



ToroWall





Key Benefits



DURABLE



100% SAFE MATERIAL



COST EFFICIENT



WATER RESISTANT



SAFE FROM TERMITE
ATTACKS AND FUNGI



EASY TO WORK WITH



FIRE RESISTANT



HEAT INSULATOR



ECO FRIENDLY

Certification



Product materials

El Toro sheets are a fiber-cement product composed of Portland Cement, Cellulose Fiber, Silica Sand and Water. A special manufacturing process ensures strength, durability, easy workability and dimensional stability. El Toro has always placed emphasis on quality, technology, service and the availability of its products, while protecting nature and its communities.

El Toro's unique design allows you to construct your home or office space with specialized separation panels and ceiling panels.

Create your next home or office space with the best and latest in panels that are not only design worthy, but also durable and environment-friendly.



Silica Sand



Cellulose



Water

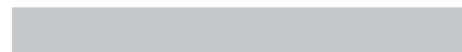
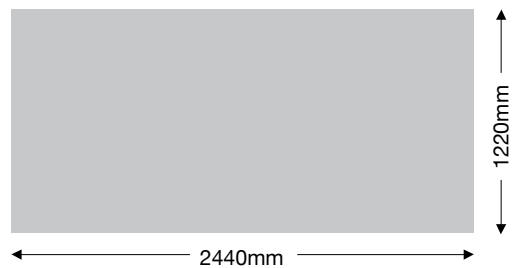


Cement

Product Details

TORO boards are an economic, eco-friendly and a simple fiber cement construction solution for internal dry walls, internal partitions and claddings. TORO boards are fast, clean, neat and people-friendly construction material suitable for residential, commercial, industrial and public buildings. TORO boards are designed for non-load bearing applications. Use TORO external boards for external use. This manual explains the use of TORO boards for internal dry walls, internal partitions and claddings.

Item Code	Size (mm)	Thickness (mm)	Edge (S/E or T/E)	Texture/Non Texture	Weight (Kg)
FGE00007	2440 x 1220	6	S/E and T/E	Texture/Non Texture	27.00
FGE00005	2400 x 1200	6	S/E and T/E	Texture/Non Texture	26.12
FGE00012	2440 x 1220	8	S/E and T/E	Texture/Non Texture	36.01
FGE00074	2400 x 1200	8	S/E and T/E	Texture/Non Texture	34.84
FGE00014	2440 x 1220	9	S/E and T/E	Texture/Non Texture	40.51
FGE00006	2400 x 1200	9	S/E and T/E	Texture/Non Texture	39.19
FGE00015	2440 x 1220	10	S/E and T/E	Texture/Non Texture	45.01
FGE00053	2400 x 1200	10	S/E and T/E	Texture/Non Texture	43.55
FGE00017	2440 x 1220	12	S/E and T/E	Texture/Non Texture	54.01
FGE00054	2400 x 1200	12	S/E and T/E	Texture/Non Texture	52.25



Square Edge (S/E)



Tapered Edge (T/E)

*In addition to the above specific (size & thickness) of products can be provided to suit your special project requirements.

*condition apply

Technical Details

PHYSICAL PROPERTIES	UNIT	RESULT	TEST METHOD
Thickness (e) Tolerance	mm	±10% e	EN12467
Length And Width Tolerance	mm	±3	EN12467
Straightness of Edges	%	0.1	EN12467
Squareness of Edges	mm/m	2	EN12467
Density	kg/m³	1300±50	EN12467
Modulus of Rupture Value (wet)	MPa	≥7	EN12467
Modulus of Rupture Value (dry)	MPa	≥10	EN12467
FIRE PROPERTIES			
Fire Propagation		Class "0" (<2)	BS 476 Part 6
Surface Spread of flame		Class 1 Class"A"	BS476 Part7 ASTME 84
System Flame Resistant	hrs.	Integrity ≥ 2	BS 476 Part 20-22
	Min	Insulation - 8	BS 476 Part 20-22
Ignitability		Class "P"	BS 476 Part 5
Combustibility		Non-Combustible	BS 476 part 4
Smoke Development		Class "A"	ASTM E84
Reaction to fire		A1	EN13501

Technical Details

MOISTURE	UNIT	RESULT	TEST METHOD
Moisture Content	%	≤15	ASTM C 1185
Moisture Movement	%	≤0.15	EN12467
Water Absorption (without Painting)	%	≤35	ASTM C 1185
Impermeability		PASS	EN12467
PH		10 to 12	
DURABILITY PROPERTIES			
Freeze/Thaw		PASS	EN12467
Heat-Rain		PASS	EN12467
Warm Water		PASS	EN12467
Soak-dry		PASS	EN12467

(ASTM— American Standard, BS— British Standard, EN—European Standard)

The properties in the above table are mean values provided for informational purposes only. If certain properties are critical for any particular application, it is advisable to consult the EL TORO Technical Staff for more information.

Protective Equipment



Required Accessories



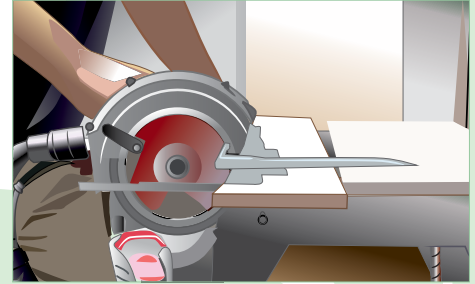


Dry Wall Installation Guide

Best Practices

Cutting

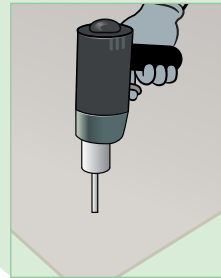
Always cut TORO boards in a well-ventilated area. TORO boards could be cut with a circular saw. PCD blades (Poly Crystalline Diamond) are recommended for cutting TORO boards. Remove the dust to clear the board before installation.



Cutting TORO boards with a Circular saw

Hole forming

Holes could be made using the hole saw. Mark the center and drill a pilot hole. Make the hole using a hole saw with the required diameter fitted to a high-powered electric saw. Drill along the circumference carefully and a close series of holes could be used to make irregular holes.



Hole forming (hole saw)

Screwing

The recommended fixing method is screw fixing. CSK Screws (counter sunk self-drilling screws) are recommended for Steel frames and Self-tapping screws are recommended for Timber frames. Pre-drilling is not required in any of the above cases.

Follow the instructions and distances given in the installation section for fixing boards.



CSK Self drilling Screw



Self-tapping Screw

Installation procedure

Fixing sheets to a frame work of Steel or Timber is called indirect sheet application.

Procedure



Step 01
Framing (Tracks)



Step 02
Framing (Studs)



Step 03
First side
board fixing



Step 04
Services
accommodation



Step 05
Second side
board fixing



Step 06
Finishing

Framing

The Set-out and construction of the frame must be done carefully because it would directly affect the sheet installation. Ensure the frame is square. Frames must be straight and true to provide a flush face to receive the panels. Longitudinal and crossword straightness of Toro boards is 0.1%.

Toro boards will not straighten excessively warped or distorted frames and any warping would still be visible after the Toro boards are fixed.

Frames could be made of Steel (GI and Aluminum) or Timber. Frame work and components used must comply with the relevant building regulations and standards.

Framing must comply with relevant construction regulations and standards. Always follow the construction consultant's instructions.

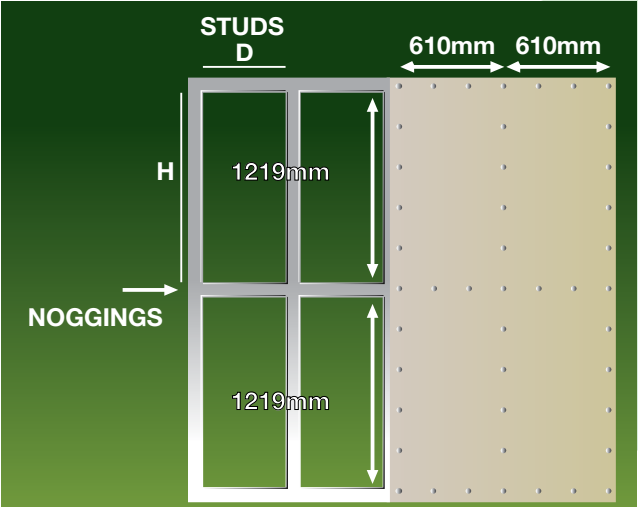


For installation consider the most suitable frame work as per the application

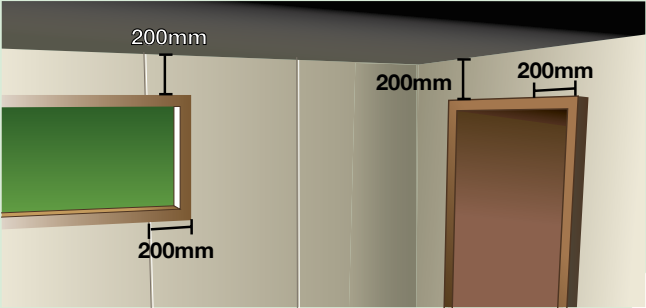
Type of work	Recommend Frame work	Board Thickness (mm)	Board Size (mm)
General Internal partitions eg: office partitions	- GI C-Channel frame work - Al Box section frame work - Timber stud frame work	6 - 9	2400 x 1200/ 2440 x 1220
Ceramic Tiles on Partition walls	- GI C-Channel Frame work - Al Box section frame work - Timber stud frame work	9 - 12	2400 x 1200/ 2440 x 1220
Room Separation	- GI C-Channel Frame work - Al Box section frame work - Timber stud frame work	6 - 9	2400 x 1200/ 2440 x 1220
External walls	- GI C-Channel Frame work - Al Box section frame work	9 - 12	2400 x 1200/ 2440 x 1220

Consider the Toro board size to make the center to center distance between the studs

TORO board Size (mm)	Center to center distance between studs (D) (mm)	Center to center distance between tracks (H) (mm)
2440 x 1220	611	1221
2400 x 1200	601	1201



Maintain the spaces between the door, window frames and sheet edges as per the following figure.



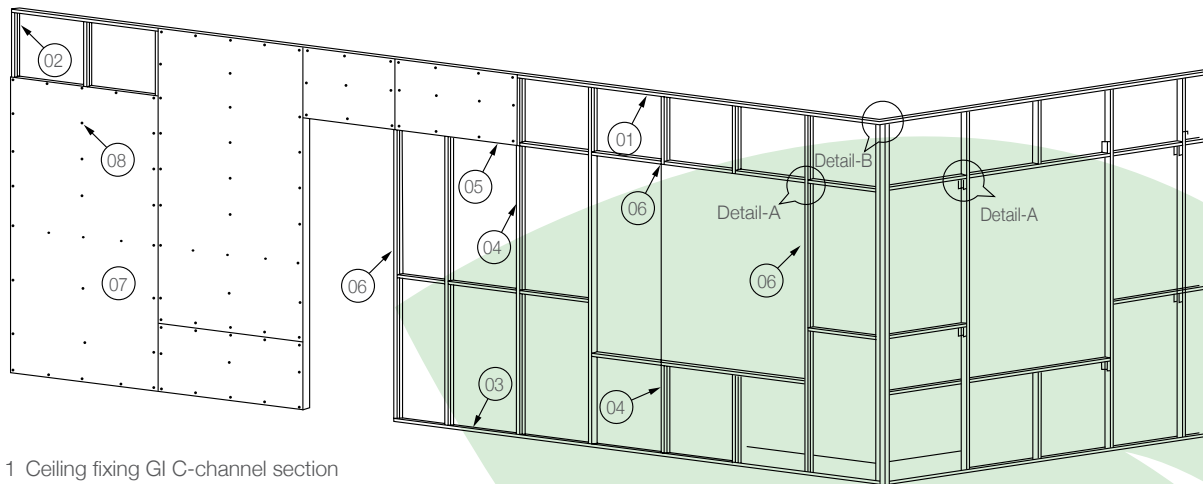
Metal Framed Dry wall

Guide for Construction of Framework

1. GI C- Channel or Box sections could be used to build a framework.
2. Begin by marking the designated area and construct the floor fixing the GI section first. General partition works could be used.
1"x1.75"x0.55mm C- Channel Sections or 50mmx25mmx1mm box section are used for fixing of floor, side wall and slab soffit and use anchor-bolts size 40x6mm or size 8mm rolled plug-in screws for the frame fixing.
3. The same C- Channel section fixed to the soffit ceiling is plumbed to the floor by fixing the GI Section.
4. Then supply and fix vertical members are at distances of 601mm or 611mm center to center using POP rivets or flat headed screws using clamps.
5. Construct the intermediate horizontal members using clamps as per the diagram and fix them at 1201mm or 1221mm C/C distances to vertical GI Sections using pop-rivets or flat headed screws.

NOTE

- The profile dimension and thickness of the c-channel depends on the strength of the structure and a 0.55mm thick c-channel is recommended for an indoor structure not exceeding 10 feet in height. If the structure is higher than 10 feet or if it directly faces the wind outside, it requires more strength and so, you would need to obtain advice from a structural engineer
- The Customer could select any dimension of C-Profile according to his discretion. But the minimum requirement of the side width of the C-channel is 50mm for the provision of screws and the width of the channel depends on the dry wall thickness, such as 75mm, 100mm or 150mm.
- GI Box sections could also be used instead of the C-Channels.
- Vertical C/C distances of 611mm are required for the 2440x1220mm size and 601mm C/C distances for 2400x1200mm.
- Special attention must be paid to the arrangement of structure and panels near the windows and doors. The door or window frame area needs to be strong. This may require an extra open frame to be inserted between the door and window frame.



- 1 Ceiling fixing GI C-channel section
- 2 Wall fixing GI C-channel section
- 3 Floor fixing GI C-channel section
- 4 GI Vertical studs
- 5 Horizontal GI C-channel section
- 6 Extra arrangement for door and window openings
- 7 TORO Sheets
- 8 Board Fixing screw



Timber Framed Dry Wall

Guide for Construction of Framework

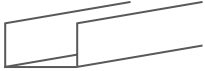
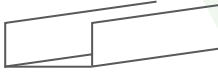
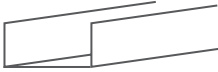
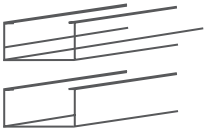
1. When using this method, hard timber studs are used for the framework. The sizes are mostly 50x100mm (2"x4").
2. Begin by marking the designated area and construct the floor fixing the timber section first.
Concrete nails or anchor bolts could be used for fixing according to the type and condition of the floor.
3. The same fixing materials could also be used for end studs and wall and soffit fixing.
Ex: Use anchor-bolts size 75x6mm or size 150mm concrete nail or size 6 Barrel Bolts.
4. The same timber section is fixed to the soffit ceiling while being plumbed to the floor by fixed timber section.
5. Make sure the Intermediate Horizontal Timber Section is as per the diagram and fix it at 1200 or 1220mm C/C distances. Some examples of timber studs:
2"x4" / 2"x3" Timber - Vertical Stud
1"x4" / 1"x3" Timber - Horizontal Floor Fixing Plate
2"x4" / 2"x3" Timber - Horizontal Floor Fixing Plate

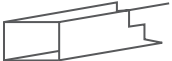
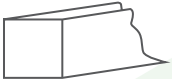



NOTE

- Timber makes a very rigid structure that is better than others.
- However, some types of timber framework will eventually deform and decay with time. Therefore, the correct quality of timber is essential. The timber should be hard, class 1 treated and straight. Ex: Kempas, Red-balou and Micro are more economical. Since the timber is not treated beforehand a timber preservative should be applied to protect it from termites and fungi.
- The structure should preferably not exceed 10 to 12 feet in height. If the structure is higher than 10 to 12 feet or it is an outdoor construction, that directly faces the wind, it requires more strength. Please consult a structural engineer.
- Supply and fix vertical timber studs, maintaining distances of 601mm c/c for 2400x1220mm size or 611 mm c/c for 2440x1220mm size using timber clamps and wire nails/screws.
- Special attention needs to be paid to the arrangement of structure and panels near the windows and doors. The door or window frame area needs more strength. This may require an extra open frame to be inserted between the door and window frame.

Material selection

Both GI and Aluminum wood frames could be used to build dry wall partitions. Always follow ASTM C-645 standards for non structural steel framing members. Take necessary action to avoid corrosion and for the structure to last the required life time. Here are the recommended sizes for frame members.

Type of work	Section details	Allocated parts	Recommended structure heights	Frame fixing method	Board frame work fixing method
GI C-Channel/ GI C-Purline	 1" x 1¾" x 0.47mm	floor fixing soffit & ceiling fixing wall end	Interior partition up to 10 feet	non-rivets	counter sunk headed self drilling tapping screw
	 1" x 1¾" x 0.55mm	floor fixing soffit & ceiling fixing wall end	Interior partition up to 10 feet	pop-rivets	counter sunk headed self drilling tapping screw
	 1" x 1¾" x 0.55mm	Vertical and Intermediate stud	Interior partition up to 10 feet	pop-rivets	counter sunk headed self drilling tapping screw
	 1" x 1¾" x 0.55mm	Vertical and Intermediate stud	Interior partition up to 10-12 feet	pop-rivets/ welding	counter sunk headed self drilling tapping screw

Type of work	Section details	Allocated parts	Recommended structure heights	Frame Fixing method	Board frame work fixing method
Aluminium	 25x50x25x0.8mm/1mm/1.2mm	floor fixed soffit & ceiling fixed wall end	Interior partition up to 10 feet	pop-rivets	counter sunk headed self drilling tapping screw
	 25x50x25x0.8mm/1mm/1.2mm	Vertical and Intermediate stud	Interior partition up to 10 feet	pop-rivets	counter sunk headed self drilling tapping screw
	 1½" x 2" / 1½" x 0.03mm	Clamps for connecting vertical stud to Intermediate stud	Interior partition up to 10-12 feet	wire-nails	
Timber	 50 x 100mm(2" x 4")	floor fixed soffit & ceiling fixed wall end Vertical and Intermediate stud	Interior partition up to 10-12 feet	wire-nails	counter sunk screw headed tapping
	 50 x 100mm(2" x 4")	floor fixed soffit & ceiling fixed wall end Vertical and Intermediate stud		wire-nails	

Sheet Layout

TORO boards are designed to be fixed both horizontally and vertically. Select the most economic and convenient method after discussing with the construction consultant. Keep an equal gap of 2 mm between the sheets for expansion on all four sides. Center lines of the gap must coincide with the center line of the framing member.



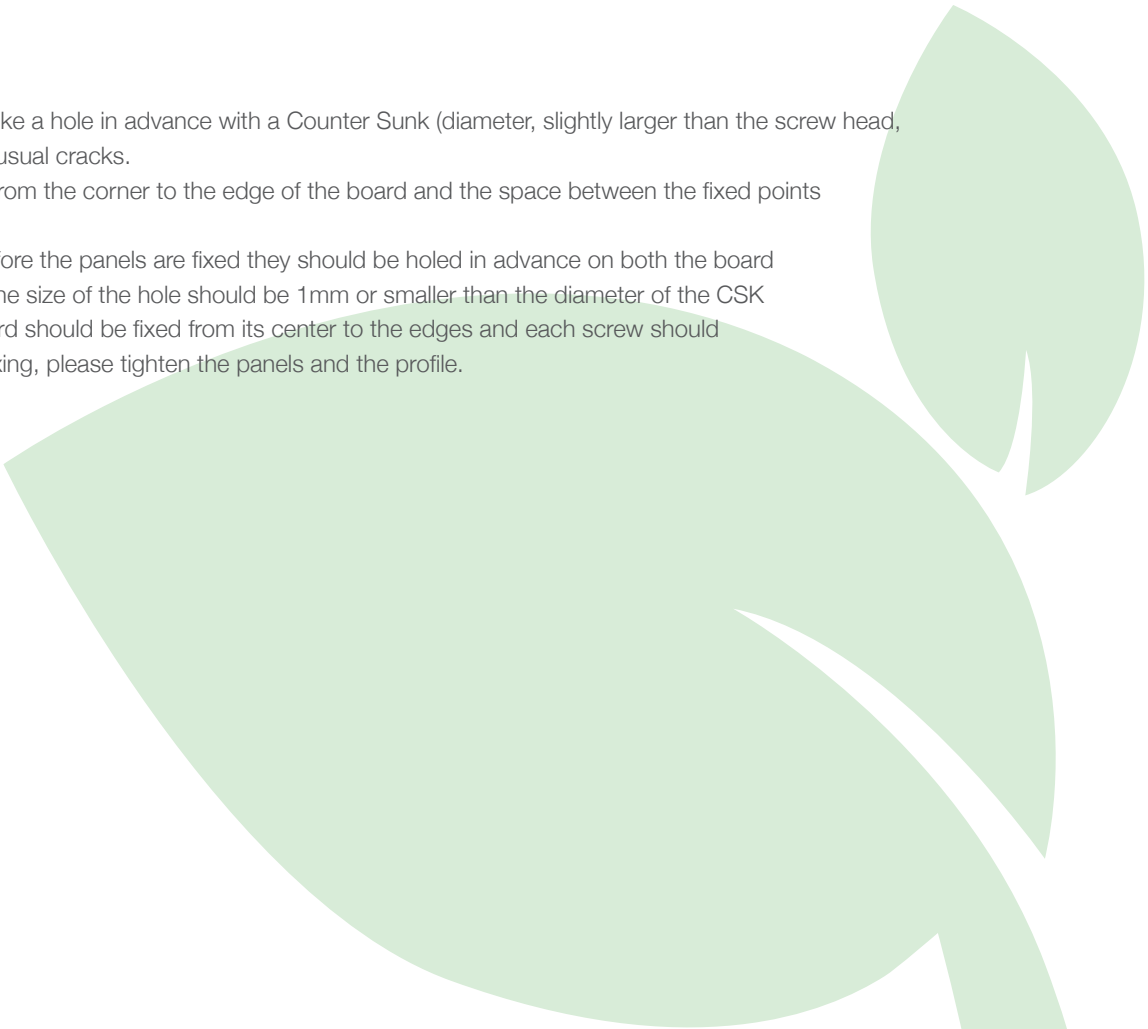
Horizontal installation

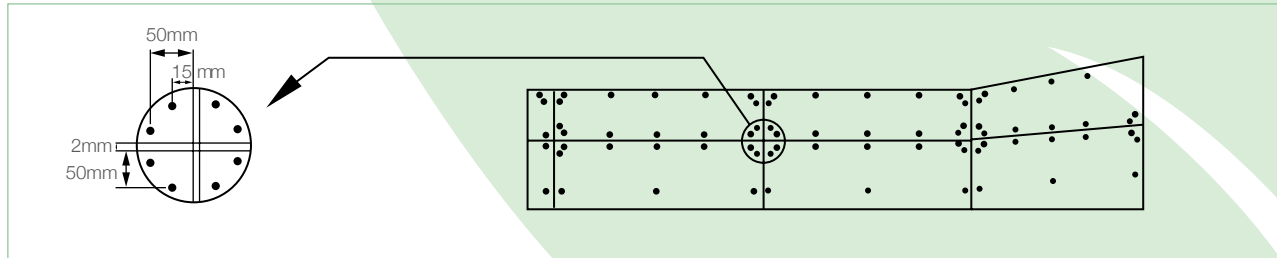
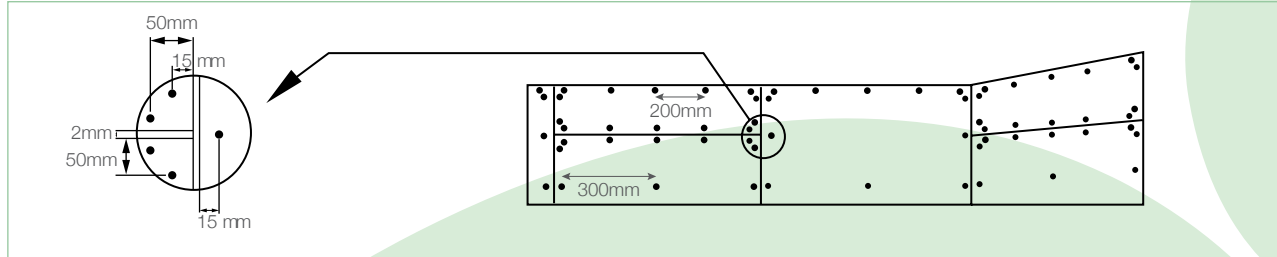


Vertical installation

General guidelines for Sheet laying

1. Use a flat and firm framework to fix the board, and ensure the Welding Junction and the Welding arms are not distorted, and avoid the Welding Slag splashing on the fastening pieces.
2. Generally, the Toro board, which is used for partitions, is installed vertically. That is to say, the longer edge should be installed on the GI Channel, Box section or Timber Frames.
3. An equal center to center distance of 601mm must be maintained for the Intermediate (horizontal) and 1201mm for the Intermediate (vertical) board. For the 2400x1200mm size board and it must be changed from center to center with the Intermediate and Vertical distances of 611mm and 1221mm according to the 2440x1220mm size board.
4. The board should not be horizontal with the profile on the frames of doors or windows. This is in order to avoid cracking due to vibrations caused by the opening or closing of doors and windows.
5. A 2mm gap must be maintained between the two boards. This is to resist the thermal and contractual expansion and to help avoid cracks during the installation stage.
6. Fix the board after finishing the complete framework for the project. All the MEP work should be finished before installation and completion of the joints. This would help in reducing the development of cracks from other activities during installation.
7. Fixing the complete size (2400x1200mm or 2440x1220mm) of board should be based on the rule of gradually fixing it from the middle to around; if not, the inside force of the board would be dispersed, thus having negative results.
8. Use CSK screws (Counter Sunk Self drilling Screws) to fix the fiber cement board, for GI / AL framed structures.
9. The distance between tapping screws with the hanging board is 200mm and the distance from the CSK Screw to the middle of the board is 300mm while it is 200mm to the other side.
10. The distance from the middle of the CSK Screws to the edge of the board, hanging board and wallboard is 15mm (minimum).
11. Special attention must be paid to the arrangement of structure and panels near windows and doors. The two longer edges of each panel are beveled edges. If the partition is higher than 2440mm, the shorter edge should be joined horizontally at the spot (the beveled edges should be about 25mm in width) to seal it better.

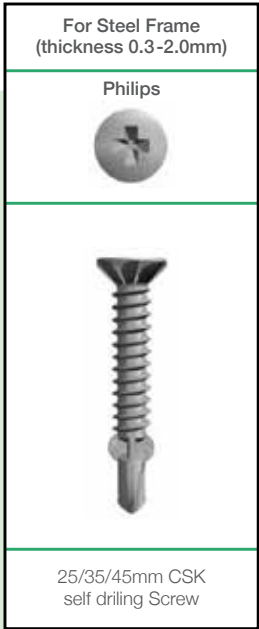
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- 12.If CSK screws are unavailable, make a hole in advance with a Counter Sunk (diameter, slightly larger than the screw head, and (1-2mm in depth) to avoid unusual cracks.
- 13.The fixed point should be 50mm from the corner to the edge of the board and the space between the fixed points should be 200-300mm.
- 15.If CSK screws are unavailable; before the panels are fixed they should be holed in advance on both the board and the profile to avoid cracks. The size of the hole should be 1mm or smaller than the diameter of the CSK screw. During installation, the board should be fixed from its center to the edges and each screw should enter the board by 1mm. When fixing, please tighten the panels and the profile.



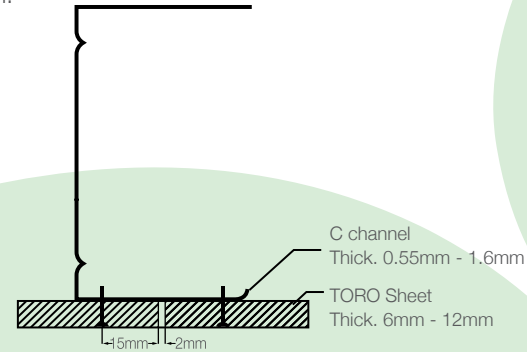
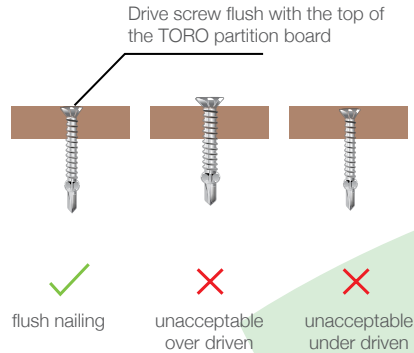
Fasteners must have the appropriate durability required for the intended project. Fasteners must be fully compatible with all other materials that they are in contact with to ensure the durability and integrity of the assembly.

TORO Screws are recommended for fixing TORO boards.

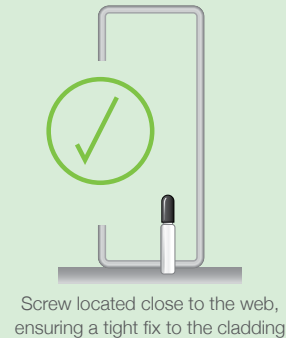
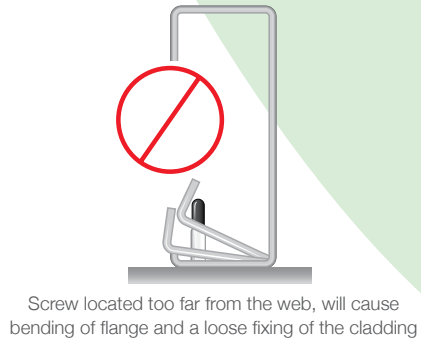
Board thickness	TORO Screw Length
6.0mm	25mm
8.0mm / 12.0mm	35mm
15.0mm – 20.0mm	45mm



Screws must be inserted in the following manner to achieve a flushed finish.

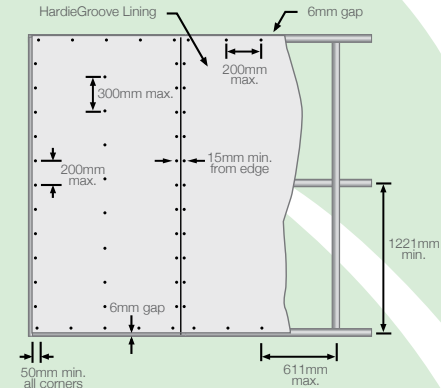


Screw fasteners must be screwed as close as possible to the web of the stud. This will ensure fixing tightly and avoid deflections, bending, unsightly fixing of sheet. In a case of fixing two screws to one stud, the close one must be screwed first.

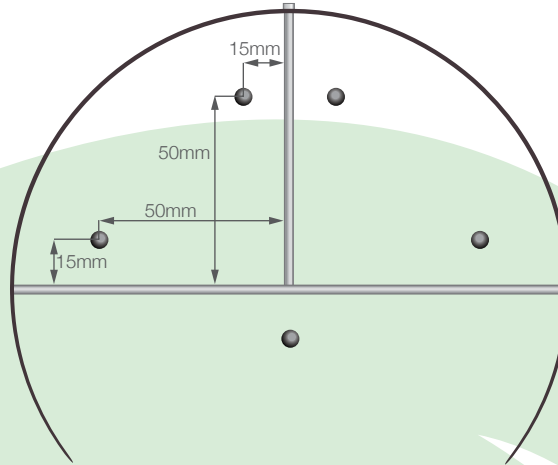


Fixing boards to the frame

- Keep 6mm thick rigid pieces (better place off cut sheet pieces) on the floor as temporary supports for the sheets to allow some movement. Install sheets as shown in the figure.
- Keep the screwing distances as shown in the following figure. When a fixing sheet, start from the center of the sheet and work outwards. Make sure that the sheet butt joints coincide with the center line of the framing members



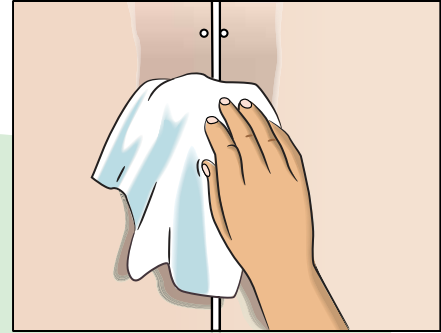
- Keep a distance of 15mm from the edge for screwing. At a corner maintain 50mm from the adjacent edge to the screw point.



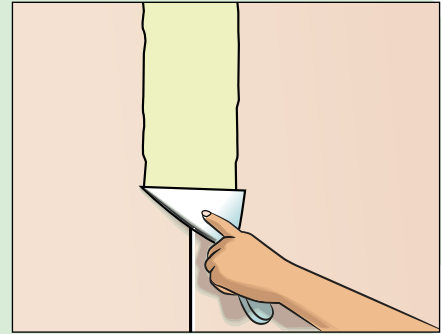
- Make sure the adjacent board does not have a level mismatch after screwing.

Joints finishing

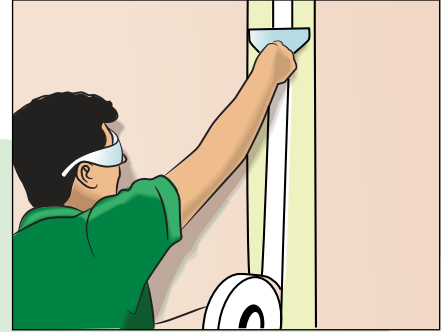
- When joining Square edge (S/E) or Tapered edge (T/E) sheets together, a butt joint should be used.
- Clean and dampen the joint gap and sheet edges using a wet sponge or a cloth. Make sure that there is no dust or any other contaminants.



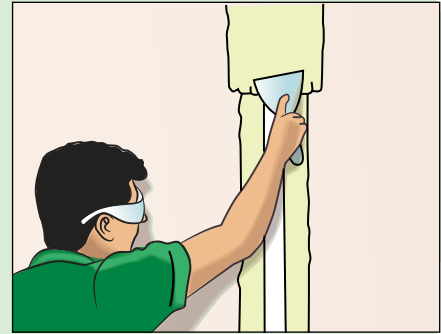
- Apply the TORO Fiber Cement Joint Compound using a scraper over the butt joint to 60mm width.



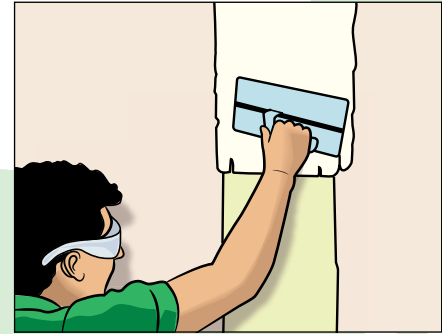
- Embed the Fiber Glass Self Adhesive Joint Mesh on the joint centrally using the scraper on the compound layer.



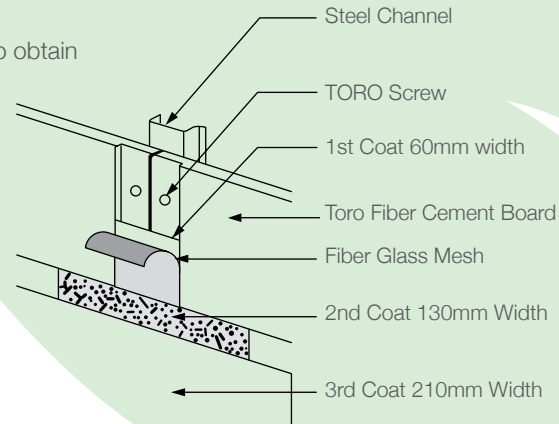
- Apply the second coat layer to a width of 130mm just after embedding the joint mesh. Let it dry for 30 minutes.



- Apply the finishing coat of 210mm on the dried second coat.



- After 1 hour sand the compound applied area in order to obtain a smooth surface.
- Joint compound coat width must be as follows.





Finishing

Fastener Heads

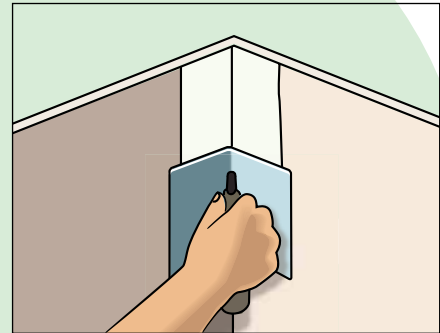
- Cover all fastener heads with TORO Fiber Cement Joint Compound.
- Let it dry then apply the second coat.
- Apply the finishing coat after drying the second coat.

Corners

Following figures show sheet butt joints at internal and external joints. To get a better appearance, place cut sheet edge first into the corner.

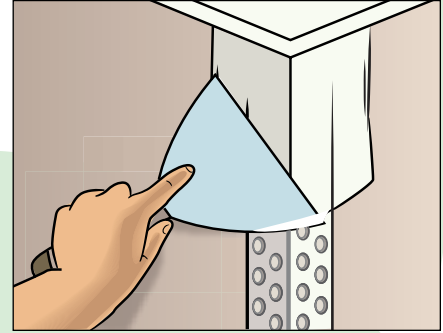
Internal Corners

- Apply joint compound on both sides of the corner using a corner tool.
- Embed the fiber glass self adhesive joint mesh or corner tape on the joint compound layer keeping the center on the corner using a corner tool.
- Apply final layer of joint compound on the corner tape after drying.
- Do not sand the corner till it dries completely.



External Corners

- Apply joint compound on both sides of the corner using a corner tool.
- Embed the fiber glass self adhesive joint mesh or corner tape on the joint compound layer keeping the center on the corner using a scraper.
- Apply an additional layer of joint compound on the corner tape after drying.
- Do not sand the corner till it dries completely.



Painting

- Remove all foreign material and residual sanding dust to make a surface that is suitable for painting.
It is advisable to follow the paint manufacturer's specifications and instructions on application.
- Apply a coat of wall filler.
- Apply two coats of Acrylic based Weather Shield paint using a brush, roller or a spray machine. Never apply an oil-based paint
- You could get a better performance by applying one finish paint coat every 24 months.

Maintenance

- **For a large damage:**

When the surface damage is large it is easy to repair by inserting a new TORO board or segment. Firstly, the damaged frame area should be removed, and both vertical and horizontal frame segments members should be removed from the main framework. Then insert a new TORO board segment for this area according to the normal Toro board fixing method.

- **For a small damage:**

First, the square segment on the FCB (fiber cement board) should be cut and removed when covering the damaged area. Supply and fix the low profile GI (thickness 0.3mm - 0.47mm) or AL (thickness of 0.8mm is better) strip, behind the previous board with a CSK self drilling screw. Then fix the new FCB segment

- **For cracks:**

Please identify the type of crack. If it is a small crack, it should be cleaned to avoid thermal expansion and further cracking. A small crack when it appears would have a gap of about 1.mm – 2.0 mm. Then apply the joint compound into the cleaned crack joint and finish the surface and paint according to the joint finishing method.

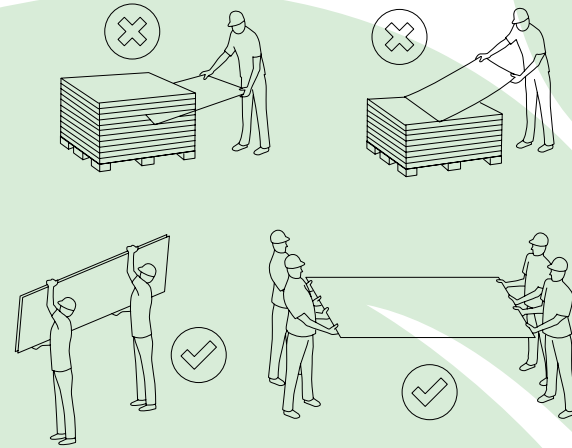




**El Toro Fiber
Cement Boards**
Handling Guide

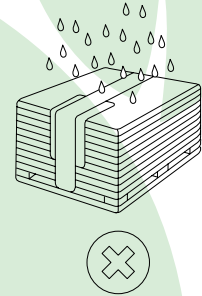
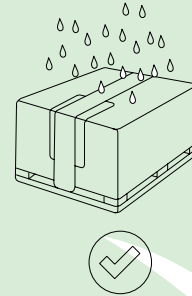
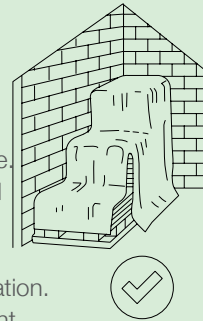
Handling

- While loading and unloading TORO boards of 2440X1220mm (8'x4'), they should be lifted by four persons, to support the four corners and the centre.
- The board should be properly lifted when being handled and should not be lifted by the corners. Also, they should not be dragged over each other which could cause scratches.
- Before taking out the boards, the packing strips should be carefully unwrapped.
- When cutting, sawing and screwing, ensure that no dirt settles on the textured surface.
- Use gloves to prevent blemishes while handling.



Storage

- TORO Boards must be stacked on a smooth, level surface.
The edges and corners must be protected against disintegration.
- TORO Boards should always be stored in a covered space that is free from moisture but with proper ventilation.
- TORO Boards should be stacked horizontally, preferably never at an incline. The stacks should be 6"-8" above the level surface.
- TORO Boards should be stacked flat, fully protected and covered during transportation to storage sites.
- Even in case of space constraints, lower thickness (6 & 8mm) TORO Boards should be stacked only horizontally and never at an incline.
- When stacking the board, direct exposure to rain, sun, frost etc can lead to damage due to thermal and moisture movements.
- If the TORO Boards get wet/damp due to inappropriate storage, they should be fully dried out in natural weather conditions before installation.
- Recommended storage of TORO Boards in each stack is up to 3m height per stack with a minimum gap of 300mm between adjoining stacks.
- If TORO Boards are to be stored at a site without covered sheds, ensure that the boards are covered with polythene covers and are stacked on wooden pallets, duly stretch-wrapped with polypropylene strips.



Transportation

- Transport on a flat surface.
- Do not overload.
- Maintain a 4-inch gap between the stack and the body of the lorry.
- When transporting in trucks, care should be taken that sharp metals, rivets, locks and other protruding objects do not damage the boards.
- Ensure that the whole pallet is completely placed inside the lorry.
- Use a forklift when loading.
- Use a protective cover over the sheet load.
- Use corner protection and a ratchet to tie the load to the lorry.









Seeing Tomorrow and Beyond

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