

REMOVING WALLS IN UNITS AND HOUSES

For Unit and Townhouse Owners

Many unit blocks and townhouse developments built over the years were constructed before it became customary for architects to take shadow lines, perspective and sunlight aspect into consideration. For this reason units can often suffer from dark and gloomy interiors, not due to lack of external windows and light sources, but due to unfortunate room layouts and placement of interior walls.

In order to introduce more natural light to units and townhouses it is becoming commonplace to remove interior walls, allowing sunlight to penetrate deeper into the unit.

Another factor to consider is contemporary design. In years gone by it was the fashion to divide a residence into small compartments, with walls separating kitchen and dining areas from the main living areas. These days, open plan layouts are much preferred in new buildings, with kitchen and dining areas blending seamlessly into living areas, giving an impression of a larger, brighter, more open space.

Removing internal walls, or even increasing existing door opening widths, in older, more compartmentalised units can help achieve this contemporary open plan look.

However, due to Strata regulations it is not permissible for an owner to remove any section of wall without permission from the Body Corporate of their Strata Plan. There are a number of reasons for this, and a number of steps that must be followed before the work can be undertaken.

Any internal wall in a residence, be it of brickwork, timber stud framing, or blockwork, may be “load-bearing” or “non load-bearing”. A load-bearing wall is so called because the structure above the wall, which can be a concrete or timber framed floor, a timber framed ceiling, another wall, or a concrete or timber framed roof, or sometimes a combination of all of the above, is actually resting on the wall, with its weight distributed down through the wall to the floor below. In this case, simply removing the wall would be akin to removing the support for the floors, ceilings and roof above, and could lead to a catastrophic collapse, particularly if, say, the wall was on a lower floor of a multi-storey block. The very best scenario would be that many of the walls, and perhaps floors, would suffer severe cracking.

In some cases the wall may be non load-bearing. In this case the floor/wall/ceiling/roof structure above the wall would have been originally designed to span across the wall without actually being supported by it, and it may be feasible to remove the wall without having to install any new structural elements to support the remaining structure above.

Smaller unit blocks, with external and internal brick walls, and concrete slab or timber floors, tend to have load-bearing internal walls, while larger more recently constructed blocks, which consist of concrete frames, concrete columns, beams and slabs, are more likely to have non load-bearing internal brick walls. However, this may not be taken for granted.

For example, when non load-bearing brickwork walls are infilled in a concrete frame (eg when the concrete floor above is supported on concrete columns), the brickwork is usually built leaving a small gap between the bricks and the underside of the slab above. When the render is applied to the wall, it sometimes partly fills this gap, inadvertently forming a load transfer between the slab and wall. As the slab above deflects over time, more load can be transferred to the “non load-bearing” infill wall through this render. Then, when the wall is removed the slab may take up its natural deflected shape and cause some cracking to the walls above.

For this reason it is required that an experienced structural engineer firstly examine the wall to determine whether or not it is load-bearing or non load-bearing. This may be determined in a number of ways; by examining structural drawings, if available, or by physically inspecting the interface between the wall and structure above. If neither of these options are viable, an engineer may use his or her experience to analyse the overall structure and determine the likelihood of the wall being load-bearing.

If the wall is determined to be load-bearing, the engineer will have to determine the most suitable procedure for removal of the wall, and how the structure above can be re-supported after the wall has been removed, in the most aesthetically pleasing manner, and with the minimum cost to the client. This is generally achieved by the design and installation of a structural beam across the top of the new opening.

The procedure for removing the wall may entail propping of the existing ceiling/floor, followed by “needling” of the wall with structural members to ensure that the process of removing the brickwork prior to installing the new beam does not adversely affect the structure above. Once the brickwork has been removed, and with the structure now fully propped, re-supporting the wall and floor above is achieved by installing the structural beam to span across the top of the new opening, with beam designed and detailed by the structural engineer. There are many ways in which this can occur, depending on variables such as the span of the required opening, existing wall layouts, height of wall to be retained above the opening and below the ceiling, amount of floors above the area in question, building materials from which the structure above is made, etc.. This beam can be of structural steel, timber, precast concrete or reinforced terracotta, whichever suits the individual situation the best. In some cases where perpendicularly intersecting walls are both to be removed it may be necessary to design steel columns to support the beams at the corners. Additionally the engineer must ascertain if the removal of the walls in question will in any way affect the overall structural stability of the building. In most cases within unit blocks, the removal of one or two walls does not prove to affect the building as a whole.

However, each situation is entirely individual, and must be assessed on a case by case basis, depending both on existing wall layout and the extent of wall removal the client wishes to undertake.

The structural engineer will provide a solution to the client, in the form of new structural member types and sizes and sketch detail drawings and notes of how to carry out the works. The engineer will also provide a structural certificate to the client stating that the extent of wall indicated on the accompanying sketch may be removed provided the building works are carried out in accordance with the sketches and nominated Standards and Codes.

These sketches and certification may then be presented to the Body Corporate for approval. The sketches and notes may also be given to a builder who can carry out the works based on their contents.

For House Owners

In a similar manner to older style unit block construction, many houses, in fact most houses up to quite recently, were not built with aspect and interior light in mind, but were simply built in a manner to ease construction and minimise cost on their respective blocks of land, irrespective of the orientation of the site. Additionally, even in small houses, areas within the residence were compartmentalised and separated by internal walls. Depending on orientation and location and number of windows, this could lead to very gloomy and dreary interiors.

Contemporary houses for the most part take site orientation, shadow lines, aspect and glazing far more into consideration. Additionally, open plan layouts are much preferred to using internal walls to partition off different areas within the house.

For this reason it is common for owners of dark houses which contain numerous internal walls to remove some of these walls, improving light flow through the house and creating a more open plan and spacious look.

Generally for internal renovations a home owner does not require permission to do so, however the home owner should contact their local council just in case there are any special requirements in place.

The process for carrying out the work is similar to that described above for units, and the principles remain the same. However, in the case of houses, which are mostly smaller than unit blocks, there is the added criteria of lateral stability to consider. Walls in a house not only support the weight of floors, ceilings and roofs, but they can provide lateral stability, or bracing to the house. An example of this is in a semi-detached house, which tends to be long and narrow. The walls that run across the house not only support the ceiling and roof, they provide bracing for the external walls. If these walls are removed the external walls, which will have been designed based on the location of these bracing cross walls, may bend or even collapse under lateral pressures.

However, this does not mean that the walls may not be removed. In some cases it may be decided to leave a portion of the wall capable of providing enough bracing, or in some cases where the wall must be removed entirely, a steel portal frame may be constructed, with columns and beams hidden in walls and ceiling spaces. In some case the walls may be stiffened by inserting steel mullions into the cavity.

Again, each house will be different and must be analysed on a case by case basis. Once the engineer has inspected the structure, designed and documented the necessary strengthening works, and provided certification for the adequacy of the works, the drawings may be presented to the builder, and council/certifier if necessary for approval and construction.

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