

MAXIMIZING PARTITION WALL EFFICIENCY WITH 6 INCH CMU

Whether striving to increase interior floor space, searching for the lowest cost solution, minimizing embodied carbon, reducing maintenance efforts in high traffic environments, or weighing all these considerations, interior partition walls constructed of concrete masonry offer an array of benefits. Often overlooked as a solution for interior partitions includes leveraging 6 in. CMU partitions. The Block Design Collective has a comprehensive series of resources covering the design, detailing, and construction of concrete masonry partition walls, including design guides, standardized schedules and details, and design calculators [Ref. 1, 2].

THE 6" CMU ADVANTAGE



MAXIMIZE INTERIOR SPACE

A thinner profile helps increase usable square footage.



REDUCE EMBODIED CARBON

Requires less material, lowering environmental impact.



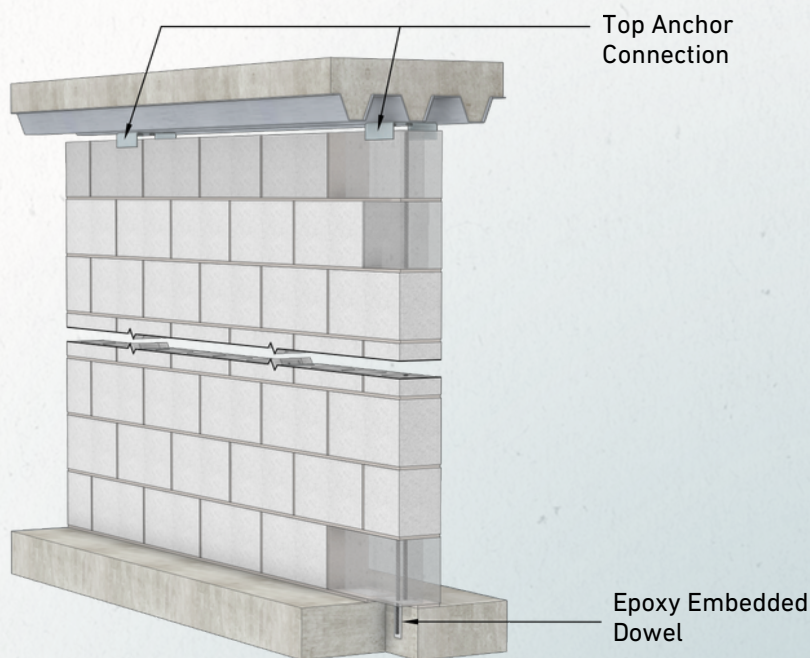
LOWER MAINTENANCE

CMU offers durability and performance in high traffic environments.



COST EFFECTIVE

Material and labor savings translate to lower overall project costs.



COST AND CARBON

There are several variables that directly impact masonry's installation productivity and thereby its cost to construct – not the least of which is the lay rate for installing masonry units. While it isn't the only factor that affects construction productivity, the weight of each masonry unit is a key driver behind installation productivity, with 6 in. CMU weighing an average of 5-10 pounds per unit less than similar 8 in. CMU. This translates to an increase in productivity of 15-20% with corresponding cost savings [Ref. 3].

Concrete masonry partitions constructed using 6 in. CMU also offer considerable material savings, which directly translate to reductions in embodied carbon as illustrated in the comparative wall assemblies and grouting schedules shown in Table 1.

TABLE 1 – EMBODIED CARBON DESIGN EFFICIENCIES

8 in. CMU Partition - Reinforcement at 48 in.	8 in. CMU Partition – Reinforcement at 120 in.	6 in. CMU Partition – Reinforcement at 120 in.
CO2e = 5.6 lb/ft ²	CO2e = 4.8 lb/ft ² (14% CO2e Reduction)	CO2e = 3.8 lb/ft ² (32% CO2e Reduction)

FIRE RESISTANCE AND SOUND TRANSMISSION CLASS (STC)

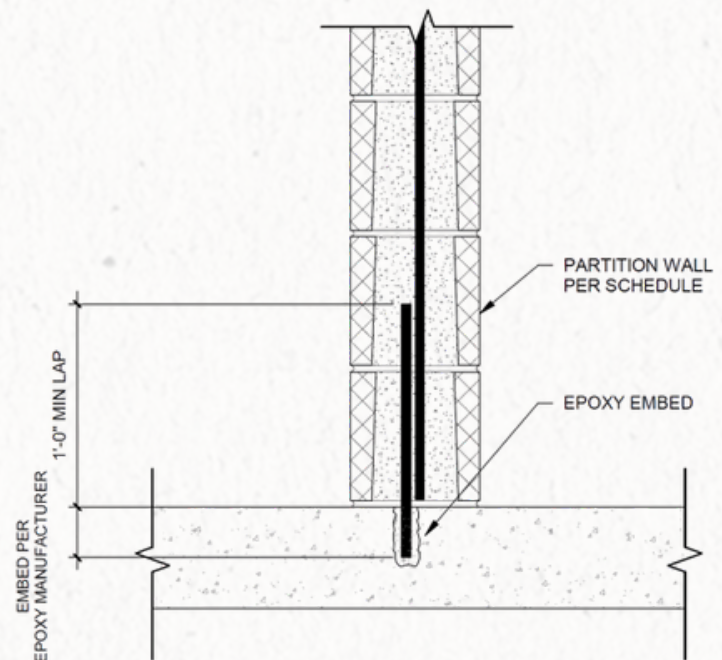
The fire resistance rating of a concrete masonry assembly is a function of the volume of masonry units used in the construction of the assembly and the type of aggregate used in the manufacture of the CMU [Ref. 5]. All hollow 6 in. CMU assemblies will have a fire resistance rating exceeding 1 hour. When solid grouted or filled with loose fill materials such as perlite or sand, all 6 in. CMU assemblies will have a fire resistance rating exceeding 3 hours, with some lightweight unit assemblies achieving a 4 hour fire resistance rating.

The Sound Transmission Class (STC) rating of 6 in. CMU partitions is a function of the installed weight of the assembly, which depends on the density of the units and the quantity of grout placed in the assembly. Concrete masonry partitions constructed using 6 in. CMU partitions have STC ratings ranging from the mid-40s for lightweight, ungrouted assemblies to the mid-50s for normal weight, fully grouted assemblies [Ref. 6].

CONNECTION DETAILING

Due to the relatively small design loads nonloadbearing partitions must be capable of resisting, it often is not necessary to detail a fully developed anchor at the base of the wall. A more practical connection would be to epoxy-set any vertical reinforcement in the assembly into the supporting slab below. This avoids necessary trade coordination and potential misalignment of the dowels.

Similarly, top-of-wall anchors are available that facilitate the installation of the assembly and any vertical reinforcement present, even with the floor or roof above is already in place, alleviating the need for complicated anchoring systems to support the assembly.



PRE-ENGINEERED SCHEDULES

The structural analysis of 6 in. CMU partitions is identical to the analyses performed for partitions of other thicknesses [Ref. 1, 7]. Interior concrete masonry partitions may be loadbearing or nonloadbearing depending on the structural needs of a given project. To streamline the design of nonbearing partitions, Tables 2 and 3 can be used for the design of unreinforced or reinforced 6 in. CMU partitions in low seismic hazard conditions. Additional pre-engineered design solutions are available for varying wind and seismic exposure conditions, wall heights, and wall thicknesses in *Design and Detailing Guide for Nonloadbearing Concrete Masonry Partition Walls* [Ref. 1].

The following design constraints apply when using Table 2 or 3. For more customized partition design options, the Block Design Collective has a free online calculator for designing concrete masonry partitions:

<https://beautyofblock.com/2026/02/03/partition-wall-calculator/>

- Design is based on the 2022 editions of TMS 402/602 and ASCE/SEI 7 [Ref. 4 and 8].
- The building is classified as enclosed or partially open in accordance with ASCE/SEI 7 Table 26.13-1.
- The minimum specified compressive strength of the masonry is 2,000 psi.
- The assembly is constructed using concrete masonry units meeting the requirements of ASTM C90 and laid in Type S non-air entrained portland cement/lime mortar or mortar cement mortar.
- Vertical reinforcement has a minimum specified yield strength of 60,000 psi and specified to be located in the center of the assembly.

- Horizontal reinforcement consists of two wire W1.7 (9 gauge) ladder-type joint reinforcement spaced at not more than 16 in. (406 mm) on center.
- The wind exposure category is Exposure B as determined in accordance with ASCE/SEI 7 Section 26.7.
- The wind topographic factor is 1.0 as determined in accordance with ASCE/SEI 7 Section 26.8.
- The partition is part of a building assigned to Risk Category I, II, or III as determined in accordance with ASCE/SEI 7 Section 1.5 with an importance factor of 1.0.
- For unreinforced assemblies, the partition is supported at the maximum design span as indicated by Table 2. For reinforced assemblies per Table 3, the partition is supported at the top and bottom for out-of-plane loads and the spacing of the supporting connections is not to exceed the maximum permitted spacing of the vertical reinforcement indicated in Table 3.
- The maximum out-of-plane live load shall be 5 lb/ft².
- Linear interpolation between tabulated values is not permitted.
- A single No. 4 vertical reinforcing bar to be placed at corners, in the first full cell of each side of openings, within 8 in. (203 mm) of each side of movement joints, and within 8 in. (203 mm) of the ends of walls. Unless verified by analysis, the length of openings in nonbearing partitions is limited to the spacing of the vertical reinforcement per Table 3 or the maximum horizontal span per Table 2.

TABLE 2 – MAXIMUM VERTICAL OR HORIZONTAL SPAN FOR NONLOADBEARING, UNREINFORCED 6 IN. NOMINAL CMU PARTITIONS ASSIGNED TO SEISMIC DESIGN CATEGORY A OR B

Mortar Type	Design Wind Speed				
	100 mph	120 mph	140 mph	160 mph	180 mph
Vertically Spanning Masonry					
Type N Masonry Cement Mortar	8	8	7.33	6.67	6
Type S Masonry Cement Mortar	10.67	10	9.33	8.67	8
Type N Portland or Mortar Cement Mortar	12	11.33	10.67	9.33	8.67
Type S Portland or Mortar Cement Mortar	13.33	12.67	12	11.33	10
Horizontally Spanning Masonry					
Type N Masonry Cement Mortar	12	11.33	10.67	9.33	8.67
Type S Masonry Cement Mortar	14.67	14	13.33	12	11.33
Type N Portland or Mortar Cement Mortar	16.67	16	14.67	14	12.67
Type S Portland or Mortar Cement Mortar	19.33	18	16.67	16	14.67

TABLE 3 – 6 IN. CMU REINFORCED PARTITIONS ASSIGNED TO SEISMIC DESIGN CATEGORY A OR B

Specified Wall Height (ft)	Maximum Spacing (ft) of No. 4 Vertical Reinforcing Bars Design Wind Speed Less Than or Equal to:				
	100 mph	120 mph	140 mph	160 mph	180 mph
Vertically Spanning Masonry					
12.00 and less	10	10	10	10	10
12.67	10	10	10	10	9.33
13.33	10	10	10	10	8
14	10	10	10	8.67	6
14.67	10	10	9.33	6	5.33
15.33	10	10	8.67	5.33	4.67
16	10	9.33	5.33	5.33	4.67
16.67	9.33	8.67	5.33	4.67	4
17.33	8.67	5.33	4.67	4	3.33
18	8	4.67	4	4	3.33
18.67	4.67	4	4	3.33	3.33
19.33	4	4	3.33	3.33	2.67
20	4	3.33	3.33	2.67	2.67

REFERENCES

[1] Design and Detailing Guide for Nonloadbearing Concrete Masonry Partitions Walls, The Block Design Collective, blockdesign.org.

[2] Concrete Masonry Partition Wall Calculator, The Block Design Collective, blockdesign.org.

[3] CMHA TEK 04-01A, Productivity and Modular Coordination in Concrete Masonry Construction, Concrete Masonry and Hardscapes Association, cmha.org.

[4] TMS 402/602-22, Building Code Requirements and Specification for Masonry Structures, The Masonry Society, masonrysociety.org.

[5] CMHA TEK 07-01D, Fire Resistance Ratings of Concrete Masonry Assemblies, Concrete Masonry and Hardscapes Association, cmha.org.

[6] CMHA TEK 13-01D, Sound Transmission Class Ratings for Concrete Masonry Walls, Concrete Masonry and Hardscapes Association, cmha.org.

[7] 6 in. CMU: Masonry's Weight Loss Plan, Structure Magazine, May, 2022, NCSEA, structuremag.org.

[8] ASCE/SEI 7-22, Minimum Design Loads and Associated Criteria for Buildings and Other Structures, Structural Engineering Institute of the American Society of Civil Engineers, asce.org.

QUICK ACCESS



PARTITION GUIDE

Scan or click to view the complete [Design and Detailing Guide](#).



WALL CALCULATOR

Scan or click to access the [Concrete Masonry Partition Wall Calculator](#).

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