

DIVISION 03 00 00. CONCRETE

03 00 00 - Concrete

Contractor shall review construction documents and provide labor and materials for concrete and foundations as required in said documents and as specified, complying with all applicable building codes.

03 05 00 - Common Work Results for Concrete

All concrete work shall be designed on the basis of "Strength Design" in accordance with 318 "Building Code Requirements for reinforced Concrete." Concrete work shall be in accordance with ACI 301 "Specifications for Structural Concrete" and ACI 308 "Recommended Practice for Selecting Proportions for Normal Weight Concrete." Concrete slabs, patios, driveways, walls and foundations shall be constructed of a minimum 4000 psi concrete, 28 day test, with a 4" minimum to 6" maximum slump maximum water - 8%. No additional water shall be added to concrete after slump test is run. **Slump shall be taken from every batch truck and tested for compressive strength.** Concrete should be a mix of high grade Portland cement, clean sand or gravel or crushed stone as coarse aggregate per ACI 530. Maximum aggregate size shall be 3/4". All aggregates shall conform to ASTM C33. Gravel should be well graded, maximum size 1/2" in size. Water shall not exceed 5 1/2 gallons for each bag, unless specified. Concrete shall be mixed using an approved batch machine or mobile mixer, and providing a 4" minimum to 6" maximum slump.

03 10 00 - Concrete Forming and Accessories

Provide all labor, materials and equipment necessary for the completion of reinforced concrete called for on the plans. Concrete when deposited shall be at a temperature ranging between a minimum of **50 degrees Fahrenheit and a maximum of 90 degrees Fahrenheit.**

Construction of Forms - Construct wood forms of sound material, proper shape and dimensions, constructed tightly and of sufficient strength to support forms together. Make joints and seams mortar tight. Install leakage protection in accordance with manufacturer's installation instructions.

Chamfered Corners - Unless otherwise noted, provide chamfered corners on all exposed corners. Provide **3/4 inch** moldings in forms for all chamfered corners.

Embedded Items - make provisions for sleeves, anchors, inserts, and other embedded features.

Form Ties - Use form ties of sufficient strength and in sufficient quantity to prevent spreading of the forms. Place ties at least **1 inch** away from the finished concrete. Do not use ties consisting of twisted wire loops. Leave ties in place when forms are stripped. Space all form ties equidistant and symmetrically both vertically and horizontally.

Cleanouts and Access Panels - Provide removable cleanout sections at the bottom of all forms to permit inspection and effective cleaning of forms and water material. Clean all forms and surfaces to receive concrete.



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sawdust, and other debris and thoroughly blow out with compressed air. Concrete is placed.

03 15 13 - Concrete Accessories

Provide 1/2" thick by 4" wide bituminous expansion joint material at all surfaces where concrete adjoins raised slab, crawlspace or basement stem-wall CMU or poured foundation.

03 21 00 - Reinforcing Steel

Reinforcing steel (rebar) shall be minimum ASTM A615, grade 40. All reinforcement shall be as follows: #5 bars 25" minimum, #7 bars 35" minimum. All rebar shall be located 3" clear from bottom and side of footing and 2" clear from top of footing. Rebar (reinforcing steel) 4'-0" on center (OC). All reinforcement splices shall be in accordance with ACI 318 for "Strength Design." All reinforcement steel shall be accurately placed, supported, and firmly tied in place with bar supports and spacers in accordance with ACI 318.

03 22 00 - Welded Wire Fabric Reinforcing

Welded wire fabric shall conform to ASTM A105 and be located in the ceiling of the slab. Install at slab on grade conditions.

03 30 00 - Footings

Center all footings on walls, piers, or columns above unless otherwise noted. Footings shall rest on undisturbed virgin soil with minimum soil bearing allowable of 2500 psf. Footings at building perimeter shall be a minimum of 12" below frost line (with local building officials for frost line level) constructed of 3000 psi concrete with #5 rebar (reinforcing steel) continuous through footers. Provide #5 rebar (reinforcing steel) at all corners and intersections of footers, beams and walls. Each bar shall be 18" long, with a 90 degree bend. Footers shall bear on undisturbed soil and keep away from water. Underneath load-bearing walls and interior or exterior column footings shall be within a 1' radius to 12" thick.

03 30 01 - Slab Foundations

Concrete floor slabs shall be constructed of 3000 psi concrete, 4" thick rebar (reinforcing steel) with #5 rebar (reinforcing steel) continuous and rebar (reinforcing steel) as per drawing. Slabs shall be over well-compacted granular fill compacted in 12 inch lifts to 95 percent density per T-180 Proctor, and a 4 or 6 mil vapor barrier. Construction or control joints shall be in slabs on grade so that the maximum area between joints shall be 400 sq ft. That area is not more than twice the width. Provide smooth steel trowel finish for all interior areas and garage surfaces. Provide broom finish texture for all exterior slabs. Provide patio or porch slabs away from building at 1/4" of drop in elevation for every 10' of run. For every garage slab, provide positive drainage and taper lip at garage/overhead door.

03 30 02 - Poured Concrete Basement Walls

Poured walls shall be constructed of 3000 psi concrete with #5 rebar (reinforcing steel) 12" on center (OC) placed in a vertical grid. Thickness of walls shall be a minimum of 8'-0" high, 10" thick for 9'-0" high, 12" thick for 10'-0" high. Patch all voids and holes exceeding 3/8 inch in any direction. Provide appropriate waterproofing system on exterior perimeter and install drainage as specified by manufacturers recommendations.



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03 35 00 - Concrete Finishing

Repair of surface defects shall begin immediately after removal of form on foundation. Provide smooth steel trowel finish for all interior slab areas and Provide broom finish texture for all exterior slabs. Slope exterior patio or building at 1/4" of drop in elevation for every 1'-0" in distance. At garage drainage and taper lip at garage/overhead door. Patch all voids and depressions in any direction.

03 40 00 - Precast Concrete

Provide all labor, materials and equipment to provide concrete structures per plans. Erect pre-cast concrete units and accurately install in place with height greater than adequate for the loads. At completion, units shall be plumb, level and square with angles and edges parallel with related building lines.

03 50 00 - Cast Decks and Underlayment

Install cementitious backer-board under ceramic tile, marble and stone finish edge as guide to score sheet's face with carbide tipped scoring knife and follow the score line. Large cutouts use a circular saw with carbide tipped blade.

Floor Installation - Install over interior wood or concrete sub-floor that is structurally sound. Ensure the sub-floor is not damaged. Replace any damaged boards. Make certain sub-floor is clean and flat. Exterior hardwood sub-floor should be at least 1 1/4" thick (5/8" minimum) over a structurally solid, movement free foundation. In addition, the spacing between joists should not exceed 16" on center. In any case, the maximum allowable deflection of your sub-floor may not exceed L/360 of the span. Stud joints align with plywood joints. Never allow all four corners of sheets to rest on joists. Apply a dry set mortar or modified thinset to sub-floor per manufacturer's recommendations. Fasten backer-board sheets with proper nails over the entire surface. Keep the fasteners between 3/8" and 3/4" from sheet corners. Provide expansion joints where required.

Countertop Installation - Ensure cabinets are level and secure. Install exterior grade plywood positioned across the wood cabinet. Spacing between supports is not to exceed 16" on center. Do not align backer-board joints with cabinet joints. Sheet ends and edges must be supported by perimeter framing. Apply a dry set mortar or modified thinset to plywood per manufacturer's recommendations. Fasten backer-board sheets with proper nails or screws every 8" over the entire surface. Keep the fasteners between 3/8" and 3/4" from sheet edges and 2" in from sheet corners. Provide expansion joints where required.

Wall Installation - Ensure framing is structurally sound. Nominal minimum 20 gauge metal studs must be straight properly aligned and spaced at a maximum of 16" on center. In tub and shower enclosures, ensure walls are adequately reinforced at the corners. Sheets may be installed vertically. Score and snap sheets to required sizes and make necessary cutouts. Stud ends and edges must be supported by a structural framing member or blocking. In wet areas, install a moisture barrier (such as 15 lb. Felt) between studs. Install sheets 1/4" above floor, tub or shower pan. Fasten backer-board sheets with proper nails or screws every 8" over the entire surface. Keep the



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and 3/4" from sheet edges and 2" in from sheet corners. Set fastener into the surface, without overdriving. Provide expansion joints where required.

03 54 00 - Cast Underlayment

Sub-floor shall be structurally sound. Clean sub-floor to remove mud, oil and other contaminating factors before the installation of the underlayment. Fill cracks with quick setting patching or caulking material. Allow joints to continue at the underlayment. Application shall not begin until the building is enclosed, including roof, walls and other fenestrations.

Gypsum Underlayment - Place gypsum cement a minimum 1 inch thick over a structurally sound deadening pad. Spread and screed gypsum cement to a uniform thickness. Contractor shall provide continuous ventilation and adequate heat to prevent condensation of moisture from the area until the gypsum cement is dry. Contractor shall provide mechanical ventilation if necessary. Under the above conditions, 7-10 days is usually adequate drying time. To test for dryness, cut a 24 inch (609 mm by 609 mm) section of plastic or high density rubber mat over a section of the underlayment. After 48-72 hours, if no condensation occurs under the mat, the underlayment shall be considered dry. Perform dryness test 5-7 days after pour.

Portland Cement Underlayment - Fill large cracks, holes and voids with a suitable underlayment placement. Contraction and control joints must be provided in the underlayment. Mark their location for later saw cutting. Mix primer and underlayment per manufacturers recommendations. Apply an even coat removing air bubbles. Porous surfaces may require a second coat of primer once the first coat has dried to seal the floor. Allow primer to dry to touch completely. Keep primer protected from abrasion. Mix cementitious underlayment per manufacturers recommendations. Spread out using gauged spreader tool set to a uniform thickness. Use spiked roller to disperse air bubbles. Repeat mixing and pouring until uniform. Use smoother for touchups. To avoid low spots between pours, use a tapered leading edge of previous pour before initial set and spread.

03 60 00 - Grouting

Concrete surfaces to receive grout shall be prepared by removing defects, dirt, grease and other foreign matter to achieve sound, clean concrete surface.

Grouting- Mix up grout per manufacturers recommendations. Use a grout float to spread the grout over a workable section of tile. Push the grout into the joints to force it down into the gaps. Grout all the joints except the expansion joints specifically along fixtures, between the floor and walls and at corners in between walls. Expansion joints will be sealed with caulking after the grouting process. Once the appropriate joints are packed with grout, scrape the surface of the tile with the grout float. Hold the float at a sharp angle and make diagonal strokes to keep from digging grout out of the joints. Clean the surface with a damp sponge and a couple buckets of clean water. Wipe the surface of the tiles using a clean sponge in circular strokes. Once the surface is clean, make another pass parallel to the grout lines to shape the grout. Smooth the joints down a little below the surface of the tile. Clean the surface of the tile with a sponge or a soft rag. In 24 to 48 hours after grouting, the surface of the tile shall be finished.



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hardened, caulk using a clear tub/shower caulk or one in a color that matches the tile in the areas that you allowed for your expansion joints and over joints. Seal joints because of movement. Specifically areas between floor tile and caulk around floor or wall tile and bathtub or shower; between floor and wall tile and caulk in corner where two walls meet. Fill the joints completely then smooth with a putty rag or appropriate tool. Caulk around plumbing valves, sinks and drains to prevent water from water penetration. Glazed ceramic tile surfaces only require a grout sealer to be sealed which will provide an enhanced water and mildew resistant surface. Apply a silicone or water-based grout sealer to all joints per manufacturer's recommendations. Wait a **minimum of 14 days** after grout has been installed.

Nonshrink Grout - Lightly roughen concrete surface for maximum adhesion. Follow manufacturer's recommendations. Cover concrete areas with protection until ready to place grout. Align and level components to ensure proper fit and maintain in final position until grout placement is complete and accept final position for grout around bases and other spaces to be grouted. The tops of components should be one inch above the surfaces to be grouted. Place grout in accordance with manufacturer's recommendations. Pour grout from one side only. Place a plate one inch above the plate on opposite side or said plate. Neatly trim the excess grout base, tapered at an angle of **60 degrees**.



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