SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section specifies cast-in-place concrete for interior locations.

1.2 INFORMATIONAL SUBMITTALS

A. Design Mixes: Submit concrete mix design at least 3 weeks prior to beginning of cast-in-place concrete Work.

B. Qualification Data: Submit qualification data for Installer.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer, acceptable to the Architect, with not less than five years' experience, who has completed concrete work on not less than three projects which were similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

C. Standards: Comply with ACI 301, "Specification for Structural Concrete," and ACI 318, "Building Code Requirements for Structural Concrete," except as modified by the requirements of the Contract Documents.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the site in manufacturer's original unopened containers. Store materials in a dry, well ventilated space.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 SLAB ON GRADE RENOVATION PREPARATION

A. Locate work to be performed below existing slabs on grade. Saw cut completely through existing slabs on grade as required to perform Work below the slabs.

B. Excavate to the lines and elevations indicated. Make excavations sufficiently large for the installation and inspection of the work below grade.

C. Excavation for Utility Trenches: Unless otherwise shown or specified, make trenches for piping and utilities not less than 16 inches or more than 24 inches wider than the outside width of the piping or utility. Excavate the trenches to indicated slopes, lines, depths, and invert elevations.

1. Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduits. Shape subgrade to provide uniform support for bells, joints, and barrels of pipes and for joints, fittings and bodies of conduits. Remove stones and sharp objects to prevent point loading.

D. Disposal of Excavated Material: Legally dispose of all excavated material off site.

E. Granular Fill: Place to the depth indicated but in no case less than 4 inches deep. Compact fill with vibratory or tamping methods to key the stone into a firm base.

F. Placing Utilities: Refer to Divisions 22 and 23 Sections for mechanical and plumbing utilities installation. Refer to Division 26 Sections for the placing of electrical utilities.

G. Backfill Placement: Embed each utility after each has been installed tested and inspected with granular fill.

H. Apply bonding agent to existing concrete surfaces that are to receive new concrete.

3.2 FORMWORK

A. General: Design, construct, erect, shore, brace, and maintain formwork according to ACI 347R. Fabricate forms to conform to the lines, dimensions and shapes of concrete shown providing for projections as required. Make forms clean and free of foreign material before placing concrete.

B. Preparation of Form Surfaces: Use non-staining mineral oil or form lacquer.

C. Dowels: Predrill holes into existing concrete, spaced 32 inches o.c. unless otherwise shown, and slightly oversized to receive dowels. Insert dowels into holes prior to placing concrete.

D. Apply bonding agent to existing concrete surfaces that are to receive new concrete.

3.3 VAPOR RETARDER FOR SLAB ON GRADE

A. Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal with manufacturer's recommended tape. Seal pipe penetrations with manufacturer's recommended pipe boot.

3.4 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting wire mesh reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 CONCRETE PLACEMENT

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Comply with ACI 309 for concrete consolidation.

B. Curbs: Place concrete into curb forms. Strike off top surfaces of all curbs true and level. Trowel smooth with steel trowel.

C. Slabs on Grade: Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints. Deposit concrete to avoid segregation at its final location. Maintain reinforcing in proper position during concrete placement.

1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
2. Bring slab surfaces to correct level using existing floor slab surfaces at either side of utility trenches, and strike off. Use darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

3.6 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.

C. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied, sheet waterproofing, or sand-bed terrazzo.

D. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system. Consolidate concrete surface by hand-troweling operation, free of trowel marks, uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied floor covering system.

E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

3.7 TOLERANCES

A. Comply with ACI 117.

3.8 CONCRETE PROTECTION AND CURING

A. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

B. Curing Methods: Cure unformed concrete for at least seven days by moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

2. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.9 FORM REMOVAL

A. Do not remove forms until the concrete has thoroughly hardened and has attained sufficient strength to support its own weight without bulging.

3.10 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION