

As discussed in *Section 1.1*, masonry walls are of two types: **structural walls** and **rainscreen veneer walls**. Single wythe concrete block or clay brick walls are the most common structural masonry walls: four such single wythe wall systems are discussed below. Each type offers different performance potential in terms of climatic factors, fire, thermal, sound and seismic resistance; and construction and maintenance costs. Furthermore, each wall system will have inherent aesthetic characteristics. Additional treatments or finishes may be added to each of these wall systems to develop them further.

Although masonry units do not have high thermal resistance, their high mass provides a beneficial moderating influence on interior temperatures. This "Mass Effect" provides better dynamic thermal performance than a lightweight wall of the same R-value, and can reduce heating and cooling loads – see *Section 2.6.3* for further information.



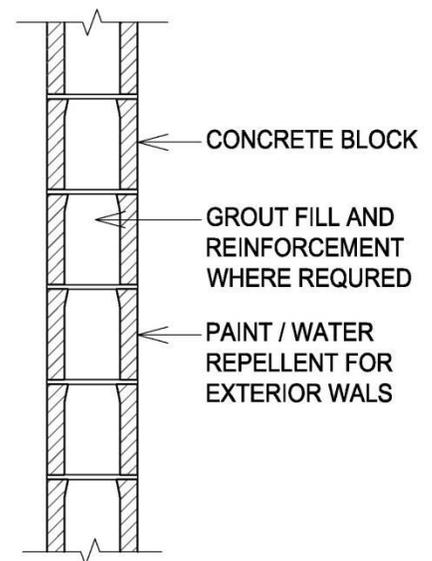
## **SYSTEM 1: UNINSULATED STRUCTURAL WALL**

The use of hollow masonry units provides an economical wall system with a masonry finish on both sides. A wide range of finishes can be achieved with different textures and colours of brick and block. Reinforcing for seismic and structural strength can be placed within the wall. Recent engineering advances permit these walls to be built to greater heights with less reinforcing.

The weather resistance of this system relies on good workmanship for full head and bed joints, a concave joint profile and exterior wall coatings. (See *Section 1.6.2 - Sealing Masonry* for further information.) Thermal efficiency is adequate for building types with low heating requirements.

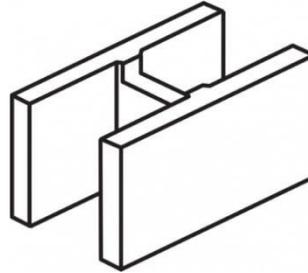
Advantages:

- Economical Wall / Structure
- Masonry finish on both sides
- Accepts reinforcing



## SYSTEM 2: FULLY GROUTED – H-BLOCK WALL

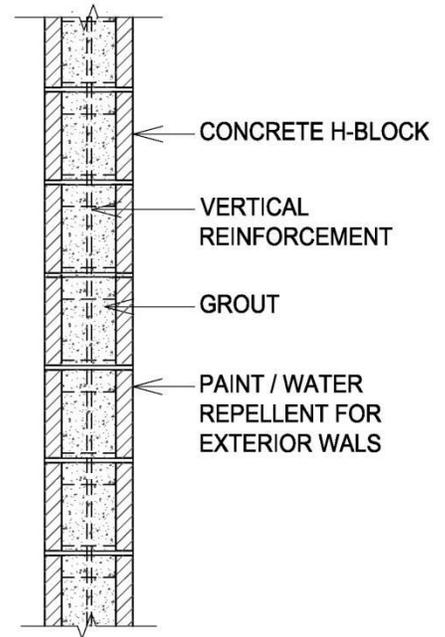
This system uses the H-Block, a special unit which allows the pouring of a continuous concrete core in the wall. The absence of end webs facilitates the laying of the block around reinforcing steel and minimizes head joint leakage potential. The finished wall has a high degree of structural strength and can be used both above and below grade as an economical alternative to formed-in-place concrete walls.



Solid filled masonry walls contribute to dryer mass walls and improved building performance. Appropriate coatings for water resistance should still be used on surfaces below grade or exposed to weather.

Advantages:

- Monolithic wall that accommodates heavy reinforcing.
- Improved water resistance

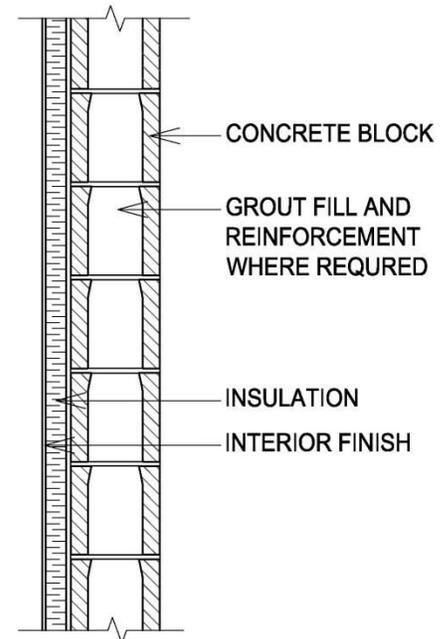


## SYSTEM 3: INTERIOR INSULATION

The placing of insulation on the interior face of the wall substantially increases the thermal resistance of the standard masonry wall. This system can include air and vapour barriers as well as interior finish options. Interior insulation places the dewpoint between the insulation and the masonry. If this is a concern, proper moisture management steps need to be taken. One method is to separate the insulation from the masonry, creating a cavity with drainage and drying potential. The other is to use sprayed urethane foam as insulation - an effective barrier against moisture. *Refer to details Section 1.2.4 for more information.*

Advantages:

- Durable exterior
- Improved thermal performance



## SYSTEM 4: EXTERIOR INSULATION

The application of insulation to the exterior of the wall combined with the mass of the masonry on the interior provides for high thermal efficiency as well as good rain resistance depending on the exterior finish applied.

Advantages:

- Improved thermal performance from insulation and exposed interior mass
- Improved water resistance

