

CHAPTER 4MASONRY4-01. GENERAL

This chapter covers brick, concrete masonry units, splitface block, tile, stone, and other masonry construction.

4-02. SAMPLES

Have samples of all materials and certificates of compliance been submitted?

- a. Check progress schedule for dates materials are needed.
- b. Is contractor submitting samples early enough to avoid delay in construction?
- c. Are the reference specifications available to you?

4-03. SAMPLE PANELS

- a. Have sample panels been erected?
- b. Are they located so as to be close enough to structure to provide ready access for comparison purposes? Do not permit sample panels to be incorporated in the structure. Only approved materials will be used in sample panels.
- c. Have precautions been taken to prevent damage to sample panels?
- d. Masonry construction shall not begin until the sample panel for the work has been approved. It is a good idea to record this approval, making note of minor deficiencies and other comments for clear understanding. All embedded items, a control joint and other features will be included in the panel.
- e. Check masonry against sample panel. The materials, workmanship and finished appearance must be the same.
- f. Each sample panel will be cleaned to demonstrate effectiveness of the cleaning solution proposed for the work.

4-04. TESTS

The following listed tests will be required in most contracts; other tests may be specified in some contracts. (For all tests, the QA Rep's responsibility is the same - to ascertain that the tests have been performed and that results are satisfactory before allowing the use or installation of materials.)

- a. Concrete Masonry Units (CMU)
 - (1) Drying - Shrinkage Test
 - (a) Specifications limit shrinkage of units
 - (b) The design of control joint reinforcing was based on the specified limit of shrinkage.

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(c) This test determines if the shrinkage of units to be used is within the specified limits.

(d) Test Results must be submitted for approval by specified time.

(2) Air - Dry Condition Test

(a) CMU passing this test have a proper moisture content and will not shrink excessively from loss of moisture to the air.

(b) The QA Rep will require that the specified number of representative samples are delivered to the laboratory from each lot. (One day*s delivery is considered a "lot" for average job.)

(c) Samples must be sealed in lab-furnished, air-tight containers if testing lab is not in the immediate vicinity of-the job site.

b. Tests for Mortar

(1) Contractor is required to have mortar proportions established and tested by an approved laboratory for each type mortar specified.

(2) A certified copy of the lab-established proportions and test results must be submitted for approval before masonry can be erected.

(3) Check for approved mix proportions and check batching accordingly. (For additional checklist on batching of mortar, see "Erection".)

(4) No change in proportioning or source of materials will be allowed without additional tests and approval.

4-05. MATERIALS

a. General

(1) Do materials on site match the approved samples for:

(a) Color or range of colors?

(b) Texture?

(c) Grade? (SN grade brick always used below grade)

(d) See that steel door and window frames are on the site before masonry is erected, since they must be anchored in the masonry.

(2) Are sizes and defects within permissible tolerances?

(a) Obtain copies of referenced Federal, ASTM or other materials specification; tolerances are spelled out.

(b) Use these tolerances as basis for accepting or rejecting units.

(c) Typical defects to look for are: chips, cracks, checks, crazing, crawling, pop outs, and warped or misshapen units.

(3) Are storage facilities adequate?

(a) Are units stored off ground and completely covered?

(b) Are Coverings waterproof; such as tarps, polyethylene sheeting or other waterproof material?

(c) Are coverings secured in place? Are coverings being re-secured at end of each day and whenever rain or snow threatens?

b. Anchors. Ties and Joint Reinforcement

(1) Do materials on site match the approved samples?

(2) Is non-ferrous metal required or must the steel be galvanized?

(3) On wall and partition intersection ties, check both specifications and plans for specific details as to type, size, shape and material.

(4) Check for omission of anchorage, especially at doors, windows, and other wall openings.

(5) The bent ends of anchors must be set into masonry cells filled full with mortar.

(6) Cavity-wall Ties

(a) With hollow masonry in either wythe, i.e., in either or both the face and backup masonry, rectangular wire ties are required. (A wythe is defined as a vertical tier or layer of brickwork or masonry.)

(b) Is length such that end anchorage occurs in specified face-shell-mortar beds?

(c) Are ties crimped for moisture drip at center of cavity space (after insulation) so no moisture will pass?

(d) Is the 1/16 inch wire either zinc-coated or copperclad steel?

(7) Joint Reinforcement

(a) Is wire zinc coated and do the different coating weights comply with specifications?

(b) Are cross-wires spaced as specified for smooth and for deformed longitudinal wire?

(c) Is specified gauge wire being used?

(d) Is configuration acceptable with number of longitudinal wires, with box ties?

c. Brick

(1) Has certificate of compliance been received?

(2) Do color range and texture match approved samples?

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(3) Have broken, cracked, chipped, warped, spalled, oversized and undersized units been rejected?

Obtain copy of ASTM C-26, C-216 or other referenced specification and base acceptance or rejection on tolerances contained therein. Is the efflorescence test required?

d. Portland Cement, Masonry Cement and Lime

(1) Check shipment containers to be sure materials received are as specified and tested.

(2) If containers are broken or damaged, reject cements or lime.

(3) Pay particular attention to sack or bag type containers for evidence of dampening, hardening or setting up cement or lime. Cement or lime that has become lumpy or semi hardened must be rejected.

(4) Any other evidence that material does not meet specifications is cause for investigation and possible rejection.

e. Concrete Brick, Split Block and Concrete Masonry Units (CMU)

(1) Have Certification of compliance or certified Laboratory Test Reports been received?

(2) Have units passed the required tests for drying shrinkage and Air Dry Condition? Air-Dry Condition tests are made on units selected from the worksite stockpile.

(3) Are all units to be used in any one structure of the same appearance (especially texture)? Have all units been cured by the same process?

(4) Have sizes of units been spot-checked? No overall dimension (width, height or length) shall differ more than the deviation allowed from the specified standard dimensions. (Standard dimensions of units are the manufacturers* designated dimensions.)

(5) Do specifications state location where bullnose units are required? (Present guide specifications state locations.)

f. Coping Tile

(1) Do tiles overhang parapet on both sides to provide for drip?

(2) Are drip grooves provided?

(3) Are flashings installed, as detailed, under copings?

g. Fireclay and Refractory Brick

(1) Should be compact, of homogeneous structure free from checks, cracks, voids or soft centers.

(2) Do the units carry the required rating or is there a testing agency and statement of results of test required?

(3) The sizes and allowable tolerances for firebrick for these special brick shall be in accordance with applicable ASTM as follows:

(a) Dimension 4 inches and over shall not vary more than + 2% from that specified.

(b) Dimensions under 4 inches shall not vary more than 3% from that specified.

(c) The standard shown in the ASTM shall be for Low Duty Refractory Brick.

h. Flue Linings

(1) Is size of flue lining as specified or shown?

(2) Does thimble size match size of boiler breeching or smoke pipe?

(3) Is the hard-burned fire clay or shale free from blisters and warping?

i. Insulation

(1) Either loose-fill or board type insulation is specified; loose-fill in CMU cells or board inside the cavity.

(2) Loose-fill type must be treated for water repellency.

(3) Board type must be closed cell plastic treated for fire resistance.

(4) Limit board insulation installed to allow a 1-inch air space in cavity walls.

j. Mortar Materials

(1) Be certain that materials delivered to site are as specified, tested and approved. Check that only one brand of one type of cement and aggregate from only one source is used. Do not allow careless mixing procedures including variations in mortar proportions. Variation from above tend to produce variations in color of mortar when dry. These variations in color are more noticeable in glazed structural facing unit wainscots.

(2) Type N masonry will be used for all non-reinforced masonry unless otherwise specified. Pointing mortar has smaller size aggregate and a waterproofing additive. Check your specifications for usage.

k. Precast Concrete Trim

(1) Has certificate of compliance been received and does unit pass absorption test?

(2) Have sills been cast with washes and drip grooves?

(3) Are lintel units labeled to show top of each unit?

(4) Is there a joint in sill at every mullion?

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(5) Inspect for crazing; pour water over precast trim; if present, crazing will be apparent. Evidence of excessive crazing is cause for rejection. Dusting, spalling and/or use of surface coatings is also cause for rejection.

(6) Have units weighing over 80 lbs. been provided with built-in loops of galvanized wire?

1. Pre-faced Concrete Masonry Units

(Usually a contractor*s option for glazed structural clay facing-tile-units for base.)

(1) Have certificates and all required current test results been furnished for units?

(2) Check units for bond between facing and concrete masonry units. Facing must turn over edges and ends for 3/8-inch in 1/18-inch thickness.

(3) Check unit for chips, cracks, crazes, blisters, crawling, holes and other imperfections detracting from appearance.

(4) Check dimension, tolerances and requirements.

m. Reinforcing Bars

(1) Are shape, spacing and size of bars as detailed?

(2) Are bars free from scaly rust, oil, grease and grout splashes?

(3) Are splices the same length as specified in "Concrete for Building Construction?"

n. Stonework

(1) Do specifications require shop drawings for stonework?

(2) If shop drawings are not required, it is particularly important that a sample panel be erected and approved by all concerned before starting stonework.

(3) Reject stone with stains, cracks, chips or seams.

(4) Check all work against shop drawings and/or sample panels.

(5) Check anchors, clamps and dowels for specified type of materials, size, shape spacing and proper installation.

o. Structural Clay Facing Units

(1) Are the units of the proper finish, texture and color range?

(2) Are bodies of units free from cracks or strength-impairing defects?

(3) Are finished faces covered with ceramic glaze of uniform quality, free from defects which would detract from appearance WHEN VIEWED FROM A DISTANCE OF FIVE (5) FEET?

(4) Obtain copy of ASTM C-126 or other referenced specification and base acceptance or rejection on tolerances contained therein.

(5) Have units been checked for non-staining properties?

4-06. ERECTION

a. Protection

(1) Is ambient (surrounding) temperature at or above the minimum temperature specified?

(a) For temperature below the minimum temperature specified, contractor shall submit for approval a written proposal of methods of protecting masonry against cold weather.

(b) Frozen materials shall not be installed or built upon.

(c) Work becoming frozen after installation shall be removed and replaced.

(d) Keep in mind that mortar must be kept continuously above freezing for at least 48 hours after units are laid, never less than 40 hours. A copy of the IMIAWC (International Masonry Industry All-Weather Council) publications on Cold Weather Masonry construction should be available.

(2) Waterproof covering are required for top of unfinished walls, including the cavity spaces. Water entry through the top of unfinished walls contribute to efflorescence stain on the face of finish wall surfaces.

(a) Use waterproof building paper, canvas, polyethylene sheeting and similar materials; not loose planks.

(b) Tie or weight in place; not just draped.

(c) Are coverings provided at the end of each work day?

(d) Are coverings provided whenever inclement weather occurs?

(e) Protect tops of complete walls from entrance of water, frost and snow until roof is in place and tight.

(3) Backfill adjacent to masonry walls

(a) Is parging required and applied to exterior concrete masonry walls below grade for basement spaces at least 3 days before backfilling against it?

(b) Carry backfill up evenly in specified lift thickness on both sides of walls.

(c) For masonry walls in basements and crawl spaces, it is best to wait until floor slab or framing is in place before placing exterior backfill. Temporary bracing may be required.

b. Erection Procedures

(1) Check masonry dimensions against existing foundations and structural framing.

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(a) The two must coincide.

(b) Bring any discrepancies to the attention of your supervisor immediately.

(c) Has tie-in to reinforced concrete structural frame been provided for?

(2) Check vertical coursing against dimensional wall heights. Would a minor change in joint width eliminate a fractional course?

(3) Check horizontal layout by either a dry-run or by tape.

(a) Is layout accurate to avoid fractional length units?

(b) Are openings located so units are of same length against both jambs? (Occasionally, openings can be slightly adjusted.)

(c) Check for conflicts between openings and partitions or equipment locations.

(d) Check that minor adjustments are made in width of head joints to keep bond plumb.

(4) Check control joints for type and location.

(a) When control joints in concrete masonry units, concrete brick and split-block are spaced more than 30 feet apart for exterior walls and more than 38 feet apart for interior walls, notify your supervisor. This is the maximum permitted with joint reinforcement in each masonry course.

(b) Control joints should be located at jambs of openings rather than a couple of feet away from opening.

(c) With control joint at jamb, is bond barrier provided under lintel bed joint? Is bond barrier made of 16-ounce sheet copper?

(d) Joint reinforcement does not pass through control joints.

(e) A good idea for control joint alignment is to carry a 3/8-inch wood strip at that head joint during erection.

(f) Check drawings for control joints that pass through bond beams. Usually every third control joint cuts the bond beam, the others are dummy joints.

(5) Is contractor erecting leads at corners and jambs?

(a) Is contractor using a story-pole to establish coursing in leads?

(b) Do not allow complete dependence on string lines between the leads. Use story pole to check coursing between the leads.

(c) Are masons using levels to check plumbness and face alignment?

- (6) Is cutting of CMU and tile being done by power masonry saw? Are CMU being wet cut? If so, they must be surface dry when used in the wall.
- (7) Are all joints in similar walls being finished with same size tools?
- (8) Are masons waiting for initial set of mortar before tooling joints? (At the end of each work day, either the mason must stop laying masonry prior to quitting time to allow mortar to take initial set before tooling, or a mason must be kept on overtime to perform the tooling after the initial set has taken place.) A good rule to follow on the job is that mortar be "thumb-print" hard when tooling is done.
- (9) If units are moved after mortar takes initial set, remove and replace them, using fresh mortar.
- (10) Has excess mortar been removed from faces of units and joints before setting up?
- (11) Are flashings installed in base courses, Under sills and copings and over lintels and bond beams? See sheet metal chapter for guidance on flashing.
- (12) Is joint reinforcing called for? Continuously around building? Under sills? Over lintels?
- (13) Are bond beams called for? At floor levels? Under sill? At or above lintel level? At top of wall? At intermediate locations?
- (14) Does brick pattern call for header courses? Full or dummy?
- (15) Cavity or composite construction may be laid up together so that the inner and outer wythes level off at all bed joints where ties or joint reinforcing occur.
- (16) Are steel strap anchors installed across chase walls as stiffeners at wall mounted fixtures, two above and two below each fixture?
- (17) Are Weep holes required wherever thru-wall flashing is used, such as at base of cavity walls, over lintels, over bond beams?
- (18) Door and Window Frames
- (a) Are the specified numbers of anchors provided for each jamb?
- (b) Have hollow door frames been filled solid with mortar?
- (c) Is hollow masonry at jambs filled with mortar for embedment of anchors?
- (d) Check dimensions of approved sash and sills. Will they fit in the masonry opening?

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(19) Embedded Items

(a) Check mechanical and electrical drawings for equipment, piping, wiring and conduit locations. Shop drawings with the location of sleeves is very useful.

(b) Sleeves and equipment will be built in as masonry is erected, not cut in afterwards.

(c) All cutting and fitting of masonry around equipment pipe lines, etc. shall be done by masons.

(d) Set flush type electric boxes so that bottom of boxes are at bed joints. This may mean a slight adjustment to given height for some boxes.

(20) Calked or Sealed Joints

(a) Are control joints being raked out uniformly and to the proper depth? Rake out 3/4-inch on exterior and 1/4 or 1/2-inch (square end CMU) on interior.

(b) Check requirements for brick expansion joints.

(c) Are wash-surface joints in precast sills being raked out?

(d) Is calking being accomplished around framed openings as required?

(e) Usually interior CMU control joints are raked out but not calked. Use No. 1 calking compound where required. Use No. 1 or No. 2 sealant on exterior.

(21) Tothing is allowed only with contracting officer approval.

(22) Incomplete walls, not capable of self-support, will be temporarily braced against wind pressure.

(23) Check masonry abutting steel and other rigid construction. provision for expansion and contraction must be detailed.

c. Batching and Use of Mortar

(1) Is mortar accurately proportioned?

(a) Check for use of approved laboratory established proportions. Type N mortar is usually required.

(b) Contractor must provide an accurate volume measuring device, such as a box of one cubic foot volume.

(c) Check proportioning at least once a week and whenever mortar tenders are changed.

(2) Mechanical mixers should be used on all but smallest jobs.

(3) Special mix and materials are required for pointing mortar and firebrick.

(4) Is mortar being used up within specified time limits?

(a) Time limit is 2 1/2 hours.

(b) Stiffened mortar can be retempered within that time limit but mortar beginning to set must be discarded.

d. Brick

(1) Has clay or shale brick been tested for rate of absorption?

(a) Test will be performed by approved laboratory.

(b) Brick will be wetted as indicated by test results.

(c) At time of laying, brick will be damp but with no visible water film on exterior surfaces.

(2) Is brick being shoved into place?

(a) Joints should be filled solidly when and as the brick is laid.

(b) Either the "end buttering" or "pick and dip" method is acceptable.

(c) Unfilled head joints is a repetitive deficiency and if not corrected results in leaky walls. "Slushing" to fill head joints, after brick is laid, is not acceptable.

(d) Check to assure that mortar bond is not broken between newly laid units and their mortar joints.

(3) Is space between brick facing and backup masonry, in solid walls, completely filled with mortar?

(4) Are structural header courses or metal ties installed between face and backup masonry?

(a) Are side joints filled with mortar for entire length of header brick?

(b) Are metal ties of specified material, shape, size and at proper spacing?

(5) Are all exposed joints of uniform width? A tolerance is given in the specifications?

e. Concrete Masonry Units (CMU)

(1) Are starting courses and other specified courses full-bedded in mortar under both face-shells and webs?

(2) Are all other courses, face-shell bedded only?

(3) Are all units laid up with a full head joint for face-shell thickness?

(4) Are units checked just prior to installation for chips, cracks, and defective units?

(5) Are joints of uniform width and finished appearance?

(6) Are all cuts being made by wet masonry saw?

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(7) Are sizes of units such that difference between vertical faces does not exceed 1/8 inch? (This applies to exposed-to-view and painted masonry in habitable rooms and spaces.)

(8) Is felt paper provided on three sides of mortar key in control joints?

(9) Are the special control joint and metal-sash jamb CMU available in both full and half sizes?

(10) Are bond beams constructed entirely of special "U"-shaped bond beam block? If 10 inch concrete masonry walls are specified, check to see if 10 inch bond beam block is available in your area. If not, notify your supervisor.

(11) Is reinforcing continuous, including bent corner bars, for full length of bond beam?

(12) Is vertical cell reinforcing in place and the cells filled full with concrete?

(13) Are all lintels of depth specified and with minimum of 8-inch bearing? Bearing shall be greater for openings over 8 feet. See your details on the drawings.

(14) Are intersecting partition anchors being installed as exterior walls are erected?

(15) Are ties provided in masonry furring for securing facing units?

(16) Has interior face of exterior walls been dampproofed? Check prior to installing furring for plaster or gypsum board.

(17) Are cuts for electric boxes and panels and other built-in items being made by masonry saws and sized so plate or frame will completely cover them?

(18) Is there a specification that electrical conduit be concealed in 4-inch, exposed, block partitions?

(a) It is all but impossible to construct proper appearing masonry under these conditions.

(b) Bring immediately to the attention of your supervisor.

f. Structural Clay Facing Units

(1) Facing tile shall be layed with full bed and head joints.

(2) Layout will be planned to avoid using pieces shorter than 4-inches.

(3) Base units only may be 2-face; other courses two unit construction in walls with facing unit finish both sides.

(4) Glazed Tile Wainscots - Use the number of full courses that will come nearest to specified height. If more than 2" below specified height, add another full course.

(5) Joints in glazed tile shall be not less than 3/16 inch nor more than 1/4 inch in width.

(6) Joints in showers and kitchens shall be raked back and filled with pointing mortar.

(7) Faces of tile will be cleaned with damp rag as work progresses.

g. Cavity Wall Construction

(1) Is cavity drainage provided by a step in the foundation wall so that exterior wythe is below finish floor elevations, a mortar wash fill at base of cavity with weep holes, or by means of flashing?

(2) Or are thru-Wall flashing and weep-holes provided at base of wall and also over lintels, bond and spandrel beams?

(a) Are Weep-holes at specified spacing?

(b) Are flashings continuous with water-tight joint?

(3) Are cavities being kept clean?

(a) Is wood strip set across ties to catch mortar droppings?

(b) Is excess mortar, squeezed out of joints, cut off flush on cavity faces?

(4) Are box type wire ties, minimum width 4 inches, being used? These ties may be an integral part of joint reinforcing wire, if required. If installed separately, do not place both in same bed joints.

(a) Is length of box ties proper to provide anchorage in face-shell mortar beds?

(b) Are box tie drips located within the air space of cavity?

(c) Is spacing of ties as specified?

(d) Have additional rows of ties been installed at jambs of openings, at either side of control joints, and at corners?

(a) Are solid masonry returns at jambs of opening detailed rather than extra ties?

h. Composite Wall Construction

(1) The collar joint between wythes shall be completely filled with mortar or grout.

(2) Is anchorage provided between wythes, either with ties or continuous type joint reinforcement?

i. Chimneys and Fireplaces

(1) Is flue-lining being carried up integral with masonry?

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(2) Is space between masonry and flue lining filled solid with mortar? If there is more than one flue in the chimney, have masonry wythes (partitions) been installed between flues?

(3) Is thimble sized and located to meet approved smoke pipe?

(4) Is fireplace throat and smoke chamber free of obstructions?

(5) Are damper, lintel angle and ash cleanout installed?

(6) Are required number of metal ties installed for bonding face and fire brick?

j. Anchors, Ties and Joint Reinforcement

(1) Anchors and ties will be installed as the work progresses

(2) For the flexible ties between structural steel columns and masonry walls - Is clearance space also provided between column and masonry to allow for differential movement?

(3) Cells of CMU will be filled with mortar where anchors and ties occur.

(4) Is joint reinforcing installed with mortar above and below it?

(5) Are sections of joint reinforcing lapped the specified amount? Required lap is greater for smooth wire than for deformed wire.

(6) Check for the required use of preformed joint reinforcing around corners and at intersecting walls. The specified ties are required in addition to joint reinforcing when masonry bond is not provided.

k. Cleaning of Masonry

(1) A little care during the laying of masonry, including removing mortar droppings, careful tooling of joints and daily dry brushing, will keep the cleaning operations to a minimum.

(2) A cleaning solution is specified for brick, however, the selection of detergent shall be verified by checking the sample panel for discoloration or stain before proceeding. (Remember that the sample panel was cleaned after erection.)

(3) Make cleaning operation one of last phases of job. Do not start before mortar is thoroughly set and cured.

(4) Remove large particles of mortar with putty before washing.

(5) Stain or discoloration remaining on brick after cleaning shall be removed with a 6 percent solution of muriatic acid applied with stiff fiber brushes. When acid is used goggles, gloves and other personnel protective equipment must be provided and used. Scaffold and boatswain*s chair ropes must be carefully protected.

- (a) Soak area to be cleaned with plenty of water before applying acid.
 - (b) The brickwork below the area being cleaned should be kept thoroughly soaked with water.
 - (c) Clean only 10 to 20 square feet at a time for each man.
 - (d) Scrub the brick, not the mortar joints.
 - (e) Wash the wall thoroughly with plenty of water immediately after scrubbing with acid.
- (6) Concrete Masonry Units
- (a) Remove excess mortar from joints and faces of units.
 - (b) Brush all dust and foreign matter from faces of walls.
 - (c) Never use the acid wash on concrete masonry.
 - (d) If tooling has not produced uniform joints, it may be necessary to rub them with carborundum stones.
 - (e) Re-point joints as necessary for watertightness and appearance.
- (7) Glazed Structural Tile and Prefaced Masonry
- (a) Masons should remove mortar smears from face of tile with clean damp rags, immediately after laying.
 - (b) Upon completion of walls, wash all surfaces of tile with soap powder and clean water, using stiff fiber brushes.
 - (c) Remove hard lumps of mortar with wooden paddles.
 - (d) Metal cleaning tools, metal brushes and acid solution should not be used.
 - (e) Re-point joints as necessary for watertightness and appearance.

4-07. REINFORCED MASONRY

a. Reinforced masonry construction uses different terms and methods not found in the material just presented. The QA/QO Reps must become well informed on this material before the Preparatory Phase Meeting.

b. Following are some of the common terms:

- (1) Reinforced masonry uses embedded reinforcement, such that the materials act together in the wall to resist lateral forces.
- (2) Reinforced composite masonry consists of solid facing units bonded to reinforced hollow masonry backing. The collar joint is filled with mortar or grout.

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(3) Reinforced solid unit masonry also consists of two wythes separated by a collar joint. Both wythes are built of solid units and the collar joint is reinforced and filled with grout.

(4) High lift grouting is the method used to fill masonry with grout in lifts from 2 feet to 4 feet high. Masonry clean-outs are required for this method.

(5) Low lift grouting includes lifts up to 2 feet and does not require cleanouts.

(6) Vertical grout barriers are used to limit horizontal flow of grout to 25 feet for each high lift grout pour. Construct grout barriers with solid masonry units.

(7) Caging devices and centering clips are embedded in masonry to position vertical reinforcing either in collar joints or in the cells of hollow masonry.

(8) Grout holes are provided in overhead construction such as slabs and spandrel beams, aligned with reinforcing in masonry below. Grout holes must be at least 4 inch diameter or 3 by 4 inch in horizontal dimension.

c. Check for special tests and requirements for samples, certificates, certified test reports, shop drawings and for the installation of the special materials in the sample panel.

d. Check for the proper grout mix depending on usage.

e. A low alkali cement is usually used in reinforced masonry to reduce chances for efflorescence. Masonry cement usually is not permitted.

f. Watch for additional tolerances specified for masonry layup.

4-08. POINTING AND CLEANING

a. Pointing

Has the construction been checked for defects and have defects been repaired? Remember the pointing of joints requires re-tooling.

b. Cleaning

Has all masonry been carefully and thoroughly cleaned as required? Efflorescence shall be removed following the masonry manufacturer*s recommended methods.