SECTION 03300

CEMENT CONCRETE – CAST IN PLACE

PART 1.00 – GENERAL

1.01 DESCRIPTION OF WORK

A. Provide all materials, equipment, and labor necessary to complete the work as indicated on the drawings or as specified herein.

B. The principal work of this section includes, but may not be limited to, the following:

1. Installation of cast in place concrete

1.02 TEST SPECIMENS

1. Furnish all concrete necessary for casting test cylinders or performing slump tests as directed by the CITY.

1.03 JOB CONDITIONS

A. Examine all surfaces to receive concrete to see that they are in proper condition to receive the work specified. Report to the CITY in writing all unacceptable surfaces. Starting work in any area shall constitute acceptance of that surface. All defects resulting from use of accepted surfaces shall be corrected by the CONTRACTOR at no additional expense to the CITY.

B. Subbase and base preparation, including material shall be as specified in Section 02200 of these Specifications. Start of work under this Section shall constitute acceptance of the foundation conditions to which the work is to be applied. Any defects in work resulting from such conditions shall be corrected at no extra cost to the CITY.

PART 2 – PRODUCTS

2.01 GENERAL

A. Unless otherwise specified, all methods and materials shall conform to the relevant provisions of Section 600, PORTLAND CEMENT CONCRETE, and Section M.02, PORTLAND CEMENT CONCRETE MATERIALS, of the Rhode Island Standard Specifications.

2.02 CONCRETE

A. Cement concrete to be used shall be class "B", unless otherwise specified, according to the classification defined in the RIDOT Standard Specifications and shall meet the following requirements.

Class	Minimum Cement Content	Minimum Compressive Strength	Type of Cement		
	Lbs. Per Cubic Yd.	Lbs. Per Sq. Inch		Max Size Aggregate	Percent of Air Entrainment
B	517	3000	2	¾	5.0

2.03 FORMWORK

A. Formwork for concrete shall be smooth plywood for exposed portions with two (2) inch framing and bracing members. Below grade portions of concrete may be formed with rough lumber.

B. Forms shall be strong enough to resist pressure of the concrete without springing, and tight enough to prevent leakage of mortar. Forms shall be staked, braced, or tied together to maintain their positions and shape when concrete is compacted in place. Forms shall be clean and shall produce a smooth, even finish for exposed surfaces.

2.04 REINFORCING

A. Welded wire fabric shall be 6-inch x 6-inch – W1.4 x W1.4 gauge cold-drawn steel wires formed into a mesh and welded together at points of intersection in conformance with ASTM – A-185. Welded wire fabric shall be furnished in mats.

B. Reinforcing bars shall consist of deformed bars unless otherwise specified. The bars shall be rolled from new billet steel conforming to the requirements of ASTM – 615, Grade 60.

C. All reinforcement shall be free from imperfections and surface coatings of rust, dirt, oils, paint, grease, and mill scale and shall present a clean, fresh surface when placed in the structure. Rust that occurs in scales or that pits

the steel will not be considered an imperfection, but the surface shall be brushed to remove loose material.

2.05 EXPANSION JOINT FILLER

A. Preformed non-extruding resilient type filler conforming to AASHTO-M153.

PART 3 – EXECUTION

3.01 GRADING AND COMPACTION OF SUBGRADE BASE

A. Do all grading and compaction of subgrade and base in conformance with Section 02200 of these specifications.

B. Bring subbase and base to required grades and cross sections after final compaction. Remove spongy and otherwise suitable material and replace with approved material. Loosen exceptionally hard spots and re-compact. Take every precaution to obtain a foundation of uniform bearing power. In absence of specific requirement, compact subbase and vase by such means as will provide firm base and insurance against settlement and cracking of superimposed work.

3.02 GENERAL FORMWORK

A. Forms shall be smooth, free from warp, sufficient in strength to resist springing out of shape, equal in height to the depth of concrete and free from all dirt or mortar if previously used. The forms shall be rigidly supported, well staked, thoroughly braced and set to the proper lines with the upper edges conforming to the finish grades. Forms shall be coated with non-staining mineral oil prior to placing concrete.

B. Forms for exposed surfaces shall be coated with Nox-Crete form coating, Sta-Kleen, or Pro-Cote as taken from its original container or approved equal, applied before the reinforcement is placed. After coating, any surplus on the form surface and any on the reinforcing steel shall be removed. Forms for unexposed surfaces may be thoroughly wetted with water in lieu of coating immediately before the placing of concrete except that in cold weather with probably freezing temperatures, coating shall be mandatory.

C. Forms shall not be removed for at least twenty-four (24) hours or until the concrete has adequately hardened. Extreme care shall be taken in removing forms in order to prevent damage to the concrete. Under no conditions shall any bar, pick or other tool be used which depends upon leverage on the concrete for removal of the forms.

3.03 CAST – IN PLACE

A. Reinforcing shall be placed as shown on the plans.

3.04 CONCRETE PLACING AND FINISHING

A. Placing and finishing of cement walls, and steps.

1. Placing and finishing shall be in accordance with applicable provisions of Section 807, of the State of Rhode Island Standard Specifications, referenced herein.

2. In conveying the concrete from the place of mixing to the place of deposit, the operation shall be conducted in such a manner that no mortar will be lost, and the concrete shall be so handled that it will be of uniform composition throughout, showing neither excess not lack of mortar in any areas.

3. Concrete shall be placed in the forms in an approved manner in order to prevent stone pockets, voids or segregation and to reduce rehandling and flowing in the forms to a minimum. Concrete shall be evenly distributed by rodding and vibrating. The face of the forms shall be carefully spaded to bring a dense mortar to the face in order to produce good surface finish. Compaction shall be accomplished by applying approved mechanical vibrators to the mass of concrete at the point and time of deposit using care to avoid over vibration. Vibration of forms or reinforcing shall not be permitted and extreme care shall be taken to prevent disturbing previously placed concrete which has become partially set.

4. Within forty-eight (48) hours after forms have been removed, all surfaces shall be finished as follows:

a. Removal of all fins, projections and irregularities from surfaces exposed to view. All voids and cavities on all surfaces shall be completely filled with stiff mortar of same composition and air entrainment as the mortar in the original concrete mix. The same brand and color of cement, and the same kind and color of fine aggregate used in the original concrete mix shall be used in this mortar. The mortar shall be mixed, allowed to set for thirty (30) minutes and then mixed, allowed to set for thirty minutes and then remixed before placing in the work. Carefully remove surface film from these pointed areas before the mortar sets. If surfaces exposed to view do not present a

uniformly smooth, clean surface of even texture and appearance when prepared in accordance with the foregoing, they shall be rubbed to obtain a satisfactory finish. Surfaces shall be wetted with clean water and rubbed with a carborundum brick without applying any cement or other coating until smooth and inform in appearance.

5. Protection and curing shall be accomplished by one of the applicable methods as approved by the CITY, specified in Section 501.03.12 of the State of Rhode Island Standard Specifications.

6. The CONTRACTOR shall be responsible for the quality and strength of the concrete. Inferior concrete, including that damaged by frost action, shall be removed and replaced at no additional cost to the CITY.

7. Existing concrete work damaged by the CONTRACTOR during operations under this contract shall be restored to the original condition acceptable to the CITY.

B. CEMENT CONCRETE FOOTINGS

1. The CONTRACTOR shall construct cement concrete footings to the dimensions and details as shown on the drawings.

3.05 EXPANSION JOINTS

A. Expansion joints shall be located as shown on the plans and details and as directed by the CITY.

3.06 COLD WEATHER CONCRETE

A. Refer to RIDOT Standard Specifications Section 601.03.08 and 807.03.7.

B. Adequate equipment shall be provided for heating the concrete materials and protecting the concrete during freezing or near freezing weather. No frozen materials or materials containing ice shall be used.

END OF SECTION