STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 1
for
NIMITZ HIGHWAY
REHABILITATION OF HONOLULU SLIP COVER AND SLIP COVER #3
92A-01-10M

The following amendments shall be made to the Bid Documents:

A. SPECIFICATIONS

1. Replace Section 509, pages 509-1a through 509-17a dated 6/11/09 with the attached Section 509, pages 509-1a through 509-17a dated r6/09/10.

2. Add Section 645 – Work Zone Traffic Control, Page 645-1a dated r6/09/10.

B. PLANS

1. Replace Plan Sheet Nos. 4, 18, 26 and 27 with the attached Plan Sheet Nos. ADD. 4, ADD. 18, ADD. 26 and ADD. 27.

2. Add Plan Sheet No. ADD. 26S-1.

C. PRE-BID CONFERENCE MINUTES

Pre-bid conference minutes and attendance sheet are attached for your information.

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

BRENNON T. MORIOKA, P.E., Ph.D.
Director of Transportation

Make the following section a part of the Standard Specifications:

"SECTION 509 – CONCRETE REHABILITATION

509.01 Description. This section describes the materials used to repair concrete spalls, delaminations and cracks.

509.02 Materials.

(A) Repair Mortar. High Strength Repair Mortar: A high strength, factory blended repair material combined with a polymer type admixture, corrosion inhibitor admixture, super-plasticizing admixture and water. The polymer type admixture shall be added at a ratio of at least 1 part polymer admixture to one to three parts of water (by volume) in accordance with manufacturer's recommendations. In addition, the ratio of polymer solids to cement weight shall not be less than 10%.

(1) High Strength, Factory Blended Repair Materials. A fast-setting cementitious waterproof material (containing no gypsum) designed specifically for repairing concrete with the following minimum properties:

Compressive Strength (ASTM C 109)
1 Day: 3,500 psi
28 Days: 7,000 psi

Tensile Strength
28 Days: 900 psi

Flexural Strength
28 Days: 2,000 psi

(2) Polymer Type Admixture. An acrylic latex bonding admixture classified as non-reemulsifiable by the American Concrete Institute and shall be specifically designed for use as an additive for Portland cement mixes to improve adhesion, water resistance, and mechanical properties. The manufacturers' test data shall show that shear bond, tensile, compressive and flexural strengths of admixture modified cement mixes are at least 50 percent greater than unmodified cement mixes. Material shall be as recommended by manufacturer for use in areas subject to tidal wave action.

(3) Super-Plasticizing Admixture. High-range water-reducing liquid admixture, ASTM C 494, Type F or G.

(4) Water. Water shall be fresh, clean, and potable.

(B) Polymer Modified Concrete and Mortar. To be used for full depth slab repairs. Polymer modified concrete shall be a mixture of cement, fine aggregate, coarse aggregate, polymer type admixture, corrosion inhibitor admixture, super-plasticizing admixture, fiber reinforcing and water. The polymer type admixture shall be added at a ratio of at least 1 part polymer admixture to one to three parts of water (by volume) in accordance with manufacturer's recommendations. In addition, the ratio of polymer solids to cement weight shall not be less than 10%.

(1) Cement. ASTM C 150, Type I, II or III.

(2) Aggregate.

(a) Fine aggregate – ASTM C 33.

(b) Coarse aggregate – ASTM C 33, 3/8-inch maximum size.

(3) Super-Plasticizing Admixture. High-range water-reducing liquid admixture, ASTM C 494, Type F or G.

(4) Corrosion Inhibitor Admixture. A 30 percent calcium nitrite based corrosion inhibitor conforming to ASTM C 494, Type C admixture, shall be added at the rate of 2 gallons per cubic yard.

(5) Polymer Type Admixture. ASTM C 1059 Type II.

(6) Fiber Reinforcing. ASTM C 1116. Synthetic reinforcing fibers shall be 100 percent virgin copolymer/polypropylene fibrillated fibers, minimum 2-1/4" long. Fibers shall have a specific gravity of 0.9, a minimum tensile strength of 90 ksi, graded per manufacturer. A minimum of 7.5 lbs of fibers per cubic yard of concrete shall be used.

(7) Added Reinforcing Bars. ASTM A 706, Grade 60. Provide additional #3@12" oc. on the bottom mat of the deck slab. This will provide a net bar spacing of 6" oc.

(8) Concrete Strength. 4000 psi in 24 hours. 6000 psi in 28 days. Shall attain 4000 psi prior to opening to traffic.

(C) Pressure Grouting Epoxy.

(1) For Cracks: ASTM C 881, Type IV, Grade 1, Class C.

(2) For Grouting Valves: ASTM C 881, Type IV, Grade 3, Class C.

(D) Surface Seal Epoxy. ASTM C 881, Type III, Grade 1, Class C.

(E) For Grouting Dowels. ASTM C 881, Type V, Grade 2, Class C.

(F) Materials for Forms. Provide wood, plywood, or steel. Use plywood or steel forms where a smooth form finish is required. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Plywood: PS 1, B-B concrete form panels or better. Steel form surfaces shall not contain irregularities, dents, or sags.

(G) Reinforcement.

(1) Reinforcing Bars. ACI 301 unless otherwise specified. ASTM A 706, Grade 60 unless noted otherwise. Unless otherwise noted, all reinforcing bars shall be epoxy coated in accordance with ASTM A 934.

(2) Welded Wire Fabric and Tie Wire. ASTM A 884/A 884M, epoxy coated.

(H) Materials for Curing Concrete.

(1) Impervious Sheeting. ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

(2) Pervious Sheeting. AASHTO M 182.

(3) Liquid Membrane-Forming Compound. ASTM C 309, white-pigmented, Type 2, Class B, free of paraffin or petroleum.

(I) Joint Sealants.

(1) Horizontal Surfaces (3 percent slope, maximum). ASTM C 920, Type S or M, Grade NS, Class 25, Use T.

(2) Horizontal Surfaces (greater than 3 percent slope). ASTM C 920, Type S or M, Grade NS, Class 25, Use NT.

(J) Bonding Compound.

(1) Epoxy Bonding Compound. ASTM C 881, Type IV and V, Class C, except that epoxy shall be moisture insensitive before, during and after cure. Provide Grade 1 or 2 for horizontal surfaces and Grade 3 for vertical surfaces.

(2) **Polymer Bonding Compound.** Provide bonding agent conforming to ASTM C 1059 for polymer modified concrete and mortar.

(K) Concrete Sealer. Sealer for repaired concrete surfaces shall be water-based alkylalkyoxysilane, meeting or exceeding the following criteria:

Composition: Alkylalkyoxysilane in water

Active Alkylalkyoxysilane Content: 40% by weight

Appearance: White, milky liquid

Average Depth of Penetration: 0.24 to 0.26 inches

VOC Content (EPA Method 24): Less than 350 grams/liter

Flash Point: Greater than 150 degrees F

Specific Gravity, 25 degrees C: 0.95

Density: 7.9 lbs/gal

Water Absorption Test: 0.042% 48 hours, 1.20% 50 days, ASTM C 642

Resistance to Salt, Acids, and Sunlight: Excellent

Scaling Resistance Test: 0 rating "No scaling," ASTM C 672

509.03 Construction.

(A) Submittals. Submittals shall be submitted in accordance with Standard Specs Section 105.02.

(1) **Product Data.** Submit the following:

(a) Materials for curing concrete

(b) Joint sealant

(c) Epoxy bonding adhesives

(d) Concrete sealer

(e) Patching mortar

(f) Polymer modified concrete and mortar

(g) Corrosion inhibitor admixture

(2) Design Data. Submit design data for the following:

(a) Job Mix Formula

(b) Trial Batches

(3) Test Reports.

(a) Aggregates: Sieve analysis in accordance with ASTM C 136 and ASTM C 117.

(b) Epoxy Resin System: ASTM C 881, including the following:

- Viscosity
- Consistency
- Gel time
- Absorption
- Shrinkage
- Thermal compatibility

(4) Certificates. Submit certificates of compliances for the following:

(a) Aggregates

(b) Cement

(c) Concrete sealer

(5) Manufacturer's Instructions.

(a) Equipment. Submit Descriptive information on the mixing and application equipment.

(b) Job Mix Formula. Fifteen days minimum prior to concrete repair work, submit a job mix formula for each type of epoxy resin, repair mortar, and polymer modified concrete and mortar. Test reports shall accompany the mix design. The formula shall identify the proposed source of the materials and state the proportions of material. Samples of materials to be used on the job shall be used to determine the job mix.

(c) **Trial Batches.** Trial batches for each use and each type of repair materials shall be performed by a certified testing laboratory. A minimum of three trial batches are required as proportioning is greatly affected by small variations in gradations and in the characteristics of individual particles of the aggregates. Different proportions shall be tried to obtain satisfactory placing and finishing characteristics. It is important that there be sufficient fines so that the binder materials can fill the voids among the individual aggregate particles. Include in the submittal the following data for the trial batches:

- Proportions by weight
- Unit weights and specific gravities of constituents
- Batch weights
- Compressive strengths of 6 inch by 12 inch cylinders, made in accordance with ASTM C 31, cured for 24 hours and 28 days and tested in accordance with ASTM C 39. Compressive strength shall be a minimum of 4,000 psi at 24 hours and 6,000 psi at 28 days. Provide E (modulus of elasticity) at 24 hours.

(6) Description of Work. In the ACI publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears; reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" shall be interpreted to mean the Engineer.

(7) Delivery and Storage. Inspect materials delivered to site for damage, unload and store with a minimum of handling. Deliver all epoxy resin components, patching materials and aggregates in original sealed containers and store in dry covered areas at temperatures below 90 degrees F.

(8) Safety Precautions.

(a) Provide Contractor personnel with and require them to use impervious clothing, gloves, face shields (eight-inch minimum), and other appropriate protective clothing necessary to prevent any possibility of skin contact with uncured resin components.

(b) Place clothing contaminated with uncured resin components in closed containers for storage until it can be discarded or until provision is made for the removal of contaminants from the clothing.

(c) Non-impervious clothing which becomes contaminated with uncured epoxy resin components shall be removed immediately and not reworn until the contaminant is removed from the clothing.

(d) Use splash proof safety goggles.

(e) Provide an eyewash fountain capable of providing not less than 15 minutes of water within the immediate work area where liquid resin components will be used; portable eyewash fountains which will provide 15 minutes of water is acceptable.

(f) Wash immediately with soap and water to remove liquid resin components in contact with skin.

(g) No eating and smoking in areas where resin components are handled, processed, or stored.

(h) Wash hands thoroughly with soap and water after handling resin components before eating, smoking, or using toilet facilities.

(9) Weather Limitations. Work shall not proceed when weather conditions detrimentally affect the quality of patching or bonding concrete. Apply epoxy resin materials only when the contact surfaces are completely dry and if the atmospheric temperature range is suitable for the specified type of epoxy adhesive or grout material.

(B) Equipment. The Equipment for blending the epoxy resin and repair materials shall be approved by the Contractor's quality control specialist. A suitable capacity metal or polyethylene container recommended by the epoxy manufacturer shall be used as the mixing vessel for blending the epoxy resin. Mixing shall be accomplished using a power drive (air or spark-proof) propeller type blade except that hand mixing may be used for small batches. Equipment for field mixing of epoxy resin shall be as specified by the epoxy manufacturer.

(C) Construction Procedures.

(1) General. ACI 318/318R, ACI 503R, ACI 503.2, ACI 503.4 for epoxy resin systems. Mix the repair materials with or without fillers in

strict accordance with the manufacturer's instruction. All applications of the mixed materials shall be performed within the working life or pot life of the repair system. Unused mixed materials which have reached the end of the working or pot life shall be removed from the job site at the Contractor's expense. Field mixing and size of batch shall be determined by the Contractor. Repair systems shall be provided as indicated and required by this specification.

(2) Repair Mortar or Concrete.

(a) Preparation of Repair Area. Remove loose concrete, oil, dirt, and coatings, from the spalled areas indicated to expose clean, sound concrete. Inspect the cavity for any remaining defective concrete by tapping with a hammer or steel rod throughout the indicated areas and listening for dull or hollow sounds. In areas where tapping does not produce a solid tone, remove additional concrete until testing produces a solid tone. Use a high frequency chipping hammer or concrete saw to deepen cavity. Make saw cuts to depths as indicated at a minimum distance of two inches outside the farthest edge of the spall or as indicated on the drawings. Roughen saw cut surfaces by power wire brushing or other acceptable means. Remove residual fines from all surfaces. Remove all rust from reinforcing steel by power wire brushing to expose clean, sound bare metal. Replace damaged reinforcing steel where indicated. Protect cleaned area from contaminating materials that may affect the bonding of the repair material. Provide a catchment/containment device to catch loose concrete, oil, dirt and coatings from the spalled areas during surface preparation.

(b) Spalls at Joint. Spalls to be repaired that are adjacent to all joints and working cracks shall have preformed joint filler of proper dimensions inserted to the bottom of the chipped spall cavities and shall be extended a minimum of one inch beyond (horizontally) the entire working faces of the spall. The joint filler strip shall be secured in place prior to and during placement of repair material. A bituminous cement bond breaker shall be applied to all working faces at keyed joints. Care shall be exercised to keep bituminous cement bond breaker off of concrete surface to be bonded. After the repair has completely cured, the top inch of the preformed joint filler shall be sawed out at the top of the slab and liquid joint sealer installed.

(c) Joints and Cracks. Joints or cracks shall be cleaned and sealed as indicated.

(d) Mixing Materials. Make batches small enough to assure placement before binder sets.

(e) Prime Coat. Prime all surfaces and around all reinforcing steel with an epoxy resin adhesive as specified in Subsection 509.03 (F)(3)(b) "Application of Epoxy Bonding Compound". Scrub prime coat into the surface with a stiff bristle brush. Apply coating in accordance with the manufacturer's recommendations.

(f) Preparation. Mix patching material in accordance with manufacturer's recommendations.

(g) Placement of Repair Material. Place repair material in thin layers as recommended by the manufacturer. Each intermediate layer shall be cross-scratched for mechanical bonding. All layers for each repair shall be placed on the same day. Use vibratory floats, plates, or hand tampers to consolidate the repair material. Level each layer and screed the final surface. Remove excess repair material on adjacent surfaces before it hardens. Do not feather out onto adjacent surfaces. Upon completion of finishing operations, cure in accordance with the manufacturer's recommendations. Protect repairs from wave and tidal action with watertight forms and/or covers until the repairs are properly cured.

(3) Pressure Grouting of Cracks. Fill cracks in concrete by pumping a low viscosity epoxy resin system under pressure into the cracks. Install valves (i.e. injection ports) into position along the cracks by bonding in concrete with high viscosity, non-sagging epoxy resin paste mixture. Cracks shall be filled by pumping low viscosity epoxy system through the valves.

(a) Valves shall be installed over the crack at 12" intervals.

(b) The crack between valves shall be surface sealed with the high viscosity epoxy mixture.

(c) After the surface seal has hardened and cured, a tube from the epoxy injection equipment containing the low viscosity resin mixture shall be attached to the first valve and the resin mixture pumped into the crack. Use a maximum pressure of 60 psi or less to protect the existing concrete.

(d) As the resin mixture appears in the second valve, pinch closed the first valve, and attach the tube from the epoxy injection equipment to the second valve and commence pumping. Avoid delays in the pumping operation.

(e) After the epoxy mixture has been pumped through all of the valves and the mixture has hardened, remove the valves by grinding off the valves flush with the concrete. Set and seal the valves with the high viscosity resin mixture and allow to cure.

(4) Non-pressure Epoxy Grout. Prepare grout in accordance with the manufacturer's instructions.

(a) Cementing Dowels. Immediately prior to placing the dowel, clean the hole of dust and other deleterious material. Fill the hole with non-pressure epoxy grout to a level that leaves enough space for the dowel without overflowing. Insert the dowel in the hole and tap down. If necessary add more grout.

(D) Placing Reinforcement and Miscellaneous Material. ACI 301. Provide bars, wire fabric, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement shall not contain rust, scale, oil, grease, clay, and foreign substances that would reduce the bond. Rusting of reinforcement is a basis of rejection if the effective cross sectional area or the nominal weight per foot of the reinforcement has been reduced to less than specified in Subsection 509.02 (G)(1) entitled "Reinforcing Bars." Remove loose rust prior to placing steel.

(1) Tolerances. Place reinforcement and secure with epoxy coated or noncorrodible chairs, spacers, or metal hangers.

(2) Installation of Epoxy Filled Anchors. Install epoxy filled anchors in accordance with the manufacturer's printed instructions. The anchor bars/rods shall be clean of dirt, dust, paint, grease, oil, rust, or other contamination or other coating which would prevent direct coating adhesion. Drill proper sized holes. Clean out hole with wire brush and blowout-bulb or blowout hose attaches to the injector tool. Prior to injection, discharge approximately one fluid ounce of epoxy; the epoxy color shall match the color band on the nozzle valve nut. Insert the nozzle into the bottom of the hole and fill the hole to 1/2 the hole depth. Insert the selected bar/rod slowly by hand into the bottom of the hole using a slow twisting motion to ensure the epoxy fills the voids and crevices. Hardening will begin in approximately 7 minutes at room temperature.

(3) **Splicing.** AWS D1.1 and AWS D1.4 as applicable. Splices shall be approved prior to use. Do not splice at points of maximum stress. All welded joints shall be cleaned to bare metal and epoxy coated.

(4) **Welding.** Welding operations in confined spaces shall meet applicable requirements of OSHA 29 CFR 1910. Welding shall conform to AWS D1.4; only competent, experienced, certified welders shall be employed. Three test samples, using six lengths of No. 9 bars shall be made by each welder under similar field conditions which will be encountered in the project. Samples shall have a lap of six inches and shall be made in the following positions: flat, vertical, and overhead. One sample shall be cut and the other two tested in tension to check the quality and strength of the weld. Cost of testing shall be paid for by the Contractor.

(5) **Setting Miscellaneous Material.** Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before concrete placement. Plumb anchor bolts and check location end elevation. Temporarily fill voids in sleeves with readily removable material to prevent the entry of concrete.

(E) **Forms.** ACI 301. Provide forms, shoring, and scaffolding for concrete placement unless indicated or specified otherwise. Set forms mortar-tight and true to line and grade. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch unless otherwise indicated. Provide formwork with clean-out openings to permit inspection and removal of debris. Forms submerged in water shall be watertight and in accordance with applicable requirements of ACI 304R, Chapter 8.

(1) **Coating.** Before concrete placement, coat the contact surfaces of forms with a nonstaining material oil, nonstaining form coating compound, or two coats of nitrocellulose lacquer. Do not use mineral oil on forms for surfaces to which adhesive, paint, or other finish material is to be applied.

(2) **Removal of Forms.** Prevent concrete damage during form removal. After placing concrete, forms shall remain in place for the minimum time periods specified in Subsection 509.03 (H)(4) "Curing Periods and Minimum Temperatures."

(F) **Measuring, Mixing, Transporting, and Placing Concrete.** ASTM C94, ACI 301, ACI 302.1R, and ACI 304R, except as modified herein.

(1) **Mixing.** ASTM C94 and ASTM C 685 where applicable. Machine mix concrete. Begin mixing within 30 minutes after the

cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 85 degrees F.

(2) Transporting. Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

(3) Placing. Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris and water from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other.

(a) Vibration. ACI 301. Furnish a spare vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4 inches in depth with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straight edge. Operate vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 impulses per minute when submerged. Do not use vibrators approximately 18 inches apart. Penetrate the previously placed lift with the vibrator when more than one lift is required. Place concrete in 18-inch maximum vertical lifts. External vibrators shall be used on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete.

(b) Application of Epoxy Bonding Compound. ACI 503R and ACI 503.2. Apply a thin coat of compound to reinforcing steel. Do not allow epoxy bonding compound to dry prior to concrete placement. Follow manufacturer's instructions regarding safety and health precautions when working with epoxy-resins. Bonding compound is not required when formwork is used.

(c) Pumping Method. ACI 304.2R. Concrete may be conveyed by positive displacement pumps when approved. The concrete mix shall be designed for pumping. The pump shall be the piston or squeeze pressure type. The pipeline shall be steel pipe or heavy duty flexible hose. The inside diameter of the pipe shall be at least three times the maximum size of the coarse aggregate. The distance to be pumped shall not exceed the limits recommended by the pump manufacturer. The concrete shall be supplied to the pump continuously. When pumping is completed, the concrete remaining in the pipeline shall be ejected without contaminating the concrete in place. After each operation, the equipment shall be thoroughly cleaned, and flushing water shall be wasted outside the forms and away from the harbor and any storm drains or deck openings.

(d) Hot Weather Concreting. ACI 305R. Provide and maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment (where worksite is remote to water source) to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

(G) Surface Finishes.

(1) Defects. Repair formed surfaces by removing minor honeycombs, pits greater than one square inch surface area or 0.25 inch maximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb (including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects) which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval of corrective action

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prior to repair. The surface of the concrete shall not vary more than the allowable tolerances of ACI 347R. Exposed surfaces shall be uniform in appearance and finished to a smooth form finish unless otherwise specified.

(2) Not Against Forms (Top of Walls). Surfaces not otherwise specified shall be finished with wood floats to even surfaces. Finish shall match adjacent finishes.

(3) Formed Surfaces.

(a) As-Cast Rough Form (for Surfaces Not Exposed to View). Remove fins and other projections exceeding 0.25 inch in height; level abrupt irregularities.

(b) As-Cast Smooth Form (for Surfaces Exposed to View). Form facing material shall produce a smooth, hard, uniform texture on the concrete. Remove fins and other projections.

~~(H)~~ **Curing and Protection.** ACI 301 unless otherwise specified. Begin curing immediately following form removal. Protect concrete from injurious action by sun, rain, flowing water, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period.

(1) Moist Curing. Provide for the removal of water without erosion or damage to the structure.

(a) Ponding or Immersion. Continually immerse the concrete throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete.

(b) Fog Spraying or Sprinkling. Provide uniform and continuous application of water throughout the curing period.

(c) Pervious Sheeting. Completely cover surface and edges of the concrete with two thicknesses of wet sheeting. Overlap sheeting 6 inches over adjacent sheeting. Sheeting shall be at least as long as the width of the surface to be cured. During application, do not drag the sheeting over the finished concrete nor over sheeting already placed. Wet sheeting thoroughly and keep continuously wet throughout the

curing period.

(d) Impervious Sheeting. Wet the entire exposed surface of the concrete thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting. Cover or wrap columns, walls, and other vertical structural elements from the top down with impervious sheeting, overlap and continuously tape sheeting joints, and introduce sufficient water to soak the entire surface prior to completely enclosing.

(2) Liquid Membrane-Forming Compound Curing. Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Provide and maintain compound on the concrete surface throughout the curing period. Do not use this method of curing where the use of Figure 2.1.5 in ACI 305R indicates that hot weather conditions will cause an evaporation rate exceeding 0.2 pound of water per square foot per hour.

(a) Application. Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance, and before joints are sawed. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of compound in a continuous operation. The total coverage for the two coats shall be 200 square feet maximum per gallon of undiluted compound unless otherwise recommended by the manufacturer's written instructions. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Respray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.

(b) Protection of Treated Surfaces. Prohibit foot and other sources of abrasion for not less than 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.

(3) Traffic Control. Vehicular or heavy equipment traffic shall not be permitted on the structure in the area of the work during construction. The Contractor shall identify all working areas with

approved warning lights, signs and barricades. When patch material attain a minimum compressive strength of 4000 psi, local traffic may be permitted on the structure if approved by the Engineer.

(4) Curing Periods and Minimum Temperatures. After placing concrete, maintain air temperature adjacent to the concrete at 60 degrees F minimum for the specified time period, or 70 degrees F minimum for a period of 3 days after placing, unless otherwise directed.

(a) Additional Curing. Double the required curing period if either one or the average of both 7-day test cylinders indicate less than 90 percent of the strength specified (f'c).

(5) Concrete Sealer. After concrete repairs are completed and accepted by Contractor's quality control specialist, coat repaired areas with a concrete sealer. The coated area shall extend 12" beyond the repaired area.

(l) Sampling and Testing.

(1) Sampling. As soon as the epoxy resin and repair materials are available for sampling, obtain random selection a sample of each batch in the presence of the Contractor's quality control specialist. Furnish duplicate samples to the Engineer. A batch is defined as that quantity of materials processed by the manufacturer at one time and indentified by number on the label. Clearly indentify samples by designated name, specification number, batch number, project contract number, intended use and quantity involved.

(2) Testing. Test samples by an approved laboratory. If a sample fails to meet specification requirements after two tests, replace the batch represented by the samples tested and retest the replacement material as specified above. Submit copy of the test results to the Engineer. Include in the report of test results a listing of any specification requirements not verified by the test laboratory.

(3) Inspection. Examine material at the job site to determine that it is the material referenced in the report of test results or certificate of compliance. Surface preparations and application procedures will be examined by the Engineer to determine conformance with the requirements specified. Approve each separate operation prior to initiation of subsequent operations.

(4) Manufacturer's Representative. Arrange for manufacturer's technical representative to be on project site to advise installer of

proper procedures and precautions for the use of materials and to check installation.

509.04 Measurement.

(A) The Engineer will measure spalls/delaminations per square foot in accordance with the contract documents.

(B) The Engineer will measure cracks per lineal foot in accordance with the contract documents.

(C) The Engineer will measure reinforcing splices per pound in accordance with the contract documents.

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

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

Pay Item	Pay Unit
Repair Honolulu Slip Cover Soffit Spalls	Square Foot
Repair Honolulu Slip Cover Beam And Bent Cap Spalls	Square Foot
Repair Slip Cover #3 Soffit Spalls	Square Foot
Repair Slip Cover #3 Soffit Cracks	Linear Foot
Repair Slip Cover #3 Beam & Bent Cap Spalls	Square Foot
Repair Slip Cover #3 Pile & Pile Cap Spalls	Square Foot
Reinforcing Splices	Pound

END OF SECTION 509

SECTION 645 - WORK ZONE TRAFFIC CONTROL

Make the following amendments to said Section:

(I) Amend Subsection 645.03(F) – Lane Closures by revising lines 248 to 251 to read as follows:

"**(F) Lane Closures.** Lane closures will be allowed only during the following hours:

ONE-LANE CLOSURE	EASTBOUND
Sunday	All day and night
Monday through Thursday	Midnight – 4:30 A.M. 8:30 A.M. – 3:00 P.M. 9:00 P.M. – Midnight
Friday	Midnight – 4:30 A.M. 8:30 A.M. – 3:00 P.M.
Saturday	10:00 P.M. - Midnight

Exceptions to lane closure hours specified require written acceptance by the Engineer. No increase in contract price or contract time will be given for lane closure restrictions specified.

END OF SECTION 645

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DESIGN BRANCH
HIGHWAY DESIGN SECTION
601 KAMOKILA BOULEVARD, ROOM 609
KAPOLEI, HAWAII 96707

PRE-BID CONFERENCE MINUTES

601 KAMOKILA BOULEVARD, CONFERENCE ROOM 111
KAPOLEI, HAWAII 96707
JUNE 3, 2010 - 9:00 AM

PROJECT: NIMITZ HIGHWAY REHABILITATION OF HONOLULU SLIP COVER AND SLIP COVER #3

PROJECT NUMBER: 92A-01-10M

The pre-bid conference began at 9:02 AM.

The conference was opened by stating that a noise variance had been requested for the project. It was also stated there is no set agenda and this conference would field questions about the project.

Statement from HDOT: Lane closures during the weekend will be allowed from Saturday, 10:00 PM through Monday, 5:00 AM.

Pre-bid conference concluded at 9:15 AM.

NIMITZ HIGHWAY

REHABILITATION OF HONOLULU SLIP COVER AND SLIP COVER #3

PROJECT NO. 92A-01-10M

PRE-BID CONFERENCE

JUNE 3, 2010
9:00 AM

NO.	NAME	COMPANY	PHONE NO.
1	BRIAN REID	TRITON MARINE	488-0854
2	Allison Agafay	Waganine Obama	536-2626
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