A WALL SECTION

FIELD OF INVENTION

This invention relates to a wall section. The invention has particular, but not exclusive, application as party walls in residential and commercial buildings.

BACKGROUND OF INVENTION

The walls between adjacent dwelling units in apartment buildings or units in commercial buildings need to have properties which are different from walls separating different rooms within a unit. These walls between adjacent units are called party walls.

Typically, party walls comprise walls made of any one of reinforced concrete, bricks or dry board. Dry boards are boards made of gypsum, calcium silicate etc. Use of bricks to make party walls is labour intensive and involves a lot of wet works on site. Party walls made exclusively of reinforced concrete or ferro concrete provide very good strength and resilience. But these reinforced concrete walls and ferro concrete walls have limited capability for noise immunity, fire resistance and thermal characteristics. Moreover, bricks and concrete walls are typically heavy and add to the weight and load the overall structure of the building.

Party walls may also be made using gypsum boards. Using gypsum boards in party walls require prior installation of extensive steel framing for the gypsum boards to be mounted on. Gypsum boards can also be mounted onto brick walls using steel plates. This results in a lot of steel being used and increased work load in mounting them. Moreover, gypsum boards

are softer than concrete material and are not suitable to be used alone as party walls due to security concerns, lesser strength and rigidity.

Party walls comprising a single layer of ferro concrete and a single layer of dry board have been tried before but have not been continued due to issues in actual usage.

SUMMARY

The invention is described in the independent claim. Some optional features of the invention are described in the dependent claims.

The wall section with the ferro concrete member and the first and second sideboards provide the qualities of both the ferro concrete member and the sideboards. These qualities are improved rigidity and strength of the wall section, improved moisture resistance, improved sound proof quality, resistance to fire and low thermal conductivity. The use of ferro concrete member facilitates mounting of the sideboard on to them without the use of any extensive steel framing on the ferro concrete member.

The use of chemical fasteners reduces the use of mechanical components for fastening and the application of chemical adhesives is also easier than using mechanical fasteners.

Insulation materials in the gap or gaps provide increased resistance to the transmission of heat and sound through the wall section. The gaps also enable running cables, wires, pipes or other domestic or commercial utility services.

The cavity in the ferro concrete member reduces the amount of raw materials used for the member, thus reducing the weight of the member. It also enhances the acoustic and thermal resistance.

BRIEF DESCRIPTION OF DRAWINGS

The accompanying drawings illustrate the invention, by way of example only and together with the description, serve to explain the principles of the invention.

Figure 1 is an elevation view of a wall section

Figure 2 is an elevation view of the wall section with the mechanical fastening arrangement between the ferro concrete member and the sideboards

Figure 3 is an elevation view of the wall section with the chemical fastening arrangement between the ferro concrete member and the sideboards

Figure 4 is an elevation view of the wall section shown with the gaps filled with insulation material

DETAILED DESCRIPTION

A wall section 100 is illustrated in Figure 1. The wall section 100 comprises a ferro concrete member 10 disposed between a first sideboard 25 and a second sideboard 30. Ferro concrete may be defined as concrete strengthened by a core or foundation skeleton of iron or steel bars. Ferro concrete is also referred to as armoured steel or reinforced concrete. At least one or perhaps both of the first sideboard 25 and second sideboard 30 may comprise any one of dry board, fibreglass, cement boards, recycled dry boards etc.

The wall section described above may be used as party walls in residential and commercial buildings. The ferro concrete member and the first and second sideboards are individually transported to the site of the party wall and then assembled together at site. The ferro concrete member and the sideboard may also be preassembled at a different location and then transported to the site. As illustrated in Figure 1, the ferro concrete member is fixed to a ceiling 35 of the building by a suitable fastening arrangement 40. The fastening arrangement may be anchor bolt, bolt and nut, stud, welding, clip, screw, etc. It may also be a snap-on, interlocking, slot-in arrangement, etc. The wall section is erected on a floor 45 of the building.

One advantage of the wall section 100 as described above is that the wall section provides the qualities of both the ferro concrete member and the sideboard. Ferro concrete members provide improved rigidity and strength required for use as party walls, even with thinner sections. They also have improved moisture resistance. Sideboard comprising dryboard provides improved sound proof qualities, fire resistance and low thermal conductivity for use as party walls. With the use of ferro concrete member, the sideboard can be easily mounted on to them without the need for excessive steel framing which saves a lot of time and cost.

As a result, the wall section provides the advantages of reducing the heat and sound transmitted between the party walls and reducing moisture ingression between the party walls. Security is also enhanced by the above wall section. Security here is defined as the privacy and safety that is enjoyed by the occupants of a dwelling unit. Because thinner sections of ferro concrete members provide the desired strength and rigidity, there is a reduced reliance of raw materials and energy consumption.

Using fibreglass for the sideboard enhances fire resistance in extreme conditions. Dryboard is lightweight. Cement boards enhance moisture ingression.

As described above, each component of the wall section may be prefabricated and then assembled on site. This improves production efficiency which translates into cost efficiency compared to fabricating each component of the wall section on site and assembling them.

As illustrated in Figure 2, the sideboards 25 and 30 are fastened to the central ferro concrete member 10 by mechanical fasteners such as screws etc.

Alternatively, as illustrated in Figure 3, the first and second sideboards 25 and 30 are chemically fastened using the likes of adhesives, epoxies, resins, mortars, industrial adhesive tapes, etc. The advantage of using chemical fasteners is that the number of mechanical components used for fastening is reduced. Moreover, application of adhesives is easy when compared to conventional mechanical fasteners. The adhesives can also be applied to the ferro concrete panels at the manufacturing site prior to delivery at the jobsite. This results in decreased cost and increased production efficiency.

The arrangement of the wall section 100 may be such that there is a gap 15 between the ferro concrete member and one or more of the first sideboard and the second sideboard. As

illustrated in Figure 4, the gap or the gaps may be filled with insulation materials 16 such as rockwool, foam or similar materials, which further reduce the sound and heat transmitted through the wall section. The gaps may also be used to run cables, wires, pipes or other domestic or commercial utility services. The gap or the gaps described above may also be varied by adjusting the position of one of the first sideboard and the second sideboard or the position of the first sideboard and the second sideboard respectively.

The sideboard may provide a good surface to create decorative finishes.

The ferro concrete member may have alternate internal reinforcements such as fabric reinforcements, plastic mesh or steel mesh. The ferro concrete member may be manufactured by incorporating recycled materials like recycled sand, fly ash or copper slag.

The ferro concrete member may comprise a cavity or alternatively more than one cavity. In other words, the cavity is a void within the member. This provides the advantage of reducing the amount of raw materials being used for the ferro concrete member resulting in lesser weight. It also enhances acoustic and thermal resistance and facilitates concealing of utility cables and pipes.

The ferro concrete member may be substituted by members made of polymer, wood, timber or metal. Similarly, the sideboards may also be made of polymer, wood, timber or metal.

It is to be understood that the foregoing description is intended to be purely illustrative of the principles of the disclosed techniques, rather than exhaustive thereof, and that changes and variations will be apparent to those skilled in the art, and that the present invention is not intended to be limited other than as expressly set forth in the following claims.

CLAIMS

1. A wall section comprising

a ferro concrete member disposed between a first sideboard and a second sideboard.

2. The wall section as claimed in Claim 1, wherein one of the first sideboard and the second sideboard is mechanically fastened to the ferro concrete member.

3. The wall section as claimed in Claim 1, wherein one of the first and second sideboards is chemically fastened to the ferro concrete member.

4. The wall section as claimed in Claim 1 or 2, wherein one of the first sideboard and the second sideboard is arranged such that there is a gap between the one of the first sideboard and the second sideboard and the ferro concrete member.

5. The wall section as claimed in Claim 4, further comprising insulation material in the gap.

6. The wall section as claimed in any one of the preceding claims, wherein one of the first sideboard and the second sideboard comprise any one of dry board, fibreglass, cement boards or recycled dry boards.

7. The wall section as claimed in any one of the preceding claims, wherein the ferro concrete member comprises a cavity.