



PERMACON

**INSTALLATION GUIDE
TANDEM® SYSTEM**

2016

TANDEM® SYSTEM INDEX

SYSTEM DESCRIPTION	4	BUILDING STAIRS	25
VENEER UNITS AND STRUCTURAL UNITS	4	MELVILLE TANDEM STEPS	25
CAPPING UNIT, STEP UNIT AND STARTER UNIT	5	LEXA TANDEM STEPS	26
TANDEM UNIT ASSEMBLY	6	LAFITT TANDEM STEPS	27
		ESPLANADE TANDEM STEPS	28
BUILDING A RETAINING WALL	7	BUILDING PILLARS	29
STARTER UNIT	7	TANDEM PILLARS WITH PILLAR GRID	29
PRE-ASSEMBLY OF UNITS	7	TANDEM PILLAR WITH STRUCTURAL UNITS	37
ANCHOR SYSTEM	8	CONSTRUCTION OF OUTDOOR LIVING COMPONENTS	41
TYPICAL CROSS SECTION AND INSTALLATION PATTERN	9	GENERALITY	41
STRAIGHT WALLS	13	OUTDOOR GAS FIREPLACE	53
CURVED WALLS	13	OUTDOOR KITCHEN (BBQ, REFRIGERATOR, BAR)	54
90° CORNER WALL	13	PATIO FURNITURE (BENCH AND TABLE)	55
RETAINING WALL CAPPING	17	PRIVACY WALLS AND FENCES	56
BUILDING A DOUBLE-SIDED WALL	18	DECK SKIRTING	62
DOUBLE-SIDED TANDEM UNIT ASSEMBLY	18		
STARTER UNIT	18		
STRAIGHT WALLS	19		
CURVED WALLS	22		
END OF A WALL	23		
90° CORNER WALL	24		
DOUBLE-SIDED WALL CAPPING	24		

DESCRIPTION

90 mm STRUCTURAL UNITS



A – 90 mm STRUCTURAL UNIT
90 mm x 155 mm x 201 mm
3 9/16" x 6 1/8" x 7 7/8"



B – 90 mm STRUCTURAL UNIT
90 mm x 155 mm x 268 mm
3 9/16" x 6 1/8" x 10 1/2"



C – 90 mm STRUCTURAL UNIT
90 mm x 155 mm x 335 mm
3 9/16" x 6 1/8" x 13 3/16"



D – 90 mm STRUCTURAL UNIT
90 mm x 155 mm x 402 mm
3 9/16" x 6 1/8" x 15 13/16"

180 mm STRUCTURAL UNITS



E – 180 mm STRUCTURAL UNIT
180 mm x 155 mm x 335 mm
7 1/16" x 6 1/8" x 13 3/16"



F – 180 mm STRUCTURAL UNIT
180 mm x 155 mm x 402 mm
7 1/16" x 6 1/8" x 15 13/16"



G – 180 mm STRUCTURAL UNIT
180 mm x 155 mm x 469 mm
7 1/16" x 6 1/8" x 18 1/2"

90 mm LAFITT VENEER UNITS



A – 90 mm VENEER UNIT
90 mm x 67 mm x 201 mm
3 9/16" x 2 5/8" x 7 7/8"



B – 90 mm VENEER UNIT
90 mm x 67 mm x 268 mm
3 9/16" x 2 5/8" x 10 1/2"



C – 90 mm VENEER UNIT
90 mm x 67 mm x 335 mm
3 9/16" x 2 5/8" x 13 3/16"



D – 90 mm VENEER UNIT
90 mm x 67 mm x 402 mm
3 9/16" x 2 5/8" x 15 13/16"

180 mm LAFITT VENEER UNITS



E – 180 mm VENEER UNIT
180 mm x 67 mm x 335 mm
7 1/16" x 2 5/8" x 13 3/16"



F – 180 mm VENEER UNIT
180 mm x 67 mm x 402 mm
7 1/16" x 2 5/8" x 15 13/16"



G – 180 mm VENEER UNIT
180 mm x 67 mm x 469 mm
7 1/16" x 2 5/8" x 18 1/2"

90 mm MELVILLE VENEER UNITS



A – 90 mm VENEER UNIT
90 mm x 67 mm x 201 mm
3 9/16" x 2 5/8" x 7 7/8"



B – 90 mm VENEER UNIT
90 mm x 67 mm x 268 mm
3 9/16" x 2 5/8" x 10 1/2"



C – 90 mm VENEER UNIT
90 mm x 67 mm x 335 mm
3 9/16" x 2 5/8" x 13 3/16"



D – 90 mm VENEER UNIT
90 mm x 67 mm x 402 mm
3 9/16" x 2 5/8" x 15 13/16"

180 mm MELVILLE VENEER UNITS



E – 180 mm VENEER UNIT
180 mm x 67 mm x 335 mm
7 1/16" x 2 5/8" x 13 3/16"



F – 180 mm VENEER UNIT
180 mm x 67 mm x 402 mm
7 1/16" x 2 5/8" x 15 13/16"



G – 180 mm VENEER UNIT
180 mm x 67 mm x 469 mm
7 1/16" x 2 5/8" x 18 1/2"

90 mm LEXA VENEER UNITS



A – 90 mm VENEER UNIT
90 mm x 67 mm x 201 mm
3 9/16" x 2 5/8" x 7 7/8"



B – 90 mm VENEER UNIT
90 mm x 67 mm x 268 mm
3 9/16" x 2 5/8" x 10 1/2"



C – 90 mm VENEER UNIT
90 mm x 67 mm x 335 mm
3 9/16" x 2 5/8" x 13 3/16"



D – 90 mm VENEER UNIT
90 mm x 67 mm x 402 mm
3 9/16" x 2 5/8" x 15 13/16"

180 mm LEXA VENEER UNITS



E – 180 mm VENEER UNIT
180 mm x 67 mm x 335 mm
7 1/16" x 2 5/8" x 13 3/16"



F – 180 mm VENEER UNIT
180 mm x 67 mm x 402 mm
7 1/16" x 2 5/8" x 15 13/16"



G – 180 mm VENEER UNIT
180 mm x 67 mm x 469 mm
7 1/16" x 2 5/8" x 18 1/2"

180 mm ESPLANADE VENEER UNITS



E – 180 mm VENEER UNIT
180 mm x 60 mm x 350 mm
7 1/16" x 2 3/8" x 13 3/4"






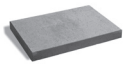

F – 180 mm VENEER UNIT
180 mm x 60 mm x 495 mm
7 1/16" x 2 3/8" x 19 1/2"




G – 180 mm VENEER UNIT
180 mm x 60 mm x 562 mm
7 1/16" x 2 3/8" x 22 1/8"

DESCRIPTION

OTHERS UNITS (SOLD SEPARATELY)


	<p>LAFITT TANDEM STRAIGHT CAPPING UNIT 90 mm × 305 mm × 400 mm 3 9/16" × 12" × 15 3/4"</p>		<p>LAFITT TANDEM STEP UNIT 90 mm × 400 mm × 400 mm 3 9/16" × 15 3/4" × 15 3/4"</p>
	<p>MELVILLE TANDEM STRAIGHT CAPPING UNIT 60 mm × 305 mm × 600 mm 2 3/8" × 12" × 23 5/8"</p>		<p>MELVILLE TANDEM STEP UNIT 60 mm × 400 mm × 600 mm 2 3/8" × 15 3/4" × 23 5/8"</p>
	<p>STARTER UNIT 90 mm × 200 mm × 400 mm 3 9/16" × 7 7/8" × 15 3/4"</p>		

60 mm CITY STEPS



60 mm × 360 mm × 610 mm
2 3/8" × 14 3/16" × 24"

80 mm CITY STEPS







80 mm × 360 mm × 610 mm
3 1/8" × 14 3/16" × 24"


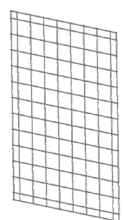




OTHERS UNITS (SOLD SEPARATELY)

	<p>ESPLANADE CHISELED CAPPING UNIT 60 mm × 381 mm × 1067 mm 2 3/8" × 15" × 42"</p>		<p>CITY CAPPING MODULE 60 mm × 305 mm × 600 mm 2 3/8" × 12" × 23 5/8" (only the front face is buffed)</p>
	<p>ESPLANADE PILLAR CAPPING MODULE 25 × 25 60 mm × 635 mm × 635 mm 2 3/8" × 25" × 25"</p>		<p>CITY DOUBLE FACE CAPPING MODULE 60 mm × 300 mm × 600 mm 2 3/8" × 11 13/16" × 23 5/8" (the front and rear faces are buffed)</p>
	<p>ESPLANADE PILLAR CAPPING MODULE 27 × 27 60 mm × 686 mm × 686 mm 2 3/8" × 27" × 27"</p>		<p>CITY PRIVACY CAPPING MODULE 60 mm × 360 mm × 605 mm 2 3/8" × 14 3/16" × 23 13/16" (both ends are buffed)</p>
	<p>ESPLANADE PILLAR CAPPING MODULE 29 × 29 75 mm × 737 mm × 737 mm 3" × 29" × 29"</p>		
	<p>ESPLANADE PILLAR CAPPING MODULE 31 × 31 75 mm × 787 mm × 787 mm 3" × 31" × 31"</p>		

ANCHORS AND CONNECTORS

	SETBACK ANCHOR		DOUBLE SIDED CONNECTOR
	CORNER CONNECTOR		TANDEM GRID CONNECTOR

OTHERS

	TANDEM GRID PILLAR KIT		TANDEM MODULAR GRID 720 mm × 1080 mm 28 3/8" × 42 1/2"
	SCREW #10 × 1 1/4"		BRACKETS (LOOP CLAMPS)
	TANDEM SHELF ANGLE 8" 64 mm × 64 mm × 2439 mm 2 1/2" × 2 1/2" × 8'		SCREW #10 × 3 1/2"

Note: Each Tandem Grid Pillar Kit comes with 1 bag of 200 Tandem Grid Connectors.

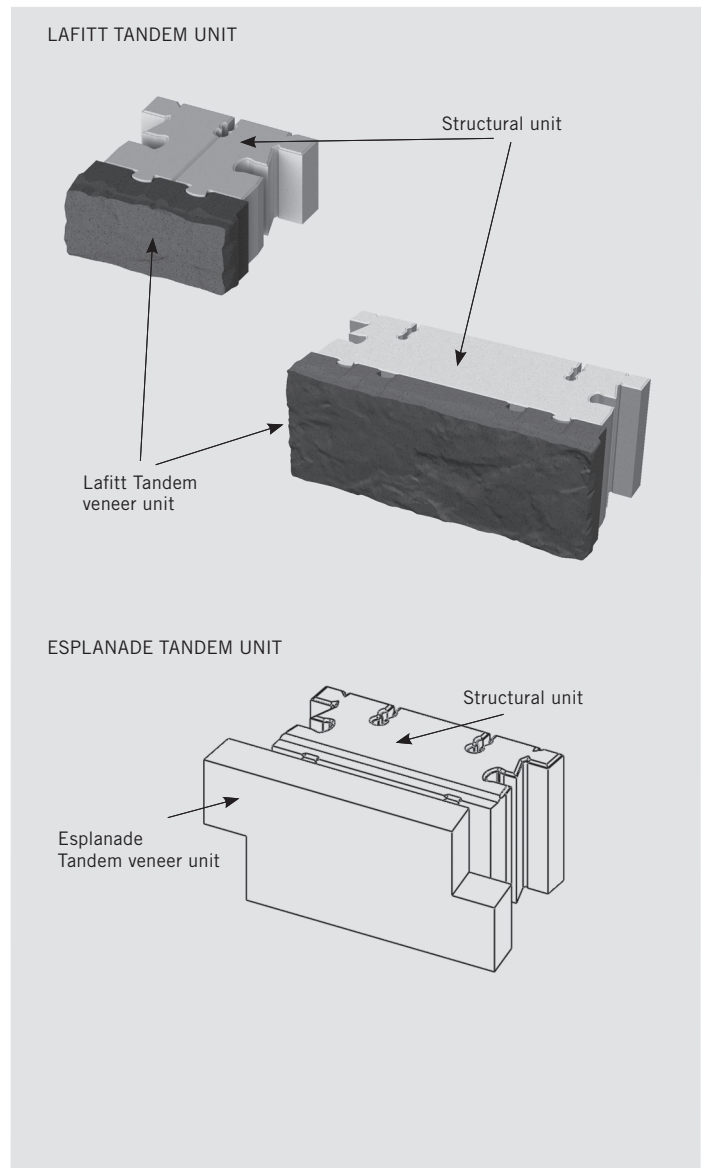
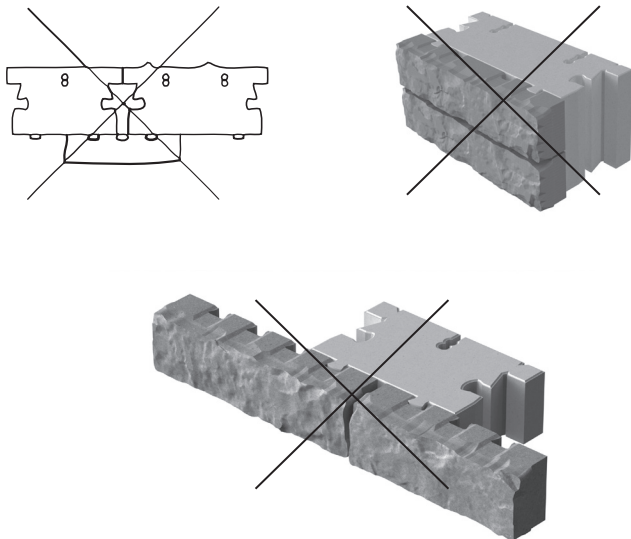
Each Tandem Modular Grid comes with 1 bag of 60 Tandem Grid Connectors, 10 screws #10 × 1 1/4" and 10 loop clamps.



TANDEM UNIT ASSEMBLY

Tandem units come in 2 heights: 90 and 180 mm (3 9/16" and 7 1/16"). For each structural unit, there is a veneer unit of the same length and height. The unit can be assembled using the dovetail joint (an interlocking male/female system). Each structural unit has two vertical tenons (male side) and each veneer unit has at least two mortises (female side). The veneer units are joined to the structural units by simply sliding the mortises into the tenons to create the Tandem unit. Today, there are four types of veneer units; Lafitt, Melville, Esplanade and Lexa Tandem units. The total depth of the Lafitt, Melville and Lexa Tandem unit is 222 mm (8 3/4"); for the Esplanade Tandem unit, it is 233 mm (9 1/8").

Attention: in general, do not overlap two veneer units on a single structural unit of the same height, and do not overlap two structural units on a single veneer unit. Do not install two 90 mm veneer units on a 180 mm structural unit.

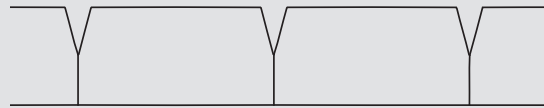
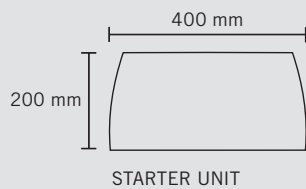


BUILDING A RETAINING WALL

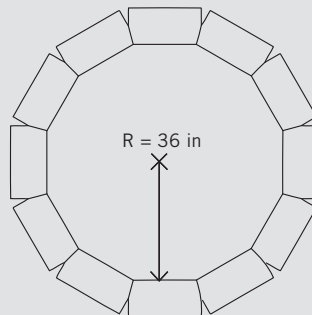
STARTER UNIT

The first course of the Tandem wall is built using the Tandem wall starter unit. This is to be installed directly on the granular base foundation and levelled. The unit is bevelled to make it easy to install curved walls.

The use of starter units is strongly recommended given that the Tandem units (structural and veneer units) can then be placed on a uniform base ensuring overall wall stability.



STRAIGHT INSTALLATION
(PLAN VIEW)

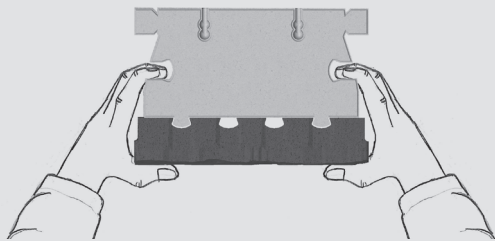


CURVED INSTALLATION
(PLAN VIEW)

PRE-ASSEMBLY OF 90 UNITS

It is best to pre-assemble veneer and structural units before beginning to stack them in building the wall.

Once pre-assembled, Tandem units are randomly installed on starter units, using the four different sizes.



Recommended handling for the Tandem 90 unit



Structural unit



Veneer unit



Tandem unit

PRE-ASSEMBLY OF 180 UNITS

Because the Tandem System 180 components are heavier, we recommend that you install the structural units first, then attach their veneer units.

ANCHOR SYSTEM

The way in which the setback anchor is positioned in the Tandem wall system determines the slope of the wall. This positioning is what allows for either vertical or sloped walls.

Generally, at least one setback anchor must be installed per Tandem 90 unit, with two setback anchors for the Tandem 180 unit, to make sure the wall is stable. Setback anchors come with or without blades. No-blade setback anchors are used in curved walls. Both types of anchor can be used in straight walls.

Allowable heights⁽¹⁾: 650 mm (26 in) without a slope (0°, vertical);
1.050 mm (42 in) with a slope of 9°

Note: For a 9° of slope, the setback per row of 90 mm is 14 mm (9/16") and the setback per row of 180 mm is 28 mm (1 1/8")

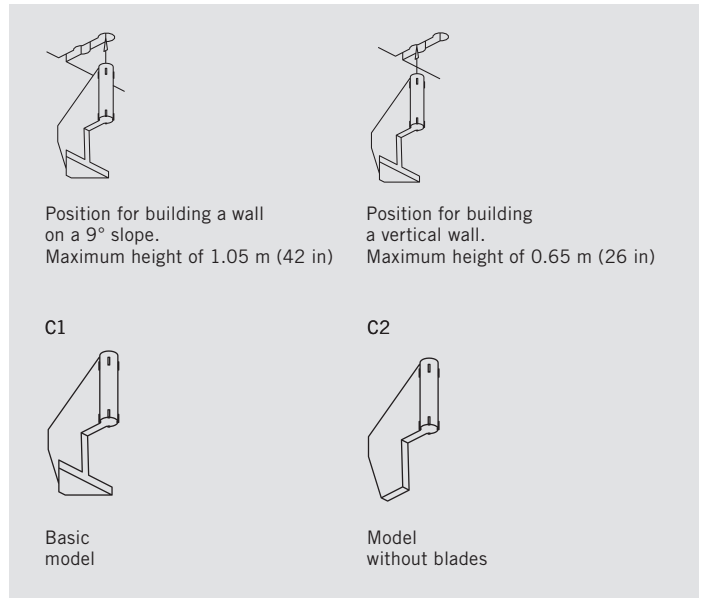
⁽¹⁾ Maximum height of the wall including the buried portion of 150 mm (6 in) without additional load or embankment above the wall.

There are several ways to build a Tandem retaining wall:

- Using only Lafitt, Melville or Lexa Tandem 90 units
- Using only Lafitt, Melville or Lexa Tandem 180 units
- Combining Lafitt, Melville or Lexa Tandem 90 and 180 units in a single wall
- Using only Esplanade Tandem 180 units

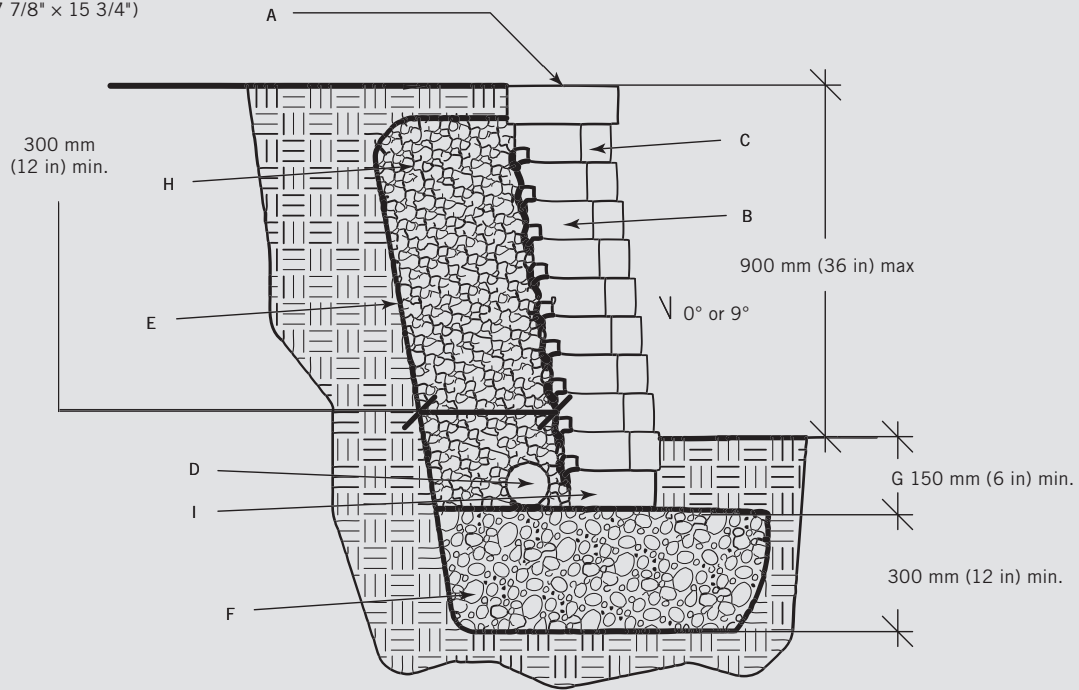
A typical cross-section and installation pattern are shown for each type of wall.

Note: It is possible to use Lafitt, Melville and Lexa Tandem veneer units in the same wall.

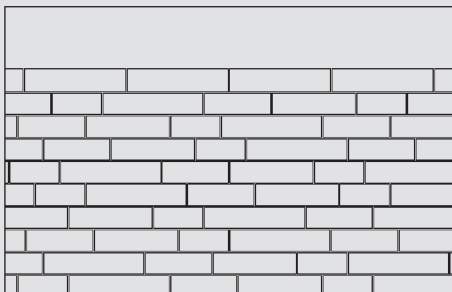


TYPICAL CROSS SECTION AND INSTALLATION PATTERN
 90 mm LAFITT, MELVILLE OR LEXA TANDEM WALL

- A Straight capping unit
 90 mm × 305 mm × 400 mm
 (3 9/16" × 12" × 15 3/4")
 or
 City capping unit
 60 mm × 305 mm × 600 mm
 (2 3/8" × 12" × 23 5/8")
- B Structural units
 90 mm × 155 mm × variable (201, 268, 335 or 402 mm)
 3 9/16" × 6 1/8" × var (7 7/8", 10 1/2", 13 3/16", 15 13/16")
- C Veneer units
 90 mm × 67 mm × variable (201, 268, 335 or 402 mm)
 3 9/16" × 2 5/8" × var (7 7/8", 10 1/2", 13 3/16", 15 13/16")
- D Perforated drain 100 mm Ø (4 in) connected
- E Geotextile membrane
- F Granular base 0-20 mm (0-3/4")
 compacted 300 mm (12") min.
- G Buried depth 150 mm (6") min.
- H Clean stone 20 mm (3/4")
- I Starter unit
 90 mm × 200 mm × 400 mm
 (3 9/16" × 7 7/8" × 15 3/4")



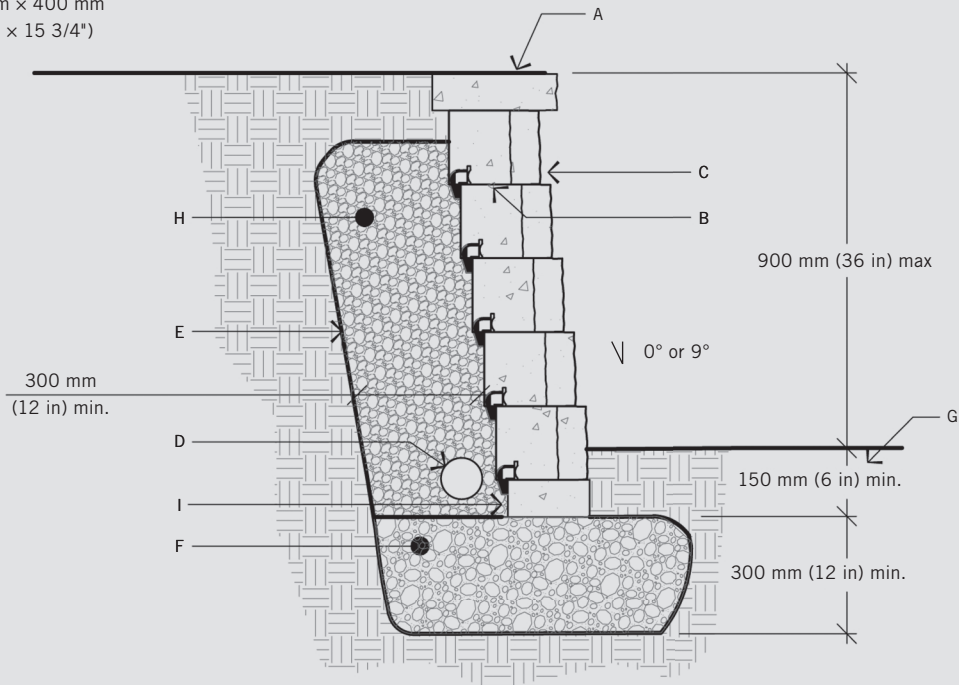
INSTALLATION PATTERN



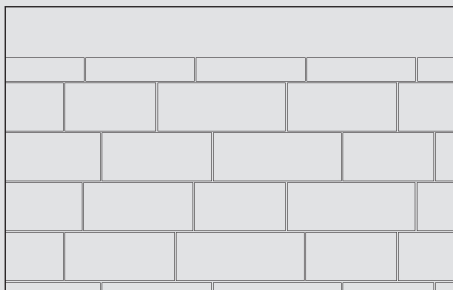
LINEAR PATTERN WITH 100% 90mm TANDEM UNITS.

TYPICAL CROSS-SECTION AND INSTALLATION PATTERN –
LAFITT, MELVILLE OR LEXA TANDEM 180 WALL

- A Straight capping unit
90 mm × 305 mm × 400 mm
(3 9/16" × 12" × 15 3/4")
or
City capping unit
60 mm × 305 mm × 600 mm
(2 3/8" × 12" × 23 5/8")
- B Structural units
180 mm × 155 mm × variable (335, 402, or 469 mm)
7 1/16" × 6 1/8" × var (13 3/16", 15 13/16" or 18 1/2")
- C Veneer units
180 mm × 67 mm × variable (335, 402, or 469 mm)
7 1/16" × 2 5/8" × var (13 3/16", 15 13/16" or 18 1/2")
- D 100-mm perforated drain (4") connected to drains
- E Geotextile membrane
- F 0-20 mm (0-3/4") compacted aggregate base,
min. 300 mm (12")
- G Min. buried depth of 150 mm (6")
- H 20 mm (3/4") clean stone
- I Starter unit
90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")



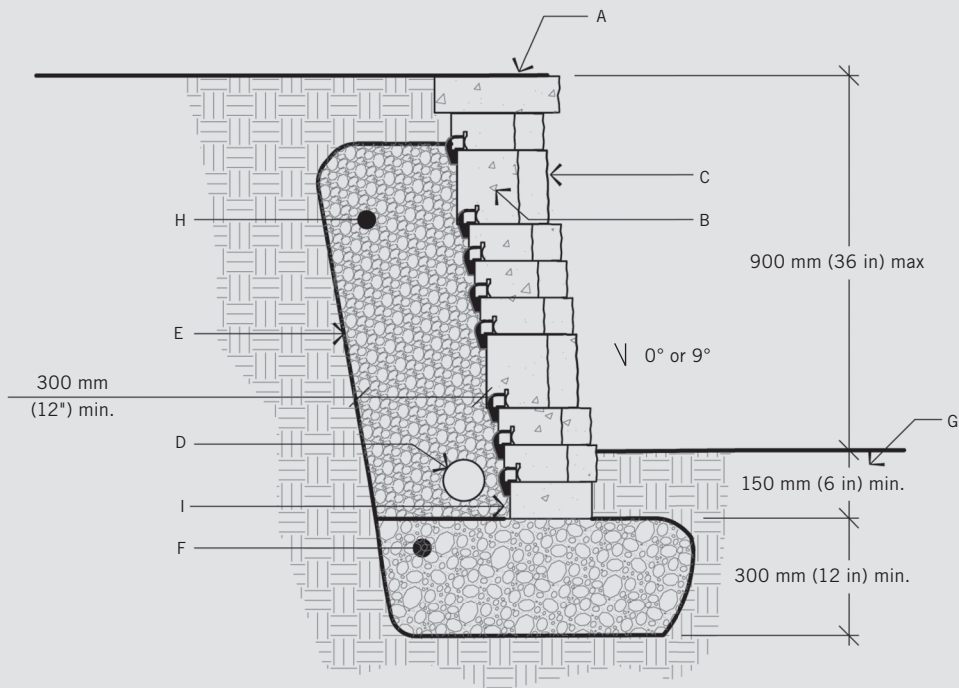
INSTALLATION PATTERN



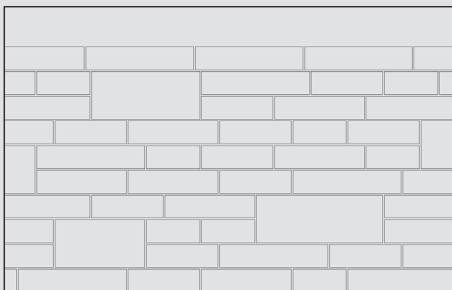
LINEAR PATTERN WITH 100% 180mm TANDEM UNITS.

TYPICAL CROSS-SECTION AND INSTALLATION PATTERN –
WALL WITH MIX OF LAFITT, MELVILLE AND LEXA TANDEM 90 AND 180 UNITS

- A Straight capping unit (connected to drains)
90 mm × 305 mm × 400 mm
(3 9/16" × 12" × 15 3/4")
or
City capping Unit
60 mm × 305 mm × 600 mm
(2 3/8" × 12" × 23 5/8")
- B Structural units
90 mm or 180 mm × 155 mm × variable
(3 9/16" or 7 1/16" × 6 1/8" × variable)
- C Veneer units
90 mm or 180 mm × 67 mm × variable
(3 9/16" or 7 1/16" × 2 5/8" × variable)
- D 100-mm perforated drain (4") connected to drains
- E Geotextile membrane
- F 0-20 mm (0-3/4") compacted aggregate base
- G Min. buried depth of 150 mm (6")
- H 20 mm (3/4") clean stone
- I Starter unit
90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")



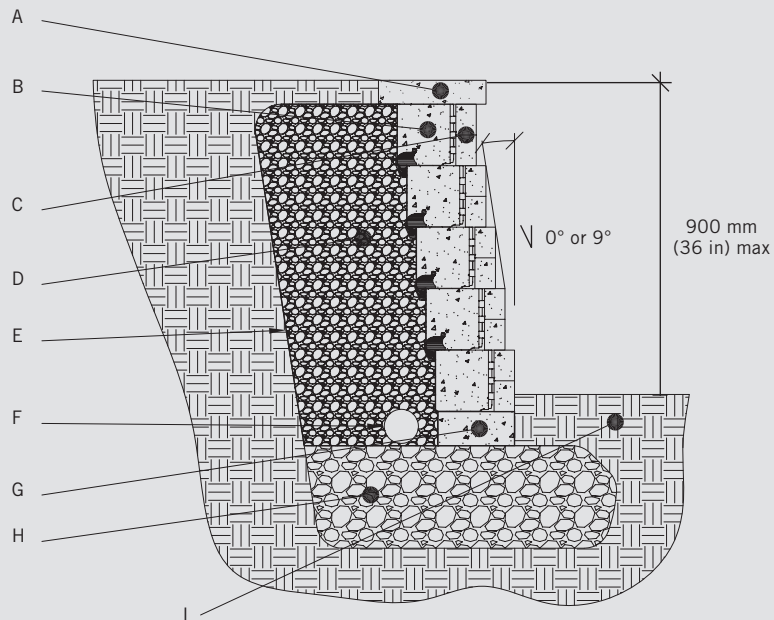
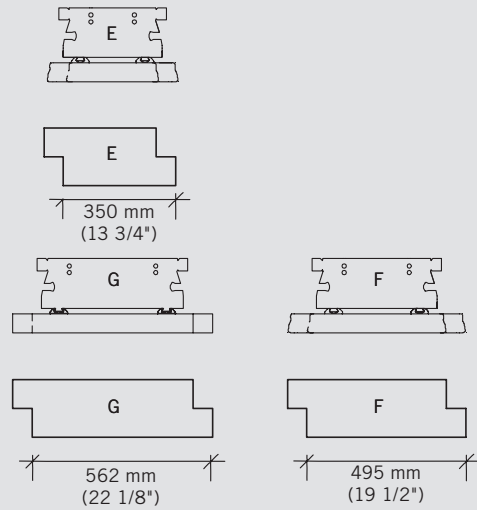
INSTALLATION PATTERN



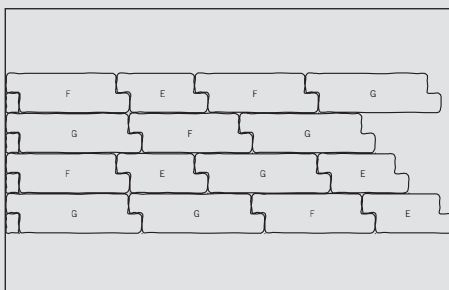
MODULAR PATTERN: 75% TANDEM 90 UNITS
25% TANDEM 180 UNITS

TYPICAL CROSS-SECTION AND INSTALLATION PATTERN – ESPLANADE TANDEM WALL

- A Esplanade chiseled capping unit
60 mm × 381 mm × 1 067 mm
(2 3/8" × 15" × 42")
- B Structural units
180 mm × 155 mm × variable (335, 402, 469 mm)
7 1/16" × 6 1/8" × variable (13 3/16", 15 13/16", 18 1/2")
- C Veneer units
180 mm × 60 mm × variable (350, 495, 562 mm)
7 1/16" × 2 5/8" × variable (13 3/4", 19 1/2", 22 1/8")
- D 20 mm (3/4") clean stone
- E Geotextile membrane
- F 100 mm (4") perforated drain connected to drains
- G Starter unit 90 × 200 × 400 mm (3 9/16" × 7 7/8" × 15 3/4")
- H 0-20 mm (0-3/4") compacted granular base, min. 300 mm (12")
- I Minimum buried depth 150 mm (6")



INSTALLATION PATTERN



LINEAR PATTERN WITH ESPLANADE TANDEM 180 UNITS ONLY

STRAIGHT WALLS

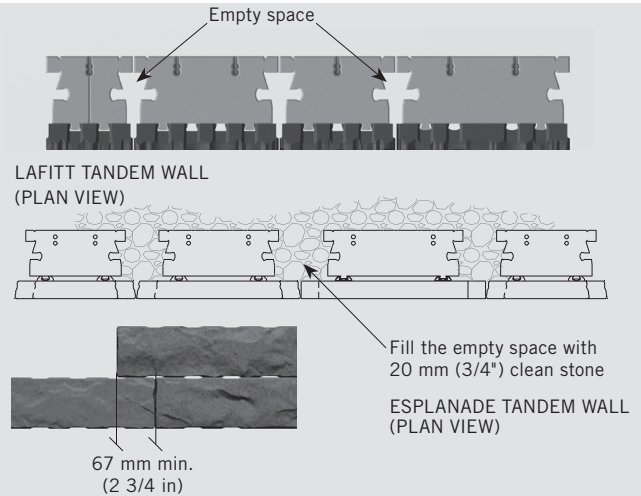
To build straight Tandem walls, install the units randomly, using equal numbers of all unit sizes according to the typical cross-section and installation pattern associated with each type of walls.

To combine the Tandem 90 and 180 units in a single wall, just use units of each height randomly, in a proportion that creates an aesthetically pleasing result. We recommend the following proportions: 75% Tandem 90 and 25% Tandem 180 (in terms of wall surface).

Note that the Esplanade Tandem system requires 17% fewer structural units than veneer units. 1 cube of 60 structural units = 4.32m² (46.52 sq. ft)

1 cube of 60 veneer units = 5.06m² (54.52 sq. ft)

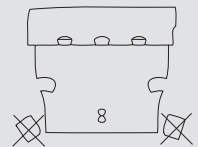
When building a Tandem wall, avoid aligning vertical joints between rows as much as possible. Allow a minimum overlap of about 67 mm (2 3/4") between modules to make sure the vertical joints do not line up.



CURVED WALLS

Using some Tandem units yields the minimum following curves:

	LAFITT TANDEM 90	LAFITT TANDEM 180	MELVILLE TANDEM 90	MELVILLE TANDEM 180	LEXA TANDEM 90	LEXA TANDEM 180	ESPLANADE TANDEM 180
Convex curves (outside)	1.5 m (5 ft)	1.5 m (5 ft)	1.8 m (6 ft)	2.4 m (8 ft)	1,8 m (6 ft)	2,4 m (8 ft)	1.5 m (5 ft)
Concave curves (inside)	1.2 m (4 ft)	1.5 m (5 ft)	1.8 m (6 ft)	2.4 m (8 ft)	1,8 m (6 ft)	2,4 m (8 ft)	1.2 m (4 ft)



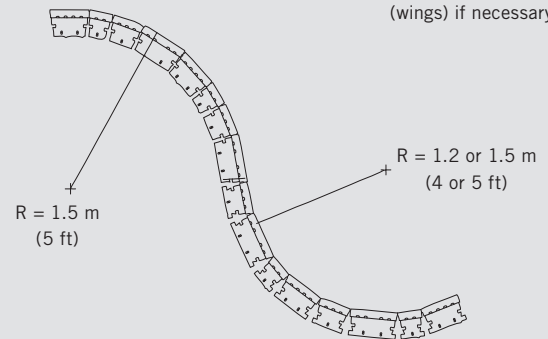
Curved sections of walls must generally be built using the smallest units.

For a curved Tandem 90 wall, use units A, B and C. For Tandem 180 walls, units E and F must be used. Their ends are bevelled to make it easier to install the curved wall.

Since Melville Tandem veneers all have a textured side, the minimum bend radius is greater.

Remember that there will be a surplus of longer units for the remainder of the wall.

In building convex curves (outer curve), the wings of structural units may have to be cut off.



90° CORNER WALL

When building a retaining wall, it is best to start with a corner to avoid breaks and alignment of vertical joints. Specially designed veneer units are needed to build a 90° corner. These units are called textured end units or corner veneer units.

LAFITT TANDEM

A Lafitt Tandem 90 cube contains 18 textured end veneer units per row.

To form the corner, use B, C or D veneer units.

A Lafitt Tandem 180 cube contains 8 textured end veneer units per row.

All of the veneer units (E, F and G) can be used to build the corner.

MELVILLE TANDEM

All of Melville Tandem veneers have one textured side.

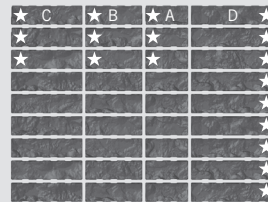
LEXA TANDEM

Lexa Tandem 90 corner veneer units are limited to B and D modules only, every second row. A cube of Lexa Tandem 90 contains 18 corner veneer units per row (every other row). Lexa Tandem 180 corner veneer units are limited to E and F modules only, every second row. A cube of Lexa Tandem 180 contains 10 corner veneer units per row (every other row).

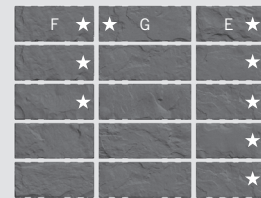
ESPLANADE TANDEM

Both ends of all Esplanade Tandem veneer units are textured, use only F & G capping to create 90° angles.

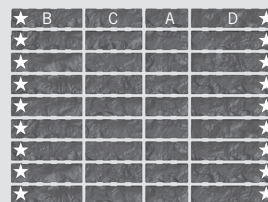
STACKING POSITION ON PALLETS (WITH A TEXTURED END)



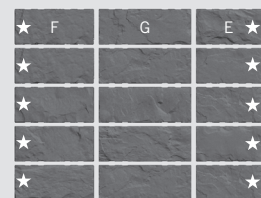
LAFITT TANDEM – 90 mm UNITS



LAFITT TANDEM – 180 mm UNITS



LEXA TANDEM – 90 mm UNITS (EVERY SECOND ROW)



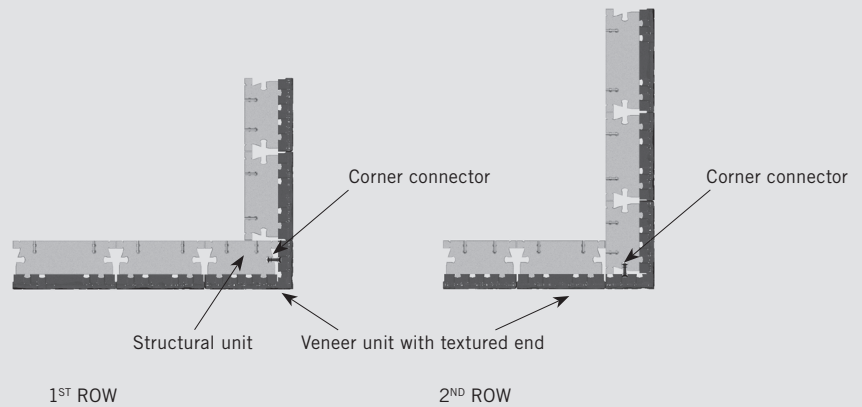
LEXA TANDEM – 180 mm UNITS (EVERY SECOND ROW)

**90° OUTER CORNER –
LAFITT, MELVILLE AND LEXA TANDEM WALL
PRINCIPLES**

An outer corner is created using veneer units with the textured end out.

These units are reversible to form both left and right corners. For each course, the veneer that forms the corner is affixed to the structural unit using corner connectors designed specifically for this purpose. It is simply a question of alternating the placement of units from one course to the next. We recommend adhering the elements used to make the corner of each row using Permapro concrete adhesive.

(spread the adhesive on the veneer units, or the structural units or on both)

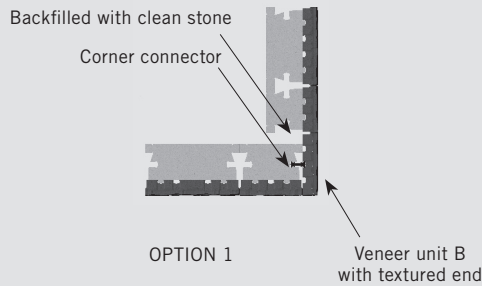


**90° OUTER CORNER DETAIL –
90 mm LAFITT, MELVILLE AND LEXA
TANDEM WALL**

There are three ways of building a corner with Tandem units:

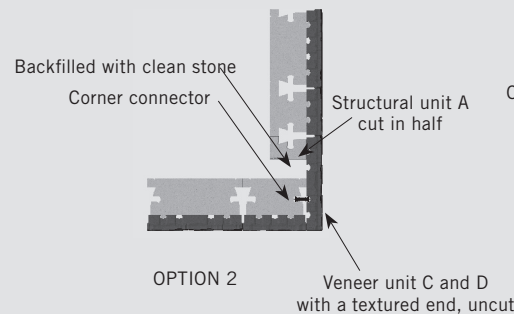
Option 1

Use corner veneer unit with a textured end B uncut, and begin the wall perpendicularly leaving an empty space that will be backfilled with clean stone



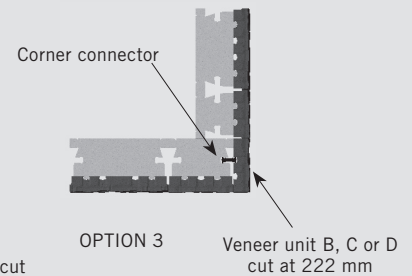
Option 2

Use corner veneer unit with a textured end C or D, uncut, attached to structural unit A cut in half.



Option 3

Use corner veneer unit with a textured end B, C or D, cut at 222 mm (8 3/4") and begin the wall perpendicularly, pressing it up against the existing wall. Gently hammer the freshly cut side to obtain a similar finish as the other sides.



90° OUTER CORNER DETAIL
180 mm LAFITT, MELVILLE AND LEXA TANDEM

There are three ways to build an outer corner using Tandem 180 units:

Option 1

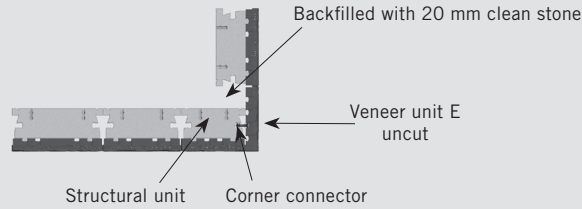
Use an uncut **textured end veneer unit E** and start the wall perpendicularly, leaving an empty space that will be backfilled with clean stone.

Option 2

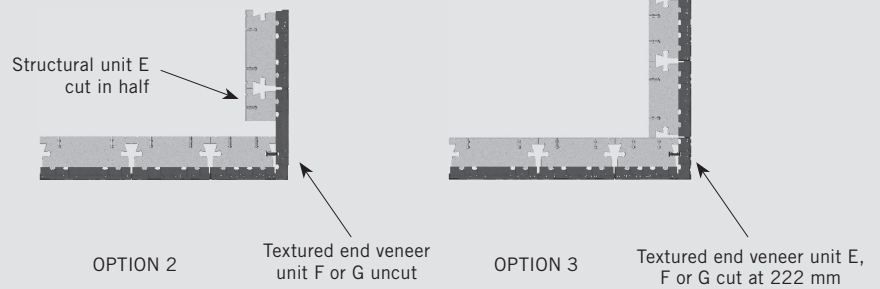
Use an uncut **textured end veneer unit F or G** attached to a **structural unit E**, cut in half. The empty space is backfilled with clean stone.

Option 3

Use a **textured end veneer unit E, F or G** cut at 222 mm, and start the wall perpendicularly, simply pressing it up against the existing wall. Gently hammer the freshly cut side to make the finish similar to the other sides.



OPTION 1



90° OUTER CORNER DETAIL OF LAFITT, MELVILLE AND LEXA TANDEM 90mm AND 180mm

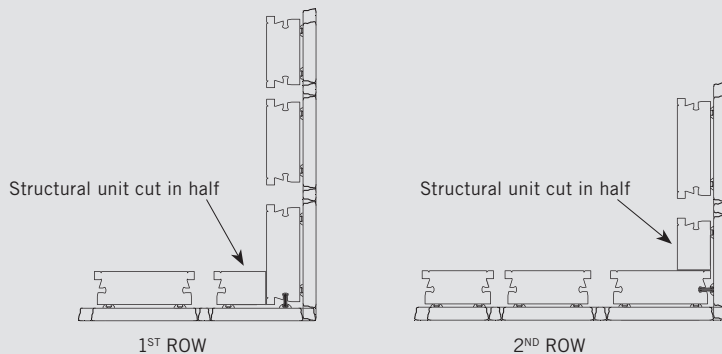
To build a corner for a wall featuring a mix of Tandem 90 and 180 units, for each given row height, use corner units of the same height (Tandem unit with associated corner veneer).

Corners are built using the options available for that height (90 or 180), as illustrated and explained earlier in this document. This principle applies to both outer and inner corners.

The choice of corner unit heights is a matter of aesthetics. The 90 and 180 units must be inserted in a similar proportion to the remainder of the wall.

90° OUTER CORNER DETAIL
ESPLANADE TANDEM

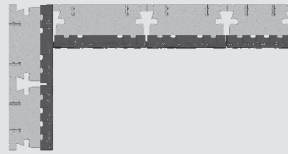
Build an outer corner by simply overlapping the ends of the veneer units. The corner is formed by installing a veneer F or G unit on the end of the last Tandem unit, and inserting a corner connector to join the two components and strengthen the corner. Then, cut a **structural unit** and install it behind the previously attached veneer.



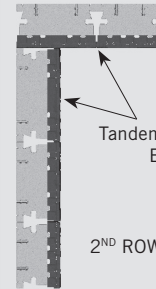
INNER CORNER

Build a Lafitt, Melville, Lexa or Esplanade Tandem inner corner according to the principle shown here, using Tandem 90 units C or D and 180 units E, F or G.

INNER CORNER, PRINCIPLES



1ST ROW

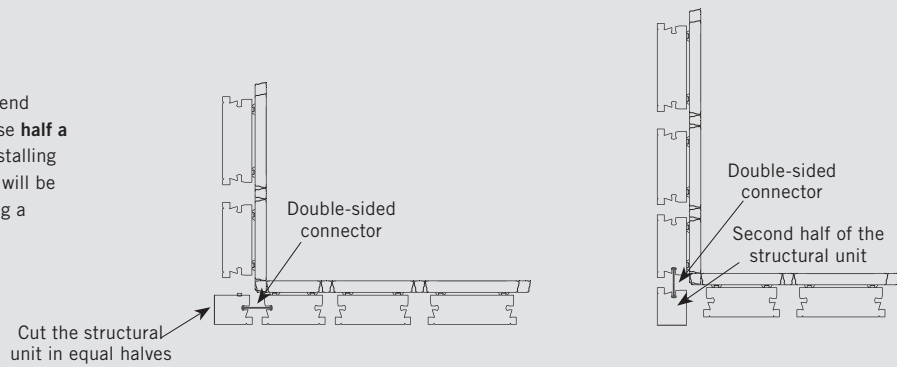


Tandem units C or D, E, F or G

2ND ROW

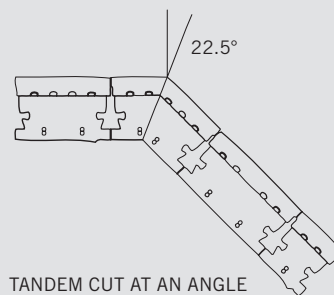
OPTION FOR ESPLANADE TANDEM

For the Esplanade Tandem wall, we recommend using **units F and G** for the inner corners. Use **half a structural unit** to fill the space created in installing the inner corner. It will support the cap and will be attached to the adjacent structural unit using a **double-sided connector**. (See the following illustration).



45° CORNER

It is also possible to build corners on a 45° angle. Simply cut each Tandem unit used to make the corner on a 22.5° angle. These Tandem units must be adhered together using Permapro concrete adhesive on the horizontal and vertical sides.



RETAINING WALL CAPPING

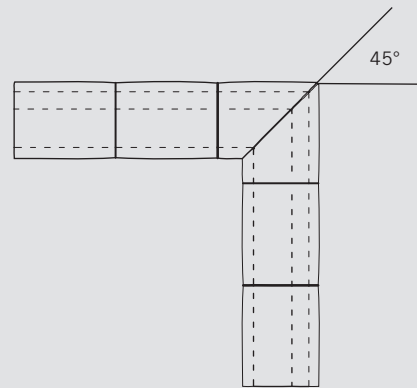
LAFITT, MELVILLE AND LEXA TANDEM WALLS

The Lafitt Tandem retaining wall is completed using **Lafitt Tandem capping units** (90 × 305 × 400 mm).

The Melville Tandem wall is finished with the use of the Melville Tandem Capping units (60 mm × 305 mm × 600 mm).

The Lexa Tandem wall is finished with the use of the City capping units (60 mm × 305 mm × 600 mm)

To cap a wall with a 90° corner, capping units must be cut at a 45° angle (see illustration).



Lafitt or Melville Tandem capping units are also used to cap curved walls. The units must be bevelled on site to match the final shape of the wall.

Options: Straight and bevelled capping units from the Celtik wall system and the Esplanade chiseled capping units can also be used to highlight the wall's finish (different colours and textures).

ESPLANADE TANDEM WALLS

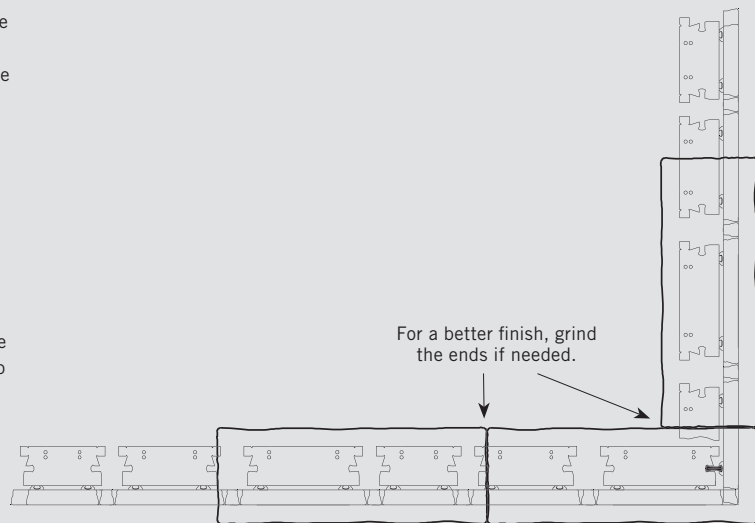
Esplanade Tandem retaining walls are capped by placing the **Esplanade chiseled capping units** (60 mm × 381 mm × 1067 mm or 2 3/8" × 15" × 42") side by side. To cap a 90° corner, simply install two capping units at a 90° angle. Note that one out of two Esplanade chiseled capping units is textured on 3 sides (2 sides and one end). For curved walls, capping units must be bevelled on site to match the final shape of the wall.

Options: Straight and bevelled Celtik wall system capping units and Lafitt or Melville Tandem capping units can also be used.

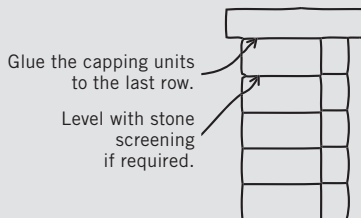
Note that all capping units must be glued to the last row of Tandem units using Permapro concrete adhesive.

GENERAL NOTE

If necessary, level the second last course with stone screening. Make sure the surface is clean, so that the capping can be glued to the top course with Permapro concrete adhesive.



ESPLANADE RETAINING WALL CAPPING





BUILDING A DOUBLE-SIDED WALL

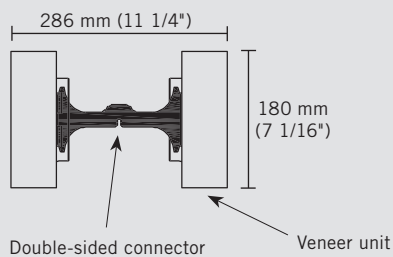
DOUBLE-SIDED TANDEM UNIT ASSEMBLY

Installing a double-sided wall requires the use of two veneer units held together using connectors. Connectors are inserted into the mortises on the veneer units thus connecting them two by two in order to create the double-sided Tandem unit. The work is complete once 20 mm (3/4 in) clean stone is placed between the veneers of every other course, and the capping unit is installed. Lafitt, Melville and Lexa Tandem 90 and 180 veneer units, as well as Esplanade units can be used to build straight or curved double-sided walls, as well as 90° corners.

Allowable heights

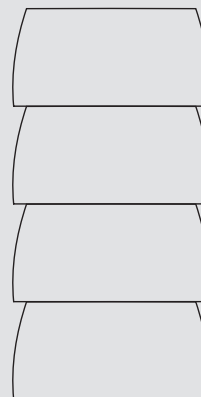
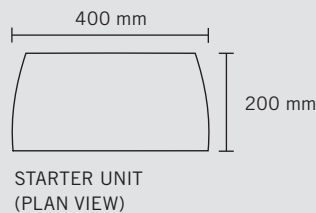
The Tandem wall system can be used to build a double-sided wall with a maximum above-ground height of 711 mm (28 in). The wall is built completely vertical without a slope.

DOUBLE-SIDED ESPLANADE TANDEM MODULE

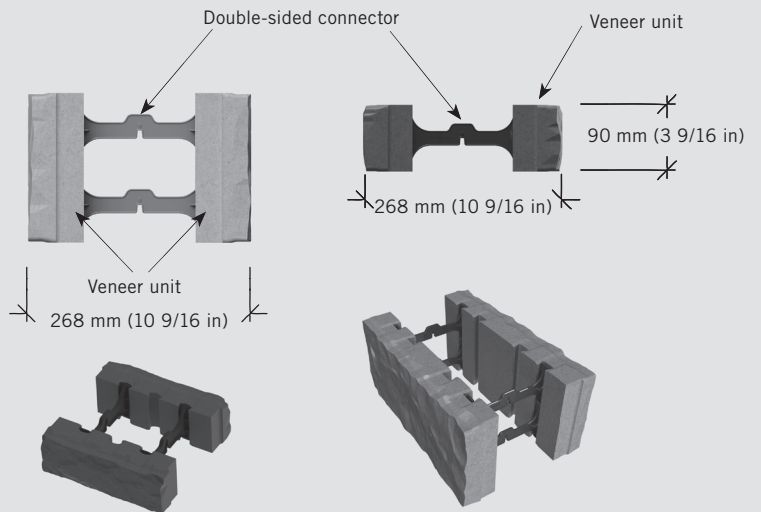


STARTER UNITS

To build the double sided Tandem wall, begin by placing the starter unit directly on the granular base perpendicular to the wall and levelling it.



DOUBLE-SIDED LAFITT TANDEM MODULES



DOUBLE-SIDED TANDEM UNIT ASSEMBLY

Note: Lafitt, Melville and Lexa Tandem 180 wall modules must be assembled using pairs of double-sided connectors installed one on top of the other for greater stability.

There are four ways to build a double-sided wall:
 Using only Lafitt, Melville or Lexa Tandem 90 units
 Using only Lafitt, Melville or Lexa Tandem 180 units
 Using a mix of Lafitt, Melville or Lexa Tandem 90 and 180 units in the same wall.
 Using only Esplanade Tandem units

To build a solid structure, the empty space inside the double-sided Tandem unit must be filled with 20 mm (3/4") clean stone on every second row. Before installing the capping, tap lightly on each side of the wall with a rubber hammer to help compact the aggregate between the veneer units.

Double-sided Tandem units are randomly installed on starter units, using an equal number of all units. The same installation patterns as for retaining walls are used here (see the installation patterns in the "Retaining Wall" section). Each veneer unit of the first row must be glued to the starter units with the Permapro concrete adhesive.

Note: Quantity of connectors required:

Lafitt, Melville and Lexa Tandem 90 wall
 7 connectors per sq. ft of double-sided wall (74 connectors per m²) based on one of the sides of the wall

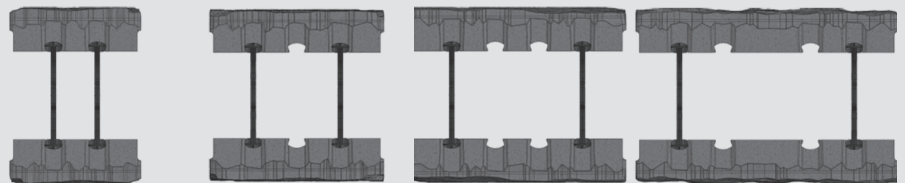
Lafitt, Melville and Lexa Tandem 180 wall
 5.5 connectors per sq. ft of double-sided wall (57 connectors per m²) based on one of the sides of the wall

Esplanade Tandem wall
 2.5 connectors per sq. ft of double-sided wall (24 connectors per m²) based on one of the sides of the wall

For a double-sided Lafitt, Melville, Lexa and Esplanade TANDEM wall, we recommend gluing all of the rows together for the four types of wall.

STRAIGHT DOUBLE-SIDED WALL

When building a straight wall, assemble veneer units of the same size using the double-sided connector. Because the veneer units come in different lengths, several layouts are possible.

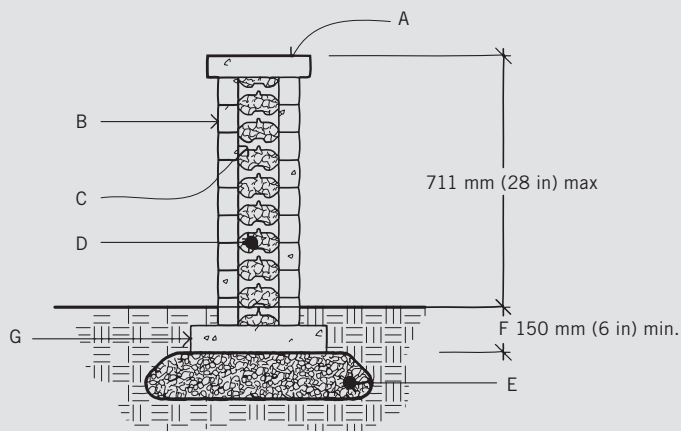


UNITS A-A 90 mm x 67 mm x 201 mm (3 9/16" x 2 5/8" x 7 7/8")
 UNITS B-B 90 mm x 67 mm x 268 mm (3 9/16" x 2 5/8" x 10 1/2")
 UNITS C-C 90 mm x 67 mm x 335 mm (3 9/16" x 2 5/8" x 13 3/16")
 UNITS D-D 90 mm x 67 mm x 402 mm (3 9/16" x 2 5/8" x 15 13/16")

DOUBLE-SIDED LAFITT, MELVILLE AND LEXA TANDEM WALL WITH 90 mm VENEER UNITS

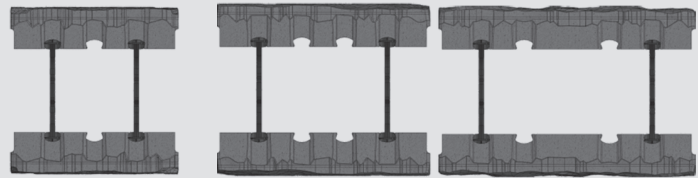
TYPICAL CROSS SECTION

- A City double face capping module (for double-sided wall)
- B Veneer units 90 mm x 67 mm x variable (3 9/16" x 2 5/8" x var)
- C Double-sided connector
- D 20 mm (3/4") clean stone
- E Granular base 0-20 mm (0-3/4") compacted 300 mm (12") min.
- F Minimum buried depth 150 mm (6")
- G Starter unit 90 mm x 200 mm x 400 mm (3 9/16" x 7 7/8" x 15 3/4")



DOUBLE-SIDED LAFITT, MELVILLE AND LEXA TANDEM WALL WITH 180 mm VENEER UNITS

Note: Tandem 180 wall modules must be assembled using pairs of double-sided connectors installed one on top of the other for greater stability.



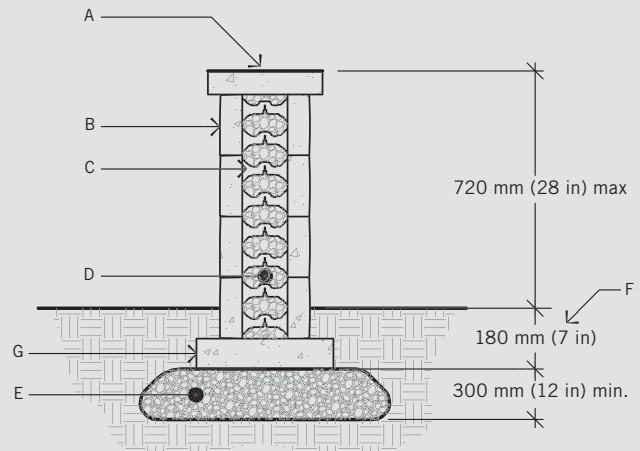
UNITS E-E
180 mm × 67 mm × 335 mm
(7 1/16" × 2 5/8" × 13 3/16")

UNITS F-F
180 mm × 67 mm × 402 mm
(7 1/16" × 2 5/8" × 15 3/16")

UNITS G-G
180 mm × 67 mm × 469 mm
(7 1/16" × 2 5/8" × 18 1/2")

TYPICAL CROSS SECTION

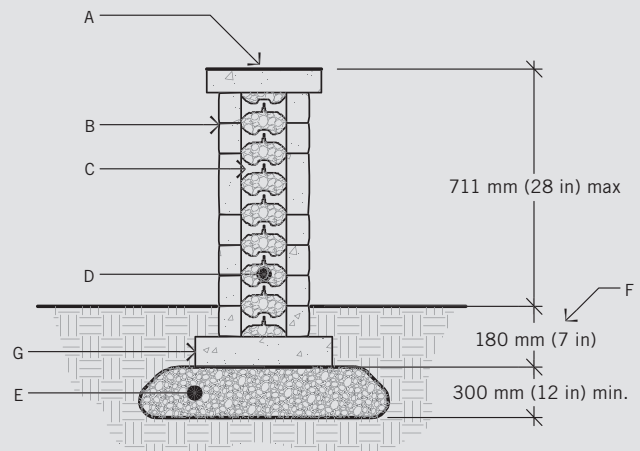
- A City double face capping module (for double-sided wall)
- B Veneer units
180 mm × 67 mm × variable
(7 1/16" × 2 5/8" × variable)
- C Double-sided connector
- D 20 mm (3/4") clean stone
- E Granular base 0-20 mm (0-3/4") compacted 300 mm (12") min.
- F Min. buried depth of 150 mm (6")
- G Starter unit
90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")



DOUBLE-SIDED LAFITT MELVILLE AND LEXA TANDEM WALL WITH 90 AND 180 VENEER UNITS

TYPICAL CROSS SECTION

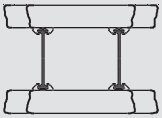
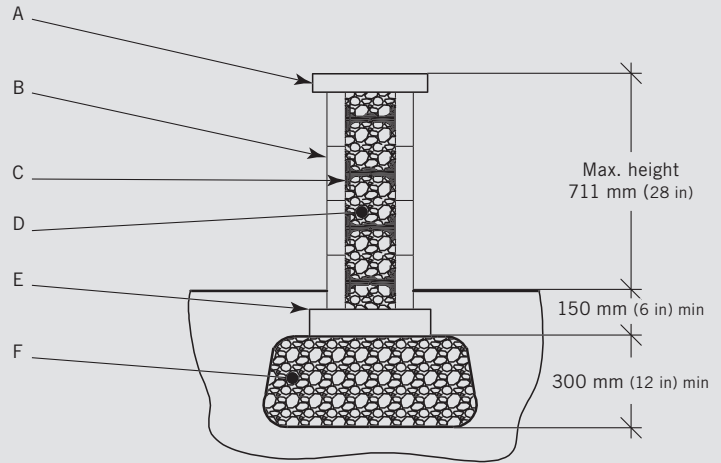
- A City double face capping module (for double-sided wall)
- B Veneer units
90 mm or 180 mm × 67 mm × variable
(3 9/16" or 7 1/16" × 2 5/8" × variable)
- C Double-sided connector
- D 20 mm (3/4") clean stone
- E Granular base 0-20 mm (0-3/4") compacted 300 mm (12") min.
- F Min. buried depth of 150 mm (6")
- G Starter unit
90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")



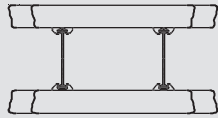
DOUBLE-SIDED ESPLANADE TANDEM WALL

TYPICAL CROSS SECTION

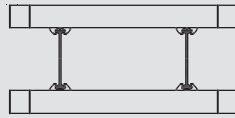
- A Esplanade chiseled capping unit,
60 mm × 381 mm × 1 067 mm
(2 3/8" × 15" × 42")
- B Veneer units
180 mm × 60 mm × variable (350 mm, 495 mm, 562 mm)
(7 1/16" × 2 5/8" × var (13 3/4", 19 1/2", 22 1/8"))
- C Double-sided connector
- D 20 mm (3/4") clean stone
- E Starter unit 90 × 200 × 400 mm
- F Granular base 0-20 mm (0-3/4")
compacted 300 mm (12") min.



UNITS E-E
180 mm × 60 mm × 350 mm
(7 1/16" × 2 3/8" × 13 3/8")



UNITS F-F
180 mm × 60 mm × 495 mm
(7 1/16" × 2 3/8" × 19 1/2")



UNITS G-G
180 mm × 60 mm × 562 mm
(7 1/16" × 2 3/8" × 22 1/8")

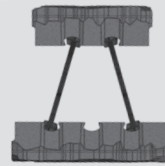
CURVED LAFITT, MELVILLE AND LEXA TANDEM WALL

To build a curved double-sided wall, while maximizing results and minimizing sizes, only the following pairs of veneer units are recommended for use:

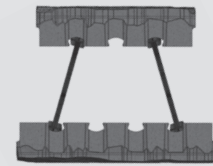
A-A, A-B, B-B and B-C for 90 mm units and E-E, E-F, F-F and F-G for 180 mm units. Consequently, there will be more D veneer units for the remainder of the wall. Some units may have to be cut to fit perfectly into the selected curve.

The design flexibility of double-sided units means that connectors can be inserted in all unit mortises, providing for better adjustment in creating curves with different radiuses.

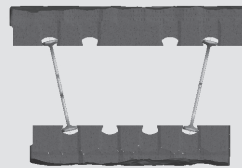
Note: Lafitt, Melville and Lexa Tandem 180 wall modules must be assembled using pairs of double-sided connectors installed one on top of the other for greater stability.



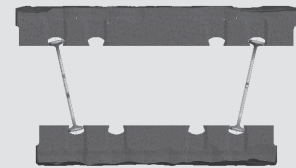
UNITS A-B



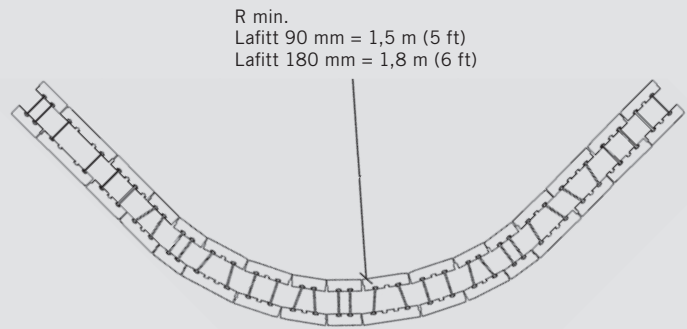
UNITS B-C



UNITS E-F



UNITS F-G



The minimum curves possible for the Lafitt Tandem wall:

- Lafitt 90 mm = 1.5 m (5.0 ft);
- Lafitt 180 mm = 1.8 m (6.0 ft).

The minimum bend radius of Melville and Lexa Tandem walls is 2,4 m (8 ft)

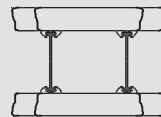
CURVED ESPLANADE TANDEM WALL

To build a curved double-sided wall, maximize results and minimize sizes, we recommend using only the following veneer unit pairs: E-E, E-F and F-G.

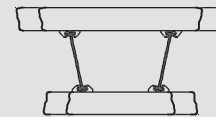
Note that the curves may vary depending on what units are selected and how they are positioned. The minimum curve is 1500 mm (5 ft).

The flexibility of double-sided connectors is invaluable to the construction of curved walls, since it is sometimes necessary to offset the elements to adjust to the desired curvature.

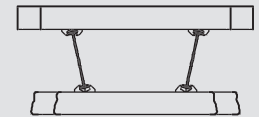
DOUBLE-SIDED ESPLANADE TANDEM UNITS FOR A CURVED WALL



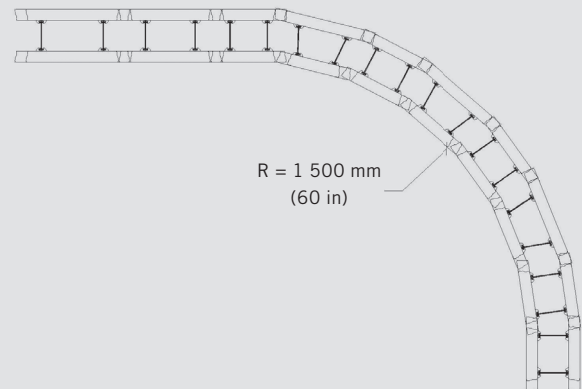
UNITS E-E



UNITS E-F



UNITS F-G



END OF DOUBLE-SIDED LAFITT, MELVILLE AND LEXA TANDEM WALL

The end of a double-sided Tandem 90 wall is built using a textured end veneer unit A installed on the end of the wall.

To ensure solid corner assembly, two double-sided connectors are overlapped in a cross shape and inserted into the mortises on the veneer units. The first connector connects the two double-sided wall veneer units, while the perpendicular connector connects the textured end veneer unit that forms the end of the wall. Glue every course forming the end of the wall using Permapro adhesive.

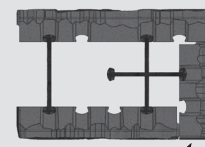
The end of a double-sided Tandem 180 wall is built using a textured end veneer unit E cut at 201 mm and installed on the end of the wall.

ASSEMBLY FOR DOUBLE-SIDED 90 WALL: END OF WALL

Connectors in a cross shape



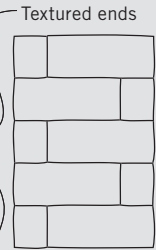
Isometric view



Plan view

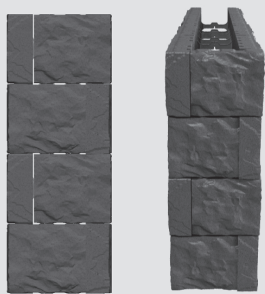
Textured ends

Veneer A



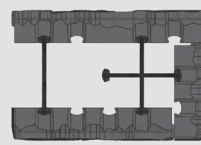
End of double-sided wall - side view

ASSEMBLY FOR DOUBLE-SIDED 180 WALL: END OF WALL



Elevation view

Connectors installed in a cross shape



Plan view

Veneer F (or G)
Textured ends

Textured end veneer E cut at 201 mm

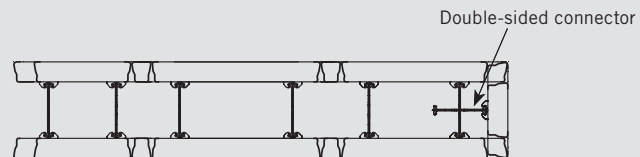
Veneer E (or F)

END OF A DOUBLE-SIDED LAFITT, MELVILLE AND LEXA TANDEM 90 AND 180 WALL

The end of a double-sided 90 and 180 wall is built by smoothly combining the two kinds of construction (90 and 180) for a wall end, described previously in this document. To build an end for a wall that mixes Tandem 90 and 180 units in the same wall, for each given row height, use units of the same height.

END OF A DOUBLE-SIDED ESPLANADE TANDEM WALL

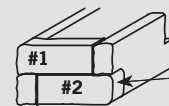
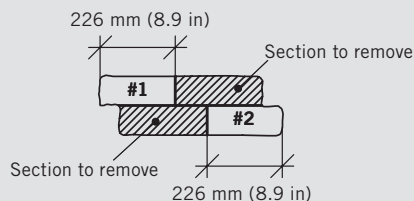
The end of a double-sided wall is built using a veneer unit F or G cut at 226 mm and installed at the end of the wall (see ILLUSTRATION). For aesthetic reasons, we recommend having the uncut end of the veneer unit face out.



Double-sided connector

Veneer F or G

Glue the unit joints at the ends.



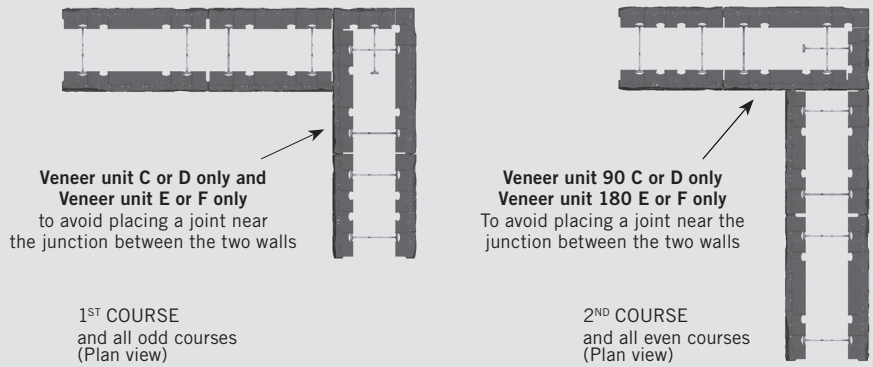
Textured ends

DOUBLE-SIDED WALL: 90° CORNERS

Building a 90° corner on a Lafitt, Melville and Lexa Tandem wall requires installing a wall end (described earlier), then juxtaposing a second wall perpendicular to it.

Glue every course in the wall corner using Permapro adhesive.

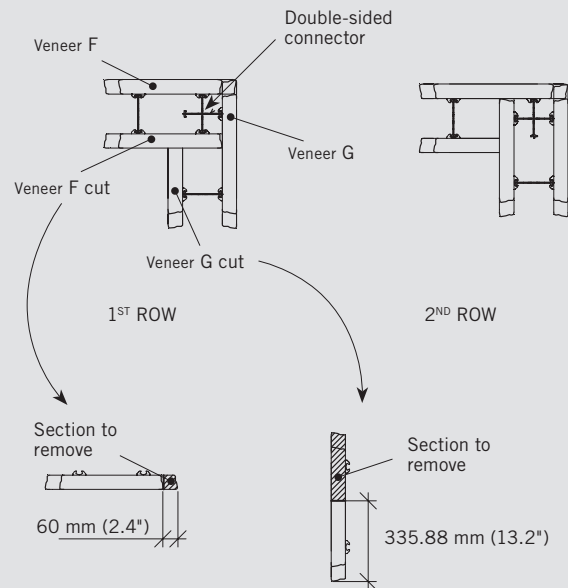
Once again, for a natural look, avoid aligning vertical joints from one row to the next on all visible surfaces.



90° CORNER IN A DOUBLE-SIDED 90 AND 180 WALL

Building a 90° corner on a wall requires installing a wall end (described earlier), then juxtaposing a second wall perpendicular to it. The second wall can be built starting with double-sided Tandem 90 or 180 units. Adhere every course in the wall corner using Permapro adhesive.

Corners are built using the options available for that height (90 or 180). These options were illustrated and explained earlier in this document. The selection of corner module heights and their positioning in the wall is a matter of aesthetics. The 90 and 180 units must be inserted in a similar proportion to the remainder of the wall so that they harmonize.



90° CORNER IN A DOUBLE-SIDED ESPLANADE TANDEM WALL

Building a 90° corner on a wall requires the assembly described below.

Some components may have to be cut to adapt to the final anchor.

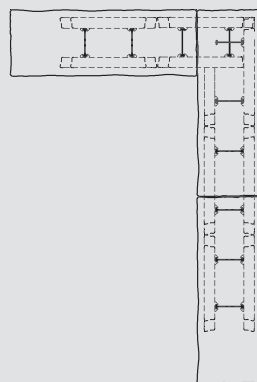
CAPPING A DOUBLE-SIDED WALL

Double-sided Tandem walls are completed using **Esplanade chiseled capping units** (60 mm × 381 mm × 1067 mm), laid side by side. Each unit is textured on both sides (front and back), and one of two modules is textured on one end. Modules can be rotated 180° for more flexibility.

To cap a 90° corner, simply install two capping units at a 90° angle. For curved walls, capping units must be bevelled on site to match the final shape of the wall.

Options: Straight and bevelled Celtik wall system capping units and Melville Tandem capping modules can also be used.

Note that all capping units must be attached to the last row of **Tandem units** using **Permapro** concrete adhesive.





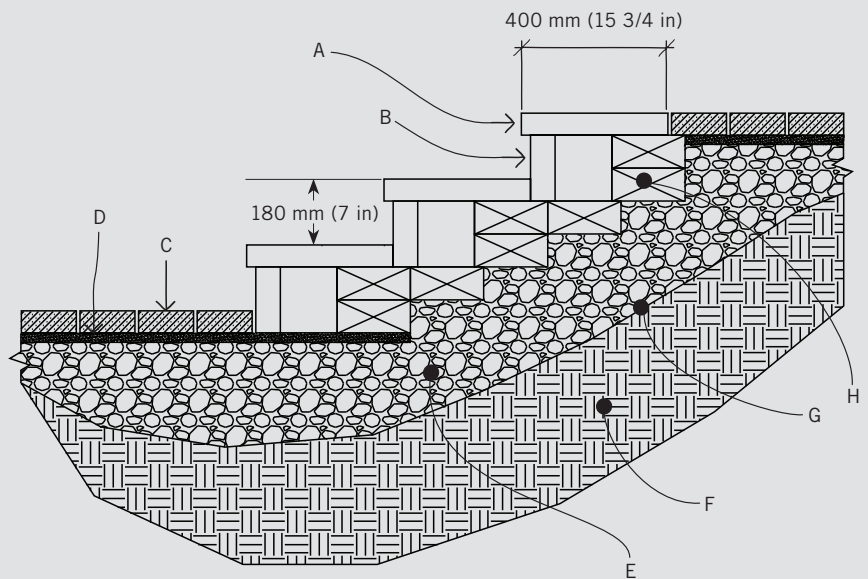
BUILDING STAIRS

MELVILLE TANDEM STEP UNITS

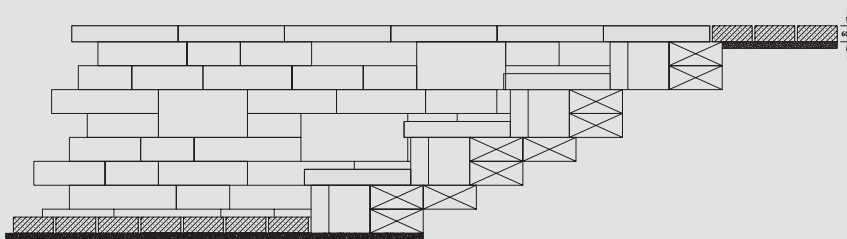
To build Melville stairs, we suggest using Melville Tandem step unit combined with the Melville Tandem unit (structural and veneer) used as risers.

- A Melville Tandem step unit
60 mm × 400 mm × 600 mm
(2 3/8" × 15 3/4" × 23 5/8")
- B Structural and veneer Melville Tandem unit
180 mm × 222 mm × variable
(3 9/16" × 8 3/4" × variable)
- C Concrete paver 60 mm (2 3/8")
- D 25 mm (1") bedding sand
- E 0-20 mm (0-3/4") compacted aggregate base
- F Existing soil
- G Geotextile membrane
- H Starter unit 90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")

All step and riser units must be glued together using Permapro adhesive.



MELVILLE TANDEM STEP UNITS STAIR INTEGRATION / TANDEM WALL





LEXA TANDEM STEP UNITS

To build Lexa stairs, we suggest using City 60 or 80 step unit combined with the Lexa Tandem 180 units used as risers.

OPTION 1

A City 60 step unit

60 mm × 360 mm × 610 mm
(2 3/8" × 14 3/16" × 24")

OPTION 2

A City 80 step unit

80 mm × 360 mm × 610 mm
(3 1/8" × 14 3/16" × 24")

B Structural and veneer Lexa Tandem unit

180 mm × 222 mm × variable
(3 9/16" × 8 3/4" × variable)

C Concrete paver 60 mm (2 3/8") or 80 mm (3 1/8")

D 25 mm (1") bedding sand

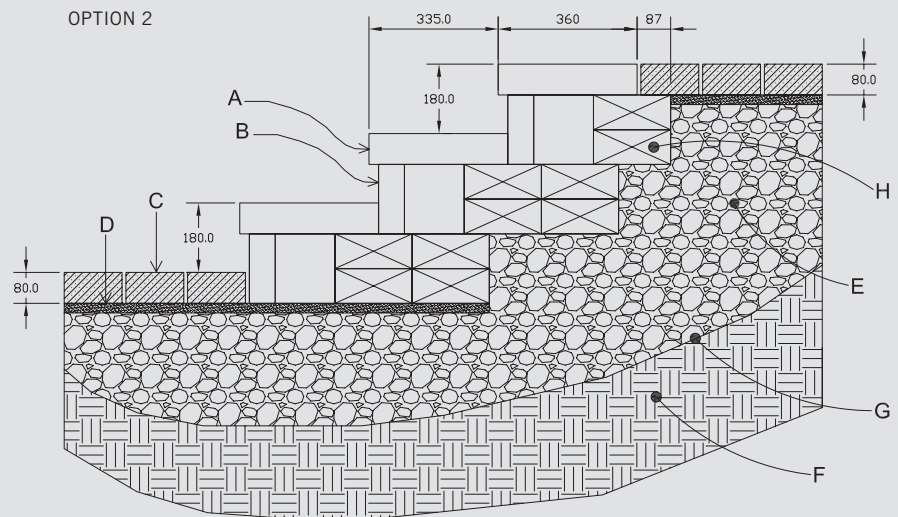
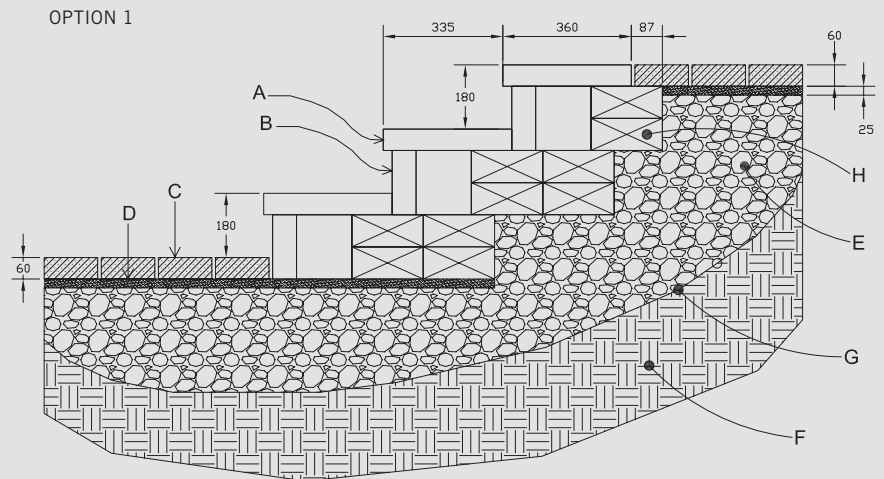
E 0-20 mm (0-3/4") compacted aggregate base

F Existing soil

G Geotextile membrane

H Starter unit 90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")

All step and riser units must be glued together using Permapro adhesive.

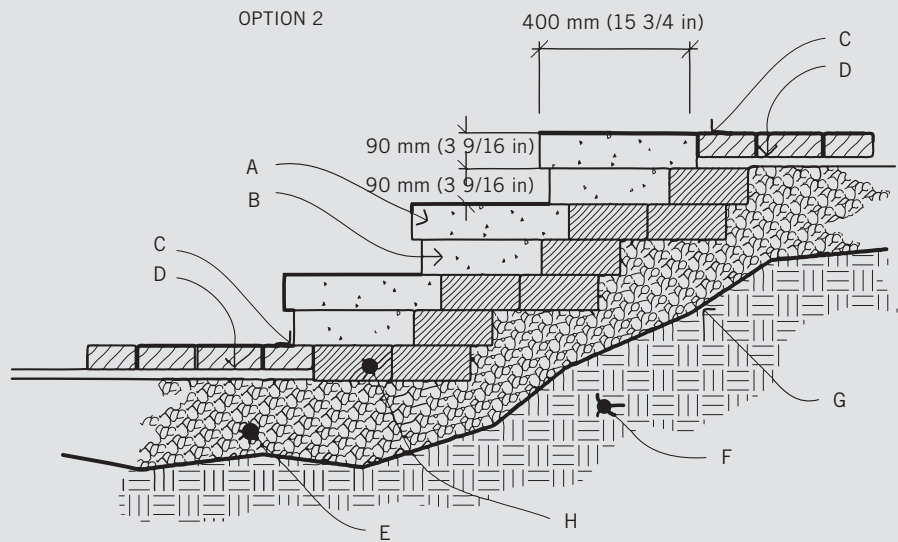
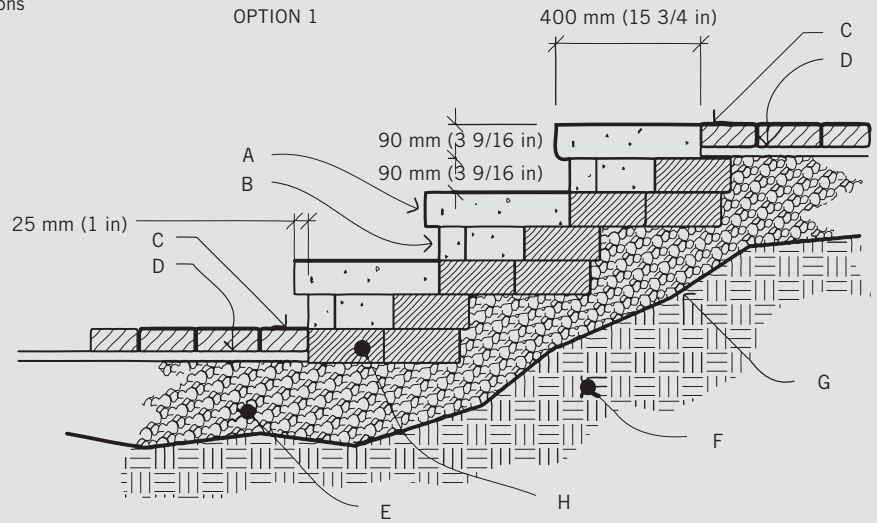


LAFITT TANDEM STEP UNITS

To build stairs, it is recommended that the step unit be used in combination with one of the following options for the riser:

- A Lafitt Tandem step unit
90 mm × 400 mm × 400 mm
(3 9/16" × 15 3/4" × 15 3/4")
- B **Option 1**
Structural unit and Lafitt Tandem veneer
90 mm × 222 mm × variable
(3 9/16" × 8 3/4" × variable)
- Option 2**
Lafitt Tandem straight capping unit
90 mm × 305 mm × 400 mm
(3 9/16" × 12" × 15 3/4")
- C Concrete paver
60 mm (2 3/8") or 80 mm (3 1/8")
- D 25 mm (1") bedding sand
- E 0-20 mm (0-3/4") compacted aggregate base
- F Existing soil
- G Geotextile membrane
- H Starter unit 90 mm × 200 mm × 400 mm
(3 9/16" × 7 7/8" × 15 3/4")

All step and riser units must be glued together using Permapro adhesive.





BUILDING PILLARS

This section discusses the different types of pillars which can be built using the Tandem system, namely:

- Tandem pillars with steel pillar grids
- Tandem pillars with structural modules

Tandem veneer units are used for the exterior facing of the pillar. The interior core of the column serves a structural function and can be built in accordance with one of the following two methods: using structural units (regular Tandem system) or using a steel pillar grid instead of structural units (Tandem pillar grid).

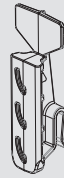
TANDEM PILLARS WITH PILLAR GRIDS

That type of pillar is built with Lafitt and Melville Tandem veneer units only. The building of this type of column begins with the use of a steel pillar grid which provides structural support for the veneer units. The units are fastened to the pillar grid using specially-designed connectors.

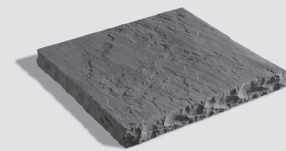
The essential details for building this type of pillar are described below.

90 mm LAFITT AND MELVILLE TANDEM COLUMN WITH PILLAR GRID ASSEMBLY

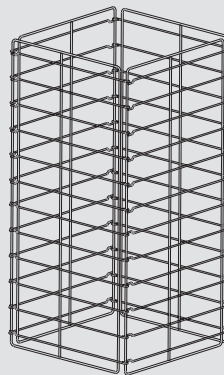
MATERIAL NEEDED:



GRID CONNECTORS
200 UNITS PER BAG



ESPLANADE CAPPING
PILLAR MODULE (29" x 29")



TANDEM PILLAR GRID

90 mm LAFITT OR MELVILLE
TANDEM VENEER UNITS:

48 REGULAR UNITS
(12A, 12B, 12C, 12D)

48 TEXTURED END CORNER
UNITS (12A, 12B, 12C, 12D)

With this material, you can construct one Pillar:
670 mm x 670 mm (26 3/8" x 26 3/8") of 1080 mm in height (42 1/2").

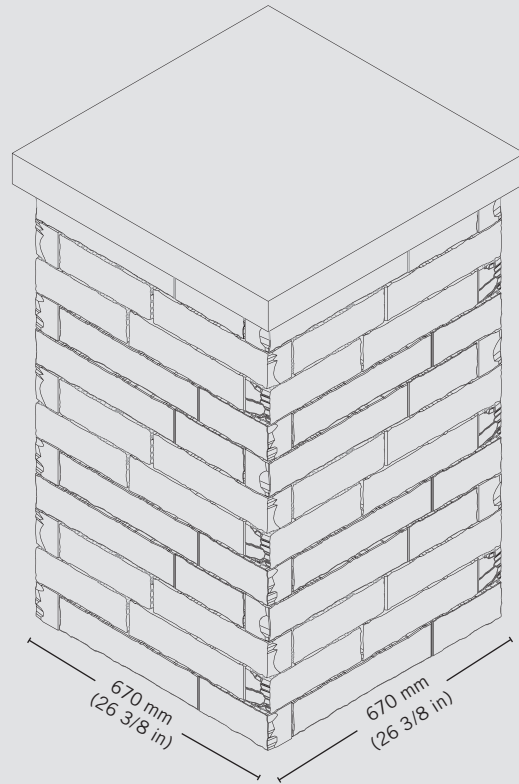
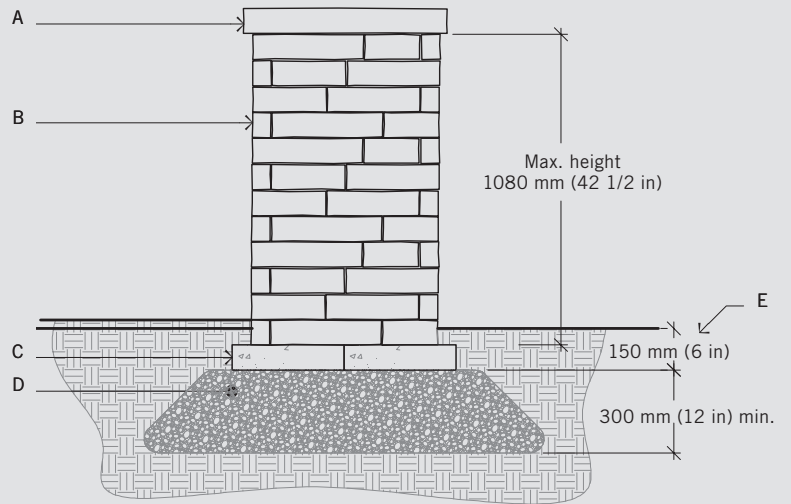
One Pillar requires the use of 2.6 m² (28 ft²) of Veneer units.

One cube contains 10 Pillar grids and 10 bags of 200 grid connectors.

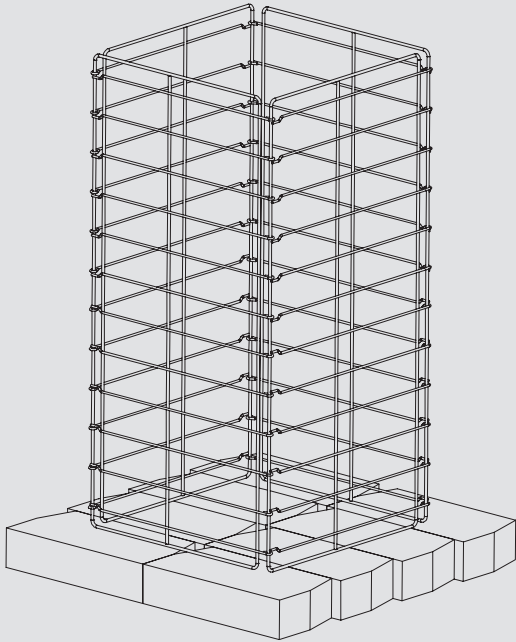
Note: All Melville veneer units come with one textured end (corner units)

LAFITT OR MELVILLE TANDEM PILLAR GRID –
CROSS SECTION

- A Esplanade Capping Pillar Module (29" × 29")
- B 90 mm Lafitt or Melville Tandem Veneer unit
- C Starter unit
- D 0-20 mm compacted granular Foundation, 300 mm (12")
- E Minimum Embedded Soil, 150 mm (6")

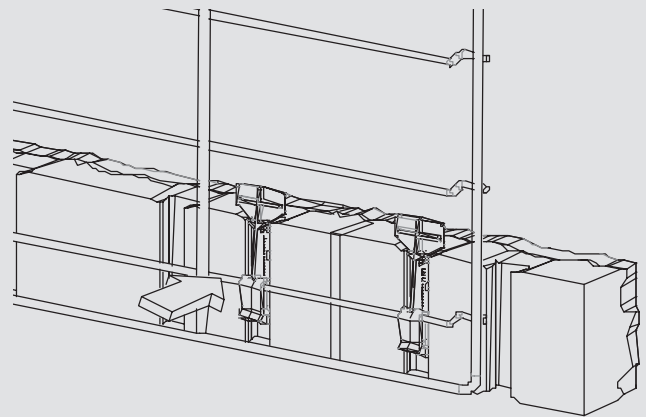
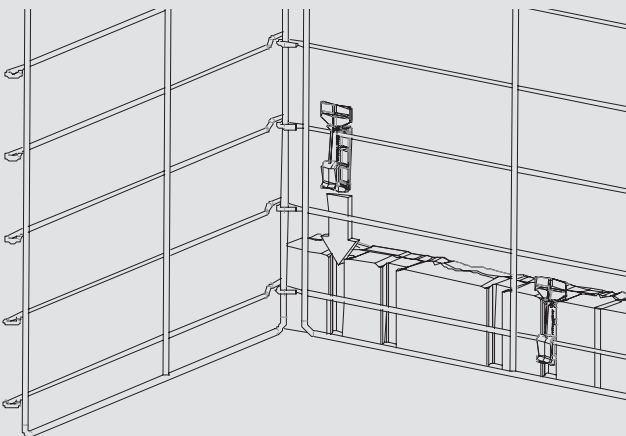


Begin by placing a row (8 units) of starter units on a base of compacted crushed stone. Unfold the steel pillar grid and place it on the prepared surface.

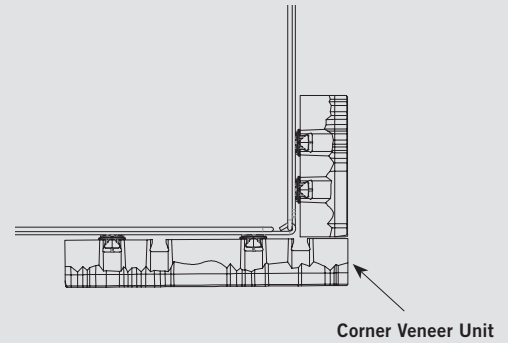
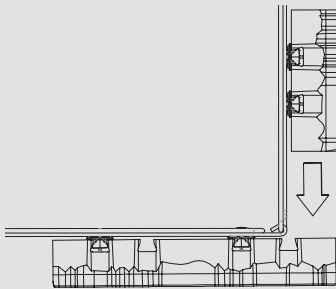
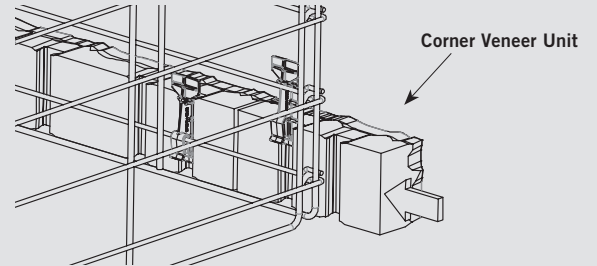
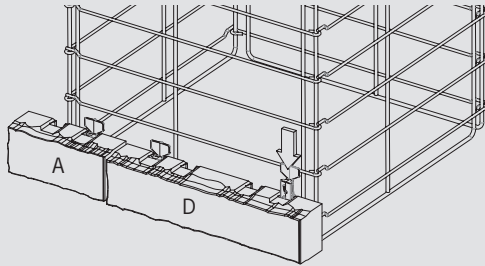


1ST ROW OF STARTER UNITS

Insert the pillar connectors (using 2 connectors for each unit) into the veneer units which form the first row of the pillar. Place the veneer units for the first row around the steel pillar grid, making sure to “click” the connectors onto the horizontal wires (refer to the recommended installation pattern for the veneer units which have been selected).



The corners of the pillar can be built easily by sliding the units along the wire until they line up with the corner unit which was installed previously.



LAYING PATTERN

Suggested installation pattern for the optimal use of the Tandem veneer units.

TANDEM PILLAR WITH 90 mm UNITS

FIRST 4 ROWS
(OVER THE STARTER UNITS)
360 mm (14 in)

D	A	D	4 TH ROW
C	B	C	3 RD ROW
B	C	B	2 ND ROW
A	D	A	1 ST ROW

INSTALLATION PATTERN TO REPEAT
UP TO DESIRED HEIGHT (FRONT VIEW)

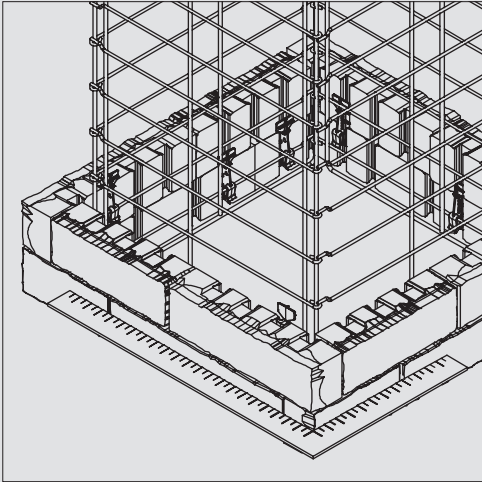
90 mm TANDEM PILLAR
WITH 180 mm UNITS

FIRST 5 ROWS
(OVER THE STARTER UNITS)
(FOR REFERENCE ONLY)

B	B	5 TH ROW	
F		A	4 TH ROW
F		B	3 RD ROW
B	C	B	2 ND ROW
A	D	A	1 ST ROW

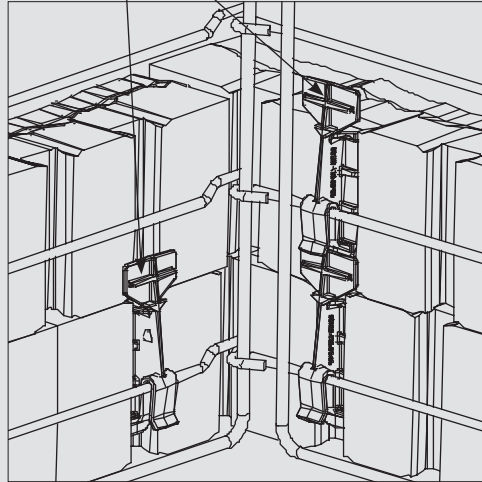
INSTALLATION PATTERN TO REPEAT
UP TO DESIRED HEIGHT (FRONT VIEW)

90 mm TANDEM PILLAR

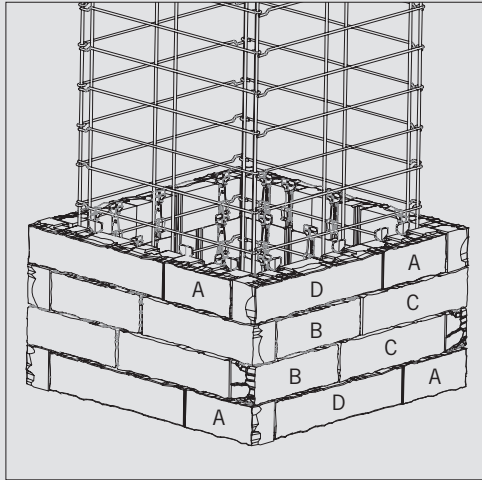


Once the first row has been completed, fill the interior space with clean 20 mm aggregate, and then use a square to ensure that the corner units are perpendicular to each other. Repeat this step after every second row has been completed. Install subsequent rows in the same manner, up to the desired height.

Upper part of the connector

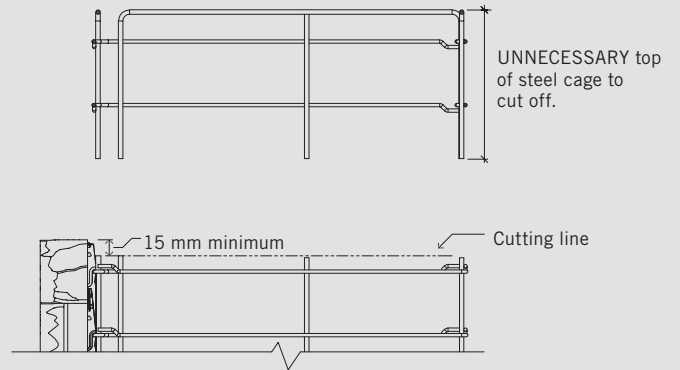


Ensure that the upper part of each connector is firmly in place behind the veneer unit, since it will serve as a support for the unit which will be installed above it.



This is the recommended installation procedure for building the first four rows of a pillar; it makes optimal use of the veneer formats within a pallet: 16 regular Veneers and 16 Veneers with a texture end.

Repeating this pattern two more times will build a pillar with 12 rows and a height of 42 1/2 inches.



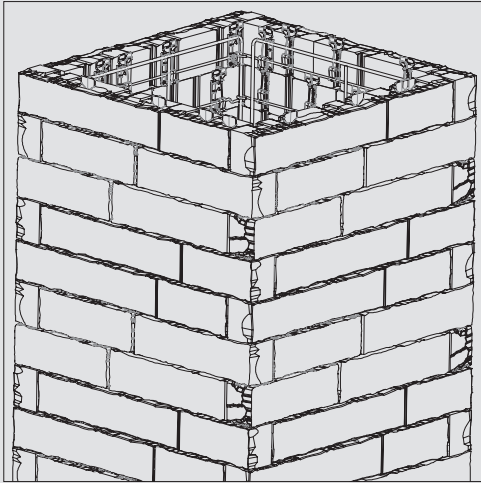
CUTTING INSTRUCTION OF PILLAR GRID (front view)

To build a pillar which is shorter than 1067 mm (42"), simply cut away the excess portion of the steel pillar grid with a grinder.

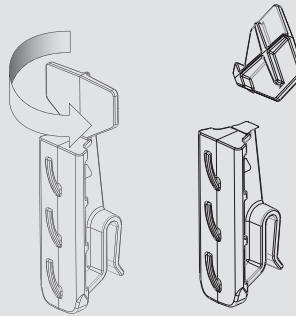
A full steel pillar grid can be used to build a pillar with an overall height above ground, including the capping unit, of 1067 mm (42").

When the last row is reached, cut off the tops of the connectors with sheet-metal shears or twist them off by hand. Then install the capping unit on the pillar, adhering it in place with glue.

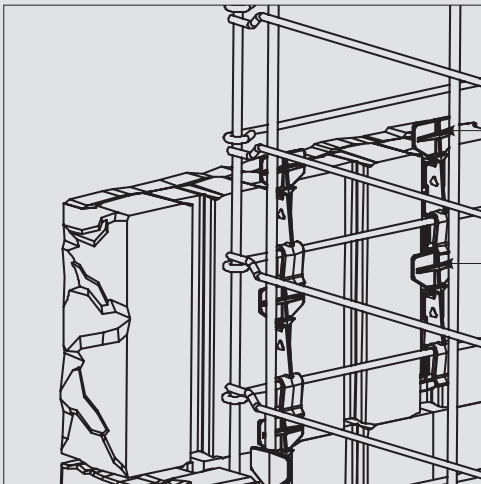
Important note: the capping unit must rest on the veneer units and not on the steel pillar grid.



*** Important note: the capping unit must rest on the veneer units and not on the steel pillar grid**



TANDEM PILLAR 90 and 180 mm VENEER UNITS



Upper connector

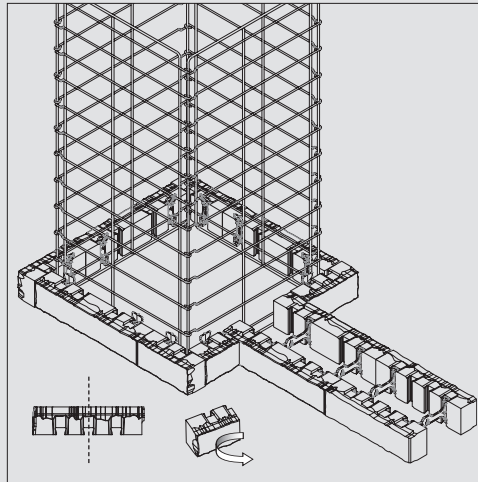
Lower connector

When using 180 mm high veneer units, use four connectors as shown below, beginning with the two lower ones and ending with the two upper ones.

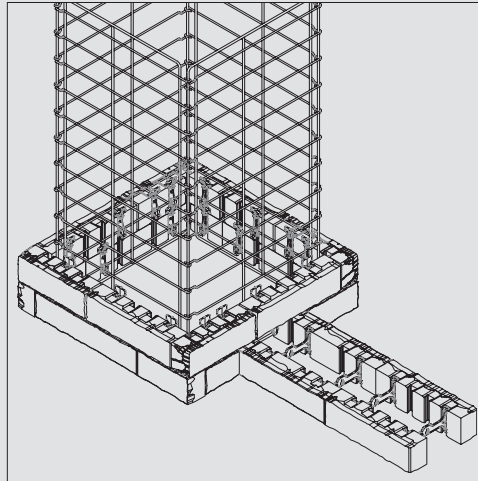
To integrate 180 mm units into a pillar, use only 180 mm E and F units with textured corners. Carefully place the veneer units so that the joints are staggered, and ensure that you place at least one 180 mm unit on each side of the pillar, and not more than two.

JOINING A DOUBLE-SIDED WALL TO A PILLAR

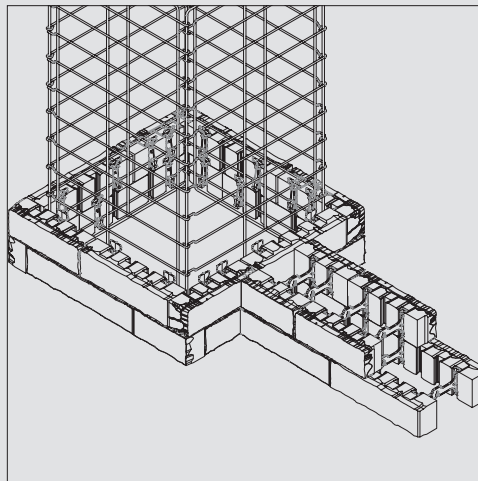
To join a double-sided wall to a pillar, you must cut the veneer unit for the pillar at every second row. Cut it at the centre of the dovetail recess.



For the second row, run the unit across the double-sided wall.



Begin the second row of the double-sided wall from the face of the pillar.



TANDEM PILLAR WITH STRUCTURAL UNITS

Four types of pillar can be built:

- Lafitt Tandem
- Melville Tandem
- Lexa Tandem
- Esplanade Tandem

LAFITT AND MELVILLE TANDEM PILLARS

Pillars are built by placing Tandem units at 90° angles to create a square. Corners can then be completed by adding the appropriate textured veneer units. These veneers are attached using a corner connector as mentioned in the section on building a corner. It is advisable to glue each module together for every course.

Two different sizes of pillar can be built by using 90 mm units. The 180 mm Tandem units could be also used in combination with the 90 mm Tandem units. When building a pillar, it is suggested to use a maximum of 15 to 20% of 180 mm units (modules E or F).

Maximum pillar height ranges from 1200 mm to 1500 mm (4 to 5 ft) above ground level with a minimum buried depth of 150 mm (6"). Capping is completed using the various Esplanade capping units from Permacon (see the table below):

PILLAR 90 UNIT	ESPLANADE CAPPING	MAXIMUM HEIGHT
670 mm × 670 mm (26 3/8 in × 26 3/8 in)	737 mm × 737 mm (29 in × 29 in)	1200 mm (4 ft)
737 mm × 737 mm (29 in × 29 in)	787 mm × 787 mm (31 in × 31 in)	1500 mm (5 ft)

LEXA TANDEM PILLAR

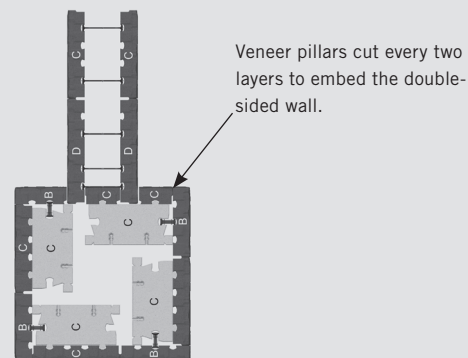
It is not recommended to build a pillar with the use of Lexa Tandem units for aesthetic and design purposes. Building a Lexa Tandem pillar requires the use of two units out of the four units available, leaving a large quantity of left over.

The predetermined installation patterns which are provided are intended to facilitate the building of each type of pillar. They also permit the optimal use of the different Tandem modules and the textured veneer units.

In all cases, it is important to avoid aligning vertical joints from one row to the next on all visible façades. For these reasons, some combinations should be avoided from row to another.

Note that for some combinations, you need to use a structural unit A cut in two and fitted together with the veneer units.

When a double-sided wall ends at a pillar, the pillar must be modified to ensure it is solidly embedded, as in the following illustration:



EXAMPLE OF EMBEDDING

LAFITT AND MELVILLE TANDEM PILLARS
WITH 90 mm UNITS

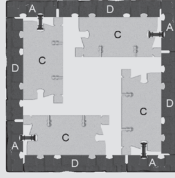
PILLAR
670 mm × 670 mm
(26 3/8 in × 26 3/8 in)

FIRST 4 ROWS
360 mm (14 3/16 in)

D	A	D	4 TH ROW
C	B	C	3 RD ROW
B	C	B	2 ND ROW
A	D	A	1 ST ROW

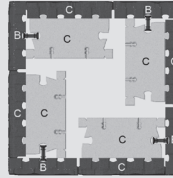
INSTALLATION PATTERN TO REPEAT
UP TO DESIRED HEIGHT
(FRONT VIEW)

1ST ROW



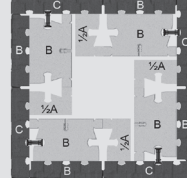
VENEER A WITH
TEXTURED END

2ND ROW



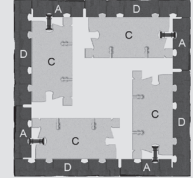
VENEER B WITH
TEXTURED END

3RD ROW



VENEER C WITH
TEXTURED END

4TH ROW



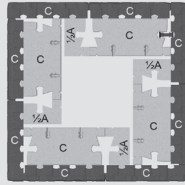
VENEER D WITH
TEXTURED END

LEGEND

- D** VENEER D WITH TEXTURED END
- C** VENEER C WITH TEXTURED END
- B** VENEER B WITH TEXTURED END
- A** VENEER A WITH TEXTURED END

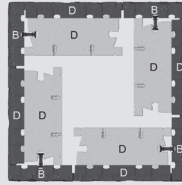
PILLAR
737 mm x 737 mm
(29 in x 29 in)

1ST ROW



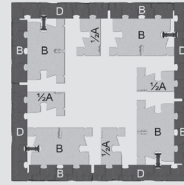
VENEER C WITH
TEXTURED END

2ND ROW



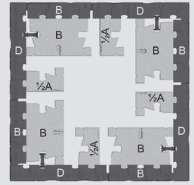
VENEER B WITH
TEXTURED END

3RD ROW



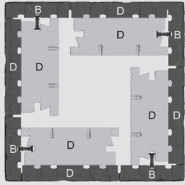
VENEER D WITH
TEXTURED END

4TH ROW



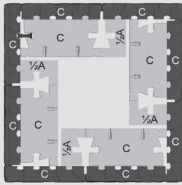
VENEER D WITH
TEXTURED END

5TH ROW



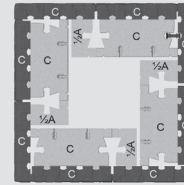
VENEER B WITH
TEXTURED END

6TH ROW



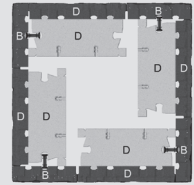
VENEER C WITH
TEXTURED END

7TH ROW



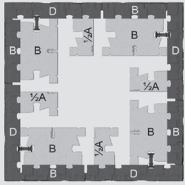
VENEER C WITH
TEXTURED END

8TH ROW



VENEER B WITH
TEXTURED END

9TH ROW



VENEER D WITH
TEXTURED END

FIRST 9 ROWS
810 mm (31 7/8 in)

D	B	D	
B		D	B
C	C		C
	C	C	
B	D		B
	D	B	D
D	B	D	
B		D	B
C	C		C

9TH ROW
8TH ROW
7TH ROW
6TH ROW
5TH ROW
4TH ROW
3RD ROW
2ND ROW
1ST ROW

INSTALLATION PATTERN TO REPEAT
UP TO DESIRED HEIGHT
(FRONT VIEW)

LEGEND

- D** VENEER D WITH TEXTURED END
- C** VENEER C WITH TEXTURED END
- B** VENEER B WITH TEXTURED END
- A** VENEER A WITH TEXTURED END

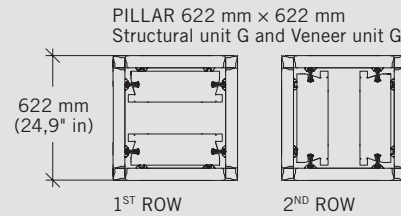
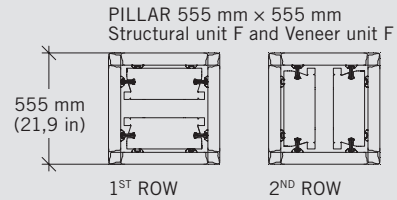
ESPLANADE TANDEM PILLARS

The pillars are built by two **Esplanade Tandem units** (F or G) facing each other to form the front and back surfaces of the pillar. Two veneers are then installed and attached on either side of the structural units, using the **corner connectors**. This forms the first course of the pillar. The second course repeats the first course, placed at a 90° angle. We recommend attaching the units together using adhesive on every course.

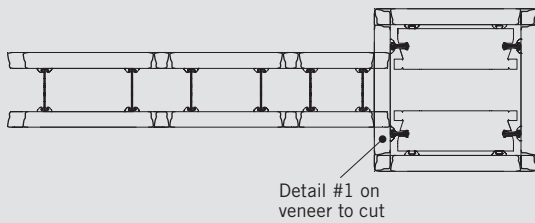
It is possible to build 2 different pillar sizes. The maximum height of one pillar ranges from 1200 mm to 1500 mm (4 to 5 ft) above ground, with a minimum buried depth of 150 mm (6"). The capping is added using the various **Esplanade capping** units from Permacon (see table below)

ESPLANADE PILLAR	ESPLANADE CAPPING	MAXIMUM HEIGHT
555 mm × 555 mm (21 7/8 in × 21 7/8 in)	635 mm × 635 mm (25 in × 25 in)	1200 mm (4 ft)
ESPLANADE PILLAR	ESPLANADE CAPPING	MAXIMUM HEIGHT
622 mm × 622 mm (24 1/2 in × 24 1/2 in)	686 mm × 686 mm (27 in × 27 in)	1500 mm (5 ft)

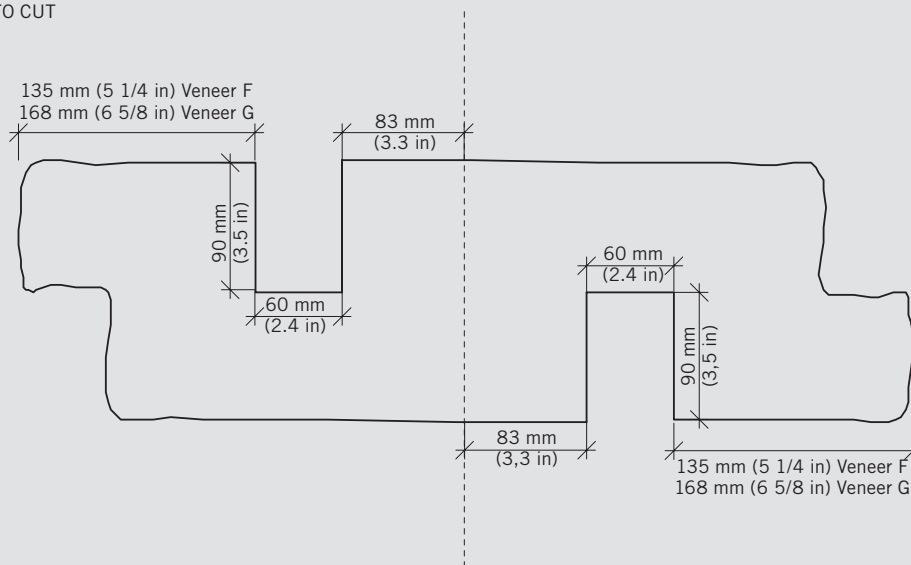
In all cases, avoid aligning joints vertically from row to row on all visible surfaces.



DOUBLE-SIDED WALL EMBEDDED IN A PILLAR



DETAIL #1 ON VENEER TO CUT





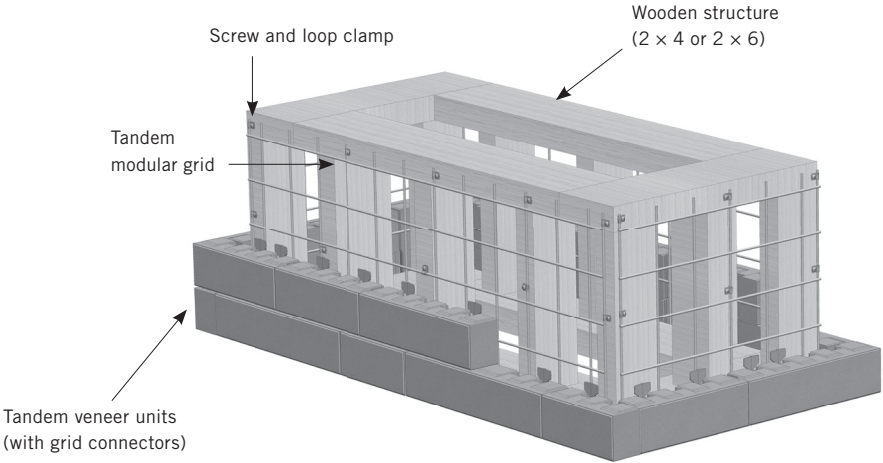
CONSTRUCTION OF OUTDOOR LIVING COMPONENTS WITH THE TANDEM MODULAR GRID (GENERALITY)

The Tandem system allows you to install different outdoor living components such as outdoor kitchens (barbecue, fridge, bar), patio furniture (bench and table), flower box, outdoor gas fireplace, privacy wall, fencing and deck skirting.

Indeed, you can easily build all these features by using the Tandem modular grid.

Our system has multiple benefits:

- Provides a unified look for all the features of the landscaping design.
- Provides a durable, economical and maintenance-free solution.
- Offers great flexibility and unrestricted creativity regarding the configuration and size of components to be constructed.
- Offers a solution to difficult issues (e.g. deck skirting).
- Eliminates the use of cementitious products (mortar).



Basic Principles

A set of Tandem modular grids is attached to a structure of treated wood to which are attached Tandem veneer units (Lafitt, Melville or Lexa). Since veneer units are manufactured in multiples of 67 mm, the overall dimensions of outdoor units should always be a multiple of 67 mm in order to avoid cuts. The wooden structure should be built taking into account the modular design of Tandem veneers. The same applies to the height, which must be a multiple of 90 mm. The item is finished off with an appropriate capping module. You can construct a range of outdoor units of various dimensions.

Main components of the system

- Tandem modular grid, 720 mm × 1080 mm (28" × 42 1/2"), including stainless steel screws and Loop clamps for fastening. A modular grid covers a facing surface of 0.78 m² (8.40 sqft). Each modular grid includes a kit of 60 connectors, 10 × 1 1/4" screws and 10 loop clamps.
- Tandem veneer units (Lafitt, Melville or Lexa).
- Galvanized shelf angle (for deck skirting, privacy walls and fences) 2 1/2" × 2 1/2" × 8' (min 10 gauge, Z275 G90 galvanized steel, ASTM A653 Grade 33).
- Permacon concrete capping module (Lafitt, Melville and Esplanade Tandem, Mondrian as well as the City and Privacy Capping).

Other components not supplied by Permacon

- Treated Wood: 2x4, 2x6 and 2x8 boards, 4x4 or 6x6 posts, 4x8 plywood sheets (all wood should be treated against rot and must be category S-P-F #1 or better). Refer to the various suppliers' specific application sheets for details.
- Fiber cement panels 1220 mm × 2240 mm × 12 mm (48" × 96" × 1/2").
- #10 screws of varying lengths, nuts, bolts and washers where required, all in stainless steel. It is not recommended to use treated wood screws (green ceramic) or metal plated screws (zinc, copper or other).
- Hilti Kwik Bolt-type anchors (for concrete deck skirting)
- Simpson Strong-Tie-type hardware for construction of wood frame for deck.
- Custom countertops made of granite, quartz, marble and natural stone as alternatives to concrete tops.

WOOD FRAMING

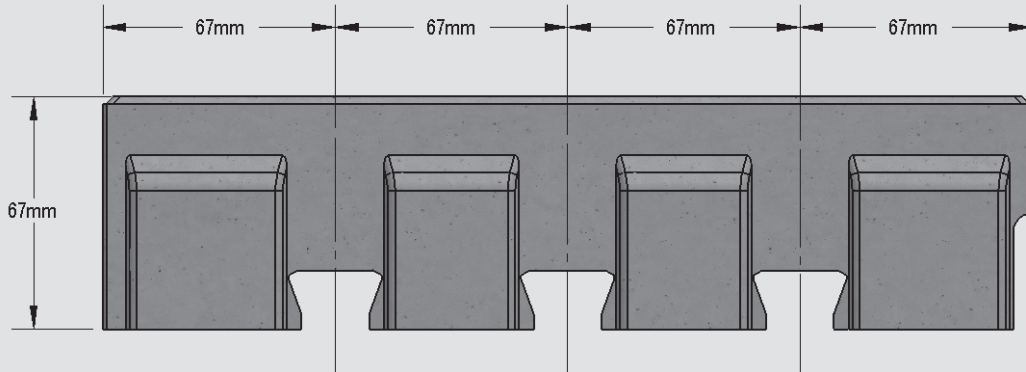
You must always take the modular design of Tandem veneers into account when constructing wood framing. The overall dimensions of outdoor units must always be a multiple of 67 mm in length and width and 90 mm in height. When installing the framing, remember that grids need a 16 mm (5/8") space between the veneer and the frame.

Bearing this in mind, the following tables show detailed measurements for the framing of units. These tables are very useful for quickly calculating the actual dimensions of the wood framing and the unit to be constructed to build the component without any veneers cut.

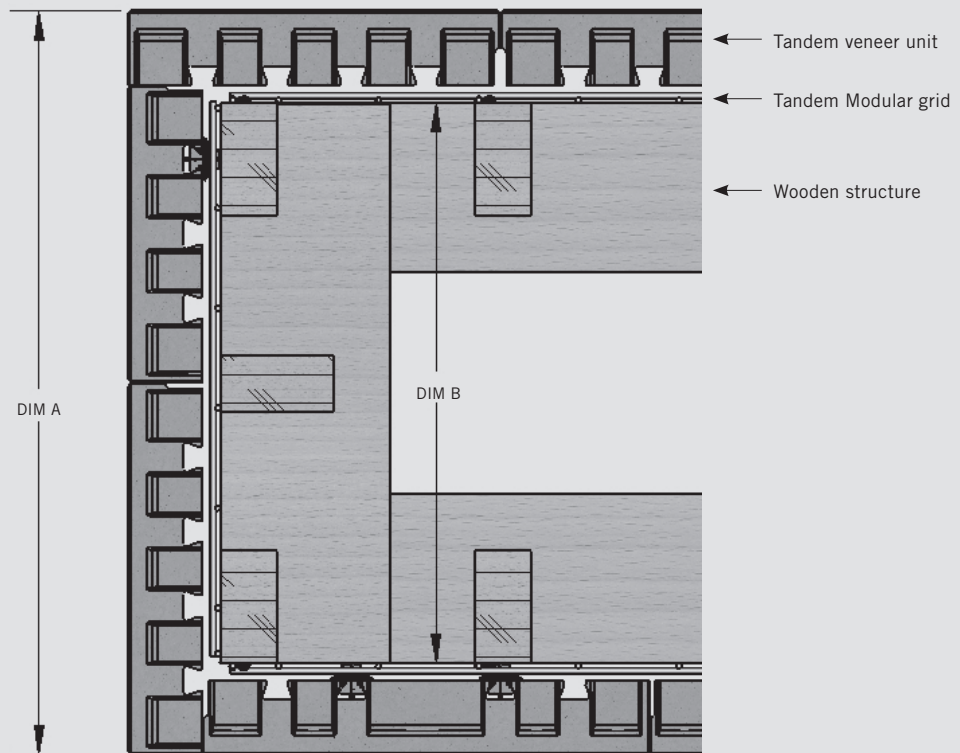
Table of component and its wood frame dimensions based on the modular format of veneers

DIM A (mm)	DIM A (in)	DIM B (mm)	DIM B (in)
201	7 15/16	35	1 3/8
268	10 9/16	102	4
335	13 3/16	169	6 5/8
402	15 13/16	236	9 5/16
469	18 7/16	303	11 15/16
536	21 1/8	370	14 9/16
603	23 3/4	437	17 3/16
670	26 3/8	504	19 13/16
737	29	571	22 1/2
804	31 5/8	638	25 1/8
871	34 5/16	705	27 3/4
938	36 15/16	772	30 3/8
1005	39 9/16	839	33 1/16
1072	42 3/16	906	35 11/16
1139	44 13/16	973	38 1/4
1206	47 1/2	1040	40 15/16
1273	50 1/8	1107	43 9/16
1340	52 3/4	1174	46 1/4
1407	55 3/8	1241	48 7/8
1474	58 1/16	1308	51 1/2
1541	60 11/16	1375	54 1/8
1608	63 5/16	1442	56 3/4
1675	65 15/16	1509	59 3/8
1742	68 9/16	1576	62 1/16
1809	71 1/4	1643	64 5/8
1876	73 7/8	1710	67 5/16
1943	76 1/2	1777	69 15/16
2010	79 1/8	1844	72 5/8
2077	81 3/4	1911	75 1/4
2144	84 7/16	1978	77 7/8
2211	87 1/16	2045	80 1/2
2278	89 11/16	2112	83 1/8
2345	92 5/16	2179	85 3/4
2412	94 15/16	2246	88 7/16
2479	97 5/8	2313	91 1/16
2546	100 1/4	2380	93 11/16
2613	102 7/8	2447	96 5/16
2680	105 1/2	2514	99

TANDEM VENEER UNITS –
MODULAR DESIGN



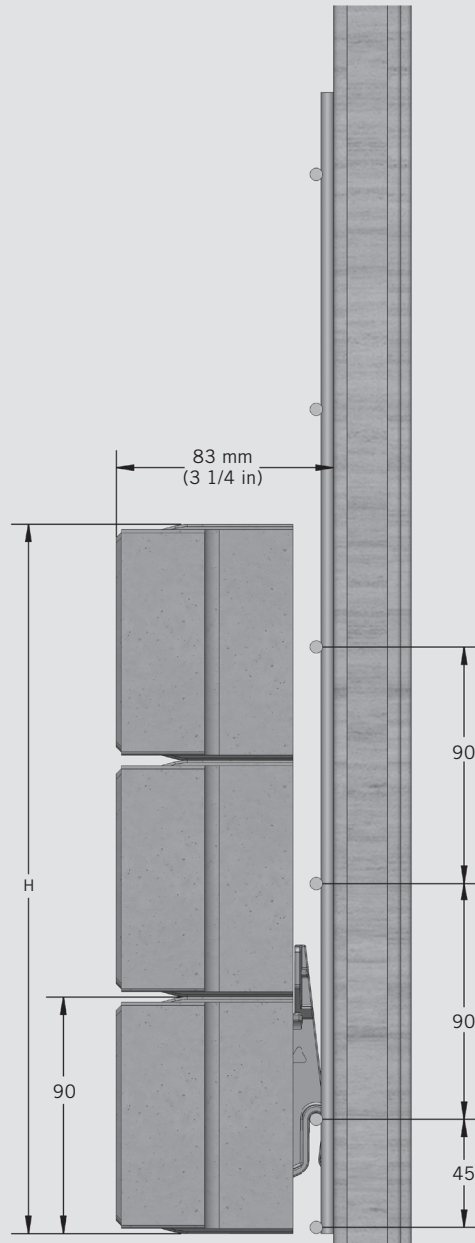
TYPICAL COMPONENT –
PLAN VIEW



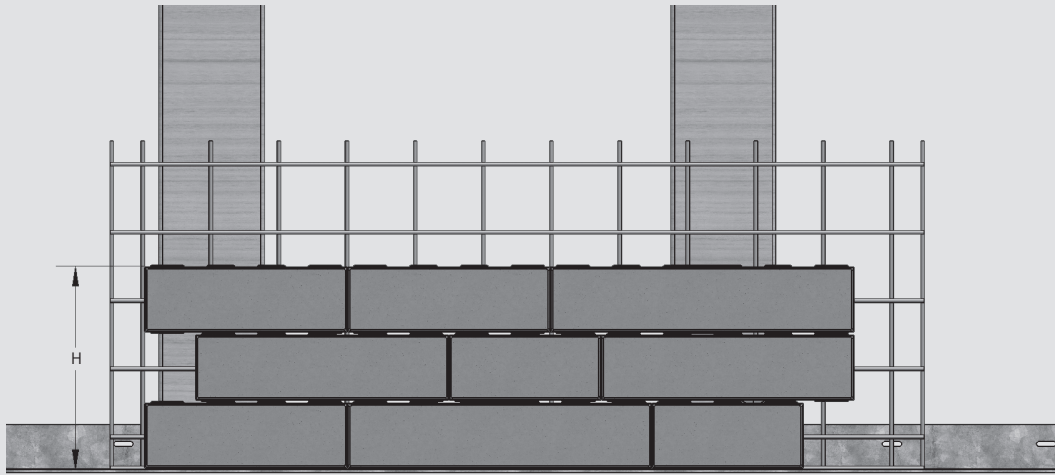
TYPICAL COMPONENT –
SIDE VIEW

Table – Height of components and its wood frame according to the modular design of veneer units (90 mm)

# OF ROWS	HEIGHT (mm)	HEIGHT (in)
2	180 mm	7 1/16
3	270 mm	10 5/8
4	360 mm	14 3/16
5	450 mm	17 11/16
6	540 mm	21 1/4
7	630 mm	24 13/16
8	720 mm	28 1/3
9	810 mm	31 1/8
10	900 mm	34 5/8
11	990 mm	39
12	1080 mm	42 1/2



TYPICAL COMPONENT –
FRONT VIEW

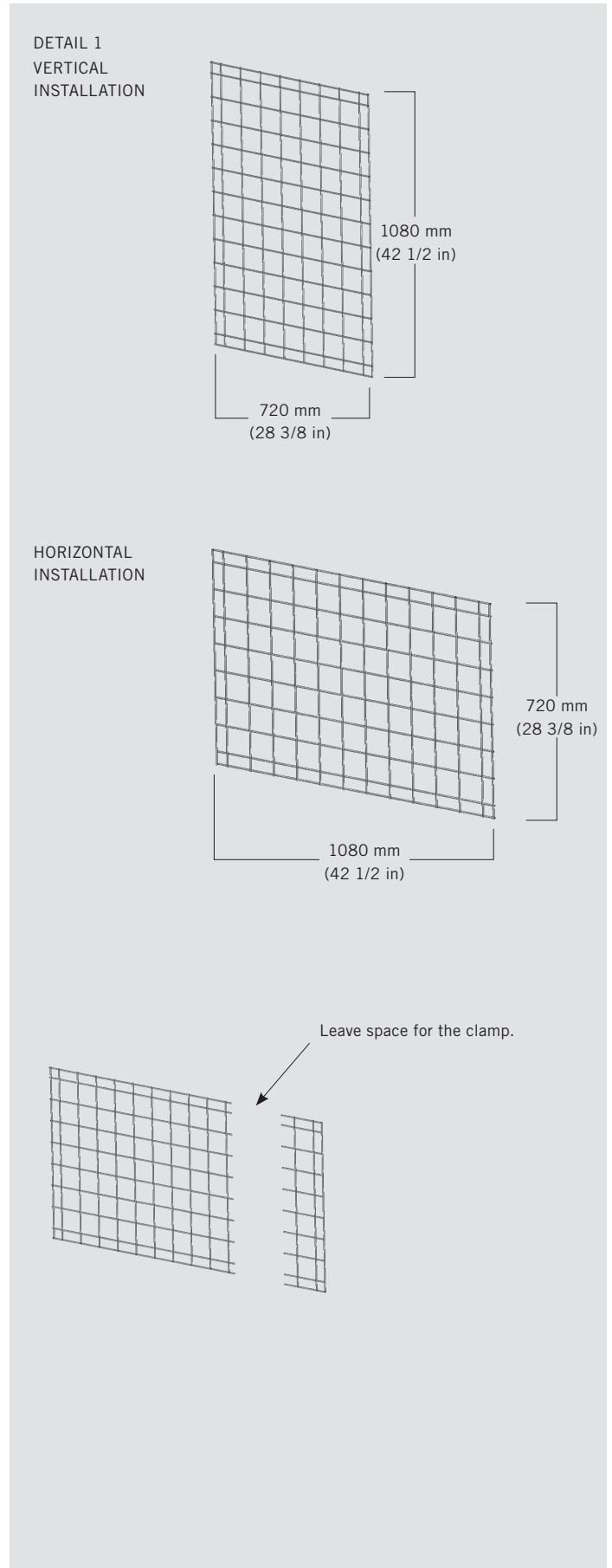


TANDEM MODULAR GRID

It is important to note that the units to be constructed must always be straight and have corners (inner and outer) forming a 90° angle. Therefore, making a corner is a common element in all construction plans. You can also refer to the plan view detail (page 44) to see how to make a 90° corner, taking into account the modular design of Tandem veneers and grids. When building the wood frame, keep in mind that you have to install Tandem grids. The flexibility of the grid means that you can install it in either direction, horizontally or vertically.

You have to cut the grids when the unit you're building is smaller in size (height or length) than a complete grid of 28" or 42 1/2". It may be helpful to decide the direction of the grid so as to minimize cuts. To cut a grid, use any suitable tool like a grinder or bolt cutters.

To avoid making cuts in the veneers, simply follow the dimensions based on the modular design of the veneers shown in the previous tables.

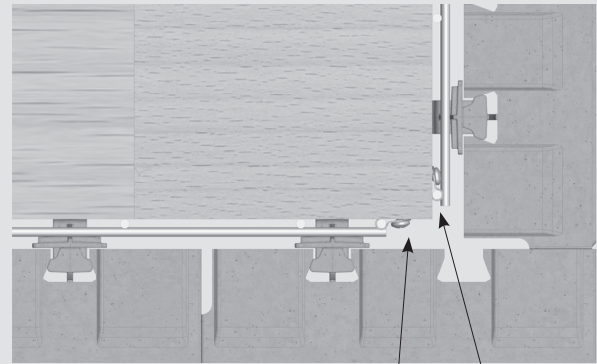


The grid is attached with the loop clamps and screws supplied. Simply place the loop clamps around the vertical rods of the grid and then insert a screw into the wood frame. There are 10 loop clamps per Tandem grid. To secure a grid, the loop clamps should be evenly positioned, starting with the edge of the grid and moving towards the center. To ensure the solidity of the grid, use approximately one fastener (screw and loop clamps) per square foot of grid or 10 fasteners per square meter. To attach a grid to the wood frame, the vertical rods must be placed directly against the structure.

Since the metal rods of the grids are spaced every 90 mm, it's helpful if the intermediate posts of the wood framing are multiples of 90 mm. This will increase the available attachment area for the grid. A continuous attachment area like plywood sheeting can also be used to provide a larger surface for attaching the Tandem grid.

When a unit requires more than one grid either horizontally or vertically, they should be installed one after the other in both directions.

DETAIL 2



CUTTING INSTRUCTION OF MODULAR GRID (PLAN VIEW)

Keep the last vertical rod intact for better fixation

Leave free space to attach the loop clamps



3D VIEW

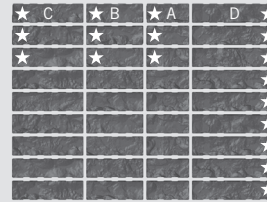
TANDEM VENEERS

When the grids have been installed, just insert the veneers for the unit using the connectors specially designed for the purpose. We recommend using 2 connectors per veneer for a solid job, but sometimes it can happen that a connector can't be inserted because of the grid's geometry. You can then secure the veneer by gluing it around other veneers with a concrete adhesive such as Permapro adhesive.

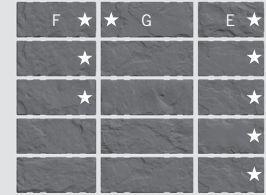
Normally, for a standard project, all formats of the veneer units are used randomly. As for retaining walls, always keep in mind the principle of staggering the vertical joints from one row to another. For the corners, you need corner units just like constructing a pillar with steel grids (see "Building Pillars" section). But it should be noted that sometimes the construction of a short unit requires a larger quantity of the same format veneers, especially corner units (for Lafitt Tandem, the amount of veneer corner units is in a proportion of about 1/3 of a pallet. For Melville Tandem, all veneer units have a textured corner. For Lexa Tandem, the amount of veneer units are limited to B and D units, every second row only). It is important to check this when calculating the quantity so as to have enough of the appropriate veneers on hand.

It is also possible to use 180 mm veneers when constructing a unit, the same as for a retaining wall or a column.

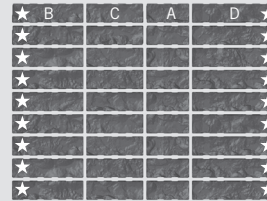
STACKING POSITION ON PALLETS (WITH A TEXTURED END)



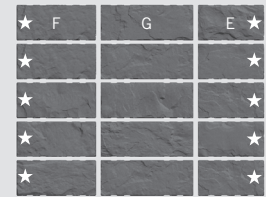
LAFITT TANDEM – 90 mm UNITS



LAFITT TANDEM – 180 mm UNITS



LEXA TANDEM – 90 mm UNITS
(EVERY SECOND ROW)



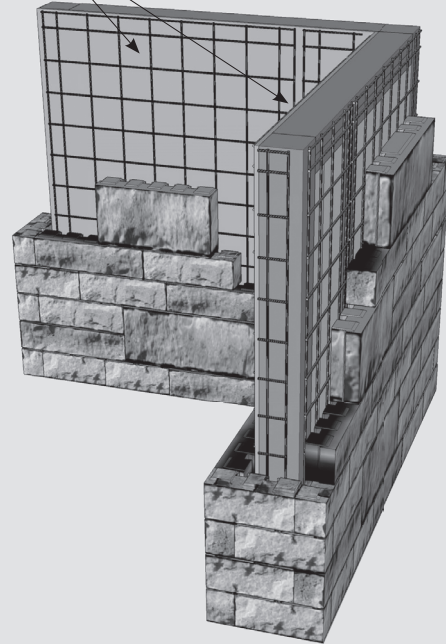
LEXA TANDEM – 180 mm UNITS
(EVERY SECOND ROW)

BRACING

Some items require bracing panels like plywood sheeting, especially for privacy walls, fencing and deck skirting. These panels are needed to strengthen the unit to withstand stress such as wind and to limit distortion under regular loads.

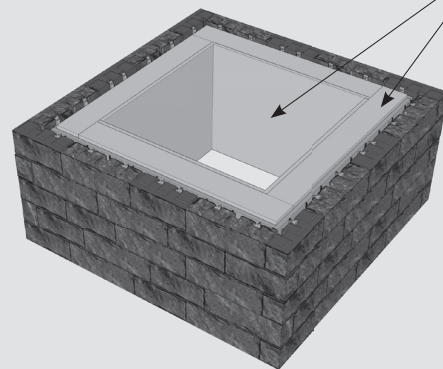
EXAMPLE OF BRACING
(PRIVACY WALL)

Plywood sheeting
for bracing



EXAMPLE OF A HEAT PROTECTION SET-UP

Fiber cement panel for
protection against heat

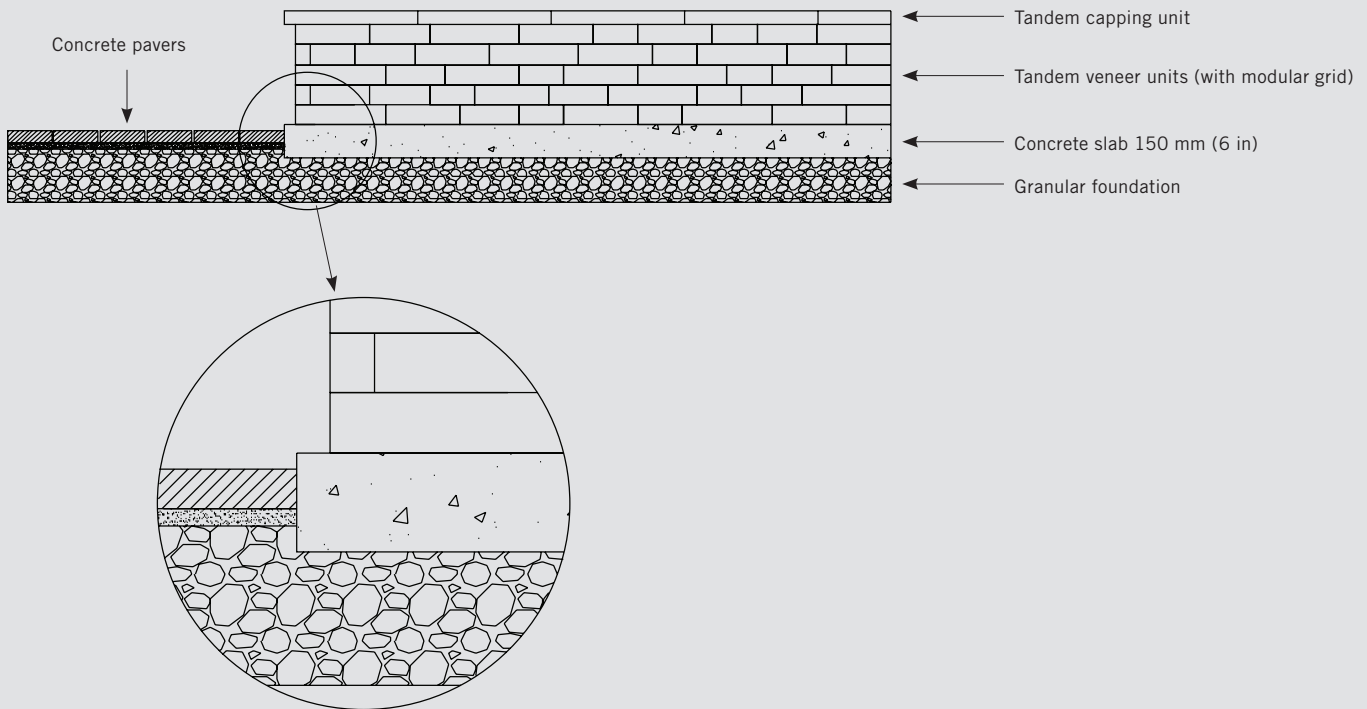


Other units require the installation of fiber cement panels for heat insulation (barbecues and outdoor gas fireplaces) or as protection against moisture (flower boxes). In these situations, we recommend fiber cement panels of a minimum thickness of 12 mm (1/2").

BASE SUPPORT FOR OUTDOOR UNITS

Outdoor units like a bench, flower box or outdoor fireplace can usually be built on a base of concrete foundation (starter modules) or placed directly onto concrete pavers. A granular base of compacted crushed stone should be laid before the foundation. However, we recommend that long or heavy units be supported on a concrete slab (minimum thickness of 150 mm or 6"). We also recommend that units like barbecues or tables with a single granite, quartz or marble top over their entire surface be supported on a reinforced concrete slab to prevent the top from breaking if the ground shifts. In each case, a compacted granular base should underlie the concrete slab.

COMPONENTS SUPPORTED ON A CONCRET SLABS – CROSS SECTION



Note: When a section of a unit has veneers that are not directly supported on the ground (foundation modules, pavers or concrete slabs), for example for installing doors, the veneers must be supported on shelf angle sections attached to the wood frame.

CONSTRUCTION LUMBER

Building the different units in this guide requires construction lumber for the framing: 2×4 , 2×6 and 2×8 boards, 4×4 and 6×6 posts and plywood sheets. We recommend that all wood used outdoors be treated against rot according to established procedures approved by Health Canada. You should use S-P-F #1 or #2 wood, or better. This type of wood usually has a minimum life of 15 years without maintenance in normal outdoor conditions.

Note: Wooden components that have been cut or sawed should be treated with an anti-rot product.

COMPLIANCE WITH CONSTRUCTION STANDARDS

In all circumstances, units to be constructed must always comply with the requirements of the National Building Code (version specific to your region) and local municipal bylaws and regulations.



CONSTRUCTION OF OUTDOOR LIVING COMPONENTS WITH THE TANDEM MODULAR GRID

BUILDING AN OUTDOOR GAS FIREPLACE

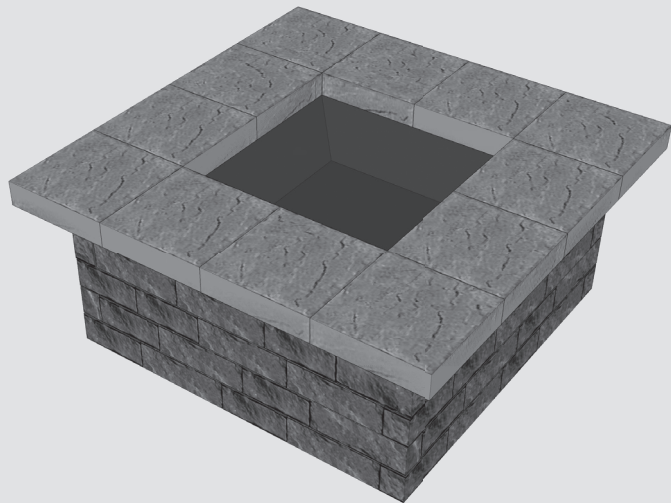
Note that the only type of fireplace recommended for this type of construction is a propane gas or natural gas fireplace. A wood fireplace is not permitted.

Construction should begin with laying a solid foundation that is leveled, compacted and well drained.

The wood framing must be built according to the type of fireplace chosen. Dimensions are calculated using the data on shop drawings provided by the fireplace manufacturer. It may be necessary to add some extra parts like plywood shims for adjusting to the exact modular dimensions of the fireplace (Tandem modular veneers according to the wood frame design).

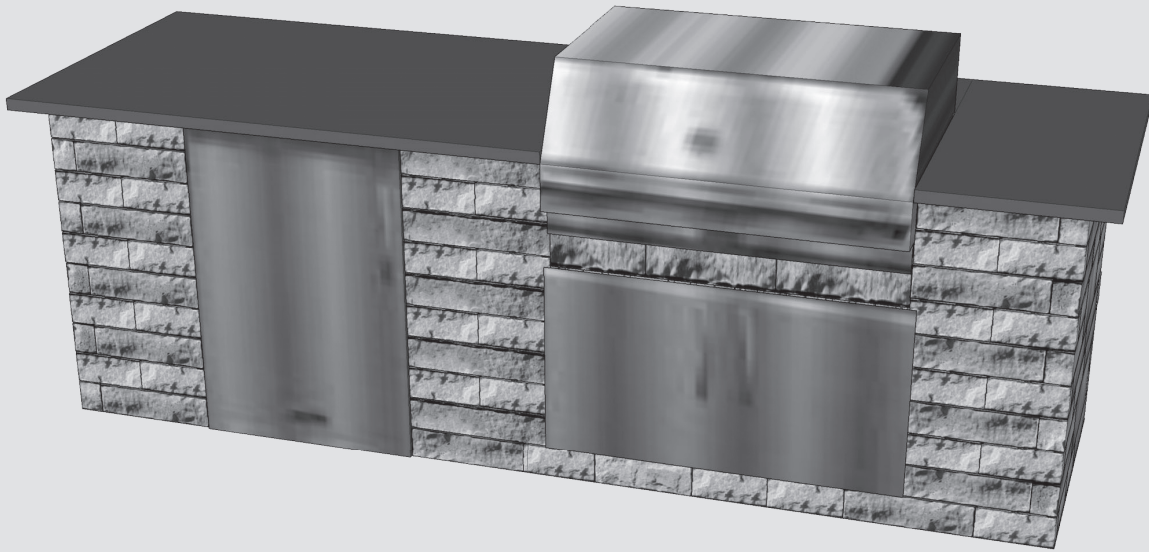
It is essential to install heat insulation. A fiber cement panel of a minimum thickness of 12 mm (1/2") is recommended for adequate protection. The panels must be installed all around the heating element (burner).

You must also plan to install conduits in the ground for gas pipes and for electric cables if required.



BUILDING AN OUTDOOR KITCHEN (BARBECUE, REFRIGERATOR, BAR)

The wood frame must be constructed according to the type of barbecue chosen. Dimensions are calculated using data on the shop drawings provided by the barbecue manufacturer. Additional accessories such as a fridge or integrated cabinet doors are also possible. Naturally, you have to plan on adding pieces of wood to attach accessories to the wooden structure, like a frame in the case of doors. When purchasing supplies, you will usually find moldings to finish the edges of the various units.



It is essential to install protection from heat and sparks. A fiber cement panel of a minimum thickness of 12 mm (1/2") or a double-skinned steel section if provided by the BBQ manufacturer is recommended for adequate protection. The panels must be installed all around the heating element (burner).

Finish off with concrete coping or panels of granite, quartz, marble or natural stone. The panels must be made to measure by specialized companies. You must make special provisions for handling and installation to avoid possible breakage. The panels are attached on top of the plywood with silicone adhesive to prevent movement.

Provide adequate means for venting gases when constructing the barbecue. (Refer to the barbecue manufacturer's recommendations for the position and size of the ventilation grid required).

You should also plan to install conduits for gas pipes and electric cables. The conduits may in certain cases be installed in the ground.

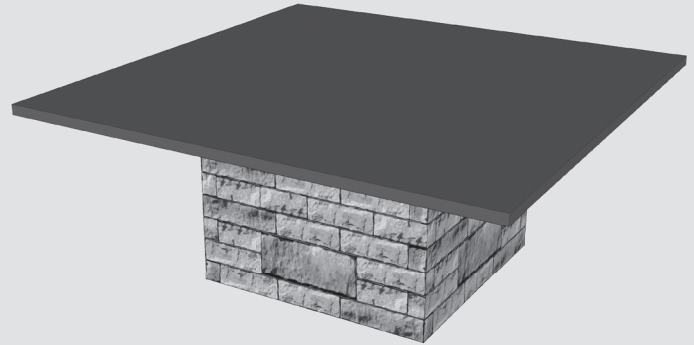
BUILDING PATIO FURNITURE (TABLE AND BENCH) AND FLOWER BOX

TABLE

You can make a table by building a Tandem unit (grid and veneers) to form the base and then adding a tabletop. The tabletop can be wood, granite, quartz, marble or natural stone.

Dimensions may vary. It is essential to leave a minimum space between the table edge and the base. At least 460 mm (18") is needed for leg room.

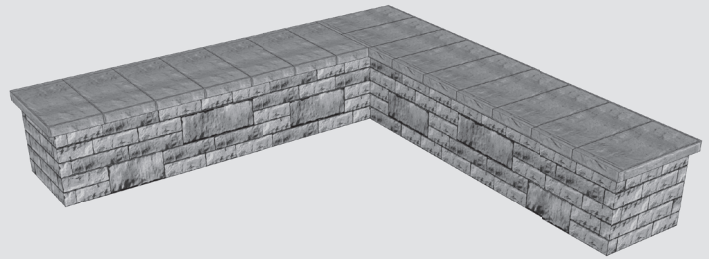
Granite, quartz or marble tabletop: the tabletop must be attached to the veneers with a silicone adhesive. We recommend that a tabletop resting on a Tandem unit be made from a single piece to increase rigidity and stability. This allows you to avoid adding a metal fastener to secure the tabletop to the structure for increased stability and extra protection where necessary. For very large tabletops, it is recommended to install steel supports (angles) to better stabilize the whole unit. You should enquire from the tabletop supplier what are the optimal sizes and thicknesses for stability and security and to avoid possible breakage.



BENCH

You can make a bench by building a structure for the base and simply adding a concrete coping unit for the seat. Bench dimensions can vary, but it may be helpful to make your decision based on available coping units in order to avoid cuts. For a typical bench, the coping will be of the Melville Tandem type.

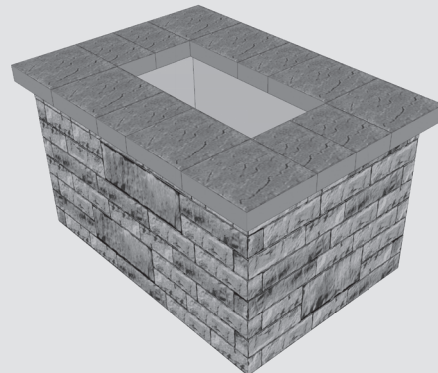
Bench minimum width is 21 in.



FLOWER BOX

It is recommended to install a fiber cement panel and a geotextile membrane to protect the wood against deterioration caused by vegetable and mineral materials (plants and soil). You should provide water drainage when building the structure.

For the coping, use the following Permacon capping products for retaining walls: Mondrian capping module 50 mm, Lafitt, Melville and Esplanade capping modules.



BUILDING PRIVACY WALLS AND FENCES

When you're building a fence or when you want to hide or conceal various pieces of equipment (e.g. pool filter, heat pump) or utility items (e.g. trash-cans or storage bins), the Tandem modular grid system is just what you need.

Fencing is mostly built with treated wood posts (structural, select quality) supported by cast-in-place concrete foundations (Sonotubes) for the main structure. An intermediate structure in treated wood boards is then installed between the posts to attach the fence components of Tandem modular grids and veneers. A shelf angle is fixed to the base of the structure to provide continuous support for the weight of the veneers. The shelf angle (2 1/2" x 2 1/2" x 8') is attached to the base of the structure (wood poles and boards forming the stringer) with suitable screws (#10 x 3 1/2") every 200 mm (8"). This shelf angle can be cut to the size of the unit under construction.

The wooden structure between the posts, combined with the shelf angle, supports the weight of the walls and transfers it to the foundations. Fences and privacy walls must rest on pillars (Sonotubes) and concrete foundations to transfer the weight of the walls to the ground. The foundations are also necessary to prevent the walls from collapsing due to the force of the wind.

The dimensions of the foundations in this guide were calculated to respect the weight-bearing capacity of the soil and to limit irregular subsidence that could lead to distortions in the wall. Calculations were made for soil conditions of low weight-bearing capacity. For different soil conditions, we recommend consulting a qualified engineer. The foundation must be built to withstand local frost conditions. The depth of frost in this guide is 1.8 m (6'). The use of screw piles is not recommended for this type of application.

Privacy walls are made with the same main structure to which a perpendicular section is added to obscure non-aesthetic items.

The maximum height of a fence or a privacy wall is limited to 1.8 m (6 ft).

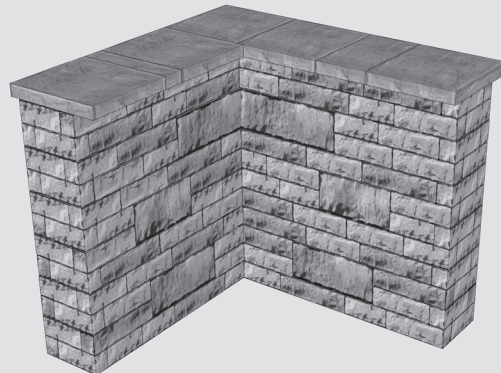
The maximum length of a wall facade between posts is 2.4 m (8 ft).

The unit can be built to display its aesthetic appearance on one side or both sides simultaneously.

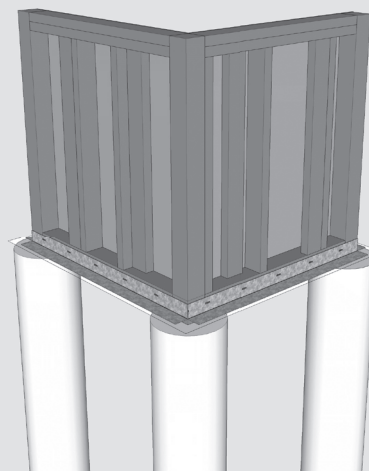
The wood frame must integrate a bracing panel such as a sheet of 12 mm (1/2") treated plywood to provide a continuous attachment area and stabilize the structure to withstand loads. To finish the walls, attach a cap on top of the wood frame, either in concrete (sizes to be decided on site) or metal (custom bent by a specialized company). Esplanade coping and Tandem Melville steps can be used to finish the top of a fence or privacy wall.

The capping unit is fixed with a suitable concrete adhesive spread on the wooden structure and the top of veneers. It may be useful to fix the wooden structure to the concrete cap with a metal attachment to provide additional wind protection.

PRIVACY WALL



PRIVACY WALL ON CONCRETE PILLAR (SONOTUBE) – CONSTRUCTION DETAILS OF WOODEN STRUCTURE



Since unit components will vary according to height from zero to 1.8 m (6'), we present the main minimum requirements in table form.

DESIGN DATA FOR FENCES

Fence with veneer on one side

HEIGHT	Ø PILASTER	FOOTING	EMBEDDING POST	POST	STRUCTURE
0 to 4 ft – Option 1	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	4 × 4*	2 × 4
Option 2	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	4 × 4*	2 × 4
Option 3	24 in / 600 mm	N/A	24 in / 600 mm	4 × 4*	2 × 4
4 to 5 ft – Option 1	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	6 × 6**	2 × 6
5 to 6 ft – Option 1	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	20 in × 20 in / 500 mm × 500 mm	24 in / 600 mm	6 × 6**	2 × 6

Fence with veneer on both sides

HEIGHT	Ø PILASTER	FOOTING	EMBEDDING POST	POST	STRUCTURE
0 to 4 ft – Option 1	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	4 × 4*	2 × 4
Option 2	12 in / 300 mm	20 in × 20 in / 500 mm × 500 mm	24 in / 600 mm	4 × 4*	2 × 4
4 to 5 ft – Option 1	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	20 in × 20 in / 500 mm × 500 mm	24 in / 600 mm	6 × 6**	2 × 6
5 to 6 ft – Option 1	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	22 in × 22 in / 550 mm × 550 mm	24 in / 600 mm	6 × 6**	2 × 6

DESIGN DATA FOR PRIVACY WALLS

Wall with veneer on one side

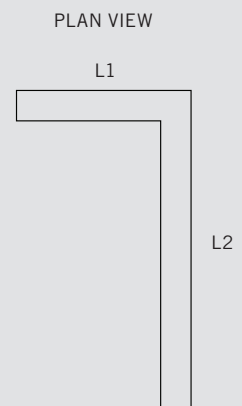
HEIGHT	Ø PILASTER	FOOTING	EMBEDDING POST	POST	STRUCTURE
L1 and L2 Configuration = 1.2 m (4 ft)					
0 to 3 ft	16 in / 400 mm	N/A	24 in / 600 mm	4 × 4*	2 × 4
3 to 6 ft – Option 1	24 in / 600 mm	N/A	24 in / 600 mm	6 × 6	2 × 6
Option 2	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	6 × 6	2 × 6
Option 3	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6	2 × 6
L1 Configuration = 2.4 m (8 ft) and L2 = 1.2 m (4 ft)					
0 to 4 ft – Option 1	24 in / 600 mm	N/A	24 in / 600 mm	4 × 4*	2 × 4
Option 2	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	4 × 4*	2 × 4
4 to 5 ft – Option 1	24 in / 600 mm	N/A	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 3	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6
5 to 6 ft – Option 1	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6

Wall with veneer on both sides

HEIGHT	Ø PILASTER	FOOTING	EMBEDDING POST	POST	STRUCTURE
L1 and L2 Configuration = 1.2 m (4 ft)					
0 to 4 ft	16 in / 400 mm	N/A	24 in / 600 mm	4 × 4*	2 × 4
4 to 6 ft – Option 1	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	6 × 6**	2 × 6
	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6
L1 Configuration = 2.4 m (8 ft) and L2 = 1.2 m (4 ft)					
0 to 3 ft	24 in / 600 mm	N/A	24 in / 600 mm	4 × 4*	2 × 4
3 to 4 ft – Option 1	12 in / 300 mm	16 in × 16 in / 400 mm × 400 mm	24 in / 600 mm	4 × 4*	2 × 4
Option 2	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	4 × 4*	2 × 4
4 to 6 ft – Option 1	12 in / 300 mm	20 in × 20 in / 500 mm × 500 mm	24 in / 600 mm	6 × 6**	2 × 6
Option 2	12 in / 300 mm	Ø 24 in / 600 mm	24 in / 600 mm	6 × 6**	2 × 6

N/A: Not Applicable * 4 × 4 SFP Wood Select Structural ** 6 × 6 #1 SFP Wood

It should be noted that the base of concrete pillars should normally have a wider section in the ground for a footing. The footing can take two shapes, square or round. There are round footings on the market, sold as Bigfoot, which can be used for the construction of pillars. Square footings must be made on site with wooden formwork.



DESIGN ASSUMPTIONS

The construction of privacy walls or fences must take into account the following assumptions:

Wall weight (grid and veneers): 28 lbs/sq ft (1.35 kN/m²)

Wind: 20 lbs/sq ft (1 kPa)

Minimum allowable bearing capacity of soil: 1,575 lbs/sq ft (75 kPa)

Density of soil around pillars and foundations (γ): 112 lbs/cu ft (18 kN/m³)

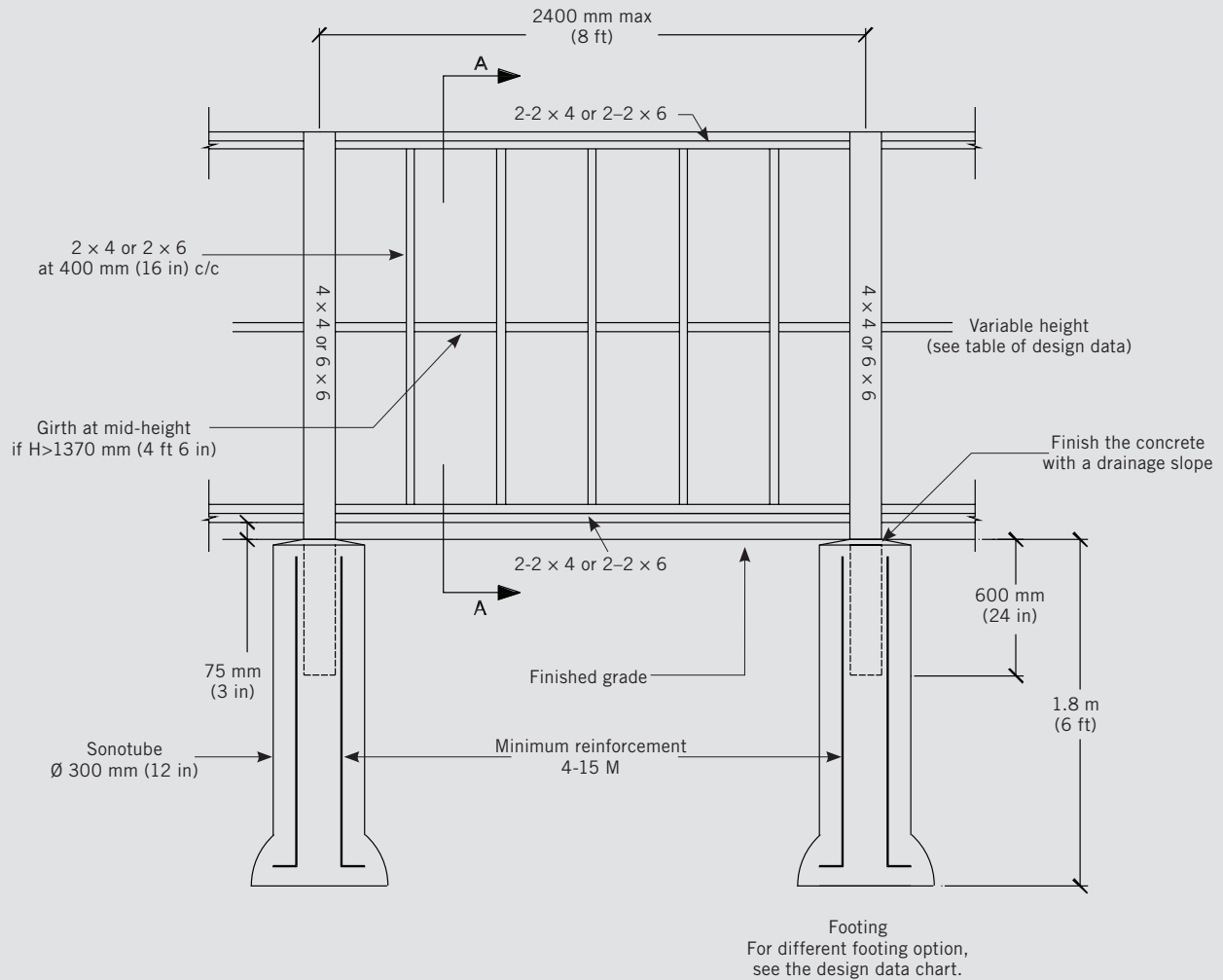
Backfill must be compacted around Sonotubes and spread footings

Minimum depth of foundations: 6 ft (1.8 m) away from frost
(consult an engineer to check the typical depth of frost for your area)

Note: Design assumptions do not take into account earthquake effects.
It may be necessary to consult an engineer.

Leave a free space under the Tandem wall of at least 75 mm (3")
to ensure proper ventilation and adequate room for the potential effects
of freezing and thawing.

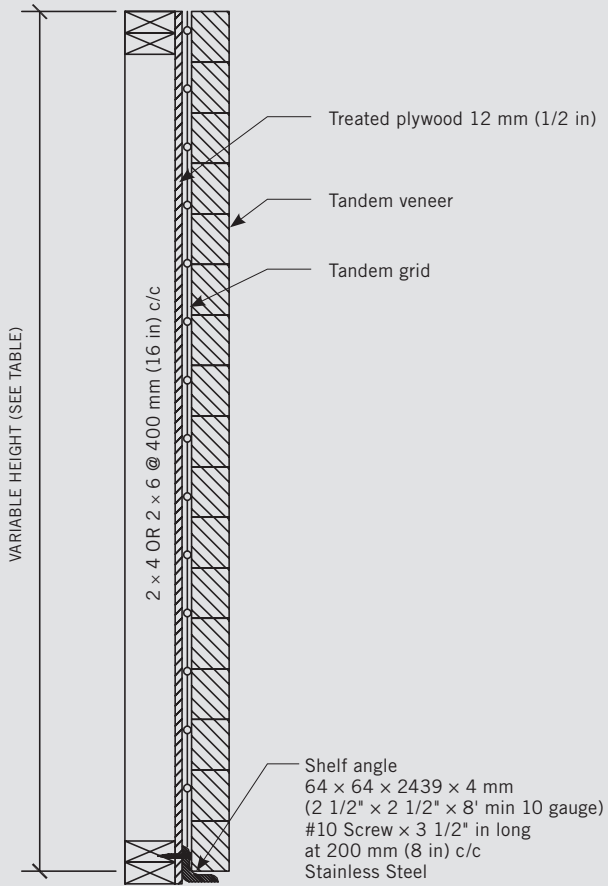
PRIVACY WALLS AND FENCES –
TYPICAL FRONT VIEW



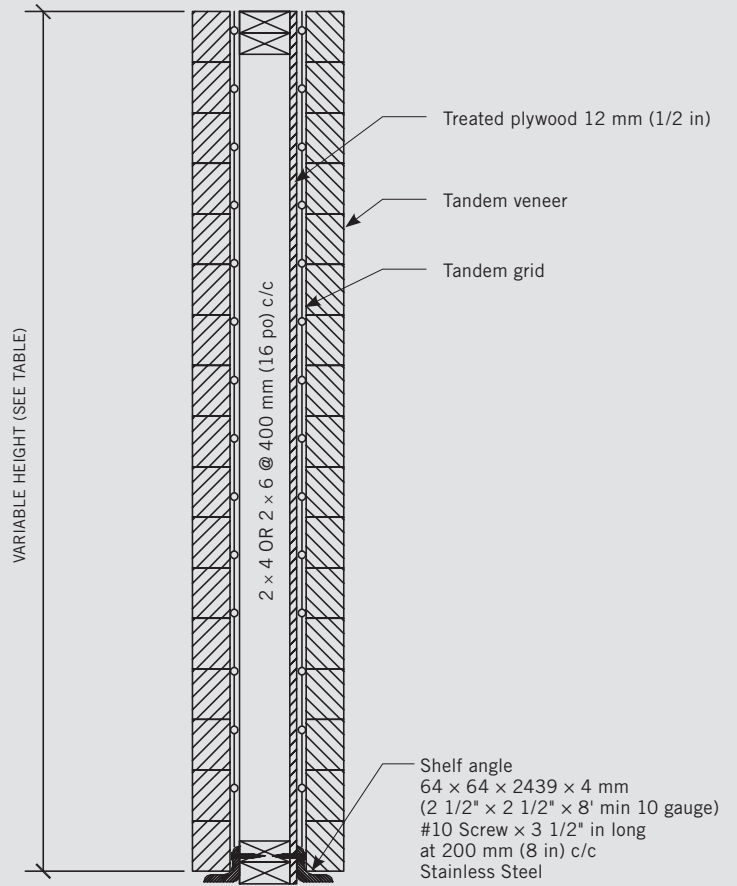
Note: The details shown here are only valid for the application suggested in this guide, taking into account the prescribed limitations. You are strongly recommended to engage a structural engineer or specialist in the field to validate structural design details for other configurations or for different soil conditions (lower or higher load capacity, presence of blocks, support on rock, etc.).

PRIVACY WALLS AND FENCES –
CROSS-SECTION A-A

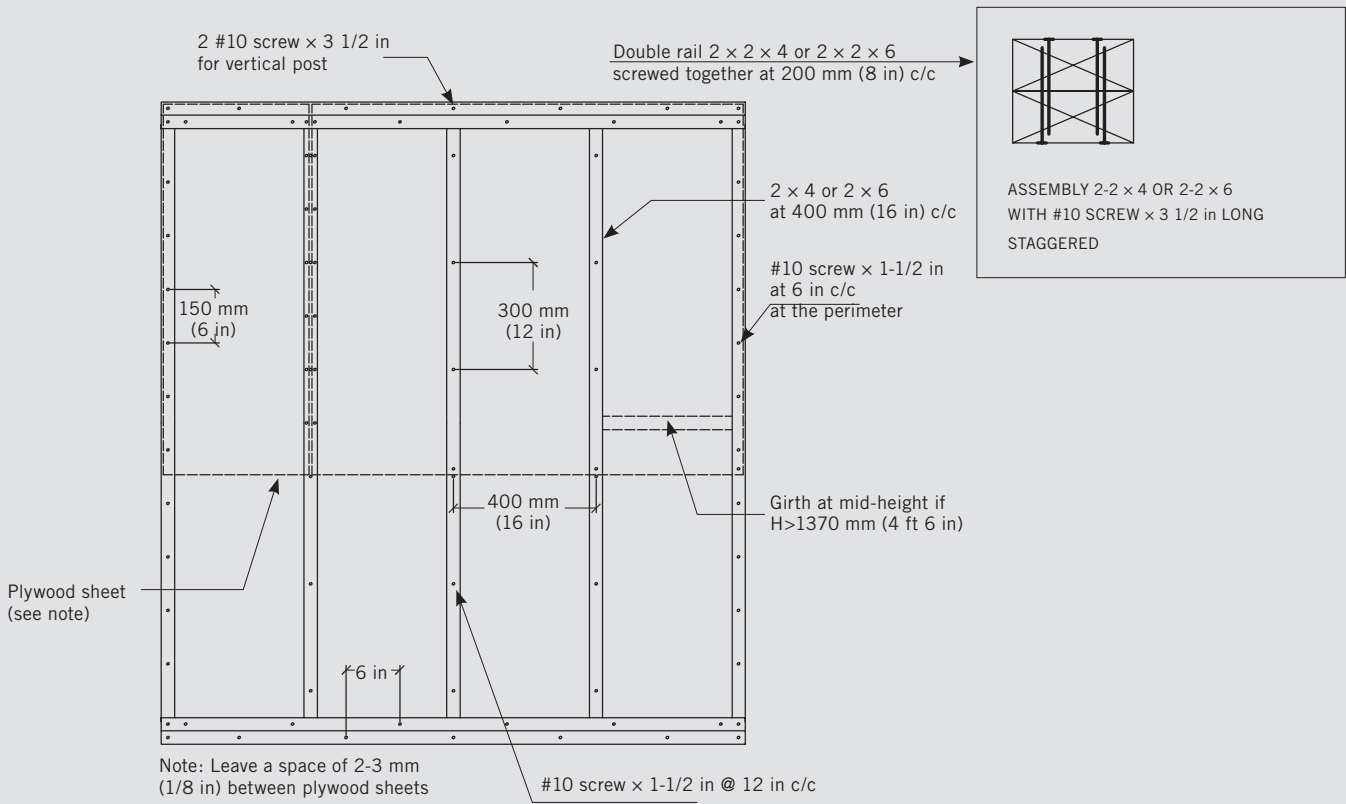
ONE-SIDED



DOUBLE-SIDED



SCREW DIAGRAM OF COMPONENTS
OF WOODEN STRUCTURE



BUILDING DECK SKIRTING

Applications: new wood or concrete decks, or existing concrete decks

Another application of the Tandem grid consists of covering the free space under a deck by building a Tandem wall around it. Tandem veneers are supported by a galvanized shelf angle and a wood frame fixed to the deck (wood or concrete). The wood frame consists of treated plywood to provide a continuous attachment area for the grid, and vertical bracing to stabilize the structure and withstand lateral loads such as the wind. The whole structure is supported by appropriate foundations (screw piles for wooden decks and concrete foundations for concrete decks).

Maximum height of Tandem wall: 1.5 m (5 ft)

To install deck skirting on existing concrete structures, you must first ensure that the initial structure (the deck itself) can bear the additional weight of new covering components: wooden structure, shelf angle and Tandem veneers. For this kind of project, it is strongly recommended to engage a structural engineer or specialist in the field to validate the structural design details for adequate load bearing.

In all cases, it is necessary to minimally comply with the design criteria shown below:

Wall weight (grid and veneers): 1.35 kN/m² (28 lbs/sq ft)

Wind: 1 kPa (21 lbs/sq ft)

Overload: 1.9 kPa (40 lbs/sq ft)

Note: Design assumptions do not take into account earthquake effects. It may be necessary to consult an engineer.

Minimum allowable bearing capacity of soil: 75 kPa (1575 lbs/sqft).

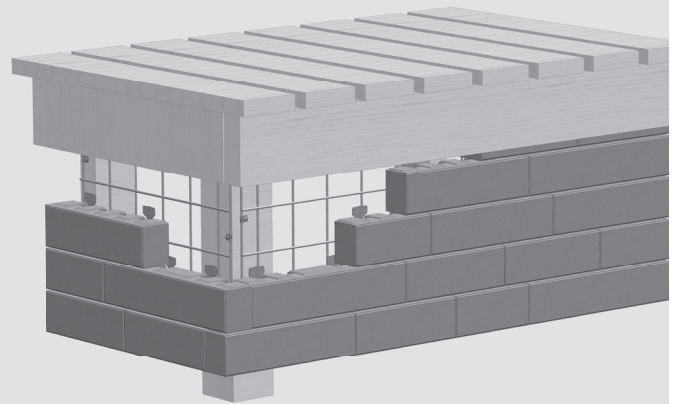
Minimum depth of foundations in soil: 1.8 m (6 ft) away from frost (consult an engineer to check the typical depth of frost for your area).

Leave a free space under the Tandem wall of at least 75 mm (3").

Note: As there is no direct access from the top of a unit (since the Tandem wall is built under the deck), it will be impossible to attach the last row of veneers to the Tandem grid with connectors. Simply glue the last row of veneers to the second-to-last row with a concrete adhesive like Permapro adhesive.

The sketches shown here have been designed to withstand the additional loads of Tandem walls. The details shown are valid for applications suggested in this guide. It is strongly recommended to engage a structural engineer or specialist in the field to validate structural design details for other configurations.

DECK SKIRTING –
3D VIEW



CONCRETE DECK

To cover a concrete deck, you must comply with additional minimum design criteria detailed below:

The minimum thickness of the slab should be 140 mm (5 1/2")

The slab should be reinforced with a minimum 10M reinforcement at 300 mm (12") c / c in both directions and positioned at the center of the slab.

The concrete deck should be supported by pillars of reinforced concrete (Sonotubes), 200 mm (8") in diameter with a minimum footing of 600 mm (24") or larger in diameter.

The compressive strength of the concrete (slab and pillars) must be at least 30 MPa with 5% to 8% entrained air.

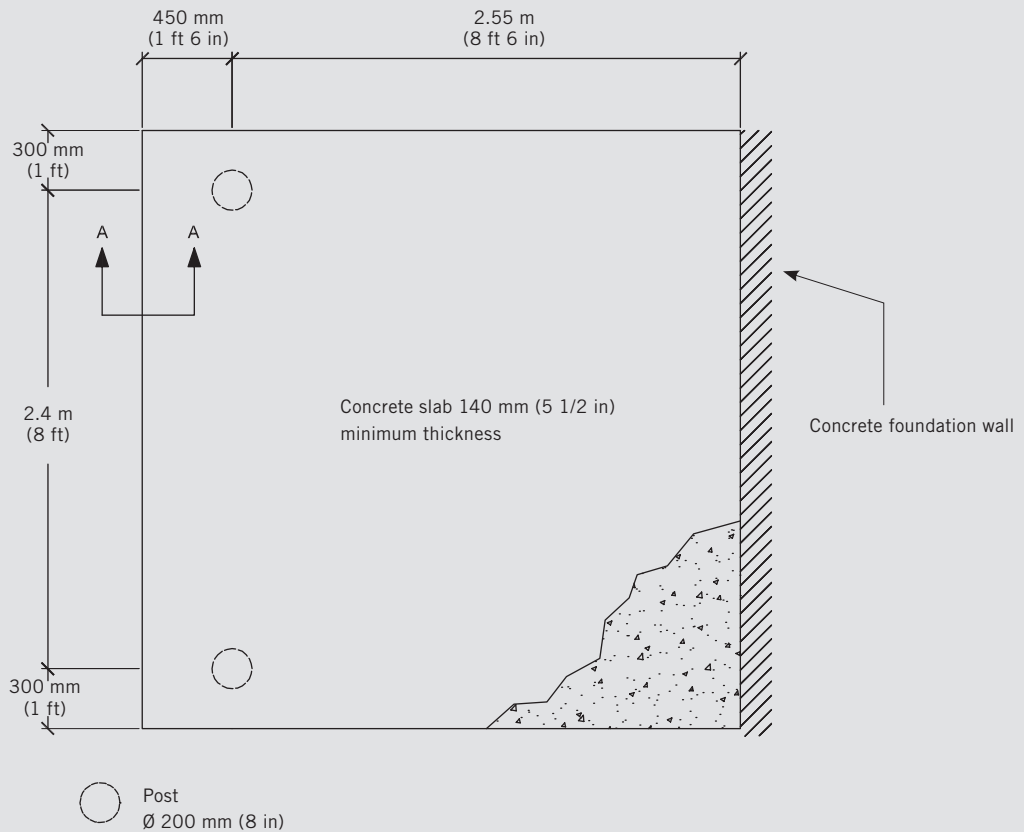
Maximum distance between pillars: 2400 mm (8 ft)

Maximum overhang of concrete slab: 600 mm (2 ft)

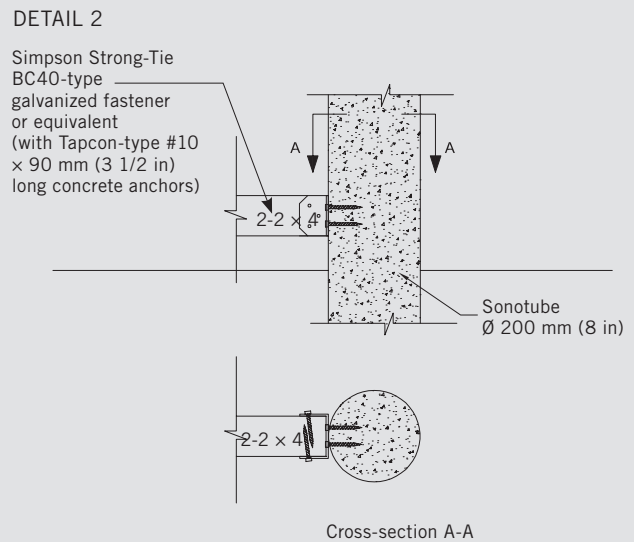
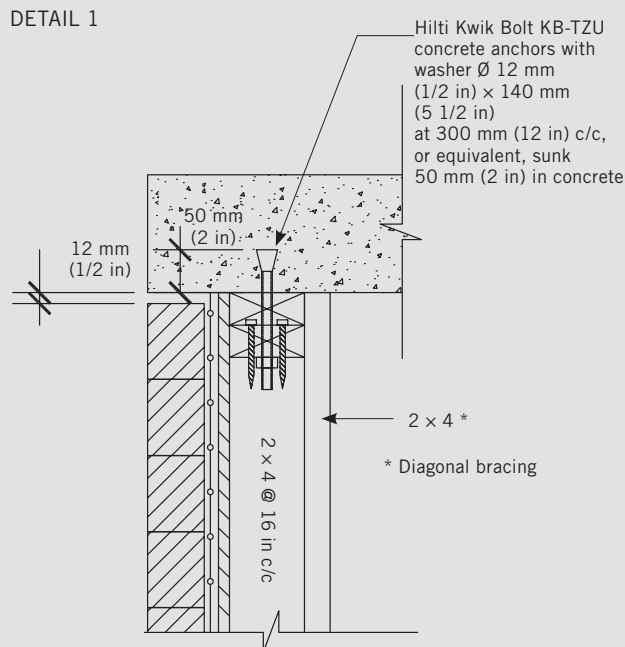
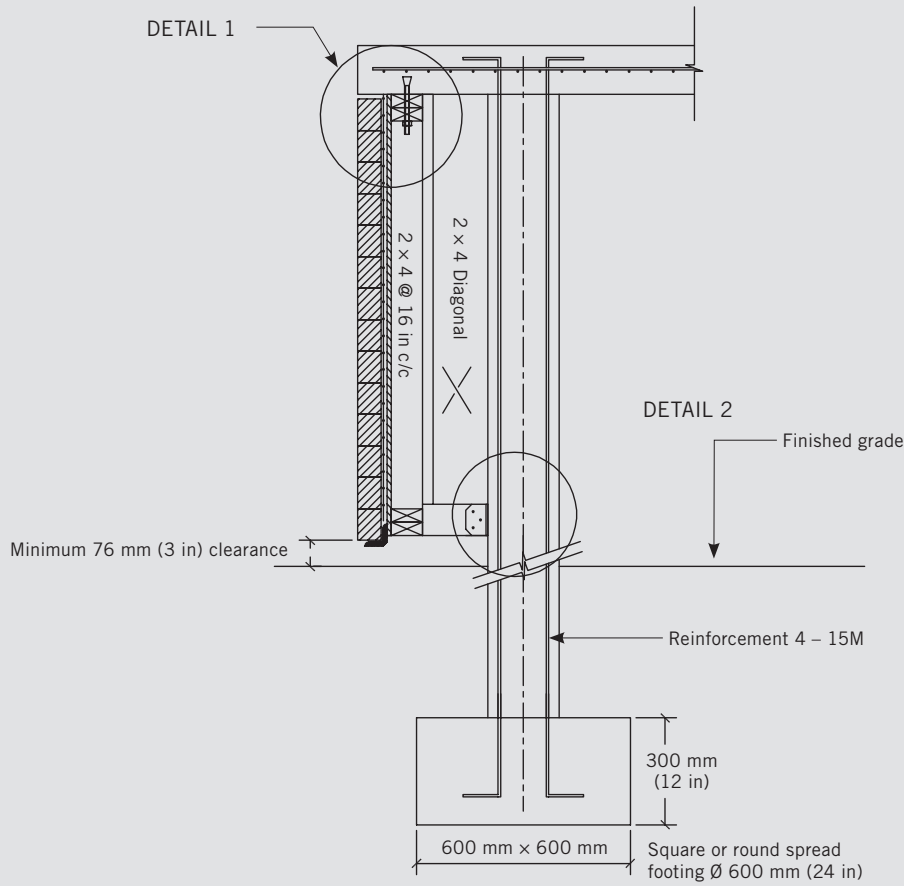
To attach the components of the wooden structure to the concrete slab, you should use mechanical anchors like Hilti Kwik Bolt TZ (12 mm diameter by 140 mm long) or equivalent (not supplied by Permacon).

Leave a space of at least 12 mm (1/2") between the top of the Tandem wall and the underside of the concrete slab.

CONCRETE DECK SKIRTING – PLAN VIEW



CONCRETE DECK SKIRTING –
CROSS-SECTION A-A



WOODEN DECK

Warning: We recommend installing a Tandem wall only for new wooden decks to be built according to the minimum specifications and data detailed below.

The wooden deck should be built with a structure composed of 2 x 8 joists spaced every 16" (400 mm) or less. The deck beams must be made of at least two 2 x 8 boards.

The beams are supported on 4 x 4 (89 x 89 mm) wooden posts. The posts themselves are supported on screw piles designed for this purpose (helical piles).

Maximum length of wood joists in both directions: 2400 mm (8 ft).

Minimum overhang of 300 mm (12") and maximum overhang of 600 mm (2 ft).

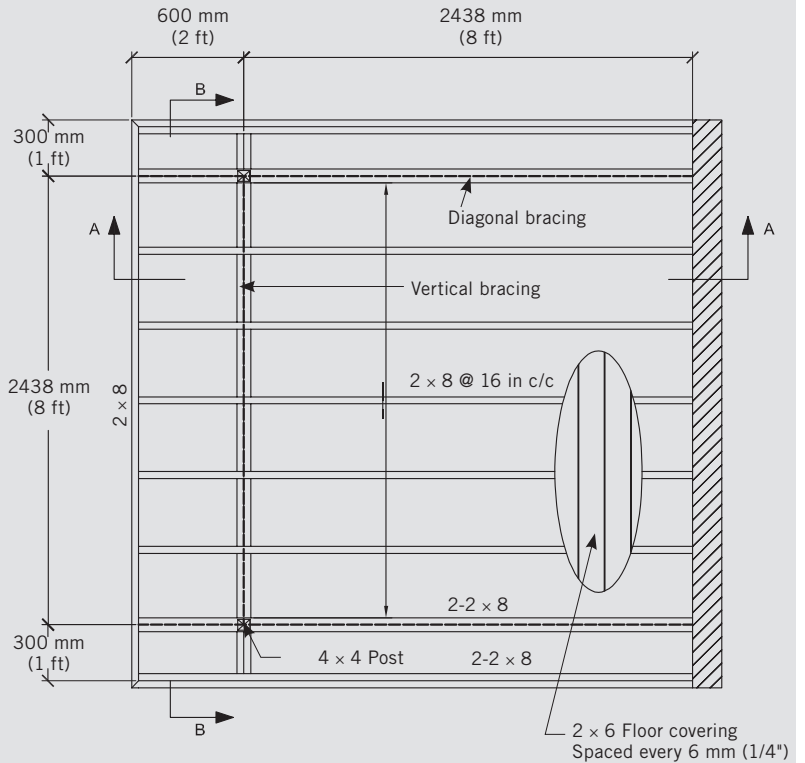
To attach the components of the wooden structure to the deck joists, you should use #10 stainless steel wood screws.

Simpson Strong-Tie hardware (or equivalent) should be used.

A waterproofing membrane must be installed on top of the wood frame to protect the wood from water saturation and rot (in the case of wood board flooring with free space). The membrane can be omitted for waterproof deck flooring such as fiberglass.

It is recommended to leave a space of 1/8" to 1/4" between the wooden boards of the deck for ventilation under the deck so as not to trap moisture.

FLOOR STRUCTURE – PLAN VIEW



WOODEN DECK SKIRTING – CROSS-SECTION A-A

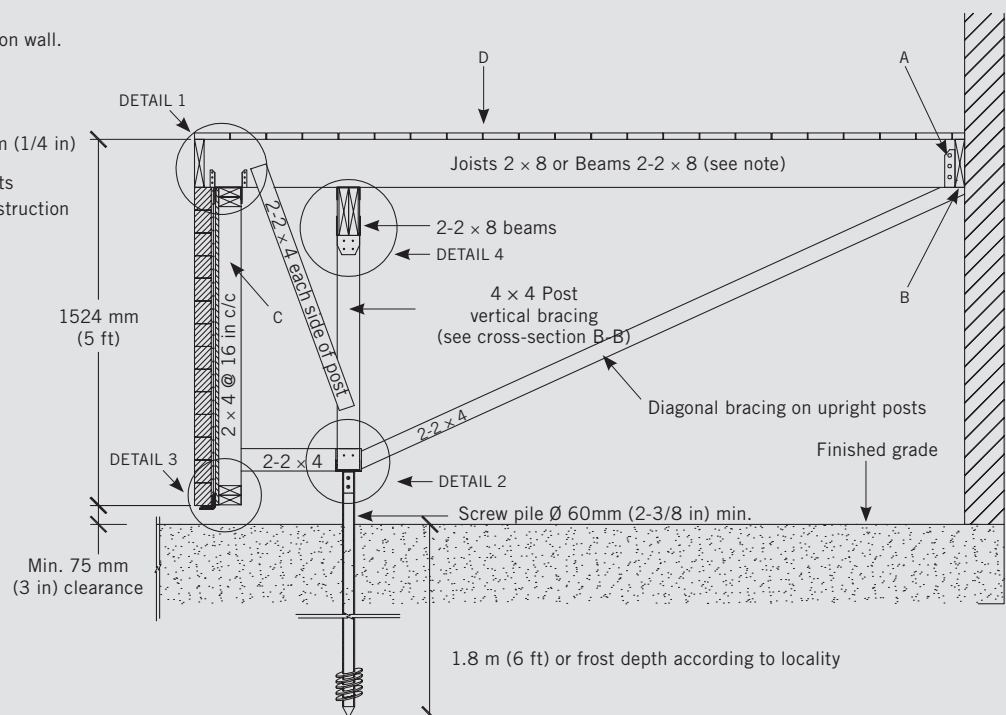
A Simpson Strong-Tie LUS 26 and LUS 26-2 (GA 18) galvanized steel joist hangers, or equivalent

B 2x8 continuous rail attached to foundation wall with Hilti KB-TZU 12 x 140 mm (1/2 in x 5 1/2 in) anchors, or equivalent
Alternative: joists resting on foundation wall.

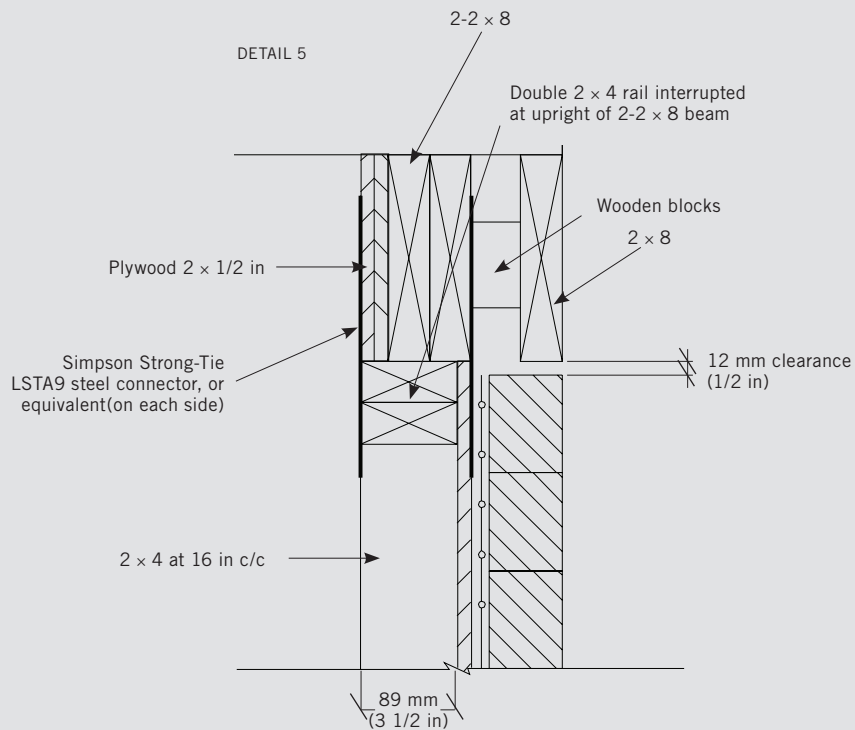
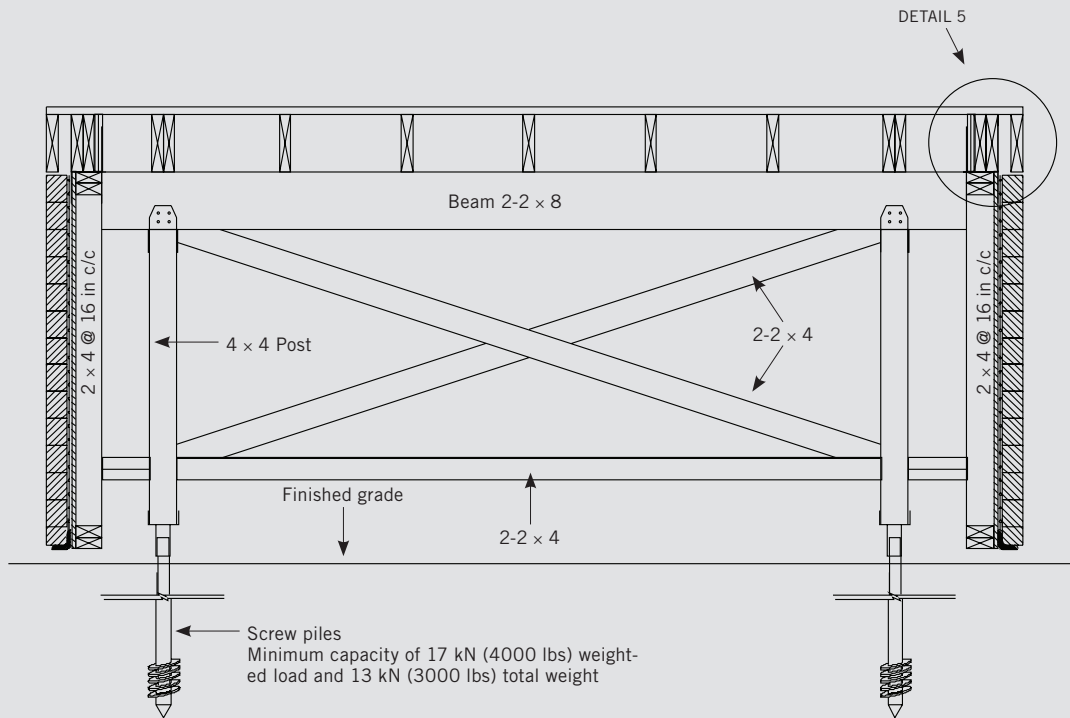
C Diagonal brace at mid-height for wall over 1200 mm (4 in) tall

D Floor coverings 2 x 6 spaced at 6 mm (1/4 in)

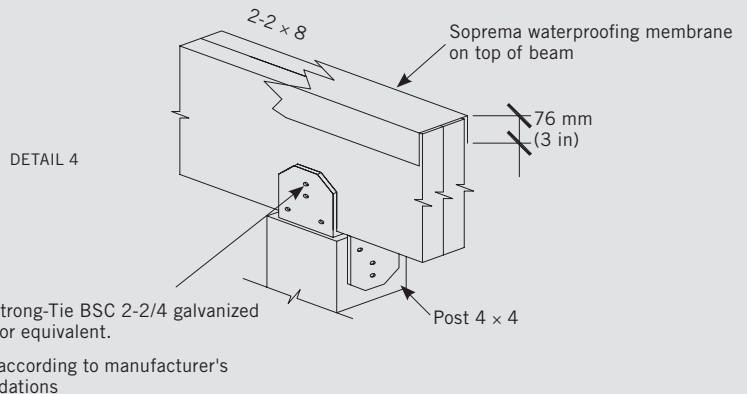
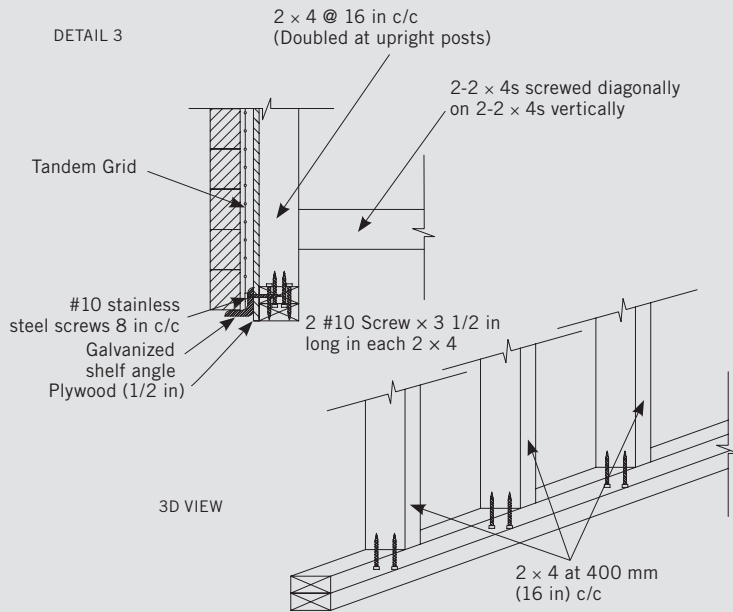
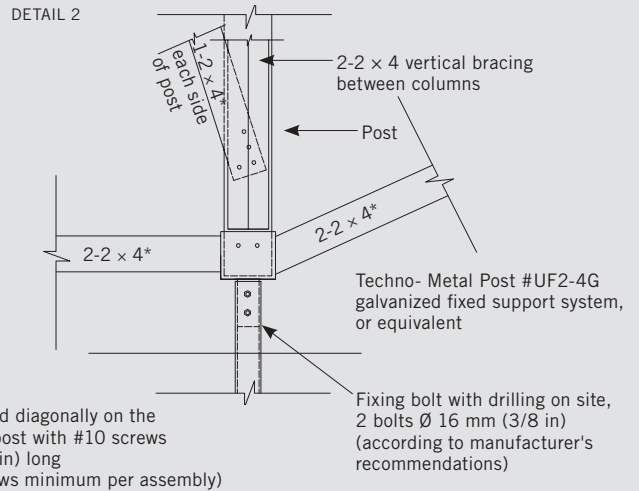
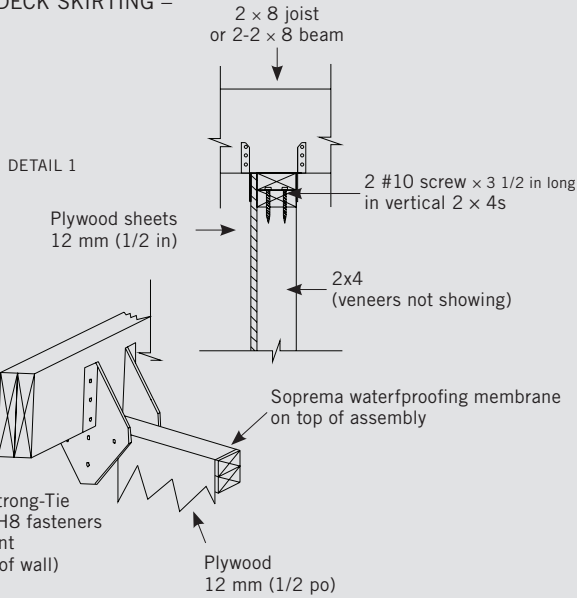
Note: During construction, 2 x 4 posts should face floor joists to enable construction of assemblies



WOODEN DECK SKIRTING –
CROSS-SECTION B-B



WOODEN DECK SKIRTING – DETAILS





1-888-PERMACON
PERMACON.CA

PERMACON BOLTON

3 BETOMAT COURT
BOLTON, ONTARIO L7E 2V9

TELEPHONE: 905-857-6773
FAX: 905-857-4774

PERMACON MILTON

8375 5th SIDE ROAD
MILTON, ONTARIO L9T 2X7

TELEPHONE: 905-875-4215
FAX: 905-875-1350

PERMACON OTTAWA SOUTH

6860 BANK STREET
METCALFE, ONTARIO K0A 2P0

TELEPHONE: 613-821-0898
1-800-361-2707
FAX: 613-821-4593

PERMACON OTTAWA WEST

6775 HAZELDEAN ROAD
STITTSVILLE, ONTARIO K2S 1B9

TELEPHONE: 613-821-0898
1-800-361-2707
FAX: 613-821-4593

PERMACON MONTREAL

8140, BOMBARDIER STREET
ANJOU, QUEBEC H1J 1A4

TELEPHONE: 514-351-2120
FAX: 514-351-7454

PERMACON QUEBEC

8845, PIERRE-BERTRAND BLVD
QUÉBEC, QUEBEC G2K 1W2

TELEPHONE: 418-622-3333
FAX: 418-622-9603

PERMACON SHERBROOKE

1080, PANNETON STREET
SHERBROOKE, QUEBEC J1K 2B4

TELEPHONE: 819-564-1414
FAX: 819-564-1340

PERMACON TROIS-RIVIÈRES

1100, DE LA COMMUNE BLVD
TROIS-RIVIÈRES, QUEBEC G9A 2W6

TELEPHONE: 819-378-2721
FAX: 819-378-6125

logo FSC EN de l'imprimeur