“A building block”

Introduction

This invention relates to a building block. More specifically, the invention relates to a building block of the type used in the construction of walls of domestic dwellings and like structures.

One common type of wall construction entails the use of concrete building blocks bonded together with mortar. The building blocks are laid in rows, typically with the next adjacent row above or below being offset from the adjacent row by one half block width. This form of construction provides for a very solid structure that has good strength, longevity and insulation characteristics. It is known to use other materials such as plastics in the construction of building blocks however these are still considered relatively niche in the industry.

Although the use of concrete building blocks has numerous advantages, there are some shortcomings with this arrangement. Most importantly, when the wall is constructed, electrical cable and mechanical ducting (for plumbing pipework) needs to be accommodated in the wall. In order to do this, it is necessary to determine the desired location of the electrical sockets, light switches, cable entry and exit points and the like, determine the location of mechanical piping if applicable, and thereafter to cut out channels in the wall structure to accommodate the electrical wiring/mechanical ducting.

However, cutting into concrete building blocks is a difficult, dangerous and time-consuming job to do. In order to cut into the concrete blocks, specialist cutting equipment is required to cut a channel in the building block that is suitably dimensioned to receive an electrical cable or pipework. This produces a significant amount of noise, dust and dirt. Furthermore, this requires a skilled tradesman to ensure that the channels are cut to the correct width and depth so that the cut channels are fit for purpose and do not have too much of a detrimental impact on the structural integrity of the building block. The cutting equipment used is also notoriously dangerous to use, and has been involved in numerous workplace accidents over the years, often resulting in serious injuries. Finally, this task is labour intensive and takes a significant amount of time. This delays the completion of the build as well as increasing the cost of the build.

It is an object of the present invention to provide a building block, a method of constructing a building block and a method of construction that overcome at least some of the above-identified problems. It is a further object of the present invention to provide a useful alternative choice for the consumer.

Statements of Invention

According to the invention there is provided a building block comprising a substantially cuboid body having a front face, a rear face, a top face, a bottom face, a left hand side face and a right hand side face, the building block having a pre-formed channel in a front face thereof configured for reception of electrical or mechanical services.

By having such a building block, there will already be a pre-formed channel configured for reception of electrical or mechanical services in the front face of the block and it will not be necessary for the builder to chase the walls and cut a channel into the front face of the building blocks. Instead, the electrical cable or pipework can simply be routed through the pre-formed channel. This is a significant improvement on the existing offerings and building techniques. It provides for a safer, more pleasant workplace as it will cut down on the use of cutting equipment and the associated noise and dust that go hand in hand with the use of such equipment. In addition, it obviates the need to chase the walls, thereby speeding up the building completion, reducing the costs, and simplifying the construction.

In one embodiment of the invention there is provided a building block in which the pre-formed channel is oriented vertically along the front face. This is seen as a particularly useful configuration as the cabling can be led vertically in the known manner to light switches and sockets, and piping can be led to sinks, showers and the like.

In one embodiment of the invention there is provided a building block in which the preformed channel is oriented horizontally along the front face. Again, this is seen as a useful configuration as electrical cabling can be led from one socket to another, all of which will be at the same height. Indeed, by having vertical or horizontal channels, this can promote more accurate and predictable wiring and piping than previous methods.

In one embodiment of the invention there is provided a building block in which the preformed channel is located centrally along the front face. By having the pre-formed channel centrally along the front face, the position will be predictable and this will match up with the most common building technique which is to have 50% overlap between adjacent rows above and/or below. In this way, the gap between the blocks in the adjacent row(s) will marry up with the pre-formed channel. Cabling can be led along the pre-formed channel and in the gap between blocks in the adjacent rows of blocks.

In one embodiment of the invention there is provided a building block in which there are provided a pair of channels evenly spaced apart across the front face. It is envisaged that the channels will be separated from each other by approximately half the width of the block so that one channel is a quarter of the width of the block from one side edge and the other channel is three quarters of the width of the block from that same side edge. This is seen as a useful alternative configuration to provide.

In one embodiment of the invention there is provided a building block in which there is provided a second channel at the corner joining the front face and the side face. This is seen as a useful configuration. With the first channel located centrally and vertically in the block, the second channel will be positioned at the corner joining the front face and one of the side faces. In this way, when the blocks are stacked in rows and offset with respect to each other by a half block's width, the channels in the centre of the blocks of one row will align with the channels formed at the edge of the block in the adjacent row above or below the first row. Again, this will make it easier to route the cables, providing plenty of space for the cables. Furthermore, this will provide more choice for the positioning of the electrical cable or pipework.

In one embodiment of the invention there is provided a building block in which there is provided a third channel at the corner joining the front face and the second side face. Again, this will provide even more flexibility for the positioning of the cables/piping. In this way, three channels will effectively be formed with each building block. This provides great choice for the person installing the cabling.

In one embodiment of the invention there is provided a building block in which the channel at the corner is approximately half the width of the other channel remote from the corner in the front face. The channel at the corner will combine with the gap between adjacent blocks and, if provided, an abutting block in the same row of blocks. Therefore, the channel will combine with other components to create a larger channel. This will reduce the amount of detrimental impact the channel provision has on the structural integrity of the block.

In one embodiment of the invention there is provided a building block in which there is provided a pre-formed channel in a rear face of the building block configured for reception of electrical or mechanical services. In this way, services can be run down both sides of the block if desired and indeed, in other cases, it will obviate the possibility of the blocks being laid in an incorrect manner.

In one embodiment of the invention there is provided a building block in which there are provided a plurality of channels in the rear face of the building block.

In one embodiment of the invention there is provided a building block in which there is provided a channel at the corner joining the rear face and the side face. This is seen as the preferred embodiment of the invention that will provide a structurally strong block. The channels on the front and rear faces may be provided to allow the weakened areas on an individual block to be separated as far apart from each other as possible. In order to align a block in one row with the blocks in the row below, the block in the upper row may be turned back to front before it is laid so that the channel in the rear face of that block aligns with the channel in the front face of the block below and vice versa.

In one embodiment of the invention there is provided a building block there is provided a channel at the corner joining the rear face and the other side face.

In one embodiment of the invention there is provided a building block in which the channel remote from the corner further comprises a pair of elongate cuts into the face defining a sacrificial mesa therebetween. This is seen as a particularly preferred embodiment of the present invention. It is envisaged that in this way, the channel may be prepared but not fully created. The sacrificial mesa will be removable when

necessary. In this way, the mesa may be left in the block if it is not required to chase a cable or piping in that location. This will improve the thermal performance of the block and it is envisaged that the block will be more structurally sound than would be the case if the channel had been hollowed out by removing the mesa between the elongate cuts.

In one embodiment of the invention there is provided a building block in which the channel at the corner joining a side face and one of the front face and the rear face comprises an elongate cut into the face defining a sacrificial mesa between the elongate cut and one of the front face, rear face and the side face. Again, this is seen as a useful way to not impact too much on the thermal performance of the block.

In one embodiment of the invention there is provided a building block in which the channel remote from the corner is of the order of between 0.01m (1cm) and 0.1m (10cm) wide.

In one embodiment of the invention there is provided a building block in which the channel remote from the corner is of the order of between 0.02m (2cm) and 0.04m (4cm) wide.

In one embodiment of the invention there is provided a building block in which the channel remote from the corner is of the order of between 0.025m (2.5cm) and 0.035m (3.5cm) wide.

In one embodiment of the invention there is provided a building block in which the channel at the corner is of the order of between 0.005m (0.5cm) and 0.015 (1.5cm) wide.

In one embodiment of the invention there is provided a building block in which the channel at the corner is of the order of between 0.007m (0.7cm) and 0.01m (1cm) wide.

In one embodiment of the invention there is provided a building block in which there is provided a rectangular trench formed in the front surface of the building block dimensioned for reception of an electrical box therein. This is seen as useful as an electrical junction box, socket or switch backing may be located in the rectangular trench.

Detailed Description of the Invention

The invention will now be more clearly understood from the following description of some embodiments thereof given by way of example only with reference to the accompanying drawings, in which:-

Figure 1 is a front view of a first embodiment of building block according to the invention;

Figure 2 is a diagrammatic representation of a wall constructed using the building blocks of Figure 1;

Figure 3 is a top view of a second embodiment of building block according to the invention;

Figure 4 is a top plan view of a third embodiment of building block according to the invention;

Figure 5 is a front view of a fourth embodiment of building block according to the invention;

Figure 6 is a front view of a fifth embodiment of building block according to the invention;

Figure 7 is a top plan view of a sixth embodiment of building block according to the invention;

Figure 8 is a top plan view of a seventh embodiment of building block according to the invention, similar in concept to the first embodiment shown in Figure 1; and

Figure 9 is a top plan view of an eighth embodiment of building block according to the invention, similar in concept to the sixth embodiment shown in Figure 7.

Referring to Figure 1, there is shown a building block, indicated generally by the reference numeral 100, comprising a substantially cuboid body having a front face 101, a rear face (not shown), a top face 103, a bottom face 105, a left hand side face 107 and a right hand side face 109. The building block 100 has a pre-formed channel 111 located centrally and arranged vertically in a front face thereof, that is configured for reception of electrical or mechanical services. The building block 100 further comprises two further channels 113, 115 at the front corners of the building block joining the front face and the side faces 107, 109 respectively.

Referring to Figure 2, there is shown a wall, indicated generally by the reference numeral 200, constructed using the building blocks 100 of Figure 1. The building blocks are arranged in three rows 201, 203, 205, one above the other. A cable 207 is led down through a channel formed by the channels in the adjacent rows of blocks. It can be seen that in the bottom row 201 and in the top row 205, the cable 207 runs through central channels 111 in those blocks. In the middle row 203, the cable 207 runs through a channel formed by two smaller “edge” channels 115, 113 in a pair of abutting building blocks 100. It can be seen that in this configuration, there are several channels formed in the wall suitable for placement of a cable or a pipe. In this way, the builder is provided with a good deal of choice for placement of the cable or pipe.

Referring to Figure 3, there is shown a second embodiment of building block, indicated generally by the reference numeral 300, where like parts have been given the same reference numeral as before. The building block 300 comprises a pair of channels 301, 303 in the front face 101 thereof. There is further shown a rear face 305 of the building block. The pair of channels are each approximately one quarter of the width of the block away from the nearest side face of the block. In this way, the channels will marry up when the blocks are in a staggered configuration.

Referring to Figure 4, there is shown a third embodiment of building block, indicated generally by the reference numeral 400, where like parts have been given the same reference numeral as before. The building block 400 differs from previous blocks in that it has channels formed in both the front face 101 and rear face 305 of the building block. The channels 111, 113, 115 in the front face are akin to those shown in the embodiment

shown in Figure 1, and the channels 301, 303 in the rear face are akin to those shown in the embodiment of Figure 3.

Referring to Figure 5, there is shown a fourth embodiment of building block, indicated generally by the reference numeral 500, where like parts have been given the same reference numeral as before. The building block 500 differs from previous blocks in that there is provided a horizontal, central channel 501 running across the width of the block and a grooved area 503 of the block suitable to receive an electrical socket back box or the like. The grooved area is substantially rectangular in shape. It will be understood that a square shape is also considered to be a special case of a rectangular shaped grooved area.

Referring to Figure 6, there is shown a fifth embodiment of building block, indicated generally by the reference numeral 600, where like parts have been given the same reference numeral as before. The building block 600 differs from previous blocks in that it comprises the central channel 111 and two side channels similar to the block shown in Figures 1 and 2, but in addition it possesses a horizontal channel 501 running across the width of the front face 101.

Referring to Figure 7, there is shown a sixth embodiment of building block, indicated generally by the reference numeral 700, where like parts have been given the same reference numeral as before. The building block 700 differs from previous blocks in that it has a single vertical, centrally located channel 111 in the front face of the block 700, and an edge channel 701 formed at the edge of the block at the juncture of the rear face 305 and side face 109. This is seen as a preferred embodiment of the invention as the channels are spaced apart from each other on the block thereby leading to a more structurally sound block. In order to create a channel for a cable or pipe, the blocks in alternate rows are reversed (i.e. half of the blocks are turned back to front 180° about a vertical axis running through the middle of the block) and in some cases reversed and flipped (i.e. half of the blocks are turned back to front 180° about a vertical axis running through the middle of the block, and then rotated 180° about a horizontal axis running through the middle of the block from front to back). In this way, the rear edge channels 701 of two abutting blocks in a row will combine together to form a larger channel. The

central channel 111 is aligned with a pair of edge/side channels 701 of a pair of abutting blocks in the row above and/or below.

Referring to Figure 8, there is shown a seventh embodiment of building block, indicated generally by the reference numeral 800, where like parts have been given the same reference numeral as before. The building block 800 is similar in most respects to the building block shown in Figure 1 however it differs from the previous blocks 100 in that instead of the channels 111, 113, 115 being hollowed out, the channels are instead defined by longitudinal cuts 801, 803, 805, 807 in the front face 101 of the block 800 and free-standing mesas 811, 813, 815 are left attached to the body of the building block. In this way, the channels in the blocks are pre-cut but are not hollowed out and fully formed.

In this way, all the builder constructing the channel in the wall has to do is to remove the mesa to provide the hollow channel for cable or piping. This requires far less labour and skill than was previously the case and also provides an accurately located channel for the builder. In addition, if the builder does not require a channel in that location, they can simply leave the mesa in place, and it is believed that this will improve the thermal performance of the building block as well as the structural integrity of the building block. The blocks could be cut to provide the longitudinal cuts 801, 803, 805, 807 after the blocks have set but preferably, the blocks will be moulded with these cuts in place or indeed a sacrificial material such as cardboard could be placed in the mould to provide the “cuts”. What is important is that there are areas of weakness that define the channel. The configuration shown in Figure 8 is deemed particularly advantageous.

Referring to Figure 9, there is shown an eighth embodiment of building block, indicated generally by the reference numeral 900, where like parts have been given the same reference numeral as before. The building block 900 is similar to the building block 700 shown in Figure 7 however it differs from that block in that again, the channels 111, 701 are defined by cuts 803, 805 and 901 respectively. There are two free standing mesas 811 and 903 created by the cuts. Again, the builder can remove the mesas as required once the wall is in situ.

It will be understood that other configurations will be readily envisaged. For example, cuts similar to those of the building blocks of Figures 8 and 9 could be used to provide the channel configuration of any of the blocks 100, 300, 400, 500, 600 or 700. Indeed, other channels and channel configurations will be envisaged. For example, it may be desirable to have a block with only a horizontal channel. There may be a centrally located horizontal channel and there may be horizontal channels along the edge or edges formed by the top and or the bottom surfaces. Channels may be formed on the front and/or the rear. Different numbers of channels could be provided. For example, four, five, six or more channels could be provided on one face of the building block if desired to give more options and greater flexibility in the placement of the electrical cables/piping. Indeed, multiple vertical channels and multiple horizontal channels could be provided in a “hatched” configuration.

In some of the embodiments described, it is said that the width of the channel at the edge of the building block is approximately half the width of the centre channel. More specifically however, the width of the channel at the edge will typically be less than half the width of the centre channel. This is due to the fact that the mortar joint between adjacent blocks will also form part of the larger channel formed by two abutting edge channels. For example, it is envisaged that the mortar joint will typically be of the order of 10mm wide (0.01m). For a block with a central channel 30mm (0.03m) wide, the width of the channel created by the pair of edge channels will be approximately the same, 30mm wide (0.03m), inclusive of the 10mm (0.01m) wide mortar joint. Therefore, each edge channel will be 10mm (0.01m) wide as the pair of opposing edge channels and the mortar joint will together combine to form a 30mm (0.03m) channel. Similarly, for a central channel of 25mm (0.025m) width and a mortar joint of 10mm (0.01m) width, the edge channels may each be of the order of 8mm (0.008m) wide, resulting in a total channel width created by a pair of opposing edge channels and the mortar joint of 26mm (0.026m) wide. It is not essential that the central channel and the channel formed by the pair of opposing edge channels combined with the mortar joint are exactly the same and some variation is envisaged. In any event, it is common for the mortar joint to vary in thickness. What is preferred is that when assuming a standard mortar joint width, the channel formed by the mortar joint and the edge joints will be roughly similar in width to the central channel.

Throughout this specification reference is made to the placement of electrical cables, conduits, mechanical services, piping and the like and these are deemed interchangeable. In other words, if reference is made to creating a channel for electrical cable, this is also understood to men creating a channel for piping, mechanical services, and/or conduits.

In this specification the terms “comprise, comprises, comprised and comprising” and the terms “include, includes, included and including” are all deemed interchangeable and should be afforded the widest possible interpretation.

The invention is not limited solely to the embodiments hereinbefore described but may be varied in both construction and detail within the scope of the appended claims.

Claims:

(1) A building block comprising a substantially cuboid body having a front face, a rear face, a top face, a bottom face, a left hand side face and a right hand side face, the building block having a pre-formed channel in a front face thereof configured for reception of electrical or mechanical services.

(2) A building block as claimed in claim 1 in which there is provided a pre-formed channel in a rear face of the building block configured for reception of electrical or mechanical services.

(3) A building block as claimed in claim 1 or 2 in which the pre-formed channel is oriented vertically.

(4) A building block as claimed in any preceding claim in which the preformed channel is oriented horizontally.

(5) A building block as claimed in any preceding claim in which the channel comprises a pair of elongate cuts into the face defining a sacrificial mesa therebetween.

Abstract

“**A building block**”

This invention relates to a building block comprising a substantially cuboid body. The cuboid body has a front face, a rear face, a top face, a bottom face, a left hand side face and a right hand side face. The building block further comprises a pre-formed channel in at least a front face thereof configured for reception of electrical or mechanical services. The pre-formed channel may comprise a free-standing mesa bounded by one or more cuts in the surface of the building block and the mesa may be removed if and when needed once the desired locations of the electrical cabling or piping has been determined. A plurality of channels may be provided and the channels may be vertically and/or horizontally aligned. In this way, the building block allows for safer, cleaner, cheaper construction techniques.

Figure 1