

SECTION 03310 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 GENERAL

This section covers providing cast-in-place concrete where indicated on the construction drawings, in place complete.

1.02 SUBMITTALS

Submit eight (8) copies of mix design for each class of concrete. Submit eight (8) copies of 7-day and 28-day compressive strength test results. Submit eight (8) copies of manufacturer's certifications that all materials meet the standards stated herein and that required factory tests have been successfully performed. Submit mill certificates for all cement and reinforcing steel. Provide submittals to the Construction Manager.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Portland Cement shall conform to ASTM C 150, Type II or modified Type I containing no more than 8 percent tri-calcium aluminate.
- B. Aggregate shall be as specified in Section 39, "Portland Cement Concrete" of the STANDARD SPECIFICATIONS.
- D. Admixture shall be water reducing, set retarding type, ASTM C 494, Type D.
- E. Form release agents shall be of a type compatible with the waterproofing systems, protective coatings, and paint systems to be applied, or they shall be completely removed from concrete surfaces when forms are removed.
- F. Curing compounds shall be water retaining membrane type conforming to ASTM C 309, Type I.

PART 3 – EXECUTION

3.01 PROCEDURES

- A. Concrete work shall conform to ACI 318-95 and the following sections of the STANDARD SPECIFICATIONS, as modified herein:
 - 1. Section 39, "Portland Cement Concrete"
- B. Concrete shall be Type B.

END OF SECTION

SECTION 03350 - CONTROLLED LOW STRENGTH MATERIAL (CLSM)

PART 1 – GENERAL

1.01 DESCRIPTION

This work includes furnishing and placing CLSM in the existing concrete ditch where indicated on the Plans and as approved by the Construction Manager.

1.02 SUBMITTALS

Submit eight (8) copies of mix design. Submit eight (8) copies of 28 day compressive strength test results. Submit eight (8) copies of manufacturer's certifications that all materials meet the standards stated herein and that required factory tests have been successfully performed. Submit mill certificates for all cement.

PART 2 – PRODUCTS

2.01 MATERIALS

CLSM is a mixture of Portland cement, fine aggregate, and water. The Contractor shall proportion the CLSM to produce a backfill material that is self-compacting and capable of being excavated later with hand tools. The proportions of the CLSM shall:

- A. Produce a uniform, flowable mixture that is essentially self-leveling when placed;
- B. Have a 28-day compressive strength of approximately 100 psi to 150 psi; and
- C. Have a wet unit weight sufficient enough to displace groundwater and achieve the required compressive strength.
- D. All materials shall conform to Section 39 – Portland Cement Concrete, Department of Public Works, City and County of Honolulu, Standard Specifications for Public Works Construction, September 1986

Aggregates shall be from a source acceptable to the Construction Manager and conform to Subsection 39.2 – Materials for Fine Aggregate. The Contractor may use aggregates that are different from Subsection 39.2 - Materials subject to acceptance by the Construction Manager. Aggregate shall stay in suspension in the CLSM to the extent required for proper flow.

PART 3 – EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

- A. Preparation. Prior to placement of the CLSM, the Contractor shall remove sediment and debris from within the existing concrete ditch to the extents indicated on the Plans and

to the satisfaction of the Construction Manager.

- B. Placement. Construct temporary bulkheads at the culvert openings to provide a finished vertical surface for the CLSM mixture. The finished vertical surface shall be flush with the culvert opening.

Place the CLSM to match the top of wall elevation of the existing concrete ditch and to adequately fill the two (2) existing culverts with no voids or as specified by the Construction Manager. Placement may be performed with or without vibration or other means of compaction. Provide sufficient mixing capacity to allow the CLSM to be placed without interruption.

Temporary bulkheads shall be removed and disposed of by the Contractor after the CLSM has reached the required compressive strength. Earthwork operations may be conducted over the CLSM after it has reached the required compressive strength

- C. Acceptance. Proportion and place the CLSM as specified herein. In general, the strength desired is the maximum hardness that can be excavated at a later date using conventional excavating equipment. Submit a manufacturer's certification of the CLSM and include the unconfined 28-day compressive strengths. The material certification shall include the actual test data for each mixture used.

END OF SECTION