

Controlled Document

# Liniar Decking Fabrication & Installation Manual

Issue A, October 2015





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# 1.0 – Health & Safety

When building a structure on a private park ensure you have written permission to construct the structure. Also for your own safety and safety of others, corner off the construction area .

Liniair are suppliers of PVCu fencing and decking products and can not accept any responsibility for the actions or omissions of personnel not employed directly by Liniair.

Installers and Fabricators are reminded of their statutory obligations to employees through the Health and Safety at Work Act (1974) and the Management of Health and Safety and Welfare regulations (1999).

Below is detailed the Health and Safety Data sheet for PVC Products manufactured by HL Plastics Ltd, for consideration when carrying out C.O.S.H.H.(Control of Substances Hazardous to Health) and Risk Assessments and subsequent PPE (Personal Protective Equipment) issue.

## Health and Safety Data For PVC and PVCu products.

General responsibilities.

This document provides information in accordance with the requirements of the UK Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Act 1988 . (COSHH)

The principles of COSHH regulations require that exposure to hazardous substances is prevented or controlled . When contact with such materials is unavoidable then personnel must be adequately protected

The HSE publication of 'The Application of COSHH to Plastic Processing' is now available and should be read in conjunction with this document .

The occupational exposure limits are taken from the HSE publication EH40/92.

### 1. Identification of Material

H. L. Plastics Ltd products are produced from PVCu composite materials converted from pellet or powder form.

### 2. Hazard Identification

It is generally accepted that under normal conditions PVCu products are inert and hazard free. During decomposition however (if allowed to burn) toxic gasses may be given off in the form of Carbon Monoxide and Hydro Chloride .

Exposure limits	LTE 8hr TWA	STE 10 min ref period
Carbon Monoxide	50 ppm	300 ppm
Hydrogen Chloride HC1	-	7 ppm

### 3. Exposure Controls/Personal Protection

In some applications it may be necessary to weld PVCu components together. Great care should be taken not to exceed temperatures that are likely to cause decomposition .

During sawing operations dust may be given off and care must be taken to avoid contact with eyes, inhalation and ingestion.

### 4. Disposable Considerations.

Whenever possible PVCu waste should be recycled . If this is not possible then dispose to national and local authority regulations .



## 5. First Aid Treatment

### Inhalation of noxious fumes

Remove casualty to fresh air and seek medical attention immediately, Apply artificial respiration if necessary .

### Ingestion

Seek medical attention immediately .  
DO NOT induce vomiting.

### Eye Contamination

Flush eyes with plenty of clean water for at least 10 minutes.  
Seek medical attention if symptoms persist.

### Skin Contact

Wash with soap and water.

Dust from PVCu has been considered as a 'nuisance dust' defined as producing no irreversible change in living tissues when exposure is kept under reasonable control, e.g. to a hygiene standard of 10 milligrams/cubic metre

The HSE have issued a guidance note 'Control of Exposure to PVC Dust 1982', in which they draw attention to possible health risks which could result from exposure to PVCu dust and in which they make the following recommendations :-

-Exposure to PVCu dust should be kept as low as is reasonably practicable .

-Any exposure to PVCu dust should not exceed 10mg/m<sup>3</sup> for total PVCu dust in air, and 5mg/m<sup>3</sup> for respiratory dust in air. The guide also gives sampling and measurement methods .

## 6. Fire

PVCu will not normally support combustion, but if supported by other combustible materials such as wood, paper, etc. then it will burn, giving off dense acrid fumes. When PVCu products are stored, it must be recognised that the packing and pallets can themselves be a fire risk and are a much more likely route for rapid fire spread .

Most commonly available fire extinguishers are effective, but care should be taken to assess the items close by, electric appliances, etc .

In the event of a small localised fire, immediate action may be taken by personnel in the vicinity. Great care should be made not to breathe in the decomposition fumes after the fire has been extinguished. Ventilation should be introduced to clear the fumes as quickly as possible.

In the event of a major outbreak of fire, the Fire Service should be called immediately and personnel evacuated from the area .

## 7. General

As with most surfaces, care must be taken when walking on a wet decked area .

Technical Sales, HL Plastics Ltd, Flamstead House, Denby Hall Business Park, Denby, Derbyshire, DE5 8JX. Tel: 01332 883900 . Fax: 01332 883901 . sales@liniar .co.uk

## 8. Product Specifications

Liniar reserves the right to change product specifications shown in this manual .

## 2.0 – Component Chart

### Deck and Steel Sub Frame



**LDS052**  
Sub Frame  
Steel



**LDM025**  
Sub Frame  
Connector  
Moulding



**LDE001**  
Sub Frame  
Fascia



**LDE002**  
Sub Frame  
Packer



**LDE003**  
225mm Deck  
Board  
(Stipple Pattern)



**LDE500**  
225mm Deck  
Board  
(Wood Pattern)



**LDE004**  
225mm Deck  
Board U  
Channel Trim



**LDE005**  
45 x 40mm  
Angle Trim



**LDE006**  
225mm  
Capping  
Board



**LDM026**  
Capping  
Board Joint  
Trim



**LDM027**  
Capping  
Board Corner  
Trim



**LDM029**  
Screw Cap  
Cover



**LDH045**  
5.5 x 45mm  
Screw  
(Sub Frame To Post)



**LDH046**  
5.5 x 1.9mm  
Screw  
(Plank To Sub Frame &  
Sub Frame Steel)



**LDS053**  
Deck Board  
Step Steel

### Sculptured Balustrade



**LDE011**  
125mm  
Sculptured Post



**LDS056**  
125mm  
Sculptured Post  
Reinforcement



**LDM044**  
125mm  
Sculptured Post  
Cap



**LDE012**  
Sculptured Top  
Handrail



**LDE013**  
Sculptured Rail  
Capping  
(Square Punched For  
40mm Square Pickets)



**LDE014**  
Sculptured Rail  
Capping  
(Diamond Punched For  
Sculptured Pickets)



**LDE015**  
Sculptured Rail  
Capping  
(Square Punched For  
Sculptured Pickets)



**LDE016**  
Sculptured Rail  
Capping  
(Punched For Glass  
Pickets)



**LDE017**  
Sculptured Rail  
Capping  
(Unpunched)



**LDE025**  
Sculptured Rail  
Capping  
(Elongated Square Punched  
For Sculptured Pickets on  
Steps)



**LDE018**  
Sculptured  
Bottom Rail



**LDM031**  
Sculptured Top  
Handrail Bracket &  
Cover Set



**LDM032**  
Sculptured Bottom  
Rail Bracket & Cover  
Set



**LDX061**  
Glass Picket



**LDS0541.7/  
LDS05412.3**  
65mm Stringer/  
Sculptured Handrail Steel  
(1.7m/ 2.3m)



**LDM033**  
Sculptured Top  
Handrail Step Bracket  
& Cover Set



**LDM034**  
Sculptured Bottom  
Handrail Step Bracket  
& Cover Set



**LDE019**  
Sculptured Picket



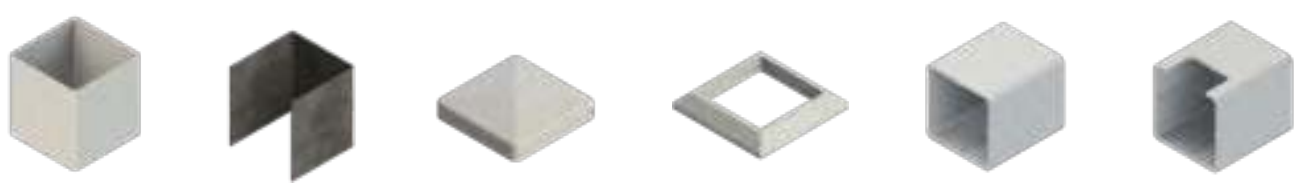
**LDH047**  
4.3 x 40mm  
Gimlet End  
(Handrail Brackets To  
Post)



**LDM045**  
125mm  
Sculptured  
Post Shroud



## Square Balustrade

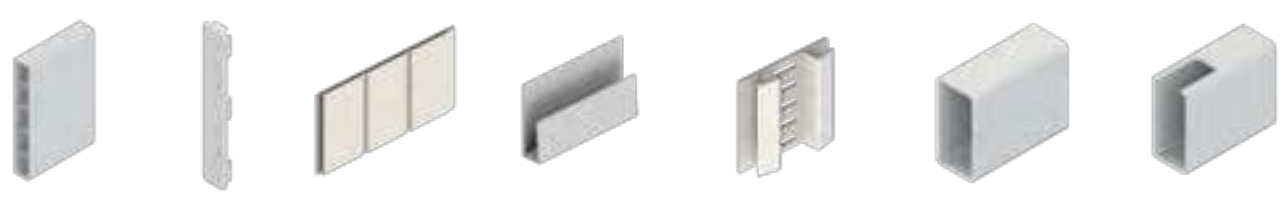


- LDE020**  
98mm Post
- LDS0551.7/  
LDS0552.3**  
98mm Post Steel  
(1.7/ 2.3m)
- LDM035**  
98mm Post  
Cap
- LDM036**  
98mm Post  
Shroud
- LDE021**  
65mm Plain  
Stringer  
(Unrouted)
- LDE022**  
65mm Plain Stringer  
(Square Routed for 40mm  
Picket)



- LDE026**  
65mm Plain  
Stringer  
(Square Routed For  
Sculptured Picket)
- LDM037**  
65mm Stringer  
Bracket & Cover
- LDE024**  
40 x 40mm  
Picket
- LDH048**  
3.9 x 32mm  
Screw  
(Handrail Bracket  
To Post)

## Skirting and Storage Box



- LDE024**  
150 x 25mm  
Skirting Plank
- LDM030**  
150 x 25mm  
Skirting Plank  
End Cap
- LDE008**  
300mm  
Skirting Plank
- LDE009**  
300mm Skirting  
Trim
- LDE010**  
Skirting Vent
- LDE064**  
80 x 40mm  
Box Section
- LDE065**  
Routed  
80 x 40mm  
Box Section

## Mouldings and Lights



- LDM039**  
Acorn Cap
- LDM040**  
Ball Cap
- LDM041**  
Gothic Cap
- LDX058**  
Globe Lantern
- LDX064**  
Solar Powered  
Post Light

## Gates



- LDM043**  
Gate Elbow For  
65mm Stringer
- LDH049**  
Hinge & Self  
Closing
- LDH051**  
Latch Inc. 2  
Keys

## 3.0 – Preparation

### Tools & Consumables Required

Below is the list of tools and consumables required to manufacture the Linia Decking System :



**Chop Saw**  
For cutting down steel and PVCu sections



**Angle Grinder**  
An alternative for cutting the steel sections



**Cordless Drill Driver**  
For drilling and fixing all components



**Hand Saw**  
For scribing the deck around corner and inline posts



**Linia r PVCu Adhesives / Sealants**  
For sealing trims and mouldings in place



**5mm Packer**  
For spacing the deck board correctly



**5mm Drill Bit**  
Used to pilot hole steel and PVCu sections



**Suitable Screwdriver Bits**  
PZ2 bit for LDH047 & 48,  
8mm Hex Head Attachment for LDH045 & 46



**Bit Extension**  
For fixing the handrails and sub-frame steel



**LDH045**  
Fixing sub-frame to post



**LDH046**  
Fixing deck board to sub-frame



**LDH047**  
Fixing handrail to post



**LDH048**  
Fixing handrail to fully reinforced post





### Ground Works

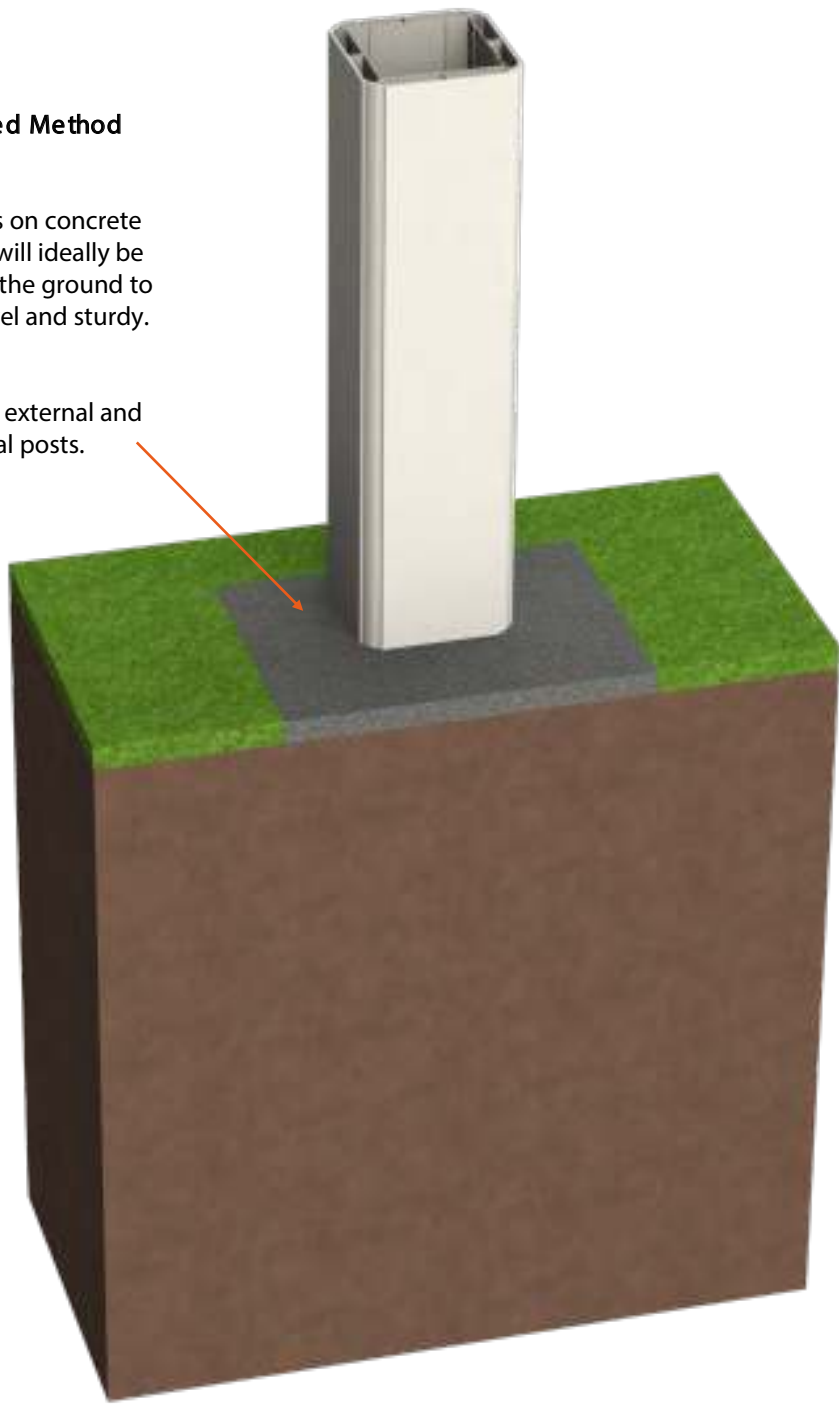
Before the installation of a deck can proceed, it is essential that the area in which the deck will be installed is fully assessed. The weight of the deck will be transferred through the vertical posts. The ground in which these posts are situated must be fully supporting and must not allow the deck to sink over time. If the deck is going to span a range of groundwork, ensure they all compact to the same extent. This means that if they settle at all under the weight of the deck structure, they will settle evenly.

Take care not to disturb any drains or underground cabling when preparing the area. Also ensure there is sufficient drainage under and around the decking area.

### Suggested Method

Seat the posts on concrete slabs. These will ideally be inserted into the ground to keep them level and sturdy.

This is for all external and internal posts.

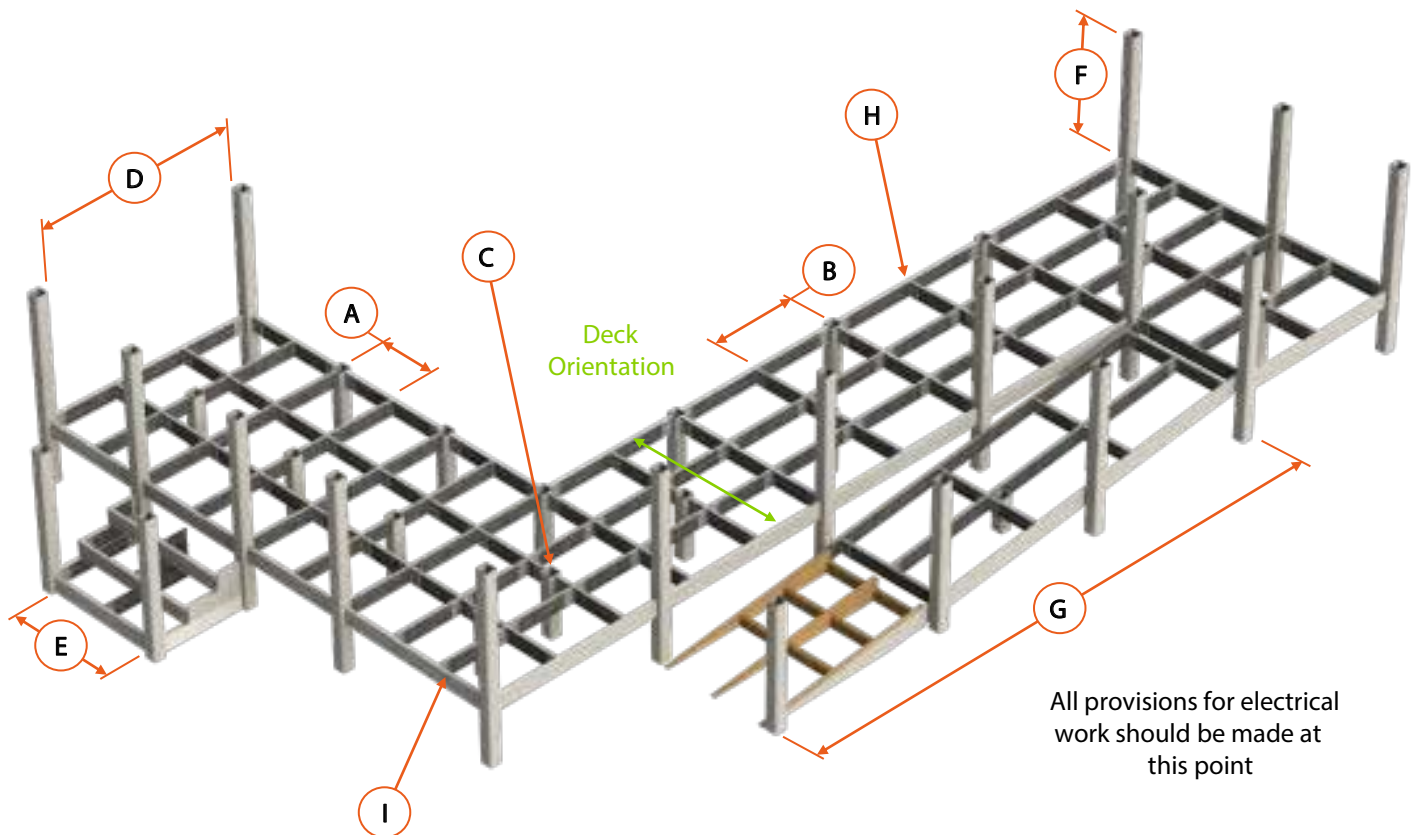


## 4.0 – Planning

### Typical Sub Frame Assembly

The diagram below shows a typical sub frame assembly. See Section 5.0 for all detailed diagrams of how it is joined.

Please make a note to see Section 8.0 (page 22) as this shows in detail what handrail sizes cannot be achieved due to glass pickets and punching restraints

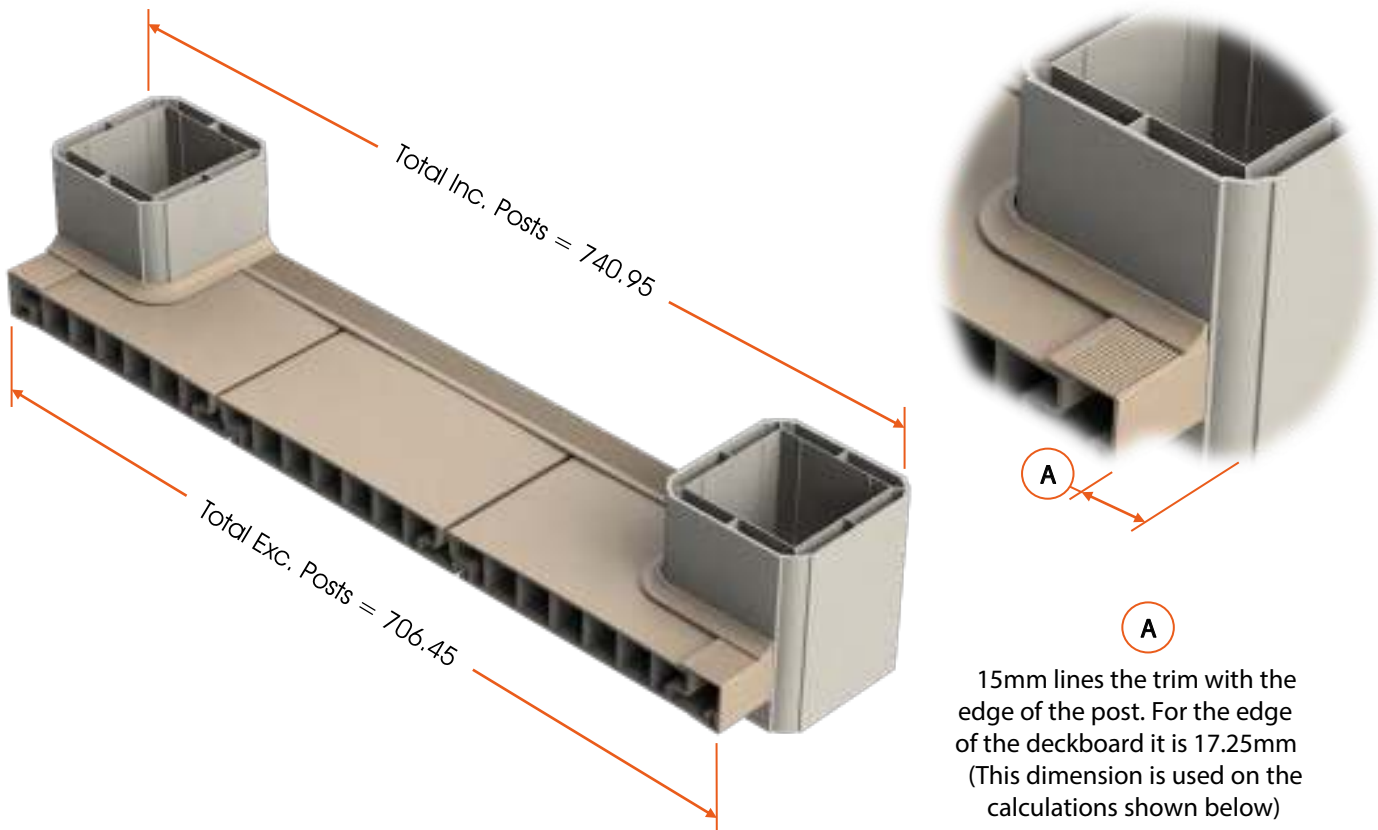


- A** Sub-frame steel that runs 90° to the deck must not be spaced more than 600 mm apart
- B** Sub-frame steel that runs inline with the deck must be spaced no more than 1200 mm apart
- C** Internal posts must be level with the top frame and be at a minimum of 1200 mm in both directions
- D** Max distance between posts is 2200 mm (This is between the two internal faces)
- E** Posts for steps must be no greater than 1200 mm if open tread (Between the two internal faces)
- F** The recommended distance from the top of the post to the sub-frame is 1100 mm
- G** For correct ramp ratios see section 10.0 (page 28) and the appendix (page 41)
- H** Paint all cut ends of galvanised steel with anti-corrosive paint
- I** All external sub-frame is clad with the fascia plank and all internal sub-frame should be fitted with the sub-frame packer

### Creating an ideal deck size

The information provided below shows you the calculations to work out the overall deck width/depth without the need to cut down the width of any of the deckboard.

The table shows the overall deck width/depth using the recommended 5mm gap between deckboards. (See appendix for more sizes)



15mm lines the trim with the edge of the post. For the edge of the deckboard it is 17.25mm (This dimension is used on the calculations shown below)

#### For calculating deck width excluding the posts

$$\text{Total No. Of Deckboards} \times 246.45 - \left( \text{Total No. Of Deckboards} - 1 \right) \times 16.45 \text{ (5mm Gap)}$$

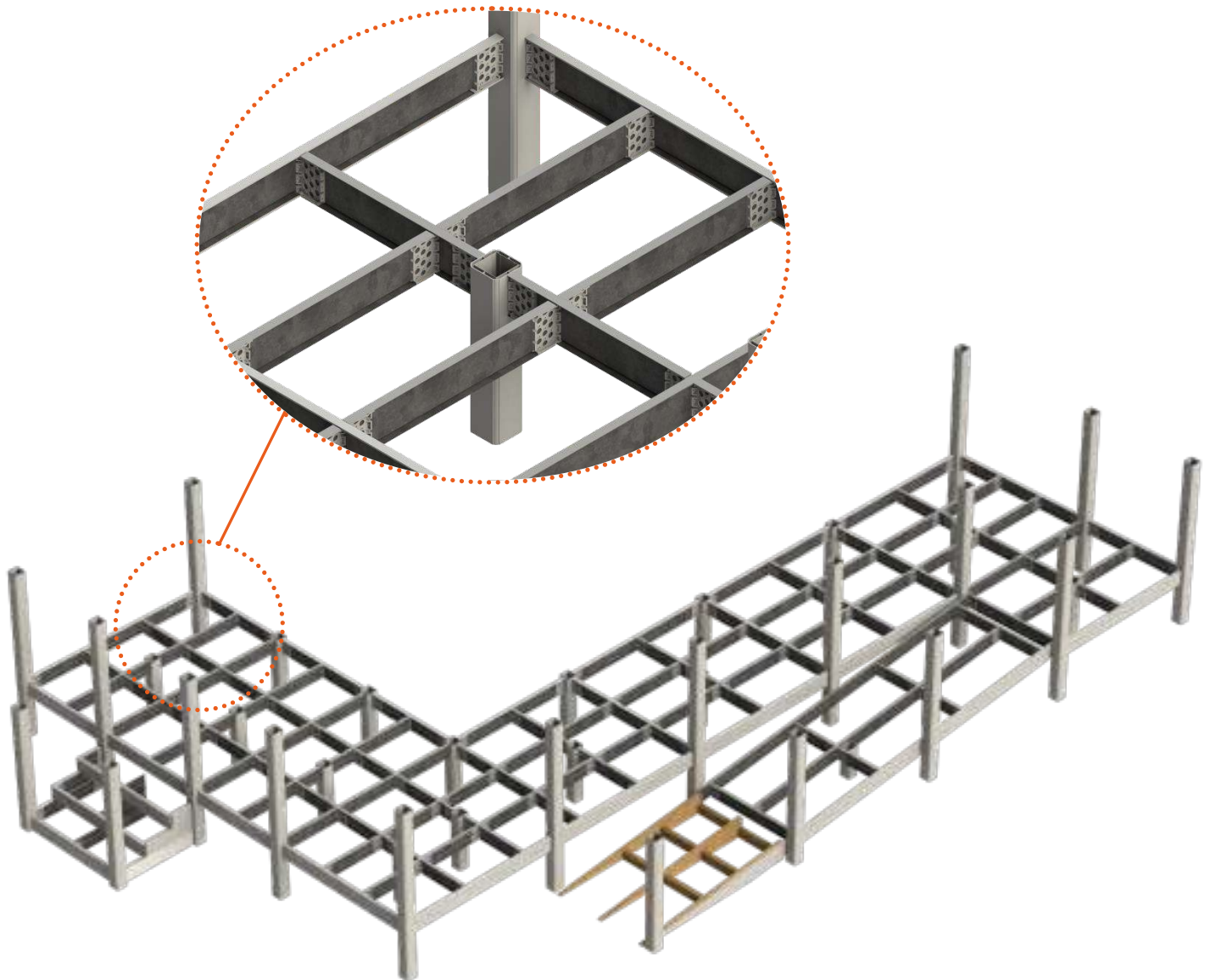
#### For calculating deck width including the posts with the correct overhang

$$\text{Overall Deck Board Width (from calculation above)} + 34.5$$

Overall Deck Width Inc. 125mm Posts	Total No. Of Deckboards	Overall Deck Width Inc. 125mm Posts	Total No. Of Deckboards	Overall Deck Width Inc. 125mm Posts	Total No. Of Deckboards
2350.95	10	3730.95	16	5110.95	22
2580.95	11	3960.95	17	5340.95	23
2810.95	12	4190.95	18	5570.95	24
3040.95	13	4420.95	19	5800.95	25
3270.95	14	4650.95	20		
3500.95	15	4880.95	21		

## 5.0 – Building The Sub-Frame

The following section shows all the connection types that are required to assemble the sub-frame correctly. Use section 4.0 to ensure you space the structure out correctly and section 8.0 for the correct handrail positioning.



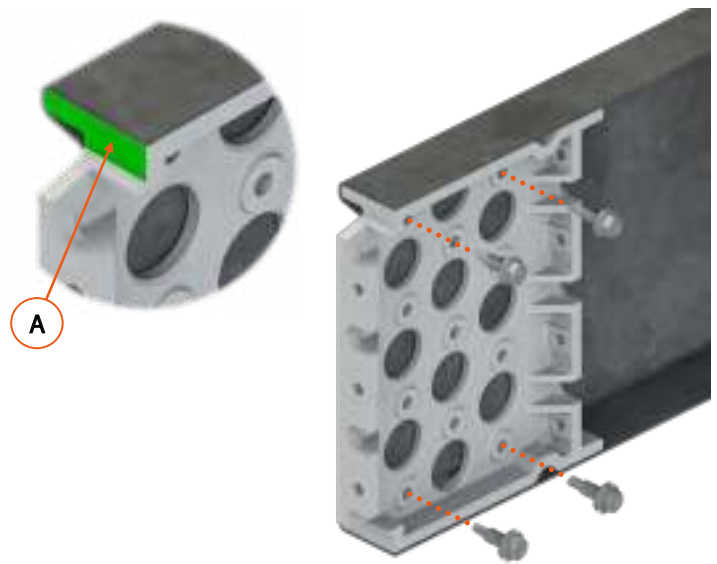
### Related Components ...





### Male Type Connection

When the sub-frame connector is used as illustrated, Face A of the sub-frame connector must be flush with the end of the steel.



Use the LDH046 19mm screws and fix as illustrated.

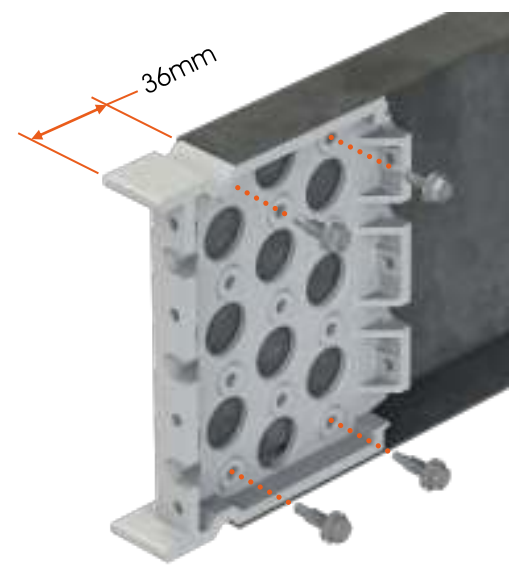
*\* Ensure a minimum of 4 screws are used \**


### Female Type Connection

When the sub-frame connector is used as illustrated, there must be a 36mm space to allow for the cladding on the external sub-frame.

Again, fix using the LDH046 19mm screws.

*\* Ensure a minimum of 4 screws are used \**



 **TIP**

Align the top of the chamfer with the steel edge to achieve the correct 36mm overhang



### Connecting Steels Opposite Each Other

The unique design of the sub-frame connector allows bracings to be directly opposite each other without interference.

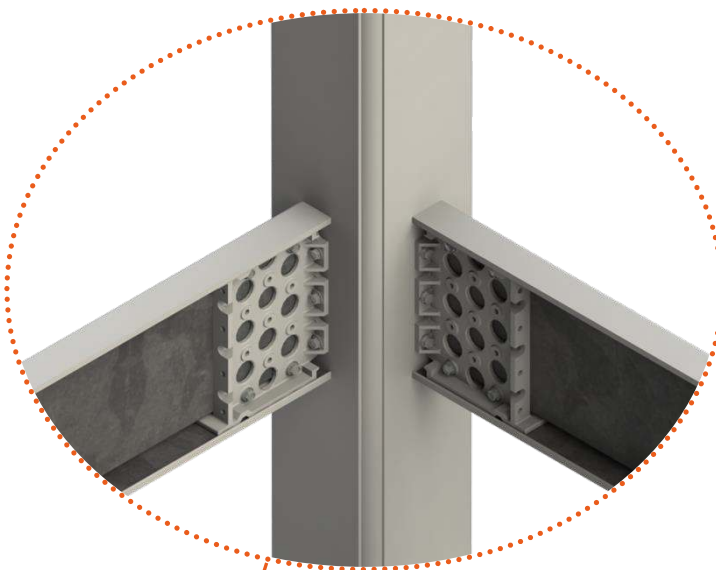
Ensure when fixing to another sub-frame you use a long bit extension to keep the screw as straight as possible.

*\* All steel deductions and connectors are shown in the appendix \**



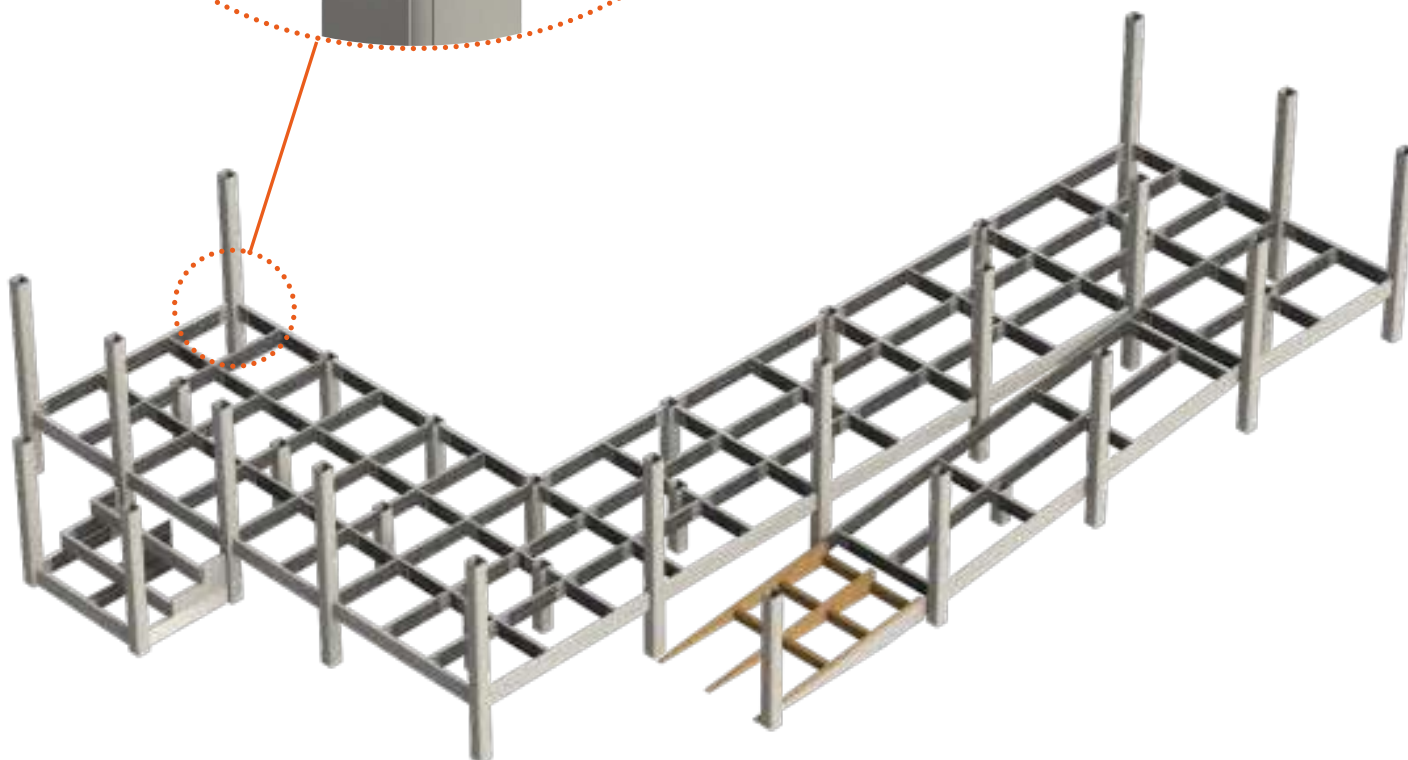
## 5.0 – Building The Sub-Fra me

This section will show the method of connecting the sub-frame to the posts and show the sub-frame packer in further depth.

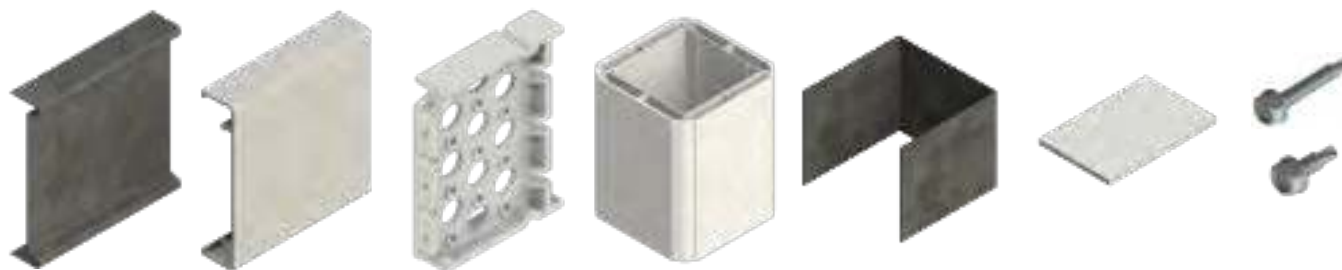


**TIP**

Once the corner posts are positioned, use a string line to ensure all inline posts are level and lined up correctly



### Related Components ...

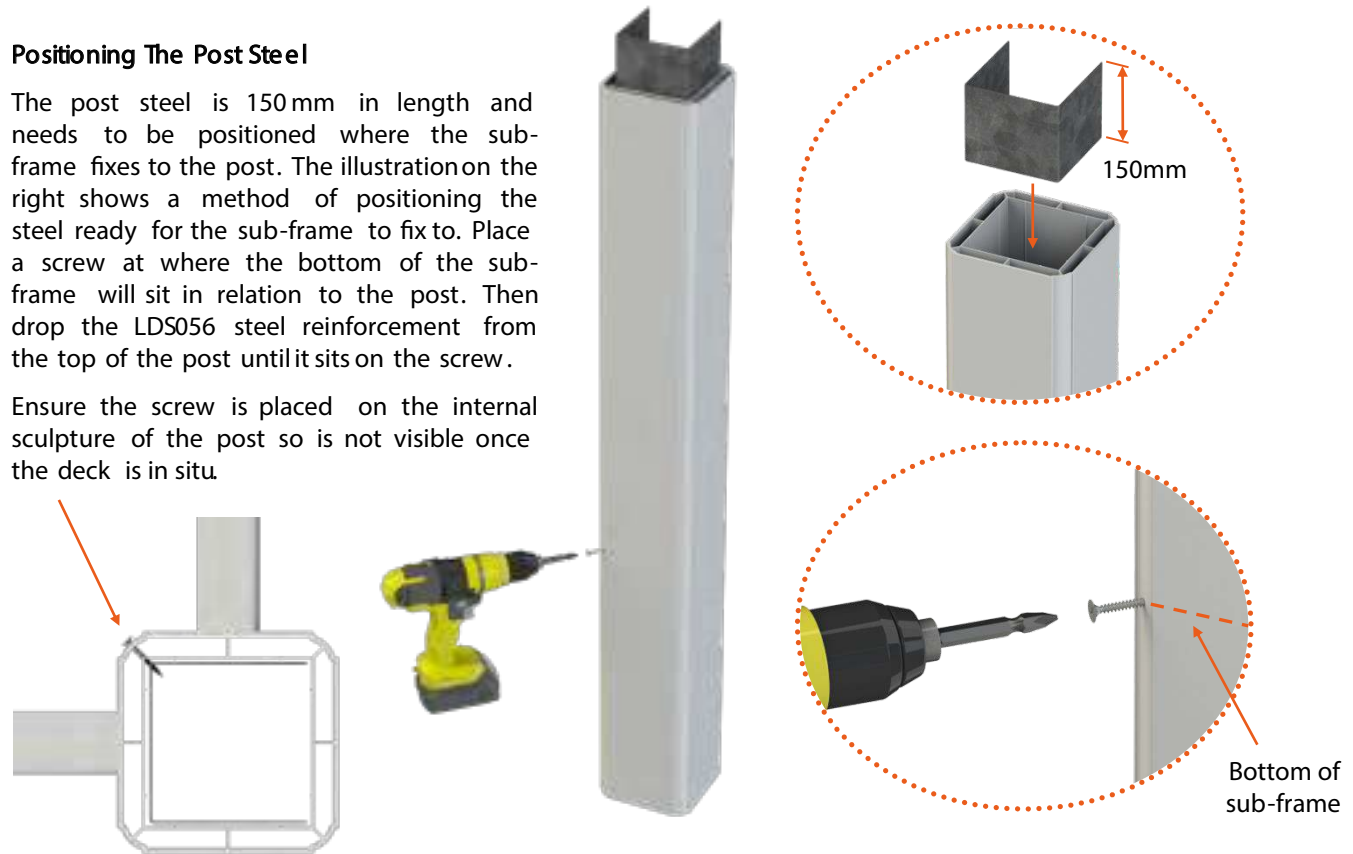




### Positioning The Post Steel

The post steel is 150mm in length and needs to be positioned where the sub-frame fixes to the post. The illustration on the right shows a method of positioning the steel ready for the sub-frame to fix to. Place a screw at where the bottom of the sub-frame will sit in relation to the post. Then drop the LDS056 steel reinforcement from the top of the post until it sits on the screw.

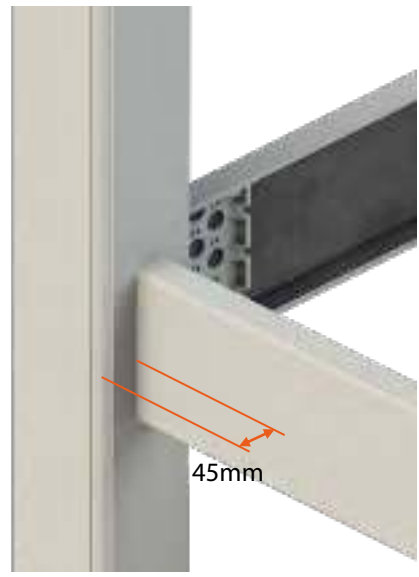
Ensure the screw is placed on the internal sculpture of the post so is not visible once the deck is in situ.



### Connecting Sub Frame Steel To The Post

When connecting the sub-frame steel to the post, use three of the LDH045 45mm screws. Ensure that the steel has been inserted in the correct orientation before fixing.

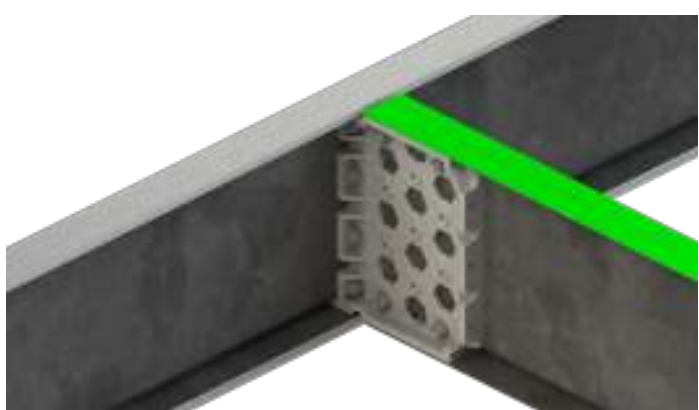
All the parts within the system have been designed around the sub-frame sitting centrally to the post. The illustration on the right shows this position and a reference dimension to work with.



### Fitting The Sub-Frame Packer

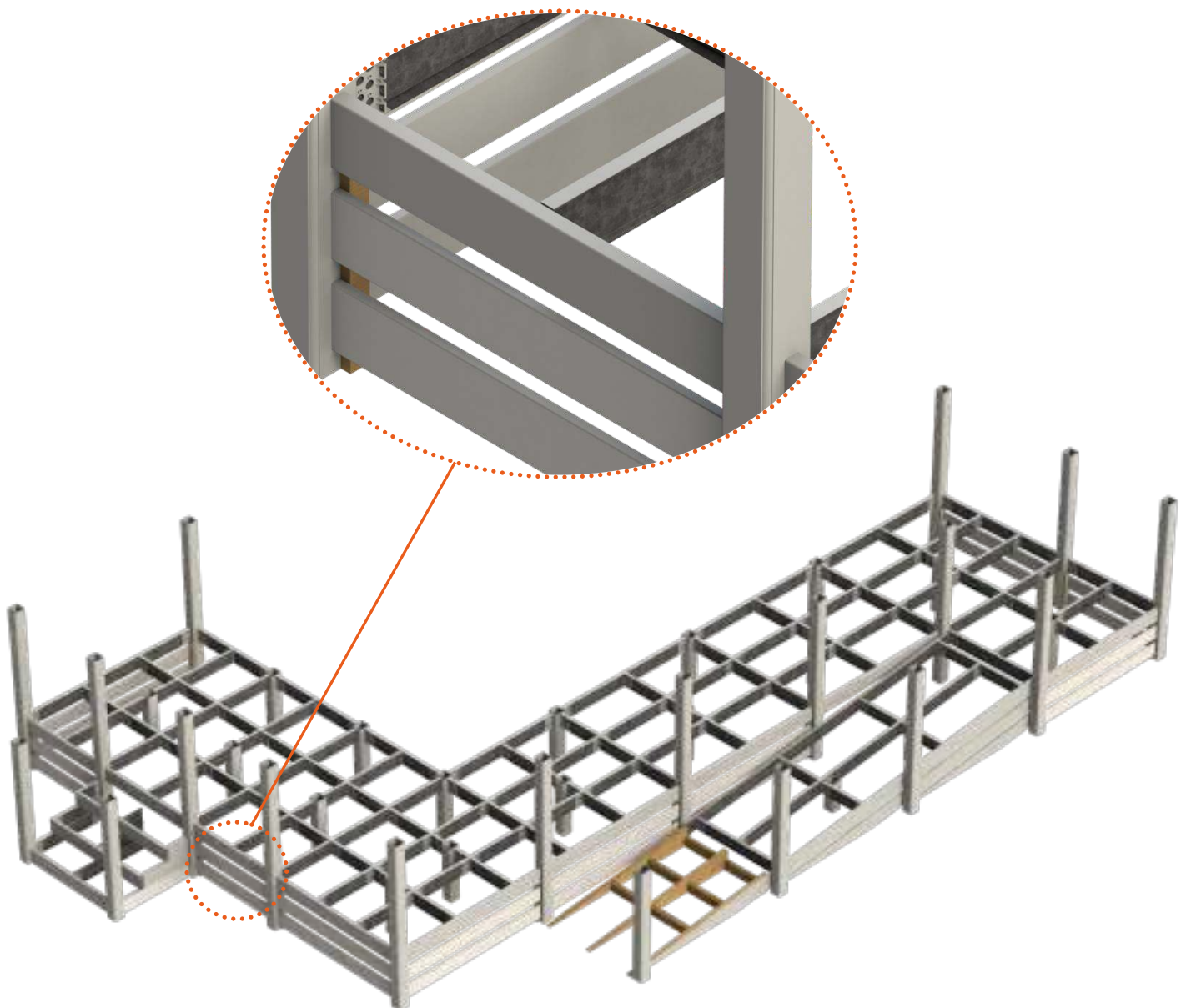
The internal sections of the sub-frame are lower than the top surface of the outer frame because of the fascia (LDE001). To bring these to the same level, place the sub-frame packer LDE002 on top of all internal steels. It may help by screwing these into position so they do not move whilst fitting the deck boards.

The illustration shows the sub-frame packer highlighted in green.

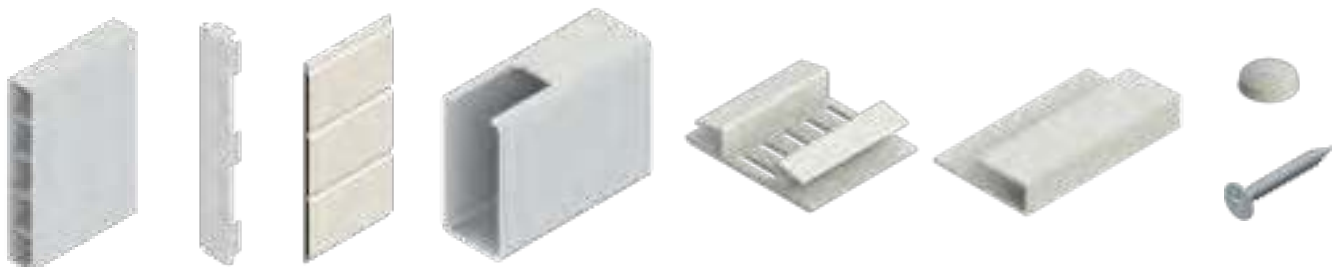


## 6.0 – Skirting Options

The various construction methods for the skirting are shown in this section. We recommend that the skirting is installed before the deckboards are fitted so that all areas can be accessed easily. It may be of benefit to make one of the skirting assemblies hinged for easy removal. This will give some access to the underneath if required.



### Related Components ...





### Ranch Style Option 1

This method uses the LDE007 150 mm skirting plank. To install the skirting this way, fix a upvc picket to the inside face of the post.

Once the pickets are installed you can then fix the skirting plank to them. If possible, fix from the inside so that no screws are present, if not use the LDM029 screw cap covers.



The skirting can also be fixed from the internal face

### Ranch Style Option 2

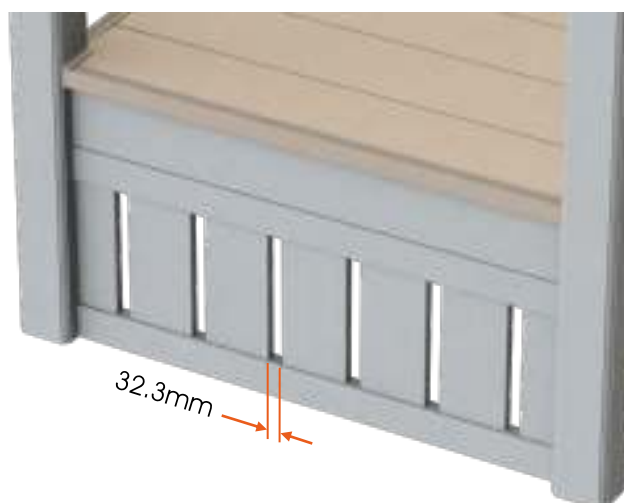
Using the LDE007, face fix the skirting plank to the vertical post. Ensure a minimum of two screws, per post, per skirting plank.

Finish off the planks by capping the ends of them with the LDM030 skirting end cap. Use Liniar PVCu adhesive to secure the caps into position. Also use the LDM029 screw cap covers for all visible fixings.

### Vertical Option

The third method uses the punched LDE065 that accepts the LDE007 150 mm skirting plank. Before installing the skirting, it is best practice to make up the panel so they can be easily rotated into position.

To fix into place, use either PVCu pickets as shown above or fix with right angle cleats on the inside face.



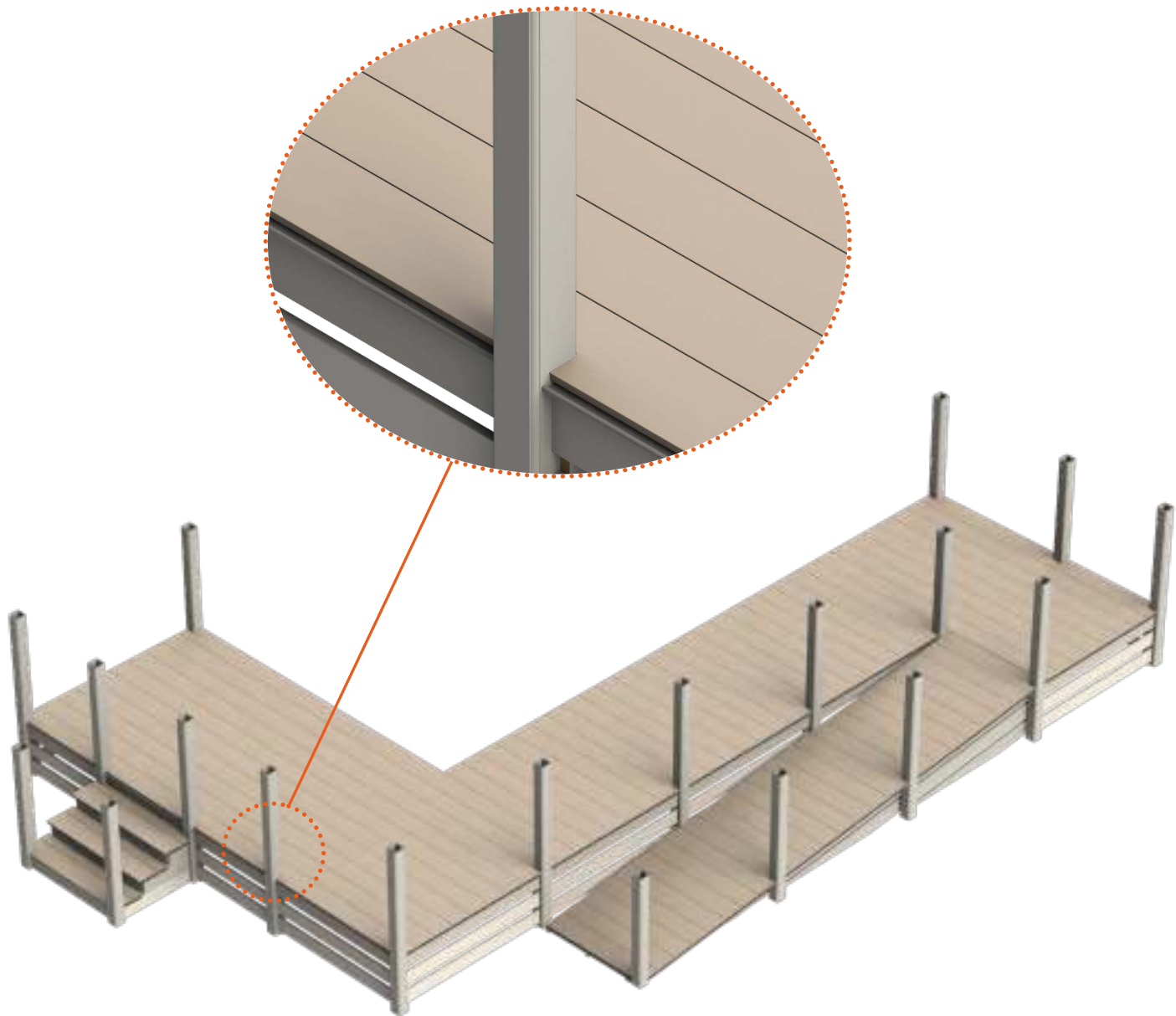
### Enclosed Option

This method uses the LDE008 300 mm skirting plank. To use this method you need to stand the skirting plank vertically. They then interlock together using a tongue and groove system.

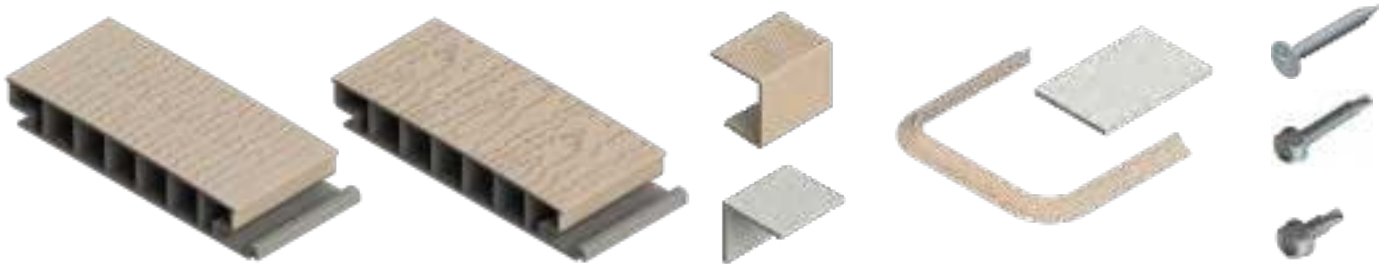
Run LDE009 skirting trim along the top and bottom to secure the planks. It is advised to also fit the LDE010 skirting vent at approximately every 1200 mm to provide ventilation.

## 7.0 – Deckboard Fitting

Now that the main structure for the deck has been built, the deckboards can now be installed. The following section will show the fixing methods for the board.



### Related Components ...

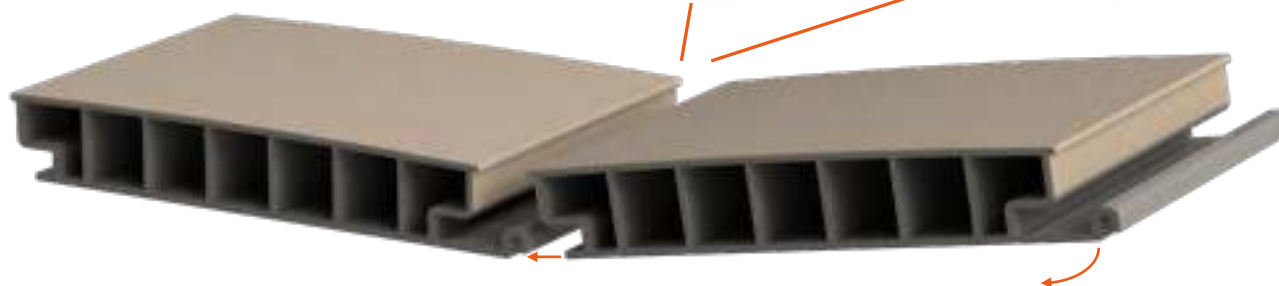
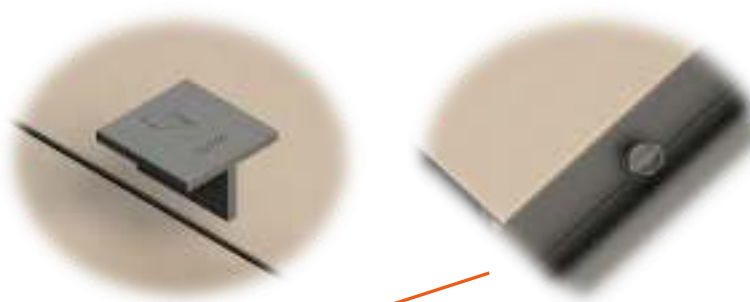


### Fixing The Deckboard

The deckboard uses a tongue and groove system and should always be fitted with a 5mm packer. This is to create the 5mm spacing required between boards. It has punching on the tongue that is every 90mm to allow for water to drain away.

When fixing the first board, you will have to fix it from underneath the sub-frame. Pre-drill the steel with a 5mm hole and then fix until secure. The illustration shown on the right shows the point in which you should fix the first board.

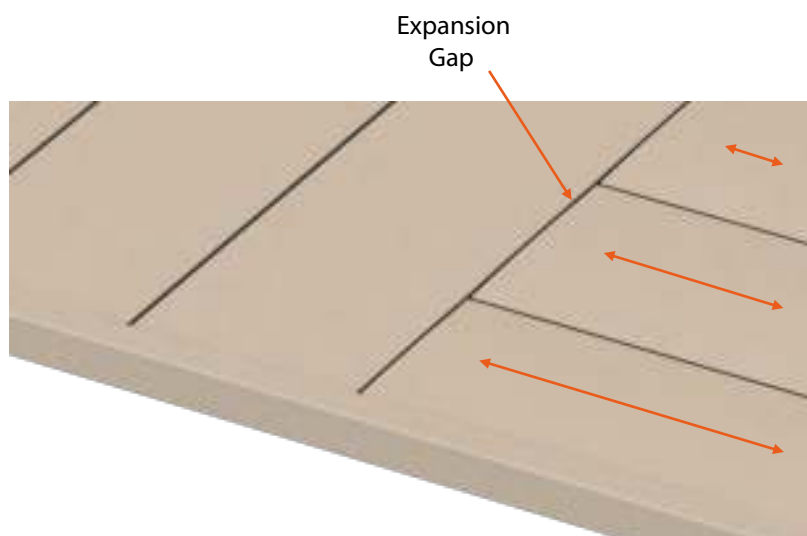
Following this, slide each board together using the tongue and groove. Then use a 5mm packer to achieve the correct spacing. Fix the board using the LDH046 screws at every supporting joist.



### Expansion Gap

In some instances, it may be necessary to run the board at 90° to the other (See illustration) If doing this, please use the necessary gap as shown in the table below :

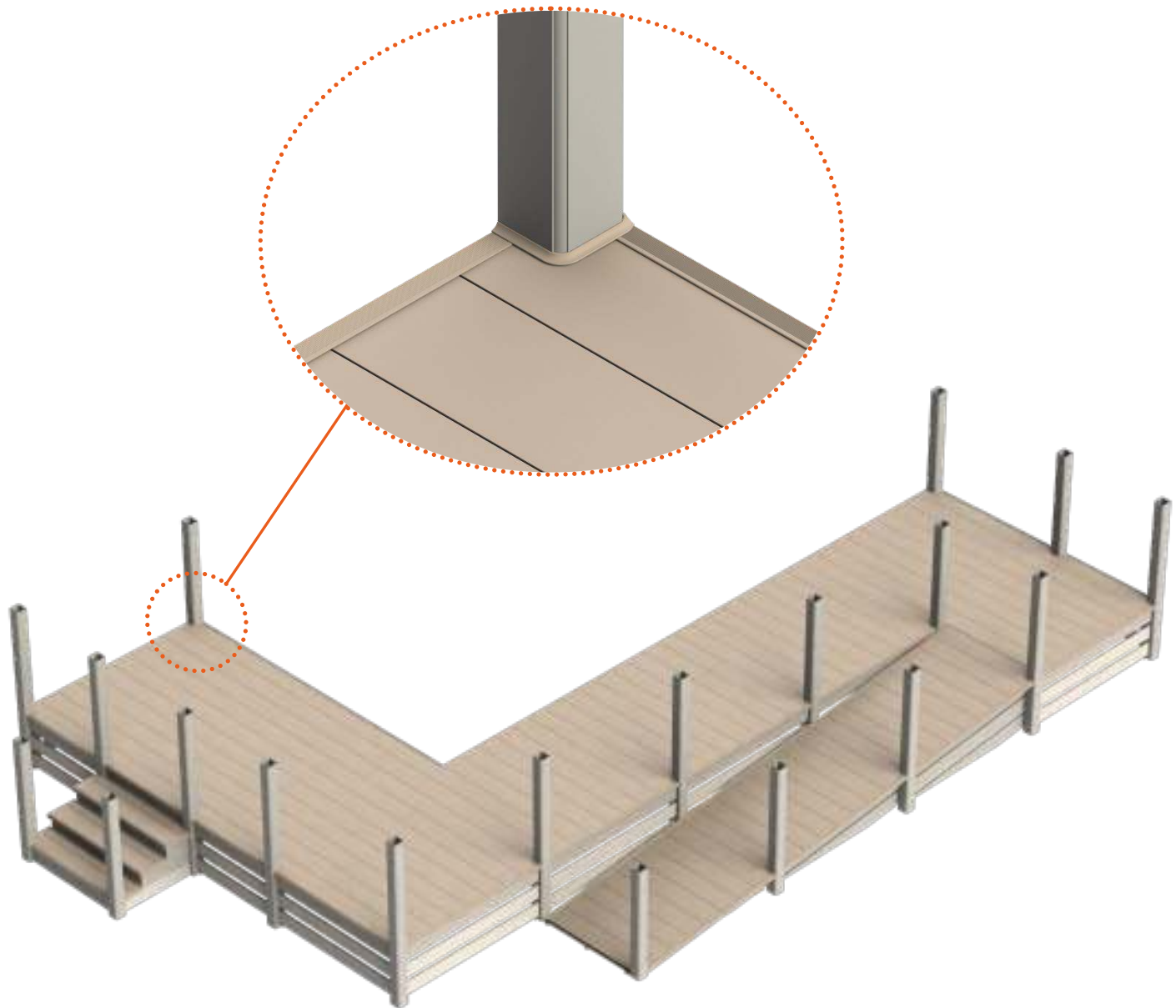
Overall Deckboard Width	Min Gap Required
1000mm	2mm
2000mm	4mm
3000mm	6mm
4000mm	8mm
5000mm	10mm
6000mm	12mm



See section 4.0 for correct deckboard overhang

## 7.0 – Deckboard Fitting

This section shows how the boards are notched around the posts and what trims to use around the deck area . All post notching can also be finished off with a post shroud.



### Related Components ...

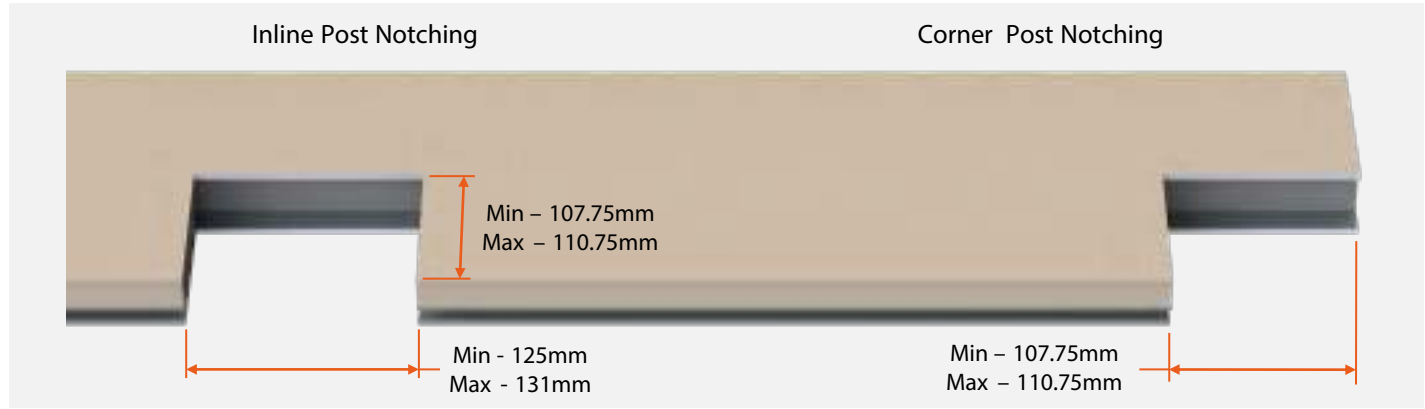




### Notching The Board Around The Posts

Whenever a deckboard meets a corner/inline post, the deck will need to be notched around this. The illustration on the right shows the correct notch dimensions. This will give the correct overhang so that the LDE004 u-channel trim can sit around the edge of the board correctly.

The trim can either be screwed into position from underneath or sealed using a Liniar PVCu adhesive. You can fix from above but ensure a screw cap cover is used.



The notching sizes above are the sizes that are used when installing the post shrouds. If you go above these sizes with a square cut corner, the shroud will not cover the notched detail correctly.

### Deckboard Edge Trim

Once all the deckboards have been fixed into position, the trim can be installed. It can either be screwed into position from underneath or sealed using a Liniar PVCu adhesive. You can fix from above but ensure a screw cap cover is used.

### Post Shroud Installation

When all the trims have been installed, the post shrouds can now be fit into place. If the sizes shown in the manual have been followed, the inline shrouds will not have to be cut down as they will line up with the edge of the trim.

For the corner shrouds, place the shroud around the post and mark with a pencil. Then cut to size as needed.

The shrouds should be sealed in place using a Liniar PVCu adhesive.



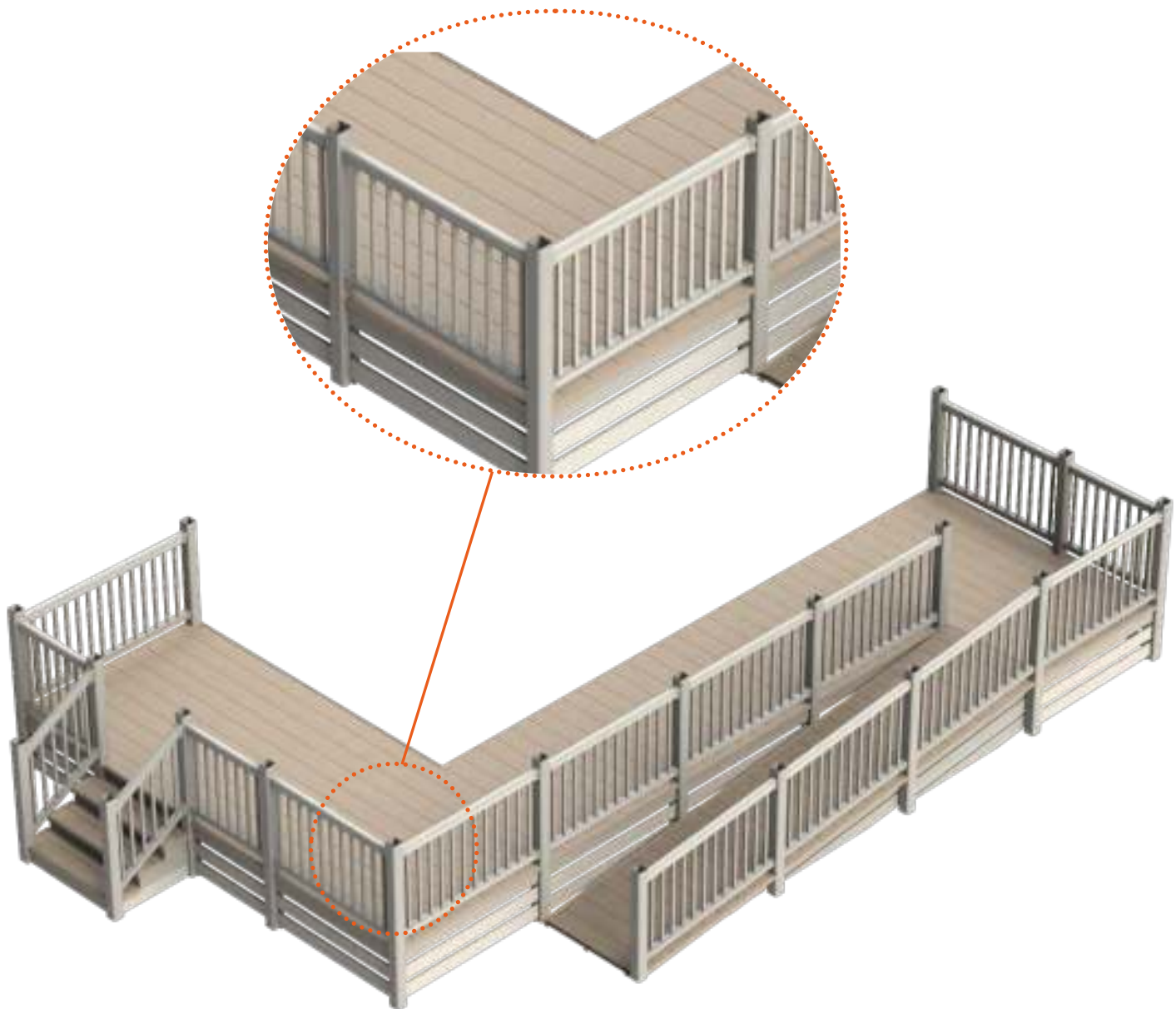
Corner Post



Inline Post

## 8.0 – Handrail Assembly

This section shows how the handrails are assembled and installed onto a typical deck assembly.



### Related Components ...



### Fabricating The Handrails

The sculptured handrail is made up from two lengths of extrusion which clip together. These are then reinforced with a length of LDS0541 u-channel steel. Reinforcement is only applicable to the bottom rail under 1800 mm but should be in both top and bottom rails when over 1800 mm long.

The clip on profile is pre-punched for the selection of pickets (this is shown on page 23). The bottom rail should always be drained as water can seep into the rail around the pickets (ensure both the PVCu and steel is drained using a 10mm drill bit). The rail should be drained 50mm from either end and also centrally.



### Installing The Handrails

It is best practice to fabricate the handrails prior to installation. The handrail can be made up on a flat surface and then wrapped together as a full unit. Installing separately can be difficult when trying to position a number of pickets within a rail.

Each end of the top and bottom handrail has a fixing bracket and cover cap. These are fixed to the post using four LDH047 screws. If fitting a handrail using glass pickets, the post must have full length reinforcing so that the handrails are fixed to the steel. Use LDH048 screws when fixing into the steel.



When installing the handrail assembly, ensure you fix the bracket centrally to the post. It is advisable to use a long drill bit extension to keep the screws as straight as possible.

As shown, the maximum gap from the deck to the bottom of the handrail is 100mm.



TIP

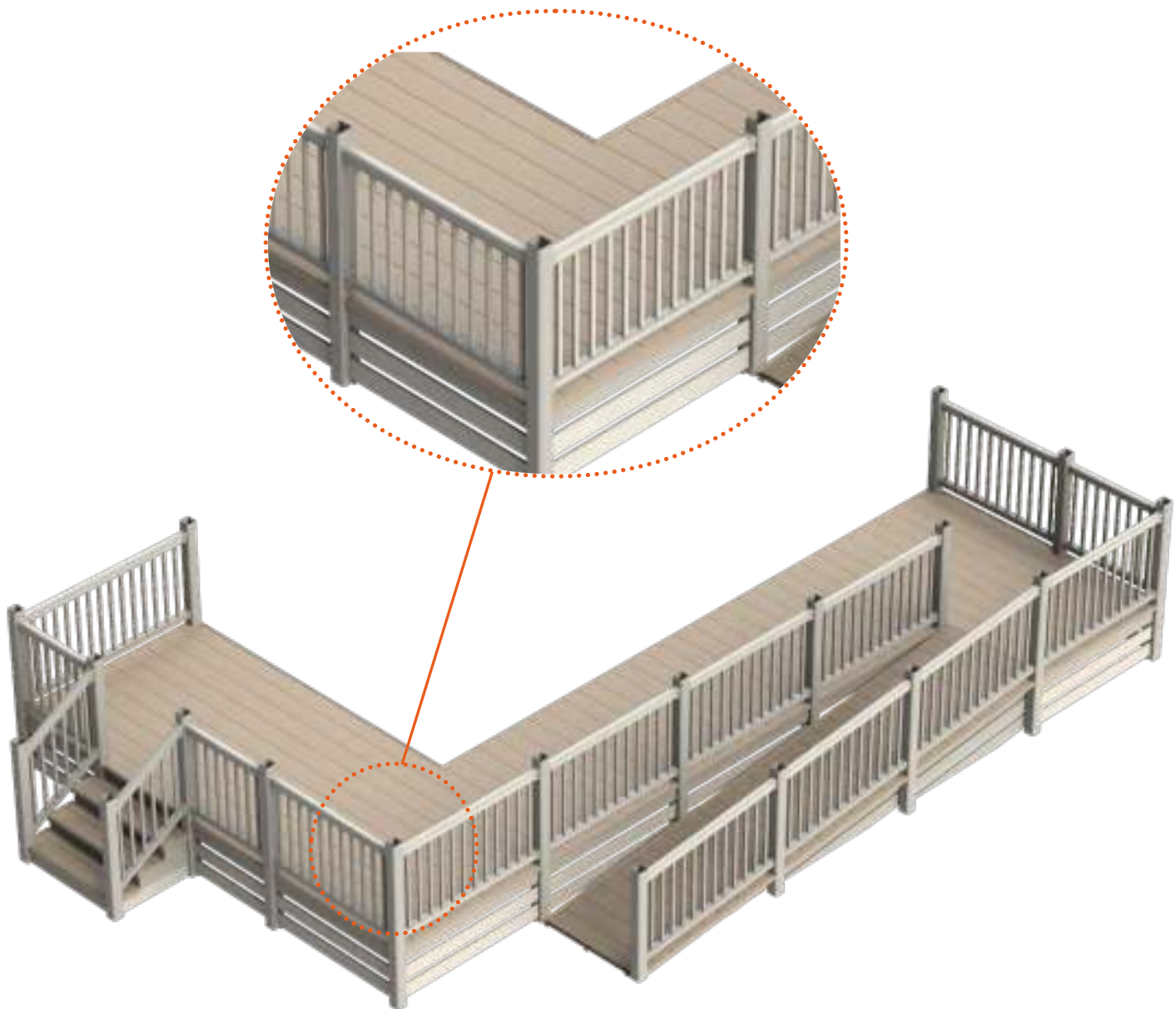
Once the vertical post has been levelled, fix the bracket to the handrail from the top. This will hold the handrail in place and also hold the vertical post level.



Drainage

## 8.0 – Handrail Assembly

The following will show the picket options available, the size limitations and critical dimensions for fabricating the handrails.



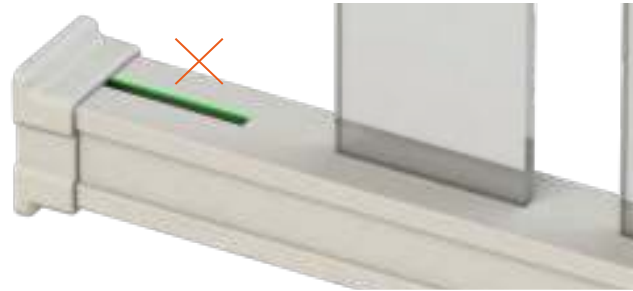
### Related Components ...





### Size Limitations

The following table shows the handrail lengths that can be used per total picket amount. If these are not followed, there will be half rounded holes present at the ends. This will mean that the pickets will not fit and you will have partial holes at either end (see illustration to the right).

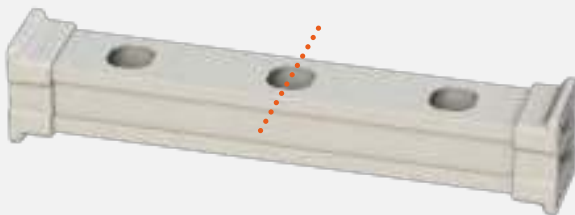


Handrail Type		No. Of Pickets (Use centreline as shown in illustration below the table) 2200mm is the Max Handrail Length														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sculp. Picket	Max	241	381	522	662	802	943	1083	1224	1364	1504	1645	1785	1926	2066	2200
	Min	137	277	418	558	698	839	979	1120	1260	1400	1541	1681	1822	1962	2102
Glass Picket	Max	316	496	676	856	1036	1216	1396	1576	1756	1936	2116	N/A	N/A	N/A	N/A
	Min	216	396	576	756	936	1116	1296	1476	1656	1836	2016	2196	N/A	N/A	N/A

Sculp. Picket	Max	100mm gap from picket to post
	Min	48mm gap from picket to post
Glass Picket	Max	98mm gap from glass picket to post
	Min	48mm gap from glass picket to post

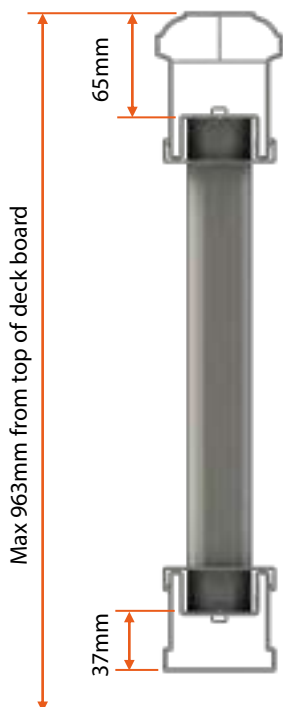
### Odd No. Of Pickets

If the total number of pickets is 'ODD', take the centreline about the centre punching



### Even No. Of Pickets

If the total number of pickets is 'EVEN', take the centreline about the centre of the two middle punchings



### Hand Rail Height Optimisation

If using the 1527mm pickets, use the calculation below to get two pickets from one length with no waste :

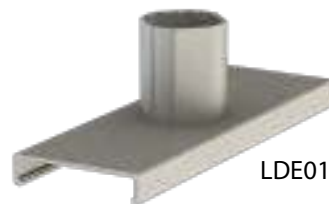
$$(1527 / 2) - 5\text{mm Saw Cut} = 761\text{mm}$$

### Handrail Height Calculation

$$761 + 65 + 37 = 863\text{mm}$$

### Picket Options Available

For all detailed sizes, please see the appendix (page 39)



LDE014  
(Diamond)



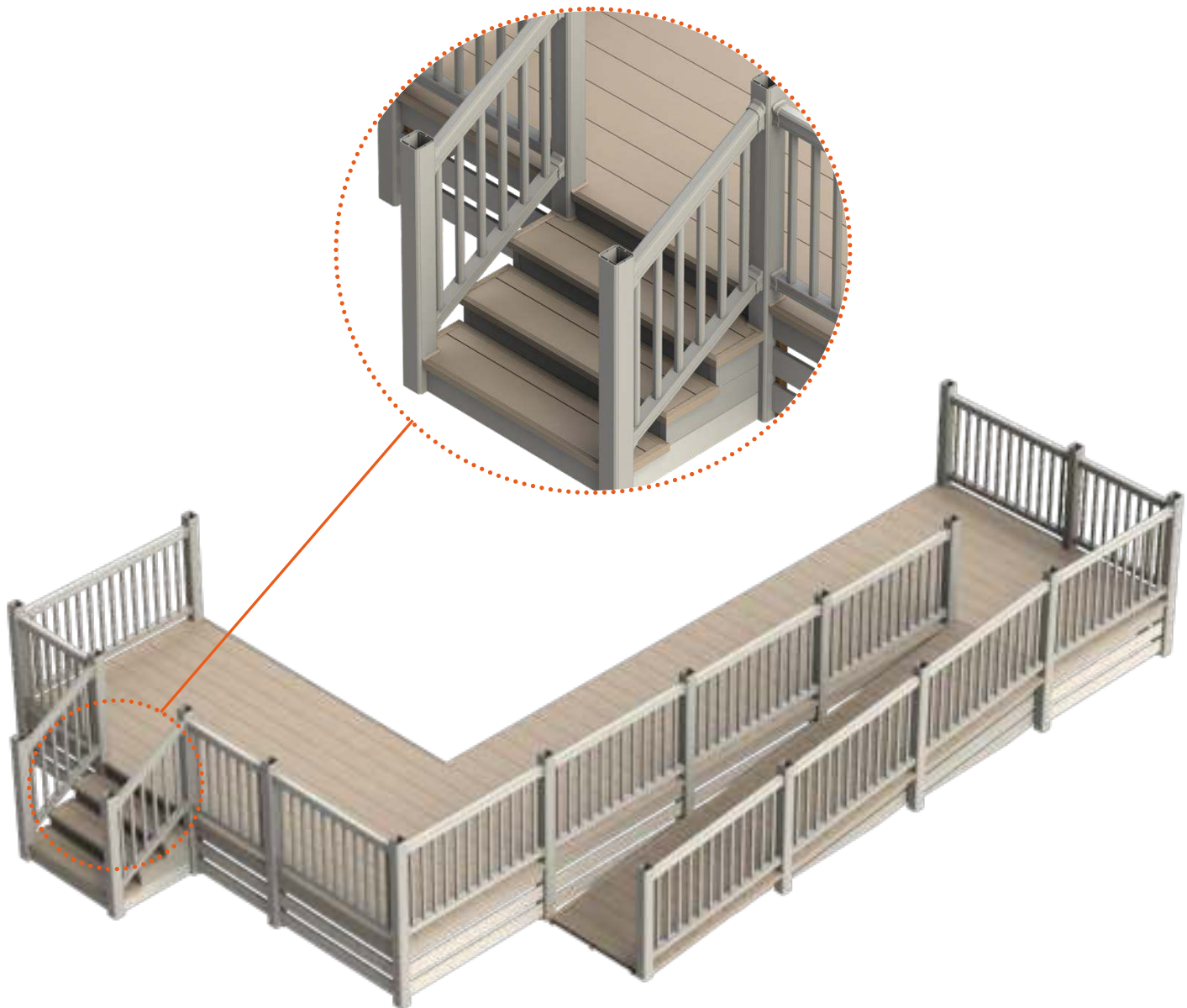
LDE015  
(Square)



LDE016

## 9.0 – Step Assembly

The first section of the step assembly will show the fabrication and installation of the box format steps.



### Related Components ...

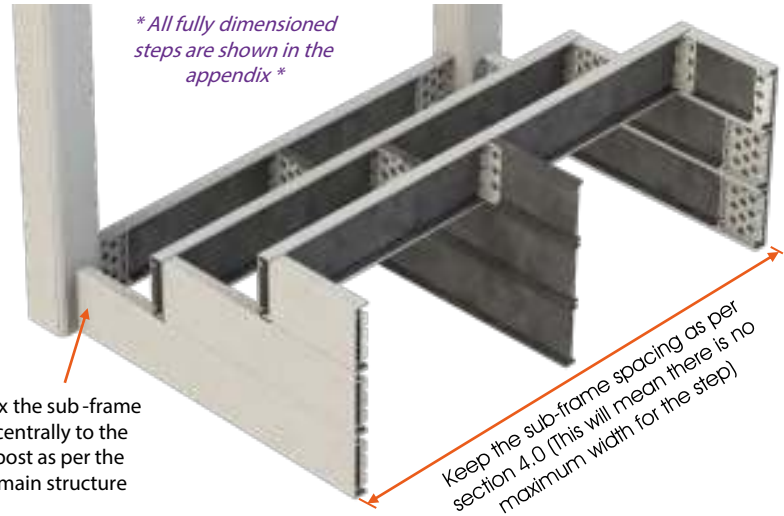


### Fabricating The Box Format Steps

The box format steps can be pre-fabricated before assembling to the main deck structure. There is no limit on the width of the steps, just ensure the sub-frame is positioned as per section 4.0 (page 8).

For each step, a u-section is created with a central member. Fix each u-section together before installing the deck boards. There is no need to fix the sub-frame to post steel as all the weight is transferred through to floor level.

When fabricating the steps using this method, the deck ideally needs to be 660 mm in height (this is to the top of the deck on the main structure).



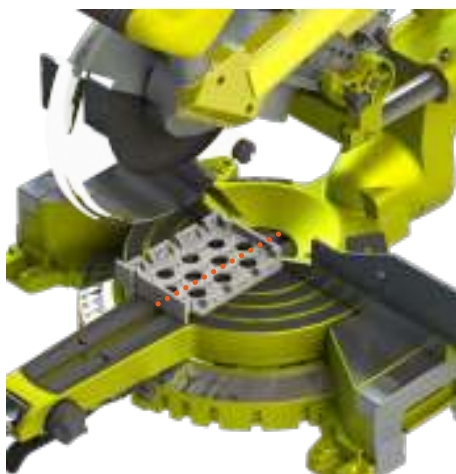
The box format system uses 1.5 deckboards. A deckboard will need to be cut down to the dimension shown above.



Once the deckboards are fixed, fully trim the boards. You will have to mitre the corners when using LDE004. For the corners of the sub-frame, use LDE005 45 x 40mm angle trim.



The majority of the deckboards will need to be fixed from underneath the sub-frame. Use a 5mm pilot hole before fixing.



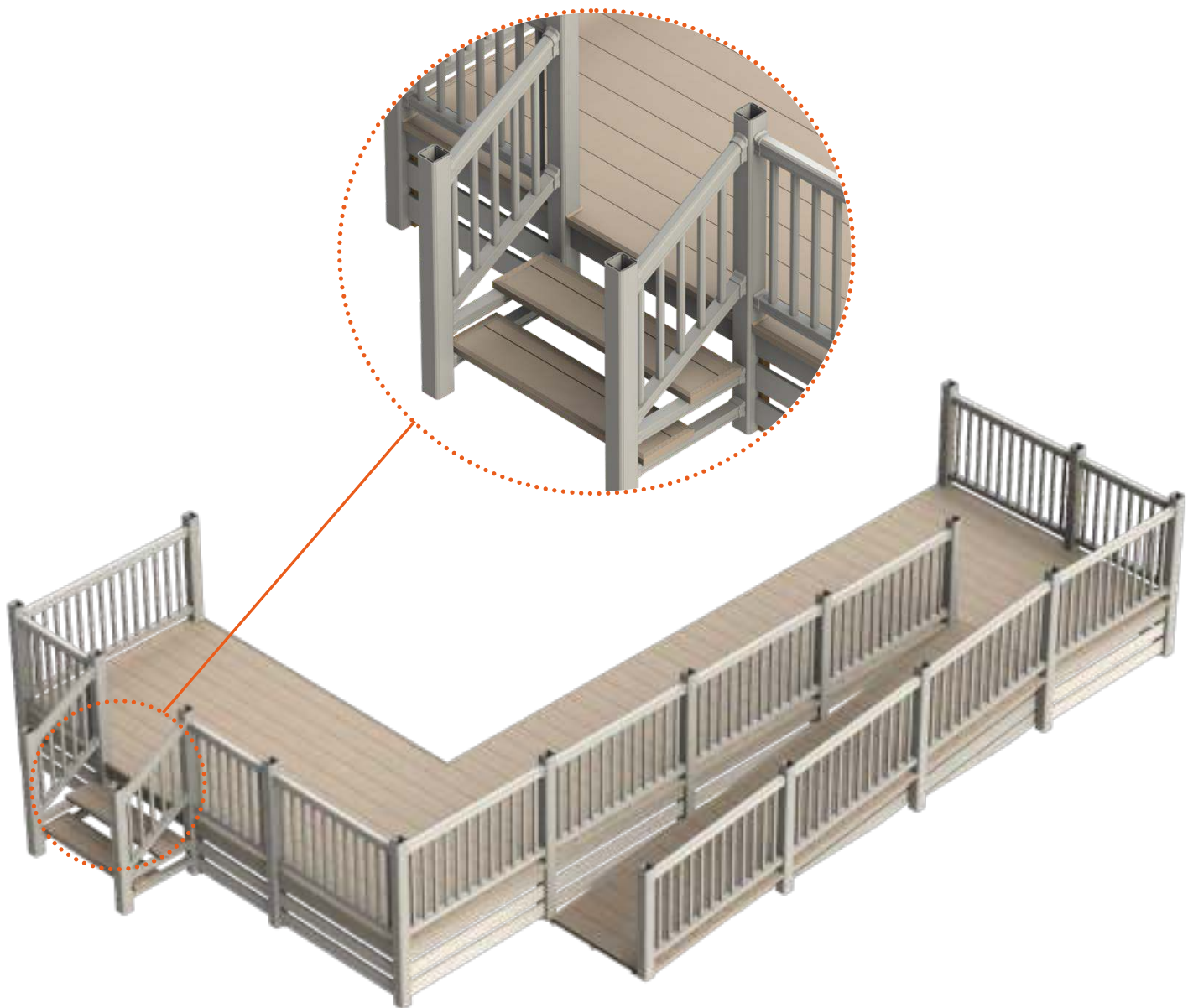
Some of the LDM025 sub-frame mouldings may need to be cut down for the top step.



The handrails for the steps work exactly as normal but they use a 30 ° bracket and punched capping LDE025. (The punched capping has elongated holes)

## 9.0 – Step Assembly

The second section of the step assembly will show the fabrication and installation of the open tread steps.



### Related Components ...



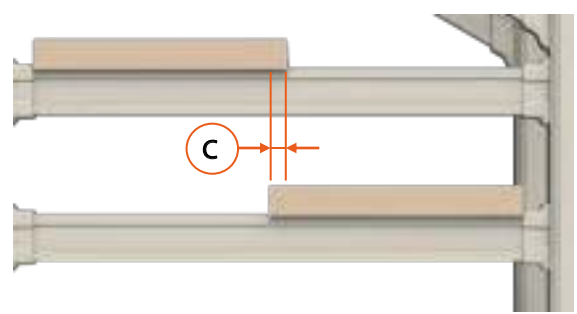




### Fabricating The Open Tread Steps

The open tread steps use the LDE018 sculptured bottom rail as the main step support. This is coupled with the LDE017 un-punched rail capping. These step bearers should be fully reinforced with LDS054.

The bearers are then fixed to the vertical posts using the LDM032 brackets. The post should be fully reinforced so that the bearers are always fully fixed to the steel.

The step width will be 1.5 deckboards as per the box format option.



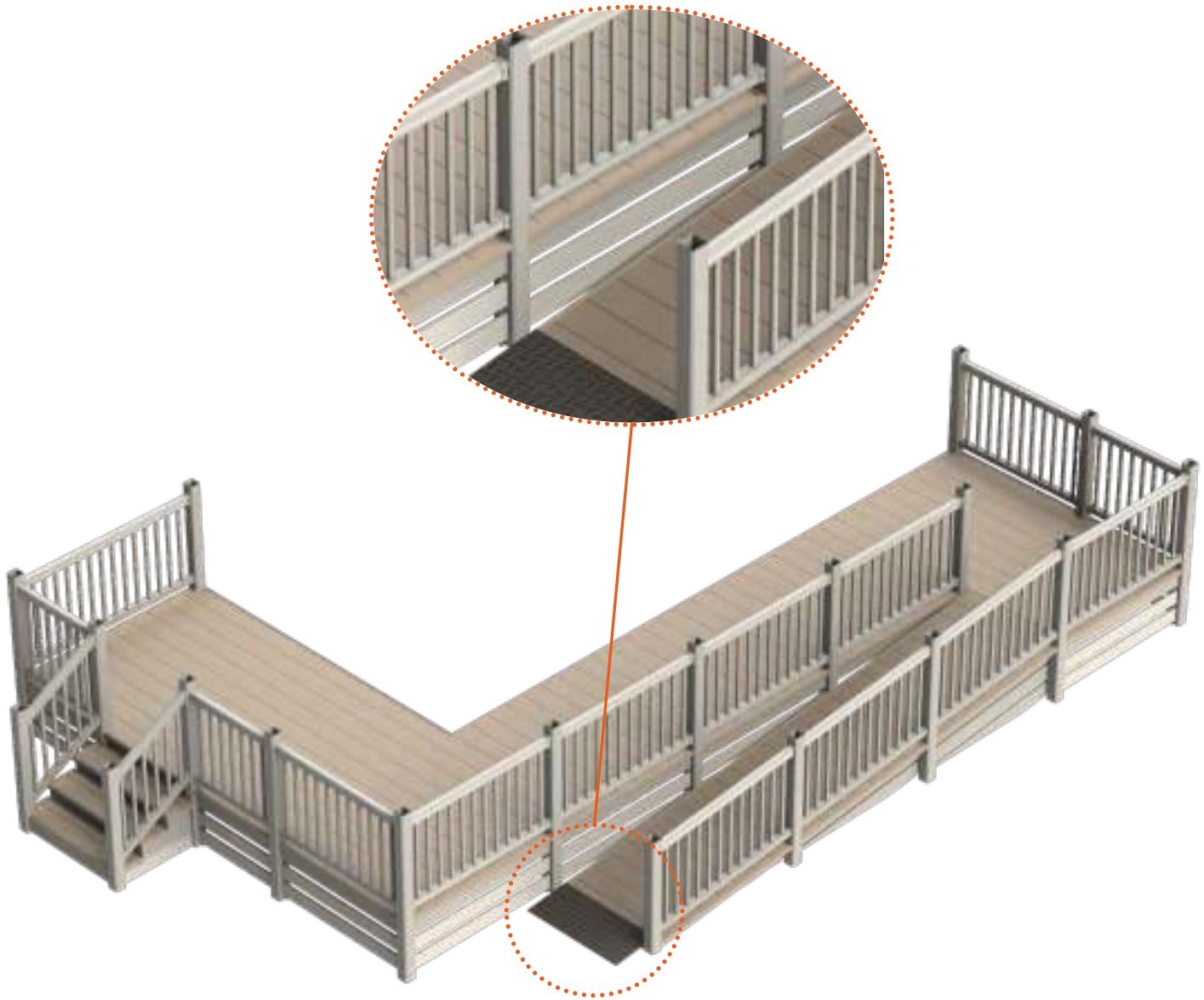
- A** Distance between steps must be no greater than 1200 mm
- B** Step riser must be no more than 220 mm
- C** Typical overhang is 25mm
-  Reinforcement for steps 900 mm and under
-  Additional reinforcement for steps between 900 mm and 1200 mm



Ensure that the step bearers are screwed into the post reinforcing using LDH048

## 10.0 – Ramp Assembly

This section will show the correct procedure for the installation of a ramp. Some parts of the ramp are non-linear supply.



### Related Components ...

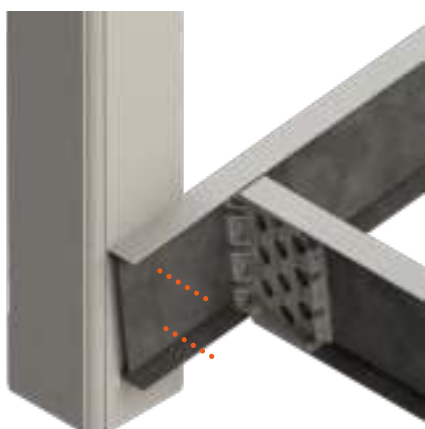


### Fabricating A Ramp

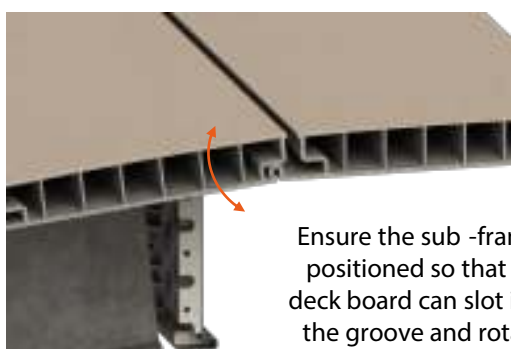
Before a ramp can be fabricated and installed, the ramp ratio table shown on the right needs to be addressed (the full table is shown in the appendix).

Once the correct dimensions have been agreed, the sub-frame work can be put into place. It is best to make up a rectangular unit that can be pre-fabricated and then installed. Ensure posts have full length reinforcing LDS0551.7/LDS0552.3 so that each time the sub-frame is fixed to the post, it bites into the steel.

Ramp Ratio 1:15 (Health & Safety Recommendation)					
Step Height (mm)	600	625	650	675	700
Ramp Length (mm)	9000	9375	9750	10125	10500



Overhang the ends at the top and bottom of the ramp to allow for fixing

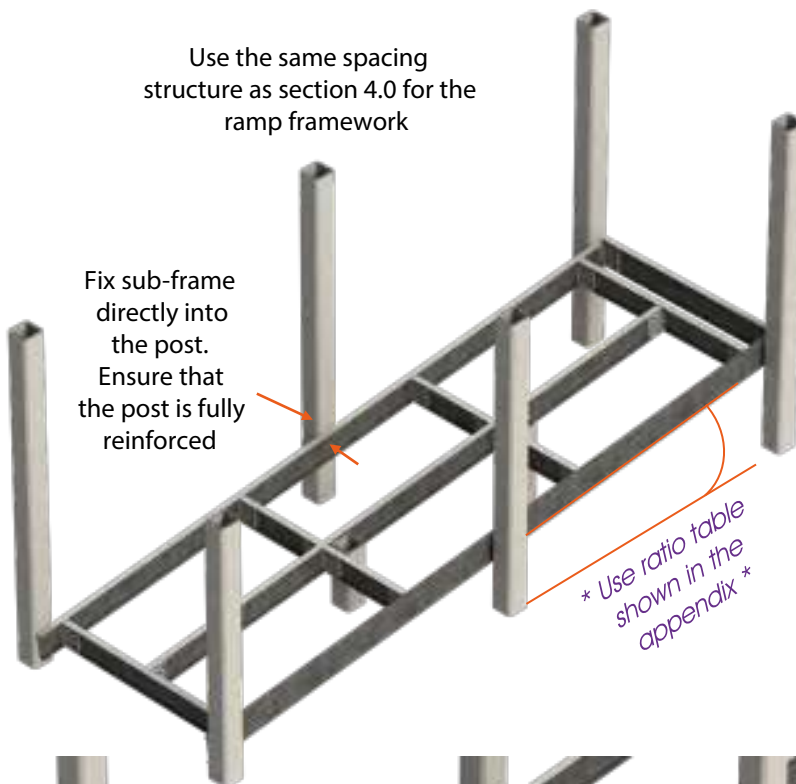


Ensure the sub-frame is positioned so that the deck board can slot into the groove and rotate to the required angle

There is suitable play within the handrail brackets to cover the ratios of ramps.

To finish off the bottom of the ramp, use a stainless steel chequer plate. This will run the ramp down to the floor without a step/trip hazard present.

Use the same spacing structure as section 4.0 for the ramp framework

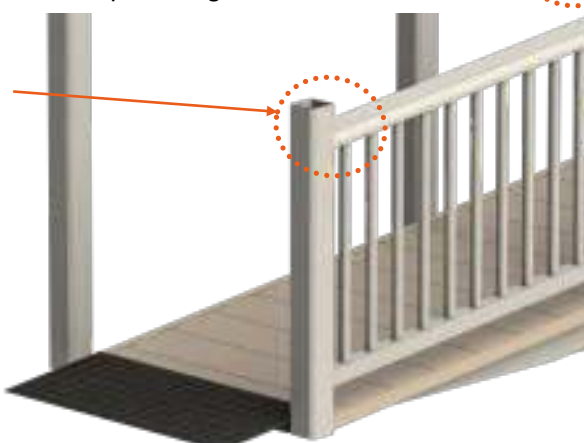


Fix sub-frame directly into the post. Ensure that the post is fully reinforced

*\* Use ratio table shown in the appendix \**



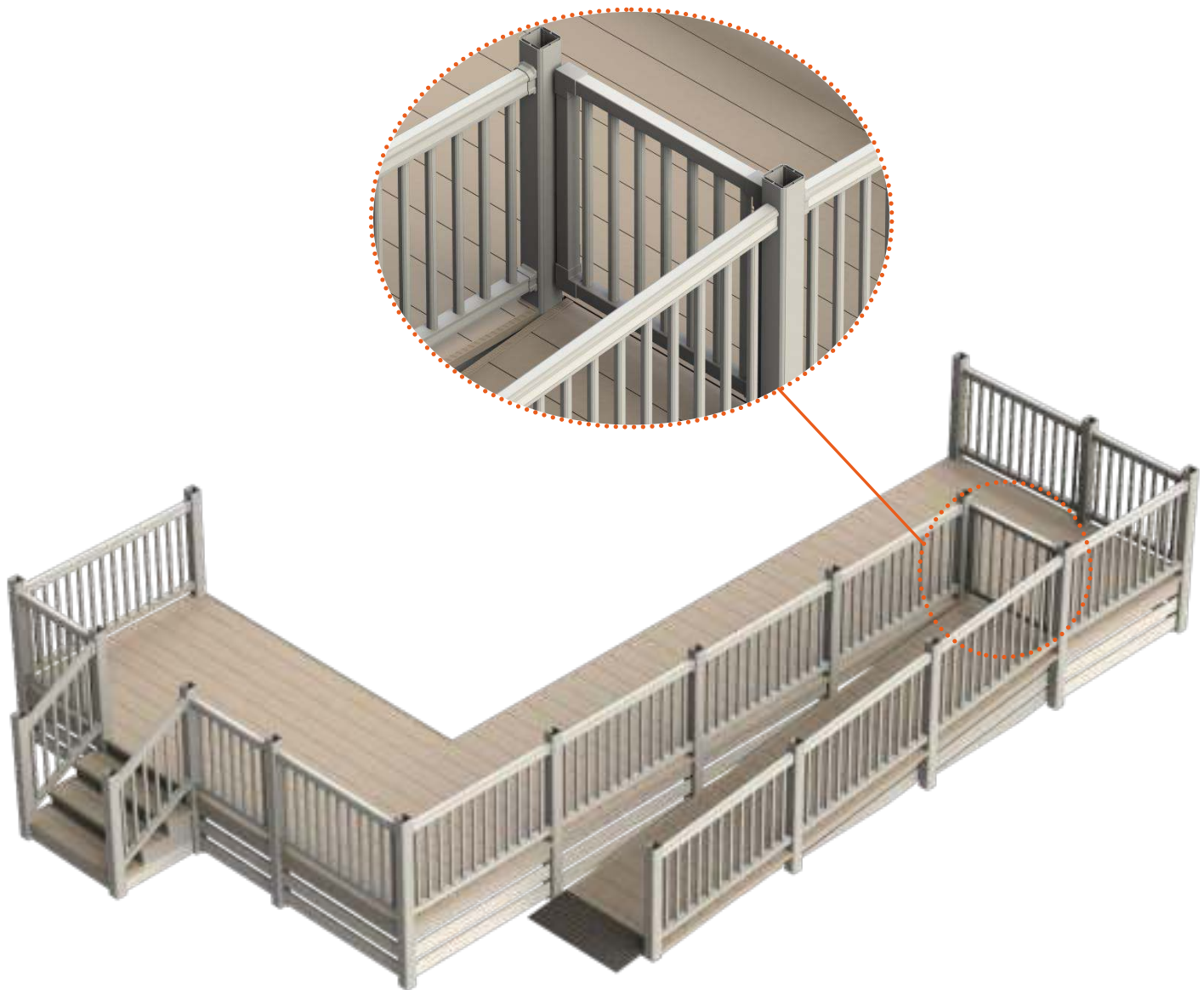
For the deckboards to run to the floor, a bespoke timber structure will need to be fabricated to do so. Ensure there is sufficient room to fix into the posts and suitable joists for the deckboard to fix to



Ensure this post is secured to the floor as no sub-frame holds this rigid

## 11.0 – Gate Assembly

This section shows the correct procedure to calculate a gate size and also how the unit is assembled and installed.



### Related Components ...

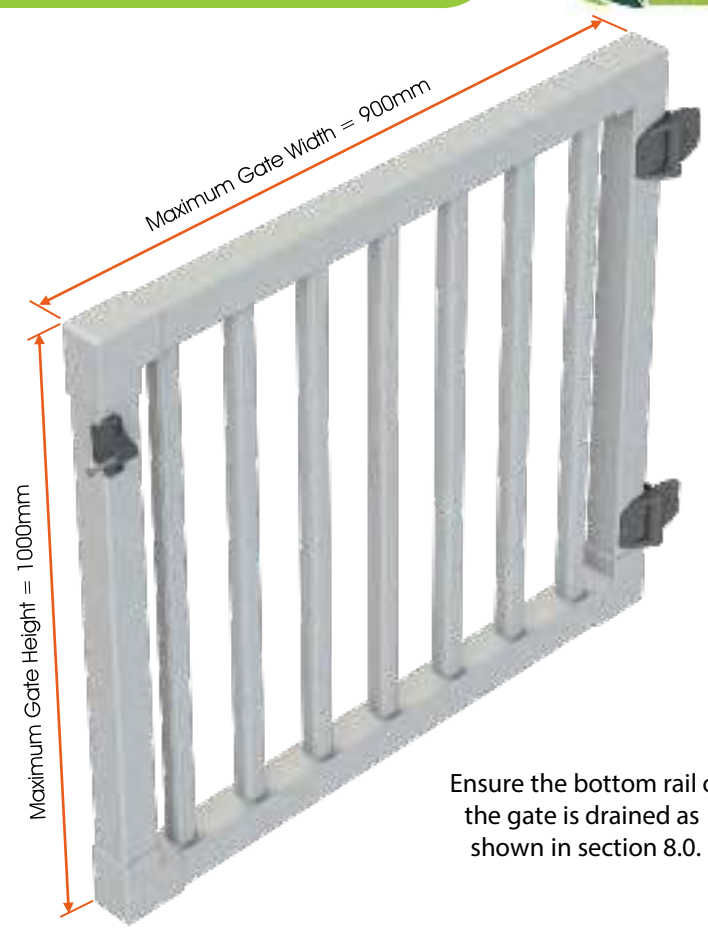
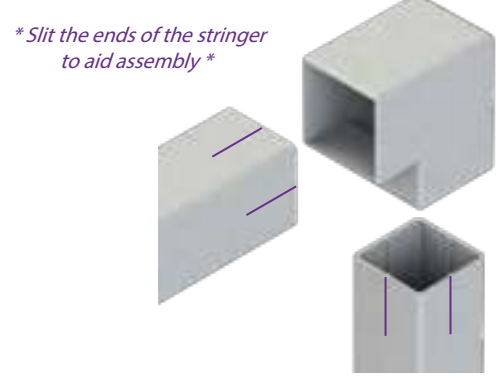






### Fabricating A Gate

The main body of the gate is built up using the 65mm plain stringer. The vertical members are the un-punched LDE021 and the horizontal members are LDE026 sculptured punched .



Ensure the bottom rail of the gate is drained as shown in section 8.0.

### LDM043 – Gate Elbow

For the corners of the gate, fix together using a Liniar PVCu adhesive . You can alternatively, or as well as fix using LDH047 with the screw cap covers (fix on the internal edges ). The stringer sits 30mm inside the elbow in both directions.



### LDS0541 – 65mm Stringer Steel

Ensure that the hinge side of the gate is fully reinforced . There is no need for the reinforcing around the full perimeter .



### LDH049 – Self Closing Hinge

Fix the hinge to the vertical reinforced stringer. Position it 5mm above/below the gate elbow. Use LDH046 to fix into the steel.



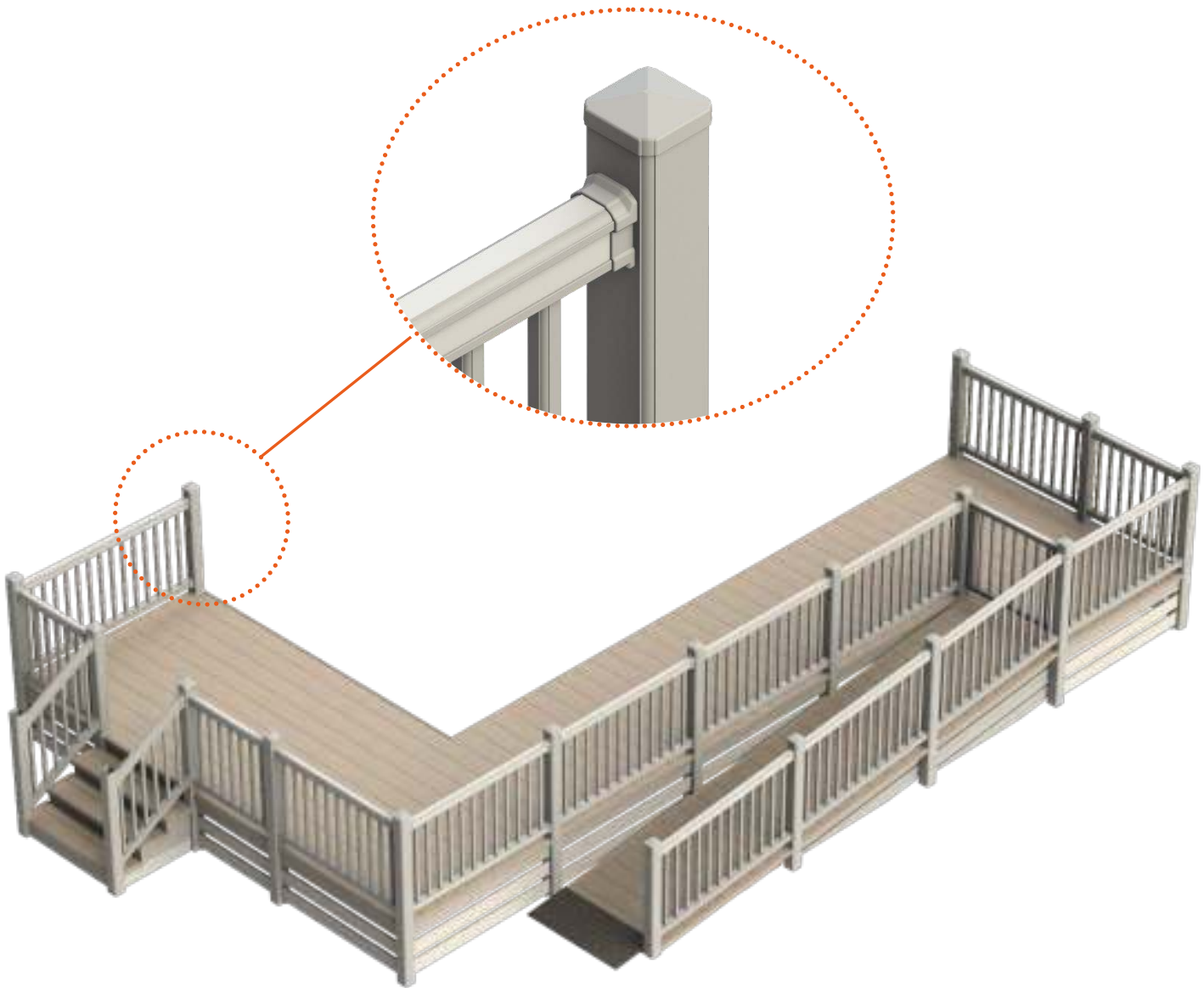
### LDH051 – Latch

Fix the male latch to the gate (again, 5mm below the gate elbow). Then position the female latch body to the vertical post.



## 12.0 – Ancillaries

The following shows how all the ancillaries are installed onto the finished deck .



### Related Components ...





### Installing Ancillary Items

To finish off the vertical posts they will need to be fitted with the LDM044 post cap. This can be fixed into place using a suitable PVCu adhesive as shown on the right.

If the post cap is to be fitted with a featured part, this needs to be fixed to the cap in advance of fitting the feature. Ensure that all electrical provisions are made before installing the lights.



Pre-drill the post cap with a 5mm drill bit. Then fix the ancillary item to the cap using LDH047. If fitting LDX057/8, use a 28mm hole and fit the light bayonet accordingly.



LDM039

Acorn Cap



LDM040

Ball Cap



LDM041

Gothic Cap



LDX057

Coach Lantern



LDX058

Globe Lantern



LDX064

Solar Powered Light

LDX064 sits directly onto the post and is then fixed using screws (screws supplied with light).

Ensure the light is not sealed using adhesive as access may be required to the batteries and switch. Ensure the light is switched on before final installation.

## 13.0 – Accreditations and Testing

The Liniar decking system has been tested to the following standards

- **BS EN 660-2: 1999 – Resilient floor coverings. Determination of wear resistance. Part 2 Frick Taber test <sup>(1)(4)</sup>.**

In accordance with the above standard and indicative results from BS EN 428: 1993 Liniar 225 mm Deck Plank is classed as wear group P and achieved a Commercial Very Heavy and Light Industrial Heavy standard. The best in its class.

- **BS 7976: Part 2: 2002 – Slip resistance testing using the pendulum tester.**

In accordance with the above standard Liniar 225 mm Deck Plank achieved low slip resistance when tested under dry conditions and low/moderate under wet conditions.

- **BS 476: Part 7: 1997 – Method for classification of the surface spread of flame of products.**

In accordance with the above standard Liniar 225 mm Deck Plank achieved Class 1. The best in its class.

- **All components (except steel) are made in our own factory to ISO 9001:2008**
- **Tested to a loading in excess of 500kg/m<sup>2</sup>**

## 14.0 – Maintenance



The following should be noted before maintaining your deck to help retain its appearance in optimum condition for many years to come .

### Do

- ✓ Frequently wash the handrails and posts with a cloth using warm, soapy water and wipe dry
- ✓ Use a stiff bristled brush with warm, soapy water to clean the deck boards
- ✓ A jet wash may also be used to clean the deck boards

### Don't

- ✗ Use glass cleaner on the deckboards or balustrade
- ✗ Use any type of bleach, solvent (e.g. white spirit, methylated spirits, nail varnish remover) or adhesives
- ✗ Use any abrasive papers, such as sandpaper

- We recommend that hot surfaces, such as barbeques, are not used in association with PVCu decking
- Please be aware that some rubber-backed mats can cause discolouration of deck boards over time
- For wood grained products, Liniair supplies matching RAL touch up pens to repair any scratches/marks
- Some brands of sun cream can permanently stain foiled balustrade finishes

## 15.0 – Guarantee

Liniar profiles are manufactured using tried and tested formulations from approved suppliers and will not warp or split for 10 years from date of installation.

# LINIAR

# 10 YEAR

## COMPONENT PRODUCT GUARANTEE

Liniar PVCu Products are manufactured using tried and tested formulations from approved suppliers. We guarantee they will not warp or split for 10 years from the date of installation providing they are installed by a Liniar-approved installer and maintained in line with our guidelines.

This guarantee is issued in association with our raw material suppliers and is based on proven technology for PVCu products. Further details can be supplied on request.

All products to be installed to Liniar recommendations



# 16.0 – Appendix



## Ideal Deck Size Data

For calculating deck width excluding the posts

$$\text{Total No. Of Deckboards} \times 246.45 - \left( \text{Total No. Of Deckboards} - 1 \right) \times 16.45 \text{ (5mm Gap)}$$

For calculating deck width including the posts with the correct overhang

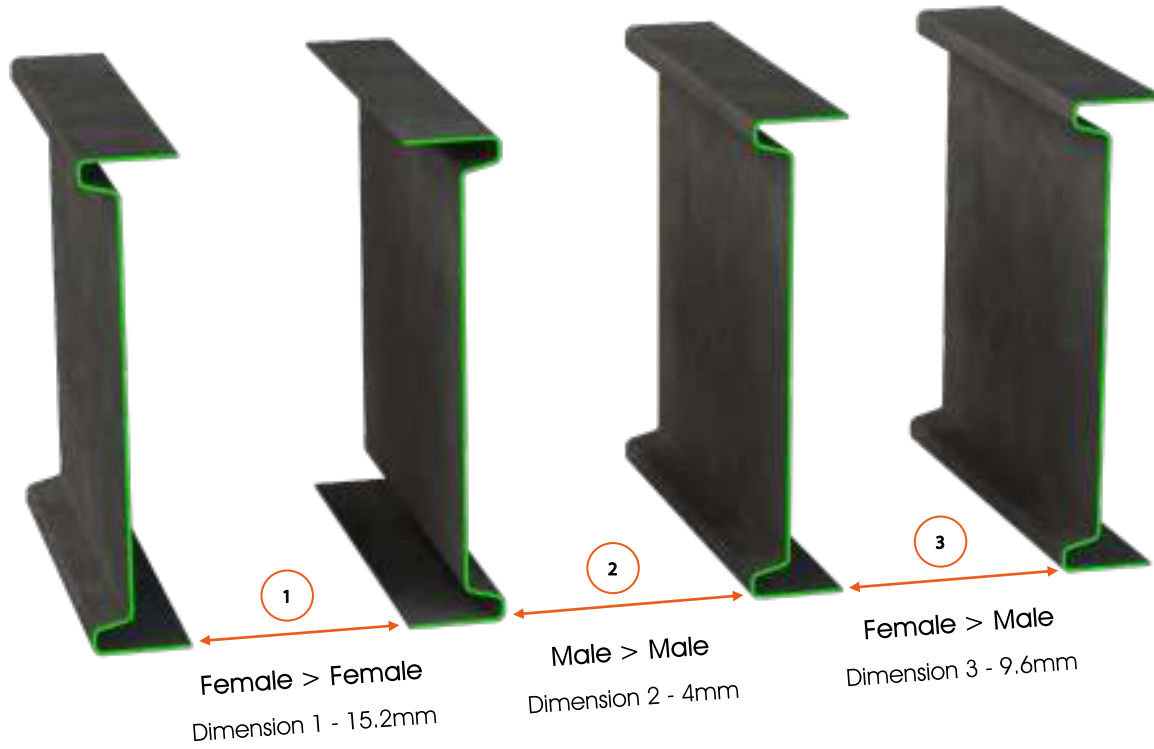
$$\text{Overall Deckboard Width (from calculation above)} + 34.5$$

Overall Deck Width Inc. 125mm Posts	Total No. Of Deckboards	Overall Deck Width Inc. 125mm Posts	Total No. Of Deckboards
510.95	2	6950.95	30
740.95	3	7180.95	31
970.95	4	7410.95	32
1200.95	5	7640.95	33
1430.95	6	7870.95	34
1660.95	7	8100.95	35
1890.95	8	8330.95	36
2120.95	9	8560.95	37
2350.95	10	8790.95	38
2580.95	11	9020.95	39
2810.95	12	9250.95	40
3040.95	13	9480.95	41
3270.95	14	9710.95	42
3500.95	15	9940.95	43
3730.95	16	10170.95	44
3960.95	17	10400.95	45
4190.95	18	10630.95	46
4420.95	19	10860.95	47
4650.95	20	11090.95	48
4880.95	21	11320.95	49
5110.95	22	11550.95	50
5340.95	23	11780.95	51
5570.95	24	12010.95	52
5800.95	25	12240.95	53
6030.95	26	12470.95	54
6260.95	27		
6490.95	28		
6720.95	29		

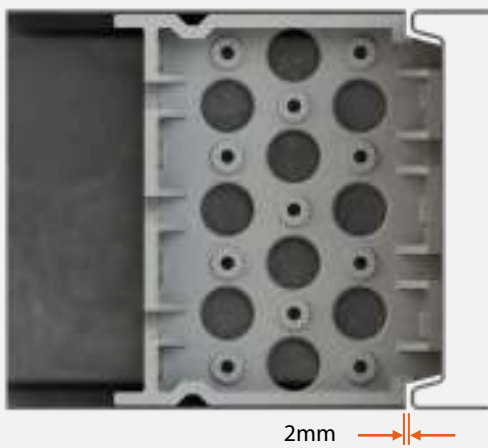
# 16.0 – Appendix

## Steel Deductions

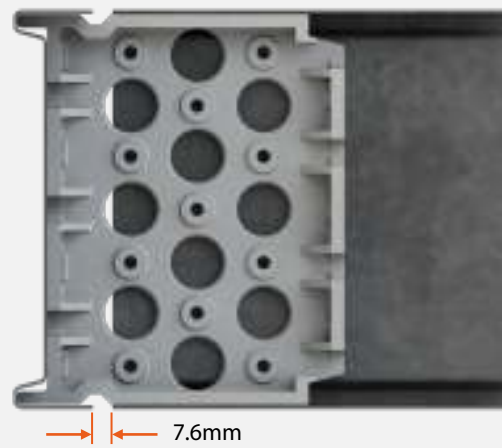
When installing the steel sub-frame, use the following deductions to work out your internal brace sizes. Using these deductions will give you the correct clearance for the LDM025 sub-frame connector mouldings.



Male Connection Deduction



Female Connection Deduction



If measuring the internal braces and the fascia boards are in place, use the following deduction :







### Detailed Rail Capping Punched Details

LDE014 – Diamond Sculptured Picket



LDE015 – Square Sculptured Picket



LDE016 – 120mm x 10mm Glass Picket

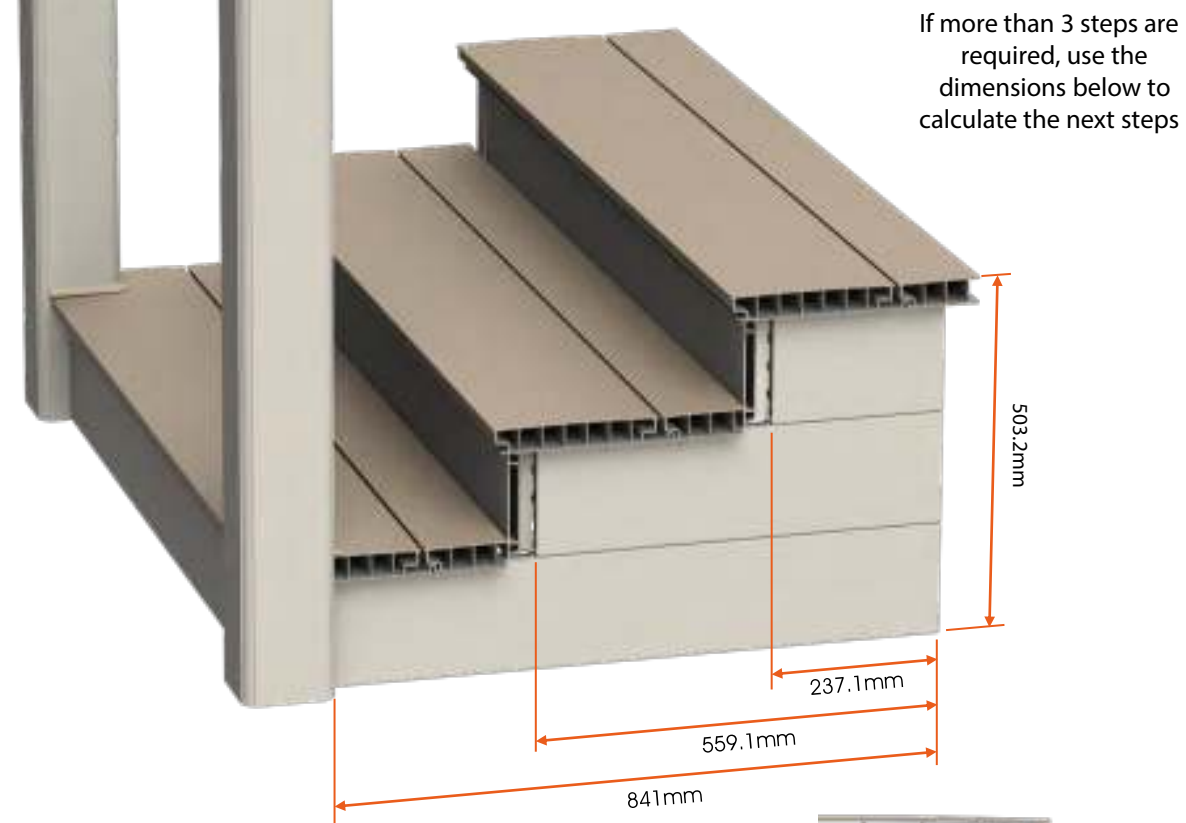
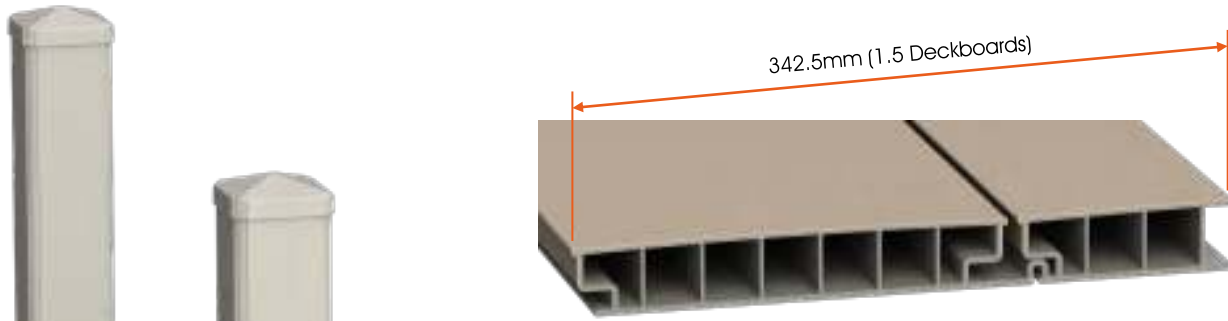


LDE025 – Square Sculptured Picket (For Steps)

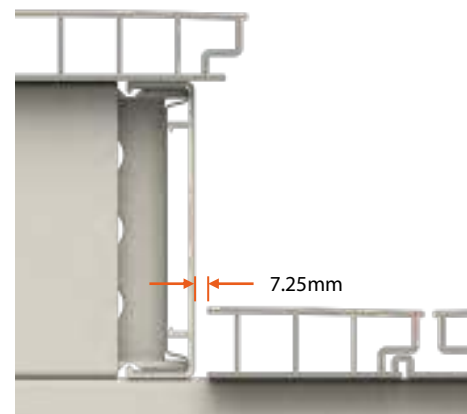


# 16.0 – Appendix

## Step Option 1 – Dimensioned Drawing



The gap of 7.25mm is for the 2.25mm U -Channel Trim and a remaining 5mm for water drainage



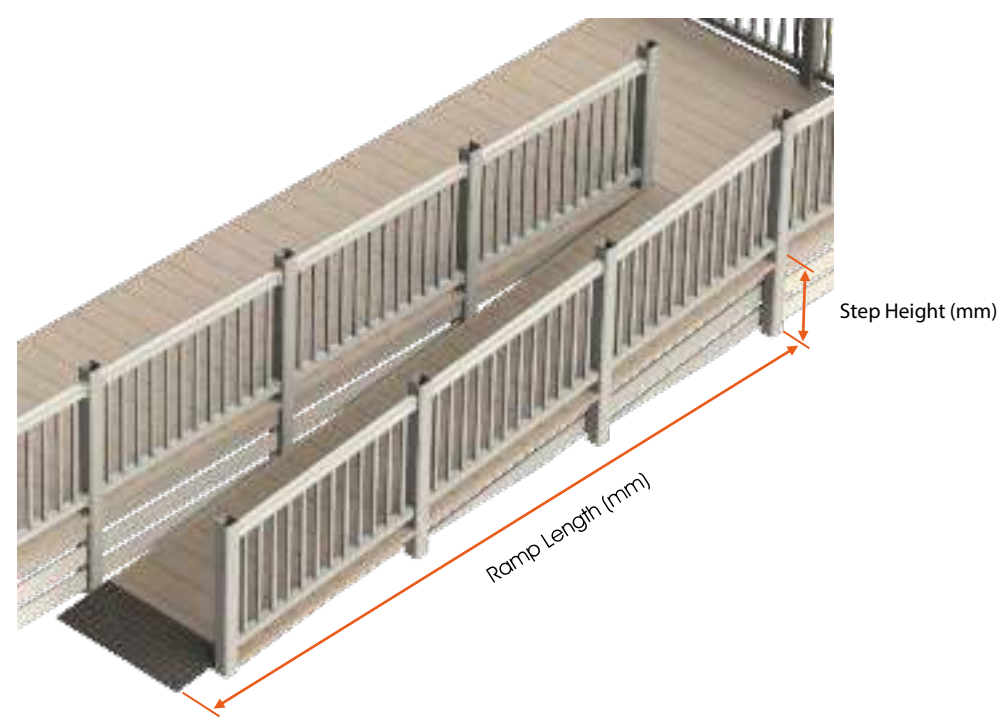


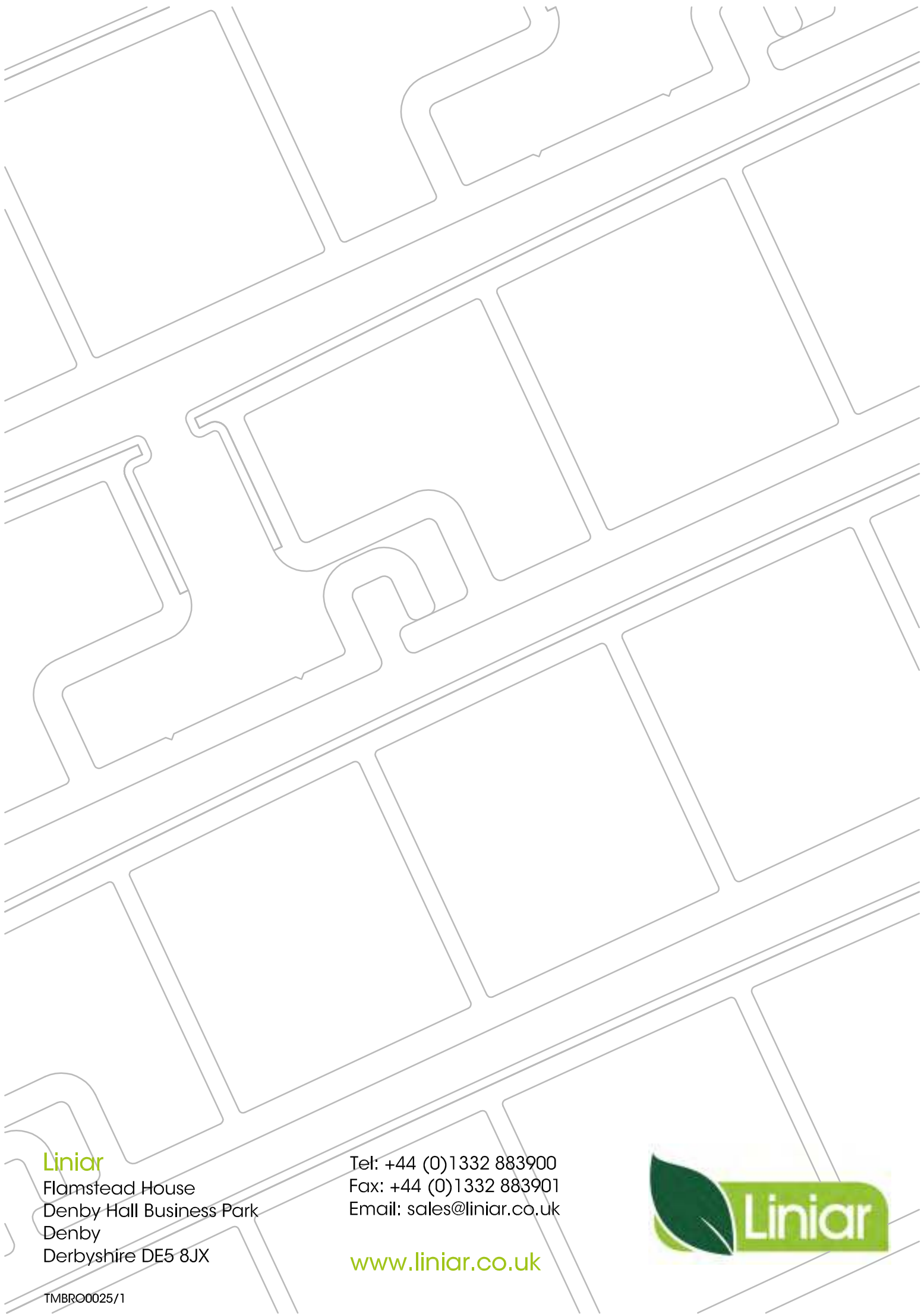
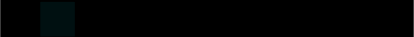
### Ramp Ratios

Ramp Ratio 1:12										
Step Height (mm)	150	200	250	300	350	400	425	450	475	500
Ramp Length (mm)	1800	2400	3000	3600	4200	4800	5100	5400	5700	6000
Step Height (mm)	550	575	600	625	650	675	700	725	750	775
Ramp Length (mm)	6600	6900	7200	7500	7800	8100	8400	8700	9000	9300

Ramp Ratio 1:15 - Health & Safety Recommendation										
Step Height (mm)	150	200	250	300	350	400	425	450	475	500
Ramp Length (mm)	2250	3000	3750	4500	5250	6000	6375	6750	7125	7500
Step Height (mm)	550	575	600	625	650	675	700	725	750	775
Ramp Length (mm)	8250	8625	9000	9375	9750	10125	10500	10875	11250	11625

Ramp Ratio 1:20										
Step Height (mm)	150	200	250	300	350	400	425	450	475	500
Ramp Length (mm)	3000	4000	5000	6000	7000	8000	8500	9000	9500	10000
Step Height (mm)	550	575	600	625	650	675	700	725	750	775
Ramp Length (mm)	11000	11500	12000	12500	13000	13500	14000	14500	15000	15500





**Liniar**

Flamstead House  
Denby Hall Business Park  
Denby  
Derbyshire DE5 8JX

Tel: +44 (0)1332 883900  
Fax: +44 (0)1332 883901  
Email: sales@liniar.co.uk

[www.liniar.co.uk](http://www.liniar.co.uk)



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