STANDARD SPECIFICATIONS

SECTION 03300

CONCRETE

PART 1 - GENERAL

A. Description

This section describes concrete materials, mixing, placement, form work, reinforcement and curing.

B. Related Work Specified Elsewhere

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s).

Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

Structure Excavation: 02200

PART 2 - MATERIALS

A. Concrete

1. All portland cement concrete shall conform to the provisions of Section 201 of the SS PWC except as herein modified.

2. Portland cement concrete shall be composed of portland cement, fine aggregate, coarse aggregate, and water proportioned and mixed to produce a smooth dense workable mixture. It can be of the ready-mix variety as produced by any reliable ready-mix concrete firm.

3. Portland cement, including portland cement used in precast products, shall be Type V conforming to ASTM C 150.

4. Concrete mix design shall conform with ASTM C 94. Use classes of concrete as described in the following table.

Class	Type of Work	28-Day Compressive Strength (in psi)	Minimum Cement Content (in lbs. Per C.Y.)
A (560-C-3250) *	Concrete for all reinforced structures, piers, vaults, manhole bases, thrust blocks, encasements, slope protection	3,000	564 (6 sack)
B (450-C-2000) *	Concrete for anchors, cutoff walls, cradles and miscellaneous unreinforced concrete	2,000	470 (5 sack)

*concrete class per SS PWC

B. Reinforcing Steel

1. Reinforcement shall conform to ASTM A 615, Grade 40.

2. Fabricate reinforcing steel in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Bend reinforcing steel cold.

3. Deliver reinforcing steel to the site bundled and tagged with identifying tags.

C. Welded Wire Fabric

Welded wire fabric shall conform to ASTM 185.

D. Tie Wire

Tie wire shall be 16 gage minimum, black, soft annealed.

E. Bar Supports

Bar supports in beams and slabs exposed to view after form stripping shall be galvanized or plastic coated. Use concrete supports for reinforcing in concrete placed on grade.

F. Forms

1. Forms shall be accurately constructed of clean lumber and shall be of sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure and tamping without deflection from the prescribed lines.

2. The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags, or holes. The surface shall leave uniform form marks conforming to the general lines of the structure.

PART 3 - EXECUTION

A. Excavation

Excavation for structures shall be in accordance with Section 02200.

B. Form Work

1. The contractor shall notify the District representative a minimum of one working day before the placement of concrete to enable the District representative to check the form lines, grades, and other required items for approval before placement of concrete.

2. Unless otherwise indicated on the plans, all exposed sharp edges shall be chamfered with at least 3/4 - by 3/4 inch triangular fillets.

3. Before placing concrete, the form surface shall be clean and coated with form oil of high penetrating qualities.

C. Reinforcement

1. Place reinforcing steel in accordance with the current edition of "Recommended Practice for Placing Reinforcing Bars," published by the Concrete Reinforcing Steel Institute.

2. All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings or prescribed by the District representative.

3. Do not straighten or rebend reinforcing steel in a manner that will injure the material. Do not use bars with bends not shown on the drawings.

4. All bars shall be free from rust, scale, oil, or any other coating which would reduce or destroy the bond between concrete and steel.

5. Position reinforcement steel in accordance with the drawings and secure by using annealed wire ties or clips at intersections and support by concrete or metal supports, spacers, or metal hangers. Do not place metal clips or supports in contact with the forms. Bend tie wires away from the forms in order to provide the specified concrete coverage. Bars additional to those shown on the drawings, which may be found necessary or desirable by the contractor for the purpose of securing reinforcement in position, shall be provided and paid for by the contractor.

6. Place reinforcement a minimum of 2 inches clear of any metal pipe or fittings.

7. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.

8. All reinforcing steel and wire mesh shall be completely encased in concrete.

9. Secure reinforcing dowels in place prior to placing concrete. Do not press dowels into the concrete after the concrete has been placed.

10. Minimum lap for all reinforcement shall be 20 bar diameters.

11. Place additional reinforcement around the pipe or opening as indicated in the drawings.

12. Wire mesh reinforcement is to be rolled flat before being placed in the form. Support and tie wire mesh to prevent movement during concrete placement.

13. Extend welded wire fabric to within 2 inches of the edges of the slab. Lap splices at least 1-1/2 courses of the fabric and a minimum of 6 inches. Tie laps and splices securely at ends and at least every 24 inches with 16-gage black annealed steel wire. Pull the fabric into position as the concrete is placed by means of hooks, and work concrete under the steel to ensure that it is at the proper distance above the bottom of the slab.

D. Embedded Items

All embedded bolts, dowels, anchors, and other embedded items shall be held correctly in place in the forms before concrete is placed.

E. Mixing and Placing Concrete

1. Concrete, either commercial of on-site ready mix or batch mixed, shall be placed in the forms before taking its initial set.

2. No concrete shall be placed in water except with permission of the District representative.

3. As the concrete is placed in the forms, or in excavations to be filled with concrete, it shall be thoroughly settled and compacted throughout the entire layer by internal vibration and tamping bars.

4. All concrete surfaces upon which or against which the concrete is to be placed, and to which new concrete is to adhere, shall be roughened, thoroughly cleaned, wet, and grouted before the concrete is deposited.

F. Concrete Finishing

1. Immediately upon the removal of forms, all voids shall be neatly filled with cement mortar.

2. The surfaces of concrete to be permanently exposed to view must be smooth, free from projections, and thoroughly filled with mortar.

3. Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces, shall be screened to a uniform surface and worked with suitable tools to a smooth mortar finish.

G. Protection and Curing of Concrete

The contractor shall protect all concrete against damage. Exposed surfaces of new concrete shall be protected from the direct rays of the sun and from frost by being kept damp for at least two weeks after the concrete has been placed, or by using the "Hunt White Coverage" process or approved equal.

H. Backfill

Backfill around structures shall be in accordance with Section 02200.

END OF SECTION