

Door frame installation

Field of the Invention

This invention relates to the installation of door frames in wall
5 openings.

Background

Door frames are normally installed at the same time wet works are
being carried out on site. When the brickwalls are being erected, the installer
has to set the door frame carefully in position based upon references marked
10 on site. Then, the plastering and tile laying are carried out.

This manner of work sequence often results in door frame
misalignment and the vulnerability of the door frame to damage.
Misalignment is due to shrinkage and differential movement of the plaster and
cement around the door frame when moisture is lost. In addition, the wall
15 finishings have inexact thickness. This inexact thickness is due to
misalignment and bad workmanship.

The door frame is easily susceptible to damage as it is exposed to
ongoing wet works. It is not unusual for the frame edges to be chipped and
dented by impact from heavy objects. The surfaces of the door frame are
20 also frequently tarnished by plaster, paint and water.

Brief Description of the Prior Art

There are two conventional ways in which door frames are installed
onto wall openings.

In the first method, the brickwall or reinforce concrete wall is erected
25 together with a wall opening based on references that are marked on the floor
by in-house surveyor and other required measurements. The measurements
of the wall opening are taken into consideration for the installation of the door
frame. The position of the door frame is set by using the setting up reference
line marked on the floor and the datum reference line marked by the in-house
30 surveyor. In order to obtain an accurate vertical alignment, timber wedges
are used between the door frame and the wall. The door frame is secured to
the wall by bending metal straps which are fastened to the door jambs and

nailed onto the wall with concrete nails. The door frame is then protected with thin plywood. There is a gap between the door frame and the wall for cement grouting.

During this stage, skilled labour is required to install the door frame in this manner. A lot of time is taken up to adjust and align the door frame with reference to the wall as there needs to be an allowance for the plastering or tiling work to be done on the surface of the wall. Any impact on the door frame due to the various work being carried out may result in misalignment as the frame is only secured with metal straps.

In the next stage, cement grout is filled into the gap between the wall and door frame. The difficulties which arise in this stage are that time is needed for the cement grout to set before commencement of other work and the door frame may be stained by the cement grout.

Plaster is then applied onto the wall or wall tiles are placed onto the wall. Screeding is done to the floor and floor tiles are laid. The floor tiles which have to be cut and fitted at the bottom of the door frame will normally not present a tidy finish.

The architrave is then installed onto the door frame using nails. As a result, the pin hole marks on the surface of the architrave can be seen.

In the next stage, the door panel is installed with ironmongeries. All the pin hole marks and dented areas on the surface of the architrave and door frame are filled up with putty. The architrave and door frame are then covered with masking tape before the painting works are carried out. The wall is painted with a few layers of paint and the masking tape is removed from the architrave and door frame once the painting work finishes. Finally, the architrave and door frame are painted or varnished.

There are some disadvantages at this final stage. The door panel needs to be adjusted and altered at the time of installation which may be due to misalignment of the door frame caused by impact from heavy objects. The door frame and door panel need to be protected while other works are being carried out. The pin hole marks and the areas where putty has been applied will still be seen after varnishing is done. It can be seen in this method of

installation of door frame that a few operations are required to complete the whole task and each trade of work needs to be completed before another one can start.

There is another conventional method of installation of door frame which uses a sub-door frame. The wall is erected with an opening in the same way as in the previous method. However, a sub-door frame is installed first instead of a main door frame. In the same way, the sub-door frame is aligned to the wall using timber wedges and secured to the wall by bending metal straps which are then nailed to the wall.

The disadvantages in the first stage of installation of a sub-door frame is similar to the previous method. Skilled labour is required to install the sub-door frame and a lot of time is needed to adjust and align the sub-door frame with reference to the wall so as to give allowance to the wall to receive the plaster or wall tiles. Any heavy impact on the sub-door frame may cause misalignment as sub-door frame is only secured with metal straps. Furthermore, there is extra cost incurred for installation of a sub-door frame due to costs of material and workmanship.

In the next stage, cement grout is applied to the gap between the wall and the sub-door frame. In this stage, time is needed for the cement grout to set before other work can commence.

Plaster is then applied to the wall or wall tiles are placed onto the wall. Following this, the floor is screeded and the floor tiles are laid. The door frame is finally installed by first setting the alignment based on existing wall and sub-door frame position. Then, the door frame is positioned and aligned to the wall using timber wedges and finally secured to the sub-door frame with screws.

The door frame is easier to install and the door frame is not stained by cement as compared to the previous method because all wet works have been completed before the door frame is installed.

The architrave is then installed. However, the pin hole marks on the surface of the architrave can still be seen. The door panel is installed with ironmongeries. All the pin hole marks on the architrave and the screw marks

on the door frame are filled up with putty. The architrave is covered with masking tape before painting work begins on the wall. After the painting work is done, the masking tape is removed and finally, the architrave and door frame are painted or varnished. The areas where the putty has been applied
 5 can still be visible after varnishing.

It is an object of the invention to overcome or at least to reduce one or more of the above disadvantages.

Summary of the Invention

According to one aspect of the present invention there is provided a
 10 door frame assembly for a wall opening in a wall upon which wet works have been completed, including a door frame having a pair of door jambs and a door head adapted to be secured together by fastening means, the door frame when assembled being locatable with the wall opening, and an architrave securable by fastening means to the door frame following
 15 installation of the door frame within the wall opening, wherein the fastening means provide for a degree of tolerance between the door frame and wall and the architrave and wall to thereby ensure proper alignment of the door frame and the architrave.

The tolerance gives allowance for the inexact thickness of the wall
 20 finishing and any misalignment of the door frame with reference to the wall.

The door frame and architraves may be fabricated off site prior to installation thereof, and may be subsequently assembled on site.

The fastening means used to secure the door frame and/or the architrave may be dowels to allow for a certain amount of tolerance which can
 25 be adjusted to overcome any misalignment of the door frame and the inexact thickness of the wall finishing.

The door jambs may be respectively made of a plurality of sections including a backing piece and at least one further section. It is however also envisaged that the door jambs and/or door head be made as a single section.

30 A rebate may be provided between the backing piece and the at least one further section. The architrave may include a leg portion adapted to be accommodated with the rebate. The fastening means may be located within

the rebate for securing the architrave therein.

According to another aspect of the present invention, there is provided a method of installing a door frame assembly in a wall opening in a wall upon completion of wet works, the door frame assembly including a door frame
5 having door jambs and a door head and an architrave, the method including the steps of:

assembling the door jambs and the door head with fastening means to provide the door frame;

installing and securing the door frame in the wall opening and securing
10 the architraves to the door frame with fastening means;
wherein the fastening means provide for a degree of tolerance between the door frame and wall, and between the architrave and wall to thereby ensure proper alignment of the door frame and the architrave.

The fastening means may be dowels to allow for a degree of tolerance
15 as previously noted.

The method may further include securing the door frame in the wall opening using mechanical fixing means, the position of the mechanical fixing means being marked on the wall for installation of the door frame and the door frame being aligned with the wall using a wedge. The mechanical fixing
20 means may be a screw or an expansion bolt and nut. Other mechanical fixing means can also be used.

The door jamb may include a main door jamb section and a cover
piece door jamb section, the main door jamb section being initially secured to the wall by the mechanical fixing means, the cover piece door jamb section
25 being subsequently secured to the main door jamb section to conceal the mechanical fixing means.

The door head may similarly include a main door head section and a cover piece door head section, the main door head section being initially secured to the wall by the mechanical fixing means, the cover piece door
30 head section being subsequently secured to the main door head section to conceal the mechanical fixing means.

The respective cover pieces sections may be secured by dowels to the

respective main sections.

Following installation of the door frame assembly, a door panel may be installed to the door frame assembly.

This invention provides for an installation of a door frame on a wall opening which allows all wet works and painting works to be completed first. Thus, there is a less likely chance for the door frame to be damaged by impact from heavy objects during ongoing work. Hence, there is no need for the door frame to be protected by thin plywood as in the conventional method and there is no need for rectification work. The door frame will not be stained by cement as all wet works would have been completed by then. The general contractor will have a better control on the quality of the wall finishing without having to worry about staining the door frame. There is minimal site coordination required as the interfacing between trades are reduced. Easy transportation and reduction in storage space on site for the various components of door frame, door jamb, door head and architrave as all these components come in separate pieces and are only assembled on site.

This method of installation is simple thus saving time. There is also a tight quality control over alignment, plumb and level as all measurements of the various components are predetermined. As the door frame can also be dismantled, renovation works can be carried out with ease without damaging the wall and floor finishes.

Preferably in accordance with the invention, all components are kiln dried and factory fabricated for precision and quality control. The designs of these various components can be customized. The positioning of the ironmongeries on the door frame and door panel can all be determined in the factory and hence, there is no need to chisel and cut the positioning of the ironmongeries on site which may result in an untidy finish.

Brief Description of the Drawings

The invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1a is a front view of a door frame assembly according to a first preferred embodiment of the present invention;

Figure 1b is a front view of a door panel to be attached to the door frame of Figure 1a;

Figure 2a is a cross-sectional view of the line A-A of Figure 1a to which is attached to a door panel;

5 Figure 2b is a cross-sectional view of line C of Figure 1a according to a first preferred embodiment of the plurality of sections and means of fastening;

Figure 3 is a cross-sectional view of line B-B from the top of the door frame of Figure 1a to which is attached a door panel;

Figure 4 is a cross-sectional view of line A-A of Figure 1a to which is
10 attached a door panel in another preferred embodiment of the invention; and

Figure 5 is a similar view to Figure 3 in said another preferred embodiment of the invention.

Specific Description of Preferred Embodiments

This method of installation of door frame assembly according to the
15 present invention is to be called 'Dri-Fix'. The specifications and measurements for the wall opening and door frame assembly are prepared beforehand and given to the general contractor for the construction of the wall opening. The general contractor will proceed to erect the wall with the opening followed by plastering or wall tiling. Flooring, painting and all other
20 wet works can be completed at this stage.

The accompanying drawings show alternative embodiments of the door frame assembly, and the same reference numerals are therefore used to designate corresponding components.

Referring initially to Figure 1a, there is shown a door frame assembly
25 to which a door panel 8 as shown in Figure 1b is attached. Figures 2A and 3 show the components of the first preferred embodiment of the door frame assembly 1, and Figures 4 and 5 show the components of the second preferred embodiments of the door frame assembly 1.

Each door frame assembly 1 includes a door frame 2 having a pair of
30 door jambs 9 and a door head 10, and architrave sections 5. Each door jamb 9 and door head 10 is supported on a backing piece 7. The door jamb 9 is therefore constructed with a backing piece 7, a main door jamb section 11

secured to the backing piece 7, and a cover piece door jamb section 12 to which the door panel 8 abuts when closed.

The cover piece door jamb section 12 is secured to main door jamb section 11 by dowels 3 to thereby conceal the screws and/or expansion bolts used to secure the door frame 2 to the wall opening of the wall 6.

The door head 10 is similarly constructed with a main door head section 15 secured to a backing piece 7, and cover piece door head section 16 to which the top of the door panel 8 abuts when closed. Dowels 3 also secures the cover piece door head section 16 to the main door head section 15 to conceal the screws and expansion bolts securing the door head 10 to the wall opening of the wall 6.

The door frame assembly 1 further includes architrave sections 5, each section 5 having a surround portion 20 which extends over the wall 6 when the door frame assembly 1 is installed in the wall opening.

A leg portion 21 extends from the surround portion 20 of the architrave section as shown for example in Figure 3. This leg portion 21 can be located in a rebate 22 defined between the main door jamb section 11 and backing piece 7 in the door jamb 9. A similar rebate 22 is defined between the main door head section 15 and backing piece 7 in the door head 10 for accommodating the leg portion 21 of the corresponding architrave section 5.

Dowels 17 join the leg portion 21 of the architrave sections 5 to the door jamb 9 and door head 10 respectively. The dowel joint is hidden within the rebate 22 to thereby ensure that the joint remains hidden from view.

Alternatively, the architrave section 5 may be a flat strip doweled directly to the door frame 2 as shown in Figure 5, on one side of the door assembly 1.

The door panel 8 is of conventional construction having an internal frame 24 covered by exterior sheets 25. Packing 26 can be provided within the cavities within door panel 8, so that it is more firm.

All the components for the installation of the door frame assembly, including the door jamb, door head and architrave are fabricated to specific sizes and come in separate pieces to be assembled on site.

The vertical alignment for the door frame 2 is set based on existing wall position. Positions of the mechanical fixings such as screws or expansion bolts and nuts are marked on the wall before the holes are drilled. Timber wedges are inserted between the door frame 2 and wall 6 in order to obtain the right position and upright alignment for the door frame. The screws or expansion bolts are then tightened.

The door jambs 9 are placed in the centre of either sides of the door frame 2 and the door head 10 is placed at the centre of the top part of the door frame 2 using fastening means such as dowels. Screws or expansion bolts and nuts are used to secure the door frame 2 to the wall 6 and are shown as dark horizontal lines which touch the edges of the door frame in Figure 1a. The architrave 5 is also installed to the door jambs 9 and head 10 with the use of dowels 17. These dowels allow a certain amount of tolerance to compensate for the inexact thickness of the wall finishing and to cover up any misalignment of the door frame 2. The cover piece door jamb section 12 and the cover piece door head section 16 conceal the screws or expansion bolts used which otherwise might be seen. The architrave 5 conceal the joint between the wall 6 and door jamb 9 and between the wall 6 and door head 10.

The door panel 8 is then installed with ironmongeries. Finally, the door frame assembly 1 and door panel 8 can be varnished or painted. However, the door frame assembly 1 and door panel 8 can also be varnished or painted in the factory before delivering to the site.

The architrave sections 5 can be designed to allow for a degree of tolerance or to fit into the door frame exactly without any tolerance. The door frame assembly 1 can be broken up into smaller components such as a backing piece 7 or it can be one whole piece. In these figures, the backing piece 7 is shown as a separate piece from the rest of the door frame 2.

The embodiments have been advanced by way of example only, and modifications are possible within the spirit and scope of the appended claims.



Claims:

1. A door frame assembly for a wall opening in a wall upon which wet works have been completed, including:
 - 5 a door frame having a pair of door jambs and a door head adapted to be secured together by fastening means, the door frame when assembled being locatable with the wall opening, and an architrave securable by fastening means to the door frame following installation of the door frame within the wall opening, wherein the fastening means provide for a degree of
10 tolerance between the door frame and wall, and the architrave and wall to thereby ensure proper alignment of the door frame and the architrave.
2. A door frame assembly according to claim 1, wherein the door frame and architrave is prefabricated off site prior to installation thereof, and are
15 adapted to be assembled on site.
3. A door frame assembly according to claim 1 or 2 wherein the door jambs and door head are respectively made of a plurality of sections including a backing piece and at least one further section thereof.
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4. A door frame assembly according to claim 3 further including a rebate provided between the backing pieces and the at least one further section, and the architrave including a leg portion adapted to be accommodated with said rebate.
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5. A door frame assembly according to claim 4 wherein said fastening means are located within said rebate for securing the architrave section therein.
- 30 6. A door frame assembly according to any one of the preceding claims, wherein the fastening means are dowels.



7. A method of installing a door frame assembly in a wall opening in a wall upon completion of wet works, the door frame assembly including a door frame having door jambs and a door head, and an architrave, the method including the steps of:

5 assembling the door jambs and the door head with fastening means to provide the door frame;

installing and securing the door frame in the wall opening and

securing the architrave to the door frame with fastening means wherein the fastening means provide for a degree of tolerance between the door
10 frame and wall, and between the architrave and wall to thereby ensure proper alignment of the door frame and the architrave.

8. A method according to claim 7 wherein the fastening means allows for proper alignment of the door frame and the architrave.

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9. A method as claimed in claim 7 or claim 8 wherein fastening means are dowels.

10. A method as claimed in claim 9 including securing the door frame in
20 the wall opening using mechanical fixing means, the positions of mechanical fixings being marked on the wall for installation of the door frame and the door frame being aligned with the wall using a wedge.

11. A method as claimed in claim 10 wherein the mechanical fixing means
25 is a screw.

12. A method as claimed in claim 10 wherein the mechanical fixing means is an expansion bolt and nut.

30 13. A method according to any one of claims 10 to 12, wherein the door jamb includes a main door jamb section and a cover piece door jamb section.



14. A method according to claim 13 wherein the main door jamb section is initially secured to the wall with the mechanical fixing means, and subsequently the cover piece door jamb section is secured to the main door jamb section to conceal the mechanical fixing means.

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15. A method according to any one of claims 10 to 14, wherein the door head includes a main door head section and a cover piece door head section.

16. A method according to claim 15 wherein the main door head section is
10 initially secured to the wall with the mechanical fixing means, and subsequently the cover piece door head section is secured to the main door head section to conceal the mechanical fixing means.

17. A method according to any one of claims 13 to 16, wherein the cover
15 piece section is secured by dowels to the main section.

18. A method according to any one of claims 7 to 17, including installing a door panel to the assembled door frame assembly.

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