

## DIVISION 3 – CONCRETE

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### **03000 CONCRETE GENERAL**

All Concrete work shall meet the code requirement in Section 01065 and ACI Standards 301 & 318. Any non-conforming work shall be removed and replaced at the contractor's expense.

Inspections required per Section 01065.

DP to specify both cold and hot weather requirements for mix, placement, and curing of concrete.

Foundation wall waterproofing must be backfilled within 3 days. Inspection required prior to backfill.

Concrete civil work design shall conform to the details set forth in the City of Flagstaff Engineering Design and Construction Standards and Specifications.

Concrete curb cuts, ramps etc. to allow for handicapped accessibility shall meet the requirements outlined in Section 01065. A copy of this law with design details are on file at Capital Assets and Services.

### **03100 CONCRETE FORMWORK**

#### 03130 Permanent or Temporary Forms

Contractor shall supply all formwork complete with necessary shoring, bracing and anchorage.

DP's or Facility Services review and inspection shall be required prior to use of earth forms. When using earth forms sides shall be hand trimmed and bottoms shall be swept clean of all loose dirt prior to placement of concrete.

Forms shall remain in place throughout any required curing period. All portions or pieces of any wood forms shall be removed completely after the cure period has been completed and prior to Owner possession.

### **03200 CONCRETE REINFORCEMENT**

#### 03210 Reinforcing Steel

Reinforcing steel shall be a minimum of 60 ksi yield grade, deformed. Exceptions to this shall require DP approval.

All sidewalks shall have, inserted at midpoint, architectural ridged 6"x6" steel mesh.

For exposed to weather concrete features, exterior stairs, exterior walks, curbs and loading docks, all reinforcing steel and accessories shall be epoxy coated: ASTM A775. Other reinforcement shall be unprotected.

#### 03240 Fibrous Reinforcing

Fibermesh reinforcement is an allowable substitute for wire mesh with DP written approval.

#### 03250 Concrete Accessories

##### Anchors and Inserts

All anchors and inserts in exterior work exposed to weather shall be inset and/or protected to prevent rusting.

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**03300 CAST-IN-PLACE CONCRETE**

All cast in place concrete shall be designed to obtain a minimum compressive strength of 3000 psi within 28 days. Sidewalks shall be designed with a 6' minimum width, or 8' minimum when adjacent to parking space, 4000 psi concrete with fiber reinforcement.

Air entrainment shall be specified for all cast in place exterior concrete exposed to weather.

03345 Concrete Finishing

In general exterior concrete traffic surfaces shall be designed with a heavy broom finish.

All stoops, porches, steps and any other exterior concrete shall be finished so as to slope a minimum of 1/4" per foot to drainage. Ponding or puddling resulting from finish work that does not address this requirement shall be repaired at the Contractor's expense.

Concrete Finished Floors

Generally concrete finished floors are to receive a hardener with colorant. Positive protection shall be provided to prevent staining and chipping during construction work.

All slabs required to slope to floor drains shall have a minimum 1/4" per foot slope to the drain with no ponding areas.

A suitable sealant or paint shall be specified for interior exposed concrete.

03370 Concrete Curing

All concrete must be cured. Compounds, water curing or blanket protection is acceptable as applicable. The Contractor is solely responsible for protection of all concrete products throughout the curing period. Any damage to partially cured concrete shall require removal and replacement at no cost.

Structural concrete must be cured a minimum of three days. Normal concrete in structures and pavement shall be cured a minimum of seven days.

On formed concrete, forms shall remain in place until work has reached 90% of its design strength.

**03400 PRECAST CONCRETE**

03430 Structural Precast Concrete (Site Cast)

Projects designed with precast, tilt-up, or special finished concrete shall include in the Specifications a requirement for a sample panel, constructed as specified. The panel shall be a minimum of 36 square feet. It shall be erected at, and remain on the jobsite as the visual criterion which the final product must match.

03460 Architectural Precast Concrete (Site Cast)

General

This section applies to areas of a building that the DP may be considering for the use of precast panels, or special design features or projection from and around the building that will be visible.

As noted above, projects incorporating architectural precast concrete shall have included in the specifications a requirement for a sample. Such sample shall be made at the site and remain on site as a visual criterion through project completion.

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The manufacturer of precast pre-stressed concrete shall submit structural calculations, certified by an Arizona registered Engineer, to the DP for approval.

### Design Standard

Color, finish and scoring shall be clearly delineated either by a sample or a drawing of a scale that can be viewed across a conference room. Elevations that contain precast material or features shall be keyed to such a sample or drawing.

Precast in-fill panels, elements or exposed precast structural members shall be designed and detailed in a manner that clearly and concisely conveys the architectural meaning and significance of its use.

Rough or heavy textured precast should be avoided immediately adjacent to heavy pedestrian traffic flow, or in the interior of the building (particularly corridors).

Precast concrete panels shall be water sealed with products warranted for a minimum of five years against UV breakdown.

Exposed panel fastening devices should be avoided due to annual maintenance costs (paint and rust inhibitors) and eventual staining of the panel.

Special consideration should be given to panel joinery and caulking when panels are intended to act as weather tight assemblies. The design of such joinery must facilitate required amounts of expansion/contraction and facilitate a neat appearance and weather tightness of the caulk joint.

03480 Precast Concrete Specialties

### Utility boxes

Utility boxes shall be traffic rated regardless of installation location. Minimum sizes shall be pre-approved by affected departments.

### Manholes

Manhole design, installation and repair shall conform to the standards and details based on the most current edition of MAG specifications, which have been adopted by the City of Flagstaff.

**03500 CEMENTITIOUS DECKS**

03520 Lightweight Insulating Concrete Deck

Lightweight concrete insulating fill roof decks shall not be used in conjunction with urethane roof systems. Lightweight structural concrete shall be allowed.

03600 GROUT

03650 Epoxy Grout

Use of epoxy grout is not encouraged. However it may be used as a retrofit or repair material upon approval by the design professional.

**\*\*\* END OF SECTION \*\*\***