

All you need to know about...

The Buildable Wall Systems

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CONTACTS FOR DRY PARTITION WALLS

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Please note that the above list is not exhaustive or final.

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INTRODUCTION

The legislation of buildable design indicates a new start to the use of more buildable systems which require less labour. One of the buildable systems that improve the site productivity is the prefabricated partition wall system.

The advantages of the prefabricated partition system include ease of installation and replacement. This means home owners can easily improve their home layouts according to their needs and remodel their homes when desired. The prefabricated partition walls are also lightweight as compared to brickwall and have better quality finish.

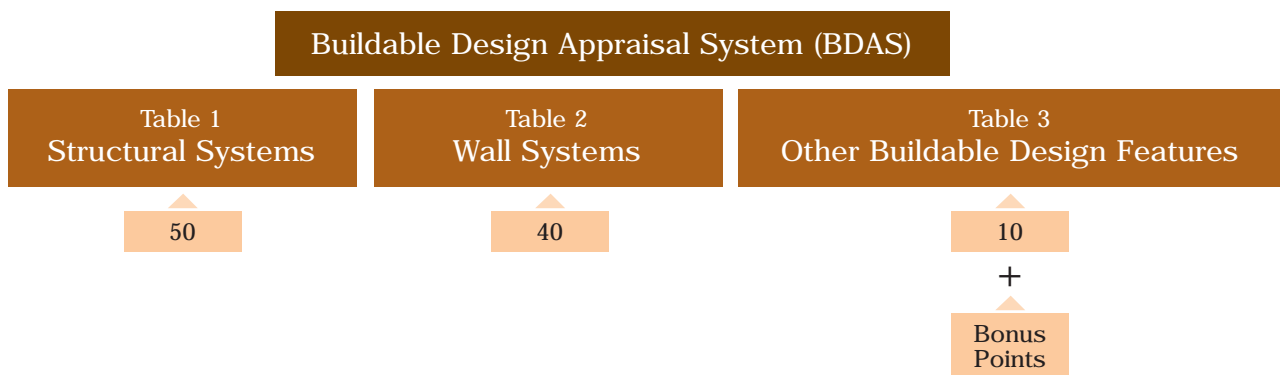
A partition wall is "an internal wall used for the purpose of subdividing a storey of a building into sections and which supports no load other than its own weight and wall fixtures. Also, "lightweight material" means:

- any sheet or board material such as timber board, plywood, fibreboard, plasterboard, aluminium sheet, corrugated metal sheet or polycarbonate sheet;
- any concrete product made with lightweight aggregates such as pumice, perlite, vermiculite; or
- any hollow concrete block, hollow glass block, autoclaved aerated concrete block and the like;

Partition walls are given grades. These are related to the level of activity in adjacent spaces and the degree of care the partition is likely to receive. Grades are also determined by the structural and functional performances of the partition.

BUILDABLE DESIGN LEGISLATION

Since January 2001, building projects with GFA of at least 5,000 m² are required to meet their respective minimum Buildability Scores. Since January 2004, Buildability legislation had been extended to building projects with GFA of at least 2,000 m². The minimum Buildability Scores will be increased progressively over the next few years. From January 2004, the points allocated to wall systems had also been increased from 30 points to 40 points. With the higher Labour Saving Indices, the use of prefabricated wall systems will help the projects to meet the minimum Buildability Scores requirement.



Extracts from Code of Practice on Buildable Design, January 2004



Buildable Design Appraisal System

The Buildable Design Appraisal System or BDAS was developed by the Building and Construction Authority as a means to measure the potential impact of a building design on the usage of site labour. The appraisal system results in a 'Buildability Score' of the design. A design with a higher buildability score will result in more efficient labour usage in construction and therefore higher site labour productivity.

Buildability Score of the Wall System

The Buildability Score for a particular wall system is computed by multiplying the percentage wall length covered by the wall systems and the corresponding labour saving indices. All wall systems must be accounted for. If a combination of systems is used, then the contribution of each system is computed and summed up to arrive at the Buildability Score (BScores) of the total wall system. The maximum Buildability Scores achieved in Table 2 is 40 points.

Wall Systems - Sw Value

WALL SYSTEM	LABOUR SAVING INDEX S_w	
Curtain wall/full height glass partition/dry partition wall ⁽²⁾ /prefabricated railing	0.70	1.00 ⁽¹⁾
Precast concrete panel/wall ⁽³⁾	0.80	0.90 ⁽¹⁾
PC formwork ⁽⁴⁾	0.50	0.75 ⁽¹⁾
Cast in-situ RC wall	0.50	0.70 ⁽¹⁾
Cast in-situ RC wall with prefabricated reinforcement	0.54	0.74 ⁽¹⁾
Precision block wall (Internal wall)	0.40	0.45 ⁽¹⁾
Precision block wall (external wall)		
Brickwall	0.30	

Wall systems with higher BScores

Extracts from Table 2 of Code of Practice on Buildable Design, January 2004

The relevant labour saving indices $LSI S_w$ to be adopted in buildability score computation for wall system depend on the wall systems and wall finishes used.

Note:

- (1) The higher indices apply to no finishes, finishes done off-site or where skim coat and/or paint is applied on site.
- (2) Dry partition walls include sandwich panel wall systems, stud (or studless) and sheet partition wall systems, demountable wall systems.
- (3) Precast concrete panels/ walls include weight concrete panels, lightweight concrete panels, autoclaved aerated concrete panels.
- (4) PC formwork refers to precast formwork panel with concrete infill.

* Indices for other systems not shown in this table shall be determined by BCA on a case-by-case basis.

CONSIDERATIONS FOR DESIGN OF WALL PARTITIONS

GRADE

- Light duty (LD) Minimal stiffness required. Small chance of impact load.
- Medium duty (MD) Moderate stiffness required. Some chance of accident occurring.
- Heavy duty (HD) High stiffness required. Chances of impact loads.
- Severe duty (SD) Prone to vandalism and abnormally rough use.

Functional Performance

- Fire protection
- Thermal insulation
- Moisture resistance
- Water vapour resistance
- Sound insulation
- Acoustical soundness
- Access
 - door openings
 - access panels, hatches
- Services
 - loadings from fitting
 - access for services
- Durability
 - effect of solar or environmental heating
 - contamination from dirt, fumes, chemicals, humidity
- Cleaning
- Maintenance

Structural Performance

- Load imposed by partitions
- Load imposed by adjacent structure
- Structural support and functional areas
- Wind loads and air pressure
- Strength and robustness
- Crowd pressure
- Fixtures and fitting

Appearance

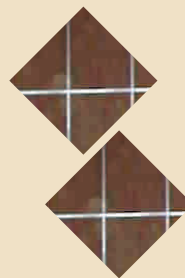
- Quality
- Finishes
- Glazing
- Trimming
- Accessories



CONSIDERATIONS FOR THE INSTALLATION OF WALL PARTITIONS

Installation

- Lighting
- Storage and handling
- Setting out
- Construction
- Accuracy of finished partition and openings
- Protection during construction
- Fixtures and fitting



Precast Concrete Panels



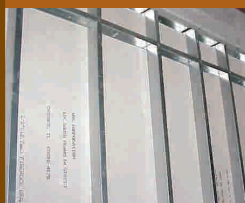
*Lightweight
Precast Panel*

LSI S_w = 0.8 to 0.9



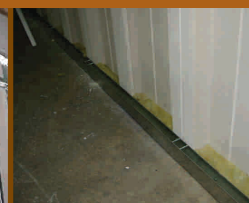
ALC Panel Wall

Dry Partition Walls



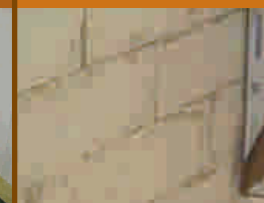
Dry Partition Wall

LSI S_w = 0.7 to 1.0



*Dry Partition Wall
(studless)*

Precision Block Walls



*Precision Block
Wall*

LSI S_w = 0.3 to 0.45



Getting Started

- Ensure adequate training is given to the project team on the installation method.
- Ensure the wall panels have satisfied the strength requirement as stated in SS492.
- Ensure the deflection of the structures (beam or slab) is less than the horizontal gaps provided at the top or bottom of the wall.
- Ensure the correct grouting compound is used. The grout should be cohesive and adhesive to the wall panels. The elasticity and strength of grout must be compatible to the wall panels, since cracks will occur at the weakest point.

Site Experiences on Use of Precast Panel Walls

One of the critical problems faced by precast panel systems is the occurrence of hairline cracks at the joints between adjacent wall panels. The list below shows some of the precautions taken by contractors to reduce such defects:

- a. Installation with freshly cast concrete panels should be avoided. This is because hydration of cement and evaporation of water create the stress within the young concrete, causing shrinkage.
- b. Provide gaps between the walls and structures: 20 mm for top, 20 mm for bottom and 10 mm for each side.
- c. Ensure that the mix proportion of grout and water is according to suppliers' recommendation.
- d. Partial grouting to the horizontal gaps of the panels at the top and bottom should be carried out immediately after the installation of wall panels to ensure that the panels are temporary secured.
- e. Grouting to the vertical gaps between the wall panels immediately after installation should be avoided. Grouting to be carried out after sufficient loadings from upper floors are added.
- f. Conduct inspection and ensure alignment of walls is in order before proceeding to grout the vertical joints and horizontal gaps.
- g. Ensure proper surface preparation is carried out with cleaning to the sides of wall panel and the face of structure that is receiving the wall panels.
- h. Ensure that the face of structure is saturated before grouting to avoid rapid absorption of water during grouting.
- i. Provide a layer of fibre mesh over the joints as additional precaution against cracks, if needed.
- j. Minimise vibration of the surrounding.

Main Causes of Defects

The main causes of cracks in the precast wall panels are:

- a. Failure of jointing compound
 - * Actual shelf-life of product had expired
 - * Incorrect mixing proportion of grout and water
 - * Surface area of the structures and the panels not properly cleaned
 - * Insufficient grout at joints
 - * Incorrect grout
- b. Improper supervision/ workmanship
 - * Correct method statement not followed
 - * Opening not grouted properly after chasing for services
- c. Structural movement
 - * Vibration during construction
 - * Excessive loadings from the floors above

FUNCTIONAL REQUIREMENTS FOR WALL SYSTEMS

a. Acceptance Criteria

Partition walls may be graded according to the level of performance expected of them during their service life. The criterion for acceptance into the various grades of performance is determined by the results of individual tests. For a partition wall to be described as having a particular grade, it shall pass all tests for that grade.

b. Stiffness

The partition wall is subjected to a static horizontal load, sustained for 2 mins, at a height of 1.4 m from the bottom of the specimen. When tested, there shall be no damage or detachment, loosening or dislodgement of a partition wall's parts or fixing, other than superficial cracking of the surface. The maximum deflection and residual deformation shall not exceed the limits for the grade being tested.

Stiffness Test			
Grade	Applied Load (N)	Maximum Deflection (mm)	Maximum Residual Deformation (mm)
LD	500	25	5
MD	500	20	3
HD	500	15	2
SD	500	10	1

c. Small Hard Body Impact

A 3 kg impactor, with its head being a 50mm diameter steel sphere, is swung to impact approximately perpendicularly the face of the partition wall. For each of the tests, 10 impacts are made, and the nature and extent of any damage to the specimen is recorded.

For surface damage test, evidence, including photographs showing the nature and extent of surface damage shall be provided to enable judgement to be made as to whether the damage is acceptable. No specific criterion for acceptance is given because the impact damage will vary with different materials and forms of construction.

Small Hard Body Impact: Surface Damage Test			
Grade	Impact Energy (Nm)	Pendulum Head Drop Height (m)	Angle of swing (°)
LD, MD	3	0.1	33.6
HD	6	0.2	48.2
SD	10	0.33	63.6

For perforation test, there shall be no perforation of the partition wall, corner junction, or panel of a hollow partition wall, after being subject to the impact energy for the grade tested.

Small Hard Body Impact: Perforation Test			
Grade	Impact Energy (Nm)	Pendulum Head Drop Height (m)	Angle of swing (°)
LD	No Requirement		
MD	5	0.17	43.8
HD	15	0.5	80.4
SD	30	1.0	131.8

d. Large Soft Body Impact

In this test, the partition wall is subjected to impacts from a soft body impactor in the form of a 50 kg spheroconical bag suspended from a test rig. For resistance to damage, the partition wall is subjected to 2 impacts at separate locations. The permanent deformation and any damage are recorded after each impact.

Large Soft Body Impact: Resistance to Damage		
Grade	Impact Energy (Nm)	Maximum Residual Deformation (mm)
LD, MD	20	0.1
HD	40	0.2
SD	100	0.33



For resistance to structural damage, 3 consecutive impacts are applied at 2 separate locations. The partition wall shall be capable of withstanding the impact without collapsing or dislocating any fixing.

Large Soft Body Impact: Resistance to Structural Damage	
Grade	Impact Energy (Nm)
LD, MD	60
HD, SD	120

e. Door Slam

This test subjects the partition wall to the impact of door slamming, transmitted through the door frame. A slamming force of 15 kg, generated by a falling mass, is applied to the door leaf. When tested, the partition wall shall not be damaged, nor shall door frame fittings and architraves become detached or loose after the test. The residual displacement of the door frame shall also not exceed 1 mm.

Door Slam Test		
Grade	Mass of Test Door Leaf (kg)	Number of Slams
LD, MD	35	20
HD, SD	60	100

f. Crowd Pressure

The partition wall is subjected to a continuous load transmitted through a 2.5 m horizontal beam at a height of 1.2 m. There shall be no collapse or damage that would render the partition dangerous, due to any of its parts becoming dislodged or shattered, in a manner that could cause injury. The sustained load applied to the timber beam shall be 0.75 kN/m, 1.5 kN/m or 3.0 kN/m.

g. Lightweight Anchorages

This test establishes the ability of the partition wall to sustain a load transmitted through a test bracket using a single anchorage, without dislodging a shim plate, positioned between the bracket and the surface of the partition wall.

For the pull-out test, the partition wall is subjected to an axial load of 100 N. The load shall be sustained for 1 min without releasing the shim plate or damaging the partition wall, other than superficial cracking.

For the pull-down test, a transverse load of 250 N is applied to the partition wall and sustained for 1 min. The shim plate shall not be released, neither shall the partition wall sustain damage, other than superficial cracking. The maximum movement of the pull-down bracket shall also not exceed 2mm.

h. Heavyweight Anchorages

This test establishes the ability of a partition wall to sustain a load applied through a pair of linked brackets designed to support a wash basin, high level wall cupboard or similar fixture. The anchorages shall be capable of withstanding the selected load for a period of 5 min without releasing the shim plates, exceeding the deflection or residual deformation limits and without loosening, detaching or damaging the partition wall.

Heavyweight Anchorage: Wash Basin Test		
Applied Load (N)	Maximum Deflection (mm)	Maximum Residual Deformation (mm)
500	5	1
1000 or 1250 or 1500	20	1

Heavyweight Anchorage: Wall Cupboard Test		
Applied Load (N) (in 500N increment)	Maximum Deflection (mm)	Maximum Residual Deformation (mm)
2000 or 4000	15	1



Wall Comparison By Strength & Robustness Tests
In Accordance To SS492 : 2001

	SS 492 : 2001 Test	Finewall (100mm thk)	3E Hollow – core Panel (90mm thk)	CSR Panel (100mm thk)	Lingjia ALC Panel (100mm thk)	Lightweight Concrete Panel (75mm thk)	Acotec (100mm thk)	Boral Impact Panel	Studless Panel (SLP) (120mm thk) Extruded fibre reinforced gypsum	Styroplast (50mm thk) with Vermiculite Core	Brick (100mm thk)
1.	Stiffness	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
2.	Small Hard Body Impact : Surface Damage	SD	SD	SD	HD	SD	SD	SD	SD	SD	SD
	Small Hard Body Impact : Perforation	SD	SD	SD	HD	SD	SD	SD	SD	SD	SD
3.	Large Soft Body Impact : Damage	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
	Large Soft Body Impact : Structural Damage	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
4.	Door Slam	SD	SD	SD	MD	SD	SD	SD	SD	SD	SD
5.	Crowd Pressure	3 kN/m	3 kN/m	3 kN/m	3 kN/m	3 kN/m	3 kN/m	3 kN/m	3 kN/m	3 kN/m	3 kN/m
6.	Lightweight Anchorages : Minimum Pull Out Force of 100 N	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
	Lightweight Anchorages : Minimum Pull Down Force of 250 N	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
7.	Heavyweight Anchorages : Wash Basin	1500 N	1500 N	1287 N	1500 N	1500 N	1500 N	Not tested	1500 N	1500 N	1500 N
	Heavyweight Anchorages : Wall Cupboard	4000 N	4000 N	4000 N	4000 N	4000 N	4000 N	4000 N	4000 N	4000 N	4000 N

Note: Test reports may be obtained from wall suppliers.

1.	Stiffness :	Partition wall is subjected to a horizontal force of 500N applied at a height of 1.5m. Maximum deflection and residual deformation should be within specified limits. Test simulates bending caused by people leaning on, or person on ladder leaning against the partition wall.
2.	Small Hard Body Impact :	Partition wall is subjected to a 3 kg impactor with a 50mm diameter steel sphere head, swung perpendicularly against the wall. Extent of damage is assessed. Test simulates impact caused by sharp or pointed objects, such as trolleys and wheelchairs.
3.	Large Soft Body Impact :	Partition wall is subjected to a 50 kg load in the form of a spheroconical bag swung against the wall. Permanent deformation should not exceed 2 mm, with no structural damage. Test simulates impact caused by people falling against the partition wall.
4.	Door Slam :	Depending on level of test to which the partition wall is to be tested, a 35 kg or 60 kg door is slammed with a force of 15 kg. No damage should be observed. Test simulates door slams caused by wind, or people closing a door energetically.
5.	Crowd Pressure :	Partition wall is subjected to a sustained load transmitted through a 2.5 m horizontal beam, at a height of 1.5 m. No damage or collapse should be observed. Test simulates loads caused by a crowd leaning against the partition wall.
6.	Lightweight Anchorages :	Partition wall is subjected to a force transmitted through a bracket, with a shim plate positioned between the bracket and the surface of the partition wall. No damage should be observed and shim plate should not be dislodged. Test simulates loadings from lightweight fixtures such as wall pictures, clothing hooks, basic wall shelving.
7.	Heavyweight Anchorages :	Similar to that for lightweight anchorages, except that configuration of brackets resembles that of heavyweight installations. Test simulates loadings from heavyweight fittings such as wall cupboards, wash basins, water closets.



Grade		Description	Acceptable Usage
LD	Light Duty	Minimal Stiffness. Is suitable for use in areas where there is a small chance of impact loads.	Domestic accommodation
MD	Medium Duty	Moderate Stiffness. Is suitable for use in areas where there is some chance of accident occurring.	Office accommodation
HD	Heavy Duty	High Stiffness. Is suitable for use in areas where there is chance of impact loads.	Public circulation areas; Industrial areas
SD	Severe Duty	Is suitable for use in areas prone to vandalism and rough use.	Major circulation areas; Heavy industrial areas



Fire Test for Walls



Crowd Pressure Test for Walls

Wall Comparison By Functional Requirements

Requirements	Finewall (100mm thk)	3E Hollow-core Panel (90mm thk)	CSR ALC Panel (100mm thk)	Lingjia ALC Panel (100mm thk)
Weight	225 kg/ m	240 kg/ m	195 kg/ m	195 kg/ m
Productivity ¹	18-23 m ² / man-day (installation & joint treatment)	15-25 m ² / man-day (installation & plastering)	15-20 m ² / man-day (installation, joint treatment & skim coat)	15-20 m ² / man-day (installation, joint treatment & skim coat)
Non-Combustibility BS 476 : Pt 4	Pass	Pass	Deemed to satisfy	Pass
Fire Rating BS 476 : Pt 20	75 mins	120 mins	240 mins (125mm thk)	132 mins (75mm thk) 194 mins (100mm thk)
Sound Insulation ¹	41 dB	42 dB	38 dB	36 – 40 dB
Usage in Wet Areas	Yes	Yes	Yes	Yes
On-Site Installation of Concealed Wiring, Ducting & Pipework	After installation of wall, wall surface can be chased. Void within wall to be filled with packing material.	After installation of wall, services can be concealed within the core of the wall. Also surface can be chased.	At joint locations or edges of panel, where there is no reinforcement.	At joint locations or edges of panel, where there is no reinforcement.
Surface Appearance	Smooth	Smooth with skim coat	Smooth with skim coat	Smooth with skim coat
Applied Finishes : Tiling	Yes	Yes	Yes	Yes
Joint Treatment	Cementitious jointing compound is applied between abutting panels.	Cementitious jointing compound is applied between abutting panels.	Fibre mesh is placed between panels, followed by application of skim-coat.	Cementitious low strength non-shrink material.
Fastener Types	Cavity Anchors	<ul style="list-style-type: none"> • Cavity Anchors • 'U' & 'L' Metal Fastener 	<ul style="list-style-type: none"> • Plastic Plugs • Lightweight Concrete Anchors 	<ul style="list-style-type: none"> • Plastic Plugs • Lightweight Concrete Anchors
Flexibility of Relocation	Can be removed and replaced with relative ease and minimal mess	Can be removed and replaced with relative ease and minimal mess	Can be removed and replaced with relative ease and minimal mess	Can be removed and replaced with relative ease and minimal mess

¹ Indicative Values Only

² Test reports may be obtained from wall suppliers

Weight :	Based on floor-to-floor height of 3.0m
Non-Combustibility :	Non-combustible materials are materials which neither burn nor give off flammable vapour in sufficient quantity to ignite when subjected to the test for combustibility as prescribed in BS 476 : Part 4. All walls in buildings shall be constructed of non-combustible materials throughout.
Fire-Rating :	The minimum period of time during which an element of structure or building element may be expected to resist fire penetration. Compartment walls, which divide a building into compartments, are required to have the appropriate fire resistance. Walls separating bedrooms in a residential unit, for example, usually do not require fire rating.

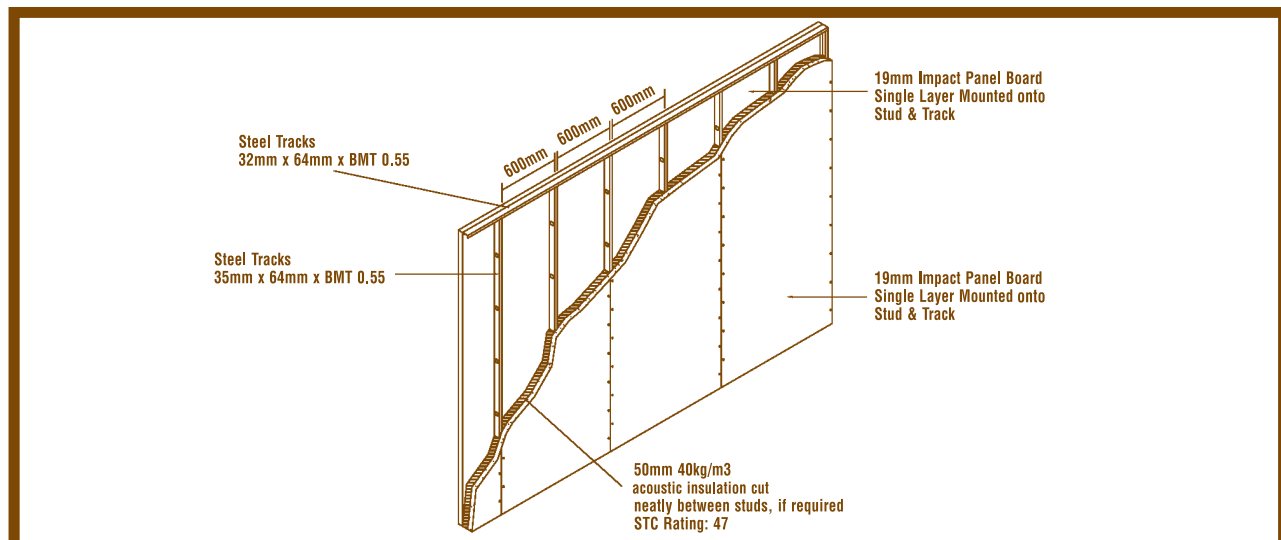


Lightweight Concrete Panel (75mm thk)	Acotec (100mm thk)	Boral Impact Panel	Studless Panel (SLP) (120mm thk)	Styroplast (50mm thk) with Vermiculite Core	Brick (100mm thk)
405 kg/ m	420 kg/ m	113 kg/ m	166 kg/ m	102 kg/ m	900 kg/ m
15-20 m ² / man-day (installation, joint treatment & skim coat)	16 m ² / man-day (installation & joint treatment)	20-25 m ² / man-day	15-20 m ² / man-day (installation & joint treatment)	35-40 m ² / man-day (installation & joint treatment)	4-7 m ² / man-day (installation & plastering)
Deemed to satisfy	Pass	Pass	Deemed to satisfy	Pass	Deemed to satisfy
-	120 mins	60 mins	60 mins 120mm (with fibre gypsum outer layer)	60 mins	120 mins
-	42 dB	47 dB	52 dB for 1 hour fire rating board 61 dB for 2 hour fire rating board	32 dB	35 dB – 40 dB
Yes	Yes	Yes	Yes	Yes with moisture-resistant coating	Yes
Services can be incorporated into the wall during the manufacturing process.	During installation of wall, services can be run through wall cell. After installation of wall, wall surface can be chased. Void within wall to be filled with packing material.	By fitting services before closing up.	By fitting services before closing up.	By surface chasing (bear in mind wall thickness).	By surface hacking.
Smooth with skim coat	Smooth with skim coat	Smooth	Smooth	Smooth	Smooth only with skilled plasterers
Yes	Yes	Yes	Yes	Yes but with adhesive	Yes
Fibre mesh with pre-packed mortar is placed between panels, followed by application of skim-coat.	Cementitious joint compound is applied between abutting panels.	Paper tape is used to seal joint, followed by application of joint compound.	Cementitious compound & fibre tape is applied between abutting panel.	Fibre tape is used to seal joint, followed by application of gypsum joint compound.	-
<ul style="list-style-type: none"> Plastic Plugs Lightweight Concrete Anchors Impact Anchors 	<ul style="list-style-type: none"> Cavity Anchors 	<ul style="list-style-type: none"> Cavity Anchors Gypsum Screws 	<ul style="list-style-type: none"> Impact Anchor Tapping Screw 	<ul style="list-style-type: none"> Plastic Plugs Gypsum Screws Impact Anchors Cavity Anchors 	<ul style="list-style-type: none"> Plastic Plugs Chemical Anchors Impact Anchors
and Relatively difficult to remove and replace	Can be removed and replaced with relative ease and minimal mess	Removal and replacement fast and easy	Removal and replacement fast and easy	Removal and replacement fast and easy	Removal and replacement fast and messy

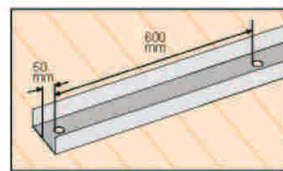
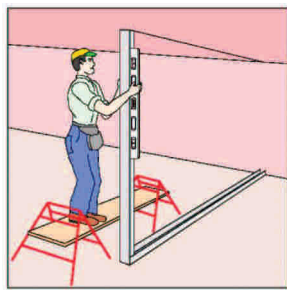
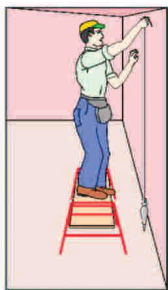
<i>Sound Insulation :</i>	<i>Sound Insulation value is an acoustic rating derived from sound transmission loss measurements over a range of test frequency bands.</i> <i>The higher the sound insulation value, the better the wall will be at reducing noise transmission.</i> <i>It should be noted that penetrations or imperfections in the wall can affect its acoustic performance.</i>
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Installation Guide for Dry Partition Walls

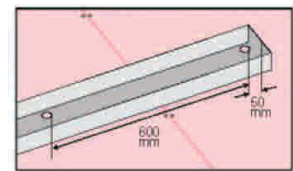
(Recommended by Boral PlasterBoard (M) Sdn Bhd)



Typical 102mm 1-hour Fire Rated Impact Resistance Drywall Partition System



Bottom Bracket



Top Bracket

Partitions are set out according to layout plan. Set-out points should be first marked on the floor then transferred to the ceiling.

Once all partitions have been set-out, wall track is installed.



Install studs into the track vertically.



Apply plasterboard to one side of a wall.



Install rockwool for acoustic insulation if needed. Install M&E Services.



Sheet the second side of the wall.



Complete with paint finish.

Install studs into the track vertically. The first stud is to be fixed against the existing wall. Door studs and the first stud on each side of the door must be fixed into the wall track.

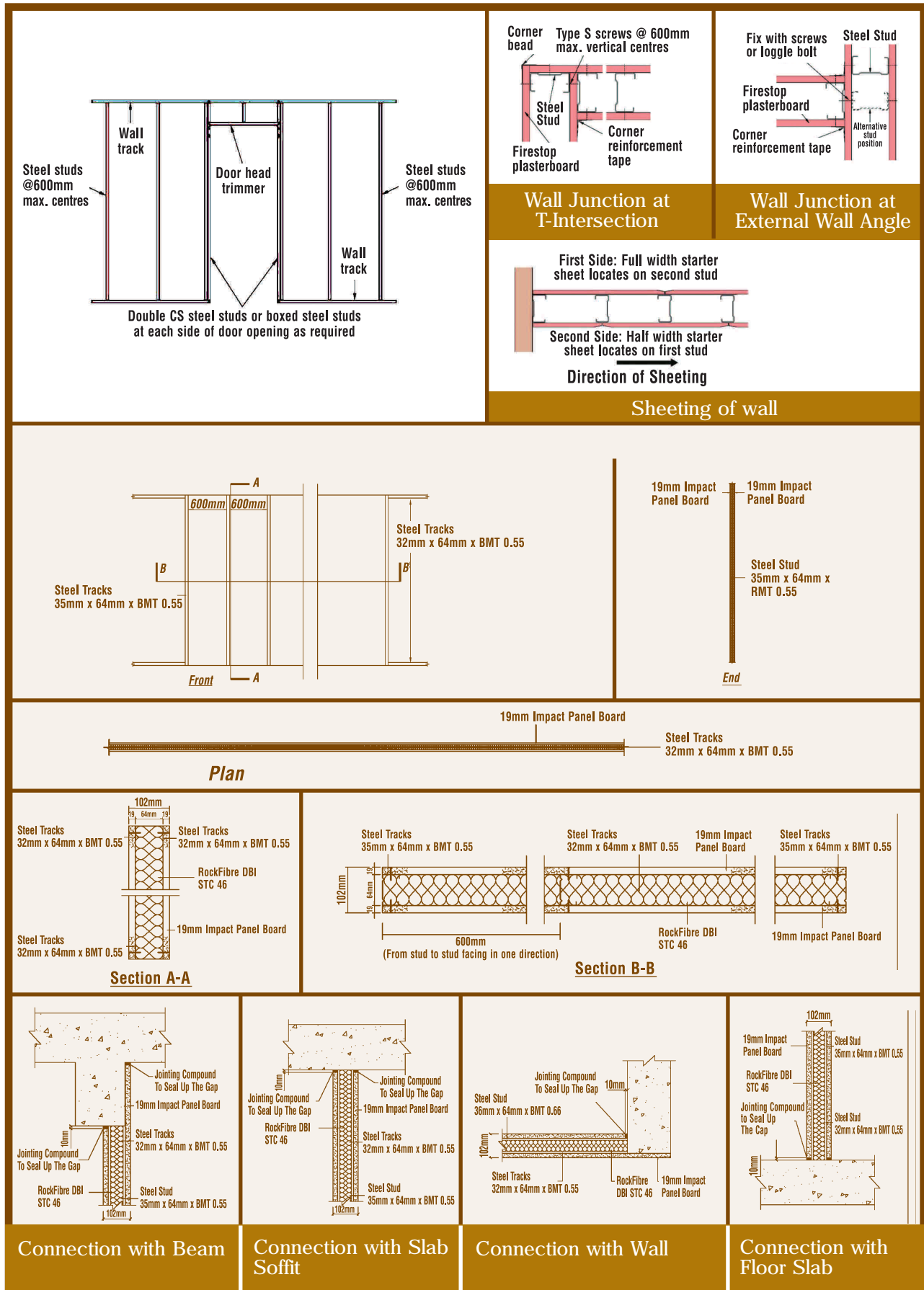
Wall studs should be cut 16mm shorter than the floor to ceiling height. This will allow for at least 16mm expansion gap and allow for possible deflection of ceiling track fixing.

Care must be taken when installing studs to ensure that studs are all facing the same direction, and that service holes are lined up.

Cut board sheet to suit the length of the floor to ceiling. Allow for a gap of 10mm at the floor and ceiling. When screw fixing board sheeting to metal studs, sheeting must be in the direction of the open stud. This allows for the board recessed joint to sit flushed.

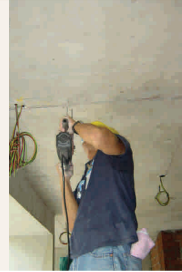
Detailing for Dry Partition Walls

(Recommended by Boral PlasterBoard (M) Sdn Bhd)



Installation Guide for Precast Concrete Partition Walls

(Recommended by Prime Structures Engineering Pte Ltd)



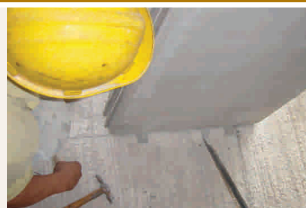
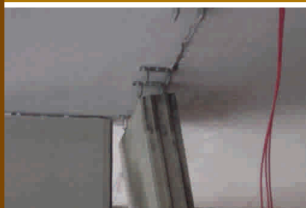
Mark out centre line of the wall position.
With the use of a laser marker or plumb line, transfer the marks to the soffit.



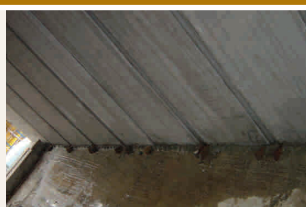
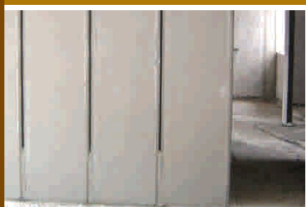
Mark and cut the panels for installation.



Moving panels into position for installation.
The bottom brackets are inserted into the bottom end of the panels.

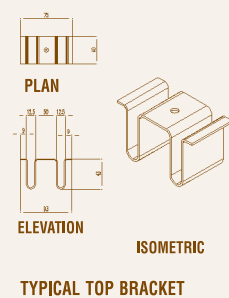


Panels are tilted to enable top brackets to slot into the cells.
Crowbar and timber wedges are used to align the wall.

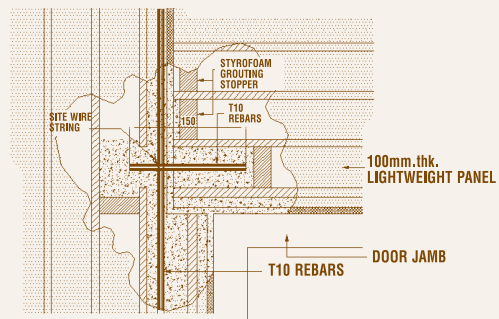


Prior to grouting the joints, the surface receiving the grout is washed thoroughly.
The grout is mixed and applied using pump according to the suppliers' recommendations.

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Connection to Slab Soffit



Connection at Door Jamb Corner

