CONCRETE MASONRY RESIDENTIAL DETAILS

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INTRODUCTION

Concrete masonry homes reflect the beauty and durability of concrete masonry materials. Masonry housing provides a high standard of structural strength, design versatility, energy efficiency, termite resistance, economy and aesthetic appeal.

A wide range of architectural styles can be created using both architectural concrete masonry units and conventional units. Architectural units are available with many finishes, ranging from the rough-hewn look of split-face to the polished appearance of ground-face units, and can be produced in many colors and a variety of sizes. Concrete masonry can also be finished with brick, stucco or any number of other finish systems if desired.

Concrete masonry’s mass provides many consumer benefits. It has a high sound dampening ability, is energy efficient, fire and insect proof, durable and can easily be designed to resist hurricane-force winds and earthquakes.

WALL TYPES

Figures 1 through 3 illustrate a few of the construction options available for concrete masonry home construction, some of which are described in more detail below. Both top plate/anchor bolt and
Figure 2—Exposed Concrete Masonry Exterior

Roof system
Roof insulation

Top plate, pressure treated or use moisture barrier (alternate: embedded strap anchor)
Finish varies
Concrete masonry lintel
Wood backing, as required
Furring and insulation, as required
Vapor retarder, as required
Solid unit to support flashing

Standard window system
Sill
See TEK 19-5A for flashing details
Flash with drip edge
Solid or filled unit to support flashing
Sheathing
Wood joist
Joist hanger
Ledger, pressure treated or use moisture barrier
Bond beam
Insulation, as required
Vertical reinforcement, as required

Grade
Horizontal joint reinforcement, as required
Anchor bolt
Grout, as required
Concrete masonry wall

Backfill
Waterproof or dampproof membrane
See TEK 19-2A for flashing details
Flash with drip edge
Flashing with drip edge
Solid unit to support flashing
See TEK 19-2A for flashing details

Foundation drain
Free draining backfill
Grout, as required
Concrete footing

Undisturbed soil
Concrete slab
Vapor retarder
Optional foundation drain
Optional footing drain

Reinforcement, as required

Foundation drain
Vapor retarder
Reinforcement, as required
Figure 3 — Wood or Vinyl Siding Exterior Finish

- Roof system
- Roof insulation
- Top plate, pressure treated or use moisture barrier (alternate: embedded strap anchor)
- Finish varies
- Concrete masonry lintel
- Wood backing, as required
- Standard window system
- Horizontal joint reinforcement, as required
- Vertical reinforcement, as required
- Soffit
- Concrete masonry wall
- Siding
- Positive slope
- Anchor bolt
- Bond beam
- Subfloor
- Floor joist
- Sill, pressure treated or use moisture barrier
- Install drain for water removal if not higher than adjacent exterior grade for majority of perimeter
- Vapor retarder
- Vapor retarder, as required
- Furring and insulation, as required
- Vertical reinforcement, as required
- 12 in. (305 mm) concrete masonry wall
- Reinforcement, as required
- Vapor retarder, as required
- Furring and insulation, as required
- Concrete footing
- Top plate, pressure treated or use moisture barrier (alternate: embedded strap anchor)
embedded strap anchor roof connections are shown and can be used interchangeably, along with several foundation types. See also TEK 5-7A Floor and Roof Connections to Concrete Masonry Walls and TEK 5-3A Concrete Masonry Foundation Wall Details (refs. 2, 3) for additional alternatives.

Single wythe walls offer the economy of providing structure and an architectural facade in a single building element. They supply all of the attributes of concrete masonry construction with the thinnest possible wall section. To enhance the performance of this wall system, two areas in particular need careful consideration during design and construction—water penetration resistance and energy efficiency. Design for water resistance is discussed in detail in References 4 through 6. A full discussion of options for energy efficient concrete masonry walls is contained in Insulating Concrete Masonry Walls (ref. 7).

The use of exterior finish systems lends itself to exterior insulation. Figure 1 shows an exterior insulation system, including a water drainage plane and stucco. Stucco can also be applied directly to the exterior block surface and used in conjunction with integral or interior insulation. Note that local codes may restrict the use of foam plastic insulation below grade in areas where the hazard of termite damage is high.

Figure 2 shows a residential wall section with exposed concrete masonry on the exterior and a furred-out and insulated interior. Concrete masonry can be exposed on the interior as well. In this case, integral insulation (placed in the masonry cores) can be used as required.

Figure 3 shows exterior siding with insulation installed between furring. Wood or vinyl siding, as shown, is typically attached using exterior wood furring strips which have been nailed to the masonry.

Cavity wall details are shown in TEK 5-1A Concrete Masonry Cavity Wall Details (ref. 8).

REFERENCES
2. Floor and Roof Connections to Concrete Masonry Walls, TEK 5-7A. National Concrete Masonry Association, 2001.
8. Concrete Masonry Cavity Wall Details, TEK 5-1A. National Concrete Masonry Association, 1995.

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