

JOINTS IN STRINGERS

Depending on the overall length of the stair, stringers may need to be produced in two or more sections - to be joined on site. Joint stringers are precut in the factory, with holes drilled to house the metal joiners (supplied with the stair).

Glue the joining edges of the stringers with construction adhesive. Insert the metal joiner and then tighten using a 10mm spanner. Cut an MDF stiffening plate from excess material to sit inside the stringers, positioned below the tread and behind the riser. Glue and screw the gusset into place (Refer Figure 1)

***Important:** Joints in stringers cannot be left unsupported. Either prop temporarily until the supporting wall has been built. If the stair is to be left open, refer to Sub-Stringers for method of support.*

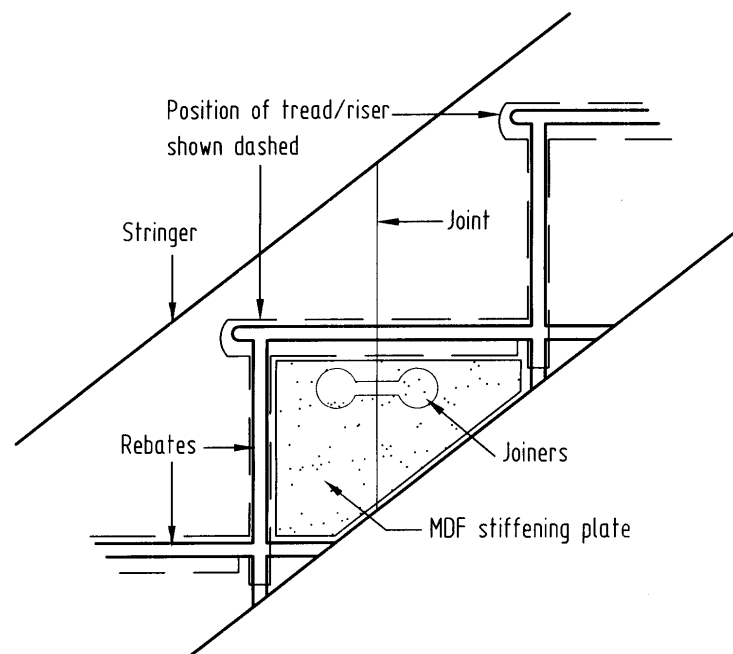


Figure 1
Joint Stringer Detail

FLIGHT ASSEMBLY

- **Method 1: Assembled In Place**

This is the preferred method of installation when the flights are either long, or if there is insufficient room to maneuver the assembled flight into position.

- 1) Place the stringers on the floor with the leading edge down and the dovetail rebates facing each other — ensure parallel.
- 2) Insert the top nosing, top tread and top riser into their respective rebates.
- 3) Screw through the back of the top riser into the stringer, at a slight angle.

- 4) Screw down through the top of the nosing into the riser, to stop the nosing from sliding forward.
- 5) Insert the lowest tread of the flight and push this all the way forward. This will prevent the riser from locating in the rebate in the underside of the tread.
- 6) Place the bottom riser into dovetail rebates and push up to the under side of the tread.
- 7) Lift the flight into position (with assistance if necessary) and screw through the top riser into the floor joist to hold the flight in place.
- 8) Apply a thick bead of construction adhesive within the rebate of each tread.
- 9) Insert all treads into the stringers making sure that they are pushed in parallel, careful not to damage the dovetails. Using a rubber mallet, tap into position. Ensure that the treads are pushed all the way forward or the risers will not locate into their respective rebates.
- 10) Apply a thick bead of construction adhesive within the rebate and along the top edge of each riser (where it will recess into the corresponding tread rebate above).
- 11) Insert the risers into the stringers starting from the top, working down. Make sure riser #1 is installed in the correct position.
- 12) Using a rubber mallet tap the riser into the rebate of the tread above, then tap the lower tread into the rebate on the face of the riser.
- 13) Continue down the flight until complete.
- 14) Before tapping tread #1 back into place ensure that riser #1 does not locate into the rebate until a bead of glue has been applied to the top edge of the riser.
- 15) Before fixing the stringers to the wall, sight up the top edge of the stringers to ensure that they have not sagged. If they have, cut in a temporary prop under the flight to remove the sag. Finally, fix the stringers to each stud using 100mm batten screws

- **Method 2: Assembled On The Floor**

Method of installation used for either small flights, or if there is sufficient room to maneuver the flight into position once assembled.

- 1) Place the stringers on the floor with the leading edge down and the dovetail rebates facing each other — ensure parallel.
- 2) Insert all of the treads between the stringers ensuring parallel. Using a rubber mallet tap each tread all the way forward.
- 3) Apply a thick bead of construction adhesive to both rebates within the risers and the treads.
- 4) Insert the risers into the stringers starting from the top, working down. Make sure that riser #1 is installed in the correct position.
- 5) Turn the flight onto one stringer face, preferably the wall side. Proceed to tap the treads and risers together as previously mentioned in steps 8-14 **Assembled In Place**
- 6) Now install the top riser and nosing as described in steps 2-4 **Assembled In Place**
- 7) Lift the flight into position (with assistance if necessary).

Note: When a flight runs down from either a mid-landing or set of winders, then

- The top nosing will not be required. The landing or first winder platform will form the nosing.
- The top riser has been reduced by 9mm in height, as the landings and/or winder platforms do not have rebates.

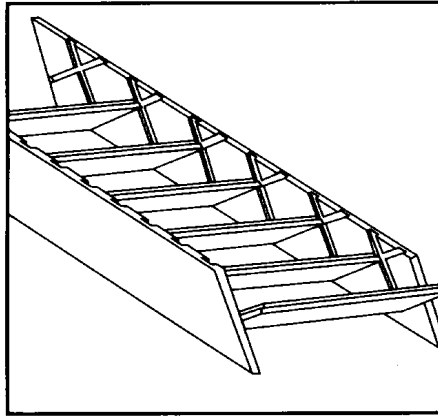


Figure 2
Flight upside down, ready for the risers to be inserted

TOP NOSINGS (OUTSTEPS)

- 43mm Standard in most cases, positions the back of the top riser hard against the upper floor joist. This will also leave 15mm for carpet wrap when a post is fitted.
- 133mm May be used to make up extra length in the stairwell.

When installing a flight using a 133mm nosing, fix to the timber joist as follows (Refer Figure 3)

- 1) Remove any plaster or plasterboard from the face of the floor joist.
- 2) Cut two lengths of 90x45mm (F5) Pine, slightly shorter than the inside measurement between stringers. Fix the first trimmer to the floor joist using 100x14g batten screws (Ensure that this is 32mm down from floor level so that the top of nosing will finish flush with the floor). Screw the second trimmer into the first.
- 3) Once the flight is in position, screw through the nosing into the trimmers.

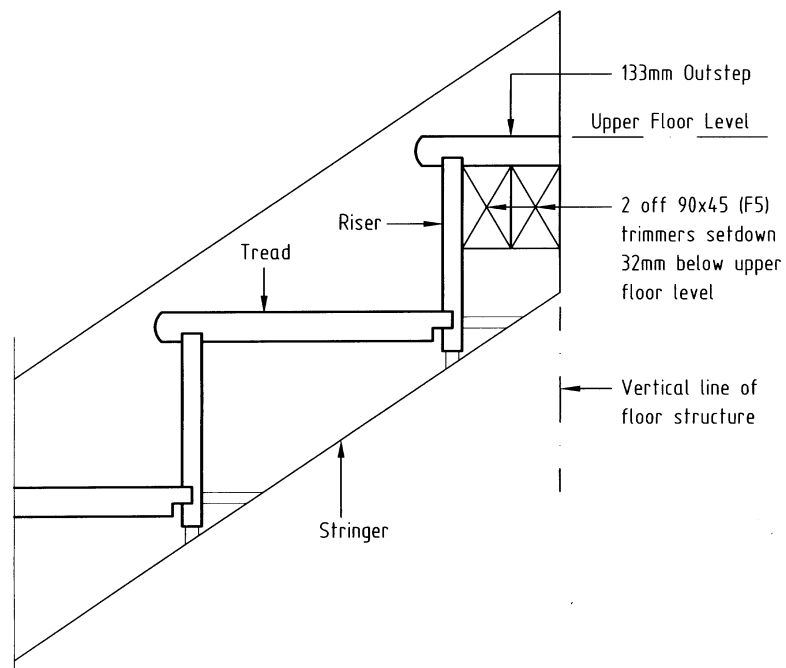


Figure 3
Stringer Detail — 133mm Nosing

QUARTER LANDINGS

- Cut-outs

Referring to the shop drawing, proceed to mark out the landing for cut-outs to suit the centre post (if applicable) and the lower flight stringer.

- 1) Centre Post Cut-out — From the nosing, measure in from the wall side and mark the overall width of the lower flight. From this point, measure inside the line by 60mm and then 60mm back from the nosing. Square these two lines through until they intersect. Proceed to cut them out.
- 2) Stringer Cut-out - From the nosing, measure out from the wall side by 32mm and then 43mm back from the nosing. Square these lines through until they intersect. Proceed to cut them out.

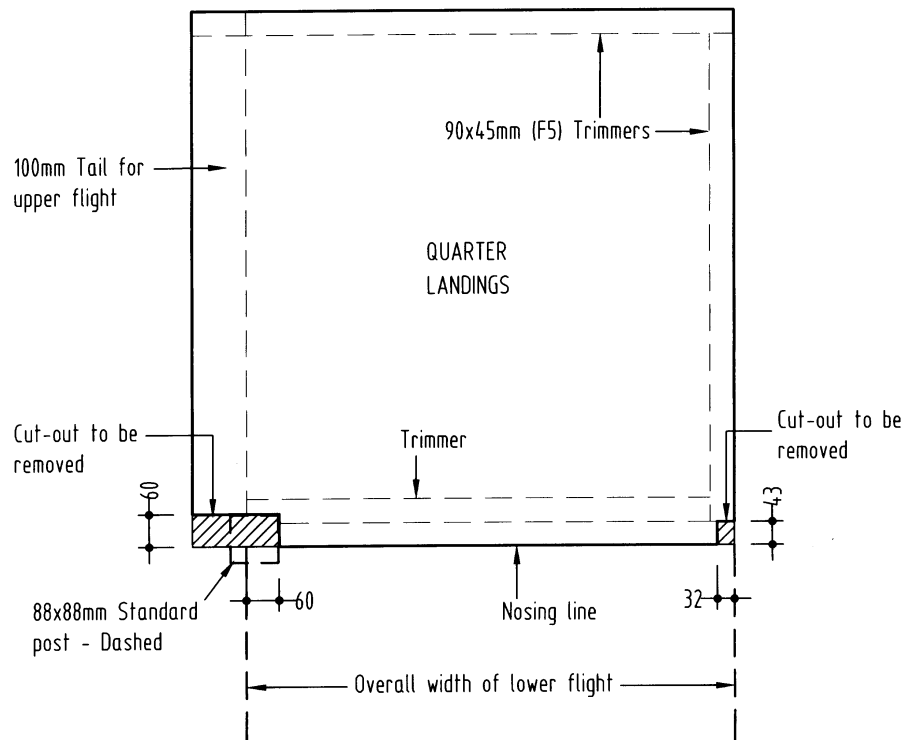


Figure 4
Quarter Landing Set-Out

- Trimmers

- 3) Cut a 90x45mm trimmer to fit between the above cut-outs. Apply construction adhesive to one edge and position the trimmer 45mm back from the nosing line. Screw through the top of the landing into the trimmer.
- 4) Calculate the height of the landing by multiplying the tread number by the individual rise. For example, if the landing is tread #10 with a rise of 185mm, then $10 \times 185\text{mm} = 1850\text{mm}$.
- 5) Mark this height on the wall and then deduct 32mm for the thickness of the landing material. Level this line around the wall where the landing will run. At this point, cut a length of timber to this height to act as a temporary prop.

- 6) Cut two 90x45mm trimmers using the landing as a guide for length. Ensure the trimmer does not foul the 32x43mm cut-out in the nosing.
- 7) Glue and screw these trimmers to wall using 100x14g batten screws (If timber frame).
- 8) Apply a bead of glue to the top of the trimmers; using the prop, sit the landing in place and screw to the trimmers using 65mm screws. Do not install the center post at this time.

- **Lower Flight**

- 9) At this point, the lower flight can be moved into position (ensure that the top riser of the flight has been reduced in height by 9mm). Screw through the face of the top riser into the landing trimmer behind. Leave the centre post stringer (if applicable) slightly long at this stage.

- **Upper Flight**

- 10) The upper flight can also be moved into position, once again leaving the centre post stringer (if applicable) slightly long.

Note: The landing is supplied with a 100mm tail on the back edge to provide bearing for the top flight. Therefore, it is not removed unless necessary.

- **Centre Post**

- 11) Using the cut-out for the centre post, measure back 88mm for the depth of the post. Plumb this line up the face of the stringer and remove the off cut. With the centre post stringer now plumbed to length, you will also need to cut 28mm out of the back of the adjacent tread to allow the centre post to slide down into position.

HALF LANDINGS

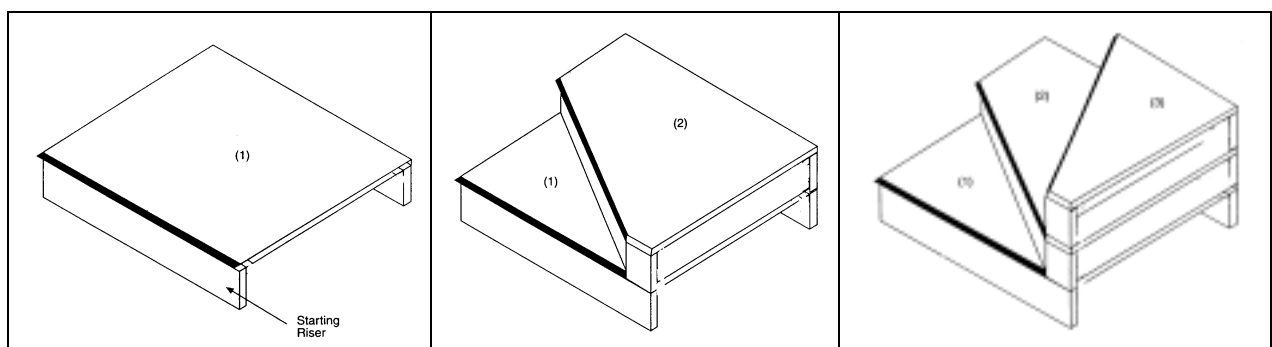
Half (180 degree) landings are installed using the same method as quarter landings, only in two sections. In addition, use a 90x45mm trimmer to run the full length of the join.

SPLIT HALF LANDINGS

Split half landings are quarter landings separated by one rise. The split landings are installed using the same method as quarter landings. In addition, there will be a 32mm thick MDF riser running from the back wall to the center post (if applicable).

WINDERS

The following diagrams show how Stair Lock s winder system is built up in stages



- **Installing The Winders**

- 1) Start by marking out the first winder platform as detailed in **QUARTER LANDINGS**. However, continue the marks down the front edge of the winder. Do not cut at this stage.
- 2) Lay the remaining winders for this block on top, making sure that the outside edges align. Clamp the winder block together in at least two places.
- 3) Using a square, scribe the nosing line of each winder to the winder below. Transfer the centre post set out marks on winder #1 to the other winders above.
- 4) Drill four 4mm holes, located 40mm behind the nosing line of each winder. Continue these holes through to the winder below. These holes are for the screws to secure the winders to the risers.
- 5) Drill several 4mm holes around the outside of the winders. These holes are for the screws to secure the winders to the trimmers and risers.
- 6) Remove the clamps and remove the centre post cut-out on each winder as marked.
- 7) Starting with the first winder platform, measure 25mm back from the nosing lines scribed earlier and cut a 32mm winder riser to this length.
- 8) Cut a second winder riser to length to run along the wall.
- 9) Glue and screw these risers into place where the pilot holes have been drilled.
- 10) Repeat this step for the next winder above (if applicable).
- 11) Glue and screw the trimmers to the wall as detailed in **QUARTER LANDINGS**.
- 12) Place the first winder platform into position (with assistance if necessary), then glue and screw to the trimmers. Continue to fix the winders in succession.

TIP: To ensure that the winders are a good fit, temporarily install the center post, and pull the winders hard against the post before screwing them down.

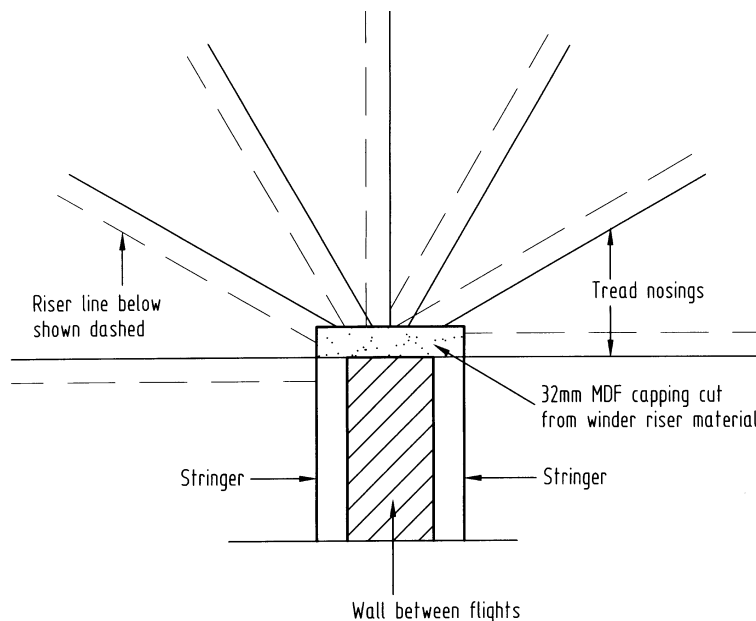


Figure 5

Detail of Winder Section — Stair with Centre Wall

Note: The 32mm MDF capping shown will overhang the blade wall by 32mm on the lower flight. The top of the capping is cut level with the upper stringer at the same pitch.

BOTTOM POST

The bottom post is fitted to the stringer using a mortise joint. Cut a 50mm deep by 32mm wide mortise into centre of the post. (Refer Figure 8) The top of the post is set 978mm above the top of the stringer and fixed using the following method.

- 1) 2 off 16mm flush plugs and 120mm x 8 gauge screws
- 2) 65mm chipboard screws into floor (assumes timber)
- 3) Construction adhesive

Cut a 28mm wide section out of the nosing of tread #1, flush with the face of riser #1. This cut out will allow the post to sit hard against the riser.

TOP POST

The top post is to be cut so its slips over the top of the stringer and down on to the last tread.

- 1) Mark the upper floor level on the post (1072mm down from top of post)
- 2) It is best to mark this post out before cutting, double-checking all measurements.
- 3) The top horn of the stringer will need to be cut level with the floor, but no further than the front face of the post.
- 4) The top post must sit on the floor by 30mm, in order to maintain both carpet wrap and the correct flight rail strike point.
- 5) Mark the trench that needs to be cut to allow the post to slide over the stringer.
- 6) The inside face of the post needs to be cut level with the last tread (one riser down from the floor).
- 7) The outside face of the post needs to be cut in line with the bottom of the stringer and then chamfered to match the top of the post.
- 8) Fix through either side of the top post into the stringer.

PINS & EXTENSION POSTS

For turned style balustrade, pins are required to prevent the flight rails from striking the posts in the turned section. The pins are fitted into an extension post by using the dowel supplied.

PIN NAME	TOTAL LENGTH	TOP SQUARE
Quarter landing	750mm	400mm
2 Tread winder	750mm	2 x 200mm
Standard	750mm	200mm
3 Tread winder	550mm	200mm

All extension posts are pre-drilled to accept the dowel. The pins are fixed into the extension posts using construction adhesive and 65mm screws through the dowel. The finished height of the extension post and pin needs to be calculated in the same manner as the bottom post.

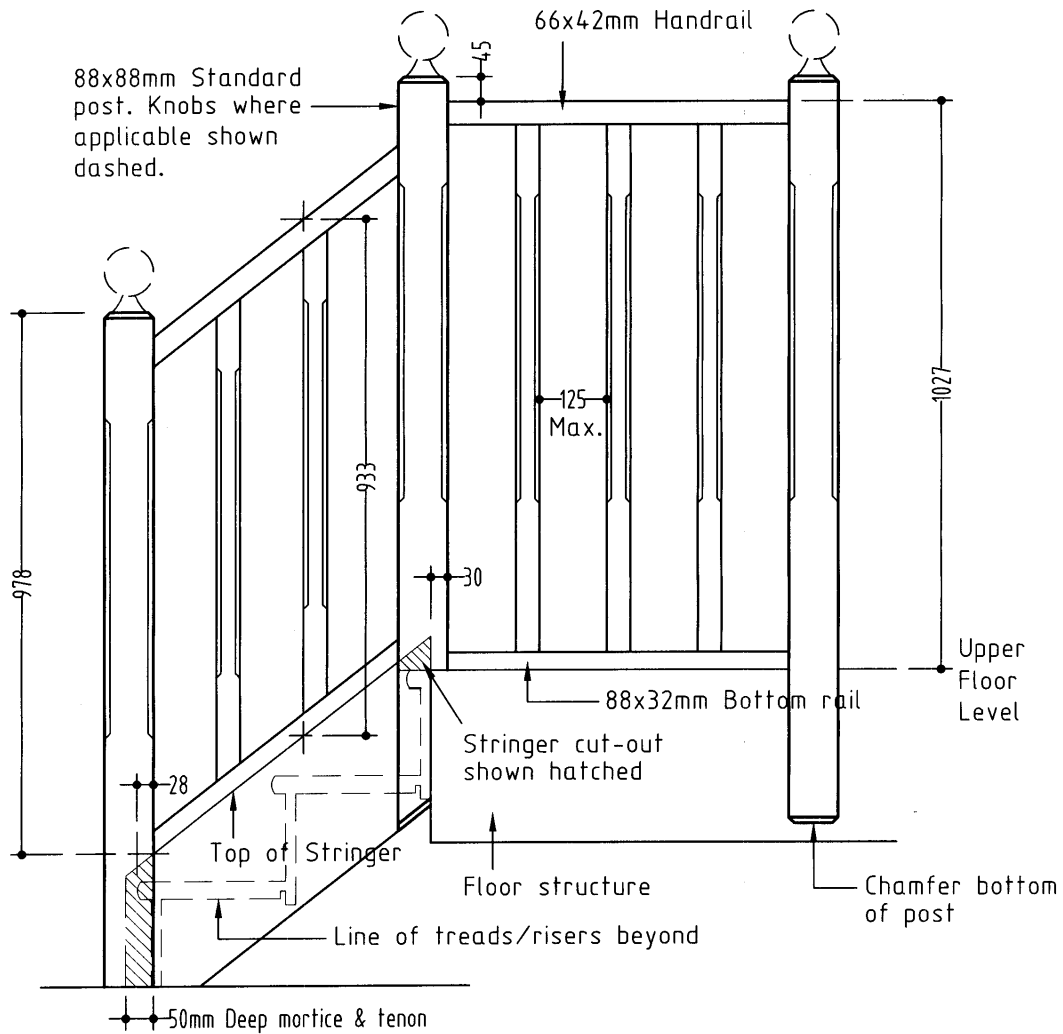


Figure 8
Typical Section Detail — Chamfered Style

LEVEL RAILS & POSTS

The level rail finishes 1027mm above floor level and 45mm below the top of post. Therefore, the post height for level (balcony) balustrade is 1072mm above floor level.

Cut the post to suit the overhang of the balustrade (normally 30mm). Fix of these posts where they run past the face of the floor joist.

BALUSTRADE HEIGHTS

We recommend the following balustrade heights:

- Flight Rail: Measured 933mm plumb above the top of stringer.
- Level Rail: Measured 1027mm above floor level.

HANDRAIL

When using a post with a square top, the level rail may be rested on top of the posts and scribed from the underside. Before cutting the bottom rail, lay it down in front of the posts and scribed to length.

When installing the handrail, use a baluster at either end for support and screw the handrail to the post from the underside. Do not screw down through the top of the handrail.

BALUSTER SPACING

The most accurate method of determining baluster spacing is as follows.

- 1) Measure the distance between posts.
- 2) Decide how many balusters are required in the section and multiply by the baluster width.
- 3) Deduct this measurement from the total distance between posts.
- 4) Divide the remainder by the number of balusters plus 1 to close.

Example: *Level balustrade section 2350mm long using pine timber balusters*

$$\begin{array}{rcl} 14 \times 42\text{mm Pine Balusters} & = & 588\text{mm} \\ 2350\text{mm} - 588\text{mm} & = & 1762\text{mm} \end{array}$$

$$1762\text{mm divided by } (14+1) \text{ Spacings} = 117.5\text{mm}$$

Therefore, 14 balusters and 15 fillets @ 117.5mm long are required

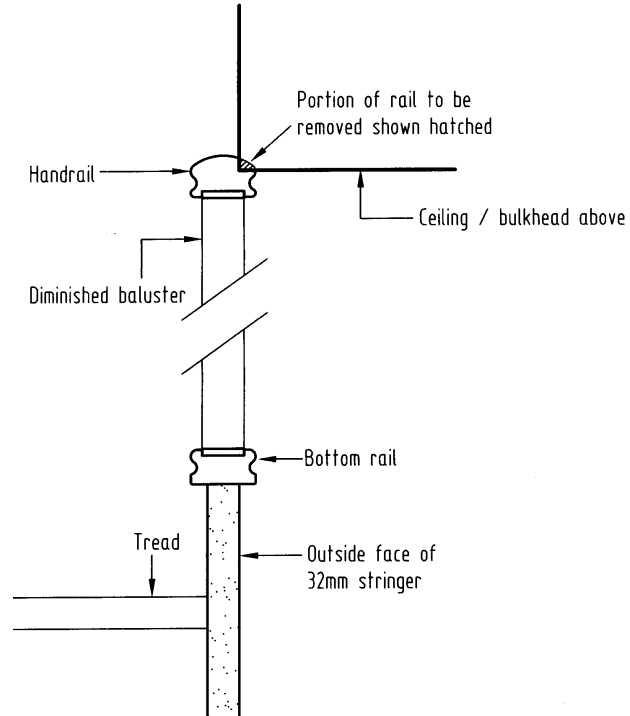


Figure 9
Diminishing Balustrade — Cross Section

DIMINISHING BALUSTRADE

Diminishing balustrade occurs as the balustrade strikes the ceiling before landing on the upper floor.

- 1) Rebate the handrail over the bulkhead (Refer Figure 9)
- 2) Mitre the intersecting handrails at the ceiling line (Refer Figure 10)
- 3) Continue the bottom rail up the flight and mitre into the underside of the handrail.
- 4) When using turned balusters, insert the fillet into handrail and plane level with the rebate. Nail the diminished baluster into the fillet. If using chamfered balusters, plain square balusters can be chamfered on site to the suit the reducing length.

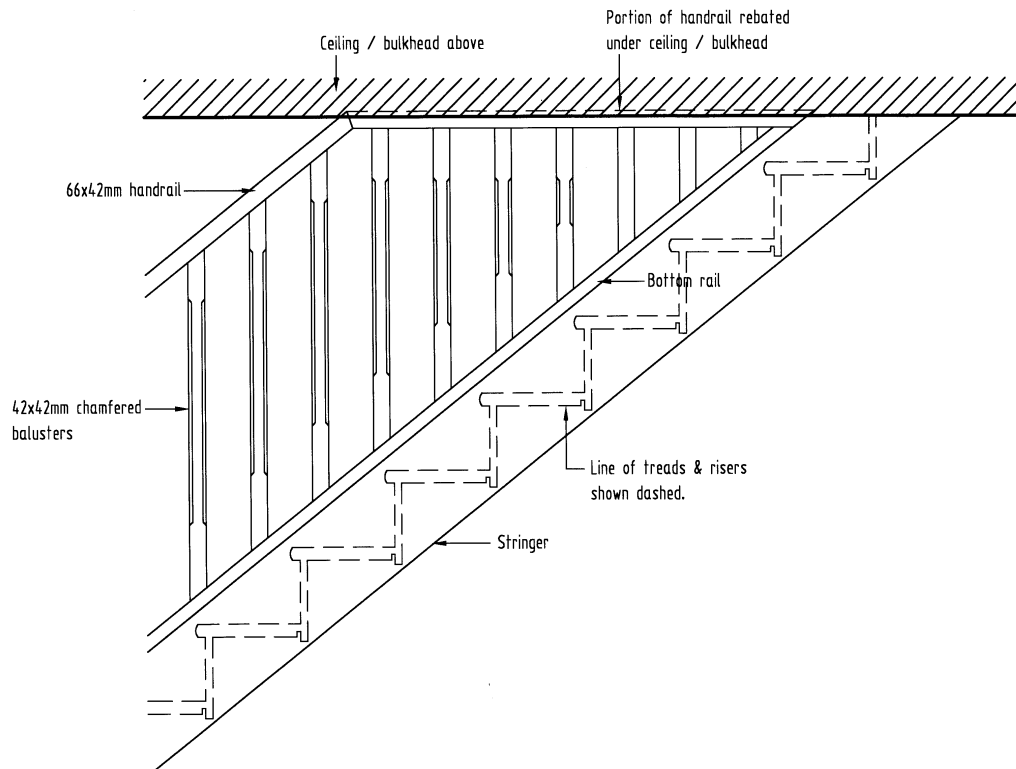


Figure 10
Diminishing Balustrade — Elevation

WALL RAIL

Install the wall rail at the same height as the flight rail (933mm plumb above the top of stringer).

- 1) Mark the center of the bracket height on the wall, 840mm above the top of the stringer.
- 2) For framed walls, locate the studs along this line.
- 3) Drill a 4mm hole center of the MDF wall plate, and then screw to the wall.
- 4) Plumb cut the wall rail to length (usually 36 degrees and the same length as the stringers).
- 5) Using only 1 screw at this stage, mount the brackets to the MDF plates at either end of the wall.
- 6) Fix the wall rail to the brackets, and insert the other screws when the angle is correct.
- 7) Proceed to install the remaining brackets; making sure that the wall rail is straight.

BULLNOSE TREADS

- 1) With the tread upside down, position the curved riser block 25mm back from the nosing.
- 2) Trace the riser block to the underside of the tread. Drill several 4mm pilot holes through the tread, then glue and screw the riser block to the tread
- 3) Cut the 32mm risers to length and fix one to each side of the tread.

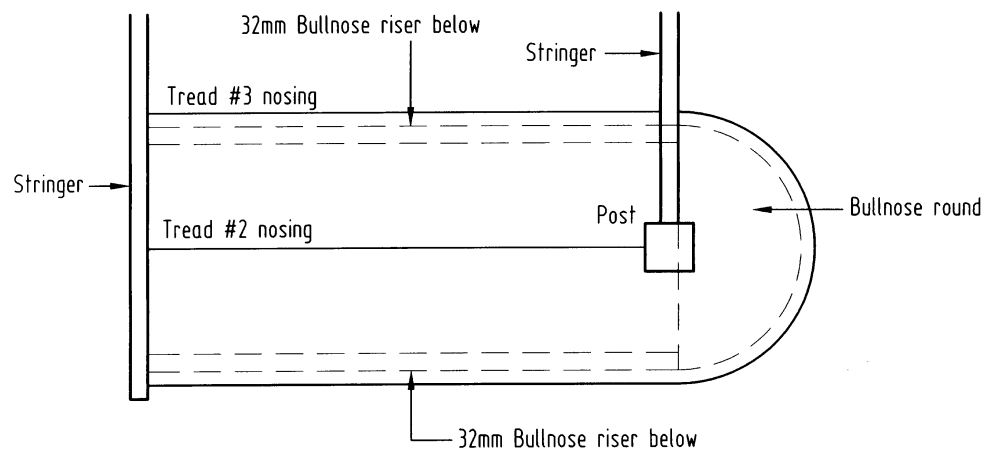


Figure 6
250mm Radius Bullnose Tread

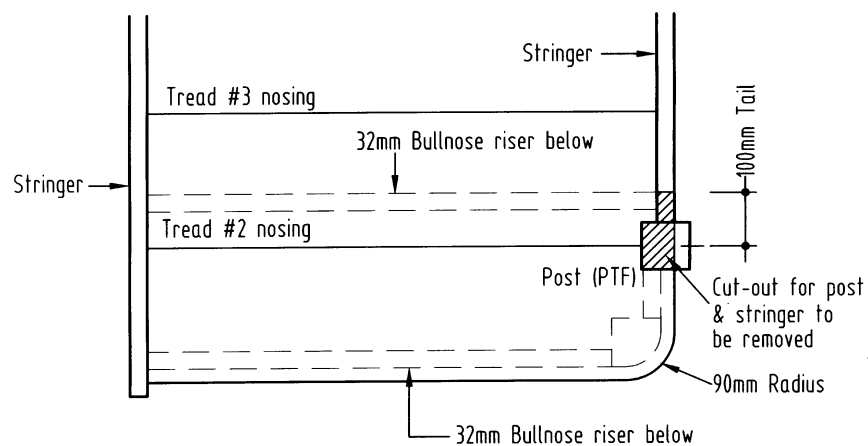


Figure 7
90mm Radius Bullnose Tread

COVER PANELS

The two types of cover panel used:

- 1) Level cover panels - 600mmx32mm
- 2) Raked cover panels - 300mmx32mm

Level cover panels are generally used on a landing, in line with the stringer. The panel is set 72mm above the landing height in order to match the landing skirting. The balustrade centres on top of the panel and is set at the same height as level rail (measured 1027mm from landing height).

Raked cover panels are generally used on winder applications. Cut to the required length and angle (approx. 15 degrees). They must be custom fitted in order to maintain sufficient carpet wrap around the winder nosings.

SKIRTINGS

The skirting material supplied is 72x32mm. Skirting should be cut around the winders and landings to continue the appearance of the stringers.

Installing Skirting

- 1) Notch the nosings on winders or landings by 32mm (to the face of riser) to suit the skirting.
- 2) Install the skirting on the face of the risers first.
- 3) Starting from the top, work down the stair cutting each skirting over the tread.
- 4) Glue the skirting to the winders or landings and the wall.

SUB-STRINGERS

Sub-stringers are supplied in 90x42mm KDHW, and are used to stiffen a flight of stairs if the stair is open on 1 or more sides or if the stair has long flights with no support underneath.

Installing a Sub-Stringer

- 1) Scribe sub-stringer to suit between posts, and then cut to length.
- 2) Drill holes to counter sink 100x14g batten screws @ 600mm centers.
- 3) Apply a generous amount of construction adhesive.
- 4) Screw into place leaving a 6mm quirk on the outside of the stringer.
- 5) Remove any excess glue.