete Retaining Wall	3,900	C.Y.	$_____	$_____
205.0200	Structure Backfill for Concrete Retaining Walls	25,000	C.Y.	$_____	$_____
205.0300	Nonwoven Geotextile Fabric	4,175	S.Y.	$_____	$_____
206.0100	Excavation for 12" Drain Line	4	C.Y.	$_____	$_____
206.0200	Excavation for 15" Drain Line	10	C.Y.	$_____	$_____
206.0300	Excavation for 18" Drain Line	8	C.Y.	$_____	$_____
206.0400	Excavation for 24" Drain Line	775	C.Y.	$_____	$_____
206.0500	Excavation for 48" Drain Line	1,050	C.Y.	$_____	$_____
206.0600	Excavation for 10’ x 4’ Concrete Box Culvert	1,330	C.Y.	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
209.0100	Installation, Maintenance, Monitoring and Removal of B.M.P.	L.S.	L.S.	L.S.	$_____
209.0200	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$ 65,000.00
301.0100	Hot Mix Asphalt Base Course	280	Ton	$_____	$_____
304.0100	Aggregate Base Course	905	C.Y.	$_____	$_____
304.0200	Imported Granular Fill	1,025	C.Y.	$_____	$_____
305.0100	Aggregate Subbase	11,700	C.Y.	$_____	$_____
315.0100	Nonwoven Geotextile Fabric	4,175	S.Y.	$_____	$_____
316.0100	Polypropylene Biaxial Geogrid	1,966	S.Y.	$_____	$_____
401.0100	Hot Mix Asphalt (HMA) Pavement, Mix No. IV	395	Ton	$_____	$_____
401.0200	Polymer Modified Asphalt (PMA) Pavement, Mix No. IV	50	Ton	$_____	$_____
411.0100	12-Inch Concrete Pavement	15,000	S.Y.	$_____	$_____
503.0100	Concrete Retaining Wall	6,300	C.Y.	$_____	$_____
503.0300	Concrete in Thrust Blocks for Water Line	18	C.Y.	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
503.0400	Concrete in Thrust Beams	11	C.Y.	$_____	$_____
503.0500	Concrete in Reinforced Concrete Jacket for Water Line	15	C.Y.	$_____	$_____
503.0600	Concrete in Headwall	13	C.Y.	$_____	$_____
503.0800	Concrete in 10' x 4' Concrete Box Culvert	675	C.Y.	$_____	$_____
503.0900	Concrete in End Posts	7	C.Y.	$_____	$_____
508.0100	Cement Rubble Masonry	365	C.Y.	$_____	$_____
603.0100	12-Inch Reinforced Concrete Pipe, Class III	36	L.F.	$_____	$_____
603.0200	15-Inch Reinforced Concrete Pipe, Class III	6	L.F.	$_____	$_____
603.0300	18-Inch Reinforced Concrete Pipe, Class III	5	L.F.	$_____	$_____
603.0400	24-Inch Reinforced Concrete Pipe, Class III	1,150	L.F.	$_____	$_____
603.0500	48-Inch Reinforced Concrete Pipe, Class III	625	L.F.	$_____	$_____
603.0600	Bed Course Material for Culvert	180	C.Y.	$_____	$_____
603.0700	Clean Existing Culverts	F.A.	F.A.	F.A.	$ 100,000.00
604.0100	Type "1A-9P" Inlet, 4 Feet to 4.99 Feet	1	Each	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.0200	Type "1A-9P" Inlet, 5 Feet to 5.99 Feet	2	Each	$_____	$_____
604.0300	Type "1A-9P" Inlet, 8 Feet to 8.99 Feet	1	Each	$_____	$_____
604.0400	Type "1A-9P" Inlet, 9 Feet to 9.99 Feet	1	Each	$_____	$_____
604.0500	Type "1A-9P" Inlet, 10 Feet to 10.99 Feet	2	Each	$_____	$_____
604.0600	Type "1A-9P" Inlet, 17 Feet to 17.99 Feet	1	Each	$_____	$_____
604.0700	Type "1A-9P" Inlet, 22 Feet to 22.99 Feet	1	Each	$_____	$_____
604.0800	Type Modified “61614P” I-2 Inlet, 9 Feet to 9.99 Feet	1	Each	$_____	$_____
604.0900	Type Modified “61614P” I-1 Inlet, 13 Feet to 13.99 Feet	1	Each	$_____	$_____
604.1000	Type “61614P” Inlet, 4 Feet to 4.99 Feet	1	Each	$_____	$_____
604.1100	Type Riser G-1 Structure, 2 Feet to 2.99 Feet	1	Each	$_____	$_____
604.1200	Type Riser H-1 Structure, 2 Feet to 2.99 Feet	1	Each	$_____	$_____
604.1300	Type SDMH I-1 Structure, 26 Feet to 26.99 Feet	1	Each	$_____	$_____
604.1400	Type SDMH I-2 Structure, 21 Feet to 21.99 Feet	1	Each	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.1500	Type Modified SDMH A-3 P, Cast Iron Frame and Cover, 0 Feet to 0.99 Feet	1	Each	$_____	$_____
604.1600	Type "A" Manhole, 4 Feet to 4.99 Feet	1	Each	$_____	$_____
604.1700	Type "C" Manhole, 8 Feet to 8.99 Feet	1	Each	$_____	$_____
604.1800	Type "C" Manhole, 21 Feet to 21.99 Feet	2	Each	$_____	$_____
604.1900	Type "C" Manhole, 24 Feet to 24.99 Feet	1	Each	$_____	$_____
604.2000	Type “B1” Catch Basin, 5 Feet to 5.99 Feet	1	Each	$_____	$_____
604.2100	Type “C1” Catch Basin, 5 Feet to 5.99 Feet	1	Each	$_____	$_____
604.2200	Type “C1” Catch Basin, 2 Feet to 2.99 Feet	1	Each	$_____	$_____
604.2300	Type “D” Manhole, 5 Feet to 5.99 Feet	1	Each	$_____	$_____
605.0200	6-Inch Perforated Underdrain Pipe	1,850	L.F.	$_____	$_____
606.0100	Guardrail Type 3 MGS W-Beam with Strong Posts	4,605	L.F.	$_____	$_____
606.0200	Guardrail Type 3 Thrie Beam with Strong Posts	70	L.F.	$_____	$_____
606.0300	Guardrail Type 3 Thrie Beam Median with Strong Posts	400	L.F.	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
606.0400	Guardrail Type MASH TL-3 Temporary Barrier	5,550	L.F.	$_____	$_____
606.0500	Reset Guardrail	25	L.F.	$_____	$_____
606.0600	Terminal Section Type MSKT or Equal	2	Each	$_____	$_____
606.0700	Terminal Section Type MFLEAT MASH or Equal	1	Each	$_____	$_____
606.0800	Terminal Section Type Thrie Beam Terminal Connector	1	Each	$_____	$_____
606.0900	Terminal Section Type Trailing End Anchorage	1	Each	$_____	$_____
606.1000	Terminal Section Type Thrie Beam End Section	1	Each	$_____	$_____
606.1100	Transition Section Type MGS to W-Beam	1	Each	$_____	$_____
606.1200	Transition Section Type W-Beam to Thrie Beam	5	Each	$_____	$_____
607.0100	6-Feet, Chain Link Fence With Metal Post	30	L.F.	$_____	$_____
619.0100	Coral Boulder and Fabric Liner	L.S.	L.S.	L.S.	$_____
622.0100	Highway Light Standards With Non-Breakaway Transformer Bases, On 31-ft-3-Inch Tall Poles, 15-ft Bracket Arms, 218 Watt LED Luminaires, 480 Volts and Concrete Foundation	38	Each	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.0200	Type C Highway Lighting Pullboxes	6	Each	$_____	$_____
622.0300	Four 2-Inch Highway Lighting Ducts, Concrete Encased	740	L.F.	$_____	$_____
622.0400	One 2-Inch Highway Lighting Duct, Concrete Encased	3,740	L.F.	$_____	$_____
622.0500	Connect Existing Highway Lighting Conduit To New Highway Lighting Conduit	5	Each	$_____	$_____
622.0600	Equipment Enclosure and Wiring Modifications in Existing Highway Lighting Equipment Enclosure	1	Each	$_____	$_____
622.0700	Stub and Cap Highway Lighting Ducts	2	Each	$_____	$_____
622.0800	Demolish and Remove Existing Highway Lighting Pullbox And Backfill, Complete	3	Each	$_____	$_____
622.0900	Remove Existing Highway Lighting Conduits And Wires, Complete and Backfill, Complete	210	Each	$_____	$_____
622.1000	Remove Existing Highway Light Standards, Bracket Arms, And Luminaires; Salvage, Clean And Deliver To The State; Demolish And Remove Concrete Bases And Backfill, Complete	9	Each	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.1100	Existing 2" Conduit With New 3 No. 1, 1 No. 2 Ground Highway Lighting Conductors	1,880	Each	$_____	$_____
622.1200	New 3 No. 1, 1 No. 2 Ground Highway Lighting Conductors	5,760	Each	$_____	$_____
622.1300	Disconnect and Remove Existing Direct Buried Highway Lighting Cables, and Backfill Complete	930	Each	$_____	$_____
622.1400	Disconnect and Remove Existing Highway Lighting Circuit Conductors, Fill Empty 2-inch Conduit With Concrete and Abandon In Place	200	L.F.	$_____	$_____
622.1500	Remove and Relocate Existing Highway Light Standard onto New Concrete Foundation, Including All Highway Lighting Wiring as Required, and Demolish and Remove Existing Concrete Base, and Backfill Complete	1	Each	$_____	$_____
622.1600	Existing Highway Light Pullbox to be Demolished and Removed and Replaced with New Traffic Rated Type C Highway Light Pullbox, Adjust to Final Grade	1	Each	$_____	$_____
622.1700	Connect existing highway lighting to JCI lightgrid system	L.S.	L.S	L.S.	$_____
623.0100	Type A Traffic Signal/Communications Pullboxes	7	Each	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0200	Type C Traffic Signal/Communications Pullboxes	7	Each	$_____	$_____
623.0300	Two 2-Inch Traffic Signal Ducts, Concrete Encased	3,910	L.F.	$_____	$_____
623.0400	Stub and Cap Traffic Signal Ducts	10	Each	$_____	$_____
623.0500	Connect Existing Traffic Signal Conduit to New Traffic Signal Conduit	5	Each	$_____	$_____
623.0600	Traffic Rated Type A Traffic Signal/Communications Pullboxes	11	Each	$_____	$_____
623.0700	Traffic Rated Type C Traffic Signal/Communications Pullboxes	11	Each	$_____	$_____
623.0800	Two 2-Inch Communications Signal Ducts, Concrete Encased	4,020	L.F.	$_____	$_____
623.0900	One 2-Inch Communications Electric Ducts, Concrete Encased	460	L.F.	$_____	$_____
623.0950	One 3-Inch Communications Electric Ducts, Concrete Encased	3,560	L.F.	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.1000	Existing Traffic Signal Pullbox to be Demolished and Removed and Replaced with New Traffic Rated Type A Traffic Signal Pullbox, Adjusted to Final Grade	1	Each	$_____	$_____
623.1100	Existing Traffic Signal Pullbox to be Demolished and Removed and Replaced with New Traffic Rated Type B Traffic Signal Pullbox, Adjusted to Final Grade	1	Each	$_____	$_____
624.0100	Water Systems	L.S.	L.S.	L.S.	$_____
626.0100	6-Inch Standard Valve Box	2	Each	$_____	$_____
626.0200	16-Inch Beveled Gear Standard Valve Box	1	Each	$_____	$_____
626.0300	24-Inch Beveled Gear Standard Valve Box	1	Each	$_____	$_____
627.0100	Hydrodynamic Separator Structures	L.S.	L.S.	L.S.	$_____
629.0100	4-Inch Pavement Striping (Thermoplastic Extrusion)	2,920	L.F.	$_____	$_____
629.0200	6-Inch Pavement Striping (Thermoplastic Extrusion)	4,870	L.F.	$_____	$_____
629.0300	8-Inch Pavement Striping (Thermoplastic Extrusion)	1,740	L.F.	$_____	$_____
629.0400	12-Inch Pavement Striping (Thermoplastic Extrusion)	1,250	L.F.	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.0500	Crosswalk Marking (Thermoplastic Extrusion)	100	L.F.	$_____	$_____
629.0600	Pavement Symbol (Thermoplastic Extrusion)	9	Each	$_____	$_____
629.0700	Profiled Thermoplastic Striping	19	Each	$_____	$_____
629.0800	Type “C” Pavement Markers	250	Each	$_____	$_____
629.0900	Type “F” Pavement Markers	2	Each	$_____	$_____
629.1000	Type “H” Pavement Markers	76	Each	$_____	$_____
631.0100	Regulatory Sign (10 Square Feet or Less, w/ post)	6	Each	$_____	$_____
631.0200	Regulatory Sign (More than 10 Square Feet, w/ 2 posts)	1	Each	$_____	$_____
631.0300	Warning Sign (10 Square Feet or Less, w/ post)	10	Each	$_____	$_____
631.0400	Warning Sign (More than 10 Square Feet, w/ 2 posts)	3	Each	$_____	$_____
631.0500	Interchange Exit Sign (2 posts)	1	Each	$_____	$_____
631.0600	Relocation of Existing Sign	1	Each	$_____	$_____
631.0700	Guide Sign (Expressway)	4	Each	$_____	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
631.0800	Guide Sign (1 Post)	3	Each	$_____	$_____
634.0100	Portland Cement Concrete Sidewalk	439	C.Y.	$_____	$_____
636.0100	E-Construction License	F.A.	F.A.	F.A.	$ 10,000.00
638.0100	Curb, Type 2D	1,650	L.F.	$_____	$_____
638.0200	Curb and Gutter, Type 2DG	2,730	L.F.	$_____	$_____
641.0100	Hydro-mulch Seeding	L.S.	L.S.	L.S.	$_____
643.0100	Maintenance of Existing Landscape Areas	F.A.	F.A.	F.A.	$ 25,000.00
645.0100	Traffic Control	L.S.	L.S.	L.S.	$_____
645.0200	Additional Police Officers, Additional Traffic Control Devices, and Advertisement	F.A.	F.A.	F.A.	$ 750,000.00
648.0100	Field Posted Drawings	L.S.	L.S.	L.S.	$_____
650.0100	Curb Ramp, Type B	6	Each	Each	$_____
650.0200	Detectable Warning Mat	6	Each	Each	$_____
696.0100	Field Office Trailer (Not to exceed $32,000, 1 Total)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE
(All Work Excluding New Sewer Facilities)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
696.0200	Maintenance of Trailers	F.A.	F.A.	F.A.	$ 50,000.00
699.0100	Mobilization (Not to exceed 6 percent of the sum of all items excluding the bid price of this item)	L.S.	L.S.	L.S.	$_____

a. Sum of All Items (All Work Excluding New Sewer Facilities) ..... $_____

NOTE: Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.

PROPOSAL SCHEDULE FOR NEW SEWER FACILITIES
(HARBOR ACCESS ROAD BL STA. 14+03.99 RT. to 19+22.76 RT.)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
204.0300	Trench Excavation for 30" Sewer Line	2,150	C.Y.	$_____	$_____
204.0400	Trench Backfill for 30" Sewer Line	2,050	C.Y.	$_____	$_____
209.0300	Installation, Maintenance, Monitoring and Removal of B.M.P.	L.S.	L.S.	L.S.	$_____
209.0400	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$ 10,000.00
503.0700	Concrete in Reinforced Jacket for Sewer Line	70	C.Y.	$_____	$_____
625.0100	Sewer System	560	L.F.	$_____	$_____
626.0400	Sewer Type "SB" Manhole, 14 Feet to 14.99 Feet	1	Each	$_____	$_____
626.0500	Sewer Type "SB" Manhole, 15 Feet to 15.99 Feet	1	Each	$_____	$_____
699.0200	Mobilization (Not to exceed 6 percent of the sum of all items under excluding the bid price of this Item)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE FOR NEW SEWER FACILITIES
(HARBOR ACCESS ROAD BL STA. 14+03.99 RT. to 19+22.76 RT.)

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT

b. Sum of All Items for New Sewer Facilities ..... $_____

NOTES:

1. See Sewer Plan and Profile (Plan Sheets no. U-1 and U-4) for new sewer facilities work.
2. Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.

PROPOSAL SCHEDULE SUMMARY

a. Sum of All Items (All Work Excluding New Sewer Facilities) ..... $ _____

b. Sum of All Items for New Sewer Facilities ..... $ _____

c. Amount for Comparison of Bids (a+b) ..... $ _____

NOTE: Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Project: **INTERSTATE ROUTE H-1 ADDITION AND MODIFICATION OF FREEWAY ACCESS (KAPOLEI INTERCHANGE COMPLEX), PHASE 3 FEDERAL-AID PROJECT NO. NH-H1-1(271)**

Prospective bidders had submitted RFI's via HIePRO. Questions and responses are as follows:

1. Are Post mounted Advisory Boards (Notice to Motorist) Required Per Spec 645.03(G) Advisory Signs. Submit advisory sign shop drawings. Construct, install, maintain, and remove two advisory signs as ordered by the Engineer. Place signs at locations designated by the Engineer. Provide signs, minimum B feet wide by 4 feet high, with black letters on orange background, and with three 4,00 pounds/foot flanged channel posts for each sign? If so, can you please provide quantity and the locations?

As noted per spec section 645.03(G), provide a quantity of 2 signs, and locations shall be designated by the Engineer (the construction engineer).

2. On sheet 52 Galvanized Steel RM-5 is called out, typically on current projects with MGS Guardrail plastic RM-5 called out. Can you please clarify the type of RM-5 for the project?

Revised to plastic RM-5. See revised sheet 52 in Addendum No. 2.

3. On sheet 52 there is a picture of a guardrail splice on the block and post, for MGS MASH Guardrail, typically the splice is midspan and on the block and the post, can you please clarify?

See revised sheet 52 in Addendum No. 2.

4. on sheet 53 Note 3 calls out NCHRP-350 approved Guardrail End Terminals, but the pay items call out MASH approved End Terminals, can you please clarify?

Revised to MASH. See revised sheet 53 in Addendum No. 2.

5. For the strong post in rock drilling notes on sheet will this drilling be required for every guardrail post?

Rock drilling is not anticipated based on the geotechnical borings. Detail is provided in the situation if rock is encountered.

6. Is there a pre-bid meeting attendees list available?

See Addendum No. 2.

7. We are currently bidding a large number of projects. We would like to humbly request a 3-4 extension to the bid date.

We are extending the bid open date to make additional changes to the plans that will be included in Addendum No. 3.

8. Our takeoff quantities are substantially lower than the proposal quantities for the items listed below. Please Clarify. a. Bid Item 603.0800 Reinforced Concrete Jacket for Drainline b. Bid Item 605.0200 6" Perforated Underdrain Pipe c. Bid Item 204.0200 Trench Backfill for Water Line

Quantities for certain items have been revised and some items have been deleted. However, quantities provided in the proposal are approximate and should be verified by the Contractor. See revised proposal schedule in Addendum No. 2.

9. Bid Item 202.0500 Removal of Existing Cantilever OH Sign, Foundation: Please provide as-built design of foundation and provide limits of foundation removal.

See as-built sheets and DOT Standard Detail sheets TE-19B, TE-19D, & TE-17A in Addendum No. 2. Demolish and remove to bottom of pile cap.

10. The geotechnical report recommends over-excavating by at least 18 inches due to the surface soils having substantial shrinkage cracks. Will this work be required? if so, in what bid item will it be paid for under?

Recommendations of the Geotech report are required per Grading Note 1, Sheet T-8. Overexcavation for substantial shrinkage cracks shall be considered incidental to bid item 203.0100 Roadway Excavation. See revised Sheet T-8 in Addendum No. 2.

11. The geotechnical report recommends removing soft and yielding materials, if encountered. Requesting that a unit price/allowance bid item be provided for this work.

Soft and yielding materials are not expected to be encountered. No bid item will be included. However, if these materials are encountered, it will be addressed and paid for by change order.

12. Due to the substantial embankment fill required, ground settlement may occur. a. Will extra surcharge material be required to account for this settlement? Since the settlement depths are unknown, please provide a separate bid item for this work. b. Plan Sheet T-8, Grading Note 2

states that the Contractor shall install settlement gauges. Since the duration for settlement is unknown, please provide a unit price bid item for this work. c. Since the duration of ground settlement is unknown, where will the Contractor be paid for potential delays?

a. As indicated in the geotechnical report, we anticipate settlement will occur during and after construction of the high fill embankment. This cost shall be incidental to the earthwork items.
b. Cost shall be incidental to earthwork.
c. As indicated in our geotechnical report, the estimated time to achieve 90 percent consolidation is about 2 months. Contractor shall anticipate a maximum of 4 months. See revised notes on Sheet T-8 in Addendum No. 2.

13. Plan Sheet SP-4 (page 62): In what bid item will "Restore Topsoil and Grass" be covered? How thick is the topsoil required?

This cost shall be incidental to the earthwork. Required topsoil thickness shall be 4". See revised plans in Addendum No. 2.

14. Plan Sheet T-3, General Note 25: Is there a designated stockpile/storage area?

Per the note, the Contractor needs to make a request to the Engineer for areas that they want to use for stockpiling and storage within the highway right of way.

15. Detail 6/T-13 shows 1.5" HMA Pavement w/ 6" subbase. However, Typical Sections only show the 1.5" HMA Pavement. Please clarify if 6" subbase is required.

Follow detail 6/T-13. 6" subbase is required. Typical sections revised to show the 6" subbase. See Addendum No. 2.

16. Please provide the 12" Concrete Pavement Jointing Plan.

Contractor shall submit jointing plan per GENERAL PORTLAND CEMENT CONRETE (PCC) PAVEMENT AND JOINTING NOTES note 6 on sheet T-8. Concrete pavement jointing shall follow DOT Std. Plan D-18 and spec section 411.

17. Plan Sheet S-5, Retaining Wall, Note 3: Please provide specifications for the textured form liners.

See revised Sheet S-5, Note 3 in Addendum No. 2.

18. Bid Item 205.0200 Structural Backfill for Concrete Retaining Walls. a. Please confirm that the structural backfill per Notes 7 and 8 on Sheet S-5 shall be included in this bid item. If so, bid proposal quantity is significantly low. Please clarify.

Revised bid item 205.0200 Structural Backfill quantity from 1,400 CY to 25,000 CY and item 203.0200 Borrow Excavated Material from 75,000 CY to 51,400 CY. See revised proposal schedule in Addendum No. 2.

19. Sheet S-7 shows a light base detail. Please provide locations where this is required.

Added callout pointing to locations of light base locations on sheet S-3 Overall Retaining Wall Plan. See Addendum No. 2.

20. Bid Item 605.0100 6" Underdrain Pipe – Please clarify where this item is required. Per detail 1/T-13, underdrain pipe is perforated.

Removed bid item 605.0100 6" Underdrain Pipe. There is only 6" perforated underdrain pipe. See revised proposal schedule in Addendum No. 2.

21. In what bid item will the 24" Corrugated HDPE Pipe be paid under?

Removed 24" Corrugated HDPE Pipe. All pipes should be RCP, minimum Class 3. See revised plans and proposal schedule in Addendum No. 2.

22. Bid Item 603.0300, 18" RCP, CL III – Reference Sheet D-11, Drain K Profile – Please clarify if the 18" Pipe is RCP or Corrugated HDPE?

Revised to 12" RCP. See revised plans and proposal schedule in Addendum No. 2.

23. Please confirm if aggregate subbase is required under all drainage structures.

Per Geotech Report, provide 12" cushion layer consisting of aggregate subbase materials 95% compaction under box culvert; 6" aggregate subbase under all drainage structures following spec section 703.17.

24. Please clarify length of the box culvert as lengths in Sheets S-4 and D-6 don't match.

The dimensioned lengths on sheet S-4 are dimensioning outside of box culvert. The length and azimuth on centerline of box culvert match the sheet D-6 Drain Line A profile.

25. Referencing Water Detail Sheets R-13, 14: In what item will cathodic protection be paid under?

Cathodic Protection to be paid under Item No. 624.0100 – Water Systems. See revised sheets Addendum No. 2.

26. Plan Sheet U-5 (page 97): Please clarify "DI Connector Piece" for all stations where this is stated.

Removed DI Connector pieces from plans. See Addendum No. 2.

27. Sheet D-2, Sta. 19+50.44 to Sta. 21+00 on Harbor Access Road shows a 6" underdrain. However, Sheet D-5 doesn't show any 6" underdrain. Please clarify.

Removed 6" underdrain on sheet D-2 and added callout to reference sheet D-5 for 6" underdrain. See revised plans in Addendum No. 2.

28. Referencing Sheets D-2 and D-5. Please clarify length of Drain Line K.

Drain Line K is 23'. See sht. D-11 Drain Line K Profile.

29. Please provide locations of Bid Item 604.2100 Type "C1" Catch Basin, 6'-6.99'.

Revised bid item 604.2200 from "Type "C1" Catch Basin, 6 Feet to 6.99 Feet" to "Type "C1" Catch Basin, 2 Feet to 2.99 Feet" and quantity from 2 Each to 1 Each. See sheet D-4 for catch basin locations. See Addendum No. 2.

30. Detail 2/S-11: Plan detail shows an inside width of 6'-9" while Section "A-A" shows an inside width of 6'-0". Which one is correct?

Revised plan view to 6'-0". See Addendum No. 2.

31. Referencing Sheet S-16: In what bid item will the concrete end posts be paid under?

Added bid item 503.0900 Concrete in End Posts for concrete end posts. See revised proposal schedule in Addendum No. 2.

32. Referencing Proposal Schedule for New Sewer Facilities, 209.0300 Installation, Maintenance, Monitoring and Removal of B.M.P.: What work is required for this bid item that is not already covered in the overall?

Item 209.0300 is for any erosion and sediment control work done specifically for the sewer work as shown on sheet U-1.

33. Referencing Proposal Schedule for New Sewer Facilities, 645.0300 Traffic Control: Please provide traffic control plan for this bid item.

Deleted item 645.0300 Traffic Control in Proposal Schedule for New Sewer Facilitates. See revised proposal schedule in Addendum No. 2.