

## NOTES &amp; SPECIFICATIONS (CONTINUED)

## CONCRETE (CONTINUED)

15. Consolidation methods should be rigorous enough to avoid all blow holes and rock pockets. If any blow holes or rock pockets occur, they shall be broken back, patched with cement mortar and rubbed to match surrounding surfaces. Break back and patch all snap-ties and form bolt holes.
16. Backfilling of any concrete retaining earth shall only take place after the new concrete reaches its design strength.
17. Provide for proper drainage under slabs and beside footings. See soils report for drainage recommendations.
18. The location and protection of existing utilities is the responsibility of the Contractor. The Contractor shall notify the Engineer of Record if utility pipes run through, or underground within 24" below, any new concrete construction. The Engineer of Record shall provide the Contractor with design details under such circumstances.
19. Stay-Form® by Amico shall be used for forming voids in concrete. Stay-Form is available from:
- A. White Cap Construction Supply, 200 Jennings St., San Francisco, CA, 94124  
ph: (415) 821-5500;
- B. Muller Construction Supply, 6565 32nd St., Richmond, CA, ph: (510) 307-9971.
20. Vapor retarder under the slab on grade shall be Griffolyn® Type-65 (contact Reef Industries, Inc., 800-231-6074). Tape joints with Fab Tape per manufacturer's specifications. An alternate vapor retarder may be Florprufe™ 120 by Grace Construction Products, (800-354-5414 or 510-220-7745). Other alternate vapor retarders may be used with prior approval by the Engineer of Record.

## SHOTCRETE (PNEUMATICALLY PLACED CONCRETE)

1. Shotcrete materials and application shall conform to ACI 506.2-95, "Specification for Shotcrete," and with SFBC Section 1913 "Shotcrete." Materials and procedures shall also comply with ACI 506R-05, "Guide to Shotcrete."
2. The shotcrete shall attain a minimum compressive strength of 2,500 psi at 28 days. Strength tests shall be made on specimens which are representative of work and which have been water soaked for at least 24 hours prior to testing. When the maximum size aggregate is larger than 3/8", specimens shall consist of not less than three 3-inch-diameter cores or 3-inch cubes. When the maximum size aggregate is 3/8 inch or smaller, specimens shall consist of not less than three 2-inch-diameter cores or 2-inch cubes. Specimens shall be taken from test panels; made not less than once each shift or not less than one for each 50 cubic yards of shotcrete placed. When the maximum size aggregate is larger than 3/8", the test panels shall have a minimum dimension of 18 inches by 18 inches. When the maximum size aggregate is 3/8 inch or smaller, the test panels shall have a minimum dimension of 12 inches by 12 inches. Panels shall be gunned in the same position as the work, during the course of the work and by nozzle persons doing the work. The condition under which the panels are cured shall be the same as the work.

The average of three cores from a single panel shall be equal to or exceed 0.85f<sub>c</sub> with no single core less than 0.75f<sub>c</sub>. The average of three cubes taken from a single panel must equal or exceed f<sub>c</sub> with no individual cube less than 0.88f<sub>c</sub>. To check testing accuracy, locations represented by erratic core strengths may be retested.

3. Per SFBC Section 1913.4.3, lap splices in reinforcing bars shall be by the noncontact lap splice method with at least 2 inches clearance between bars.

4. Any rebound or accumulated loose aggregate shall be removed from the surfaces to be covered prior to placing the initial or any succeeding layers of shotcrete. Rebound shall not be reused as aggregate.
5. Unfinished work shall not be allowed to stand for more than 30 minutes unless all edges are sloped to a thin edge. Before placing additional material adjacent to previously applied work, sloping and square edges shall be cleaned and wetted.
6. In-place shotcrete which exhibits sags or sloughs, segregation, honeycombing, sand pockets or other obvious defects shall be removed and replaced at the Contractor's expense. Shotcrete above sags and sloughs shall be removed and replaced while still plastic.
7. Preparation: Existing concrete surfaces shall be thoroughly cleaned by sandblasting. All excess sand and loose debris shall be removed by vacuum or compressed air. Particular care should be taken to remove such debris around anchors and reinforcing bars. Existing concrete surfaces shall be moistened for at least two hours prior to shotcreting, and such surfaces shall remain damp during shotcrete application.
8. Curing: the shotcrete shall be moist-cured for at least 7 days after application.
9. Inspections: Per SFBC Section 1704.4 (Table 1704.4), 1913.5, & 1913.10 a special inspector is required for continuous inspection of the placement of the shotcreting and during the taking of test specimens. The inspector shall submit a statement indicating the contractor's compliance with the plans and specifications.

## WOOD (STRUCTURAL CARPENTRY)

1. All wood in contact with concrete or masonry, and all lumber exposed to weather, shall be pressure treated (CA-C without ammonia) to resist rot in accordance with current AWPA standards using EPA approved preservatives. Chromated copper arsenate (CCA), ammonia, amine & chlorine preservatives shall not be used. Preservative and retention shall be suitable for the application above the ground, and shall bear AWPA marks indicating the member is acceptable for its intended use. All cut or drilled surfaces of pressure-treated members shall be repainted with copper naphthenate, minimum 2% strength solution. Pressure treated wood (CA-C w/o ammonia) is available from Beronio Lumber, 2525 Marin Street, San Francisco, CA, 415-824-4300.
2. Mudsills on concrete or masonry shall be Douglas Fir, pressure treated with EPA approved preservatives (see wood spec 2 above), and shall be fastened to the concrete or masonry with a minimum of two fasteners per piece, and with end fasteners no further than 12 inches nor closer than 7 times the bolt diameter from end of piece. Anchor bolts shall be galvanized or stainless steel. Galvanized plate washers with a minimum size of 3"x3"x0.229" shall be used at each anchor bolt.
3. Pest-damaged structural wood may exist in this structure. The Contractor shall make as thorough an inspection as practicable to identify decayed or termite-infested wood members. The Contractor shall, to the best of his abilities, identify and stop all sources of water infiltration associated with any termite damage or other decay. The Owner and the Engineer of Record shall be notified of the full extent of any decay or damage, and of any methods proposed to stop further decay. The full length of all decayed or termite-damaged members shall be replaced. Where this is impractical, special approval and structural detailing by the Engineer of Record is required.

## HARDWARE (ROUGH METALS)

1. All bolts, including threaded rods, machine bolts and anchor bolts, shall conform to ASTM A307, unless otherwise noted on the drawings. Where nuts or bolts bear on wood, malleable iron or cut steel washers shall be placed between the wood and the nut or bolt. The diameter of all bolt holes in wood shall not exceed the bolt diameter by more than 1/16 inch.

2. Any and all nails, bolts, washers and sheet metal connectors exposed to the weather shall be hot-dipped galvanized to resist rust. Any other rust-proofing techniques require prior approval of the Engineer of Record.
3. All bolts, washers, and other hardware in contact with pressure-treated lumber shall be hot-dipped galvanized with a galvanized rating of G-185 (1.85 oz zinc per sq. ft. steel sheet per ASTM A653), post-manufacture hot dip galvanized per ASTM A153, or shall be stainless steel.

