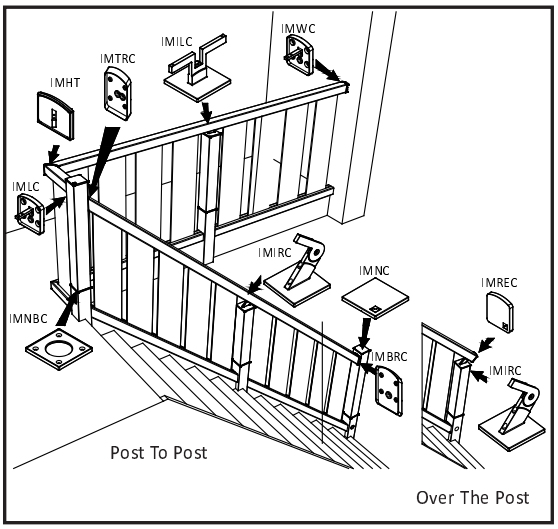
# IMMIX - STAIR BALUSTRADE TIMBER BALUSTER & GLASS PANEL SYSTEM

The following instructions are for installing Richard Burbidge Immix™ timber baluster and glass panel - Over the Post and Post to Post Stair Balustrading.
If you have any queries please contact our Technical Helpline on 01691 678212.

Richard Burbidge Immix™ stair balustrading has been designed to suit staircase pitches between 40° & 43°
Components have been independently tested to guarantee conformity to UK building regulations.




Note –
Please check all components carefully PRIOR to installation for any damage to the surface, as Richard Burbidge cannot be held responsible for any damage once installation has commenced.

Immix™ balustrade system has been independently tested by FIRA and when installed in accordance with these instructions conforms with Building Regulations for balustrades at 900mm high and 0.36kN/m domestic loadings. FIRA Structural testing reports and Richard Burbidge balustrades are safety approved by TRADA (BM TRADA Approved Timber Balustrading Scheme certificate number 022/001).

Before commencing your installation of the Immix system, please read these instructions carefully.

**Tools And Fixings Needed When Installing Immix (with new Newel Bases)** - battery drill, long series pozi drive bit, countersink bit, saw, combination protractor, spirit level, grip fill adhesive, clear silicone, tape measure, 2 x batten material 900mm x 50mm x 8mm, maskin tape, 6mm allen key (T shape with handle reccomended), pencil, Ø16mm spade bit, Ø10mm & Ø4mm drill bit, long series 3mm drill bit, 56mm No6 csk screw, 32mm No6 csk screws,38mm No6 csk screws, 62mm No6 csk screws
**Additional Tools Required If Using Existing Bases** - Ø50.8mm (2") drill bit, Ø35mm & Ø13mm drill bit.

## INSTALLATION - POST TO POST STAIRS

This system is designed to suit 40° - 43° pitches only.

## SETTING THE NEWEL BASE HEIGHT

### Existing Newel Bases

Existing bases need to be 90mm x 90mm square and installed central to riser and string. If the section size of the newel base is smaller, they will have to be built up by cladding each side equally to the required size. Use glue and pins to fix **(Fig.1)**.

If the stairs is greater than 2400mm long, an intermediate newel base and newel must be used at the mid point of the stairs.
In most cases a new newel base will have to be installed. To install the new pre drilled newel bases onto stairs see **(Fig.2)**.

Fig.1

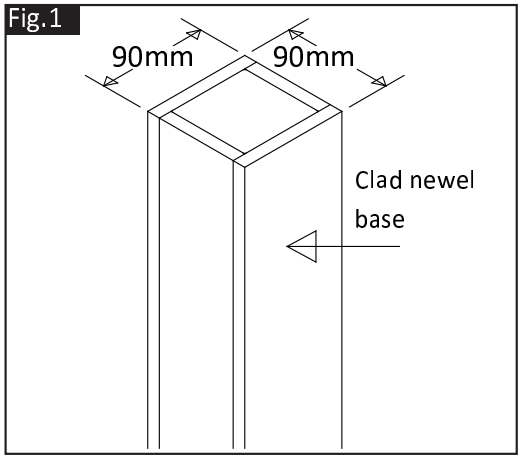
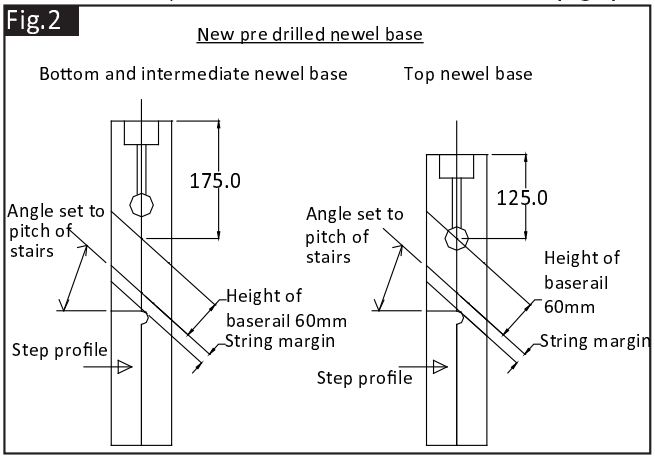



Fig.2




Set the bottom newel base height at 175mm from where the top of the baserail intersects the middle of the newel base.
If using intermediate newel on stairs, set the intermediate newel base height at 175mm from where the top of baserail intersects middle of the newel, the same height as the bottom newel base.
For newel bases at the top of the stairs, set the height at 125mm from where the top of baserail intersects the middle of newel base **(Fig.3)**.

If using existing 90mm bases, locate and mark the centre of face (face that points towards the stairs) and measure down 125mm. Drill a 35mm hole to a depth of 62mm. Locate and mark the centre on top of the base and drill a 50.8mm hole to a depth of 35mm deep then drill a 13mm hole to a depth where it intersects with the 35mm diameter hole **(Fig.4)**.

Fig.3

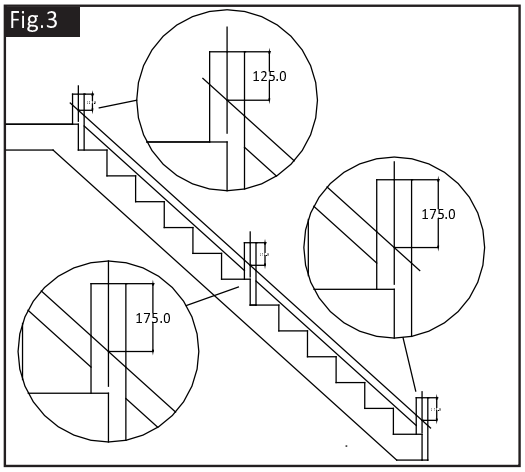
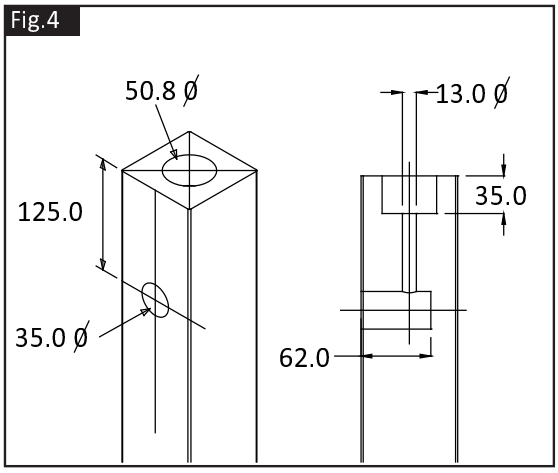



Fig.4




## INSTALLING THE BASERAIL

Lay the baserail on top of the stair nosing and offer up to the side of the newel bases. Mark and cut to length **(Fig.5)**.
Drill clearance holes for the screws through the bottom of the groove in the baserail and countersink.
Position the baserail between the newel bases, ensuring the rail is central to bases. Drill pilot holes through the baserail into the string.
Before securing the baserail to the string, ensure that all debris is cleared from within the rail groove.
Reposition the baserail and fix to the string, making sure all the screw heads are below the surface and do not project into groove **(Fig.6)**.

Fig.5

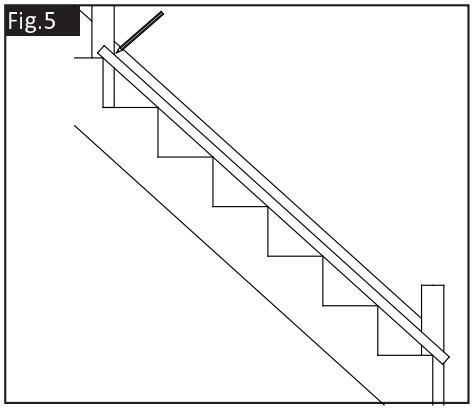
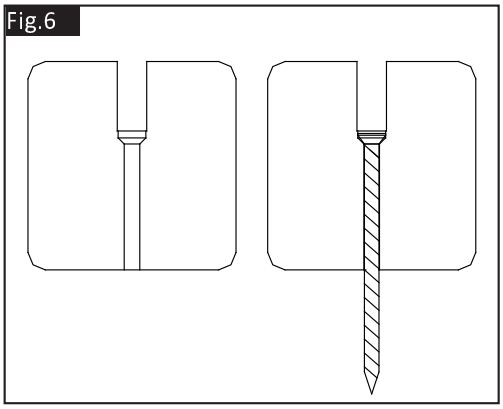


Fig.6



## INSTALLING THE NEWELS

Bottom and top newels -

Position the newel base connector **(IMNBC)** on top of the newel base and mark the position of screw holes. Pilot drill, using a 3mm drill bit and fix the connector to the base using screws supplied **(Fig.7)**.

Insert the circular locking nut into the 35mm diameter hole ensuring the arrow is facing outward and up. Insert the threaded bar on the bottom of the newel post into the newel base so it locates in the locking nut. Support weight of newel until threads have aligned correctly. Tighten with an allen key until the newel post starts to be drawn down ensuring newel alignment will sit within newel base connector **(IMNBC)**, Tighten until fully down **(Fig.8)**. Repeat for top newel.

Fig.7

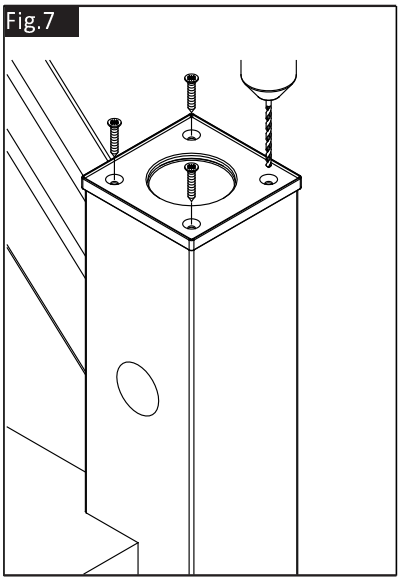
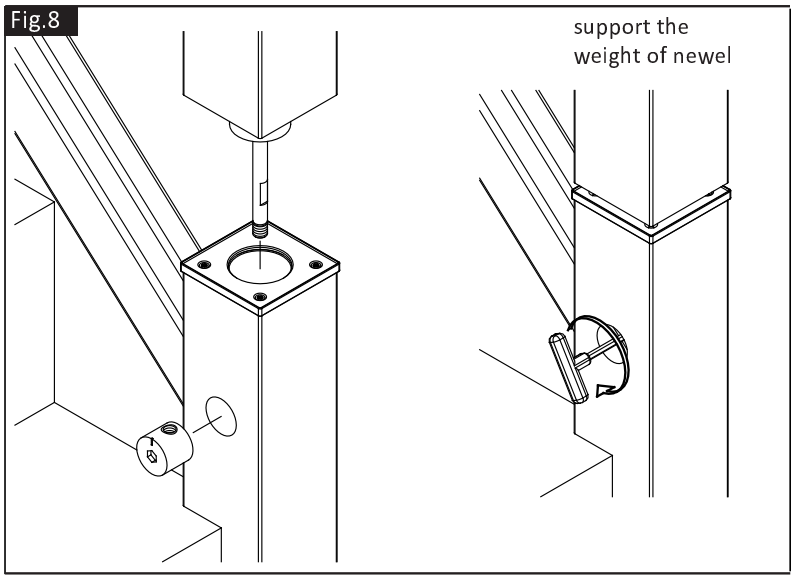


Fig.8



## INTERMEDIATE NEWELS

Establish the pitch of your stairs and cut the intermediate newel to length (see table opposite).

| | GLASS | BALUSTERS |
|---|---|---|
| Pitch of stairs | Length of newel | Length of newel |
| 40° | 466mm | 463mm |
| 41° | 464mm | 462mm |
| 42° | 462mm | 460mm |
| 43° | 459mm | 459mm |

Insert and fix the intermediate newel into the newel base following the same instructions for the top and bottom newels.
Place the Intermediate rake connector **(IMIRC)** onto the top of the intermediate newel and mark the position of the screw holes on top of the newel and pilot drill the holes **(Fig.9)**.

Swing the connector arm out of the way and fix the connector to the top of the newel with the screws supplied **(Fig.10)**.
Swing the arm back into position, set to the pitch of the stairs and tighten.

Fig.9

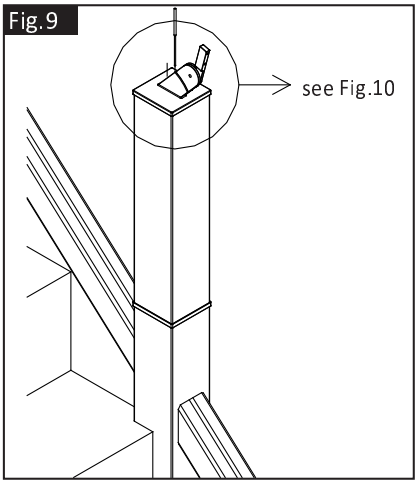
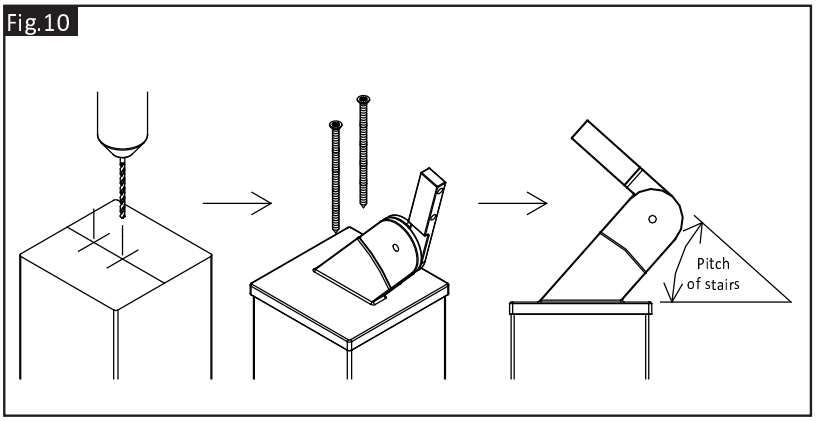



Fig.10




## INSTALLING THE HANDRAILS

Place a length of handrail on the stair nosing up against the newel bases and mark the handrail from the inside face of the bottom newel base and the inside face of the top newel base.
Subtract 14mm from the length, mark and cut to the angle of the newel. This will ensure the correct rail length when using connectors **(Fig.11)**.

Offer the bottom rake connector **(IMBRC)** to the bottom end of the handrail ensuring the top of the connector is as close to the top of the handrail as possible. Pilot drill through the screw holes and secure with the screws provided.
Fasten the top rake connector **(IMTRC)** to the top end of the handrail following the same instructions as bottom rake connector **(Fig.12)**.

Glass panels - Cut 2 x battens at 795mm high x 50mm wide x 8mm deep cut at the stair pitch and locate in the baserail groove.
**Note - <u>If you are fitting the timber balusters then use a baluster with the assembled brackets instead of the battens to set the height.</u>**
Offer the handrail between newels and over the intermediate rake connector **(IMIRC)** ensuring that the bottom of the handrail groove is sitting on thetop edge of the battens **(Fig.13)**.

Mark the location of bolt holes for top and bottom rake connectors on the newels using the location mark on the side of the connector **(Fig.14)**.

Fig.11

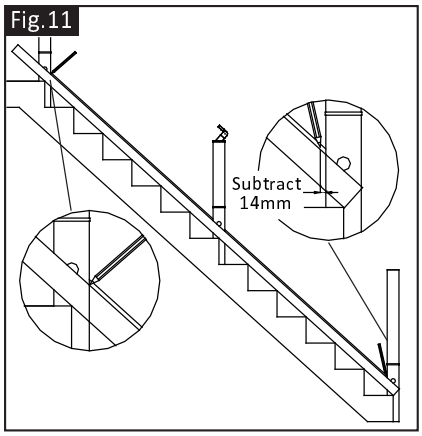



Fig.12

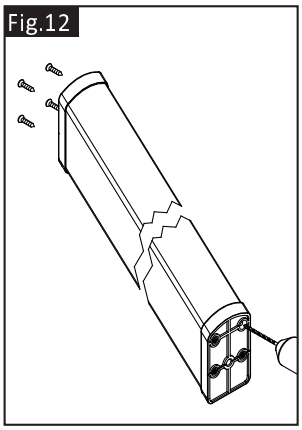


Fig.13

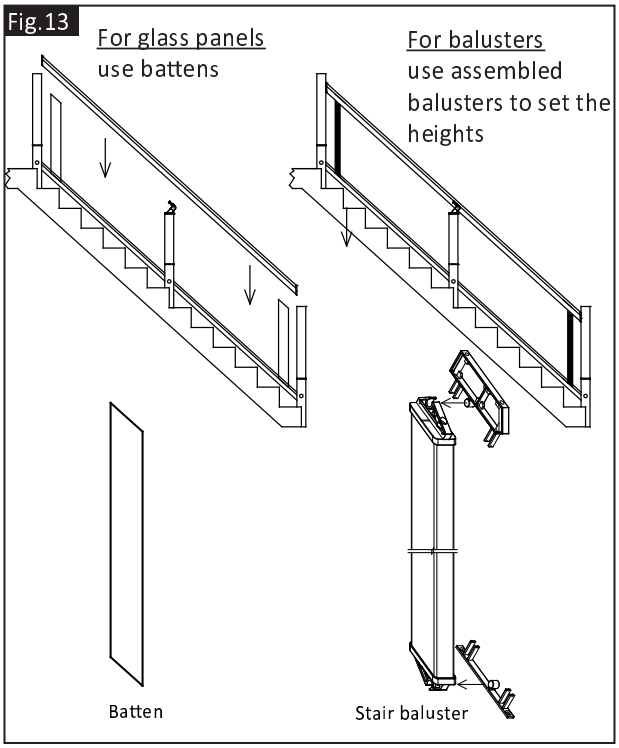
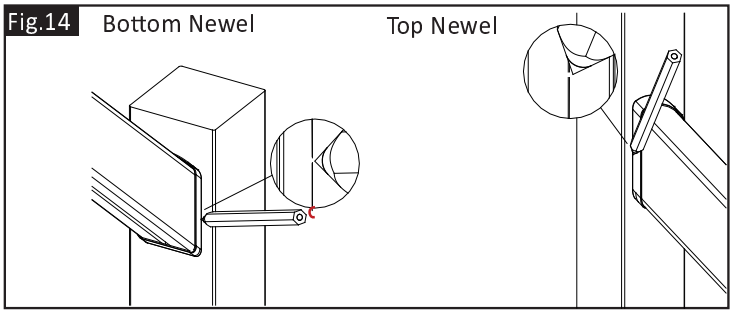



Fig.14



Run a line around to the opposite face of the newels and mark the centre of the newel **(Fig.15)**.
Drill a counter bore hole using a 16mm flat bottom spade bit to a depth of 20mm. Drill a 10mm clearance hole through the newel **(Fig.16)**.

Offer the handrail between newels and onto the intermediate connector. Secure rake connectors to the newels using bolts and washers supplied **(Fig 17)**.
Secure the handrail to the intermediate connector by drilling 2 x pilot holes through the intermediate fixing arm located in the rail groove and fix using the screws supplied **(Fig.18).**

Fig.15

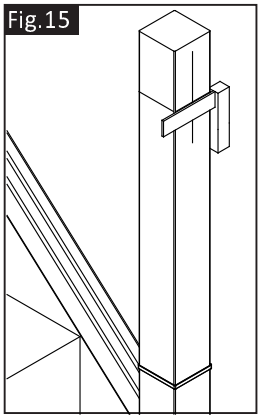


Fig.16

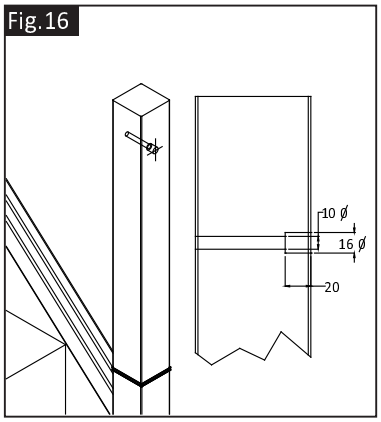



Fig.17

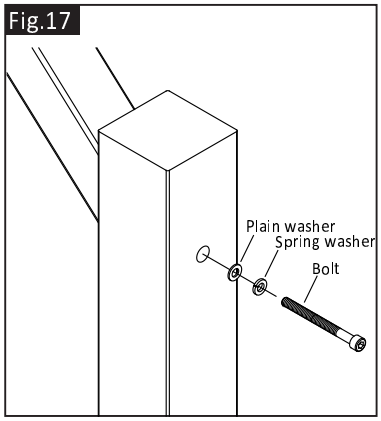
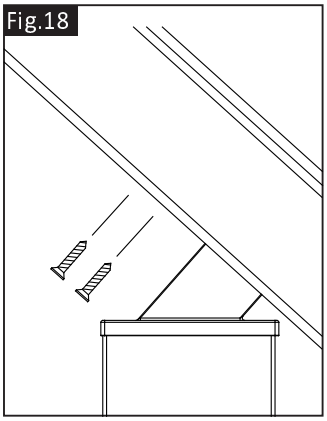



Fig.18



## INSTALLING THE TIMBER BALUSTERS ON STAIRS

Building Regulations state that the space between spindles/balusters should not allow the passage of a 100mm sphere.
**Maximum gap should not exceed 99mm.**
Apply masking tape along the length of the baserail on top face nearside of the groove. Mark a line 100mm from inside face of newel bases onto the masking tape at top and bottom of baserail to establish centres for first and last baluster location **(Fig.19)**.
Measure distance between the two marks which will allow you to calculate the number of balusters and their centres **(Fig.20)**.

Fig.19

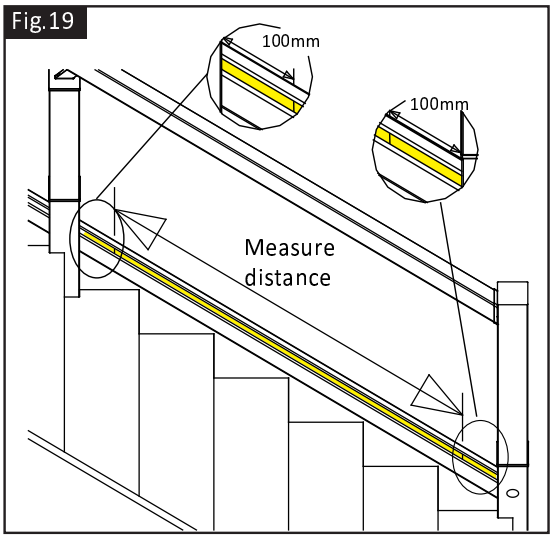
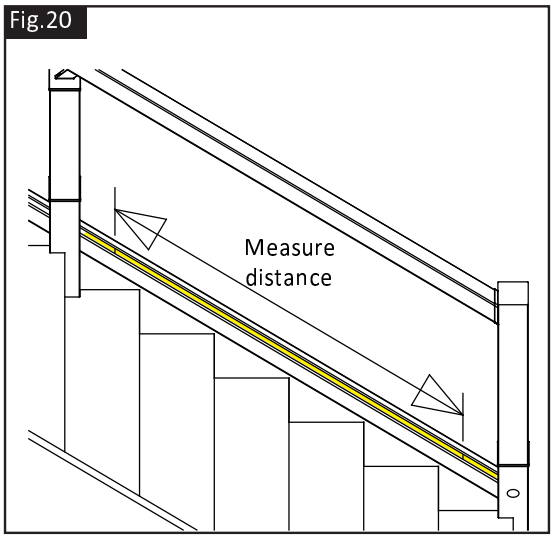



Fig.20




To calculate the number of balusters required, divide distance by 148.5. Round the figure up to next whole number.
Divide the distance by the whole number to give centres for remaining baluster locations.

### Example

Distance between centre location marks = 1440mm

Divide distance by 148.5 = 9.69 (round figure up to 10)

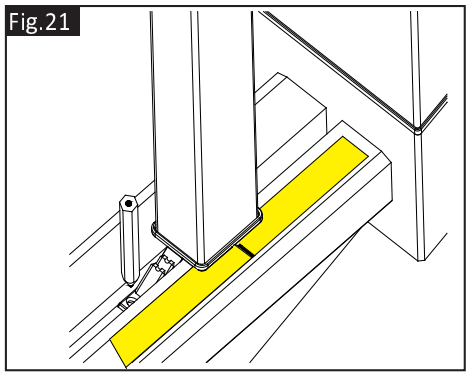
Divide distance 1440mm by 10 = 144mm centres for remaining balusters.
**Please note centres must never exceed 175mm. If they do, add another baluster and recalculate.**

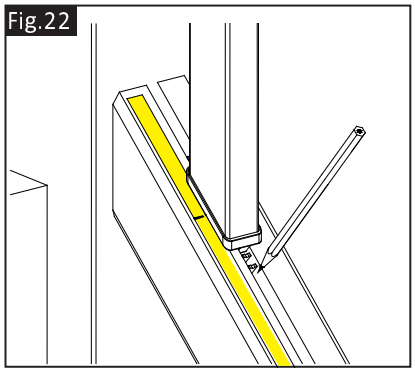
Mark the remaining baluster centres onto the masking tape.

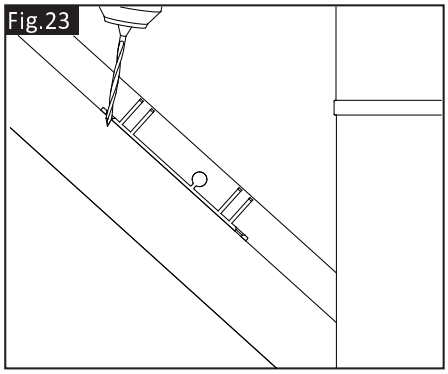
Offer an assembled baluster into rail grooves and align centre of baluster to first/bottom location mark on the tape. Using a pencil, mark position of back-hole onto the bottom of the baserail groove **(Fig.21)**.

This will mark the location of the baserail pilot holes. Continue up the stairs until you reach the last mark. Please note, the last spindle next to the newel should be marked through the front hole **(Fig.22)**.

To pilot drill, remove bottom bracket from the baluster assembly and place in baserail groove so hole is over pilot hole mark.
This will ensure that the pilot holes are drilled centrally.
Using a 3mm diameter long series drill bit, drill to a depth of approx. 2mm **(Fig.23)**.



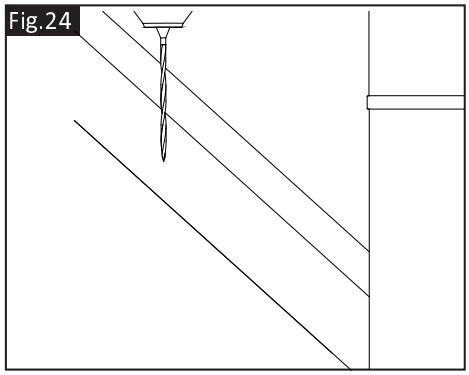



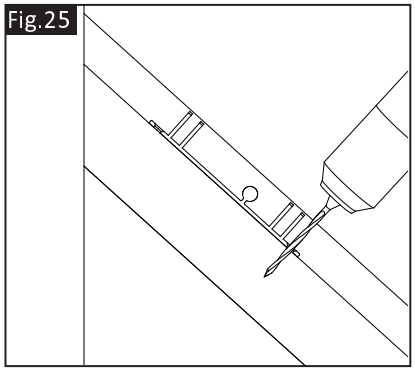



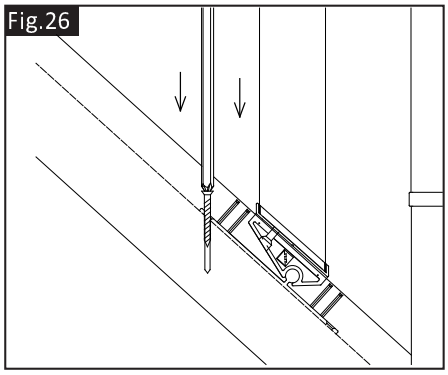

Remove bracket and drill vertically down to a depth of 30mm **(Fig.24)**.

Repeat exercise for all baluster locations on baserail until you reach the last baluster that should be pilot drilled through front hole. Please note, the last spindle hole position can be drilled perpendicular to baserail **(Fig.25)**.

Once all pilot holes have been drilled in baserail, offer assembled rake baluster back into rail grooves so that it is central to first/bottom mark on tape and that the back-hole in bracket is aligned over pilot drill hole. Offer screw through back hole in bottom bracket into the hole and secure ensuring the screw is driven down vertically **(Fig.26)**.



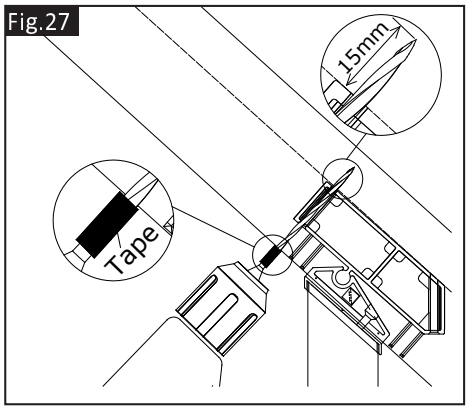



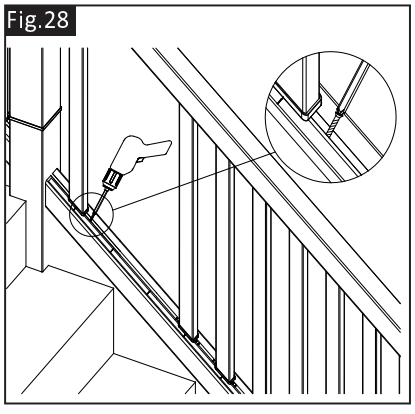



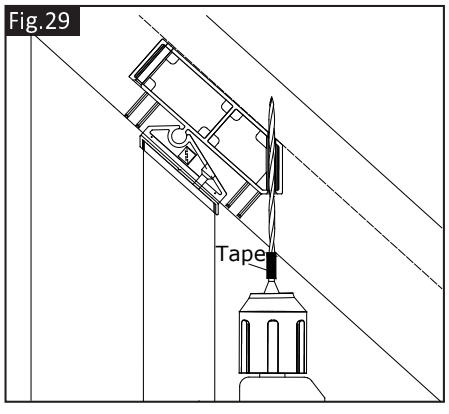

To fix top bracket, ensure that baluster is fully pushed into handrail and is perpendicular. Pilot drill through back hole to a depth of 15mm using 3mm diameter long series drill bit and secure with 44mm screw supplied. Use piece of tape on drill bit to act as depth gauge **(Fig.27)**.

Continue installing balusters up the stairs until you come to the last 3 balusters down from newel post. Install baluster closest to newel post first by lining assembled baluster into rail grooves and align bottom bracket front hole over pilot hole mark drilled previously. Secure to base rail using screw supplied **(Fig.28)**.

To fix top bracket, pilot drill using 3mm dia long series drill bit, through front hole of top bracket to a depth of 15mm and secure with screw provided **(Fig.29)**.

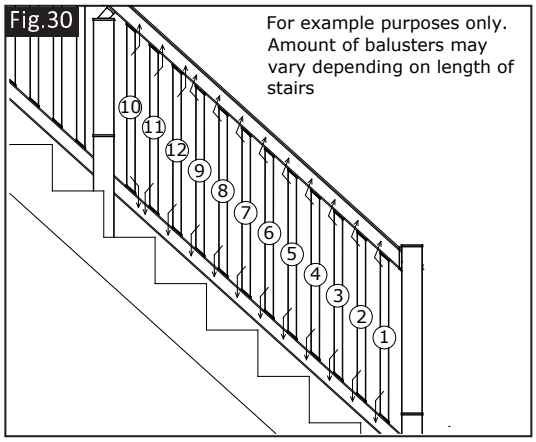


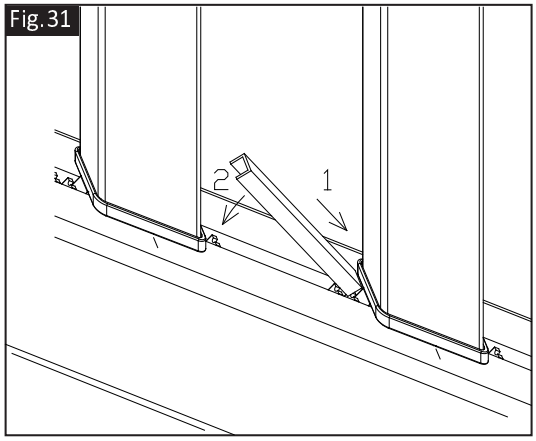




To fix final two balusters, line bottom bracket central to mark on tape ensuring that back hole in bottom bracket lines up with pilot drill hole and fix with screw supplied. To fix top of baluster, pilot drill through front hole in top bracket and fix using screw supplied. A summary example of which bracket holes to use to fix balusters and also the sequence, can be found in **(Fig.30)**.

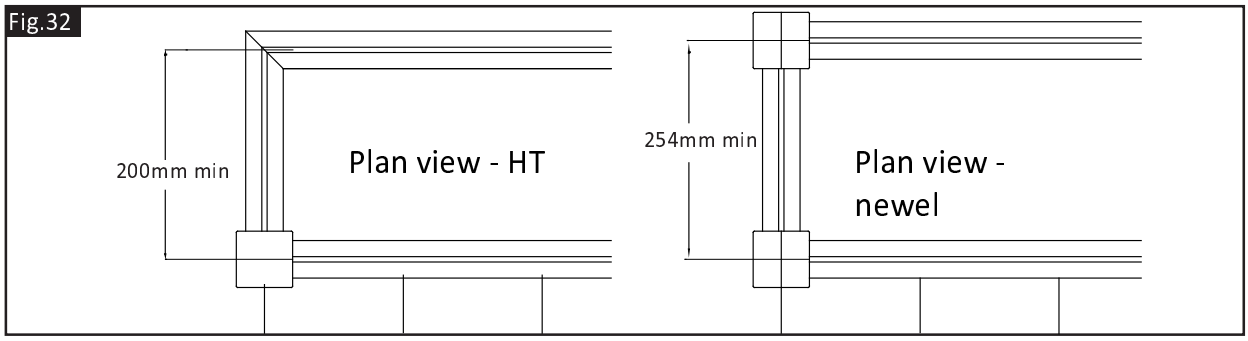
To fill gaps between balusters in base rail and handrail, cut decorative plastic strips to suit and press into grooves. If plastic strips are loose, please apply a bead of clear silicon sealant to groove **(Fig.31)**.




## Installing Timber Balusters On Landings

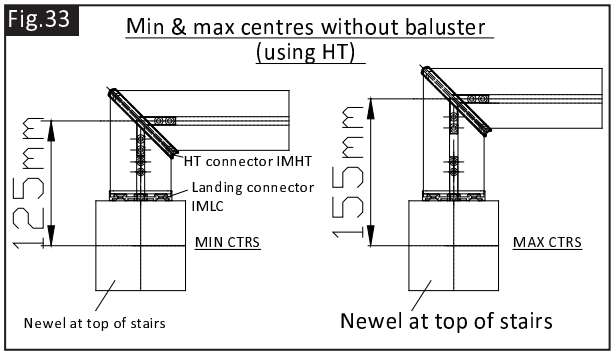
The maximum distance between newel centres is 2400mm. For landing exceeding this maximum, an intermediate newel must be installed. Set the newel base height, if using an intermediate newel, to the same height used on the top newel base at the top of the stairs.
For landings that return 180° off the staircase, the minimum required distance, if using a baluster, is shown in **(Fig.32)**, which details the newel and HT options.

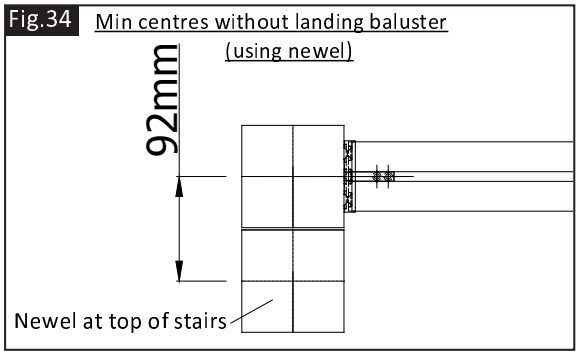



It is possible to reduce the minimum centres by 30mm when using the HT and 60mm when using the newel by cutting 30mm off the locator arm on the landing connector **(IMLC)** as the arm is not used to fix the rail in this particular configuration.
Minimum and maximum centres, without using a baluster are highlighted in **(Fig.33)**.

Please ensure gap is no greater than 99mm when balusters are installed on landing

It is possible to reduce the minimum centres by 30mm when using the HT by cutting 30mm off the locator arm on the landing connector **(IMLC)** as the arm is not used to fix the rail in this particular configuration. Minimum centres achievable using a newel is detailed in **(Fig.34)**.



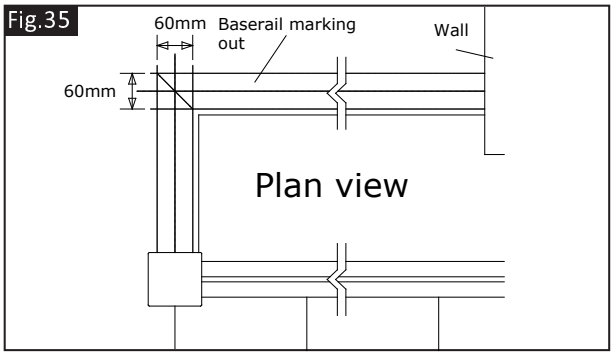

## Installing The Baserail On Landings

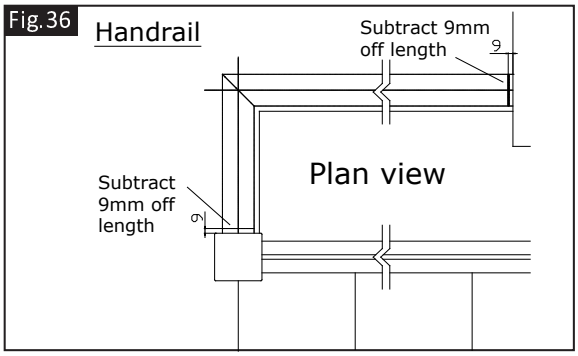
For return landings, mark out where baserail is going to be located. Where the lines intersect on the corner, draw a diagonal line to represent where the baserail will be mitred **(Fig.35)**.

Mark and cut baserail to length. Drill clearance holes through the groove in the baserail and countersink so screw heads will be below top of the groove **(See Fig.6)**.
Apply glue to the mitred faces and position the cut baserail on top of location marks and fix to floor using 63mm No8 screws.

## Installing Handrail On Landings

For return landings, measure and mark the handrails to the same length as the baserails, then subtract 9mm off the square ends to allow for the connectors. Cut to length **(Fig.36)**.



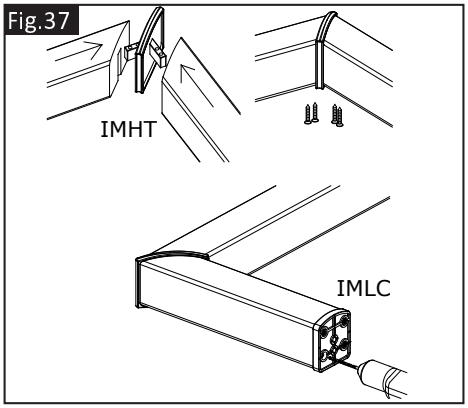



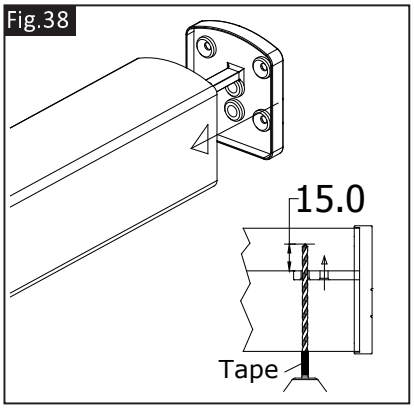

Fix HT connector to the mitred end of the rail by offering the connector over the rail, ensuring the locator arms are up against the top of the groove. Pilot drill through locating arm to a depth of 15mm and secure with screws supplied.
Fix other mitred rail end into HT connector and repeat.

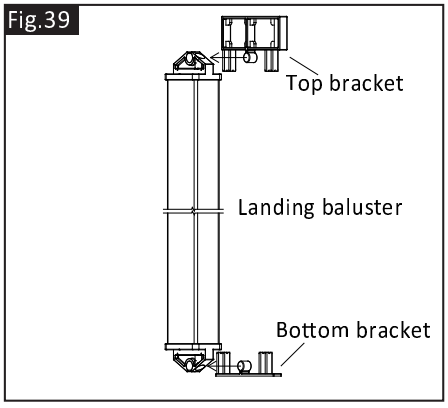
Fix the landing connector **(IMLC)** to the rail end to be fixed to the newel. Drill 4 x pilot holes using 3mm dia drill bit to a depth of 20mm and secure with screws provided **(Fig.37)**.

Offer the wall connector **(IMWC)** over the end of the rail to be fixed to the wall and drill 2 x pilot holes using 3mm dia drill bit through the locator arm holes to a depth of 15mm but do not fix at this stage. Place the handrail assembly to one side **(Fig.38)**.

Draw a perpendicular line up from centre of baserail end that terminates at the wall to a height of approx 920mm. This will ensure correct alignment of wall connector location.
To set handrail height, assemble 3 x landing balusters which will be used as setting battens **(Fig.39)**.



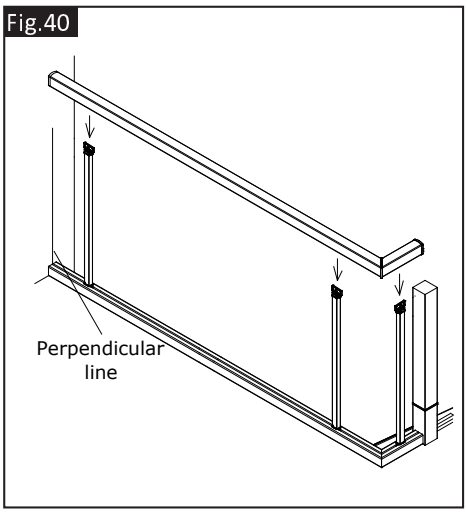



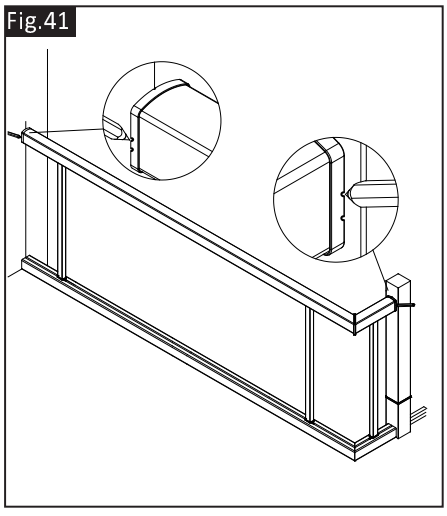



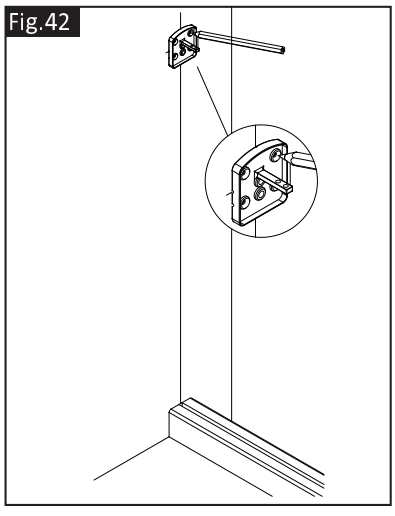

Place the balusters into the baserail groove and carefully lower handrail assembly complete with wall connector inserted but not fixed, onto top baluster bracket so it is fully located into the handrail groove **(Fig.40)**.

Ensuring that balusters are perpendicular, line the wall connector up so it is central to previously drawn perpendicular line and mark location using top location mark on side of connector. Mark location of landing connector on newel face using top location mark on side of connector **(Fig.41)**.

Remove handrail assembly. Remove wall connector from end of handrail and reposition next to mark on wall. Mark through 4 x screw holes onto wall. Drill plug and fix the connector to wall using screws supplied **(Fig.42)**.



For the landing connector, run a line from mark to opposite face of the newel. Mark the centre of the newel and drill a 16mm diameter counter bore hole to a depth of 20mm and a 10mm diameter through hole **(See Fig.15 & Fig.16)**.

Before handrail assembly is relocated and fixed in position, baluster infill and spacing is required.
Take handrail assembly and turn it upside down so top of handrail is facing downward and place on floor ensuring that the floor surface has adequate protection so as not to damage the rail and connectors ie carpet, cardboard packaging etc.

Run a strip of masking tape along the side of the handrail groove so when it is turned over the correct way, the tape is on the landing side. Repeat for small return, between HT and top newel **(Fig.43)**.

Place a mark on the tape 100mm from wall end of rail and another mark 115mm from HT end. This will be location for first and last baluster centres on landing run **(Fig.44)**.

Place a baluster between HT and top newel, if applicable, and mark centre of preferred location, ensuring that top bracket hole is positioned facing HT **(Fig.45)**.

Fig.43

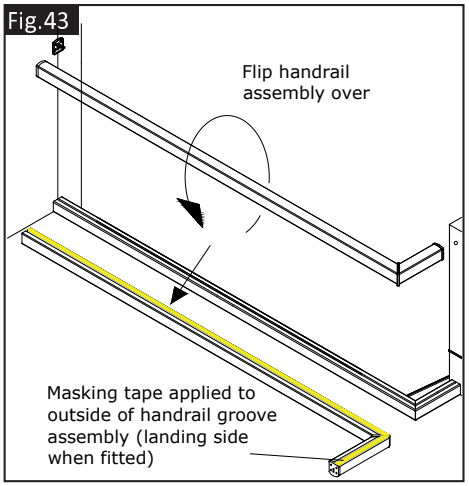



Fig.44

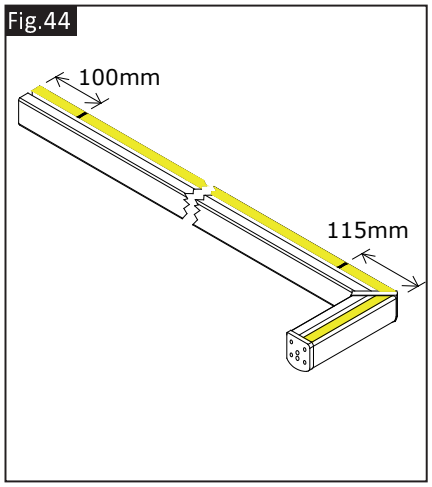
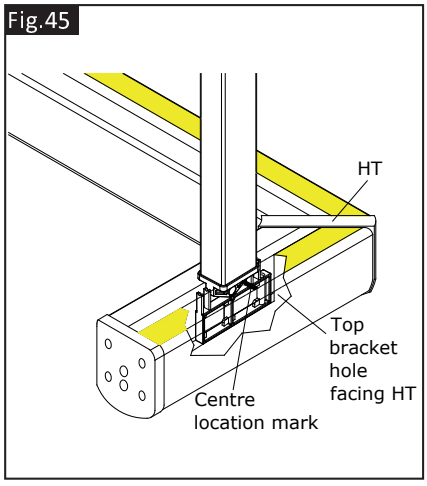



Fig.45




To calculate locations for rest of balusters, measure distance between the 100mm and the 115mm marks and divide by 118.
Round figure up to next whole number. Divide distance by whole number to obtain baluster centres.

## Example

Distance between marks = 1500mm
Divide distance by 118 = 12.7 (round up to 13)
Divide distance 1500mm by 13 = 115mm centres for remaining balusters. Mark the centre locations on the tape.

Please note - **The centres must never exceed 137mm. If they do, add another baluster and recalculate**

Offer a top landing bracket into the handrail groove and align the middle part of the bracket to the mark **(Fig.46)**.

Please ensure that the fixing hole on the bracket is always the same side, which we recommend is the right hand side if you are right handed.

With bracket located, drill pilot hole through bracket hole into handrail, using 3mm dia bit, to a depth of 15mm. Place piece of tape on drill bit to act as depth stop **(Fig.47)**.

Slide bracket to next mark and pilot drill. Continue until all locations have been pilot drilled. Place bracket on centre mark in small return of handrail between HT and newel, if applicable, ensuring that that bracket hole is positioned facing the HT and pilot drill

Assemble all landing balusters ensuring that holes in top and bottom brackets are same side as each other and correct orientation i.e right hand side in this example **(Fig.48)**.

Fig.46

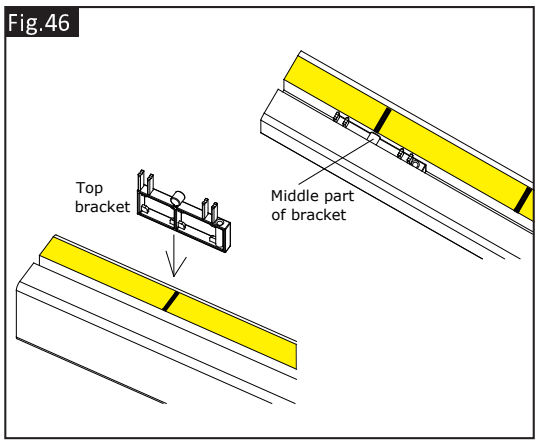



Fig.47

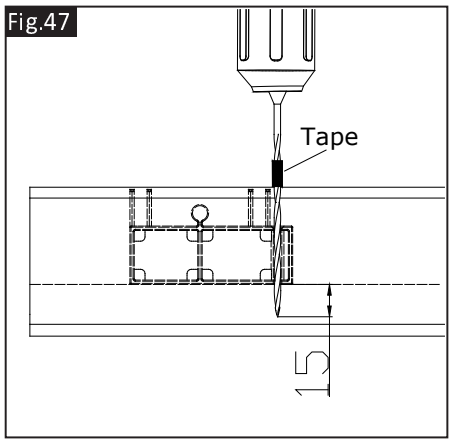
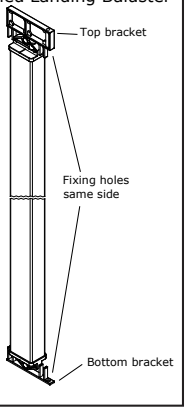



Fig.48 Assembled Landing Baluster



Turn handrail assembly over and carefully offer into wall connector so handrail groove locates onto wall connector location arm. Place baluster into small return, ensuring bracket fixing holes are facing HT. Using bottom tapped hole in landing connector IMLC, temporarily fix with bolt and washers supplied but do not over tighten. This will aid ease of baluster installation **(Fig.49)**.

Ensuring that all baluster brackets which have been fitted to top and bottom of balusters are the same way, i.e right hand side if right handed, offer balusters into rail grooves carefully lifting the handrail to ease insertion.
Depending on centre distance, it may be necessary to insert balusters and gather at one end to get all balusters in. With all balusters inserted, carefully move balusters to location marks on tape.

Supporting the rail, carefully unscrew the landing connector bolt. Lower handrail onto the top of the balusters and ensure rail end is fully inserted into wall connector. Fix landing connector **(IMLC)** to newel using bolt and washers supplied using top tapped hole.
Fix wall end of rail into wall connector **(IMWC)** by inserting screws up through locator arm into previously drilled pilot holes **(See Fig.38)**.

Fix top brackets to handrail first by ensuring balusters are central to marks. Offer 44mm screw up through top bracket hole until it locates in previously drilled pilot holes and secure using long series Philips screw driver bit. Repeat for all baluster top brackets **(Fig.50)**.

Use a spirit level to check balusters are perpendicular and pilot drill through bottom bracket hole into baserail, using 3mm diameter long series drill bit, to a depth of 30mm **(Fig.51)**. Secure with screws supplied.

Fig.49

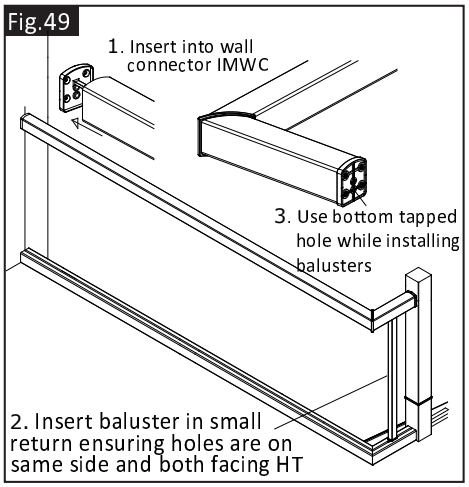



Fig.50

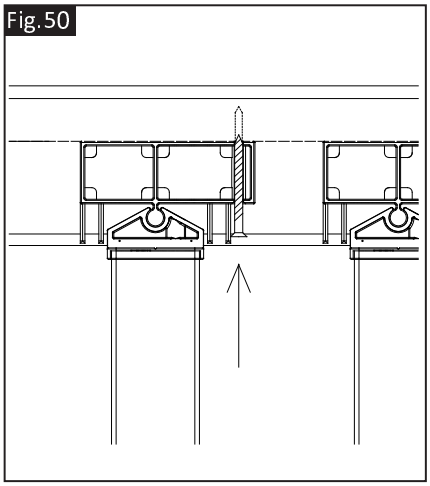
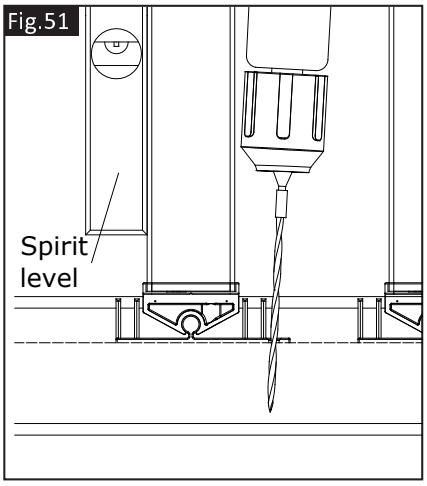


Fig.51




To fill gaps between balusters, cut decorative plastic strips to suit and press into grooves. If plastic strips are loose, please apply a bead of clear silicon sealant to groove **(see Fig.31)**.

## INSTALLING THE GLASS PANEL INFILLS ON THE STAIRS

Measure 60mm from the newel bases along the top face of the baserail and mark. This will locate the position of the side edge of the first and last glass panels in the run **(Fig.52)**.

Cut the fillets for the bottom of the stairs for the handrail and base rail. Ensure that fillets are cut to the angle of the stairs. Drill a 4mm hole down through the centre of the fillet parallel to the cut sides and countersink so screw head will be below top of fillet.
You will have to trim approx 7mm off the top handrail fillet to allow for the connector.
Pilot drill and fit the bottom fillet using 38mm No 6 screw **(Fig.53)**.

To check the top fillet is the correct length before it is fixed, offer a piece of glass into the groove and up against both fillets to ensure the gap is equal. Once parallel, remove the glass panel and fix the top fillet by pilot drilling and secure using No6 x 63mm screw **(Fig.54)**.

Fig.52

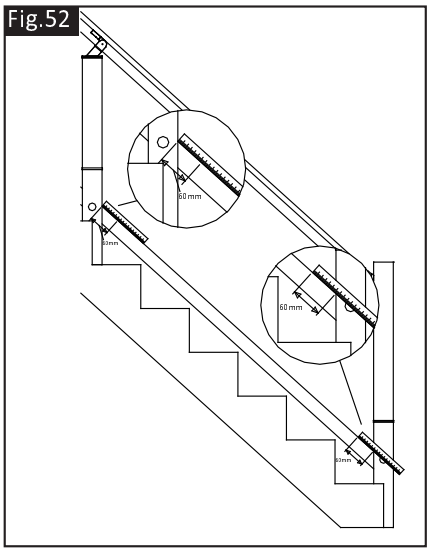



Fig.53

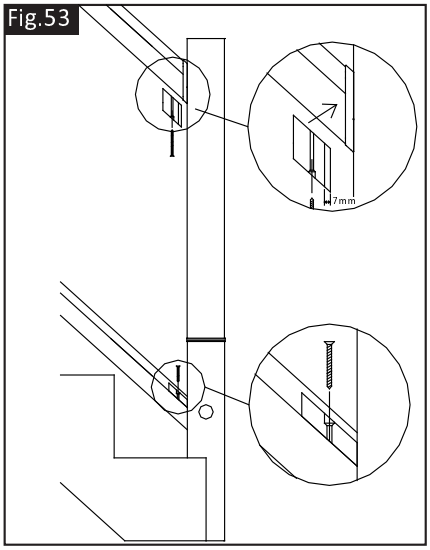
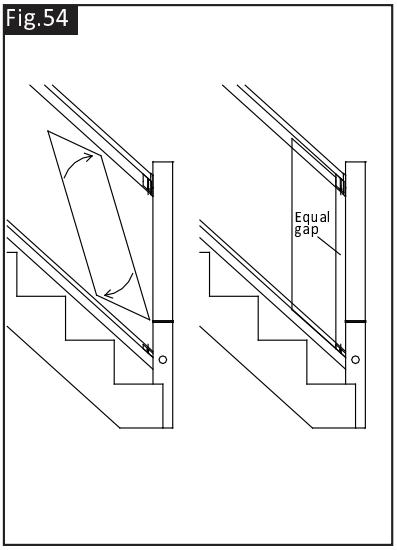



Fig.54



To help work out how many panels are required please to refer to the table opposite

To work out how many panels are required and the size of fillets, measure the distance between 2x marks on the baserail.
Divide this measurement by 350. Round the figure down to the next whole number (number of panels required).
Multiply this number by the panel dimension according to the pitch of stairs.
Subtract this figure from the original measurement.
Divide by number of panels (less 1) to get fillet size

| Pitch of stairs | Panel dimension |
|---|---|
| 40 degs | 261mm |
| 41 degs | 265mm |
| 42 degs | 269mm |
| 43 degs | 274mm |

## Example –

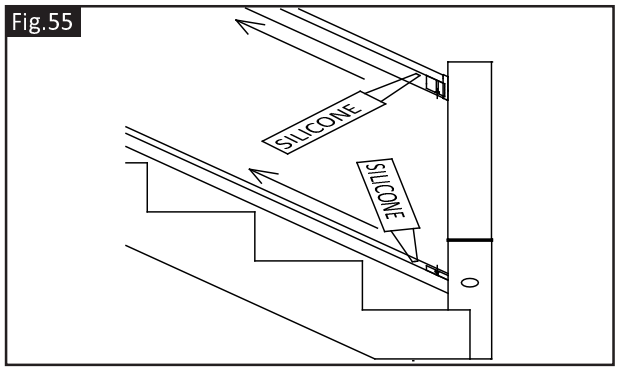
Measurement between marks = 1820mm
1820mm divided by 350 = 5.20, rounded down to 5
Pitch of stairs is 42 degrees so panel dimension is 269mm x 5 =1345mm
Original measurement 1820mm minus 1345mm = 475mm
475mm divided by 4 (number of panels 5 less 1) = 118.75mm (length of fillet)

Please note - maximum length of fillet must not exceed 129mm. If maximum length is exceeded add another panel by rounding up (after dividing by 350) and re-calculate.

Cut all fillets to length and drill a clearance hole parallel to the cut sides through the centre using a 4mm bit and countersink so the screw heads are below top of fillet. Cut all decorative plastic strips to suit.

Apply a bead of clear silicone to both handrail and base rail grooves ensuring you also put a bead on side wall of handrail groove **(Fig.55)**.

Fig.55




Insert the glass panel into the groove and up against the previously installed fillets. Place another set of top and bottom fillets, pilot drill and secure. Depending on how many panels are used and the gaps between them, you may have to insert the last 2 panels into the groove first before installing the fillets.
If this is the case wrap some cardboard around the side edge of the panels and insert, carefully allowing them to butt up to each other.
Once all panels are in, separate the panels by installing the fillets between them and securing the fillets in place as previous.
Push decorative plastic strips into the grooves to hide timber fillets. If they seem loose, secure with clear silicone.

To finish off, glue the newel caps to the top of newels and insert all bolthole cover caps into the newels by tapping them in.
Silicone all of the square timber cover caps in the newel bases.

## Over The Post Stairs

1. Setting newel base heights
   Set the newel base heights using the “Post to Post” instructions (see page 1).

2. Installing base rail
   Install the baserail using the “Post to Post” instructions (see page 2).

3. Installing newels
   The bottom newel will need to be cut to the same height as the intermediate newel (see table on Page 5). Secure the newels to newel bases using the “Post to Post” instructions.
   Fix the intermediate rake connectors **(IMIRC)** to the top of the bottom and intermediate newels using the “Post to Post” instructions.
4. Installing handrails
   Place a length of handrail on the stair nosing up against the newel bases and mark the position of the inside face of the top newel base and cut the top end of the handrail to the angle of the newel.
   For the bottom end of the handrail where the handrail projects past the bottom newel base, measure 90mm from the outside face of the newel base and cut off square **(Fig.56)**.

Install the top rake connector **(IMTRC)** to the top of the handrail using the “Post to Post” instructions and install the rail end connector (IMREC) to the bottom end of the handrail which has been cut square.
Mark the hole position and pilot drill. Offer the rail end cap over the handrail and secure with the screws provided **(Fig.57)**.

Fig.56

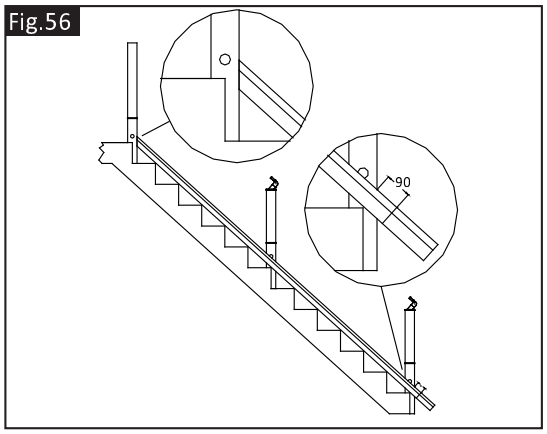
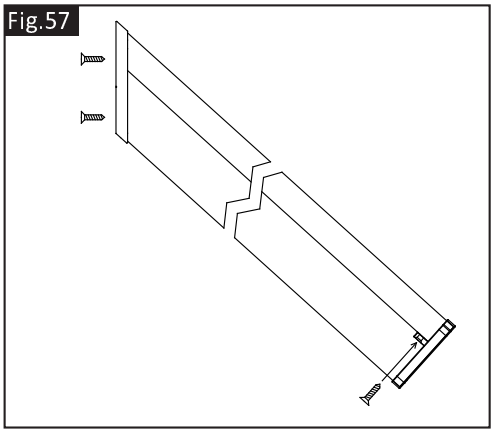



Fig.57



To fix the handrail to the newels, carefully offer the handrail onto the intermediate connectors so that the top rake connector is touching the top newel.
Mark the position on the newel for the bolthole and drill holes using the “Post to Post” instructions.
Pilot drill holes for the intermediate connectors and fix using the screws provided.

## Installing The Glass Panel Infill

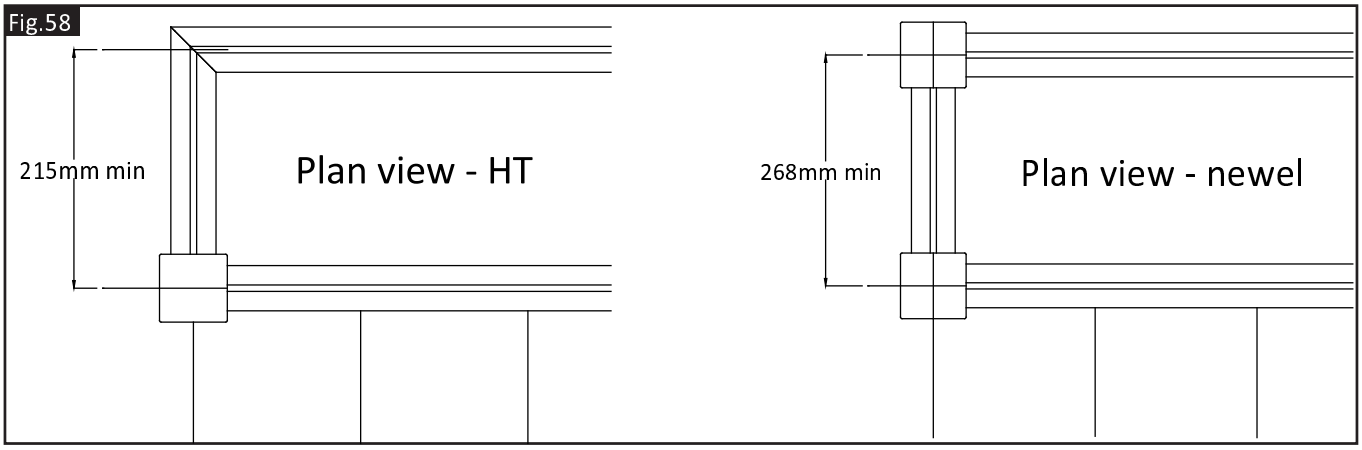
See “Post to Post” instructions (on page 9).

## LANDINGS

Layout Of Newels

The maximum distance between the landing newel centres is 2400mm. For landings exceeding this maximum an intermediate newel should be used.
Set the newel base height for landings the same height as used on the top newel base on top of the stairs.
For landings that return 180° off the staircase the minimum required distance, if using a small return landing glass panel **(IMGPSL)** is shown in **(Fig.58)**, which detail newel and HT options.

Fig.58




It is possible to reduce minimum centres by 30mm when using HT, and 60mm when using newel, by cutting off locator arm on the landing connector **(IMLC)** as the locator arm is not used in this particular configuration.

The minimum and maximum centres using HT connector (IMHT) without a small return glass panel **(IMGPSL)** is detailed in **(Fig.59).**
Minimum centres achievable using a newel is detailed in **(Fig.60)**.

Fig.59

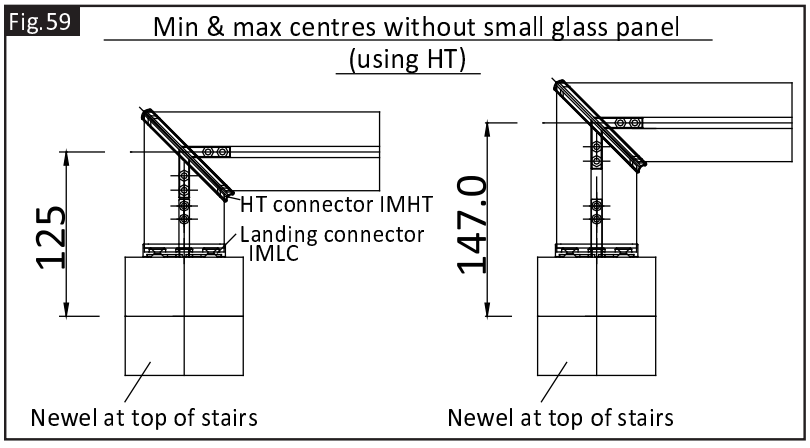
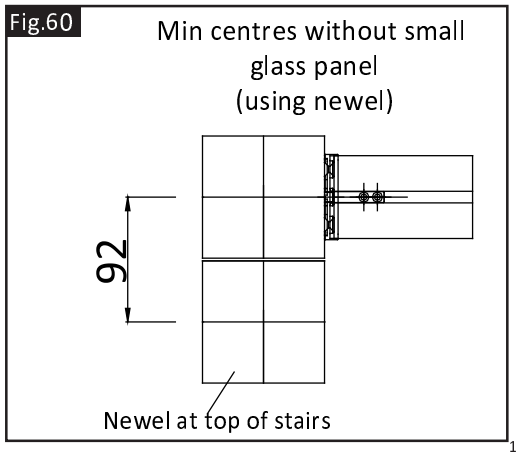



Fig.60



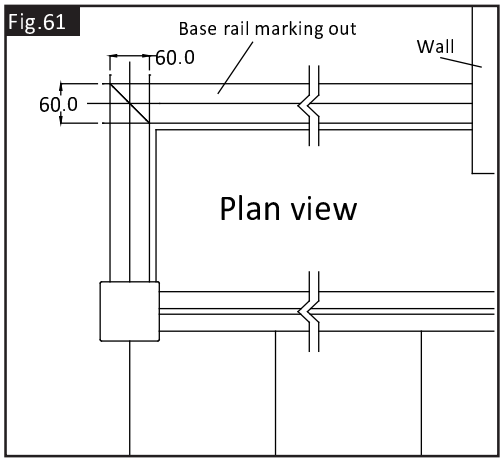
## Installing The Baserail

Install the baserail ensuring all debris is cleared from within the groove and also making sure all the screw heads are below the surface and do not project into the groove **(Fig.6. - page 2)**.

For return landings, mark out where the baserail is going to be located. Where the lines intersect on the corner, draw a diagonal line to represent where the rail will be mitred **(Fig.61)**.

Mark and cut the baserails to length. Drill clearance holes through the groove in the baserail and countersink so screw heads will be below top of the groove.
Apply glue to the mitred faces and position the cut baserail on top of location marks and fix to the floor using 63mm No 8 screws.

Fig.61




## Installing The Handrails

For return landings, measure and mark the handrails to the same length as the baserails, then cut 9mm off the square ends to allow for the connectors **(Fig.62)**.

Fix the landing connector **(IMLC)** to the rail end to be fixed to the newel. Drill 4 x pilot holes and secure with screws provided.
Fix the HT connector to the mitred end of the rail by offering the connector over the rail, ensuring the locator arms are up against the top of the groove.
Mark and pilot drill through locating arm and secure with screws provided. Fix the other mitred rail end into the HT connector **(Fig.63)**.

Fig.62

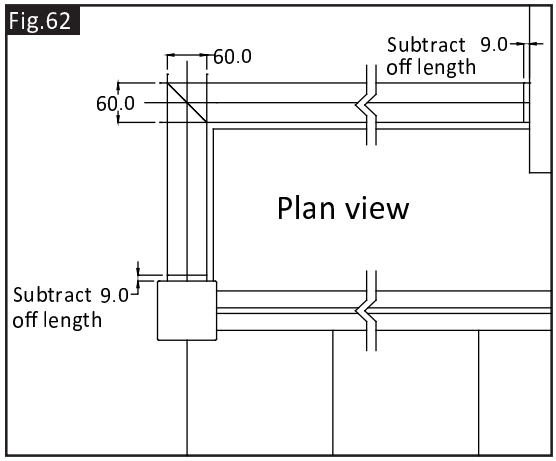
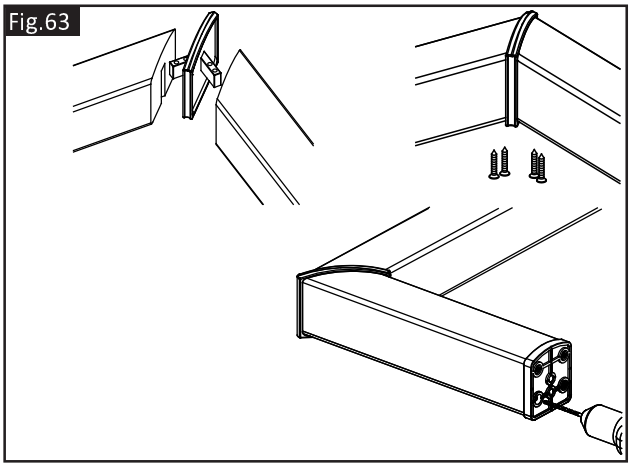



Fig.63



Slide the wall connector **(IMWC)** over the end of the rail to be fixed to the wall and drill 2 x pilot holes through the locator arm but **do not fix at this stage** **(Fig.64)**.
Place the handrail assembly to one side.

Draw a perpendicular line up from the centre of the baserail end which terminates at the wall, to a height of approx 920mm.
This will ensure correct alignment of wall connector.
Measure up 876mm from the floor and mark a horizontal line, this ensures the correct height for the wall connector.
Align the wall connector so the vertical location groove on top of the connector lines up with the perpendicular line and the top horizontal location groove on the side of the connector is aligned to the 876mm horizontal line.
Mark 4 x screw holes, drill, plug and fix the connector to wall using screws supplied **(Fig.65)**.

For the newel, measure up 876mm from the floor and mark face of newel **(Fig.66)**.

Fig.64

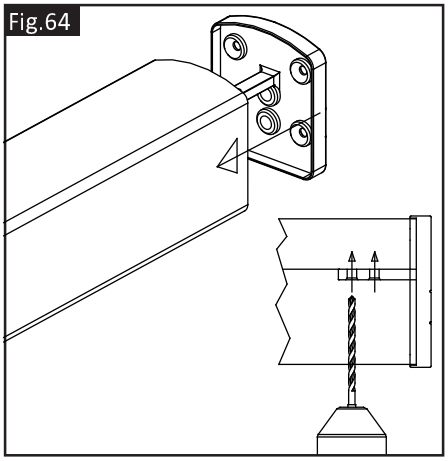


Fig.65

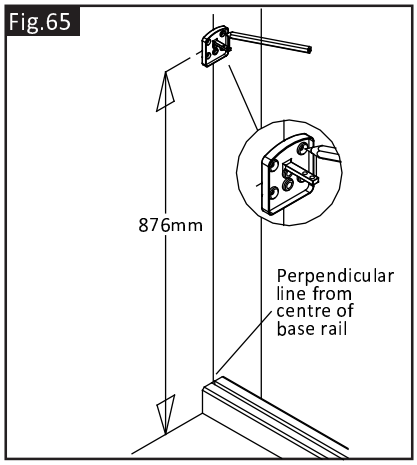
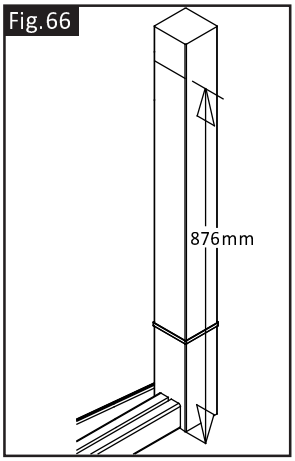



Fig.66



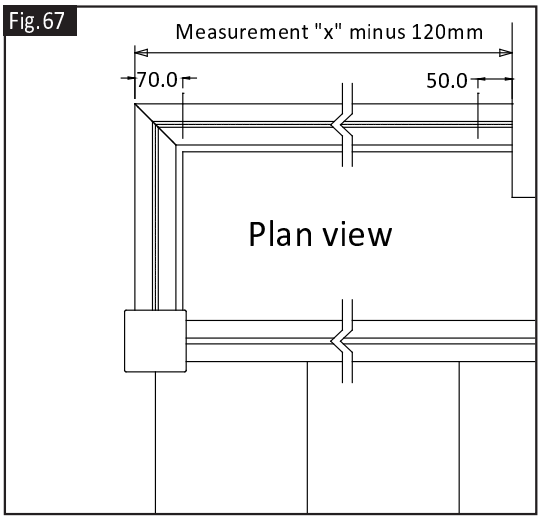

Run a mark to the opposite face of the newel. Mark the centre of the newel and drill a 16mm dia counter bore hole to a depth of 20mm and a 10mm diameter through the hole **(see Fig.16 on page 4)**.

Before the handrail assembly is relocated and fixed in position, glass infill and spacing is required.

## Installing The Landing Panel Infill

To calculate the number of panels required for the landing, measure from the corner of the mitred base rail to the wall.
Subtract 120mm from the measurement, this is due to the glass panel that will be positioned next to the mitred corner will be set 70mm from the corner of the baserail and the glass panel closest to wall will be set at a distance of 50mm away **(Fig.67)**.

Fig.67




Divide the distance by 250 and round down to the whole number, this gives the number of panels required.
Multiply the number of panels by 200. Subtract this number from the original measurement (measurement less 120mm).
Divide by number of panels less 1 (to give gap sizes)

## Example

Measurement is 2150mm.
2150mm –120mm = 2030mm
Divide 2030 by 250 = 8.12, rounded down to the whole number = 8 (panels).
Multiply 8 x 200 = 1600
(Measurement less 130) 2030 – 1600 = 430
430 divided by 7 (8 panels less 1) = 61.5mm gap/fillet size

**Please note – maximum fillet size is 99mm. If fillet size is exceeded add panel by rounding up to the next whole number (after dividing by 250) and recalculate.**

Cut 35mm timber fillet and 50mm timber fillet, these will be used for setting the first and last panels.
Cut all other timber fillets (handrail and baserail) and plastic cover strip to size previously worked out.
Drill a 4mm hole through the middle of each fillet and countersink so the head of screw will be below top of the fillet **(Fig.68)**.

Measure 70mm from the outside corner of the mitred baserail and mark rail. Set the 35mm timber fillet to mark, pilot drill using 3mm drill and fix with 38mm No 6 screw. Insert the 50mm timber fillet into the groove next to the wall, pilot drill and fix **(Fig.68)**.

Fig.68

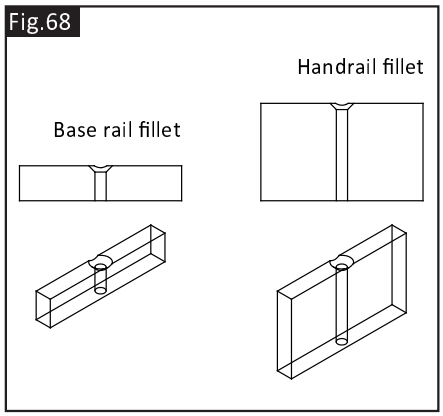
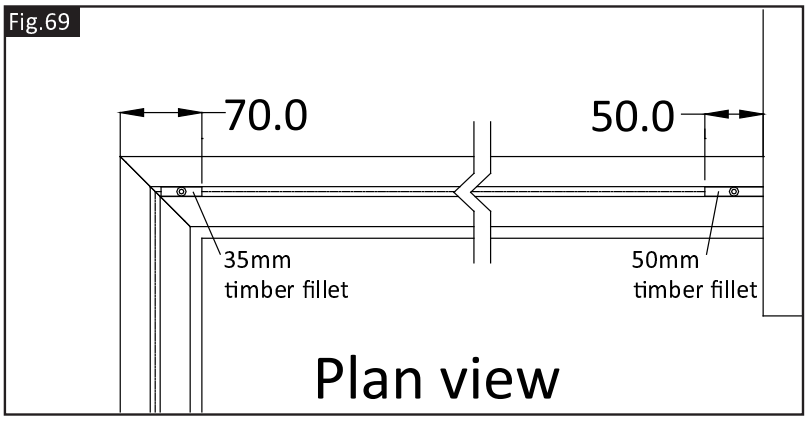



Fig.69




Starting from one end of the baserail, apply a bead of clear silicone 200mm long and insert the glass panel into the groove on top of the silicone, ensuring the edge of the panel is fully up against timber fillet.
Place the next previously drilled timber fillet up against the edge of the glass panel but do not pilot drill at this stage, then apply 200mm run of silicone for the next glass panel and carry on until the baserail is completed **(Fig.70)**.

Pilot drill through all timber fillets and secure into base rail groove using 38mm No 6 screws.

Apply a bead of clear silicone to the bottom of the grooves in the top handrail assembly.
Offer handrail assembly into the wall connector and align the tops of glass panels into the groove – this is best done with 2 people **(Fig.71)**

Fig.70

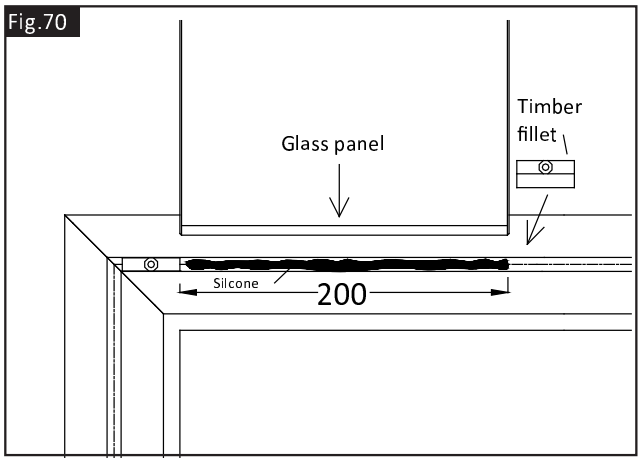
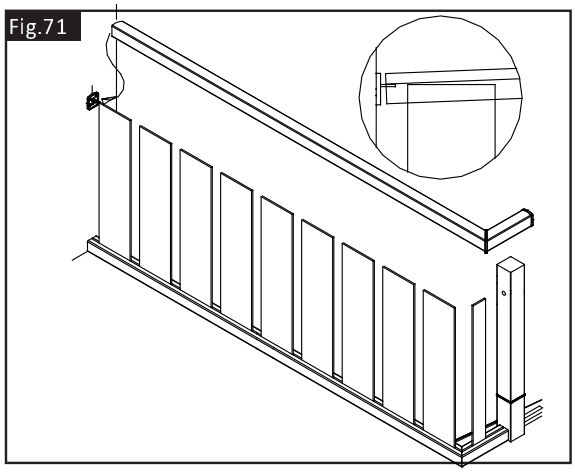
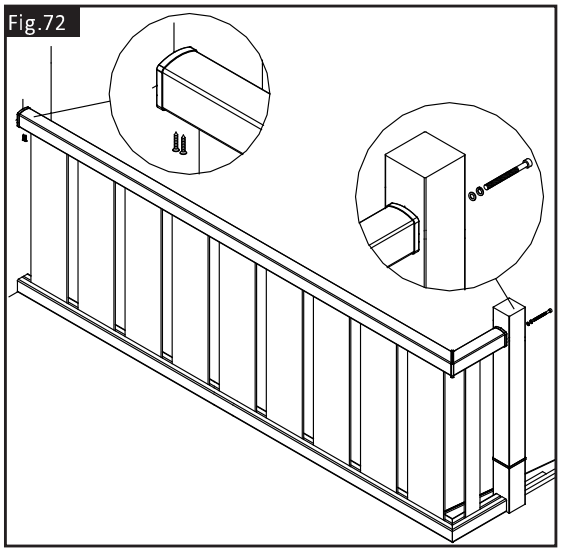



Fig.71



Once the handrail is fully located on top of the glass panels, secure in place by inserting the bolt and washers through the newel into the landing connector **(IMLC)** and tighten.
Insert 2 x screws through the locator arm in the wall connector into the previously drilled pilot holes and tighten **(Fig.72)**.

Fig.72



Insert the handrail timber fillets between the glass panels into the groove, pilot drill and fix with 50mm long No 6 screws.
Where there are connector locator arms present in the groove, timber fillets will have to be trimmed to suit and fixed in position with clear silicone.

Insert all plastic decorative strips, to hide timber fillets, between all the glass panels.
These should have a good push fit but if they seem loose, apply a spot of clear silicone to the inside of the groove to secure.

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