

REFLECTIONS

FITTING INSTRUCTIONS

Important information.

The following instructions are for installing the Cheshire Mouldings **Reflections Range**

Cheshire Mouldings **Clarity Range** has been designed to suit stair pitches between **40 and 44°**

Cheshire Mouldings Reflections Range 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.

For balustrade runs greater than 2400mm long, an intermediate newel is required

As only official Cheshire Mouldings parts have been tested, the use of non Cheshire Mouldings products used in conjunction with this system cannot be guaranteed to conform

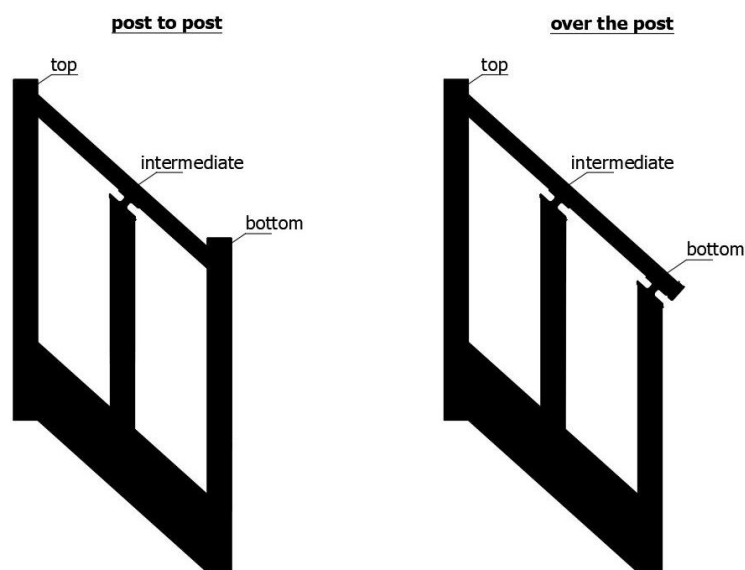
If you have any queries please contact our technical helpline on (0800) 085 3475

Please note:

All components should be inspected BEFORE installation commences for any damage, as Cheshire Mouldings cannot be held responsible for any damage caused during installation

Tools required:

Saw, Battery drill, Drill bits - $\varnothing 4\text{mm}$, $\varnothing 7.5\text{mm}$, $\varnothing 12\text{mm}$, $\varnothing 25\text{mm}$, 7mm spanner, 5mm allen key, adjustable bevel/protractor, square, tape measure/1m steel ruler, PVA glue, Multi Purpose Adhesive i.e No Nails, clear silicon sealant



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- Post to Post – go to **Fig 1**
- Over the Post – go to **Fig 32**
- Landing – go to **Fig 43**

POST TO POST INSTALLATION

Newel Posts

For Over the Post installation, fit top newel post as illustrated in Fig.4, then proceed to Fig 32

Note: for stair runs longer than **2400mm** an **intermediate newel** is required for both Post to Post and Over the Post options

To establish **bottom newel** post height, draw centre line down bottom half of newel.

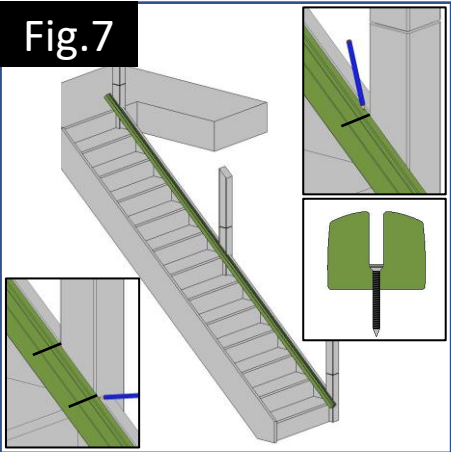
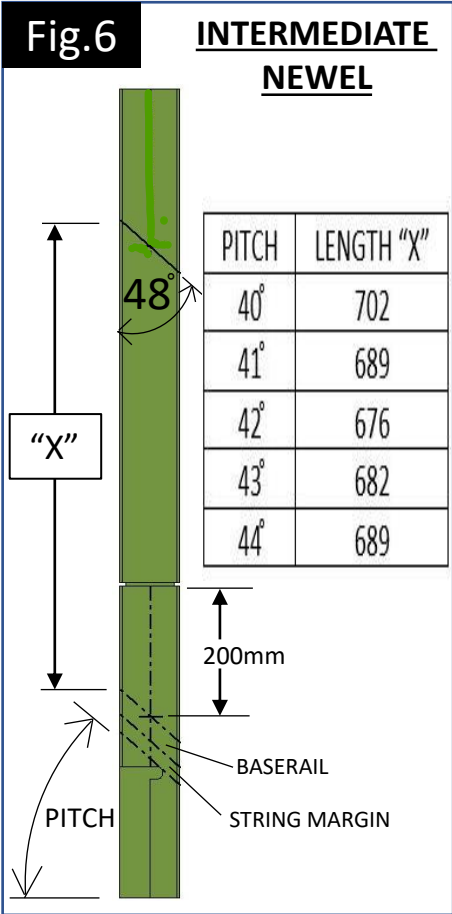
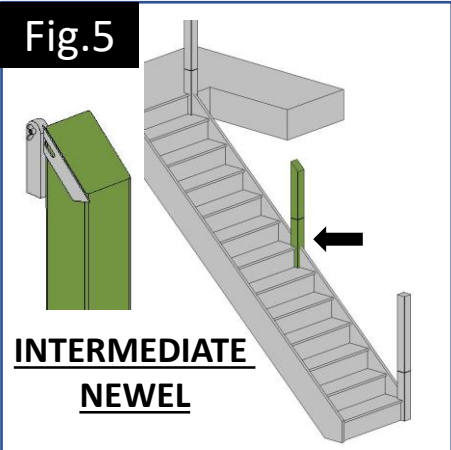
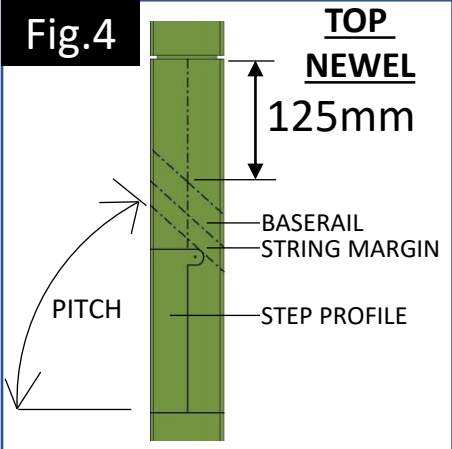
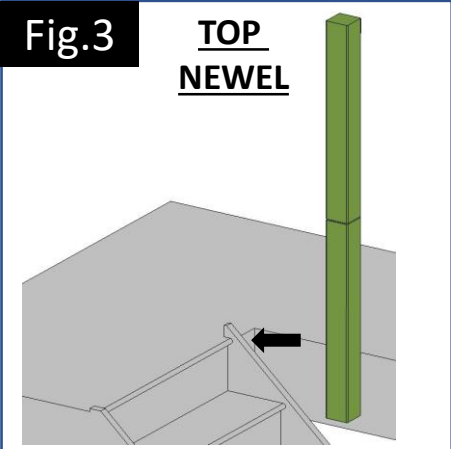
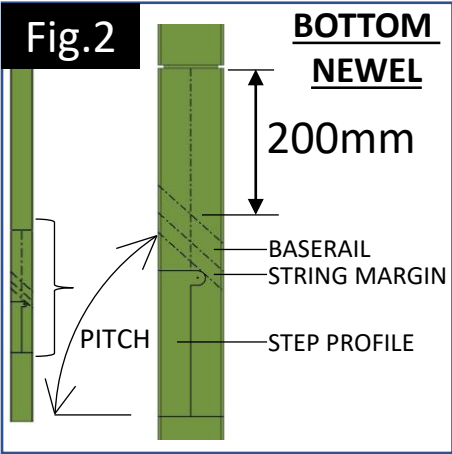
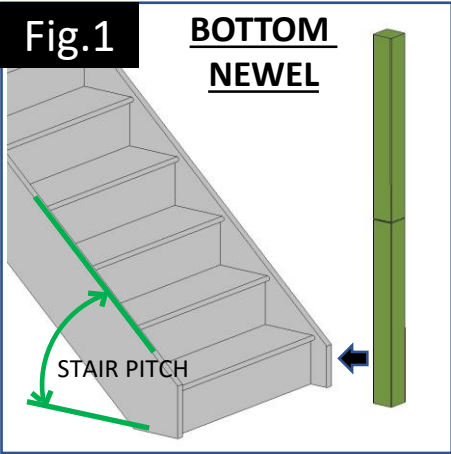
Measure down **200mm** from bottom of newel groove and mark. Using adjustable bevel which has been set to pitch of stairs, strike line through intersecting lines – this represents top of base rail. Measure down the thickness of the base rail, parallel to line and strike line through. Measure and mark string margin then add step profile (**Fig.1 & 2**). Cut and temporarily fit to stairs.

For **top newel** post, draw centre line down bottom half of newel. Measure down **125mm** from bottom of newel groove and mark. Add base rail, string and step profile detail as previous (**Fig.3 & 4**). Cut and fit to stairs.

The **Intermediate newel** post is positioned at the mid point of the stairs (**Fig.5**). To mark, use same measurements as used on bottom newel i.e **200mm** down from newel groove and mark. Add base rail, string margin and step profile (**Fig.6**). To cut the top of the newel, refer to table in **Fig.6** to establish correct measurement for "X". Once established, measure up from location shown in **Fig.6** and mark. Using an adjustable bevel set at **48°** (to accommodate the newel connector), mark a line down across face of newel and cut. Fit to stairs, checking it is perpendicular with spirit level

Handrail & Base rail

Place the base rail onto the stair nosing and offer up against sides of newel posts. Mark base rail and cut to length. Check fit between newels. Attach to string by drilling countersunk clearance holes for screws, through bottom of base rail groove, pilot drill through into string and fix, ensuring screw heads are sat below groove bottom (**Fig.7**).



To cut handrail to length, place handrail onto stair nosing and offer up against sides of newel posts. Mark handrail at bottom and top newel posts and cut to size (**Fig.8**).

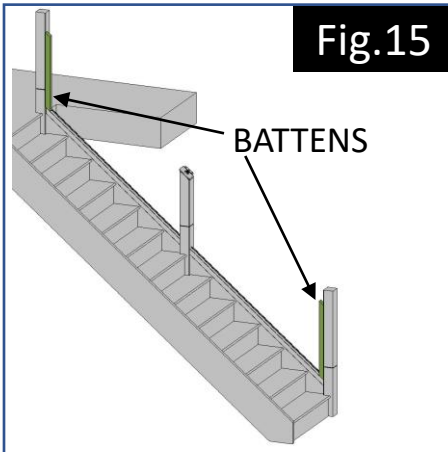
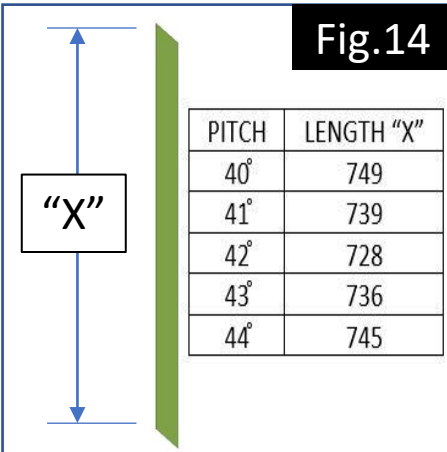
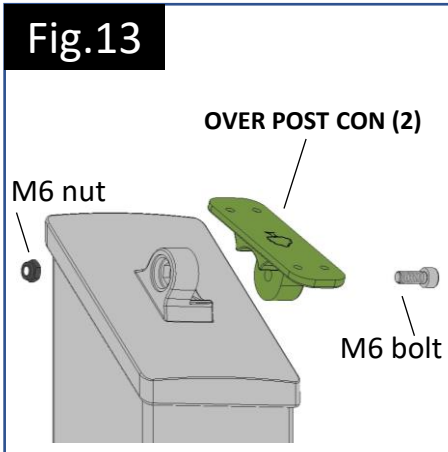
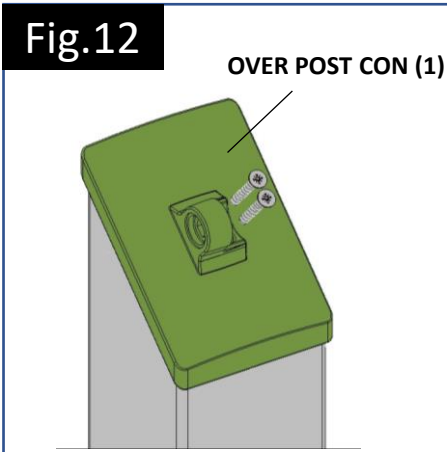
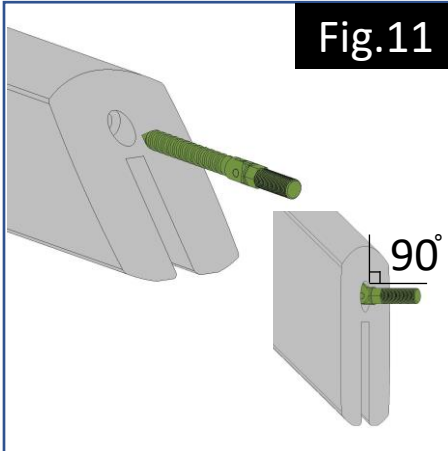
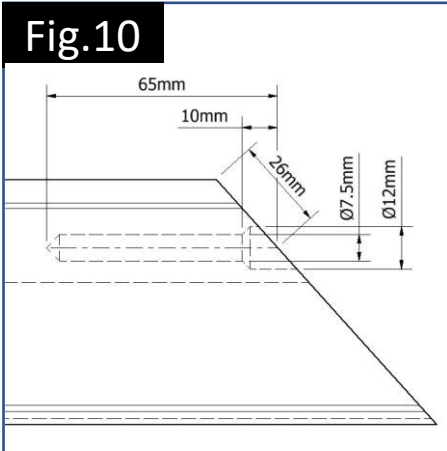
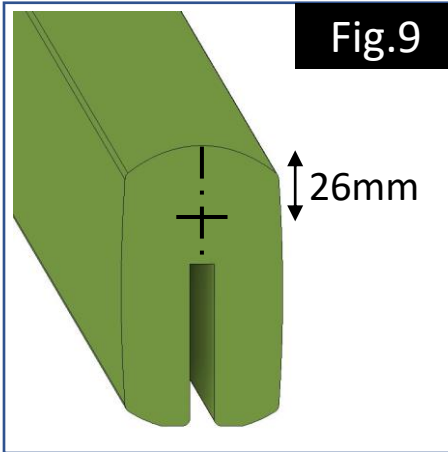
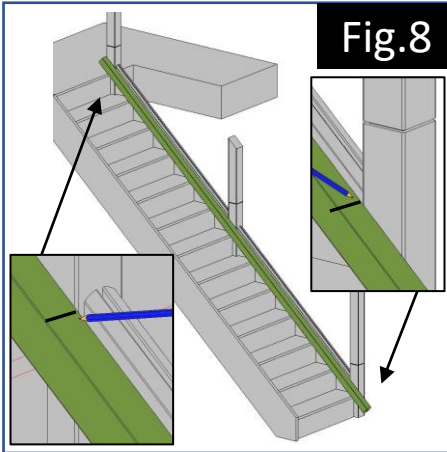
On the rake handrail, mark centre line on cut face and measure down 26mm and mark (**Fig.9**). Using a 12mm dia drill bit, drill a hole to a depth of 10mm. Then, using a 7.5mm dia drill bit drill a hole 65mm deep (**Fig.10**). Repeat for other cut end of rail
Take rail bolt fastener and insert woodscrew end into hole and wind into rail using 7mm spanner or drive it in using cordless drill on slow speed (**Fig.11**). Insert rail bolt fastener until hinge joint is halfway in.

Once inserted, align so that threaded end is rotated 90 degrees to rail face, at both ends.

Next, fix over post connector to top of intermediate newel post, apply bead of multi purpose adhesive to top of newel. Offer over post connector P1 (1) onto top of newel post. Pilot drill through 2 x screw holes using 3.5mm dia bit. Secure connector to top of post using 2 off, 4.8mm x 40mm screws supplied (**Fig.12**). Temporarily fit over post connector P2 (2) to base using M6 bolt and nut supplied but do not overtighten (**Fig.13**).

To set handrail height, you will need to cut 2 off, battens (40mm x 40mm section is ideal) for the handrail to sit on. Cut batten length in accordance with pitch of the stairs. Refer to table in **Fig.14**

Place one batten up against bottom newel, on top of base rail and secure to newel with tape. Place other batten against top newel and secure with tape (**Fig.15**).



Offer handrail assembly between top and bottom newels and onto tops of battens with threaded fasteners located to side of newel faces on stair side. Mark fastener location on bottom and top newels (**Fig.16**).

While the handrail is in position, mark location of over the post connector (2), ensuring the connector is flat with underside of rail.

Remove handrail and lay it on floor. Remove connector (2) from top of intermediate newel and place against marks on rail, **ensuring it is correct orientation**.

Position centrally on rail and pilot drill through 4 x screw holes using 2.5mm drill bit to depth of 30mm. Fix in place using 4 off, 4.2 x 30mm screws supplied (**Fig.17**).

To drill newels to accept rail fastener, using a square, draw horizontal line across from threaded stud mark performed in Fig.16. Measure 25mm in from rail face of newel and mark (**Fig.18**). Using 25mm dia bit, drill hole to depth of 60mm (**Fig.19**).

Take square and draw horizontal line across rail face, level with side horizontal line previously marked. Find and mark centre (**Fig.20**).

Using a 12mm dia bit, drill hole so that it intersects with previously drilled 25mm dia hole.

Repeat same procedure for top newel post

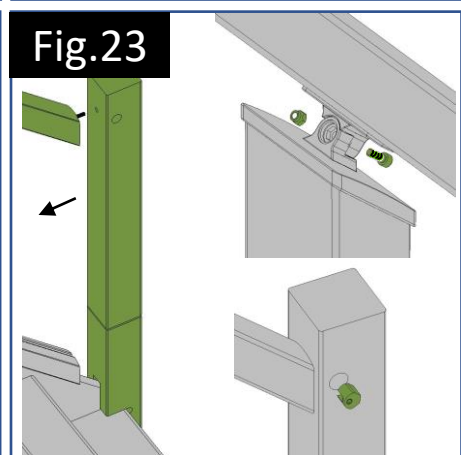
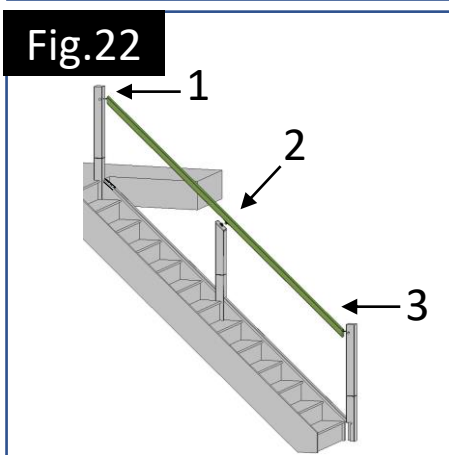
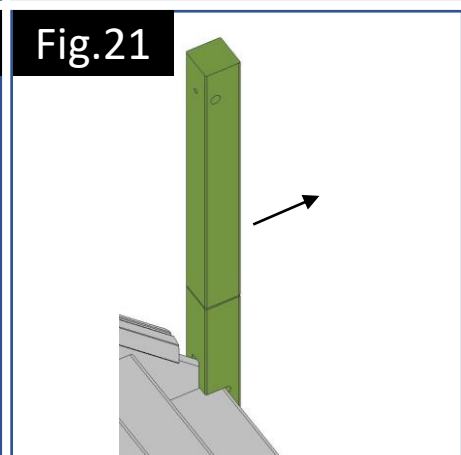
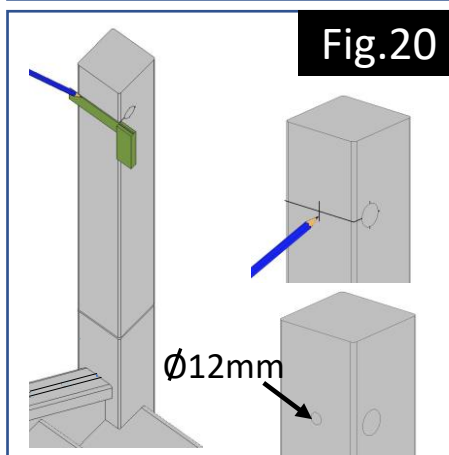
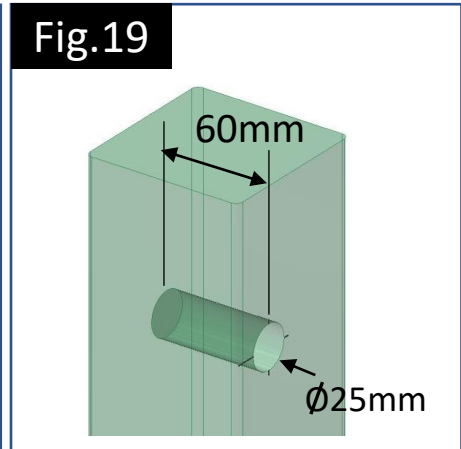
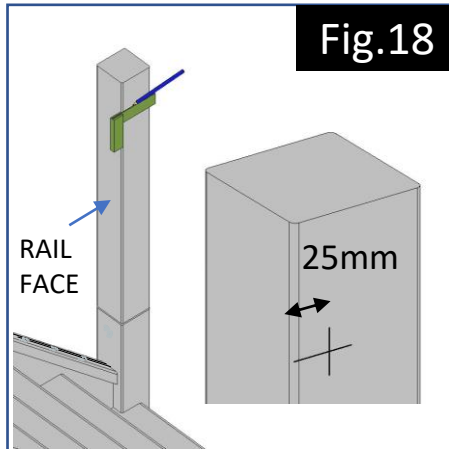
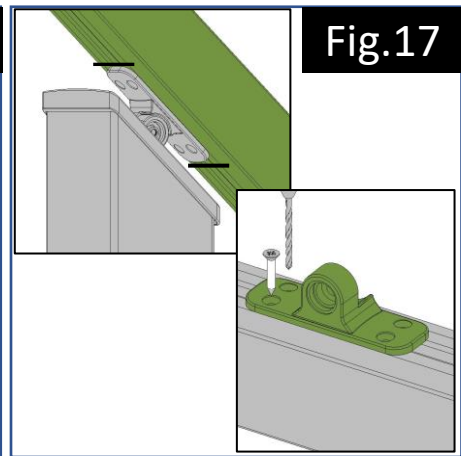
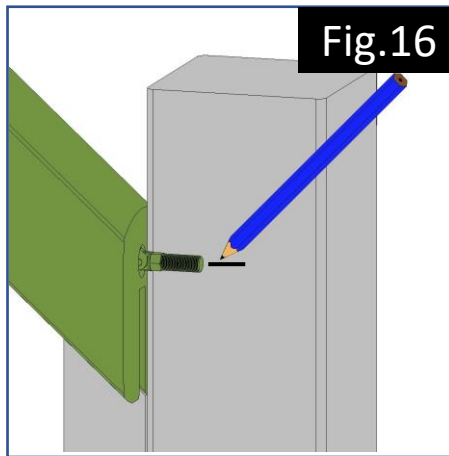
Bottom newel post which was temporary fixed now needs to be loosened off and pulled out of the way approx. 40mm in order for the rail bolt fasteners to be inserted (**Fig.21**).

Apply some pva glue to rail faces

Inserting Handrail

Offer rail bolt fastener into top newel post 12mm hole. Ensure over post connector 2 fixing lug is aligned with over post connector 1 on top of intermediate newel. Push bottom newel post back into position so that the bottom rail fixing stud is located in the 12mm hole (**Fig.22 & 23**). Offer locking nuts into 25mm dia holes on top and bottom newels and tighten using 5mm allen key. Connect over post connector parts 1 & 2 together using fixings supplied.

Secure bottom newel post in place



Installing Stair Glass Panels

To establish number of glass panels required between newel posts and fillet lengths required, measure length between newel posts (Fig.24)

Divide the length by 425 and round down to next whole number (this gives No of panels required). Next, multiply this number by the panel length in rail measurement (Fig.25) which corresponds to the stair pitch. Subtract this number from original measurement between posts. Divide remainder by number of panels plus one to give fillet lengths

Example:
- Length between posts = 1526mm
- Divide length by 425 ($1526 \div 425 = 3.59$)
- Round down to next whole number = 3
- Stair pitch is 42° ($3 \times 404 = 1212$)
- Subtract number from original length ($1526\text{mm} - 1212 = 314\text{mm}$)
- Divide number by No of panels 3 + 1 ($314 \div 4 = 78.5\text{mm}$ fillet length)

Cut all base rail and handrail fillets to length then drill a countersunk clearance hole down through centre to allow for fixing screw ensuring the countersink is deep enough to allow screw head to sit beneath fillet face (Fig.26)

Apply bead of clear silicone to walls of base rail and handrail on stairs (Fig.27).

Offer rake glass panel between rails at an angle and rotate so panel sits in bottom and top rail groove. Carefully slide panel down so it rests against newel post. Place some cardboard or similar, between newel and panel for protection. Insert remaining panels in the run, sliding them down, ensuring that protection is placed between panels to stop any damage (Fig.28)

Take base rail cut fillet and offer into top end of base rail, pilot drill through into string a fix with suitable screw (not supplied). Check that the screw head is below fillet surface (Fig.29).

Slide panel up to base rail fillet and adjust to perpendicular using a spirit level (Fig.30). Locate and fix handrail fillet. Apply next base rail fillet and repeat process until all panels are secured.

With all panels now fixed, cut decorative cover fillets to length and fix over fillets using glue/clear silicone (Fig.31).

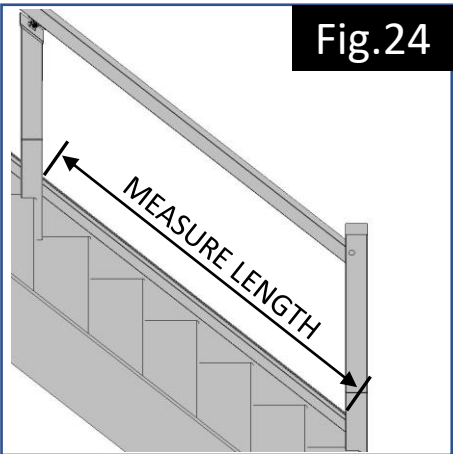
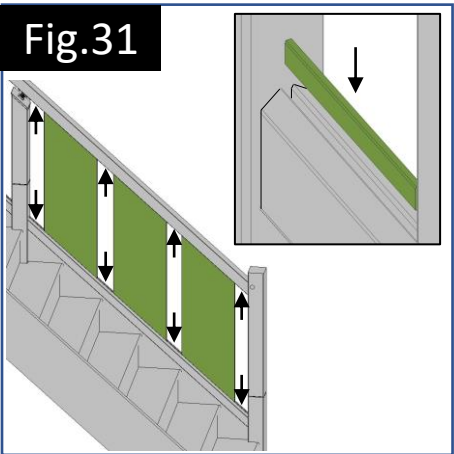
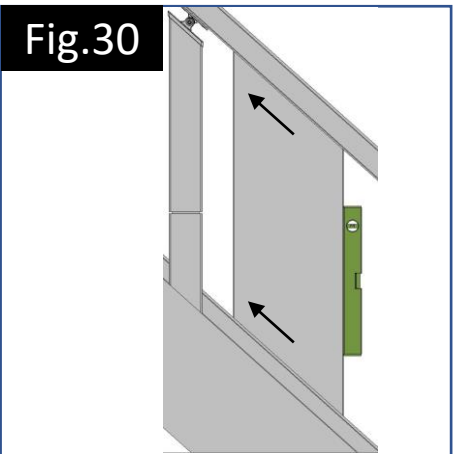
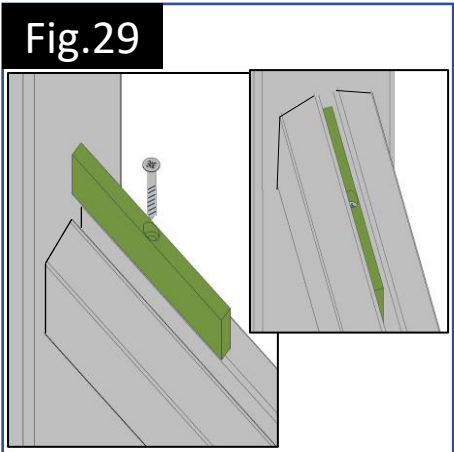
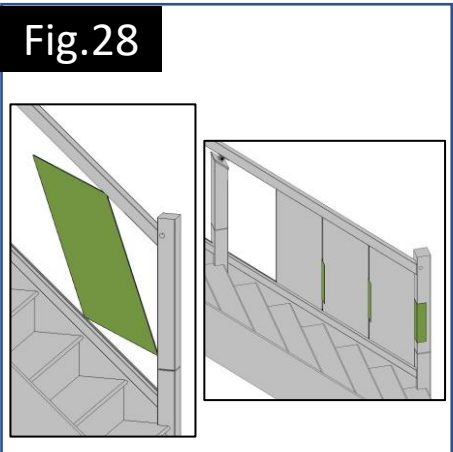
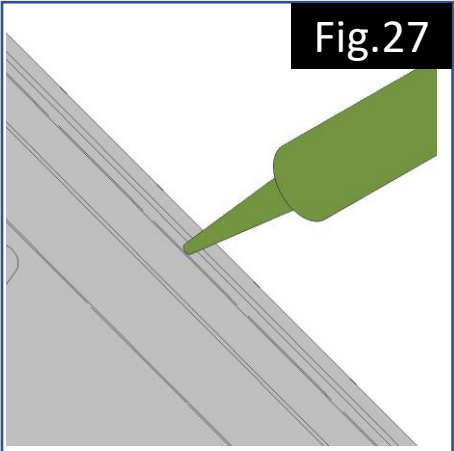
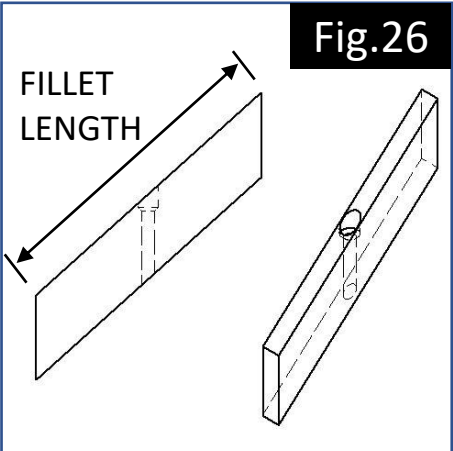


Fig.25

PITCH	PANEL LENGTH IN RAIL "X"
40°	392
41°	397
42°	404
43°	410
44°	417



OVER THE POST INSTALLATION

Newel Posts

The **bottom newel post** and **intermediate newel post** use the same dimensions and should be installed central to riser and string. The intermediate newel must be positioned at midpoint of stairs.

To mark **bottom newel**, draw a centreline down bottom half of newel. Measure down **200mm** from newel groove and mark. Using adjustable bevel which has been set to pitch of stairs, strike line through intersecting lines – this represents top of base rail. Measure down thickness of base rail, parallel to line and strike line through. Measure and mark string margin then add step profile (**Fig.32**)

To cut the top of the newel, refer to table in **Fig.32** to establish correct measurement for "X". Once established, measure up from location shown in **Fig.32** and mark. Using an adjustable bevel set at **48°** (to accommodate the newel connector), mark a line down across face of newel and cut. Fit to stairs and check it is perpendicular with a spirit level (**Fig.33**)

The **intermediate newel** is the same as bottom newel, repeat above instructions and fit to stairs. If the midpoint falls on middle of step and not central to riser, mark and cut accordingly. Fit to stairs and check it is perpendicular using a spirit level (**Fig.33**)

For **top newel post**, follow instructions for **Figs 3 & 4**.

Handrail & Base rail

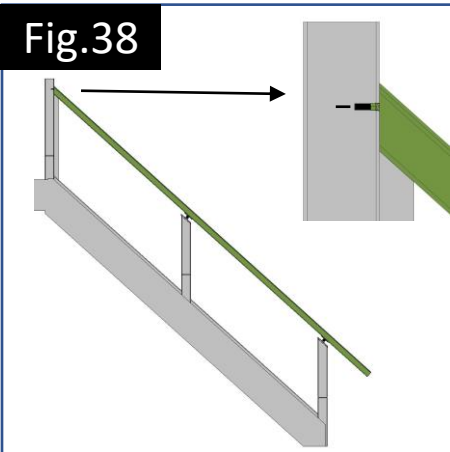
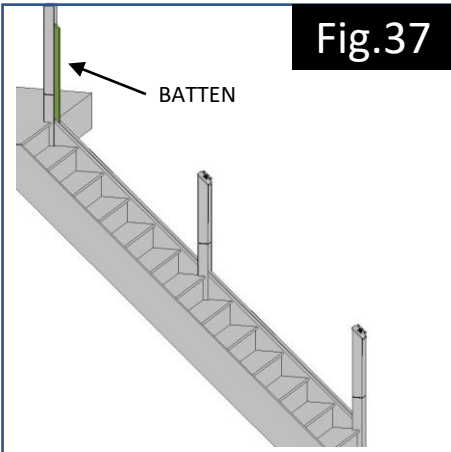
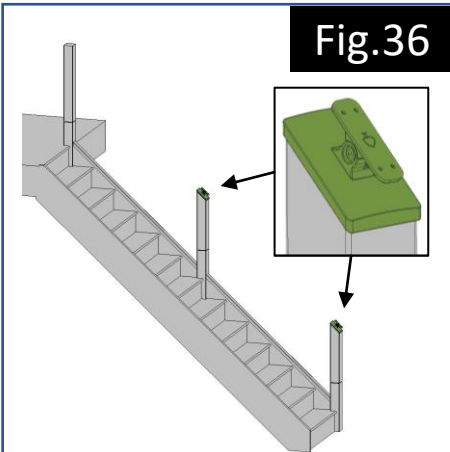
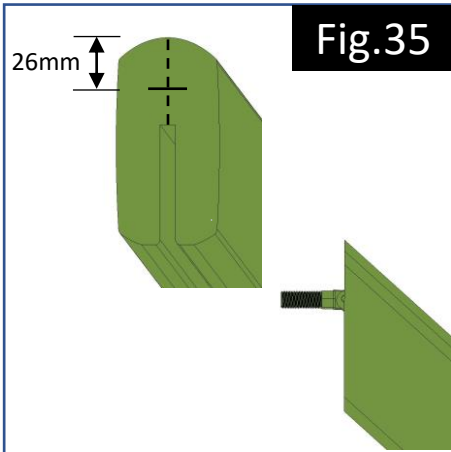
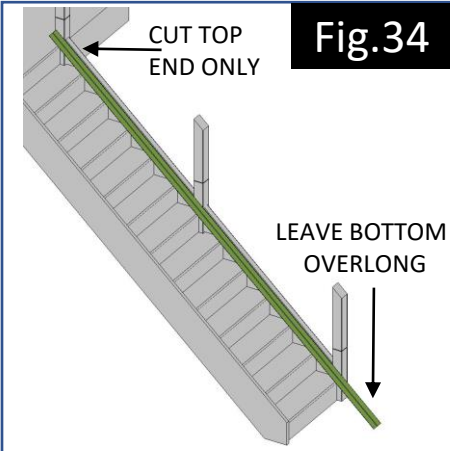
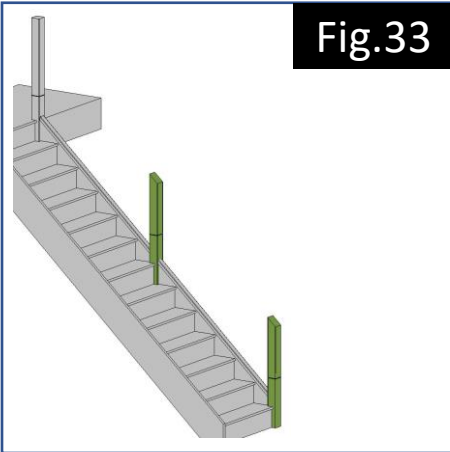
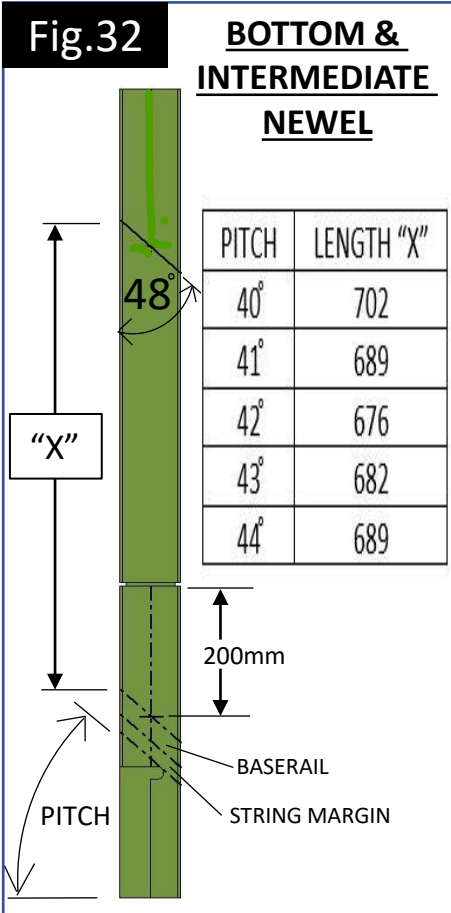
Cut **base rail** to length and fix to string, following instructions referring to **Fig.7**.

To cut rake **handrail** to length, place handrail onto stair nosing and offer up against sides of newel posts with excess rail at the bottom of the stairs. Mark handrail at top newel post only and cut (**Fig.34**). Draw centreline down cut rail face. Measure down 26mm and mark (**Fig.35**). See **Figs.10 & 11** for drill operation and inserting rail fastener.

Fix **over the post connector** assembly to bottom and intermediate newels following instructions for **Figs.12 & 13**, so it looks like **Fig.36**.

Cut **batten** and fix to top newel using tape (**Fig.37**). See table in **Fig.14** for correct batten length.

Offer handrail onto bottom & intermediate newels and top batten with cut rail face up against top newel with rail fastener to side of newel and mark location (**Fig.38**). Mark locations of over post connector 1 on underside of rail. Follow **Figs 16 to 20**



To cut handrail to correct length, measure approx. 25mm away from connector 1 at bottom of handrail, mark and cut rail square (**Fig.39**).

To fit Rail End Cap, offer end cap onto rail end and pilot drill through 2 off, screw holes, using 2.5mm drill bit, to depth of 25mm. Fix with 2 off, 3.5 x 25mm screws supplied (**Fig.40**)

Inserting Handrail

Offer top of handrail into 12mm dia hole in top newel and align connectors on top of intermediate and bottom newels. Insert locking nut in top newel (**Fig.41**) and tighten. Secure over the post connectors together using nut and bolts supplied (**Fig.42**). Insert cover caps into over post connectors using small bead of clear silicon. Insert timber cover cap for locking nut by applying pva glue and gently tapping cap home

Installing Glass Panels

To install glass panels, follow instructions covered by **Figs 24 to 31** in Post to Post section

Fig.39

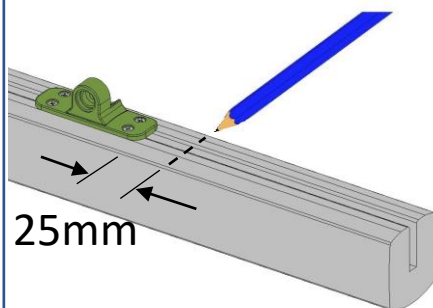


Fig.40

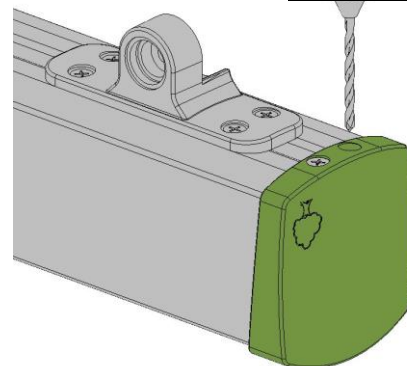


Fig.41

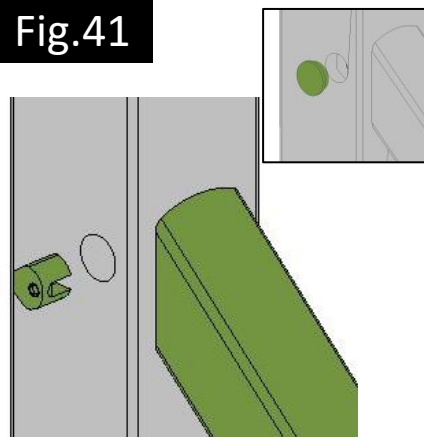
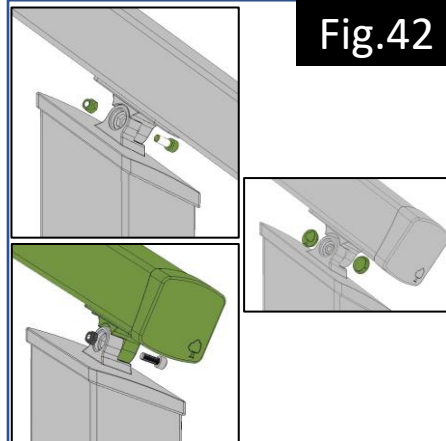


Fig.42



Landing Balustrade

To install **half newel post (CP15OH)**, cut bottom of newel so that newel groove is level with groove in top newel. Temporary fix half newel to wall (fixings not supplied) (**Fig.43**).

Draw tramlines where landing **base rail** will be located (**Fig.43**). Align and mark base rail and cut to length. Fix by drilling countersunk clearance holes through bottom of base rail groove. Pilot drill and fix using suitable screws, ensuring head of screw is below surface (**Fig.44**).

Mark and cut **handrail** to exact dimensions as base rail. Mitre the corners and glue and dowel. Check fit (**Fig.45**)

To fit **rail fastener**, draw a centreline down handrail ends and measure down 19mm and mark location. Drill 12mm dia hole to depth of 10mm. Then drill 7.5mm dia hole to total depth of 65mm (**Fig.46**).

Insert rail fastener into rail ends using 7mm spanner until hinge joint is inserted half way into rail.

Fig.43

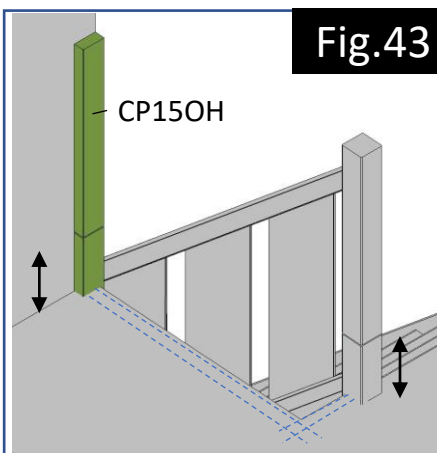


Fig.44

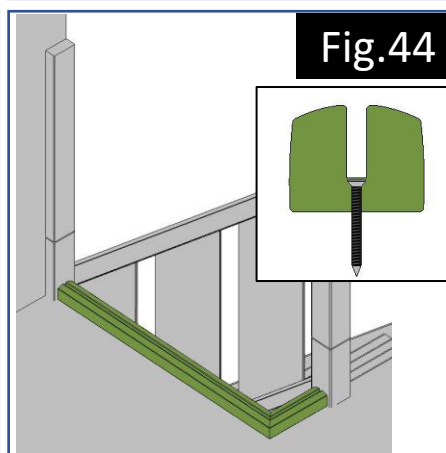


Fig.45

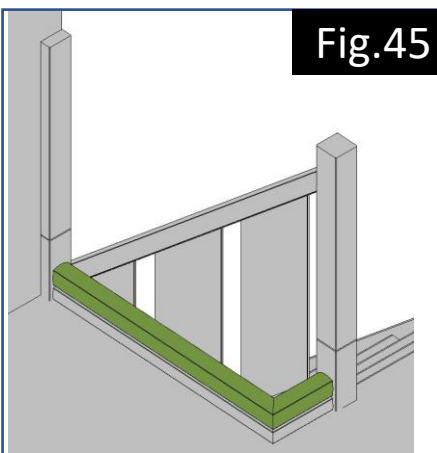
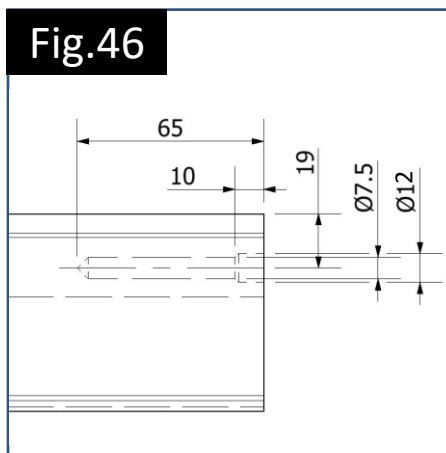


Fig.46



Cut 2 off, **battens** at **791mm** long and place on top of base rail and up against half newel and top newel posts (**Fig.47**).

Offer handrail assembly onto top of battens so rail fixing threaded bolt is up against side of each newel post and mark location (**Fig.48**).

To drill newel posts, follow procedure in **Figs 18, 19 & 20**. You may need to remove half newel post in order to drill holes more easily. Once drilling is completed, secure half newel post back to wall.

Installing Landing Glass Panels

Measure landing base rail length from half newel to centre of top newel post (**Fig.49**).

To work out how many panels are required on the main landing run and fillet lengths, divide the length by 350, rounding down to next whole number (this is number of panels required). Multiply this number by 300. Subtract this number from original length. Divide remainder by number of panels plus 1

Example:

- Base rail length is 825mm.
- Divide length by 350 ($825 \div 350 = 2.35$)
- Round down to next whole number = 2
- Multiply x 300 ($2 \times 300 = 600\text{mm}$)
- Subtract number from original length ($825\text{mm} - 600\text{mm} = 225\text{mm}$)
- Divide number by No of panels 2 + 1 ($225 \div 3 = 75\text{mm}$ fillet)

To establish if you require a small landing panel for the short length of base rail which branches off from top newel post, the maximum distance from newel post to centre of base rail must not be greater than **102mm**. If it is greater, then a small panel will have to be installed. The maximum distance using 1 small panel is **267mm**. If the distance is greater than this, add another small panel (**Fig.50**).

Cut base rail and handrail fillets to length and drill holes through as per instructions for **Fig.26**. Starting at half newel, fix base rail fillet into groove, pilot drill and secure with screw (not supplied). Run beads of clear silicone along base rail walls (**Fig.51**). Carefully place glass panel into groove. Repeat along full length (**Fig.52**).

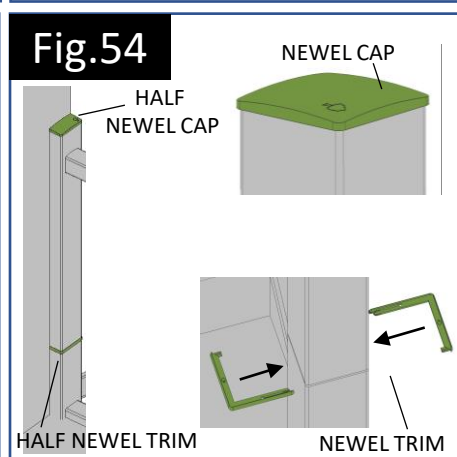
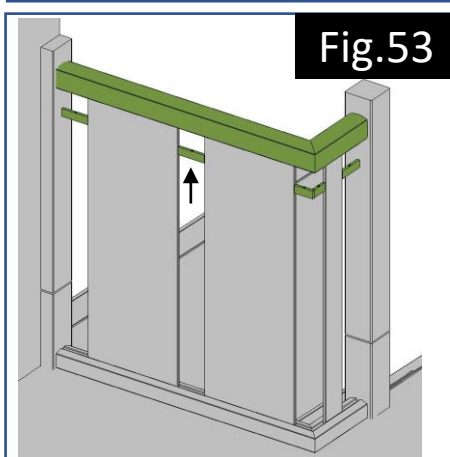
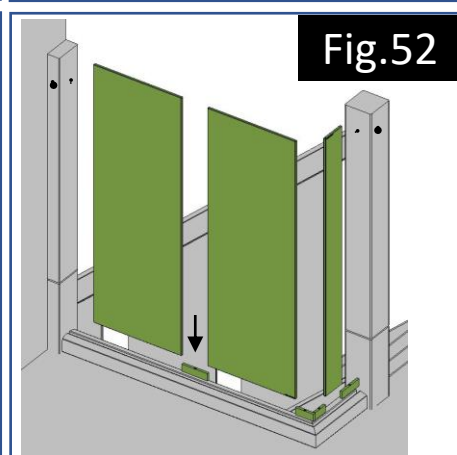
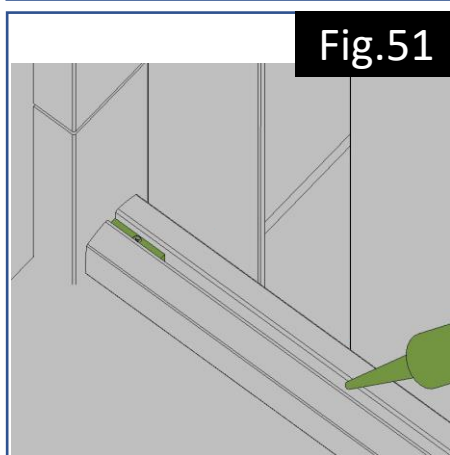
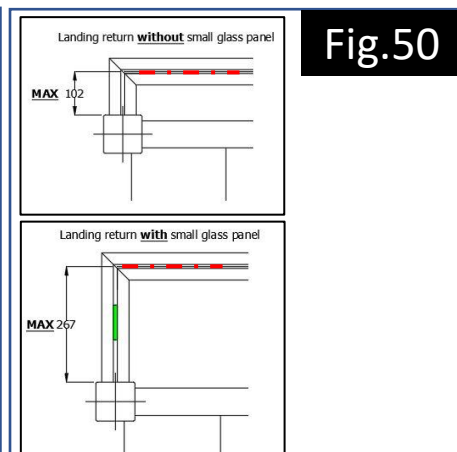
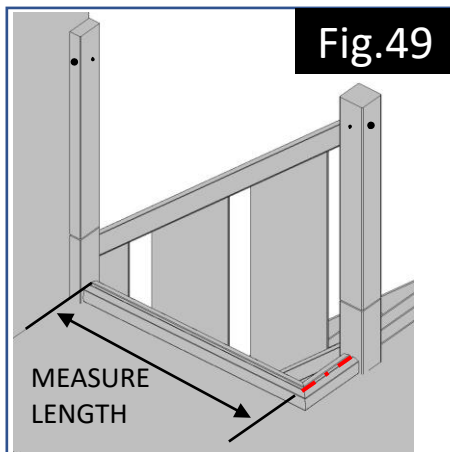
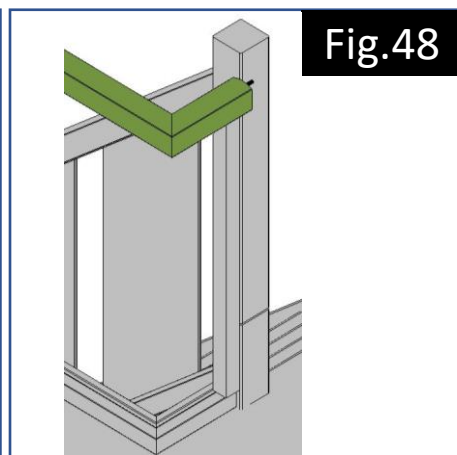
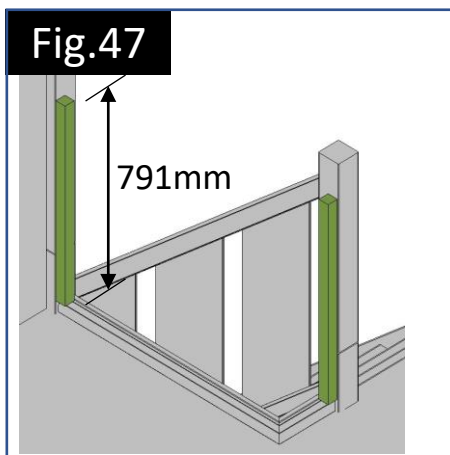
Installing Landing Handrail

Run small bead of clear silicone along walls of landing handrail assembly grooves. Offer rail fastener on end of handrail assembly into half newel and carefully align tops of landing panels into handrail groove and insert other end into top newel. Insert locking nuts and tighten (**Fig.53**).

Cut and fit all decorative cover fillets as per stairs

Metal **Newel caps** can be installed using multi purpose adhesive.

Newel trims should be installed using clear silicon (**Fig.54**)



Glass Angle explained:

The Reflections rake panels are manufactured to an angle of 48 degrees.

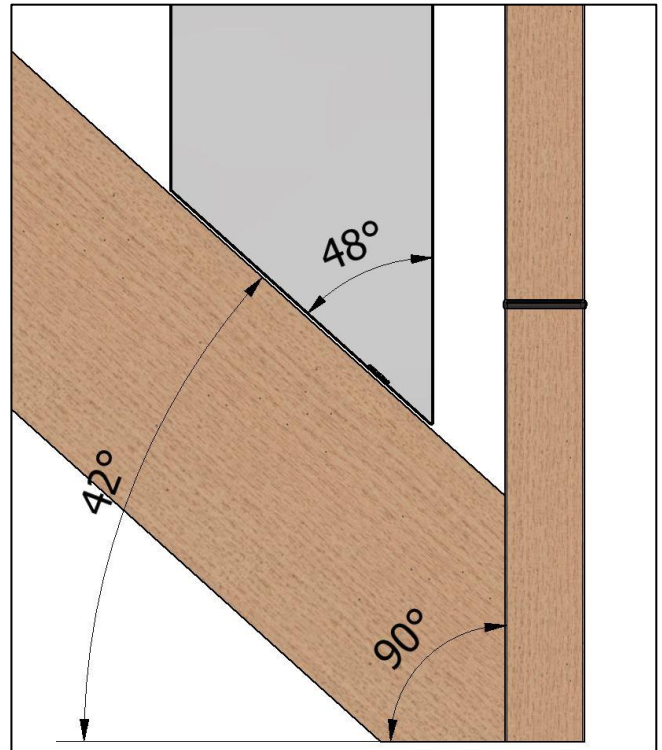
When used on a 42 degree pitch the vertical edges of the panel will be parallel to newel post ($42 + 48 = 90$ degrees).

Due to the design of the rail groove depth, Reflections panels can be used on stair pitches between 40 – 44 degrees.

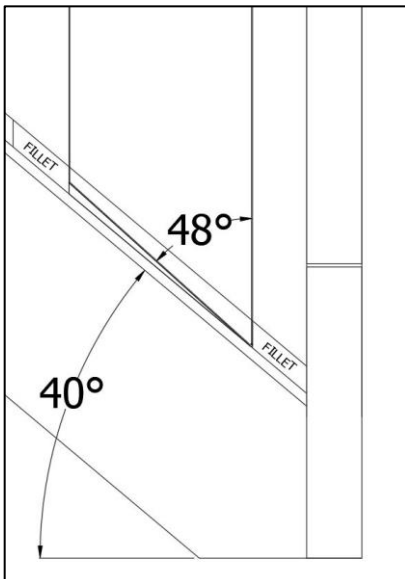
On a pitch of 40 degrees there will be a gap at the back end of the panel when glass edges are vertical.

On a pitch of 44 degrees there will be a gap at front end of panel when glass edges are vertical (see diagrams below).

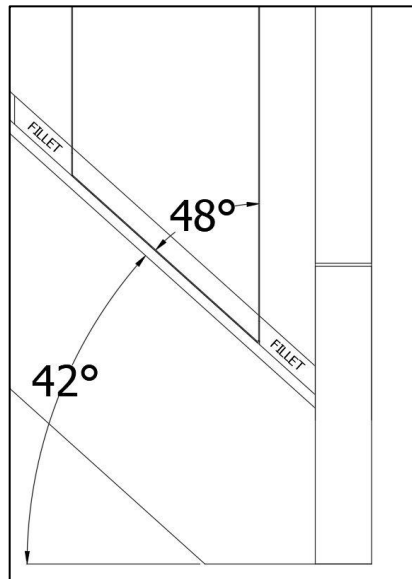
Ensure panels are fully pressed up to first fillets top and bottom and secure in place with next fillets and clear silicone sealant.



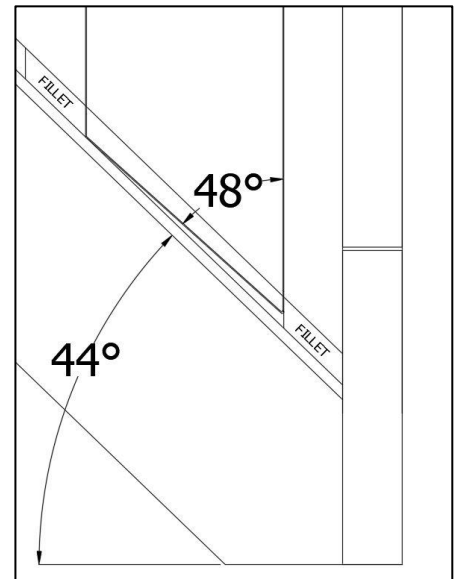
**40 deg pitch –
gap at back of panel**



**42 deg pitch –
no gap**



**44 deg pitch –
gap at front of panel**





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