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Design Standards

Section 6

Reinforcing Steel

SECTION VI

REINFORCING STEEL

6-1 GENERAL

This section of the specifications defines materials, design and construction standards for the use of reinforcing steel in concrete construction.

6-2 MATERIALS

All material used for nonstructural reinforcement of concrete shall be intermediate grade steel conforming to the requirements of ASTM designation A-I 5 and shall be deformed in accordance with ASTM designation A-305. All structural steel shall be grade sixty unless specified in the plans and approved by the City Engineer.

Reinforcing steel bars shall conform to the requirements of specifications for minimum requirements for the deformations of deformed steel bars for concrete reinforcement ASTM A-305-53T, or the latest revision thereof, and the tentative specifications for billet-steel bars for concrete reinforcement, ASTM A14-54T, or latest revision thereof, or the tentative specifications for billet-steel bars for concrete reinforcement bars, ASTM A16-54T or the latest revision thereof. All bars shall be deformed either round or square and have net section equivalent to that of plain bar or equal nominal size. Only intermediate and hard grades will be used and no twisted bars will be accepted.

All reinforcing steel, at the time concrete is placed, shall be free from flaws, cracks, mill scale, rust, oil, dirt, paint, or other coatings that will destroy or reduce the bond.

6-3 CONSTRUCTION STANDARDS

6-3.1 BENDING. Metal reinforcements shall be accurately formed to the dimensions indicated on the plans. Bonds for stirrups and ties shall be made around a pin having diameter not less than six times the minimum thickness of the bar, except that for bars larger than one inch, the pin shall be not less than eight times the minimum thickness of the bar. Heating of bars to facilitate bending or straightening will be permitted provided the temperature of steel is not permitted to exceed that which corresponds to a cherry-red color, and provided the cooling rate is slow and uniform; rapid quenching of heated bars, such as might occur if the bars were dropped in snow or cold water, will not be permitted.

6-3.2 SPLICING. Splicing of bars at points other than as shown on the plans will be permitted only by permission of the Engineer. Splices of reinforcement at points of maximum stress shall be avoided wherever possible, and shall be staggered. The minimum overlap for a lapped splice shall be twenty-four bar diameters, but not less than twelve inches.

6-3.3 PLACING. All metal reinforcement shall be placed accurately in the position shown on the plans, and shall be securely held in position by annealed iron wire ties of not less than sixteen gauge or suitable clips at intersection and supported by metal supports, spacer or hangers, in such a manner that there will not be any displacement while placing concrete. Where indicated on the plans or required by the specifications, metal supports shall not be placed in contact with the forms.

6-3.4 EMBEDMENT AND PROTECTION. All reinforcement steel shall be protected by concrete embedment and protective cover as indicated in the plans. Where not otherwise shown, the thickness of concrete over the reinforcement shall be shown in the accompanying table, such cover in each case being the shortest distance between

the face of the form or concrete surface, and the nearest edge or face of the reinforcement.

<u>LOCATION OF REINFORCEMENT</u>	<u>COVER</u>
A. Bottom bars- where contact is deposited against ground with out use of forms.	Not less than 3"
B. Main bars- where concrete is exposed to weather, or exposed to the ground but placed in forms.	Not less than 2"
C. Bars in slabs and walls not Exposed to ground or weather.	Not less than 1"

It is essential that the designated distance of steel reinforcements from the opposite concrete face be not materially reduced, and the Contractor shall so install and maintain all reinforcements so that the specified minimum thickness of the protective cover of reinforcement at any point is not exceeded by more than five percent of the thickness of the concrete section at such point.

6-4 WIRE OR MESH REINFORCEMENT

Welded wire fabric for concrete reinforcement shall conform to the requirements of ASTM A-185. Wire for concrete reinforcement shall conform to the requirements of the "Standard Specifications for Cold Drawn Steel Wire for Concrete Reinforcement" ASTM A92-54 or the latest revision thereof. All wire reinforcement, wire mesh, or expanded metal shall be of the type designated or of an alternate type approved by the Engineer.

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