

The Richard Burbidge Continuous Handrail System uses straight lengths of handrail connected to handrail fittings and ramps, allowing the handrail to flow over the tops of newel turnings. This system is designed for installation by professional joiners.

There are two newel turnings used for the fitting of the Continuous Handrail System. The NTO is used at all points of the staircase except where a volute is used at the bottom of a staircase. In this situation the NTV newel is specifically designed for fixing to the solid part of a curtail step.

The best method of installing the Continuous Handrail System is to draw all details in full size side elevation onto 8' x 4' sheet material or similar (the wall accommodating wall string is ideal). Mark out all details including handrail position/height above pitch line, newel positions, tread and riser details. This will give you a solid foundation in establishing lengths, angles of cuts and newel post heights.

During assembly it is good practice to lay overlong handrail lengths with fittings attached to stairs, resting on nosings, and also using an extra pair of hands offer assembly to side of newel posts, checking angle of cuts to ramps and lengths of vertical turns are correct.

All handrail fittings and ramps are joined to handrails and each other using tie-rail bolts and metal fixing plates. Full instructions and templates are supplied with all fittings.

UPWARD & OVER EASINGS

Handrail fittings/ramps are used to change the direction/pitch of handrails. These ramps (UE, UE90° and OE) are supplied overlong to suit the majority of staircase pitches and will need to be cut down to suit individual requirements.

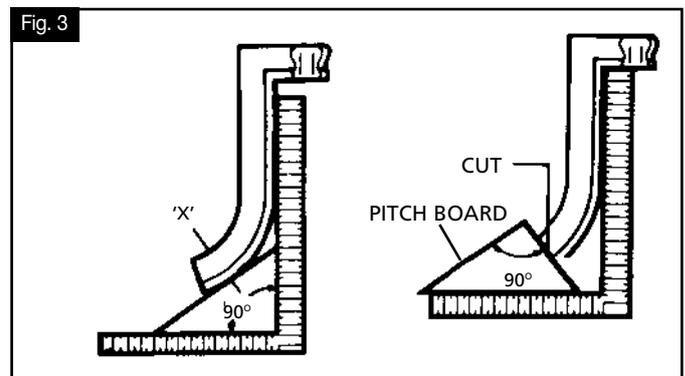
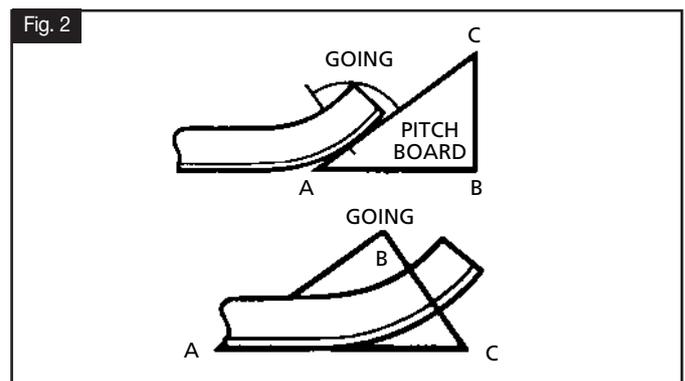
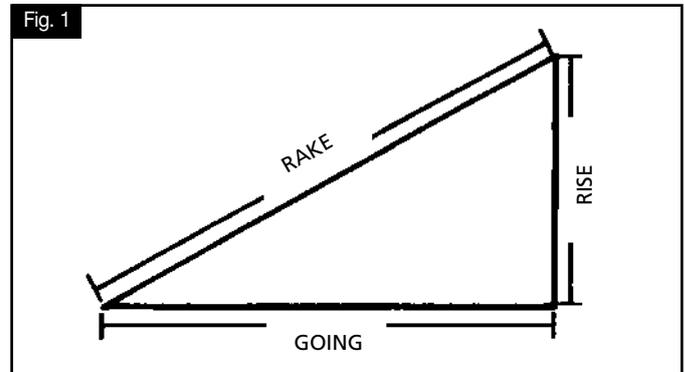
To mark and cut angles of ramps use a pitch board/block which is a triangular piece of cardboard/plywood with the sides the same rise, going and pitch as the stairs (**fig. 1**). Place the handrail fitting and pitch board onto a flat surface and offer the pitch board to the underside of the handrail fitting/ramp. At the centre point where the hypotenuse of the pitch board touches the ramp mark with a pencil 'x' (**fig. 2**). Reverse the pitch board as detailed in **fig. 2** and align the marked point 'x' on the handrail fitting with the B-C axis. Scribe a pencil line onto the handrail fitting to give the angle of cut.

VT VERTICAL TURN

The overall length of the vertical arm of the VT is 475mm. This is usually longer than required when used with the Continuous Handrail System and will need to be cut down to suit. Using the full size side elevation previously discussed, establish the length of VT and angle of cut UE required. Mark the UE for joining the pitching handrail using pitch board (**fig. 3**). You should note it is not necessary to cut both faces of the UE when used at the bottom and top of the stairs. The face to be cut is the one adjoining the handrail length.

Note - we do not recommend the use of the Continuous Handrail System at points on the staircase that have extra rises, eg. winder flights, as the stability of the vertical turn cannot be guaranteed due to the extended length required.

When setting out UEs and VTs assemble so as to allow the back face of the 1100mm length spindle to sit flush with the inside edge of UE/VT. If the spindle requirement is longer than 1100mm check setting out details and adjust accordingly.



If the position of the newel at the top of the flight accommodating both pitching and horizontal handrails is set some distance back from the front face of the last riser, the OE over easing can be used instead of the UE and VT gooseneck style assembly.

OR OPENING RISES

The OR opening rise is a factory assembly of the OC opening cap and UE upward easing. It is used at the bottom of stairs to commence raking/pitching handrail.

You should note that the OR is specifically designed for standard staircase pitches of 42° and saves on-site installation time. For staircases with pitches other than 42° assemble the opening rise by using individual OC and UE handrail fittings. These fittings should be cut down and assembled as detailed in **fig. 4**. The only change will be the angle of cut to suit the staircase pitch, which in **fig. 4** is 42°, plus the 50mm measurement. The overall reach of 225mm should remain the same.

In order to achieve a handrail height of 900mm, the top shoulder of the NTO bottom newel should be set according to the following:

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'x'mm plus one rise

'x'mm = 792mm (HDR) 796mm (OHR)

eg, if using HDR handrail with an individual rise of 200mm, the newel base height is calculated as follows:

$792\text{mm ('x'mm HDR)} + 200\text{mm (individual rise)} =$

$992 - 675 \text{ (length of NTO)} = 317\text{mm}$

317mm is the height of the newel base from pitch line to top of newel base.

HORIZONTAL & STRAIGHT CAPS

The HC horizontal cap turn is used where the staircase turns through 90° (eg quarter landings) and 180° (half landings). Use the full size side elevation to establish cuts and lengths.

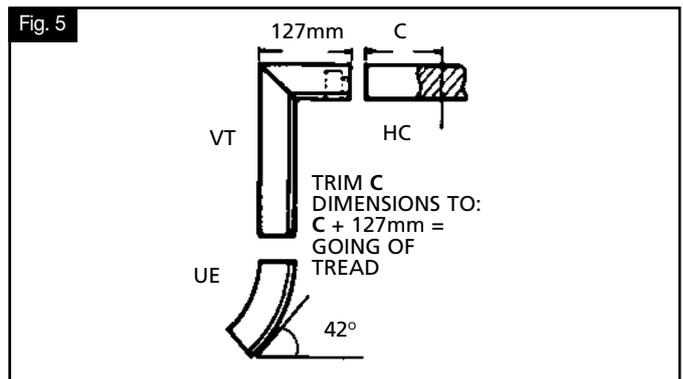
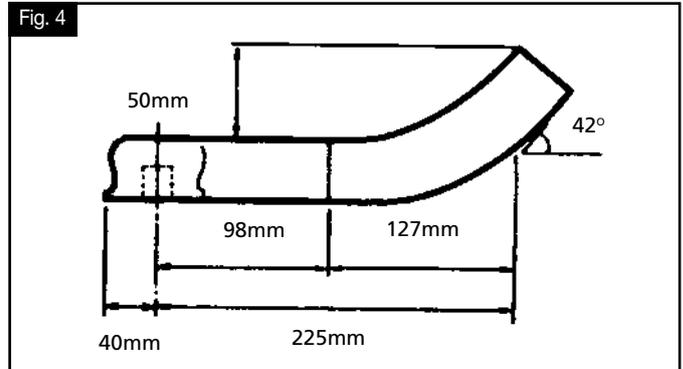
Where the HC is used with a VT the overall reach of the two components when joined together should equate to one going (**fig. 5**). The overall reach is taken from the centre of the spigot drill position on the underside of the HC to the front face of the VT. The length of cut of the leg of the HC is established by subtracting 127mm from one going.

When using HC with a UE to pitch up the second flight off a quarter/half landing, assemble the HC and UE using dimensions detailed in (**fig. 4**), eg overall reach 225mm.

The SC straight cap is normally used over the top of an NTO with horizontal balustrading (eg mid-newel on landings exceeding 2400mm). It is also used at the top of flights where the landing handrail runs in the same direction as the raking handrail. Follow the instructions for joining HCs and VTs with the overall reach of the SC and VT equivalent to one going. Where the SC is used to accommodate a horizontal rail and pitch up a further flight of stairs with a UE, the overall reach of the two components when assembled should be 225mm (**fig. 4**).

The height of the top raking newel base is calculated by subtracting the length of the NTO and handrail section from the handrail height to be achieved. The newel base height is set above landing floor level, for example,

900mm (minimum landing handrail height)
 - 675mm (length of NTO) - 59mm (HDR section)
 = 166mm (height of base).



VOLUTES AND NTVs

The volute is available as left and right hand forms and is supplied with a UE and a full size plan view template for positioning onto curtail steps. The UE is factory assembled dry-fixed, enabling the face joining the pitching handrail to be cut on-site to suit individual staircase pitches.

The volute is fixed using an NTV newel turning and is supplied with an adjustable sleeve which will be cut to suit once the length of NTV required has been established (**fig. 6**).

As previously discussed, draw all details in full size side elevation, mirroring in effect **fig. 6**. Once centre of NTV has been established, measure to underside of volute handrail tramlines and cut adjustable sleeve to suit. Four x 1100mm spindles are used in conjunction with the volute and NTV. The template supplied with the volute details the position mortises should be cut into step. The volute also comes pre-mortised saving time in on-site assembly. Spindles should be stub-tenoned on both the top and bottom shoulders once overall length required has been established (spindles will be the same length as the NTV newel).

When setting out the volute you will note the further forward it is positioned to front edge of step the lower the assembly. The further back the higher it becomes.

Note - The volute is specifically designed for domestic installations with handrail heights of 900mm and a maximum handrail length of 3600mm.

The curtail step used should have a solid block which will be bored on-site to accommodate the 34mm diameter spigot of the NTV once positions/dimensions have been calculated.

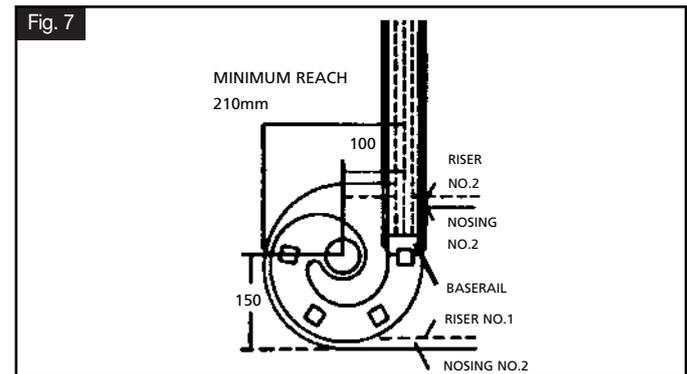
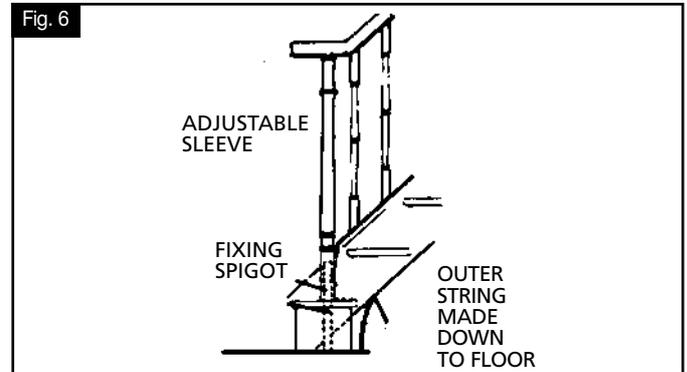
Glue the NTV into position and draw bore from side face of curtail riser (use a spirit level to plumb NTV).

The minimum reach/step dimension when using a volute is 210mm (**fig. 7**) with the centre of the NTV usually positioned 150mm from nosing. The volute can be lowered/moved slightly forward if desired using template provided, to establish suitability of mortises for spindles in relation to step edge.

For added stability/strength, we recommend that during setting out allow for a piece of baserail to run down the face of the staircase string, next to the last spindle under the volute. Fix through the bottom square of the spindle by gluing and screwing into groove of baserail.

HALF NEWELS FOR CONTINUOUS HANDRAILS

There are a number of options for finishing horizontal landing rails against walls when using the Continuous Handrail System. Traditionally the continuous rail ran straight into the wall and was secured with angle iron. Alternatively, the rail can be run into the wall as above with an NTO cut in half to form a decorative finish, or a full NTO can be used with an SC straight cap running over the top of the newel and leg of the SC fixed into wall, again using angle iron. You can also use NT160 half straight rail newel with NC2 ball cap which lends itself to this situation better than other cap designs.



USE OF TIE RAIL BOLTS

All Richard Burbidge handrail fittings are joined to handrails and each other using tie-rail bolts and metal fixing plates (**fig. 8**). In the groove of preferably the straight component when joining a ramp to a straight, drill an access hole 30mm diameter to a depth of approximately 30mm (HDR and OHR) and 23mm (LHR) at a distance 30mm from the face to be joined (**fig. 9**).

Mark the position of the bolt hole (using the paper template provided with the fitting) onto the end section of this component and drill through to the access hole using 9mm diameter wood bit ensuring the drill is at 90°.

Again, using the template, mark and drill the other component to be joined, this time using a 6mm wood bit to a depth of 40mm. Ensure the drill is at 90° to the face (**fig 9**). Screw wood threaded part of rail bolt into the 6mm hole using the nut screwed to the full extent of the thread. Remove nut, fit together applying glue to faces of components. Secure nut and washer to the bolt in the access hole and tighten slowly with a ring spanner ensuring profiles align.

After assembly position the metal fixing plate (supplied with fittings) across the joint within the groove of the assembled components. This should be positioned to ensure that the maximum number of drill holes can be used for screw fixing. Minimum three screw holes each side of joint. Pilot drill using a fine drill bit and secure into position using a proprietary wallboard adhesive, 32mm (1 1/4") No. 8 screws (HDR and OHR) or 19mm (3/4") No. 8 screws (LHR). Recess fillets for a flush fit.

For assembly of other components, refer to the appropriate Bracket Fix section.

