

03 00 00. CONCRETE

- .1 Reference Division 32 for Rigid Pavement requirements.
- .2 STRUCTURAL DESIGN OF SLABS: Consideration shall be given in the design of floor and roof slabs to provide exposed construction which can be used as finished ceilings insofar as practicable. Such construction, however, shall be planned only if requirements for limits in heat losses and for noise control can be met.
- .3 DESIGN OF CONCRETE FOOTINGS: Bottoms of footings for exterior foundations shall be at least 3'-0" below finish grade.
- .4 Not Used.
- .5 Unprocessed bank run materials shall not be used in any concrete mix.
- .6 All footing steps shall not exceed 2 feet for every 4 feet length of foundation walls.
- .7 Not used.
- .8 All construction joints below grade shall have water stops.
- .9 Slabs on ground, including contraction joint spacings, shall be designed in accordance with ACI 360 "Guide to Design of Slabs on Ground" except for agricultural facilities containing livestock.

33 00 01. SUSTAINABILITY

- .1 AE shall reference Division 18 "Sustainability" where some of the requirements are related to this division and adopt applicable requirements into the design.

03 30 00. CAST-IN-PLACE CONCRETE

- .1 ON-SITE SUPERVISION: The Architect/Engineer (A/E) or his approved representative shall make pre-pour observation visits to review basic conformance with specifications and drawings including, but not limited to excavations, reinforcing configurations and formwork, and shall report non-compliance with specifications and drawings to the University Project Manager.
- .2 Concrete work, mix design, testing and tolerances shall be specified on the Contract Documents to conform to the requirements of the following:
 - ACI 301-16 "Specifications for Structural Concrete"
 - ACI 306.1-90 "Standard Specification for Cold Weather Concreting"
 - ACI 306R-16 "Guide to Cold Weather Concreting"
 - ACI 305.1-14 "Specification for Hot Weather Concreting"
 - ACI 305R-10 "Guide to Hot Weather Concreting"
 - ACI 117-10 "Specification for Tolerances for Concrete Construction and Materials"
- .2.1 Tests:

- .2.1.1 The A/E may not waive tests for quantities less than 50 yd³ without permission from the University Engineer.
 - .2.1.2 Provision for additional tests (i.e. 7- day, 14 day, ect) shall be included to allow for the removal of formwork, shoring and reshoring, steel erection and putting the concrete into service prior to 28 days or achieving full design strength.
- .3 MISCELLANEOUS REQUIREMENTS:
- .3.1 MATERIALS:
 - .3.1.1 Blended Hydraulic Cement meeting ASTM C 595/C595M, Type IL (Portland Limestone Cement) shall be specified in lieu of Portland Cement meeting ASTM C 150/C150M, Type I or Type II for general use concrete.
 - .3.1.2 “Neat” concrete mixes containing only cement are prohibited. The inclusion of supplementary cementitious materials (SCMs) shall be specified.
 - .3.1.3 Reference 18 60 00 Materials for additional requirements.
 - .3.2 EXTERIOR CONCRETE: Aggregate for exterior concrete exposed to view shall be washed crushed limestone only.
 - .3.3 INTEGRAL FINISH shall be specified for all floors. No separate topping.
 - .3.4 HARDENER TREATMENT: All finished floors that will be left exposed shall receive hardener treatment. Verify that the hardener used is compatible with the finish material curing requirements as listed by the manufacturer.
 - .3.5 PROTECTION FOR NOSINGS on concrete steps shall be provided by rounded cast nosing with non-slip surface. Nosing reinforcing to be epoxy coated.
 - .3.6 NON-SLIP SURFACING: Ramps, treads, and platform of stairs shall have non- slip surface when not covered with finish flooring materials.
 - .3.7 Minimum 10mil Vapor Barrier is required for Slabs on Grade.
 - .3.8 Not Used
 - .3.9 Not Used
 - .3.10 CURING COMPOUND CAPABILITY: Curing compound manufacturer is to provide certification that their product is compatible with the resilient flooring or carpet adhesive scheduled for the space.
 - .3.11 Not Used
 - .3.12 The use of Precast, Prestressed, Post Tensioned concrete construction methods for primary structural elements require written approval from the University Engineer.
 - .3.13 Not Used

03 33 00. ARCHITECTURAL CAST-IN-PLACE CONCRETE

- .1 SPECIFICATIONS shall meet current standard specification for architectural concrete as published by the American Concrete Institute.
- .2 A DETACHED SAMPLE PANEL of adequate size based on the project's visual and performance mock-up goals shall be erected at the site when cast-in-place architectural concrete is to be used. Panel shall be protected from construction operations, but shall be left exposed to the elements. Apply curing compound if specified for the final product. Panel shall be left in place until the University Architect has approved all architectural concrete.

03 34 00. LOW DENSITY CONCRETE

- .1 ROOF FILL: Lightweight concrete for roof fill shall be made with expanded shale aggregate. For consideration of other materials, the A/E shall submit a recommendation with complete back-up documentation to the University Project Manager for the UA and UE's acceptance.

03 35 43 POLISHED CONCRETE FINISHING

- .1 Coordinate polished concrete finishing with Section 03 30 00 work. Floor flatness and floor levelness requirements are more stringent for this type of work and must be coordinated with the Structural Engineer.
- .2 SAMPLE PANEL: A designated 50 sq. Ft. sample panel shall be used to demonstrate polished concrete finishing materials, equipment, and application methods. Retain acceptable sample panel during construction as a standard to judge complete work. Undamaged areas may remain as part of the completed work.

03 37 00. CURING COMPOUNDS

- .1 Require a manufacturer's certification that the compounds used for architectural concrete are non-yellowing and non-staining. Compound must be applied to sample panels.

03 40 00. PRECAST CONCRETE

- .1 Using precast concrete requires approval from University Engineer.

03 41 00 PRECAST STRUCTURAL CONCRETE

- .1 Base design and specifications on recommendations of the American Concrete Institute, ASTM tests and the Precast/Prestressed Concrete Institute (PCI). All structural precast shall have bonded strains.

03 41 10. PRECAST CONCRETE PANELS

- .1 Base design and specifications on recommendations of the American Concrete Institute, ASTM tests and the Precast/Prestressed Concrete Institute (PCI).

03 41 13. PRECAST CONCRETE HOLLOW CORE PLANKS

- .1 Use minimum 2 inches of concrete topping slab with 1.5 pounds per cubic foot of fibrillated polypropylene fibrous reinforcing for floor slabs.
- .2 Plank design shall include consideration of the relative perceptibility of floor vibrations based on the use of the space.
- .3 Verify that standard camber in plank is accurate for anticipated dead load deflection and that any residual camber does not significantly affect serviceability.
- .4 Differential camber between adjacent precast planks shall be limited to 3/8 inches

03 45 00. ARCHITECTURAL PRECAST CONCRETE

- .1 Follow the design and specification recommendations of the Precast/Prestressed Concrete Institute (PCI) for architectural precast concrete.
- .2 Installer and Fabricator to be PCI-certified.
- .3 Field-construct mock-ups for each finish color and texture variations.
- .4 Field quality control, Special Inspection and testing by agency under University contract.

03 52 00. LIGHTWEIGHT CONCRETE ROOF INSULATION

- .1. INSULATING CONCRETE ROOF DECKS: Concrete shall have the following characteristics:
 - Wet Density: 40-60 lbs. per cu. ft.
 - Dry Density: 20-30 lbs. per cu. ft.
 - Compressive Strength: 125-225 psi

END OF DIVISION 03 – CONCRETE