

Revised: 7/1/10 Laboratory: _____ Inspector(s): _____ Date: _____
 Interviewee: _____

S ___ F ___

**COMPRESSIVE STRENGTH OF HYDRAULIC CEMENT MORTARS
 USING 2-IN. OR [50-MM] CUBE SPECIMENS
 ASTM C 109-08**

- 5.1. Weight & weighing devices conform to C 1005 ___
- 5.2. Glass graduates of suitable capacities ___
- 5.3. Specimen molds – 2-in. cube molds; interior faces plane & conform to tolerances in Table 1 ___
- 5.4. Mixer, bowl, & paddle – electrically driven mechanical mixer conform to C 305 ___
- 5.5. Flow table & flow mold conform to C 230 ___
- 5.6. Tamper – nonabrasive, nonbrittle rubber mat'l w/ Shore A rdg of 80 ± 10 or seasoned oak, $\frac{1}{2} \times 1 \times 5$ or 6-in. ___
- 5.7. Trowel – steel blade 4 – 6 in. long ___
- 5.8. Moist cabinet or room conform to C 511 ___
- 5.9. Testing machine w/ accuracy of ± 1.0 % of indicated load ___
 If dial indicator, dial readable to at least 0.1 % of full scale & readable to w/in 1 % of indicated load ___
- 5.9.1. Digital load indicator numerical increment ≤ 0.1 % of full-scale load & accurate to 1.0 % ___
- 5.9.2. Spherical seated upper block & plane to 0.001-in. (0.025-mm) ___
- 6.1.1. Sand shall be natural silica sand conform to C 778 ___
- 7.1. Temp of air in vicinity, mixing water, moist cabinet or room, and tanks $73.5 \pm 5.5^\circ\text{F}$ ($23.0 \pm 3.0^\circ\text{C}$) ___
- 7.2. Humidity of lab not < 50 % & moist cabinet or room conform to C 511 ___
- 8.1. Make 3 specs for ea period of test or test age ___
- 9.1. Lubricate mold ___
- 9.2. Seal the surfaces where the halves of mold join ___
- 9.3. Make a watertight seal ___
- 10.1.1. Mix 1 part cement to 2.75 parts graded sand by wt; use water-cement ratio of 1.485 for Portland cements & 0.460 for air-entraining cements ___
- 10.1.2. Quantities for 6 & 9 spec using proper proportions ___
- 10.2.1. Mechanically mix in accordance w/ C 305 ___
- 10.3.1. Determine flow in accordance w/ C 1437 ___
- 10.3.2. Portland & air-entraining cements record flow ___
- 10.3.3. Cements other than 10.3.2, make trial mortars w/ various % of H_2O until correct flow obtained ___
- 10.3.4. Return to mixing bowl, remix 15 sec ___
- 10.3.5. If dup batch skip flow, stand 90 sec, scrape sides last 15 sec, remix 15 sec @ med speed ___
- 10.4.1. Complete consolidation by hand tamping or qualified alternate method ___
- 10.4.2. Mold not $> 2 \frac{1}{2}$ min after mix, place mortar 1-in in cube, tamp 32 times ~ 10 sec in 4 rounds, tamp 2nd layer same s 1st layer and trim ___
- 10.4.3. Alternate methods (See this paragraph in C 109) ___
- 10.4.4. Qualification procedure (See this paragraph in C 109) ___
- 10.4.5. Requalification of alternate compaction method (See this paragraph in C 109) ___
- 10.5. Place spec in molds on base plates in moist cabinet or room 20 – 72 hr, if removed from molds before 24 hr, keep in moist environ until 24 hr, immerse except those for 24 hr test in saturated lime water ___
- 10.6.1. Test soon as practicable from moist storage & test according to time table ___
- 10.6.2. Surface-dry specs. & remove loose particles ___
 If more than 1 spec removed, keep moist until test ___
- 10.6.3. Load faces that were in contact w/ true plane surfaces of mold ___
 Load rate of 200 – 400lb/s (900 – 1800 N/s) ___
- 11.1. Calculate compressive strength in psi or MPa ___
 Maximum load / area of loaded surface, in^2 or mm^2 ___
- 12.1. Report flow to 1 % & water used to 0.1 %, avg compr strength to nearest 10 psi ___
- 13.1. Do not use specimens that are manifestly faulty ___
- 13.2. Max permissible range between specs from same batch of mortar @ same test age 8.7 % of the avg when 3 cubes represent a test age & 7.6 % when 2 cubes represent a test age (Note 9) ___
- 13.3. If range of 3 specs exceeds max in 13.2, discard result differing most from avg & chk other 2 spec ___
 Make retest of the spl if < 2 specs remain after discarding faulty specs or tests that fail to comply w/ max permissible range of 2 specs ___

Data Sheet ____

SAMPLING AND TESTING CONCRETE MASONRY UNITS AND RELATED UNITS
ASTM C 140-09

- 5.1.1. Select full-sized units ____
- 5.2. Unless specified, get 6 units ____
- 5.3. Remove loose material from specs. (including cores) before getting received weight ____
- 5.4. ID ea spec (markings not cover > 5 % of surface area) ____
- 5.5. Weigh ea spec after sampling & marking (record weight as W_r , time & place measured) ____

- 6.1.1. Steel scale w/ dimensions not > 0.10-in. (2.5 mm) ____
- 6.1.2. Calipers w/ dimensions not > 0.01-in. (0.25 mm) ____
- 6.2. Specs – 3 full-size units for measurement of dimensions ____
- 6.3. Measurements: Measure in accordance w/ applicable annex ____
For those not covered in annex, measure overall dimensions (width, ht, length) in @ least 2 locations on opposite sides of the spec & document w/ a sketch or photo ____

- 7.1.1. Testing machine w/ accuracy of ± 1.0 % of indicated load w/ spherical seated upper block ____
- 7.1.2. Single bearing plate (1/4-in > length & width of units) if upper or lower platen not large enough ____
- 7.1.3. Platen & plate plane to 0.001-in. (0.03-mm) ____
- 7.1.4. Testing machine verified in accordance w/ E 4 @ frequency set in C 1093 ____

- 7.2.1. Unless specified in annex, test 3 specs ____
- 7.2.2. Unless specified in annex, specs full-sized units, unless full-size can't be tested, reduce spec size in accordance w/ Annex A 1 ____
- 7.2.3. Store specs (unstacked & separated by not < 0.5-in. (13 mm) on all sides) in air @ $75 \pm 15^\circ\text{F}$ ($24 \pm 15^\circ\text{C}$) @ humidity < 80 % not < 48 hr ____
- 7.2.4. Saw-cut specs if req'd or allowed (if spec is wetted, dry to equilibrium as in paragraph 7.2.3) ____
- 7.3. Cap specs in accordance w/ C 1552 ____
- 7.4. Compression testing procedure:
 - 7.4.1. Align w/ center of upper bearing block ____
 - 7.4.2. At time of test specs free of visible moisture ____
 - 7.4.3. Load up to $\frac{1}{2}$ expected max load @ any rate, then adjust rate to apply remaining load 1 – 2 min ____
 - 7.4.4. Record max compressive load in lb. (newtons) as P_{\max} ____

- 8.1. Apparatus – balance sensitive to w/in 0.5 % of wt of smallest spec ____
- 8.2. Test Specimens: – 3 full-size units properly prepared & recorded ____
 - 8.2.1. Unless specified otherwise in applicable annex, test 3 specs. in absorption ____
 - 8.2.2. Unless specified otherwise in applicable annex, tests on 3 full-size units ____
- 8.3. Procedure:
 - 8.3.1. Soak in H_2O @ $60 - 80^\circ\text{F}$ ($15.6 - 26.7^\circ\text{C}$) for 24 hr, remove & drain 1 min \pm 5 sec ____
 - 8.3.2. Dry in oven @ $212 - 239^\circ\text{F}$ ($100-115^\circ\text{C}$) not < 24 hr until 2 weighings change not > 0.2 % ____

- 9.1. Absorption ____
- 9.2. Moisture content ____
- 9.3. Density ____
- 9.4. Average net area ____
- 9.5. Gross area ____
- 9.6. Compressive strength ____
 - 9.6.1. Net area compressive strength ____
 - 9.6.2. Gross area compressive strength ____

10. Report ____
 - A1. Test procedures for concrete masonry units ____
 - A2. Test procedures for concrete and calcium silicate brick ____
 - A3. Test procedures for segmental retaining wall units ____
 - A4. Test procedures for concrete interlocking paving units ____
 - A5. Test procedures for concrete grid paving units ____
 - A6. Test procedures for concrete roof pavers ____
 - A7. Determining plate thickness requirements for compression testing ____

Data Sheet ____

AUTOCLAVE EXPANSION OF PORTLAND CEMENT
ASTM C 151-09

5. Apparatus:

- 5.1. Weighing devices & weights in accordance w/ C 1005 ____
- 5.2. Glass graduates (200 or 250-ml) conforming to C 490 ____
- 5.3. Molds, conforming to C 490 for specs. used in determination of length change of cement paste ____
- 5.4. Flat trowel, straight-edged, 4 – 6-in (100 – 150-mm) long ____
- 5.5. Autoclave, consisting of a high-pressure steam vessel w/ therm well ____
Automatic pressure control & rupture disk w/ bursting pressure of 350 psi (2.4 Mpa) \pm 5 % ____
- 5.5.1. Rupture disk – made of mat'l w/ tensile strength rel insensitive to temp 68 – 420°F (20 – 216°C) & electrochemically compatible w/ pipe leading to it & its holder ____
- 5.6. Length comparator conforming to C 490 ____

6. Temperature & Humidity:

- 6.1. Maintain temp of molding room, dry mat'ls & mixing H₂O, & rel humidity of room to limits of C 490 ____
- 6.2. Moist storage facilities – maintain temp & humidity of moist storage in accordance w/ C 511 ____

8. Number of Test Specimens:

- 8.1. Make at least one test spec ____

9. Preparation of Specimen Molds:

- 9.1. Prepare molds in accordance w/ C 490 ____

10. Preparation of Test Specimens:

- 10.1. Mixing cement paste – make std batch of 650 g of cement & H₂O to get normal consistency in accordance w/ C 187 & mix in accordance w/ C 305 ____
- 10.2. Molding specs – immediately after 9.1, mold spec in 2 layers, compacted w/ thumb or forefingers, trim flush w/ top of mold ____
- 10.3. Store specs in moist closet or room 20 hr, if removed before 24 hr, keep in moist closet or room ____

11. Procedure:

- 11.1. 24 \pm 30 min, remove from moist environment, place in autoclave @ room temp ____
Autoclave w/ enough H₂O, @ temp of 68 - 82°F (20 - 28°C) to maintain saturated steam vapor for entire test ____
- 11.2. Early, leave vent valve open until steam begins to escape, close valve & raise temp to bring gage pressure to 295 psi (2 Mpa) in 45 – 75 min, maintain 295 \pm 10 psi (2 \pm 0.07 Mpa) for 3 hr, cool such that pressure is < 10 psi in 1 ½-hr, vent, place spec in H₂O @ temp > 194°F (90°C), cool H₂O around bars so that temp of H₂O is lowered to 74°F in 15 min, remove 1 spec & obtain length comp rdg ____

12. Calculation:

- 12.1. Calculate change in length by subtracting length comp rdg before autoclaving from rdg after, report as % of effective gage length to 0.01 % ____
Report % of increase in length as autoclave expansion ____
Indicate a decrease in length by a minus sign prefixed to the % value ____

Data Sheet ____

AIR CONTENT OF HYDRAULIC CEMENT MORTAR
ASTM C 185-08

5. Apparatus:

- 5.1. Flow table, mold, & caliper conforming to C 230 ____
- 5.2. Measure – cylindrical, inside dia 76 ± 2 mm & depth (~ 88 mm), adjusted by standardization w/ H₂O to contain 400 ± 1 ml @ $23.0 \pm 2.0^\circ\text{C}$ ____
- 5.3. Mixer, bowl, & paddle conforming to C 305 ____
- 5.4. Steel straightedge not < 200 mm long & not < 1.5 mm or < 3.5 mm thick ____
- 5.5. Weights & weighing devices conforming to C 1005 ____
- 5.6. Glass graduates – 250-ml conforming to E 438, & E 694 ____
- 5.7. Tamper conforming to C 109 ____
- 5.8. Tapping stick – hard wood, ~ 16 mm dia & ~ 152 mm long ____
- 5.9. Spoon – not < 230 mm long & w/ bowl ~ 100 mm long ____

6. Temperature & Humidity:

- 6.1. Maintain temp of room & dry mat'ls @ $23.0 \pm 4^\circ\text{C}$ ____
- 6.2. Condition mixing H₂O & measure, if it is cal'd $23.0 \pm 2^\circ\text{C}$ ____
- 6.3. Maintain rel humidity of lab @ not < 50 % ____

7. Standard Sand:

- 7.1. Sand conforming to C778 for 20 – 30 sand ____

8. Sampling:

- 8.1. Spl cement in accordance w/ C 183 ____

9. Procedure:

- 9.1. Batch 350 g mortar to 1400 g 20 – 30 sand w/ H₂O for flow of 87.5 ± 7.5 % in accordance w/ 9.3 ____
- 9.2. Mix mortar in accordance w/ C 305 ____
- 9.3. Place layer of mortar ~ 25 mm thick & tamp 20 X, overfill mold & tamp same as 1st layer, trim flush w/ top of mold, lift mold after 1-min & drop table 10 X ____
- 9.4. When H₂O has flow of 87.5 ± 7.5 %, get mass of 400 ml of mortar, place in 400-ml measure in 3 layers tamp 20 X, complete w/in 1.5 min, get mass of measure & contents & get mass of mortar ____

10. Calculations ____

11. Report:

- 11.1. When used for specific action in compliance testing, report air content to 1 % ____

Data Sheet ____

NORMAL CONSISTENCY OF HYDRAULIC CEMENT
ASTM C 187-04

4. Apparatus:

- 4.1. Weights & weighing devices in accordance w/ C 1005 ____
- 4.2. Glass graduates (200 – 250-ml) conforming to C 490 ____
- 4.3. Vicat apparatus as in Fig 1 ____
- 4.4. Flat trowel w/ sharpened steel blade 100 – 150 mm long ____

5. Temperature & Humidity:

- 5.1. Temp of air in work area & equipment 20 – 27.5°C (68 – 81.5°F) ____
Temp of mixing H₂O 23.0 ± 2.0°C (73.5 ± 3.5°F) ____
- 5.2. Rel Humidity of lab not < 50 % ____

6. Procedure:

- 6.1. Mix 650 g cement w/ measure amt H₂O using Procedure for Mixing Pastes in C 305 ____
H₂O conform to num limits in D 1193 for Type III or IV grade of reagent H₂O ____
- 6.2. Form paste into ball w/ gloved hands ____
Toss 6 X thru free path of ~ 150 mm (6 in) from 1 hand to another to get nearly spherical mass ____
Press ball into larger end of conical ring, remove excess @ larger end, place ring on larger end on base plate & slice off excess ____
- 6.3. Center paste under rod B, plunger end brought in contact w/ paste, tighten set-screw ____
Set movable indicator to upper 0 mark or take initial rdg, release rod not > 30 sec after mixing ____
Paste normal consistency when rod settles 10 ± 1 mm below orig surface in 30 sec after release

____ Use trial pastes w. varying % of H₂O ____

7. Calculation:

- 7.1 Calculate amt of H₂O req'd for normal consistency to 0.1 % & report to 0.5 % of wt of dry cement ____

Data Sheet ____

TIME OF SETTING OF HYDRAULIC-CEMENT PASTE BY GILLMORE NEEDLES
ASTM C 266-08

6. Apparatus:
- 6.1. Trowel w/ steel blade 100 – 150 mm (4 – 6 in) long ____
 - 6.2. Mixer, bowl, paddle, & scraper conforming to C 305 ____
 - 6.3. Glass graduates, 200 or 250 ml, conforming to C 1005 ____
 - 6.4. Mass determining devices conforming to C 1005 ____
 - 6.5. Plane non-absorptive plates (102 ± 3 mm (4 ± 0.125 in) square ____
 - 6.6. Gillmore needles conforming to the following ____
 - 6.6.1. Initial setting-time needle 113.4 ± 0.5 g (0.250 ± 0.001 lb) ____
Tip dia 2.12 ± 0.05 mm (0.84 ± 0.002 in) ____
 - 6.6.2. Final setting-time needle 453.6 ± 0.5 g (1.000 ± 0.001 lb) ____
Tip dia 1.06 ± 0.05 mm (0.042 ± 0.002 in) ____
 - 6.6.3. Needle tips cylindrical for distance of 4.8 ± 0.5 mm (0.189 ± 0.020 in) ____
Needle ends plane & @ rt angles to axis of rod ____
7. Reagents:
- 7.1. Potable H₂O for routine tests ____
Referee & cooperative tests, reagent H₂O conforming to D 1193 for Type III or IV ____
8. Sampling:
- 8.1. For acceptance testing, spl cement in accordance w/ C 183 ____
9. Conditioning:
- 9.1. Temp of room & equipment 23.0 ± 3.0°C ____
Temp of mixing H₂O 23.0 ± 2.0°C ____
 - 9.2. Rel Humidity of lab not < 50 % ____
 - 9.3. Moist cabinet or room conform to C 511 ____
10. Procedure:
- 10.1.1. Mix 650 g cement w/ H₂O for normal consistency in accordance w/ C 305 ____
 - 10.1.2. At option of tester, use rest of paste for autoclave expansion spec (C 151) or from normal consistency determination (C 187) ____
 - 10.2. Molding test spec., make pat w/ flat top & sides taper to thin edge ____
 - 10.3. Time of setting, get time of setting by holding needle vertical & apply lightly to surface of pat ____
 - 10.3.1. Get Gillmore initial time of setting ____
 - 10.3.2. Get Gillmore final time of setting ____
11. Report
- 11.1. Initial Time of Setting, Gillmore, min ____
Final Time of Setting, Gillmore, min ____
- Data Sheet ____

MECHANICAL MIXING OF HYDRAULIC CEMENT PASTES AND
MORTARS OF PLASTIC CONSISTENCY
ASTM C 305-07

4. Apparatus:

- 4.1. Mixer – electrically driven mechanical of epicyclic type ____
- 4.2. Paddle – removable stainless steel as in Fig 2 ____
- 4.3. Mixing bowl w/ 4.73 L capacity ____
- 4.4. Scraper – semi rigid rubber ____
- 4.5. Supplementary apparatus – balances, wts, glass graduates, & other apparatus needed ____

5. Temperature & Humidity:

- 5.1. Temp of room & equipment, 20 – 27.5°C (68 – 81.5°F) ____
Temp of mixing H₂O, 23 ± 1.7°C (73.4 ± 3°F) ____
- 5.2. Humidity – not < 50 % ____

6. Materials, Proportioning, & Consistency:

- 6.1. Mat's, proportions, & quantity conform to requirements in particular method for preparation ____

7. Procedure for Mixing Pastes:

- 7.1. Put dry paddle & dry mixing bowl in mixing position in mixer, add batch mat'ls ____
 - 7.1.1. Place all mixing H₂O in bowl ____
 - 7.1.2. Add cement to H₂O, allow 30 sec for absorption ____
 - 7.1.3. Mix @ 140 ± 5 RPM for 30 sec ____
 - 7.1.4. Stop for 15 sec, scrape paste off sides ____
 - 7.1.5. Mix @ 285 ± 10 RPM for 1 min ____

8. Procedure for Mixing Mortars:

- 8.1. Put dry paddle & dry mixing bowl in mixing position in mixer, add batch mat'ls ____
 - 8.1.1. Place all mixing H₂O in bowl ____
 - 8.1.2. Add cement to H₂O & mix @ 140 ± 5 RPM for 30 sec ____
 - 8.1.3. Add all sand slowly for 30 sec while mixing ____
 - 8.1.4. Stop mixer, change to 285 ± 10 RPM, & mix for 30 sec ____
 - 8.1.5. Stop mixer, stand for 1.5 min ____
First 15 sec scrape mortar off sides, rest of 1.5 min cover bowl w/ lid ____
 - 8.1.6. Mix @ 285 ± 10 RPM for 1 min ____

Data Sheet ____

PRECONSTRUCTION AND CONSTRUCTION EVALUATION OF MORTARS FOR
PLAIN REINFORCED UNIT MASONRY
ASTM C 780-08

7. Apparatus:

7.1. Apparatus listed in the individual tests included in the annexes ____

9. Sampling:

9.1. This section deals with sampling in lab & @ jobsite:

9.2.1. Bagged mat'l be type & brand used or considered for actual construction ____

9.2.2. Aggregate from same source & same description as used or considered for actual construction ____

9.2.3. Water not need to be same as construction, except water that has properties that affect testing ____

9.3. Get spls from lab & construction site & mix together ____

9.3.1. Batch mixer spls from discharge or after discharged into receptacle ____

9.3.2. Take mortar for mortar boards as in 9.3.1 & place on typical mortar boards used @ job site ____

9.3.3. Take retempered mortar board spls from mason's mortar board after mixing & retempering ____

9.4. Record date, time, place, & method of sampling ____

10. Test Specimens:

10.1. Measure mortar properties during preconstruction evaluation on single spec ____

10.2. Measure mortar properties during construction evaluation on single spec ____

10.3. Actual constr eval, & for batch-to-batch variations, spl 3 batches for plastic & hardened properties ____

11. Procedure:

11.1. Mechanically prepare & mix mortar for preconst eval w/mat'ls & proportions for constr ____

11.1.1. Use sand damp, as-received, correct H₂O added as free water above SSD condition ____

11.1.2. Prebatch by wt, to desired volume proportions ____

11.1.3. Mix to the following:

11.1.3.1. If 2⁺ cementitious mat'ls for preconst eval, pre-blend ____

11.1.3.2. Charge mixer for preconst eval as follows:

(1) ~ ½ estimated H₂O ____

(2) Sand ____

(3) Cementitious mat'l ____

(4) Balance of mixing H₂O ____11.1.3.3. Mix mortar for preconst eval @ normal speed 5 min, H₂O additions made during 1st 4 min ____

11.1.3.4. Determine cone penetration for preconst eval in accordance w/ Annex A1 ____

12. Report:

12.1.1. Test results & all pertinent data ____

Annexes:

A1. Consistency by Cone Penetration Test Method ____

A2. Consistency Retention of Mortars for Unit Masonry ____

A3. Initial Consistency & Consistency Retention or Board Life of Masonry Mortars using a Modified Concrete Penetrometer ____

A4. Mortar Aggregate Ratio Test Method ____

A5. Mortar Water Content Test Method ____

A6. Compressive Strength of Molded Masonry Mortar Cylinders & Cubes ____

A7. Splitting Tensile Strength of Molded Masonry Mortar Cylinders ____

Data Sheet ____

SAMPLING AND TESTING GROUT
ASTM C 1019-09

4. Apparatus:

- 4.1. Max-min thermometer ____
- 4.2. Steel straightedge not < 6-in long & not < 1/16-in thick ____
- 4.3. Tamping rod – nonabsorbent, nominally 5/8-in w/ hemispherical tip, not < 12-in long ____
- 4.4. Nonabsorbent blocks – rigid squares & rectangles, to get spec ht in Figs 1 & 2 ____
- 4.5. Panels & plates – pieces of 3/4-in. plywood or equivalent, coated to make impermeable ____

5. Test Specimens:

- 5.1. Spec sq. cross-section \geq 3-in (76-mm) on sides, ht. 2 X width ____
- 5.2. \geq 3 spec @ ea age ____

6. Mold Construction:

- 6.1.1. Select level vibration free location for molds to remain undisturbed up to 48 hr ____
- 6.1.2. Construction of mold simulate in-situ constr ____
- 6.1.3. Form space w/ sq cross-section \geq 3-in high, ht 2 X width ____
Surface of unit in contact w/ grout shall not previously be used ____
Space tolerance & spec dimensions w/in 5 % of width (Figs 1 & 2, & notes) ____
- 6.1.4. Line surfaces w/ thin, permeable mat'l ____
- 6.1.5. Brace units to prevent displacement ____

7. Sampling Grout:

- 7.1. Spls for slump & compr strength minimum $\frac{1}{2}$ ft³ (0.014 m³) ____
- 7.2. Use appropriate precautions that allow representative sampling; after final slump adjustment, spl as grout being placed ____
 - 7.2.1. Field sampling - get 2⁺ portions from middle portion of batch ____
 - 7.2.2. Lab sampling – use entire batch of grout ____
- 7.3. Transport spl to mold location, protect from sun, wind, rapid evaporation ____

8. Temperature & Slump Test:

- 8.1. Measure & record temp in accordance w/ C 1064 ____
- 8.2. Start slump w/in 5 min ____
- 8.3. Measure & record slump in accordance w/ C 143 ____
- 8.4. Self-consolidating grout, measure & record slump & visual stability index in accordance w/ C1611 ____

9. Compressive Test Specimen:

- 9.1. If spl from slump, remix, start filling mold w/in 15 min ____
- 9.2. Fill in 2 layers, rod ea. layer 15 times, $\frac{1}{2}$ in. penetration, overfill mold ____
- 9.3. Self-consolidating grout, fill mold w/ grout in 1 layer & do not rod ____
- 9.4. Strike off w/ straightedge ____
- 9.5. W/in 30 min. add grout to fill void caused by initial H₂O loss, strike off w/ straightedge, cover ____
- 9.6. Protect from freezing & variations in temp, store max-min therm, record temps prior to final cure ____

10. Transportation, Curing, & Testing of the Specimens:

- 10.1. Remove molds 24 – 48 hr after making specs ____
- 10.2. W/in 30 min of mold removal, place in protective container & keep damp ____
- 10.3. Transport to lab w/in 8 hr after mold removal ____
- 10.4. W/in 8 hr after mold removal, store in moist room, moist cabinet, or water storage tank conforming to C 511 until day of testing ____
- 10.6. Cap in accordance w/ C 617 ____
- 10.7. Measure & record width of ea. face @ mid-ht., ht @ mid-ht., & amt out of plumb @ mid-width ____
- 10.8. Test in damp condition in accordance w/ C 39 ____

11. Calculations:

- 11.1. Determine avg. cross-sectional area ____
- 11.2. Calculate compr strength to nearest 10 psi ____

12. Report ____

Data Sheet ____