Design Guideline 033000
Concrete

Scope

Designing and specifying concrete work including structural, slab on grade, site work, sidewalks, etc.

Related Sections

U-M Design Guidelines:
6.4 321000 Walks, Roads and Parking Paving: Sidewalks
6.1 093000 Ceramic Tile and Waterproofing

U-M Master Specification Sections:
7.2 033053 Miscellaneous Cast-in-Place Concrete (A digitally accessible version is pending; please email AEC-Digital Accessibility Support if assistance is needed)

Design and Installation Requirements

Design Requirements

Structural Elements: ACI 318, designed for calculated structural requirements. A/E's may use their own office standards for details such as chamfered vs. square edges. Include the following language in specifications:

Water shall not be added to concrete at the jobsite.

Floors, General: The University supports the use of floor flatness and levelness "F-numbers" as described in ASTM E 1155-87 and ACI 117. Flatness and levelness specified in terms of "1/8-inch in 10 feet" or similar descriptions are difficult to enforce. Job-site quality control will be provided by a testing firm engaged and paid for by the Owner, unless otherwise determined by the Design Manager.

Strength: As required, but not less than 3500 psi at 28 days.

Flat Slabs-On-Grade: Design slabs-on-grade to comply with the following requirements:

- Vapor Barriers: Usually required. Omit vapor barriers only in consultation with the Design Manager. The practice of perforating vapor barriers to avoid the phenomenon of "slab curling" is not acceptable.
- Thickness: Comply with the following:
    - General: 4 inches, or greater if required by expected live load.
    - Mechanical Rooms: 5 inches, or greater if required by expected live loads.
    - Strength: As required, but not less than 3000 psi at 28 days.

Equipment Bases and Foundations:

- Minimum Compressive Strength: 4000 psi at 28 days.

Finishes:

- Chamfer exterior corners and edges of permanently exposed concrete.
- Mechanical, electrical, storage rooms etc. shall have clear sealed finish. Rooms that are typically unoccupied and have an exposed concrete floor shall be sealed for easier maintenance.
- Include moisture, alkalinity and adhesion testing in specifications to verify concrete is cured appropriately to accept finishes.

Floor and trench drains:

- Design professionals shall provide details, minimum 3”=1’-0” for each type of floor or trench drain. Details shall include termination of surface finish materials, crack isolation membranes, and waterproofing materials.