ARTICLE XIII – CONCRETE PAVEMENT REPAIRS

13.1 GENERAL

A. Description. Work under this Article includes furnishing all labor, materials, and equipment necessary to replace the damaged concrete pavement slabs. In general, the work includes, but is not necessarily limited to, the following:

1. Removal of damaged concrete, fill and debris at the areas designated for replacement.

2. Furnishing, installing, and compacting base course.

3. Furnishing and installing new reinforcing steel.

4. Furnishing, placing, and curing new concrete.

B. All work shall be in accordance with the following sections of the Standard Specifications except as modified or supplemented herein:

Section 304 Aggregate Base Course
Section 503 Concrete Structures
Section 601 Structural Concrete
Section 602 Reinforcing Steel
Section 711 Concrete Curing Materials and Admixtures

C. Sections on Materials referenced in the above sections are hereby incorporated.

13.2 MATERIALS

A. Concrete - Concrete for pavement replacement shall be Class f'c = 6000 psi with both macrofibers and microfibers. Concrete shall obtain a minimum compressive strength of f'c = 4,000 psi at 1 day. The water to cementitious ratio shall be as low as practical with the following admixtures manufactured by BASF.

1. MasterFiber MAC Matrix: 7.5 lb/yd3

2. MasterFiber M70 1 lb/yd3

3. MasterLife SRA 035 1.5 gal/yd3

4. MasterGlenium as needed to achieve the desired slump.

To combat climate change and reduce the concrete carbon footprint, supplementary cementitious material(s) shall be used to reduce the cement content

in the concrete for this project subject if approved by the concrete supplier and all admixture manufacturer(s).

B. New Reinforcing Steel - New reinforcing shall be ASTM A615, Grade 60.

C. Epoxy Grout - Epoxy for grouting of reinforcing steel shall be Set-3G by Simpson Strong-Tie Co. or approved equal.

D. Snap ties and inserts shall be plastic or stainless steel.

E. Tie Wire – Tie wire shall be plastic-coated or of a non-corrosive material approved by the Construction Engineer. Tie wire shall be installed at all intersections of reinforcing steel.

F. Aggregate Subbase – Aggregate subbase shall consist of crushed basalt aggregates and shall conform to Section 703.17 of the State of Hawaii, Standard Specifications for Road And Bridge Construction. Imported fill materials shall be tested for conformance with these recommendations prior to delivery to the project site for the intended use.

13.3 CONSTRUCTION METHODS

A. Removal of Existing Pavement – Remove existing damaged concrete pavement slabs as shown on the drawings. Locate sawcut at edge of the repair beyond any existing joint or feathered edge.

B. Live Load Limitation - Forklift and heavy live loads shall remain a minimum of 20 feet away from the pavement repair in all directions starting from the time of removal of existing concrete until 48 hours after concrete placement. The repair area shall remain barricaded with barriers visible at night from traffic during this period. At 48 hours after concrete placement, live loads may be placed over the repairs.

C. Subgrade Preparation

1. Foundation design is based on geotechnical investigation report prepared by Geolabs, Inc dated December 9, 2022. A copy of the report can be obtained from the Harbors Division Project Manager.

2. Notify the Harbors Division Construction Engineer and Geotechnical Engineer if loose and/or soft materials are encountered at the bottom of the concrete pavement repairs. A stabilization layer shall be provided at the bottom of the pavement repairs. The stabilization layer shall be constructed by over-excavating the subsurface materials to a minimum depth of 6 inches below the bottom of the pavement repairs. The over-excavation shall be backfilled with a stabilization layer consisting of aggregate subbase with one layer of triaxial geogrid (Tensar TX7 or equal) wrapped in a non-woven geotextile fabric (Mirafi 180N or equivalent).

The layer of triaxial geogrid shall be placed at the bottom of the excavation directly above the non-woven filter fabric.

3. The subgrade soils under concrete pavement repairs shall be scarified to a minimum depth of 8 inches, moisture-conditioned to above the optimum moisture content, and recompacted to a minimum of 95 percent relative compaction. The aggregate subbase shall be moisture-conditioned to above the optimum moisture content and compacted to at least 95 percent relative compaction. Compaction shall be accomplished by using sheepsfoot rollers, vibratory rollers, or other types of acceptable compaction equipment.

4. A minimum of 6 inches of aggregate subbase shall be provided between the concrete pavement and the underlying subgrade soils.

5. During construction, drainage shall be provided to minimize ponding of water adjacent to or on foundation and pavement areas. Ponded areas shall be drained immediately. Any subgrade soil that has become soft due to ponding shall be removed to firm material and replaced with compacted structural fill.

D. Epoxy Grouting - Blow holes completely clean of all concrete debris to allow for adequate bonding of the epoxy. The holes shall be completely dry and filled with epoxy before inserting and turning the supplemental reinforcement to displace the grout. Reinforcing bars and other items to be cast in the concrete shall be secured in position prior to placement of concrete.

E. Placing Concrete

1. Concrete shall be placed in accordance with Section 503.03 - "Construction" of the Standard Specifications.

2. Prior to placement of concrete, all concrete repair surfaces shall be thoroughly washed with clean water and the exposed concrete surface shall be saturated with no water accumulation on the surface.

3. The concrete shall be vibrated, rodded or tamped during placement to consolidate the pour and fill all corners of the patch and beneath the reinforcing.

4. There shall be no cold joints in the field of the repair.

5. Concrete repairs shall be built up to the original concrete surface.

F. Finish - Concrete finish shall be Class I - Ordinary Surface Finish as specified in Section 503.03.M.1 of the Standard Specifications.

G. Concrete Curing - Concrete repairs shall be cured a minimum 48 hours by covering the surface with a polyethylene sheet over wet burlap.

H. Sawcut joints in the concrete pavement repairs are not required.

13.4 PAYMENT - Payment for Concrete Pavement Repairs shall be made as described in Article X of these Specifications.