READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [ ] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [ “ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Shift) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

This document provides a guide for specifying concrete unit masonry including concrete building bricks and hollow load, non-load-bearing and solid load-bearing concrete masonry units. It also includes autoclave concrete masonry units. Bonding of multiple-wythe walls and abutting walls and partitions is limited to wire and masonry-type bonds.

These guide specifications are prepared with the assumption that drawings indicate pattern details, extent, and arrangement of masonry; that plans indicate location, horizontal dimensions and masonry unit width that elevations indicate design, vertical arrangement and dimensions; and that sections and details indicate vertical coursing and special conditions, such as junctions with other building components, anchorage, solid-bearing requirements, expansion and control joints, flashing, sealants, locations and size of reinforcement and length of laps in lapped splices.

Specifications describe concrete masonry units in terms of face dimensions, materials composition, installation workmanship and cleaning, bond types, fire ratings and joint tooling.

Masonry sills, copings and lintels should be closely coordinated with this specification section or combined with concrete masonry units into a single specification section, depending upon the complexity of the Project.

Within the guide specifications are several blank spaces which must be filled in to indicate Type, Grade, etc. There are two types available: Type I is moisture-controlled (kiln-dried); Type II is non-moisture-controlled. Generally, Type I is specified because it is less likely to develop shrink breaks. Concrete building brick and hollow load-bearing, hollow non-load-bearing, and solid loadbearing units are available in both types. Hollow units, both load-bearing and non-load-bearing, must also be specified as to grade. Two grades are available: Grade N for general use in exterior walls above or below grade that may or may not be exposed to moisture penetration or the weather; Grade S, limited to above grade in exterior walls with weather-protective coatings and in walls not exposed to the weather. As a rule, non-load-bearing units are used above grade in protected areas and therefore are always specified as Grade S. Grade N must test fc 1000 psi, whereas Grade S must test only fc 700 psi.

Concrete Building Brick and Solid Load-Bearing units are available in three grades: Grade G, fc = 1200 psi, for backup of interior masonry or where protected against moisture; Grade P, fc = 1800 psi, for moderate strength where exterior walls are protected from moderate frost action; Grade U, fc = 1800 psi, for veneer facing units in exterior walls where high strength and resistance to moisture penetration and severe frost action are desired. Although there is some strength difference, grading is based on resistance to frost action and degree of exposure. Refer to ACI Bulletin 67-23, “Concrete Masonry Structures Design and Construction.”

There are many special styles manufactured for particular uses. Care should be exercised in specifying blocks by name since “Bullnosed Beam Lintel” block may be only supplied by one manufacturer.

1. GENERAL
   1. SUMMARY OF WORK
      1. The extent and location of the “Concrete Unit Masonry” Work is indicated in the Contract Documents.
   2. GOVERNING CODES, STANDARDS, AND REFERENCES
      1. Governing Codes, Standards, and References:
         1. Building Code Requirements and Specification for Masonry Structures (MSJC)
         2. American Society for Testing and Materials (ASTM)
            1. ASTM A82, Standard Specification for Steel Wire
            2. ASTM A116, Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric
            3. ASTM A153, Standard Specification for Zinc Coating (Hot-Dep) on Iron and Steel Hardware
            4. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
            5. ASTM B227, Standard Specification for Hard-Drawn Copper-Clad Steel Wire
            6. ASTM C55, Standard Specification for Concrete Building Brick
            7. ASTM C90, Standard Specification for Loadbearing Concrete Masonry Units
            8. ASTM C129, Standard Specification for Nonloadbearing Concrete Masonry Units
            9. ASTM C140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
            10. ASTM C270, Standard Specification for Mortar for Unit Masonry
            11. ASTM C426, Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units
            12. ASTM C476, Standard Specification for Grout for Masonry
            13. ASTM C516, Standard Specification for Vermiculite Loose Fill Thermal Insulation
            14. ASTM C549, Standard Specification for Perlite Loose Fill Insulation
            15. ASTM C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
            16. ASTM C612, Standard Specification for Mineral Fiber Block and Board Thermal Insulation
            17. ASTM D2240, Standard Test Method for Rubber Property—Durometer Hardness
            18. ASTM E72, Standard Specification Methods for Conducting Strength Tests of Panels for Building Construction
            19. ASTM E90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
            20. ASTM E119, Standard Test Methods of Fire Tests of Building Construction and Materials
         3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers
            1. ASHRAE, Fundamentals Handbook
      2. All Work shall comply with the applicable provisions of [the International Building Code] [the City of Seattle Building Code].
   3. SUBMITTALS
      1. Submit materials data in accordance with Section 01 33 00 - Submittals. Furnish manufacturers’ technical literature, standard details, product specifications, and installation instructions for all products.
      2. Submittals shall include the following:
         1. Mix Design and Test Results
            1. One of the following for each mortar mix:

Mix designs indicating type and proportions of ingredients in compliance with the proportion specification of ASTM C270, or

Mix designs and mortar tests performed in accordance with the property specification of ASTM C270

* + - * 1. One of the following for each grout mix:

Mix designs indicating type and proportions of the ingredients according to the proportion requirements of ASTM C476, or

Mix designs and grout strength test performed in accordance with ASTM C476, or

Compressive strength tests performed in accordance with ASTM C1019, and slump flow and visual stability index (VSI) as determined by ASTM C1611/C1611M.

* + - * 1. Material certificates for the following, certifying that each material is in compliance:

Reinforcement

Anchors, ties, fasteners, and metal accessories

Masonry units

Mortar, thin-bed mortar for AAC, and grout materials

Self-consolidating grout

* + - * 1. Construction procedures

Cold weather construction procedures

Hot weather construction procedures

1. MATERIALS

A. If only one product is acceptable (single or sole source product), obtain an approved Competition Waiver and submit to the CPO Construction, Contract Administrator. The language shall read as: “Manufacturer Name, Product # XXXXX, No Equal.” Refer to CPO-6 Competition Waiver Policy for more information.

B. If a Competition Waiver is not approved or more than one product is acceptable, this section must list a minimum of 2 products plus the language “Or Approved Equal,” along with salient characteristics. Refer to CPO Construction’s Salient Characteristics Guidelines for more information.

* 1. PREPARATION FOR MATERIALS
  2. MATERIAL REQUIREMENTS
     1. Concrete Masonry Units
        1. Use concrete building brick conforming to the requirements of ASTM C55, Type [I] [II], Grade [G] [P] [U], with nominal face dimensions of 2-1/4 inches x 8 inches.
        2. Use hollow load-bearing units conforming to the requirements of ASTM C90, Type [I] [II], Grade [N] [S], with nominal face dimensions of 8 inches x 16 inches.
        3. Use hollow non-load-bearing units conforming to the requirements of ASTM C129 [normal weight aggregate] [half-and-half units] [lightweight aggregate], Type [I] [II], with nominal face dimensions of 8 inches x 16 inches.
        4. Use solid load-bearing units conforming to the requirements of ASTM C90, Type [I] [II], Grade [G] [P] [U], with nominal face dimensions of 8 inches x 16 inches.

Check ASTM reference for compressive strengths, types and grades. Also check availability of any special shape, pre-faced unit, aggregate weight, etc.

* + 1. Mortar and Grout
       1. Use mortar, for non-reinforced unit masonry, conforming to the property or proportion requirements of ASTM C270. Use Type [S; fc 1800 psi] [N; fc 750 psi] [O; fc 350 psi] [K; fc 75 psi] mortar. [Use grout, for non-reinforced unit masonry, conforming to ASTM 476.]
       2. Use mortar, for reinforced unit masonry, conforming to the requirements of ASTM C270.
       3. Use grout, for reinforced unit masonry, conforming to the requirements of ASTM C476, “Fine Grout” for filling voids with dimensions of less than 1-1/2 inches, “Coarse Grout” for filling voids with dimensions of 1-1/2 inches or larger.
       4. As grout for filling cavities in reinforced unit masonry walls, lintels, bond beams, pilasters, or columns, use “Pea Gravel” Concrete, compressive strength of 2500 psi. Add water in the field to maintain the design slump [approximately 10 inches], but place no grout which has been mixed longer than 1-1/2 hours.
    2. Reinforcement, Anchors, and Ties
       1. Use masonry joint reinforcement that is factory-fabricated from zinc-coated, cold-drawn steel wire, ASTM A82. Use reinforcement consisting of two or more deformed longitudinal wires, minimum size No. 9 gage, weld-connected with minimum size No. 9 gage cross wires, forming a truss or ladder design. Zinc coating: ASTM A116, Class 1, except that cross wires used for cavity wall ties shall be Class 3. Arrange out-to-out spacing of longitudinal wires approximately one inch less than the nominal width of the block or wythe in which it is placed. Do not allow the distance between welded contacts of cross wires with each longitudinal wire to exceed 16 inches.
          1. Furnish joint reinforcement in flat sections 10 to 20 feet in length, except that factory-formed corner reinforcements and other special shapes may be less.
       2. Use steel bar reinforcement conforming to ASTM A615, [Grade 40] [Grade 60].
       3. Use anchors and ties of zinc-coated ferrous metal of the types specified. Zinc coating shall be ASTM A153, Class B-1, B-2, or B-3, as applicable. Copper cladding of steel wire shall conform to the requirements as specified for Grade 30 HS wire in ASTM B227.
          1. Wire Mesh Ties: 1/2-inch mesh of steel wire, minimum of 16 gage, minimum of 12 inches in length, and one inch less in width than wall in which placed.
          2. Rigid-Steel Anchors: 1-1/2 inches by 1/4 inch with ends turned up minimum of two inches, not less than 24 inches long.
          3. Cavity-Wall Ties: 3/16-inch diameter, formed in a rectangular shape four inches wide for hollow units laid with cells vertical and formed in a U or Z shape for solid units.
          4. Dovetail Anchors: Minimum of 16 gauge, one inch wide, turned up 1/4 inch at outer end.
          5. Corrugated or Crimped Metal Ties: Sheet steel not less than 7/8 inch wide, 22 gage in thickness.
          6. Wire Ties Joint Reinforcement: 1/2-inch mesh of steel wire, minimum of 16 gauges, lengths as required.
          7. Length of Ties: two inches shorter than combined thickness of cavity and walls but not less than six inches.
    3. Control Joint Resilient Keys
       1. Use a factory-fabricated solid section of natural or synthetic rubber, a combination thereof, plastic, or other rubber-like material. Durometer hardness shall be not less than 70 when tested in conformance with ASTM D2240. The key shall be shape indicated and of dimensions to completely fill and fit neatly, but without forcing, in masonry-unit jamb or sash grooves, and to provide a control joint width of 3/8 inch with a tolerance of 1/16 inch. The shear section shall be of a 5/8 inch minimum thickness.
    4. Insulation
       1. Water-Repellent Loose-Fill Masonry Insulation:
          1. Perlite: ASTM C549, Type II (surface-treated for water repellency and limited moisture absorption.
          2. Vermiculite: ASTM C516, Type II (surface-treated for water repellency and limited moisture absorption), Grade 3 (Fine), complying with 29 CFR 1926 by containing less than 0.1 percent by weight of asbestos and then demonstration shows will not release asbestos fibers in excess of 0.1 fibers per cubic centimeter.
       2. Rigid Board-Type Insulation: Thickness shall be sufficient to provide a coefficient of heat transmission (“U” value) through the completed wall construction, air to air, maximum [\_\_\_] BTU/hour/ sq. ft./°F temperature difference when determined for winter conditions in accordance with ASHRAE Fundamentals Handbook.
          1. Mineral Fiber Board: ASTM C612, Class 1 and 2, nominal density of 3.0 pcf.
          2. Extruded Polystyrene: ASTM C578, Type II, Grade 2.
          3. Molded Polystyrene: ASTM C578, Type I, Grade 2.
       3. For adhering rigid board insulation to masonry, use adhesive types recommended by insulation manufacturers. Adhesive shall be non-combustible, non-toxic and have no persistent or disagreeable odor.
    5. Dampproofing
       1. Siloxane penetrating, water repellant, “Euco weather-Guard” as manufactured by Euclid Chemical Company, “Klere-Seal 908-SX as manufactured by Pecora Corp., “Weatherseal Siloxane” as manufactured by ProSoCo, Inc. or approved equivalent.
    6. Certification
       1. Furnish certificates, test reports, or other acceptable evidence that the masonry materials comply with specification requirements. Furnish certificates for the following materials:
          1. [\_\_\_]
          2. [\_\_\_]
    7. Fire-Resistance Classification
       1. Concrete masonry walls and partitions shall have the fire-resistance ratings indicated on the drawings. Units shall be of the minimum equivalent thickness specified for the fire rating and corresponding aggregate type.
  1. FABRICATION & SUPPLY OF MATERIALS
  2. MATERIAL HANDLING & STORAGE
     1. Store masonry units above ground on level platforms which allow air circulation under stacked units.
     2. Cover and protect against wetting prior to use.
     3. Handle units on pallets or flatbed barrows.
     4. Do not permit free discharge from conveyor units or transporting in mortar trays.
  3. QUALITY ASSURANCE & INSPECTIONS

1. EXECUTION
   1. PROJECT INFORMATION
   2. PREPARATION FOR EXECUTION
      1. Job Conditions
         1. Cold Weather Conditions:
            1. Do not place concrete masonry units when the air temperature is below 40°F.
            2. Protect in-place masonry construction from freezing by the use of enclosures, covers, or supplemental heat, or by a combination of the above, until the danger of temperature effect has passed.
         2. Hot Weather Conditions: Protect masonry construction from direct exposure to wind and sun when erected in an ambient air temperature of above 90°F in the shade with relative humidity of less than 50%.
         3. Dust Control: Use masonry saws equipped to collect masonry dust while cutting the units.
      2. Samples
         1. Sample Panels: Erect on the site sample panels, approximately 6 feet long by 4 feet high, of each of the following masonry materials [\_\_\_]. Sample panels shall be separate from the building and shall show facing backup or cavity Work and reinforcement. Full-size units shall be used to show color range, bond, mortar color, finish of joints and workmanship. After approval, the panels shall be the standard of minimum requirements of workmanship. The panels shall remain until removal is authorized by the Engineer.
         2. Units: [Five] [\_\_\_] representative full-size units of all masonry types to show range of colors, textures, finishes and dimensions.
         3. Anchors: Anchors, reinforcement and accessories, each type and size to be used.
         4. Insulation: One (1) bag of loose-fill insulation. A 12 x 12-inch sample of each board or blanket type.
         5. Adhesives: Labeled pint container of each type.
         6. Resilient Key Material: six-inch length of each type.
   3. EXECUTION OF WORK
      1. General
         1. Lay only dry Type I masonry units. Type II units need not be dry where installed underground or below the water table.
         2. Use masonry saws to cut masonry units for proper fit.
         3. Run bond with vertical joints located at center of masonry units in alternate course below, unless indicated otherwise.

OR

* + - 1. Stack bond with vertical joints aligned.
      2. Set units plumb, true to line and with level courses accurately spaced.
      3. Adjust masonry unit to final position while mortar is soft and plastic.
      4. If units are displaced after mortar has stiffened, remove them, clean the joints and units of mortar, and re-lay the units with fresh mortar.
      5. Adjust shelf angles to keep masonry level and at proper elevation.
      6. Provide pressure-relieving joints by placing a continuous 1/8-inch foam neoprene pad under the shelf angle and seal joint with sealant specified in Section 07 92 00 - Joint Sealers, of these specifications.
      7. When joining fresh masonry to set or partially set masonry construction, clean the exposed surface of set masonry and remove loose mortar prior to laying fresh masonry.
      8. If necessary to stop off a horizontal run of masonry, rack back one-half block length in each course.
      9. Do not use toothing to join new masonry to set or partially set masonry when continuing a horizontal run.
      10. Keep chases and raked-out joints free from mortar or debris.
      11. Solidly fill spaces around metal door frames and other built-in items with mortar or grout.
      12. Install anchors, wall plugs, accessories, flashings and other items to be built in as the masonry Work progresses.
    1. Protection of Work
       1. Protect sills, ledges and offsets from mortar drippings or other damage during construction.
       2. Remove misplaced mortar or grout immediately.
       3. Cover the top of walls with non-staining, waterproof, protective coverings when Work is not in progress.
       4. Provide a minimum 2-foot overhang of protective covering on each side of each wall, and securely anchor, when Work is not in progress.
       5. Protect face materials against staining.
    2. Mortar Beds
       1. Hollow Units:
          1. Lay with full mortar coverage on horizontal and vertical face shells.
          2. Provide full mortar coverage on horizontal and vertical face shells and webs in all courses of the following:

Piers, columns and pilasters.

Starting course on footings and solid foundation walls.

Where adjacent to cells or cavities to be filled with grout or concrete.

* + - 1. Solid Units: Lay with full mortar coverage on horizontal and vertical joints.
    1. Reinforcing
       1. General: Accurately cut to length all reinforcement and bend by methods that will prevent damage to the material. Before placing bars in the masonry, straighten, without damage to the material, all kinks or bends in the bars caused by handling incidental to delivery.
       2. Joint Reinforcement: Place masonry joint reinforcement so that longitudinal wires are located over face-shell mortar beds and are fully embedded in mortar for their entire length with a minimum mortar cover of 5/8 inch on the exterior side of walls and 1/2 inch at other locations. Extend joint reinforcement at openings no less than 24 inches beyond the end of sills or lintels or to the end of the panel if the distance to the end of the panel is less than 24 inches. Joint reinforcement shall not be continuous through a control joint or an expansion joint. Lap joint reinforcement six inches or more. Install factory-fabricated sections at corners and wall intersections.
       3. Placing Reinforcement:
          1. Minimum Bar Spacing: The minimum clear distance between parallel bars, except in columns, shall be equal to the nominal diameter of the bar.
          2. Splices in Reinforcement: Make splices only at such points and in such a manner that the structural strength of the member will not be reduced. Provide sufficient lap using lapped splices to transfer the working stress of the reinforcement by bond and shear. The minimum lap shall be 30-bar diameters. Develop the strength of the reinforcement with welded or Splices in Reinforcement: Make splices only at such points and in such a manner mechanical connections.
          3. Protection for Reinforcement: Completely embed all bars in mortar or grout. Provide all reinforcement with a coverage of masonry not less than the following:

Three inches for bottom of footings.

Two inches on vertical members where masonry is exposed to action of weather or soil for bars larger than 5/8 inch, and 1-1/2 inches for bars 5/8 inch or less.

1-1/2 inches for all reinforcement in columns.

1-1/2 inches on bottom and sides of beams or girders.

3/4 inch from faces of all walls not exposed to action of weather or soil.

One-bar diameter over all bars, but not less than 3/4 inch at upper faces of any member, except where exposed to weather or soil, in which cases minimum coverage shall be two inches or three inches, respectively.

5/8 inch at exposed face of wall for reinforcement consisting of bars or wire 1/4 inch or less in diameter embedded in the horizontal mortar joints.

1/4 inch between masonry units and reinforcement, except that 1/4-inch bars may be laid in 1/2-inch horizontal mortar joints, and No. 6 gage or smaller wires may be laid in 3/8-inch horizontal joints. Vertical joints containing both horizontal and vertical reinforcement shall be not less than 1/2 inch larger than the sum of the diameters of the horizontal and vertical reinforcement contained therein.

* + 1. Joints
       1. Horizontal and Vertical Face Joints:
          1. Nominal thickness: 3/8 inch.
          2. Construct uniform joints.
          3. Shove vertical joints tight.
          4. Cut joints flush in surfaces to be plastered, stuccoed, or covered with other masonry or other surface-applied finish other than paint.
          5. Point joints tight in masonry below ground.
          6. Tool joints in exposed or to-be-painted surfaces when thumb-print hard with [round] jointer.
          7. Remove mortar protruding more than 1/2 inch into cells of cavities to be reinforced or filled.
          8. Fill horizontal joints with mortar between the top of masonry partitions and the underside of concrete slabs or beams.
       2. Collar Joints: Except in cavity walls, fill with mortar by back-parging either facing or backing wythe and shoving, or by grouting.
       3. Raked Joints: Provide raked joints for sealing on the exterior face at control joints and at such other locations where sealed joints are indicated. Rake such joints to a uniform depth of [\_\_\_] inch(es).
    2. Grouting
       1. Do no grouting until hollow masonry walls have been constructed for a minimum of four hours; fill vertical cells full of grout, where indicated, making no lifts or pours more than 48 inches in height. Puddle or vibrate grout to ensure that voids are filled as required. Clean and wet the surface of the preceding pour before making new pours; if grouting is stopped for more than one hour, form a horizontal construction joint by stopping the pour 1-1/2 inches below the top of the uppermost masonry unit.
    3. Bonding
       1. Bond the facing and backing of multiple-wythe masonry walls, load-bearing and non-load-bearing, in accordance with the following methods:
          1. Bonding with Metal Ties: Bond the facing and backing (adjacent wythes) of masonry walls with cavity wall ties or metal wire of equivalent stiffness embedded in the horizontal mortar joints. Provide a minimum of one 3/16 wire tie for not more than each 4-1/2 square feet of wall area, or one corrugated tie for not more than each two square feet of wall area. Stagger ties to alternate courses embed them in the face shell of hollow units. The maximum vertical distance between ties shall not exceed 24 inches, and the maximum horizontal distance shall not exceed 36 inches. Use rods or ties bent to rectangular shape with hollow masonry units laid with the cells vertical. In other walls, bend the ends of ties to 90 degree angles to provide hooks not less than two inches long. Provide additional bonding ties at all openings, spaced not more than three feet apart around the perimeter and within 12 inches of the opening.
          2. Bonding with Prefabricated Joint Reinforcement: Bond the facing and backing (adjacent wythes) of masonry walls with prefabricated joint reinforcement. There shall be one cross wire serving as a tie for not more than each two square feet of wall face area. The vertical spacing of the reinforcement shall not exceed 16 inches. Thoroughly embed the longitudinal wires in the mortar.

Bonding with masonry headers and bonders is considered too expensive by most masonry contractors. The use of metal ties is recommended as a better and faster method.

* + - * 1. Bonding with Masonry Headers: Where the facing and backing of masonry construction are bonded by means of masonry headers, a minimum of four percent of the wall surface of each face shall be composed of headers extending not less than three inches into the backing. The distance between adjacent full-length headers shall not exceed 24 inches, either vertically or horizontally. In walls in which a single header does not extend through the wall, overlap headers from the opposite sides at least three inches, or cover headers from opposite sides with another header course overlapping the header below at least three inches.
        2. Bonding with Masonry Bonders: Where two or more masonry units are used to make up a thickness of a wall, bond the inner and outer wythes at vertical intervals not exceeding 34 inches by transverse lapping of stretcher units at least three inches over the units below, or by lapping with units at least 50 percent greater in width than the unit below at vertical intervals not exceeding 17 inches.
      1. Bonding Faced or Composite Walls: Bond faced or composite walls as provided, or where the facing and backing are bonded by means of masonry headers, extend such headers not less than three inches into a hollow masonry backup unit designed to receive and provide mortar bedding for the header. The thickness of masonry units used as facing shall be not less than two inches and in no case less than 1/8 the height of the unit.
      2. Bonding Hollow Units in Cavity Walls: Bond the facing and backing of cavity walls as required in subparagraph A.1. or subparagraph A.2. above.
      3. Masonry Laid in Stack Bond: Provide masonry units laid in stack bond with continuous prefabricated joint reinforcement or other steel bar or wire reinforcement embedded in the horizontal mortar beds at vertical intervals not to exceed 16 inches.

Waterproofing may make weepholes unnecessary. In Seismic Zone 3, through-the-wall flashing can cause shear failure and seriously weaken the structure. Consider the need and use of dowels and special reinforcement to solve shear problems.

* + 1. Weepholes
       1. Provide in mortar joints of exterior wythes of cavity walls.
       2. Install along bottoms of cavities over foundations, bond beams, [through wall flashings] and other waterstops in the wall.
       3. Space 32 inches o.c.
       4. Keep free of mortar and other obstructions.
       5. Cover the cavity side of weepholes with copper or plastic insect screen cloth before placing loose-fill masonry insulation between wythes.
    2. Anchorage
       1. General: Securely anchor all structural elements depending upon one another for continuity or support.
       2. Intersection of Walls and Partitions: Securely anchor or bond masonry walls and partitions, at points where they meet or intersect, by one of the following methods:
          1. Bonding: Bond walls by:

Laying at least 50% of the units at the intersection in a masonry bond, with alternate units having a bearing of not less than three inches upon the unit below; or,

Metal ties, joint reinforcement, or anchors, as indicated.

* + - * 1. Interior Non-Load-Bearing Walls: Anchor interior non-load-bearing walls at their intersections, at vertical intervals of not more than two feet in centers, with metal ties extending at least four inches into the masonry, or with other ties which provide an equivalent method of anchorage.
      1. Walls Carried Up Separately: Where the courses of meeting or intersecting walls are carried up separately, make corner intersections by regularly toothing or blocking with eight-inch maximum offsets and provide the joint with rigid steel anchors. The maximum vertical spacing of such anchors shall be four feet. Space other metal ties, joint reinforcement or anchors, if used, to provide equivalent anchorage at the intersection to that required by this section. Similarly bond other intersections, except that the masonry bond may be omitted.
      2. Walls Adjoining or Intersecting Structural Framing: Anchor curtain walls, panel walls, or other walls dependent upon the structural frame for lateral support, to the structural members with flexible metal anchors, or otherwise key to the structural members.
      3. Anchorage of Furring: Anchor masonry furring to the backing with hardware cloth ties extending at least 1-1/4 inches into the facing and backing or by an equivalent means of anchorage. Space ties not farther apart than 24 inches vertically and 36 inches horizontally. Powder-actuated fasteners may be used in accordance with Department of Labor and Industry standards.
    1. Built-in Work
       1. Install bolts, anchors, nailing blocks, inserts, frames, vents, flashings, conduit and other built-in items as masonry Work progresses.
       2. Solidly grout spaces around built-in items.
       3. Provide outside joint around exterior door and window frames and other framed wall openings as follows:
          1. Width: 1/4 inch to 3/16 inch.
          2. Rake (and tool smooth) to a uniform depth of [\_\_\_].

Check with sealant manufacturer for above depth.

* + 1. Control Joints
       1. Provide control joints in accordance with the locations and details indicated on the drawings and construct the joints by using special control-joint units, open-end stretcher units, or metal-sash-jamb units and control-joint key. Extend control joints through bond beams, unless otherwise indicated. On the weather side of exterior walls, rake out control joints about [\_\_\_] inch and leave ready for sealing. (See Section 07 92 00 - Joint Sealers.) On the exposed-to-view faces of interior walls, rake control joints to a depth of 3/8 inch and [neatly tool square and smooth] [caulk as indicated].
    2. Insulated Masonry Walls
       1. General: Insulate exterior cavity walls, where indicated, [by completely filling the cavity between the wythes] [by completely filling the cells of the inner wythe] with loose-fill insulation, or [by installing board-type insulation on the cavity side of the inner wythe]. [Insulate exterior single-wythe hollow-masonry-unit walls by completely filling the cells of the units with loose-fill insulation.] [Insulate exterior masonry walls by installing rigid board insulation on inner face.] Completely bring up insulation to the elevations indicated for the underside of [door and] window sills, bond beams, lintels, through-wall flashing, and similar interruptions through the cavity before installing these items.
          1. Loose-Fill Insulation: Pour the insulation from the top of each height of wall section completed and allowed it to assume its natural density. Do not tamp loose-fill insulation.
          2. Board-Type Insulation: Apply directly to the masonry with adhesive. Neatly fit insulation between obstructions [without impaling the insulation on cavity-wall ties or anchors]. Apply the insulation in parallel courses with joints breaking midway over the course below, apply in moderate contact with adjoining units without forcing, and cut to fit neatly against adjoining surfaces.
    3. Masonry and Precast Concrete Sills and Coping
       1. Set with faces plumb and true in a full bed of mortar; except, for precast concrete sills with lugs, provide mortar beds under the ends of the sills only until completion of the walls, at which time solidly fill the remainder of the bed joint under the sill with mortar and tool it smooth on the exposed face. Use dowels to attach coping to masonry walls. Build in flashing, as specified elsewhere, or provide for its installation later in accordance with the details. Make dowel holes and other openings in flashing watertight with mastic waterproofing compound. Provide expansion joints and caulking where indicated.
    4. Lintels
       1. Furnish and place precast concrete or concrete masonry lintels of the type and dimensions shown and of the quality specified herein. Extend lintels at least eight inches beyond edge of openings and firmly bed them at bearings in mortar of the same quality as used in laying the wall. Where ends of lintels are at control joints, level the bed joint at such ends and cover it with a sheet of 16-ounce smooth copper with edges cut back 1/2 inch from face of wall, and rake out the bed and end joint for caulking.
    5. Bond Beams
       1. Bond beams shall consist of load-bearing units filled with concrete or grout and reinforced as indicated. Reinforcement shall be continuous except through [expansion joints] [control joints]. Where the bond beam is not broken at the control joint, form a dummy control joint in the bond beam.
    6. Bearing Plates
       1. Set bearing plates for beams, joists, joist girders and similar structural members to the proper line and elevation with damp-pack bedding mortar, except where non-shrink grout is indicated.
    7. Chases
       1. Build chases in; do not cut.
       2. Minimum installation distance from jambs of openings: one concrete masonry unit length.
    8. Pointing and Cleaning
       1. At final completion of unit masonry Work, fill holes in joints and tool.
       2. Do not fill weepholes.
       3. Cut out and repoint defective joints.
       4. Dry-brush masonry surface after mortar has set at the end of each day’s Work and after final pointing.
       5. Leave Work and surrounding surfaces clean and free of mortar spots and droppings.
    9. Tolerances
       1. Bed Joint: Thickness +/-1/8 inch, level +/-1/4 inch in 10 feet with 1/2 inch maximum.
       2. Head Joint: Thickness +/-1/8 inch, vertical alignment +/-1/4 inch in 10 feet with 1/2 inch maximum.
       3. Vertical Wall Alignment: +/-1/4 inch in 10 feet with 1/2 inch maximum per floor and 1 inch maximum for total height.
       4. Horizontal Wall Alignment: +/-1/4 inch in 10 feet with 1/2 inch maximum.
    10. Dampproofing
        1. Verify that surfaces are dry, clean, free from all dirt, rust and other foreign matter and ready to receive treatment.
        2. Mask surfaces to receive caulking or sealants specified elsewhere.
        3. Apply dampproofing material in strict accordance with the manufacturer’s recommendations for the conditions of the application, but not less than 600 square feet per gallon for the first coat and 200 square feet per gallon for the second coat.
        4. When painting is specified, apply the second coat of dampproofing after painting.
        5. Allow dampproofing to dry for twenty-four hours before proceeding with other Work.
  1. QUALITY ASSURANCE
     1. Inspection and Testing: Sampling and testing to assure compliance with the contract provisions shall be in accordance with [Section 01 45 29 - Quality Control; Testing Laboratory Services] [Section 01 45 16.13 – Contractor’s Quality Control Program] of these specifications. The Contractor may obtain copies of results of tests performed by the Port of Seattle from the office of the Engineer at no cost. Tests conducted for the sole benefit of the Contractor shall be at the Contractor's expense

Use paragraph above when the project does not utilize CQC. Coordinate closely with Section 01 45 29 - Quality Control; Testing Laboratory Services to assure Sampling and Testing on materials called for in that section agree with intent of this section.

OR

Use “Contractor Quality Control Testing and Inspection” section when project utilizes CQC and Section 01 45 16.13 – Contractor’s Quality Control Program. Provide text for inspection and testing to be performed by the Contractor with specifics on frequency and scope.

* + 1. Testing and Inspection for Contractor Quality Control: The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and shall submit specified reports.
       1. Field Testing of Mortar:
       2. Field Testing of Grout:
       3. Efflorescence Test:
       4. Prism Test:
       5. Reports:
  1. DELIVERABLES

1. MEASUREMENT AND PAYMENT
   1. GENERAL
      1. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices] [Lump Sum price bid for the Project].

End of Section

Revision History:

05/01/2014 Conversion to 2004 CSI Numbering System

10/15/2014 Added Sole Source and Salient Characteristics Note to Part 2

01/12/2025 Revised 3.04 Quality Assurance