

STÄRKEN[®]

Installation Manual

AAC WALL BLOCKS AAC WALL PANELS



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Installation Manual

Starken AAC Block Wall

Infill Wall (Non-Load Bearing)



Delivering World-class Lightweight Solutions

Notes:

1. This manual serves as a guide for Starken AAC blocks and its related accessories for the erection of infill wall system. It is not meant to provide exhaustive (complete) instruction on AAC block installation, as such, installers must possess a basic knowledge/ skill related to masonry work.
2. Starken offers block wall systems ranging from 50mm thick to 300mm thick (excluding skim coat or render). Each wall thickness may yield different performance in its fire/acoustic rating and thermal insulation value.
3. Specific design criteria stipulated in the contract documents such as fire resistance level and sound insulation value must be checked and confirmed by relevant parties such as architect/ consultant/contractor before commencing block installation.
4. To ensure optimum compatibility, use accessories (i.e. thin bed adhesive, skim coat & render) obtained from Starken's approved suppliers. Contact us for the list of approved accessory suppliers.
5. If Starken AAC lintel is used, ensure the load capacity is adequate to support the AAC block wall above the opening. Check the lintel specification.
6. General instructions about the application of associated items for installation of AAC blocks such as thin bed adhesive, skim coat base, skim coat finish & render are shown on the respective package.

For further assistance, contact us at:

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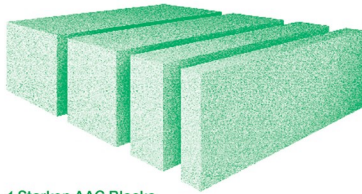
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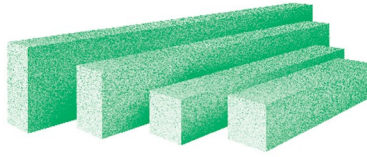
Disclaimer Note:

Please be informed that Starken AAC Sdn. Bhd. shall not in any way be held responsible for the use / adoption of the information in this document, be it expressed or implied. The content of this document represent typical details related to installation of Starken AAC products. Each application may be unique and requires specific attention that may be outside the scope of this document. Thus, it is recommended that Specifiers/ Designers to consult Starken Technical Department and also analyze the relevant product specifications, and (but not limited to) other performance criteria related to the overall construction.

Basic Wall Components & Accessories



Starken AAC Blocks



Starken AAC Lintels



Thin Bed Adhesive



Skim Coat Finish



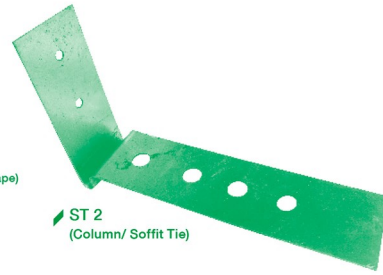
Skim Coat Base



Render



Fiber Mesh
(Fiber Glass Reinforcing Tape)



ST 2
(Column/ Soffit Tie)

Basic Installation Tools

Note: 1. Accessories marked with  are available from Starken AAC Sdn. Bhd.



Notched trowels
available in:
100mm, 125mm,
150mm & 200mm.



Tungsten Carbide
Tipped Saw



Stirrer



Spirit Level



Wall Trencher



Hand Drill



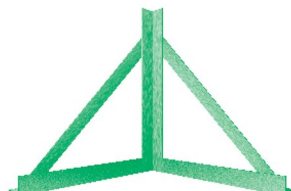
Mixing Container



Rubber Mallet



Sanding Float



Square

General Requirements

Recommended Minimum Block Thickness

Starken recommends the following minimum block thickness based on the intended applications. For wall application, blocks are available in standard face dimension of 200mm (height) x 600mm (length). Block thickness of 50mm and 75mm can be used for encasement or box-up, while 100mm, 125mm, 150mm, 175mm, 200mm, 225mm, 250mm and 300mm can be used for wall applications. It is the building designer's responsibility to select the suitable block thickness to ensure all design criteria such as fire rating, sound insulation and thermal insulation properties are satisfied. Below are some of typical scenario where thicker block wall may be required:

1. External wall requiring lower U values to satisfy EE requirements such as GBI certified buildings
2. Wall separating spaces with 24-hour air-conditioned (min. 150mm thick recommended)
3. Internal wall required to accommodate 'larger than usual' services such as hospitals (min. 125mm thick recommended)
4. M&E rooms – min. 150mm thick
5. Sub-station & gen set rooms – min. 200mm thick

Application	Minimum Block Thickness	Surface Coating	Max. nominal wall thickness using min. block thickness
• Internal Wall (Dry)	100mm	Both surfaces 3mm to 5mm skim coat	110mm * Both sides skim coated
• Internal Wall (Wet)	100mm	Dry area 3mm to 5mm skim coat Wet area 10mm to 12mm render	115mm * Excluding tiles and adhesive * One side skim coated
• Party Wall (Fire Rated)	150mm	Dry area 3mm to 5mm skim coat Wet area 10mm to 12mm render	110mm * Both sides skim coated
• Party Wall (Fire Rated)	200mm	Dry area 3mm to 5mm skim coat Wet area 10mm to 12mm render	210mm * Both sides skim coated
• External Wall	125mm	Int. dry area 3mm to 5mm skim coat Int. wet area & Outdoor side 10mm to 12mm render	140mm * Skim coat internally & render externally

Note: 1. When applied as party, compartment and separating walls, always refer to relevant clauses in the UBBL Malaysia.
2. It is the responsibility of project consultant to obtain necessary approval from local authorities such as Bomba and local council.
3. Chases formed on the erected wall shall comply with the UBBL Malaysia requirements.

Block Mortar Adhesive

It is compulsory to use Starken Thin Bed Adhesive (TBA) when assembling AAC block wall. TBA is used for bonding/ joining AAC blocks with approximately 2mm to 3mm mortar bed. Lampiran C1/C2/C3 will only be issued for wall erected using Starken TBA.

Coatings

Block wall surface can be skim coated (dry area) or rendered (external wall or wet area). Final wall finishes recommended include emulsion paint for internal walls, exterior grade (i.e. acrylic, PU) paint for external walls and tiles for wet area. Consult respective finishes' manufacturers for recommendation.

Block Wall Installation Method

Important

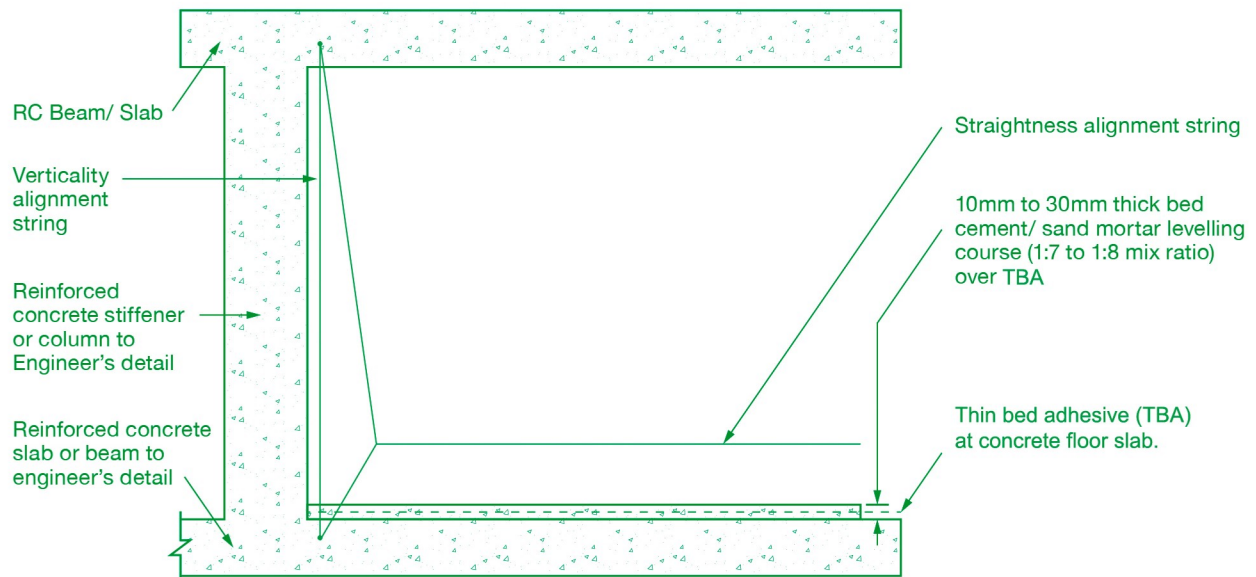
Block wall installation notes

1. Thick bed levelling mortar should be nominally 10mm to 30mm thick (Final mortar bed thickness after blocks are tapped in place).
2. Provide 10mm to 20mm gap between block wall and columns/ stiffeners.
3. Allow a minimum of 20mm clearance between block wall and beam/ slab soffit.
4. Use cement sand mortar having a mix ratio of 1:7 to 1:8 for filling the clearance gaps and thick bed leveling purpose.
5. AAC blocks must be installed in a stretcher bond pattern with a minimum 100mm block overlap. Blocks are typically cut to 300mm length to achieve 300mm vertical joint offset.
6. Fix ST2 Ties vertically at 600mm centres, first and last courses [A].
[A] One end of ST2 tie is fastened to the column/ stiffener, while another end is embedded into block horizontal joint.
7. Install ST2 Ties horizontally at 1200mm centres, first and the last blocks of final course [B].
[B] One end of ST2 tie is fastened to the soffit of beam/ slab, while another end is embedded into block perpend joint.
8. Ensure 2mm to 3mm thickness of Thin Bed Adhesive (TBA) at block vertical and horizontal joints. Joints should be completely filled with TBA.
9. Clean any excess TBA within 1 to 2 hours after block laying.
10. Where required by design, clearance gaps can be filled with compatible sealant instead of cement/ sand mortar.
11. Ensure the first block course is true and level before proceeding to the subsequent courses.
12. Allow wet blocks to dry before installation.
13. Minimum block size (Length) is 100mm.
14. Erected block wall must be protected from rain or water.
15. Check the level and alignment of subsequent courses occasionally.
16. Reinforced concrete beams, columns, slabs and stiffeners must be designed by qualified engineer.
17. The details provided in this manual is only applicable to internal wall only for service load of 0.25kPa. For external wall and applications required to withstand more than 0.25kPa load, stiffeners may be spaced less than 4m. Refer Starken technical department for advice.
18. When used externally and subjected to wind load, stiffeners spacing should be reduced to engineer's specification.

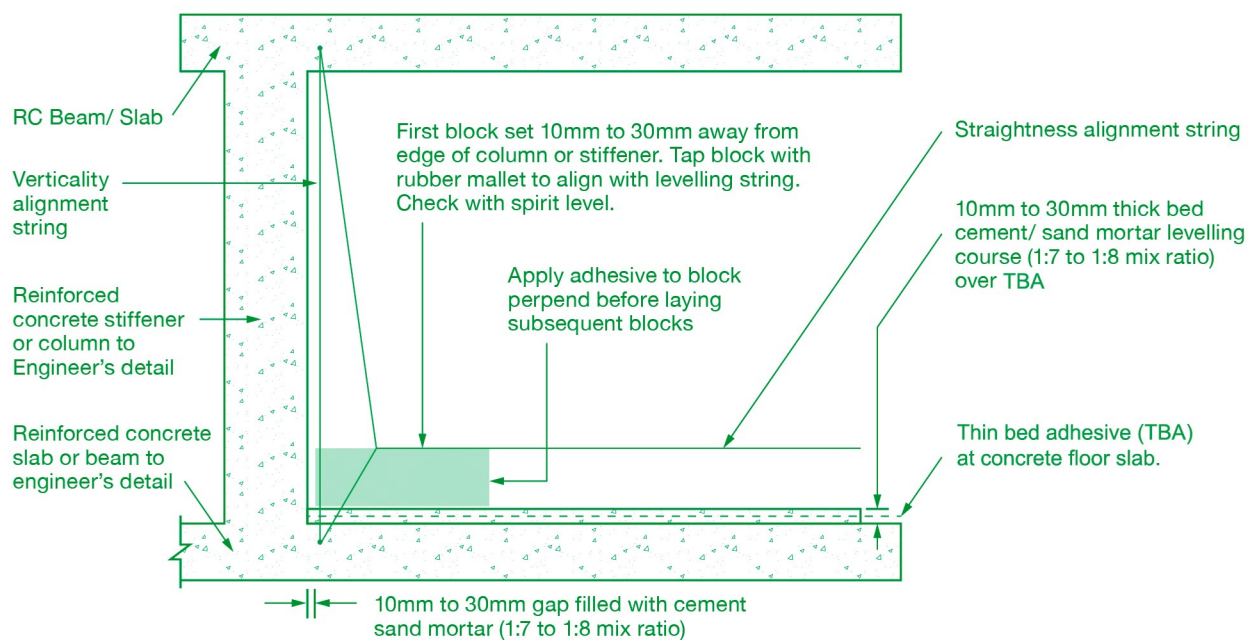
Block Installation Guidelines

Step 1 – Setting up & levelling

Note: Verticality alignment string must be installed at least at each wall end or corner

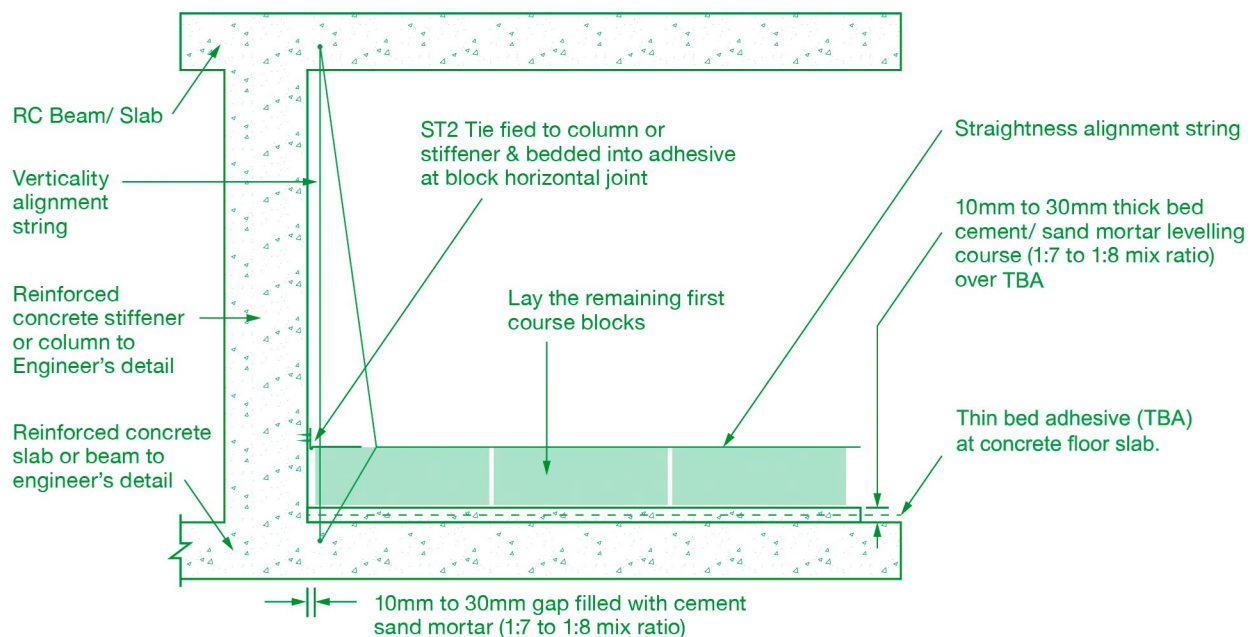


Step 2 – First block course (laying first block)



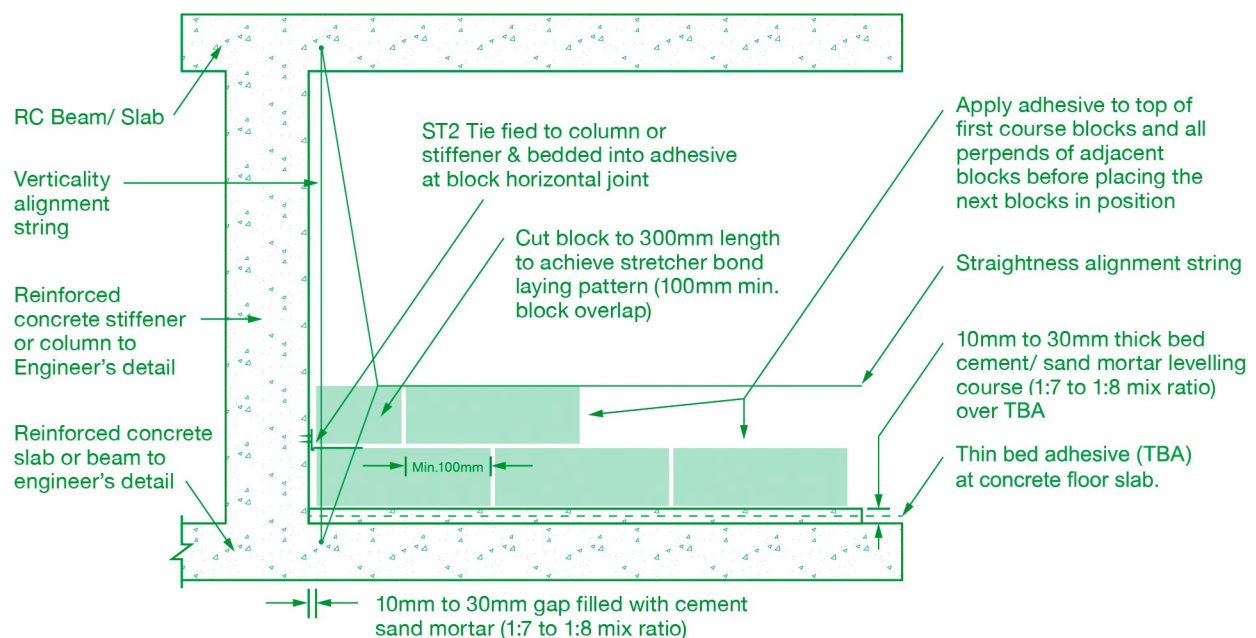
Block Installation Guidelines

Step 3 – First blocks course (Laying subsequent blocks)



Step 4 - Laying subsequent blocks courses

Note: Straightness alignment string should be moved upward as each block course progresses



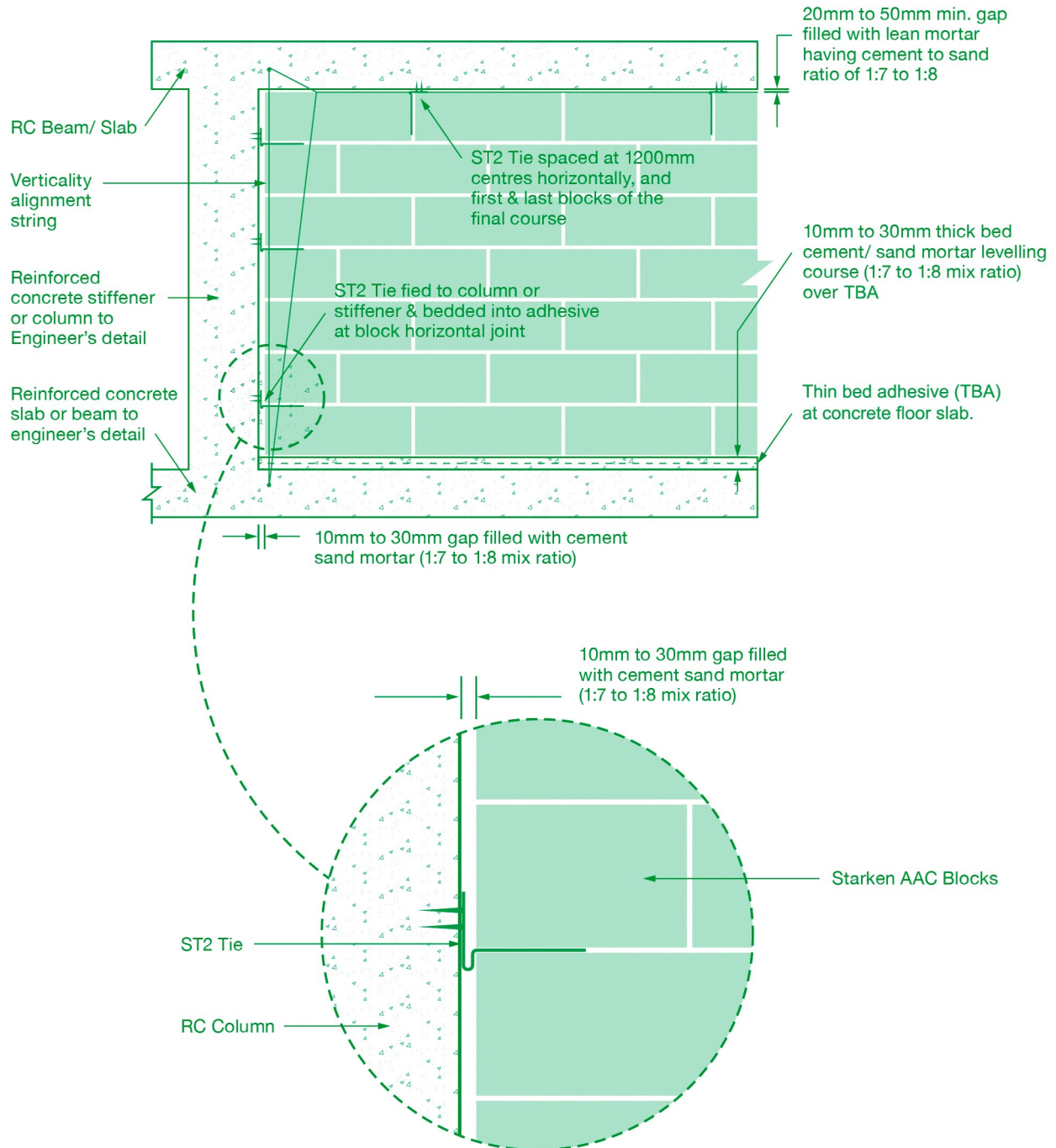
Block Installation Guidelines

Step 5 – Final block course

Note: 1. The longer leg of ST2 Tie is sandwiched between block join and embedded into thin bed adhesive.

2. The shorter leg of ST2 Tie can be fix to RC Structure / Stiffener by one of the following methods:

- Gas-driven fastening system (Hilti / Ramset)
- Nylon wall plug (min. 6mm Ø) & suitable fastener
- Hand-driven concrete nail (3mm Ø x 25mm long min.)



METHOD STATEMENT OF INSTALLATION FOR STARKEN AAC

1. STAGES OF WORKS

1.1 SURFACE PREPARATION FOR STARKEN AAC

- 1.1.1 Clean the area where AAC block will be installed:
 - a. if rough surface finish slab, proceed with installation
 - b. If smooth surface finish slab, add thin layer of Thin Bed adhesive before levelling mortar application.

1.2 INSTALLATION OF AAC BLOCK WALL

- 1.2.1 Prepare all tools, materials & equipment to be used and check layout of wall based on approved plan with survey team.
- 1.2.2 Setting up & levelling. Layout wall lines on building slab by vertical and horizontal straightness alignment strings.
- 1.2.3 Start the levelling bed. Apply the adhesive on the concrete slab using trowel then apply mortar as the base course for the first layer of AAC blocks. 10mm to 30mm thick deep sand-cement mortar joint (Mortar to be 1:7 to 1:8 mix ratio)
- 1.2.4 Set the first corner block. Set the first corner block in the sand-cement mortar using 10mm to 30mm thick bed cement/sand mortar levelling course (1:7 to 1:8 mix ratio). First block set 10mm to 30mm away from edge of column or stiffener. Tap block with rubber mallet to align with levelling string. Check with spirit level. Lay the remaining first course blocks ensuring the straightness with the alignment strings.
- 1.2.5 Laying subsequent blocks courses. Provide ST2 Tie, one end fixed to reinforced concrete stiffener/column and another end embedded into adhesive at block horizontal joint. ST2 Tie spaced at 600mm center vertically, and first and last block courses while ST2 Tie spaced at 1200mm center horizontally, and first & last blocks of the final course.

1.3 NOTE

- 1.3.1 Do not use Starken thin-bed Adhesive as levelling mortar material. If moisture and wicking is a problem, add water resistance mixture to sand-cement mortar. Ensure that the top level of all 1st blocks layer is at same height.
- 1.3.2 The gap filled at the beam/slab soffit must be 20mm to 50mm minimum using mortar with cement to sand ratio of 1:7 to 1:8.
- 1.3.3 Provide stiffener column every 4.0 meters length and lintel beam every 4.5 meters in height of wall.

METHOD STATEMENT OF WALL FIXING ON STARKEN AAC

STAGES OF WORKS

1. LIGHT DUTY. THIS METHOD IS SUITABLE FOR HANGING LIGHT-WEIGHT ITEMS.

Max Weight: up to 10kg per point | Fixing accessories: Concrete Nail Ø3mm x 40mm

- 1.1 Place the nail 10° to 15°.
- 1.2 Hammer the nail on the wall.
- 1.3 Place attachment.

2. MEDIUM DUTY. THIS METHOD IS SUITABLE FOR HANGING MEDIUM-WEIGHT ITEMS.

Max Weight: up to 25kg per point | Fixing accessories: Nylon wall plug up to 5kg; Ø5mm x 30mm; Use 3-4mmx30mm Screw
Nylon wall plug up to 10kg; Ø6mm x 30mm; Use 4-5mmx30mm Screw

- 2.1 Drill hole using an electrical drill with a standard setting. Do not use impact setting.
- 2.2 Clean the hole from any dust.
- 2.3 Insert Nylon anchor into the hole.
- 2.4 Tighten the screw.

3. HEAVY DUTY. THIS METHOD IS SUITABLE FOR HANGING HEAVY-WEIGHT ITEMS.

Max Weight: up to 50kg per point
Fixing accessories: Metal Sleeve/anchor bolt up to 30kg; Ø8mm x 50mm; | Hole ; Ø8mm x 75mm; Use Ø 8mmx75mm Screw
Metal Sleeve/anchor bolt up to 50kg; Ø10mm x 60mm; | Hole ; Ø10mm x 75mm; Use Ø 10mmx75mm Screw

- 3.1 Drill hole using an electrical drill with a standard setting. Do not use impact setting.
- 3.2 Clean the hole from any dust.
- 3.3 Insert Nylon anchor into the hole.
- 3.4 Tighten the screw.

NOTE:

1. Use same size drill bit diameter with nylon or metal anchor.

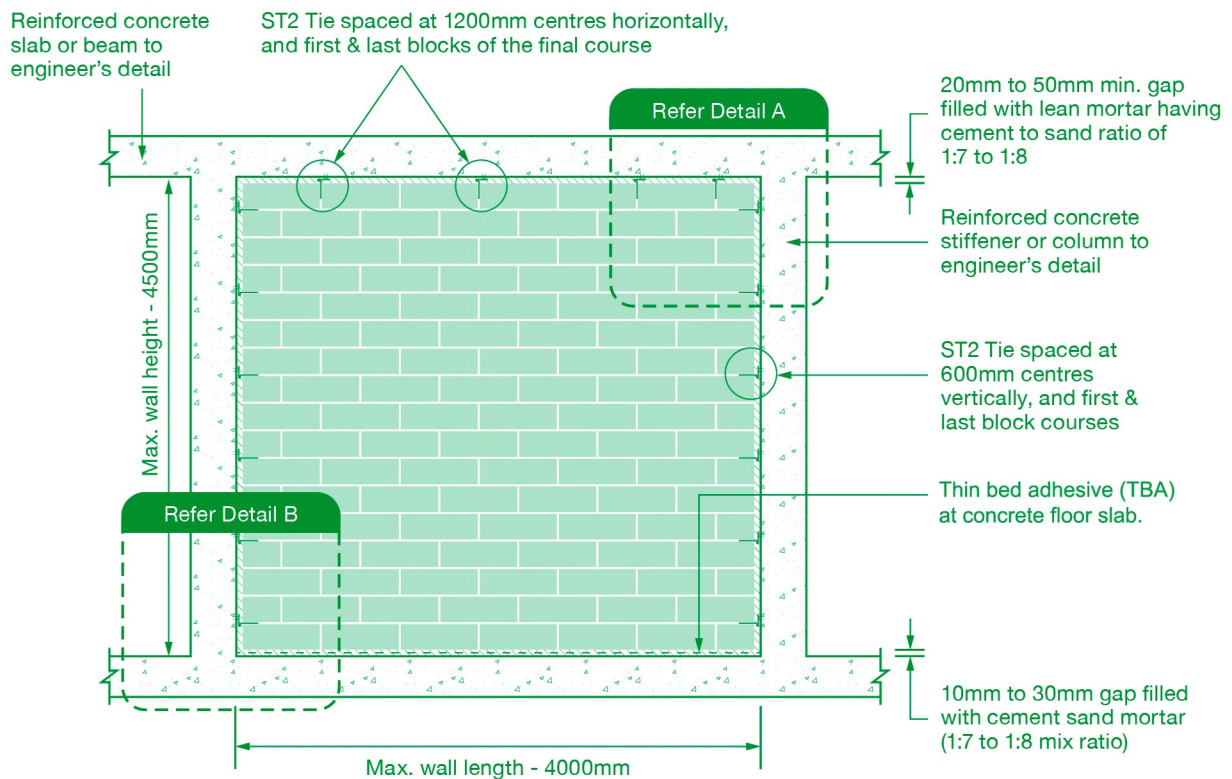
Standard Installation Details

Standard Installation Details

Non-Load Bearing Starken Block Wall Installation (Figure 1)

Note: 1. Cement to sand ratio is by volume

2. If necessary or more practical, reinforced concrete stiffener may also be constructed after erection of block wall. Under such practice, provide adequate temporary support for the erected block wall

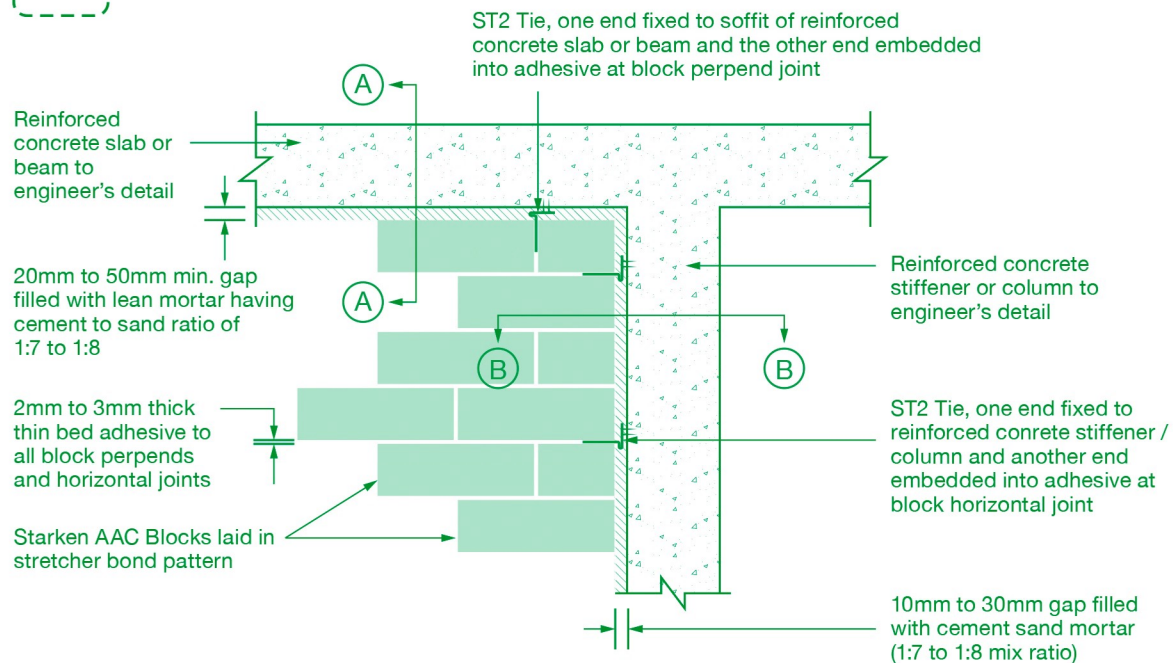


Elevation View

Standard Installation Details

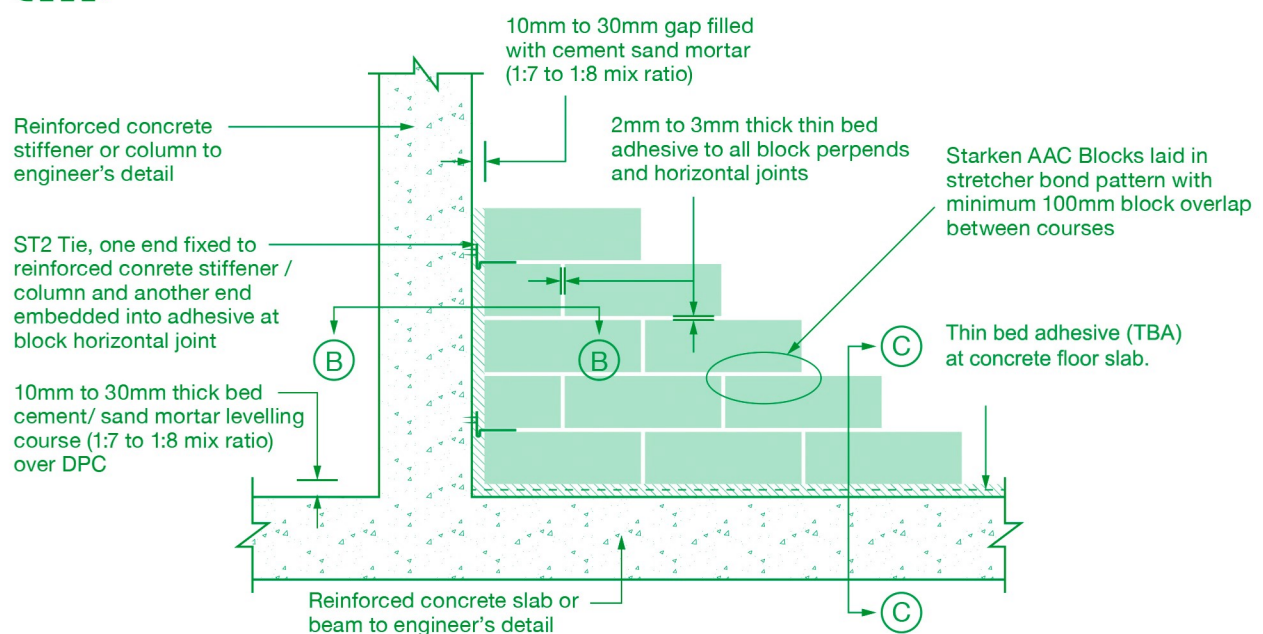
Detail A

Starken Block Wall to Column & Slab / Beam Soffit Detail (Figure 2)



Detail B

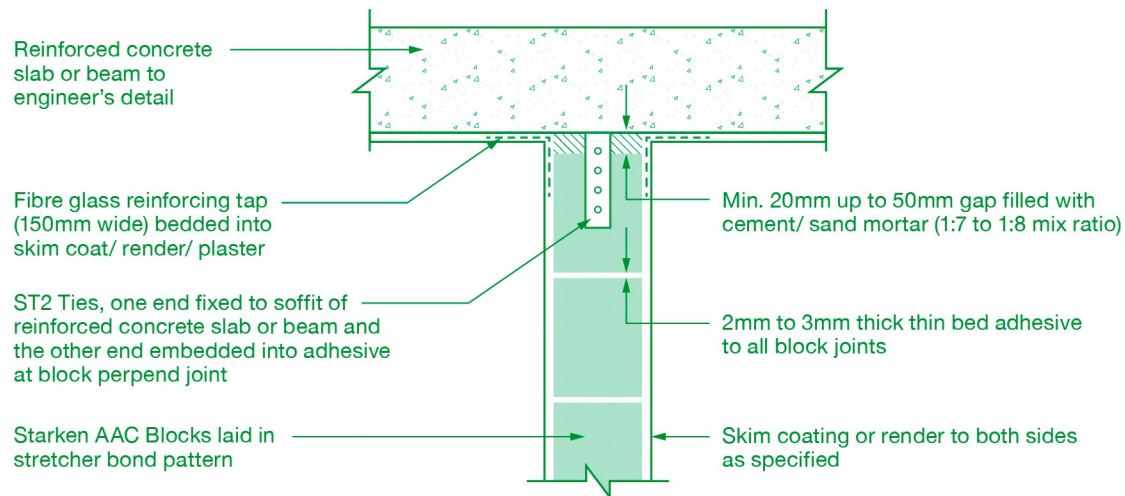
Starken Block Wall to Column & Floor Detail (Figure 3)



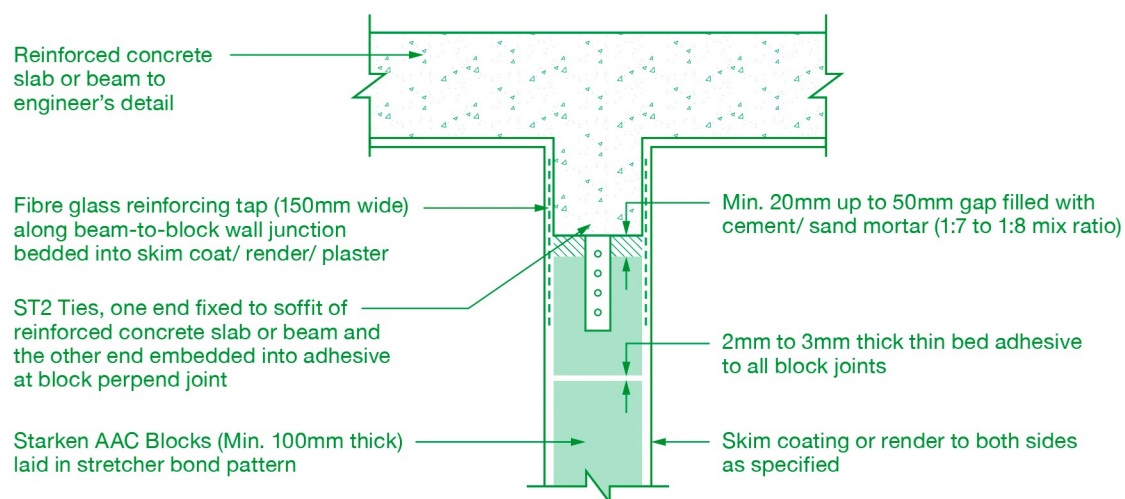
Standard Installation Details



Starken Block Wall & Slab Soffit Junction (Figure 4)



Starken Block Wall & Beam Soffit Junction (Figure 5)

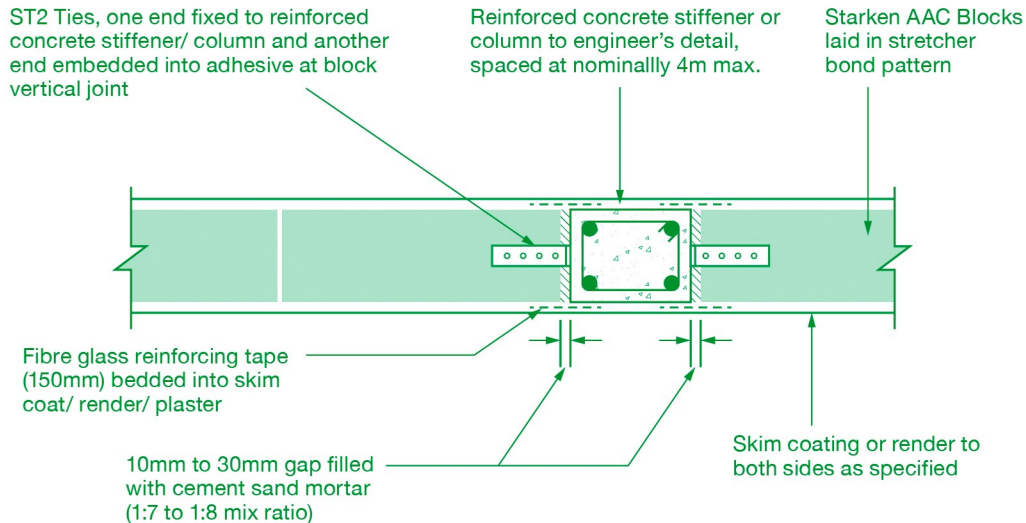


Standard Installation Details

Section B-B

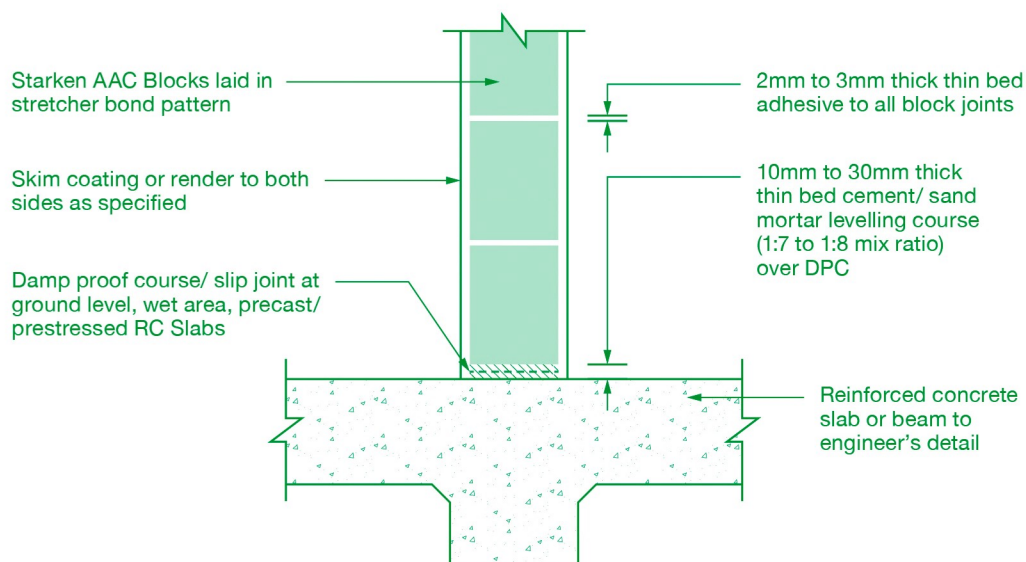
Starken Block Wall & Stiffener Junction (Figure 6)

Note: This item can be omitted if stiffener is constructed after the erection of block wall under such circumstances, Block wall should terminate along the sides of the proposed stiffener or/ can be offset up to 30mm away



Section C-C

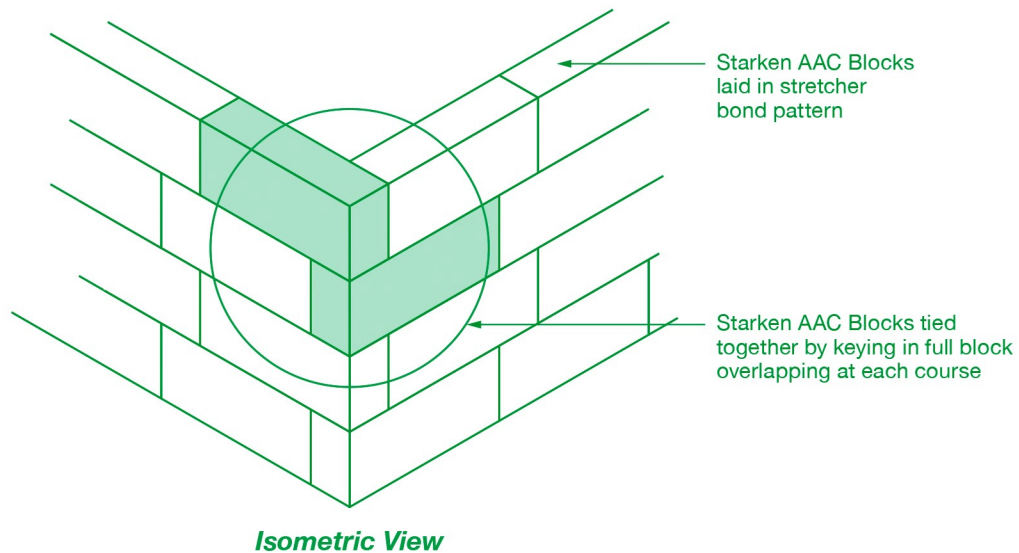
Starken Block Wall & Floor Junction (Figure 7)



Standard Installation Details

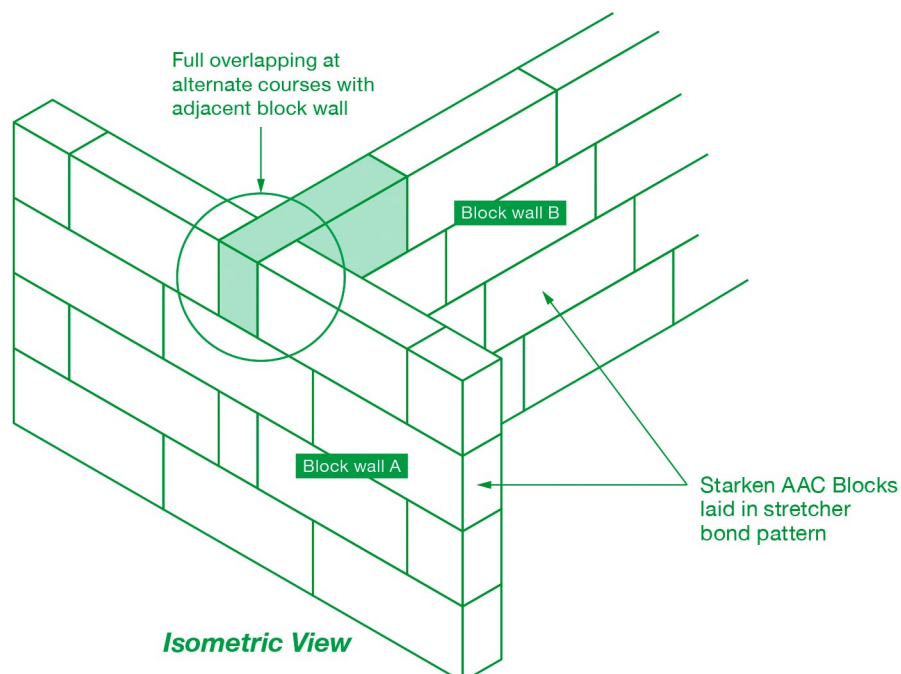
Starken Block Wall Corners (Figure 8) - For Wall Without Horizontal RC Stiffener

Note: 1. This detail is applicable to wall without horizontal stiffener only
2. For best results, install angle corner bead during application of skim coat or render



Starken Block Wall to Block Wall Junction (Figure 9) - For Wall Without Horizontal RC Stiffener

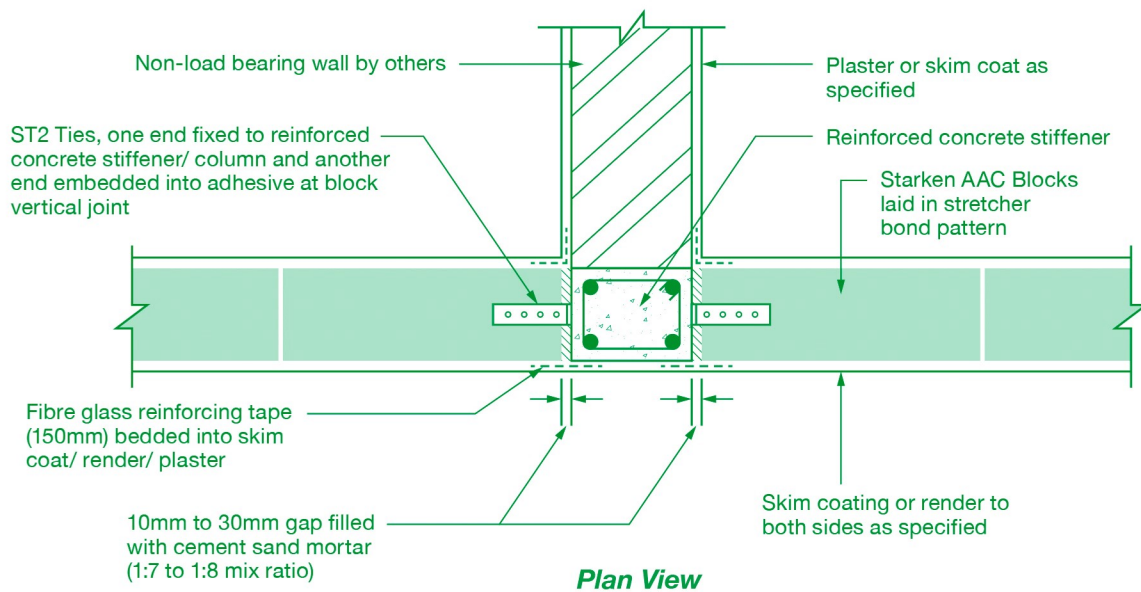
Note: 1. This detail is applicable to wall without horizontal stiffener only
2. For best results, install angle corner bead during application of skim coat or render



Standard Installation Details

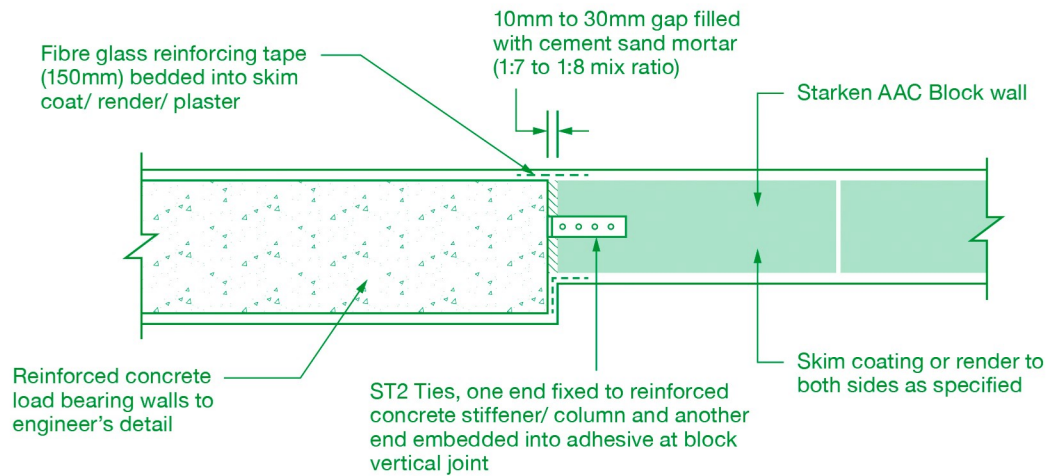
Starken Block Wall & Other Masonry Wall Junction (Figure 10)

Note: This item can be omitted if stiffener is constructed after the erection of block wall under such circumstances, block wall should terminate along the sides of the proposed stiffener or/ can be offset up to 30mm away



Starken Block Wall & Other Masonry Wall Junction (Figure 11)

Note: This detail was prepared based on current standard practice applicable to most masonry walls such as brick wall. Such details may prone to exhibit hairine crack (At the RC wall & AAC wall joint). For best result, control joint incorporating flexible sealant is recommended.



Wall Junction (Plan View)

Installation Details with P.U Foam

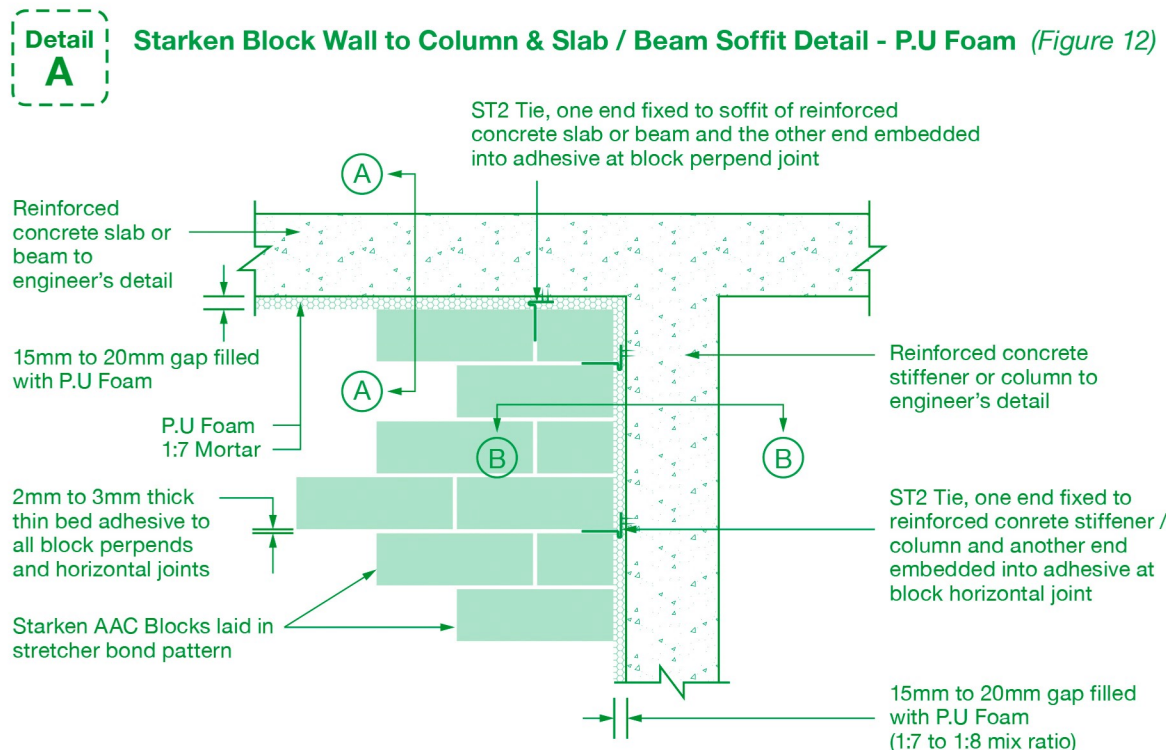
P.U Foam Details

This section provides an alternative details with respect to the join between Starken AAC block wall and RC structures (beam/ column and soffit of slab). The details presented in this section incorporate the spray-type PU foam encapsulated (restrained) with cement/ sand mortar at the ends or edges. Figure 12 to Figure 16 should be read in conjunction with Figure 1. These are alternative details to Figure 2 to Figure 6.

PU foam possesses some degree of 'compressibility' characteristic compared with cement/ sand mortar. When used for filling clearance gaps along the two vertical and top edges of AAC block wall, PU foam will minimize the cracking of masonry wall caused by 'sideway column movement' and deflection of beam or ceiling slab.

Note: This detail is only applicable for NON Fire-rated block wall. Consult Starken Technical Department for details not covered in this Installation Manual.

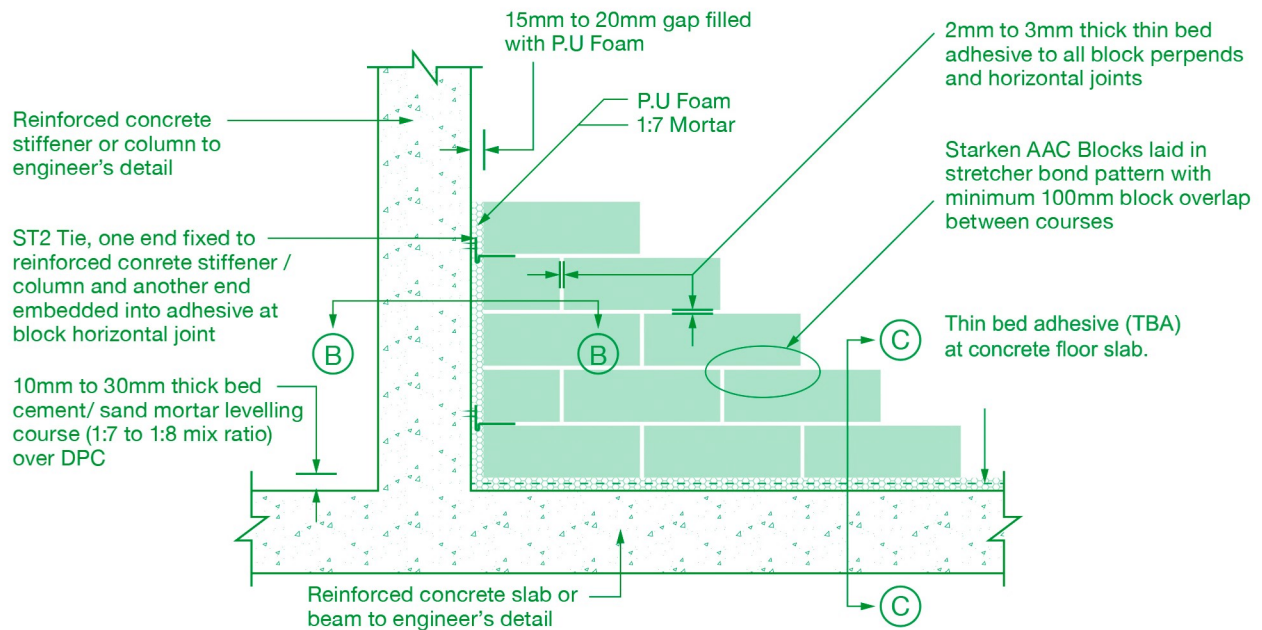
Installation Details with P.U Foam



Installation Details with P.U Foam

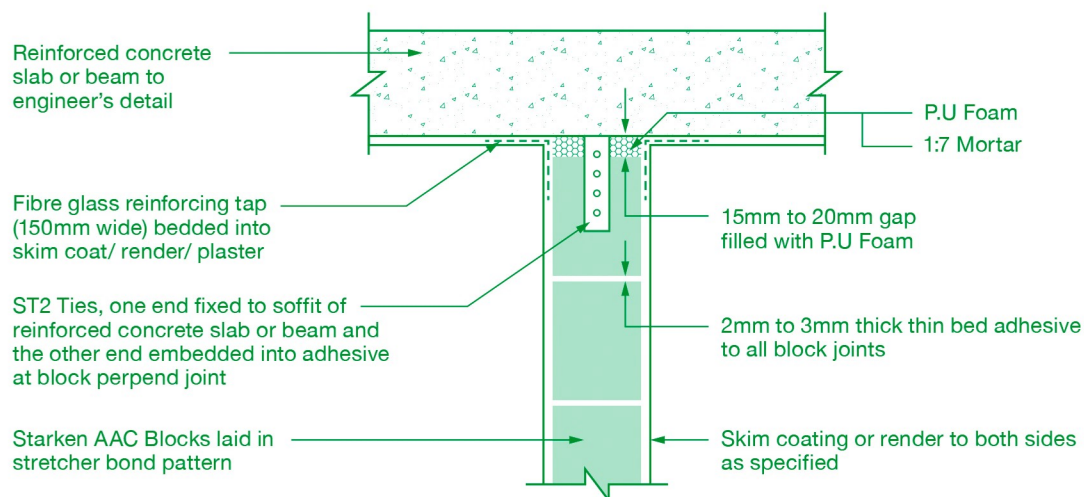
Detail B

Starken Block Wall to Column & Floor Detail - P.U Foam (Figure 13)



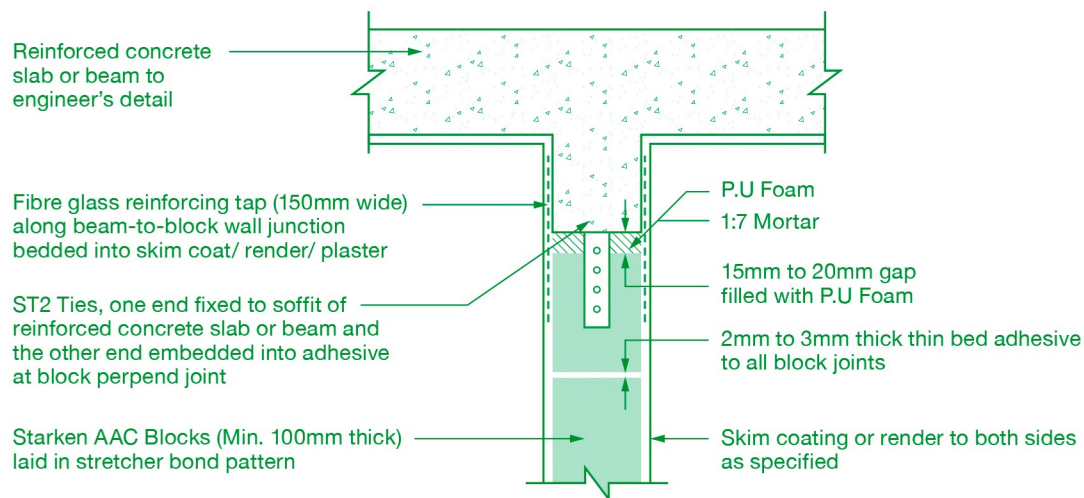
Section A-A

Starken Block Wall & Slab Soffit Junction - P.U Foam (Figure 14)



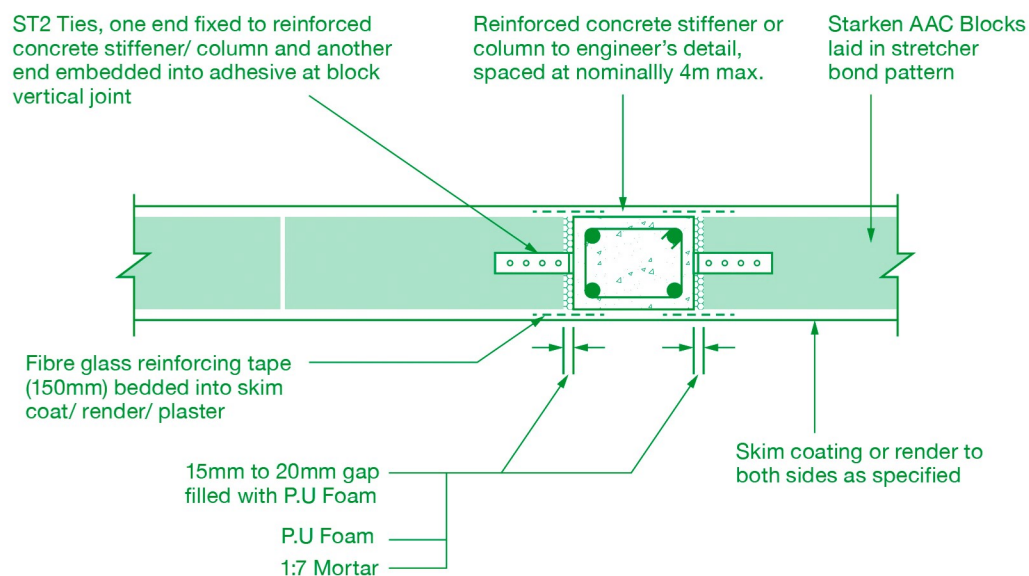
Installation Details with P.U Foam

Section A-A **Starken Block Wall & Beam Soffit Junction - P.U Foam** (Figure 15)



Section B-B **Starken Block Wall & Stiffener Junction - P.U Foam** (Figure 16)

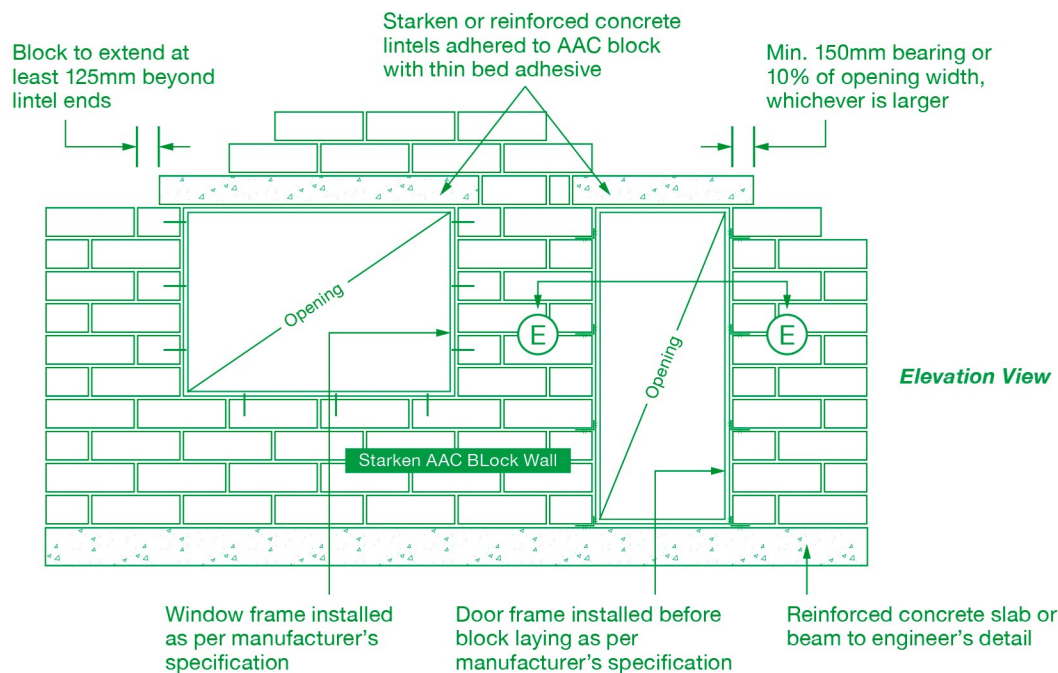
Note: This item can be omitted if stiffener is constructed after the erection of block wall under such circumstances, Block wall should terminate along the sides of the proposed stiffener or/ can be offset up to 30mm away



Lintel & Openings

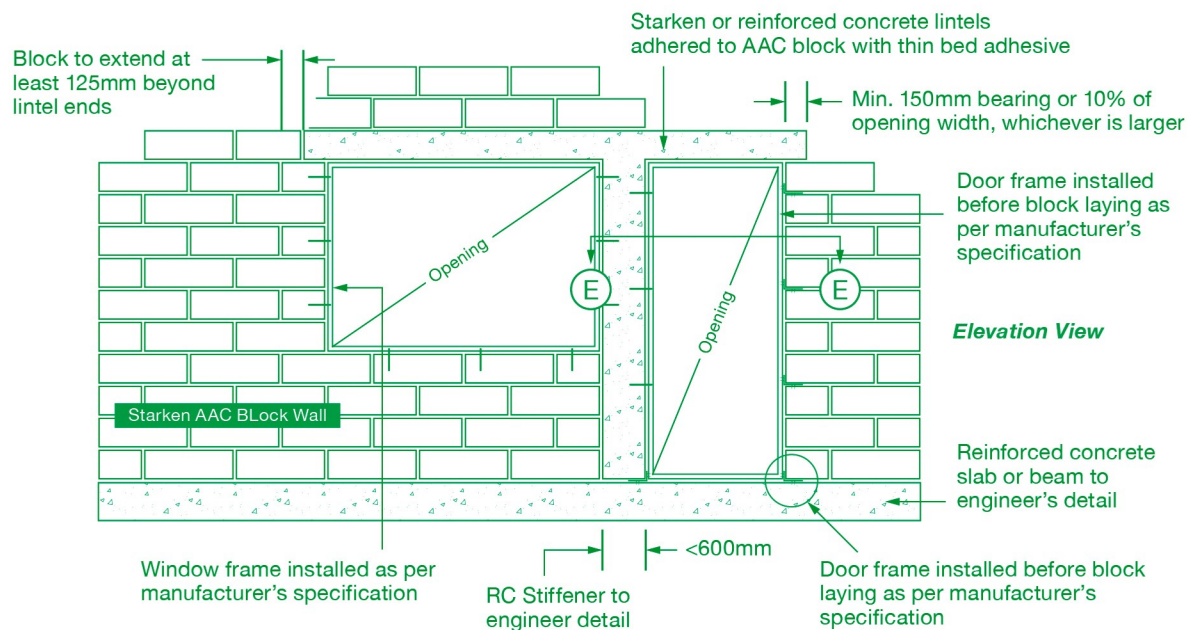
Lintel & Openings

Lintel & Door Installation (Figure 17)



Lintel & Door Installation with Stiffener (Figure 18)

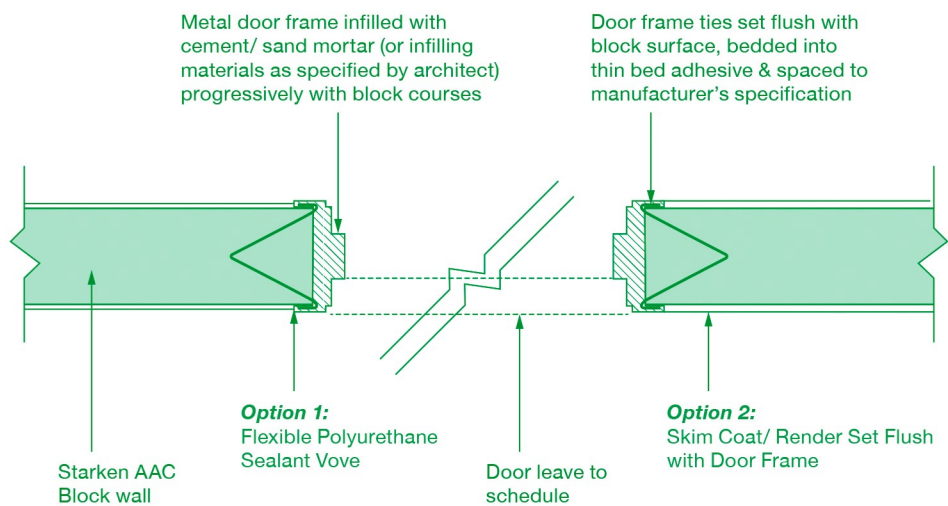
- Note:**
1. Do not cut AAC lintels at site.
 2. Provide a minimum of 150mm bearing at lintel ends or 10% of length of opening, whichever is higher.
 3. To provide clarity, some installation details not related to lintels maybe intentionally left out.
 4. Blocks are bonded to AAC lintel using thin bed adhesive.
 5. For heavy door installation, door frame must be supported with stiffeners and lintel.
 6. Door and window frames may require temporary support while block work progresses.



Lintel & Openings

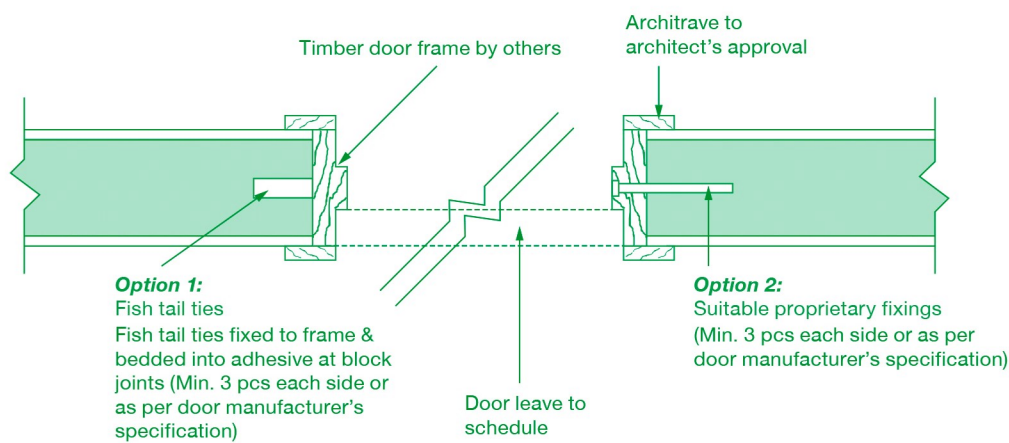
Section
E-E

Metal Door Frame Installation Detail - Non-Fire Rated (Figure 19)

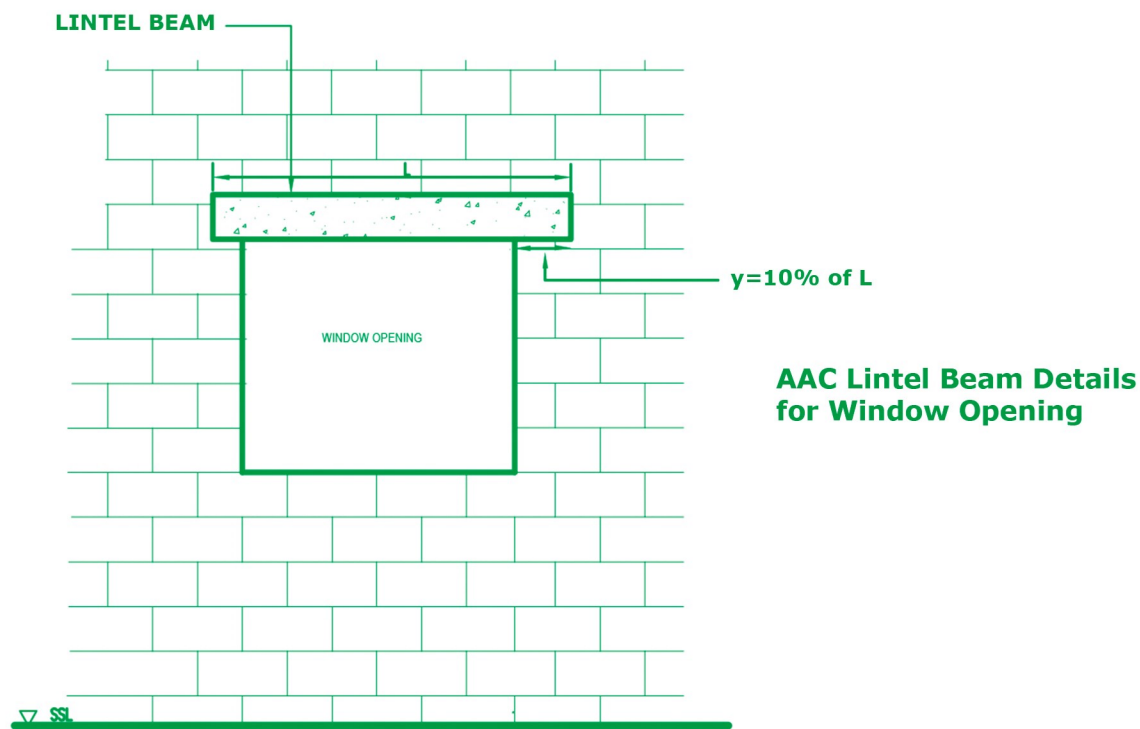


Section
E-E

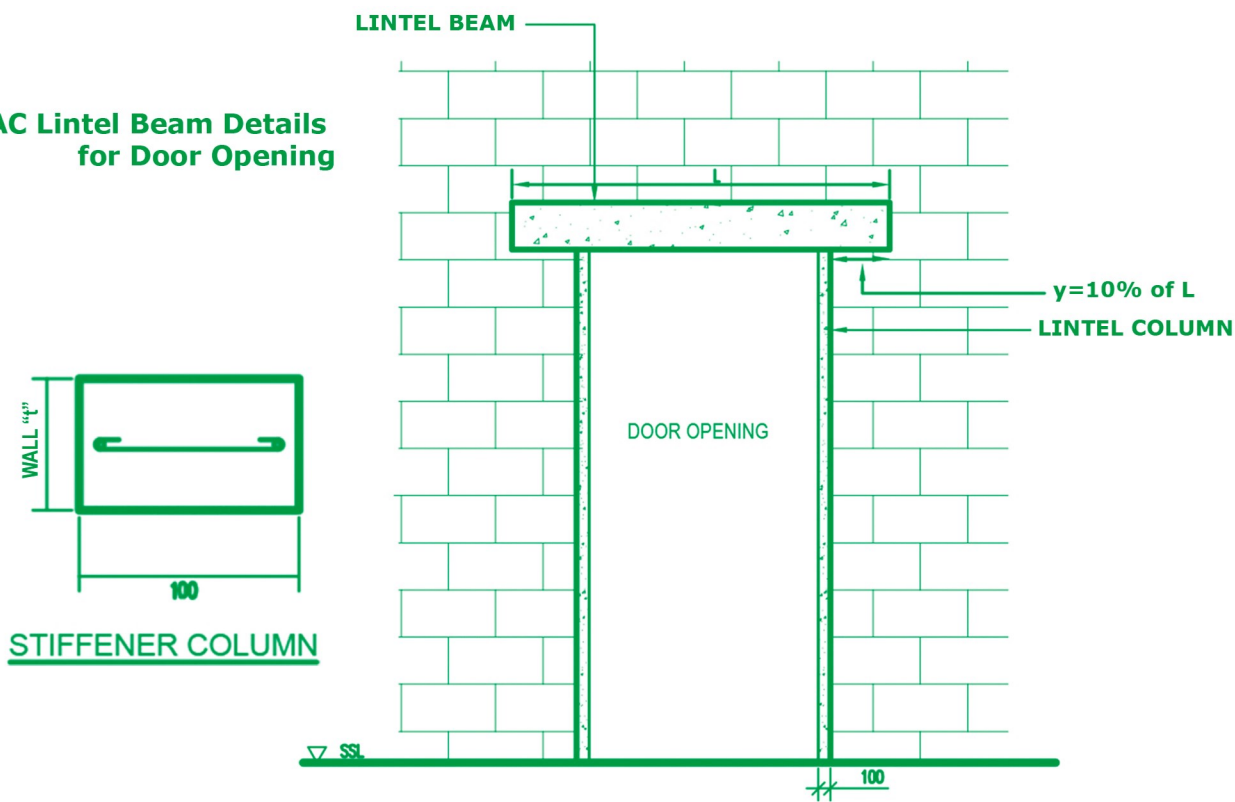
Timber Door Frame Installation Detail - Non-Fire Rated (Figure 20)



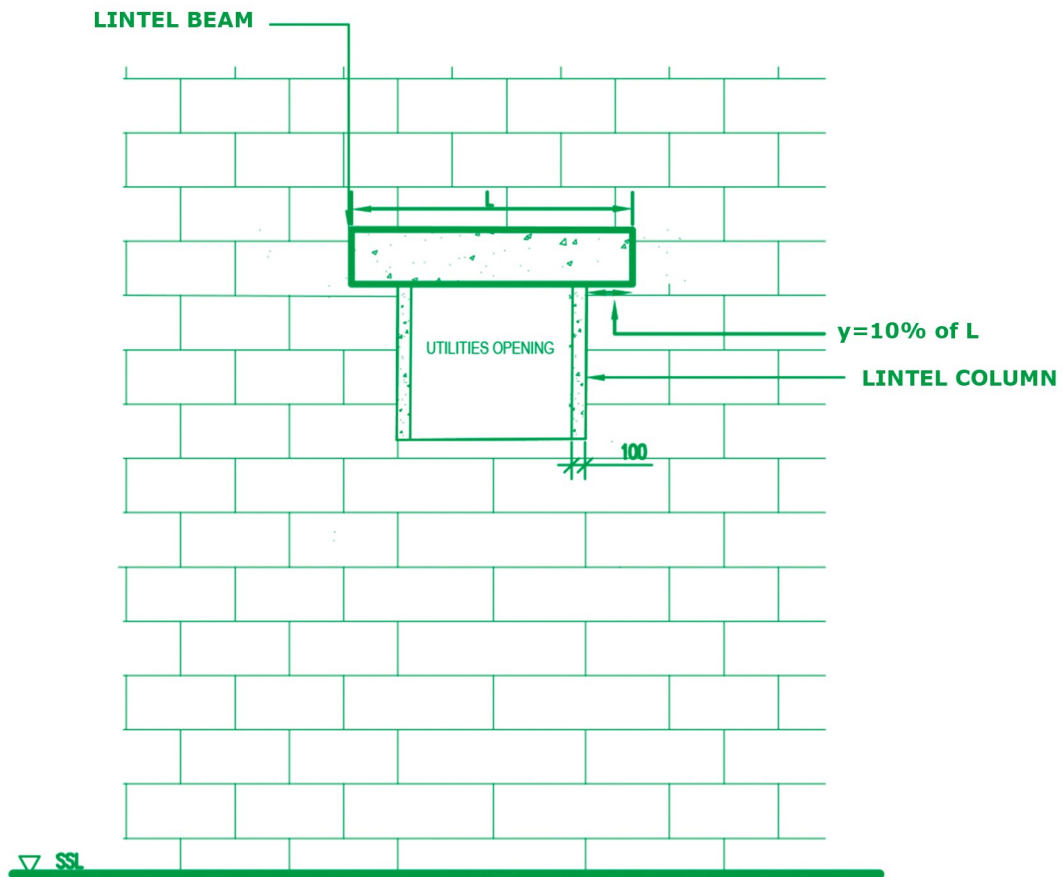
AAC Lintel Beam Details



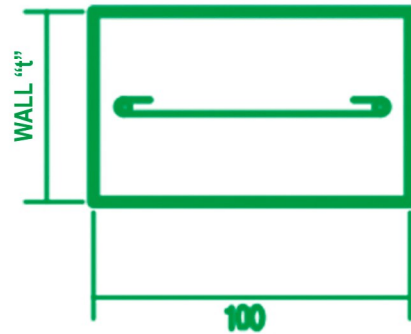
AAC Lintel Beam Details for Door Opening



AAC Lintel Beam Details



AAC Lintel Beam Details for Utilities Opening (AC Ducting)



STIFFENER COLUMN

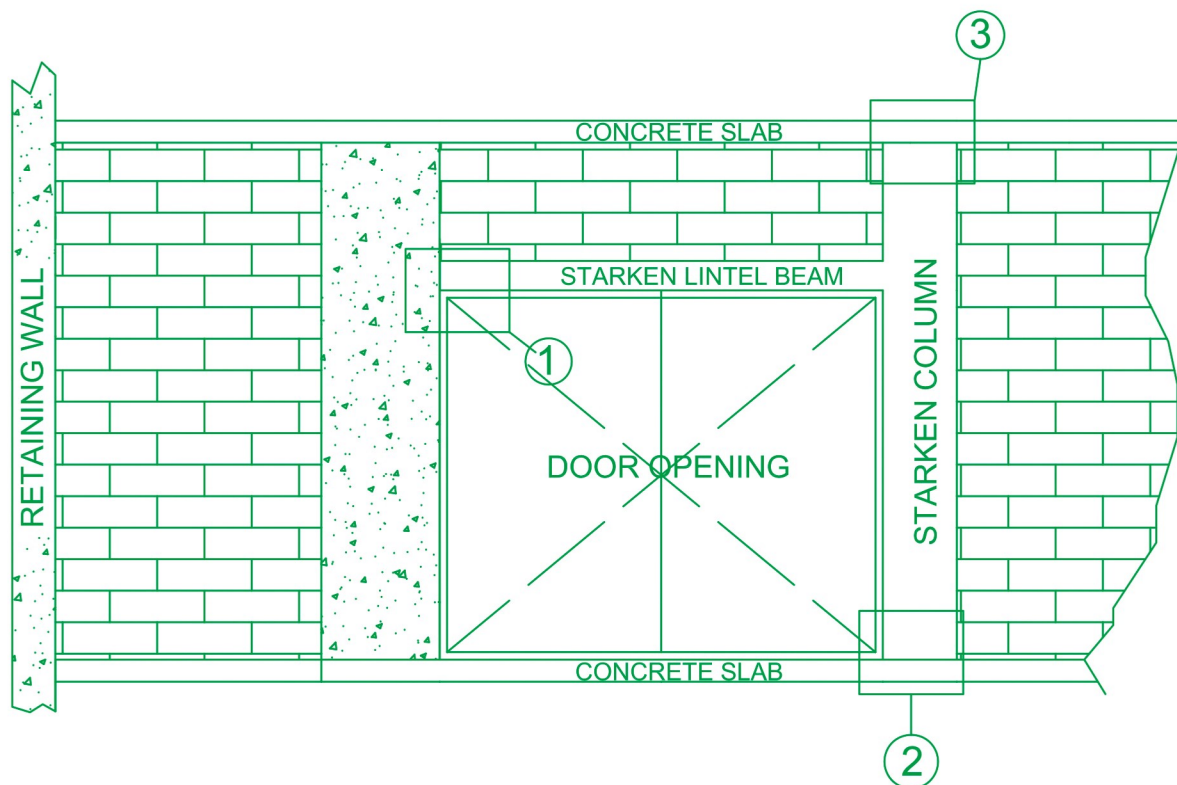
Method
Statement

Starken
Lintel
&
Lintel
Column

Method Statement of Starken Stiffener Column

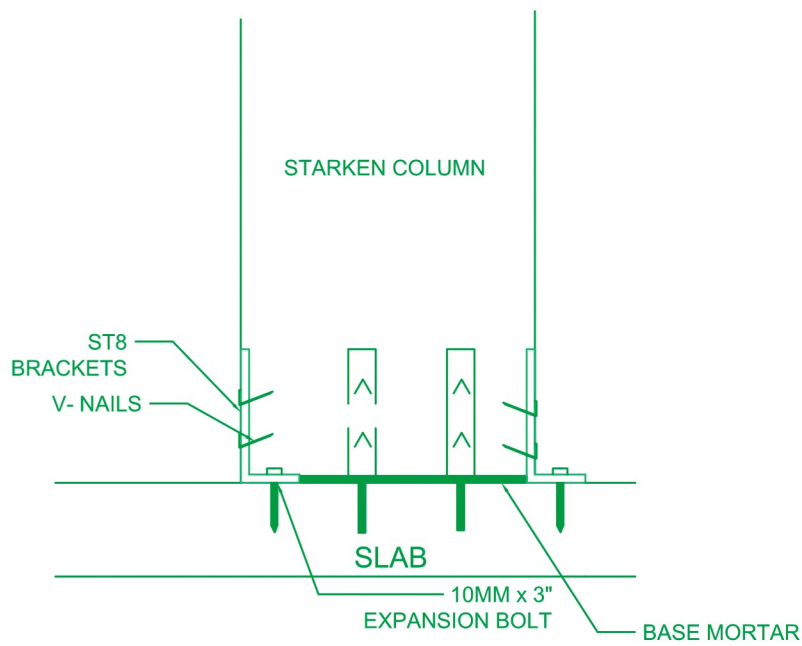
1. Prepare all necessary materials:
 - a. Starken Stiffener Columns
 - b. Drill
 - c. Bolts
 - d. Brackets
 - e. Hammer
2. Set up lay-out of Stiffener columns using nylon string guide.
3. Drill holes on the concrete floor slab and beam or slab soffit for the expansion bolts where to install the Starken stiffener column.
4. Install one ST8 bracket on both floor slab and beam/slab soffit, and put the base mortar on the layout of the stiffener column.
5. Erect the stiffener column, check the plumbness and alignment of the column and fixed on the installed ST8 bracket on the floor slab and on the beam or slab soffit using the V-nail.
6. Install another three ST8 bracket support on both floor slab and on beam or slab soffit.

As shown on Elevation A Drawing in Detail-2 & Detail-3

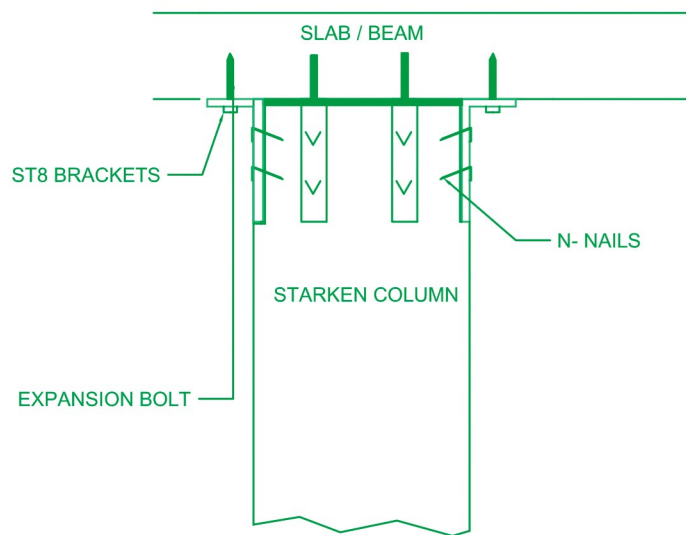


ELEVATION A

Method Statement of Starken Stiffener Column



DETAIL - 2



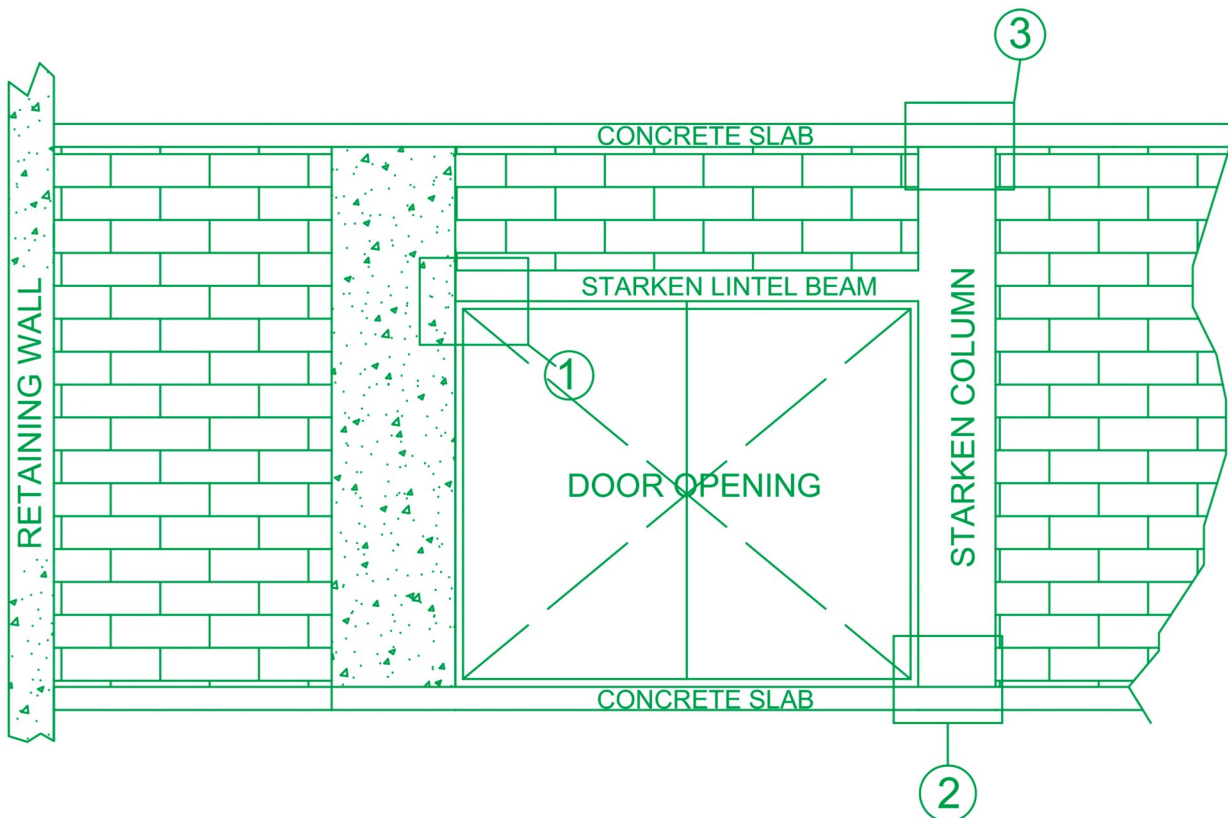
DETAIL - 3

Method Statement of Starken Lintel Beam

1. Prepare all necessary materials:
 - a. Starken Stiffener Columns
 - b. Drill
 - c. Bolts
 - d. Brackets
 - e. Hammer
 - f. Welding Machine
2. Lay-out lintel position on the concrete column.
3. Drill holes on the concrete column with a minimum depth of 100mm and diameter equivalent to the rebar diameter.
4. Insert four 12 mm rebars on the concrete column with epoxy.
5. Chip off the AAC Concrete cover on atleast 200mm on one end of the Starken Lintel and expose it's reinforcement.
6. Lift the lintel on it's position, weld the 12mm rebar on the concrete column on the reinforcement of the Starken lintel beam.
7. Cover the reinforcement with mortar having cement to sand ratio of 1:3.
8. Install one ST8 bracket below and on top of the Starken Lintel fixed with bolts and V-Nails for additional support.

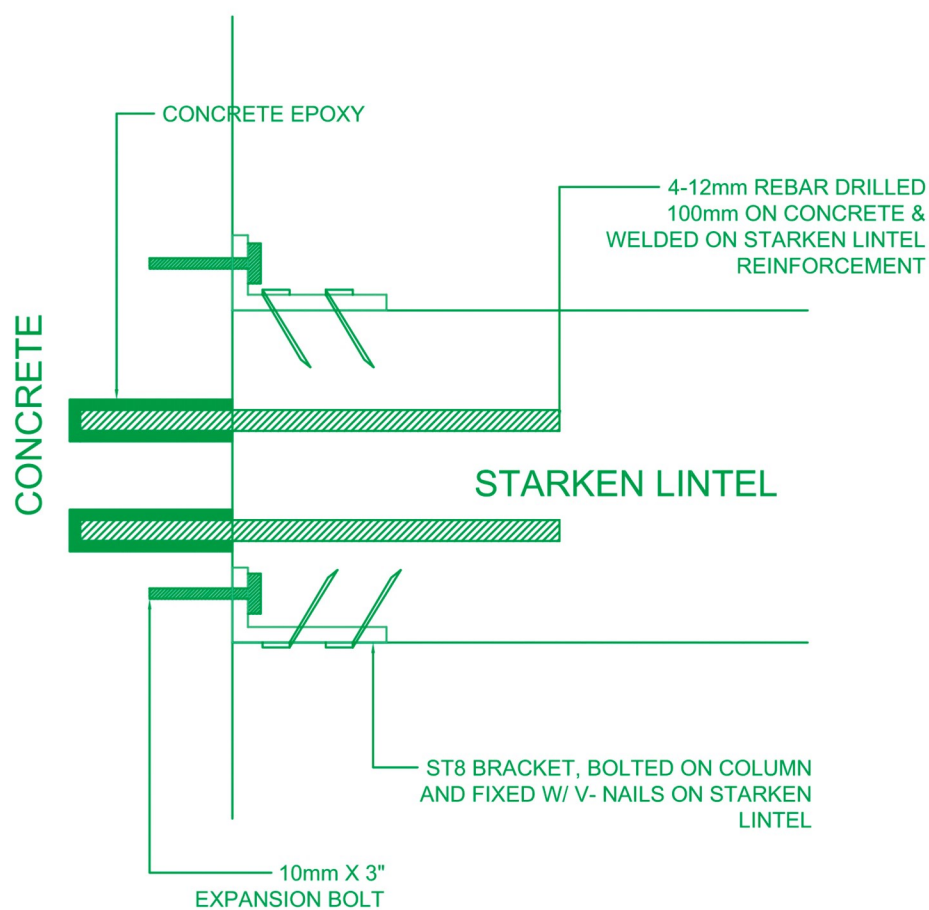
As shown on Elevation A Drawing in Detail-1

Method Statement of Starken Lintel Beam Drawing Detail - 1



ELEVATION A

Method Statement of Starken Lintel Beam

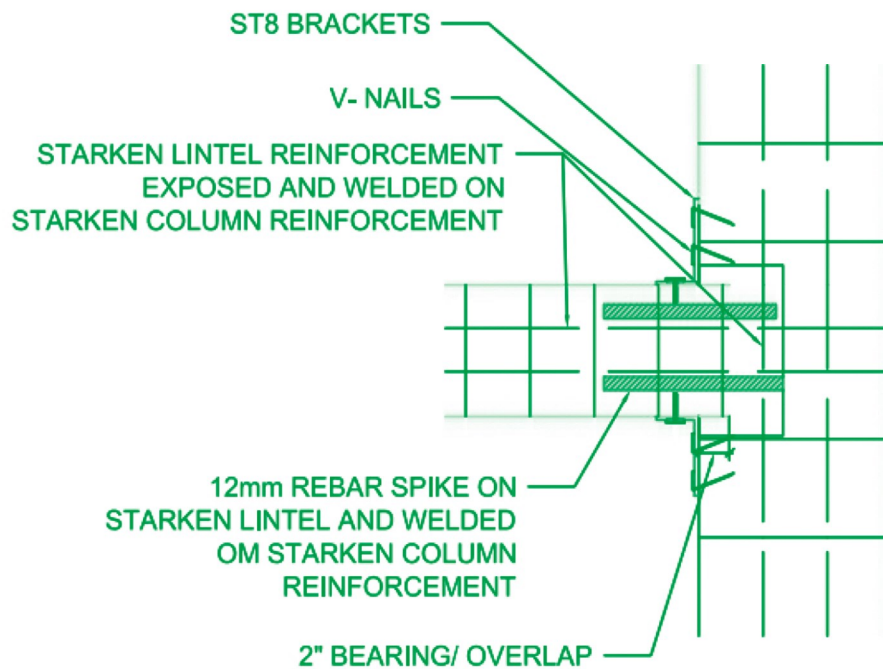


DETAIL - 1

Method Statement of Starken Lintel Beam

1. Prepare all necessary materials:
 - a. Starken Stiffener Columns
 - b. Drill
 - c. Bolts
 - d. Brackets
 - e. Hammer
 - f. Welding Machine
2. Lay-out the Lintel position on the Starken Lintel column.
3. Chip off the AAC Concrete cover Starken Lintel column and expose it's reinforcement.
4. Chip off the AAC Concrete cover on atleast 100mm on one end of the Starken Lintel and expose it's reinforcement, Spike 4-12mm rebar on the lintel beam.
5. Lift the Lintel on it's position, weld the the reinforcement of the Starken Lintel beam and the 12mm rebar to Starken Lintel column reinforcement.
6. Cover the reinforcement with mortar having cement to sand ratio of 1:3.
7. Install one ST8 bracket below and on top of the Starken Lintel fixed with bolts and V-Nails for additional support.

As shown in Drawing Detail-3



DETAIL - 3

General Guidelines For Installation For Starken AAC Lintel And Starken AAC Column

1. The connection of Starken AAC lintel to Starken AAC column must provide atleast 2" bearing/overlap on the connection.
2. The connection of AAC block to concrete must be covered with fibre mesh tape embedded to skim coat or render.
3. Use 10mmx3" expansion bolt in fixing the St8 Bracket on concrete column, slab or beam soffit.

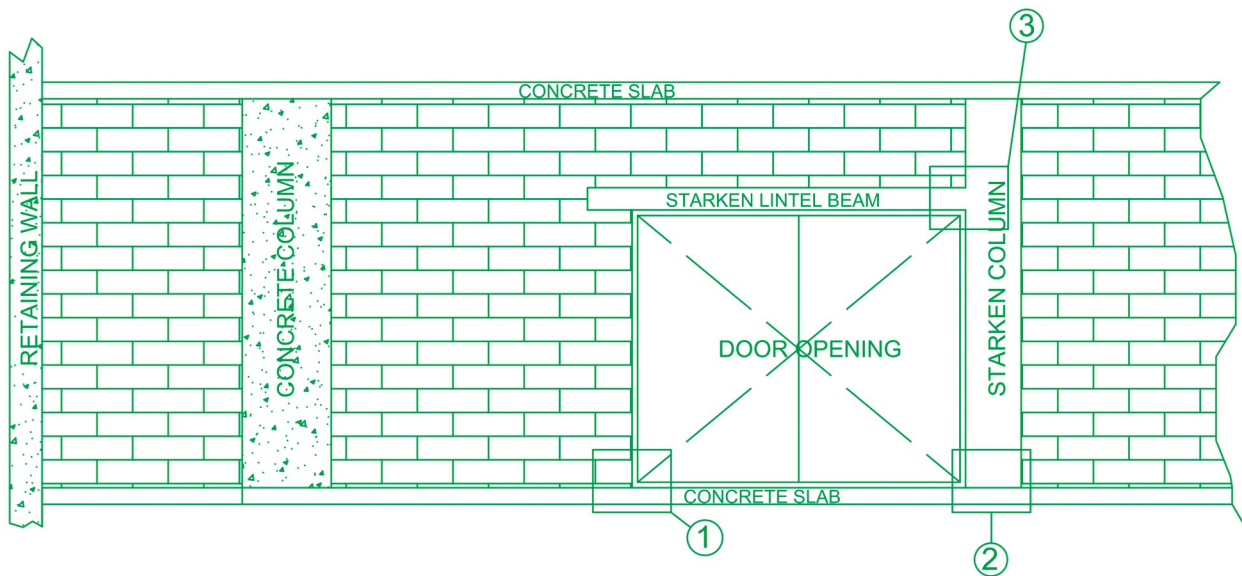
**Method
Statement**

**Steel
Jamb
Installation
on Starken
Stiffener
Column**

Method Statement Of Steel Jamb Installation

1. Provide ST8 Bracket on floor slab, under the first layer of the last block on the door opening.
2. Spike 12mm rebar on every 400mm on Starken Lintel Column.
3. Install the jamb on its position.
4. Weld the steel jamb on the ST8 bracket on the floor slab.
5. Add additional bolt on the jamb on every 400mm on the Starken AAC Block and weld the steel jamb on the rebars on Starken Lintel Column.

As shown on Elevation B Drawing in Detail 1 & Detail 2

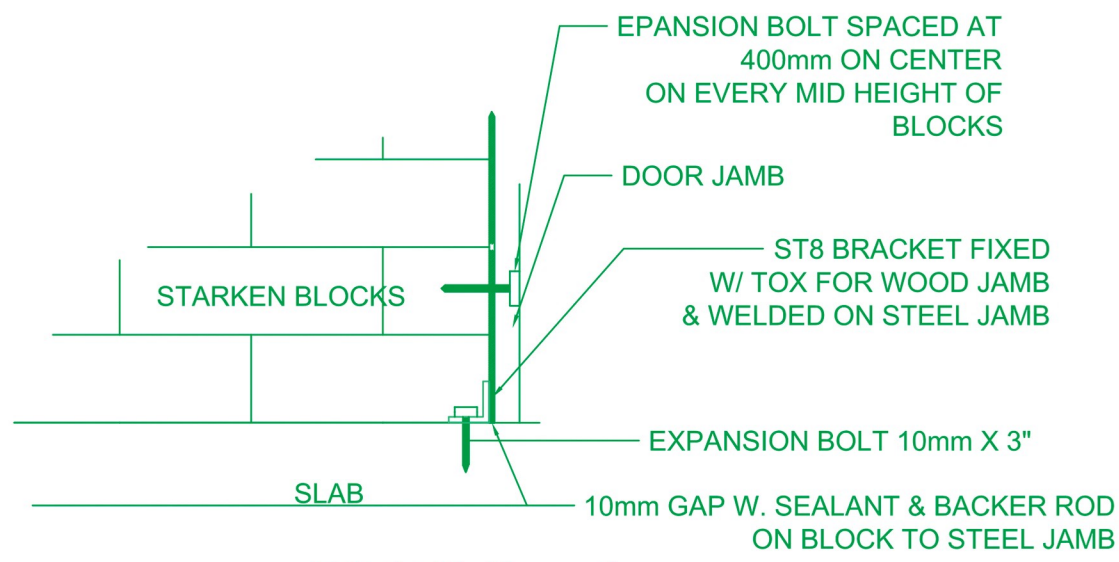


ELEVATION B

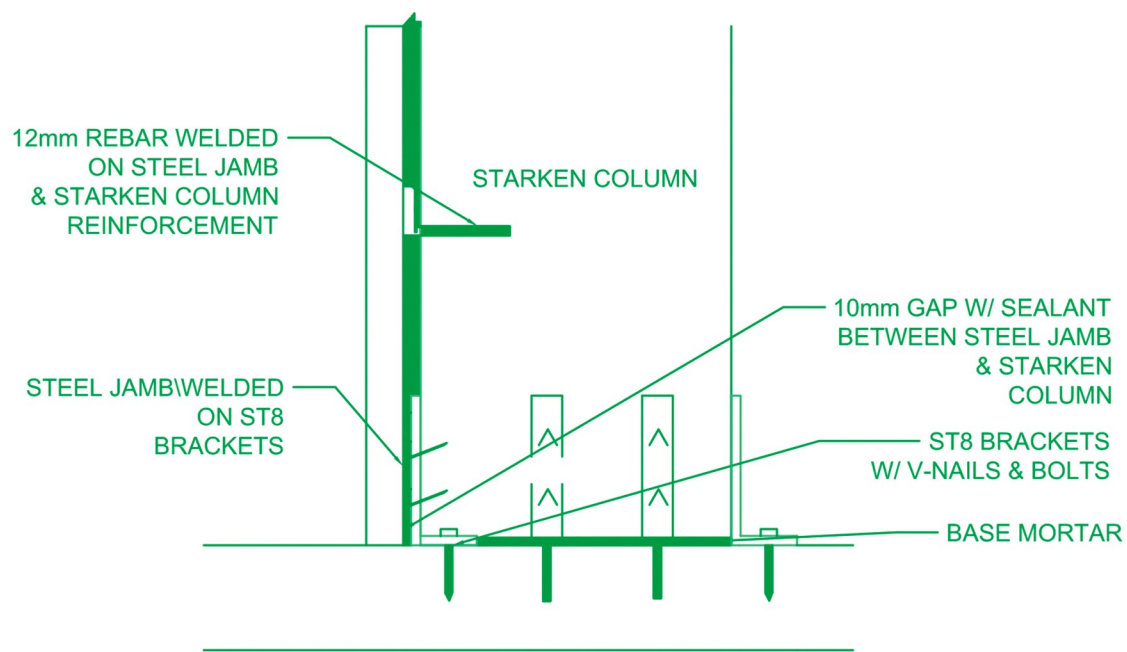
General Guidelines For Installation Of Steel Jamb

1. The 5mm- 10mm gap on columns or AAC block to steel jamb is filled with sealant with backing rod.

Method Statement Of Steel Jamb Installation



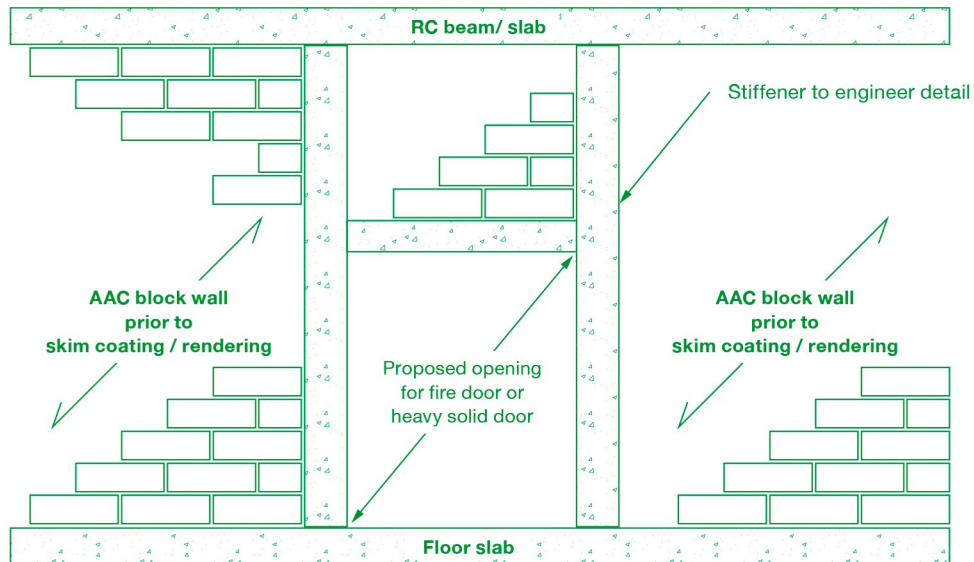
DETAIL - 1



DETAIL - 2

Lintel Installation

Door Installation - Heavy Fire Rated/ Solid Door & Large, Double Leaf Door (Figure 21)



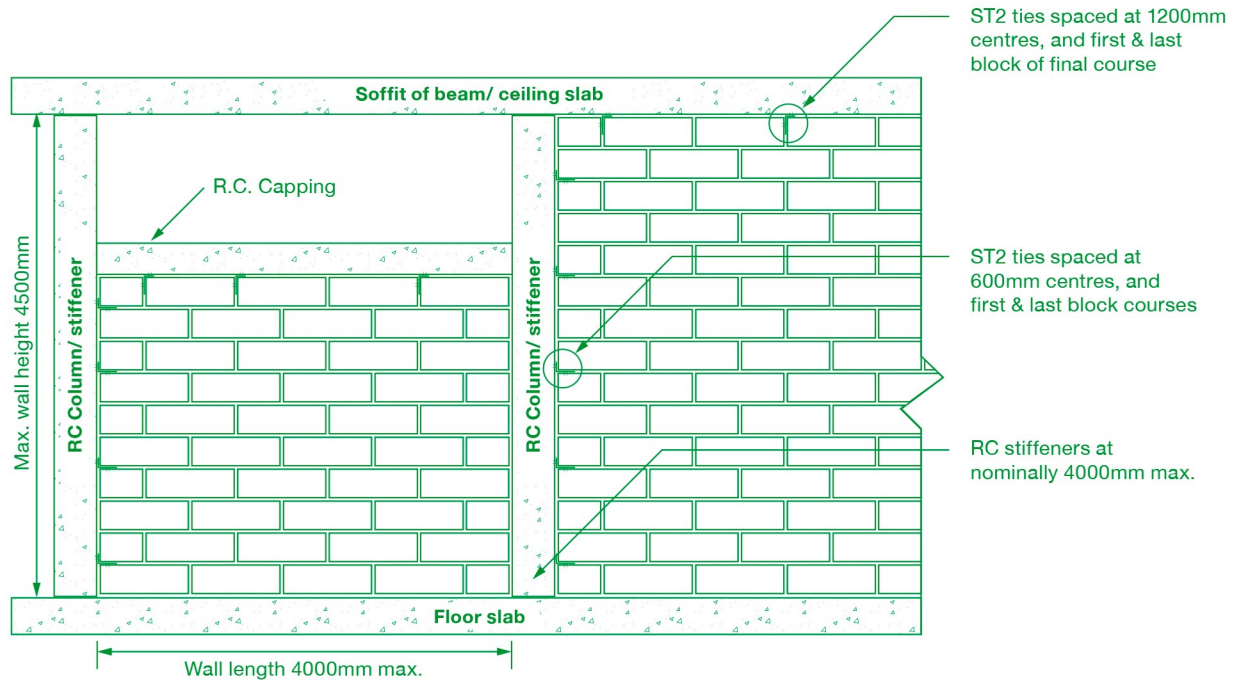
Elevation View

Stiffener Requirements

Stiffener Requirements

Infill Wall with Stiffener - Non-Full Height (Figure 22)

Note: 1. If necessary or more practical, reinforced concrete stiffener may also be constructed after erection of block wall.
Under such practice, provide adequate temporary support for the erected block wall
2. Provide horizontal stiffener when block wall height exceeds 4500mm

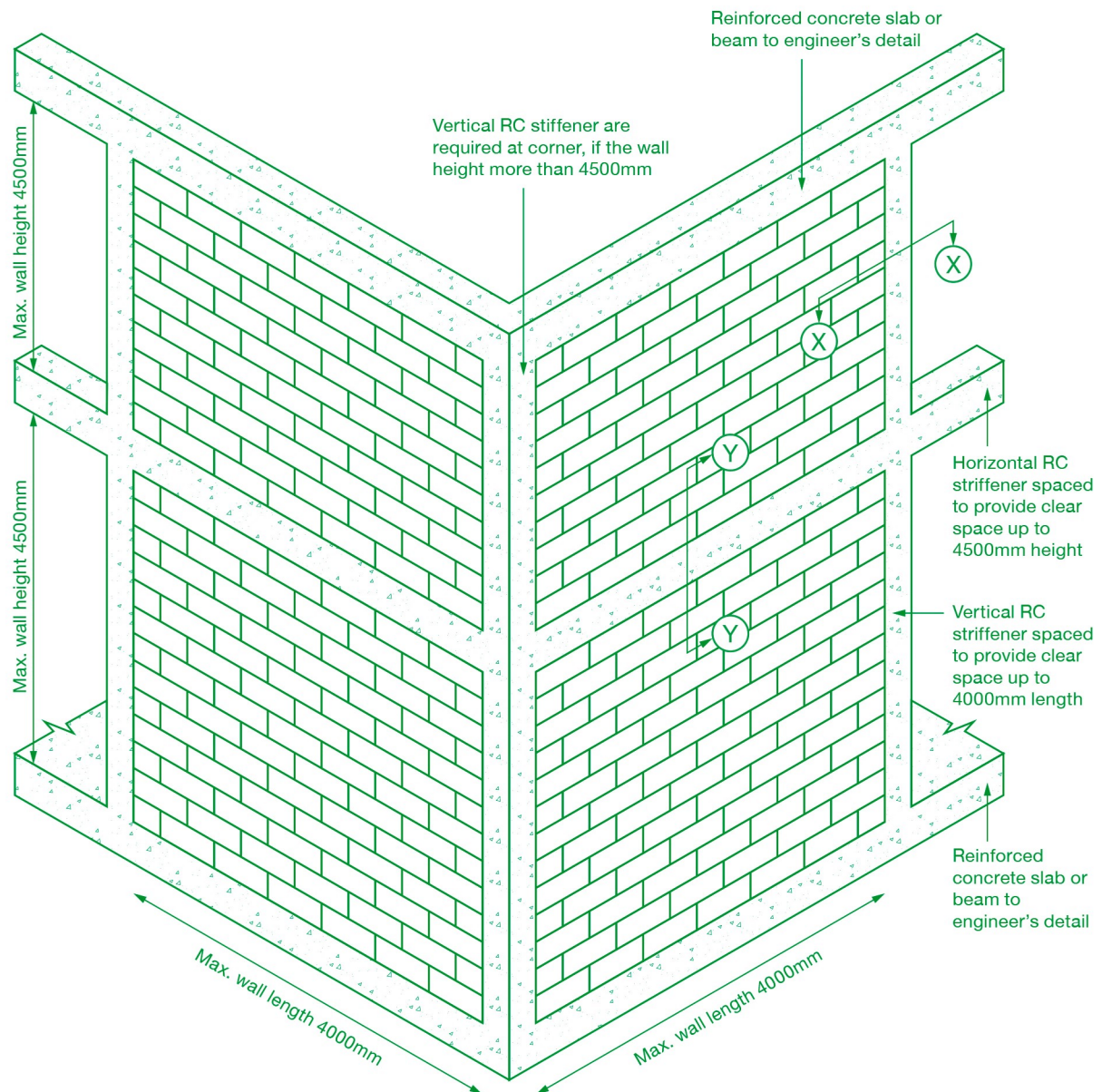


Elevation View

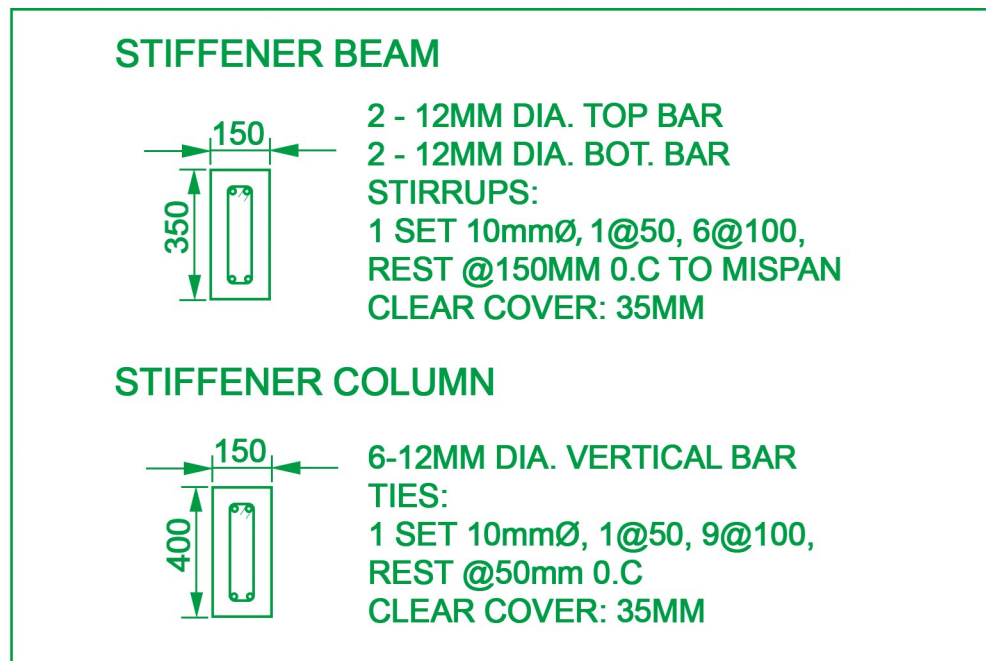
Stiffener Requirements

Stiffener Requirement for Starken AAC Block Wall Exceeding 4000mm in Length & 4500mm in Height (Figure 23)

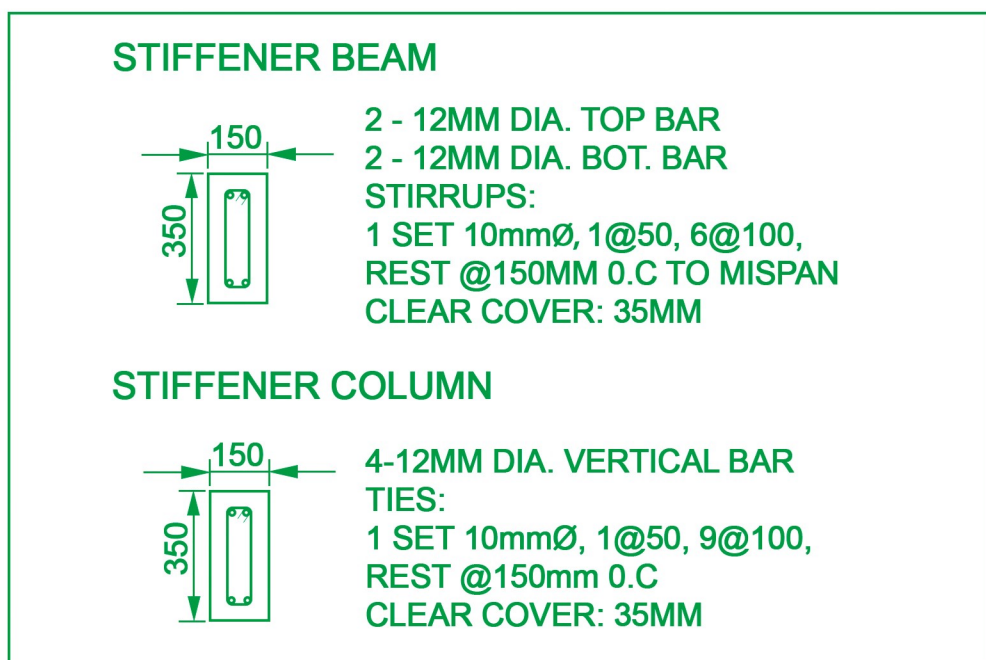
Note: 1. If necessary or more practical, reinforced concrete stiffener may also be constructed after erection of block wall.
Under such practice, provide adequate temporary support for the erected block wall
2. Detail not relevant to stiffener requirement may have intentionally left out



Standard stiffener columns and beams for Exterior walls for length or heights more than 3000mm.

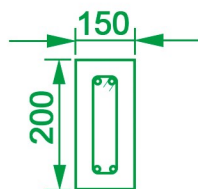


Standard stiffener columns and beams for Exterior walls for less than 3000mm height or length.



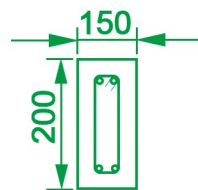
Standard stiffener columns and beams for INTERIOR WALL length or heights up to 4000mm

STIFFENER BEAM



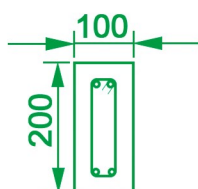
2 - 12MM DIA. TOP BAR
2 - 12MM DIA. BOT. BAR
STIRRUPS:
1 SET 10mmØ, 1@50, 6@100,
REST @150mm O.C TO MISpan
CLEAR COVER: 35MM

STIFFENER COLUMN



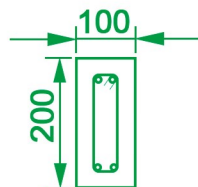
4-12MM DIA. VERTICAL BAR
TIES:
1 SET 10mmØ, 1@50, 9@100,
REST @50mm O.C
CLEAR COVER: 35MM

STIFFENER BEAM



2 - 12MM DIA. TOP BAR
2 - 12MM DIA. BOT. BAR
STIRRUPS:
1 SET 10mmØ, 1@50, 6@100,
REST @150mm O.C TO MISpan
CLEAR COVER: 35MM

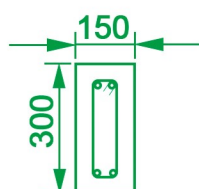
STIFFENER COLUMN



4-12MM DIA. VERTICAL BAR
TIES:
1 SET 10mmØ, 1@50, 9@100,
REST @150mm O.C
CLEAR COVER: 35MM

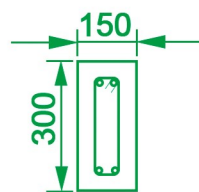
Standard stiffener columns and beams for INTERIOR WALL length or heights more than 4000mm

STIFFENER BEAM



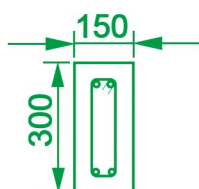
2 - 12MM DIA. TOP BAR
2 - 12MM DIA. BOT. BAR
STIRRUPS:
1 SET 10mmØ, 1@50, 6@100,
REST @150mm O.C TO MISSPAN
CLEAR COVER: 35MM

STIFFENER COLUMN



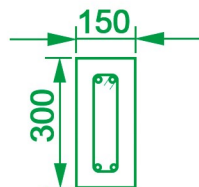
4-12MM DIA. VERTICAL BAR
TIES:
1 SET 10mmØ, 1@50, 9@100,
REST @150mm O.C
CLEAR COVER: 35MM

STIFFENER BEAM



2 - 12MM DIA. TOP BAR
2 - 12MM DIA. BOT. BAR
STIRRUPS:
1 SET 10mmØ, 1@50, 6@100,
REST @150mm O.C TO MISSPAN
CLEAR COVER: 35MM

STIFFENER COLUMN

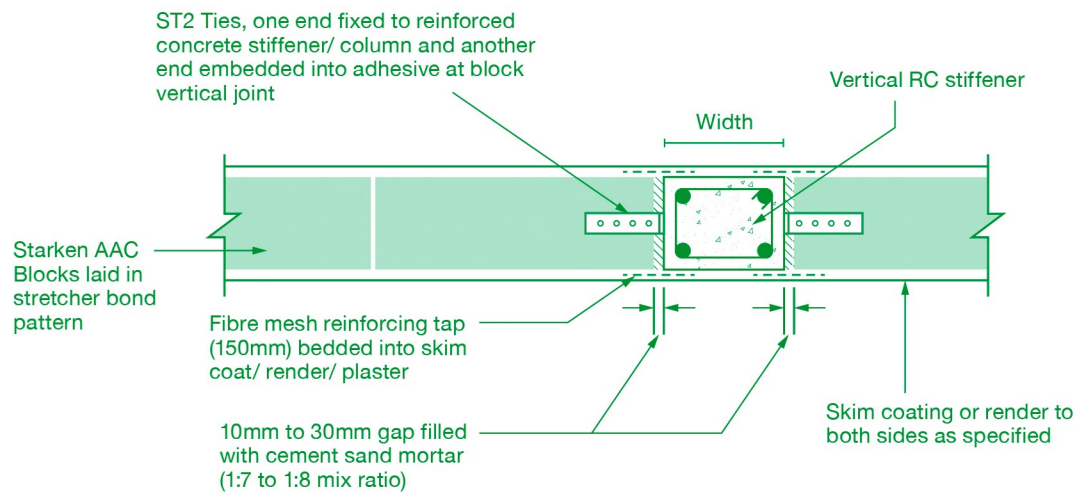


4-12MM DIA. VERTICAL BAR
TIES:
1 SET 10mmØ, 1@50, 9@100,
REST @150mm O.C
CLEAR COVER: 35MM

Stiffener Requirements



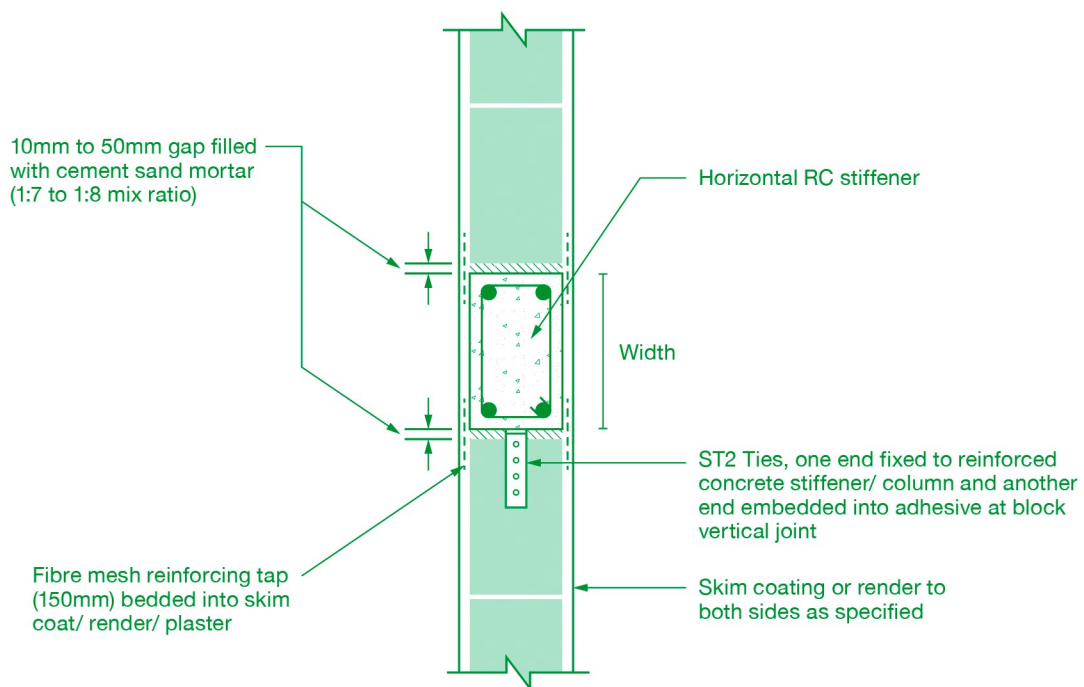
Vertical Stiffener (Figure 24)





Horizontal Stiffener (Figure 25)

- Note:** 1. This limiting heights and lengths is applicable to all block thickness of 100mm and above.
2. Thickness of RC stiffeners should be adjusted to match with the AAC block wall thickness, the width and steel reinforcement requirement should be determined by qualified structural engineer.
3. The above detail relates to RC stiffeners only. This detail shall be read in conjunction with other relevant details contain in the Starken AAC Sdn. Bhd. installation manual.

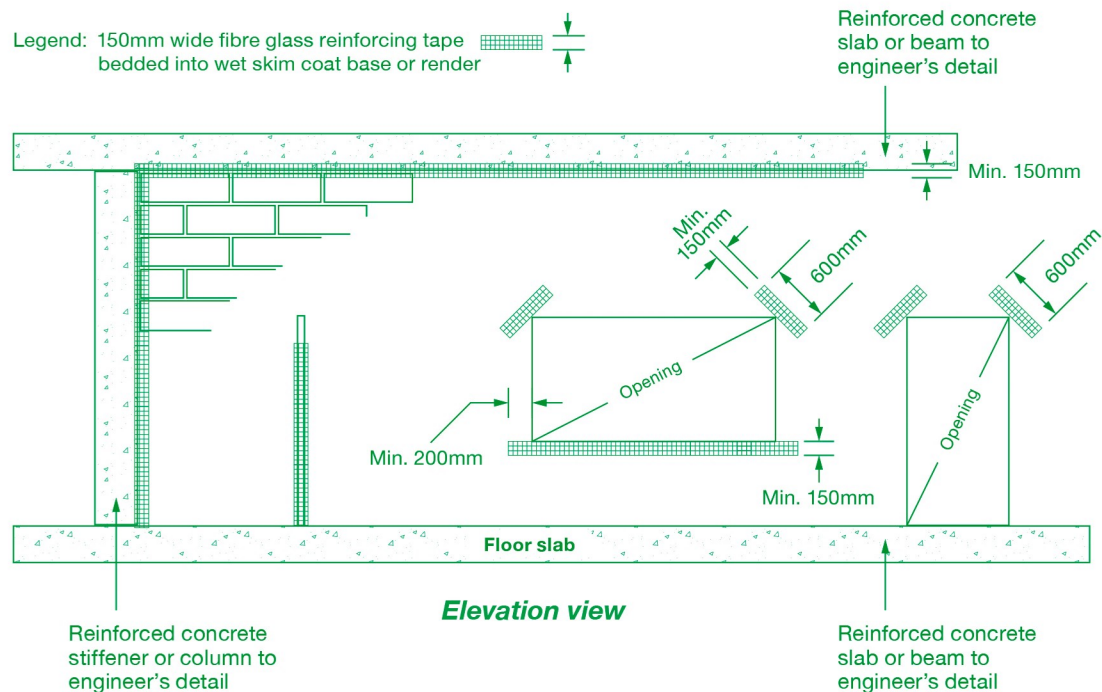


Reinforcement Tape Placement & Chasing

Reinforcement Tap Placement & Chasing

Placement of Reinforcing Tape for Skim Coat & Render/ Plaster (Figure 26)

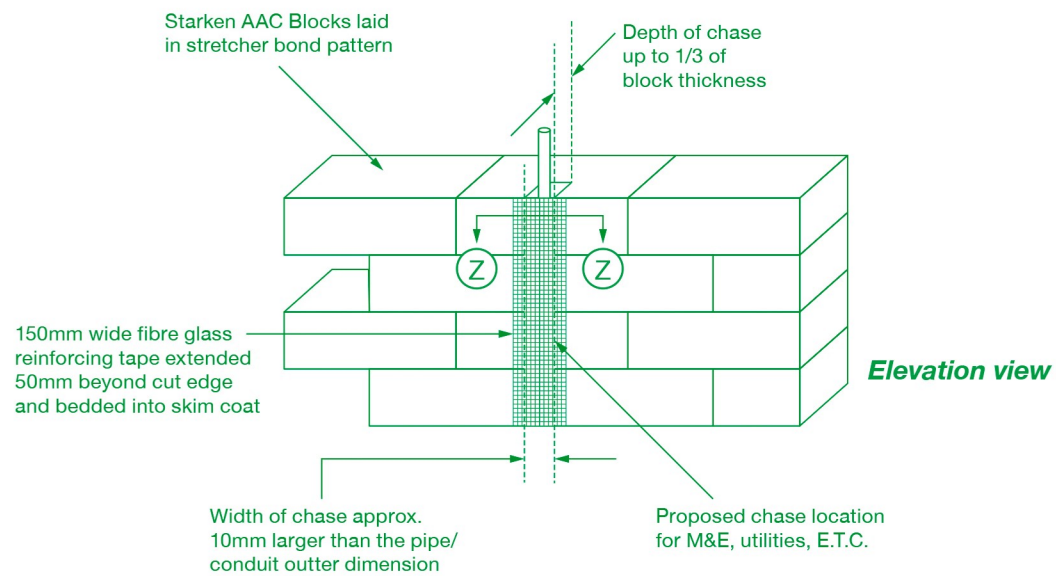
- Note:**
1. Place fibre glass reinforcing tape at areas where high stress is anticipated.
 2. Typical areas to apply the tape are top corners of openings, below window sill and interface between block wall and RC stiffener/ beams/ columns/ slabs.
 3. Where possible, fibre glass mesh must be applied to both sides of the wall.
 4. Refer to relevant wall section details for the actual placement of the reinforcing tape.
 5. Detail placement of reinforcing tape at chases are shown separately.
 6. At the junction of block wall and soffit of beam or ceiling slab, reinforcing mesh may be folded to for an appropriate shape (angle) to suit the junction.
 7. Use a minimum of 150mm wide fibre glass mesh.
 8. Tape must be embedded into wet skim coat base/ render.
 9. Other components such as DPC, infilling mortar and lintels are intentionally not shown in order to provide better clarity on the tape installation.
 10. Drawing is not to scale.



Reinforcement Tap Placement & Chasing

Chasing/ Trenching on Starken Block Wall (Figure 27)

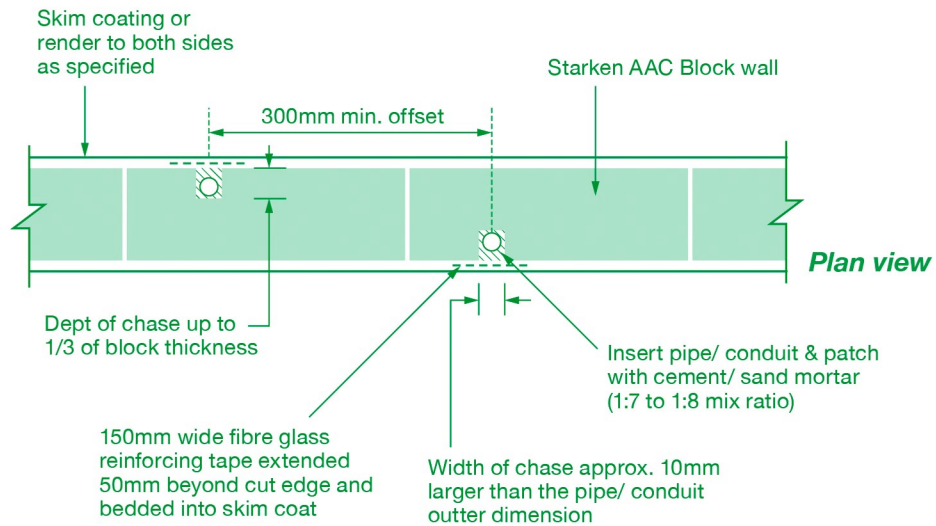
** This should be carried out prior to applying skim coat or render*



Section
Z-Z

Chasing (Figure 28)

Note: 1. If wall needs to be chased more than 1/3 of block thickness, consult Starken AAC Technical Department.
2. Chases formed on party walls shall leave behind at least 100mm thick block.

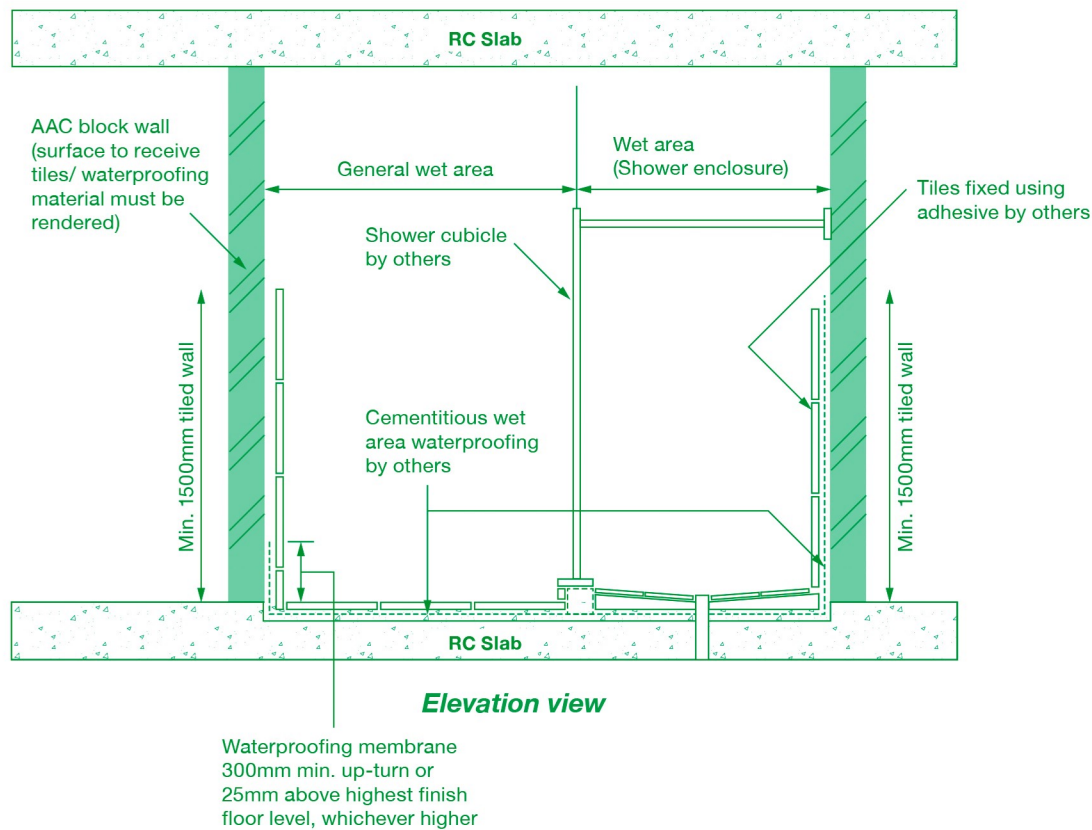


Wet Area Details

Wet Area Details

Typical Detail for Wet Area (Figure 29)

- Note:** 1. The above represent a typical wet area detail in all cases, always refer to the relevant contract document and construction drawings of the specific project.
2. Generally, AAC block wall will be rendered approximately 10mm thick prior to applying waterproofing material or tile adhesive.
3. Waterproofing material must be fully compatible with the tile adhesive and preferably be supplied by one supplier or manufacturer.
4. For best result, Starcken recommends cementitious type of waterproofing material. However, for final recommendation please consult the respective manufacturer for advice.
5. For generally dry area, AAC block wall surface may be directly finished with tile. Preliminary block wall surface preparation may be required. Consult tile adhesive manufacturer for recommendation.





Delivering World-class Lightweight Solutions

EFFICIENT
STRONG
PRECISE

Starken AAC Wall Panels

Internal Infill Walls

Delivering Quality Sustainable Building Solutions

Starken AAC Sdn Bhd is the leading AAC (Autoclaved Aerated Concrete) manufacturer in Malaysia that aims to deliver quality products to its customers. With its commitment to quality products & services, Starken invested in the state-of-the-art machineries and technology supplied by Wehrhahn of Germany.

Situated at Serendah, Selangor. Starken's production facility manufactures blocks efficiently and engineered panels cost-effectively with an annual capacity of 600,000 cubic meters. It covers a wide range of AAC products with various compressive strengths to cater for specific architectural and design requirements of various types of buildings. Starken's main products include AAC blocks, panels and lintels with dry density of 450 kg/m³ – 820 kg/m³.

With its storage capacity of more than 10,000 m², the supply of AAC products will always be sufficient to meet the demand of on-going projects.

Commitment to Excellence

Starken prides itself on maintaining the highest level of customer service and support. Every member of Starken is committed to both excellence in customer service and the production of quality building materials.

At Starken, we listen very carefully to our customers' needs and concerns. We ensure that our customers receive better value and excellent product performance through our expertise, knowledge and experience in assisting them in all areas of their construction related needs on AAC products.



ADVANTAGES OF AUTOCLAVED AERATED CONCRETE WALL PANEL



Cost-effective



Thermal Comfort &
Energy Saving



Lightweight



Eco-friendly



Dimensional
Accuracy



Durable



Sound
Resistant



Impact Resistant



Good Workability



Water Resistant



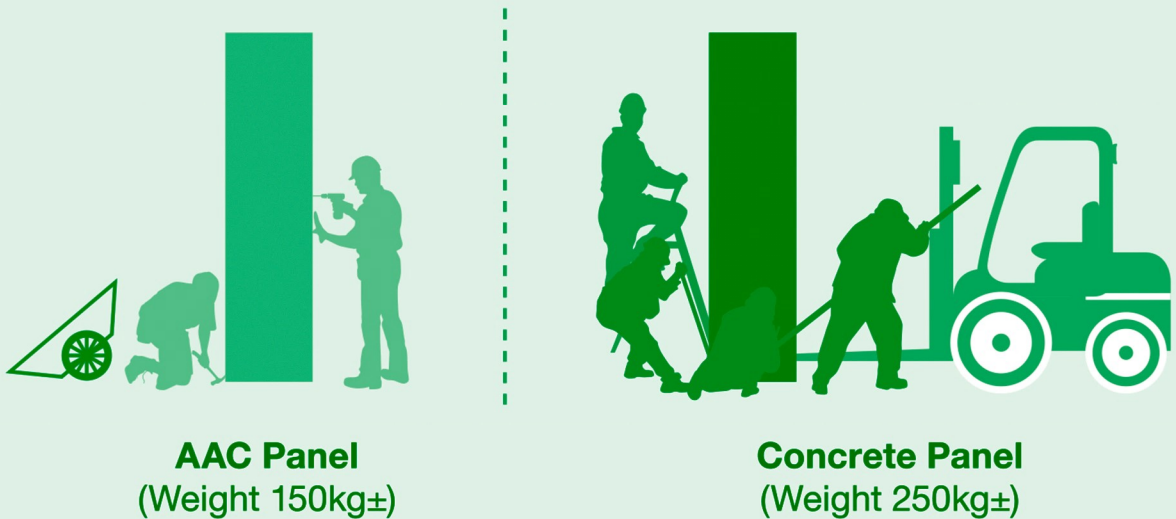
Fire Resistant

Key Benefits of Wall Panel

1

Manpower Efficiency

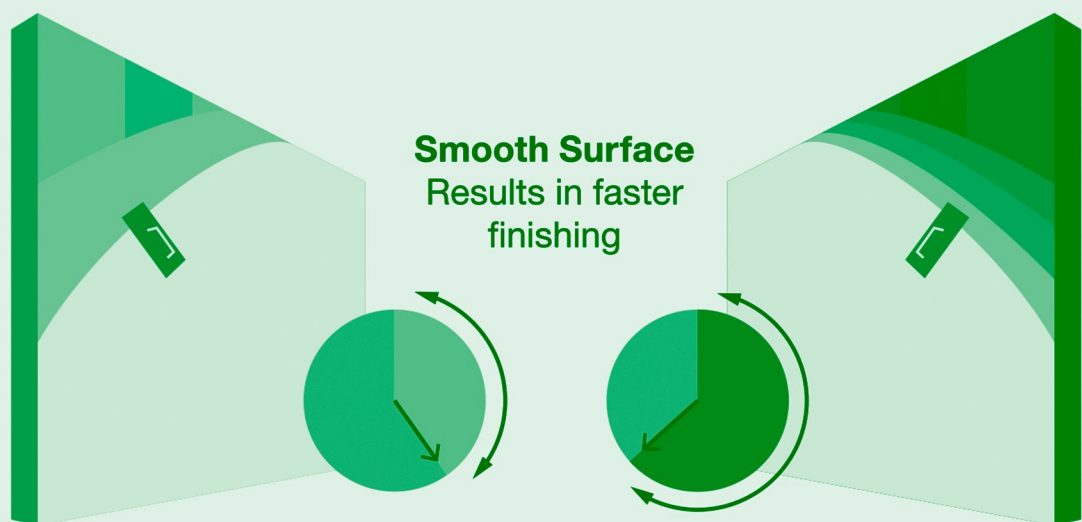
AAC Panel vs Concrete Panel



2

Wall Installation & Finishing Speed

AAC Panel vs Concrete Panel



3

Reinforcement Strength

AAC Panel vs Concrete Panel



AAC Panel



Concrete Panel

Starken Infill Wall Panels

Starken infill wall panels are reinforced lightweight concrete panels that can be used as internal non-loadbearing wall partitions as a replacement for common brickwalls. They are suitable to be used for both steel and concrete-framed structures.

Starken infill wall panels are much lighter than any other solid or hollow core concrete wall panel systems. Overall, the system offers rapid installation and faster completion time. The lighter weight of the panels will result in savings in the foundation and structure costs. A typical 3m L x 0.1m T x 0.6m W AAC panel only weighs approximately 150kg. A similar size hollow core panel weighs close to 250kg.

Compressive Strength: **3.5 MPa**

Working Density: **780 - 820 kg/m³**

Modulus of Elasticity: **2,190 MPa**

Thermal Conductivity: **0.172 w/mK***

Fire Resistance: **4 Hours****

Note: All values shown are nominal.

**Dry State*

***Sirim Test Report 2016FE0307 (29/06/2016)*

Starken wall panels are designed with a double steel mesh to withstand uniform lateral loads. For the internal infill wall applications, to assist the contractors, Starken offers the cost effective standard panel length from 2,400 - 3,000mm which designed to withstand a service lateral pressure of up to 0.5kPa. For longer panels with higher lateral loads of up to 1.0 kPa, Starken offers panel length from 3,300 - 4,000mm.

Working dimension:

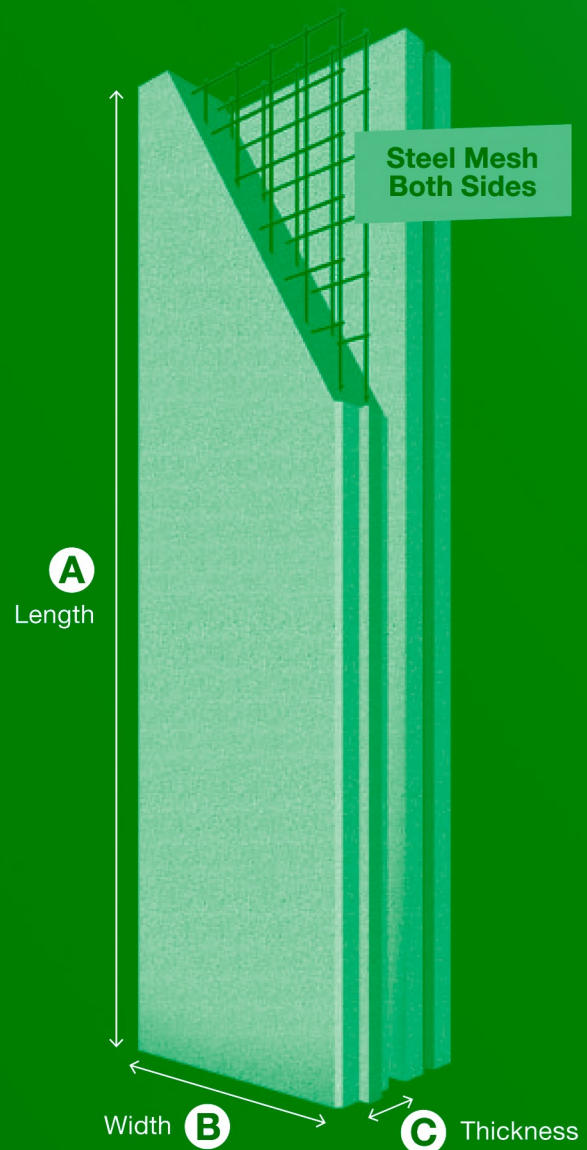
A Length: **2,400 - 4,000mm (±5mm)**
(In multiple of 10mm)

B Width: **600mm (±2mm)**

C Thickness: **100mm (±2mm)**

Lateral Loads : **0.5 kPa** (Length from 3,000mm)
1.0 kPa (Length from 4,000mm)

We advise early consultations with Starken Technical Department during the design stage to ensure all the intended design requirements are fully met in order to select the right panel solution.



Finishes

Starken infill wall panels can be finished with skim-coating or rendering systems.

Coating for Internal Partition:

Dry Area: **5mm Thickness *Skimcoat**

****Wet Area: 10mm Thickness *Render with
***Tile Finish**

*Note: *Starken Skimcoat and Render coating systems*

***Apply cementitious type waterproofing material*

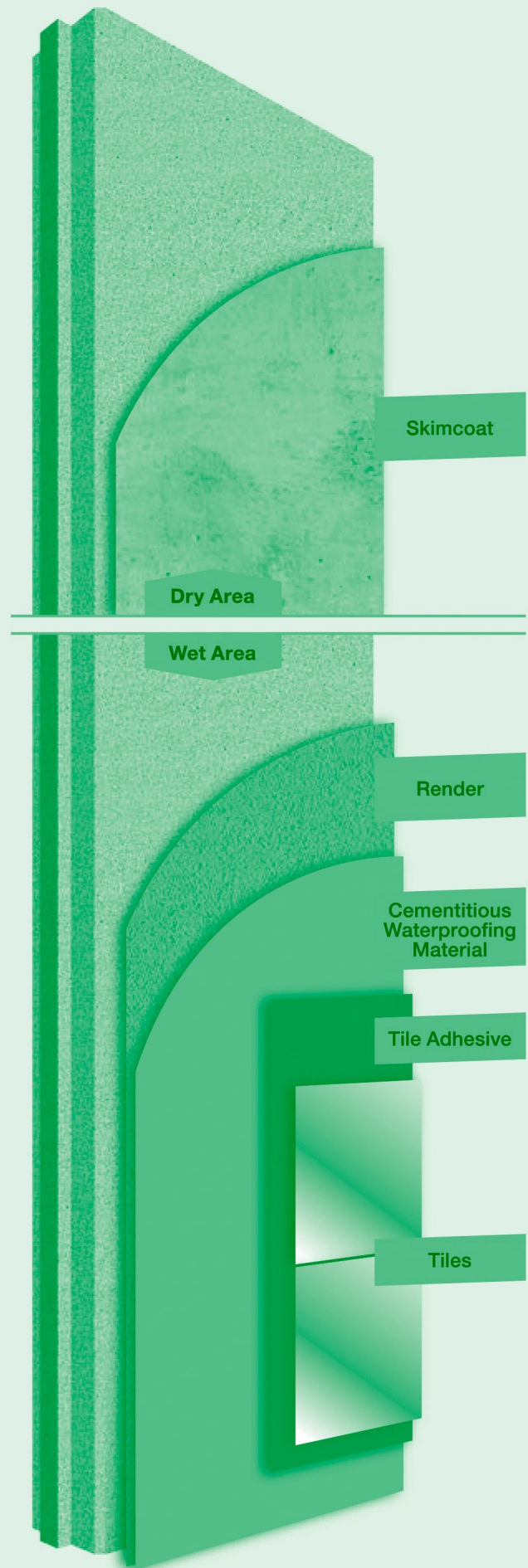
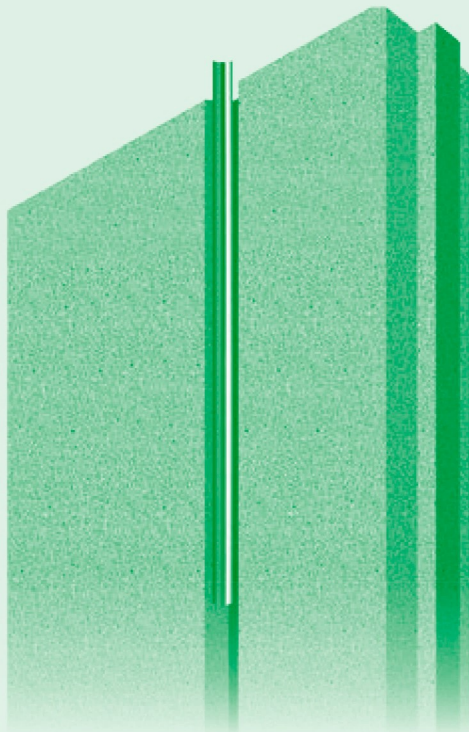
****Use tile adhesive*

To achieve the best possible quality finish, the wall surface should be cleaned of oil, dusts before applying the coating system.

Emulsion or acrylic paint system is applied on the skim-coated or rendered wall surface to provide the final pleasing aesthetic looks.

Conduits

M&E conduits can be concealed in Starken infill wall panel system. Chasing is carried out up to 30mm deep and 40mm wide. Refer to the installation detail for chasing allowance.

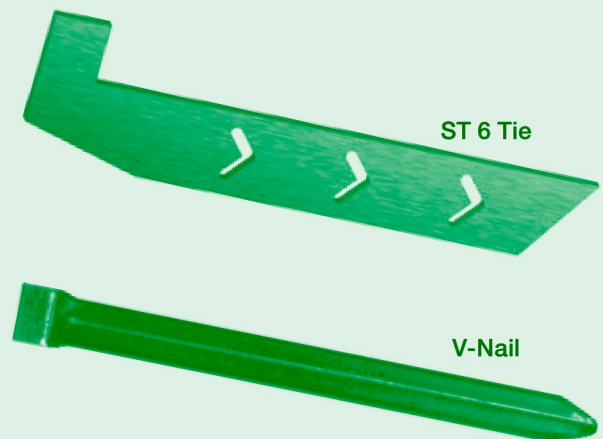


Fixtures

Nylon plugs should be used on STARKEN infill wall panels to fix low to medium duty wall fixtures. There are easily available from Fischer, Hilti or Ramset.

For heavy duty applications, a suitable epoxy grout system should be used to hang heavy fixtures.

STARKEN advises consultations with the fixing suppliers to select the best fixing solutions for projects.



STARKEN Thin Bed Adhesive(TBA) is used to join the panel at the joints using a steel trowel and a notched trowel. Concrete fasteners are then used to secure the ST8 tie to the concrete members. For steel members, it is simply welded for secure fixing.

Installation

STARKEN infill wall panel system comes with a simple installation method. The panels can be installed in vertical or horizontal orientation. The vertical installation is the preferred method as the panel supports at the base and top are readily provided by the structure. For horizontal erection, additional vertical supports in the form of stiffeners or secondary columns need to be installed prior to panel erection.

Each panel is easily transported and manoeuvred into position using dollies, a panel trolley or other suitable equipment. Once in position, the panel is tilted upright and secured to the supporting structure using a special ST8 tie brackets at the base and the top of the panel. 2 V-nails are then nailed into the panel at each tie bracket.



Expansion Joint(E.J) should be incorporated for panel wall that exceeds 8m in length. Typical detail for the E.J is a 10mm wide gap infilled with a suitable backing rod and flexible sealant material. Additional insulation materials such as glasswools or rockwools can be incorporated if deem necessary.



Thin Bed Adhesive



Render (Outdoor)



Skim Coat Base



Skim Coat Finish (Indoor)

Installation Manual

Starken AAC Vertical Panel

Infill Wall

Version.01

**Notes:**

1. This manual serves as a guide for Starken AAC panels and related accessories for the erection of infill wall panel system. It is not meant to provide exhaustive (complete) instruction on AAC panel installation as such installers must possess a basic knowledge/ skill related to panel installation.
2. Starken offers panel wall systems ranging from 100mm to 200mm (excluding skim coat or render). Each wall thickness may yield different performance in its fire/ acoustic rating and thermal insulation value.
3. Specific design criteria stipulated in the contract documents such as fire resistance level and sound insulation value must be checked and confirmed by relevant parties such as architect/ consultant/ contractor before commencing panel installation.
4. To ensure optimum compatibility, use accessories (i.e. thin bed adhesive, skim coat & render) obtained from Starken's approved suppliers. Contact us for the list of approved accessory suppliers.
5. General instructions about the application of associated items for installation of AAC panels such as thin bed adhesive, skim coat base, skim coat finish & render are shown on the respective package.

For further assistance, contact us at:**STARKEN AAC SDN. BHD. (752003-D)**

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Shaw Blvd, Ortigas Center, Pasig City

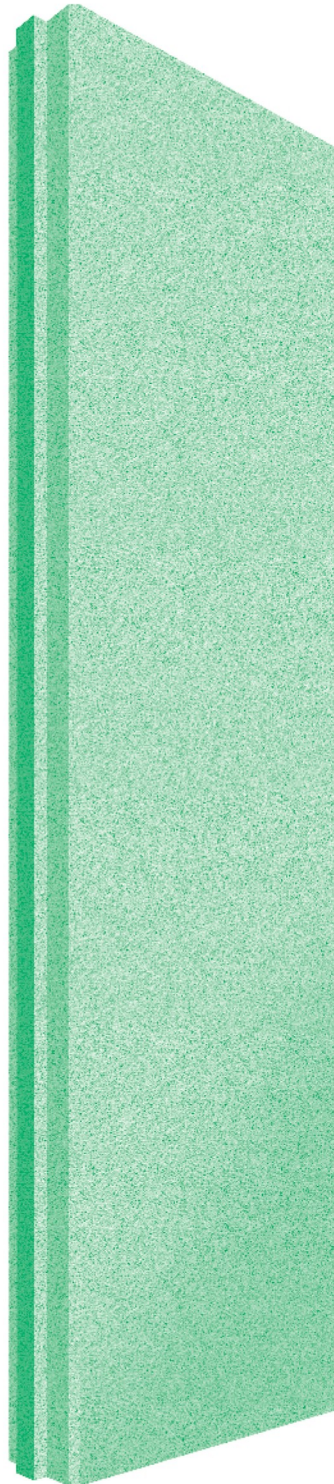
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Disclaimer Note:

Please be informed that Starken AAC Sdn. Bhd. shall not in any way be held responsible for the use / adoption of the information in this document, be it expressed or implied. The contents of this document represent typical details related to installation of Starken AAC products. Each application may be unique and requires specific attention that may be outside the scope of this document. Thus, it is recommended that Specifiers/ Designers to consult Starken Technical Department and also analyze the relevant product specifications, and (but not limited to) other performance criteria related to the overall construction.

Basic Wall Components & Accessories

Note: 1. Accessories marked with  are available from Starken AAC Sdn. Bhd.



 Starken AAC Panel



 Thin Bed Adhesive



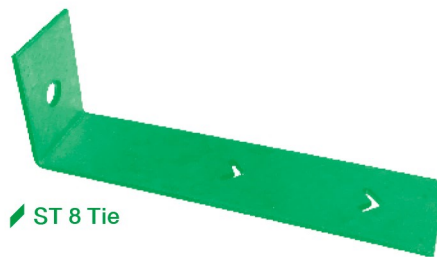
 Skim Coat Finish
(Indoor usage)



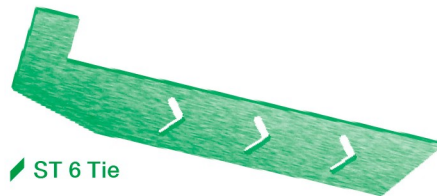
 Skim Coat Base



 Render (Outdoor Usage)



 ST 8 Tie



 ST 6 Tie



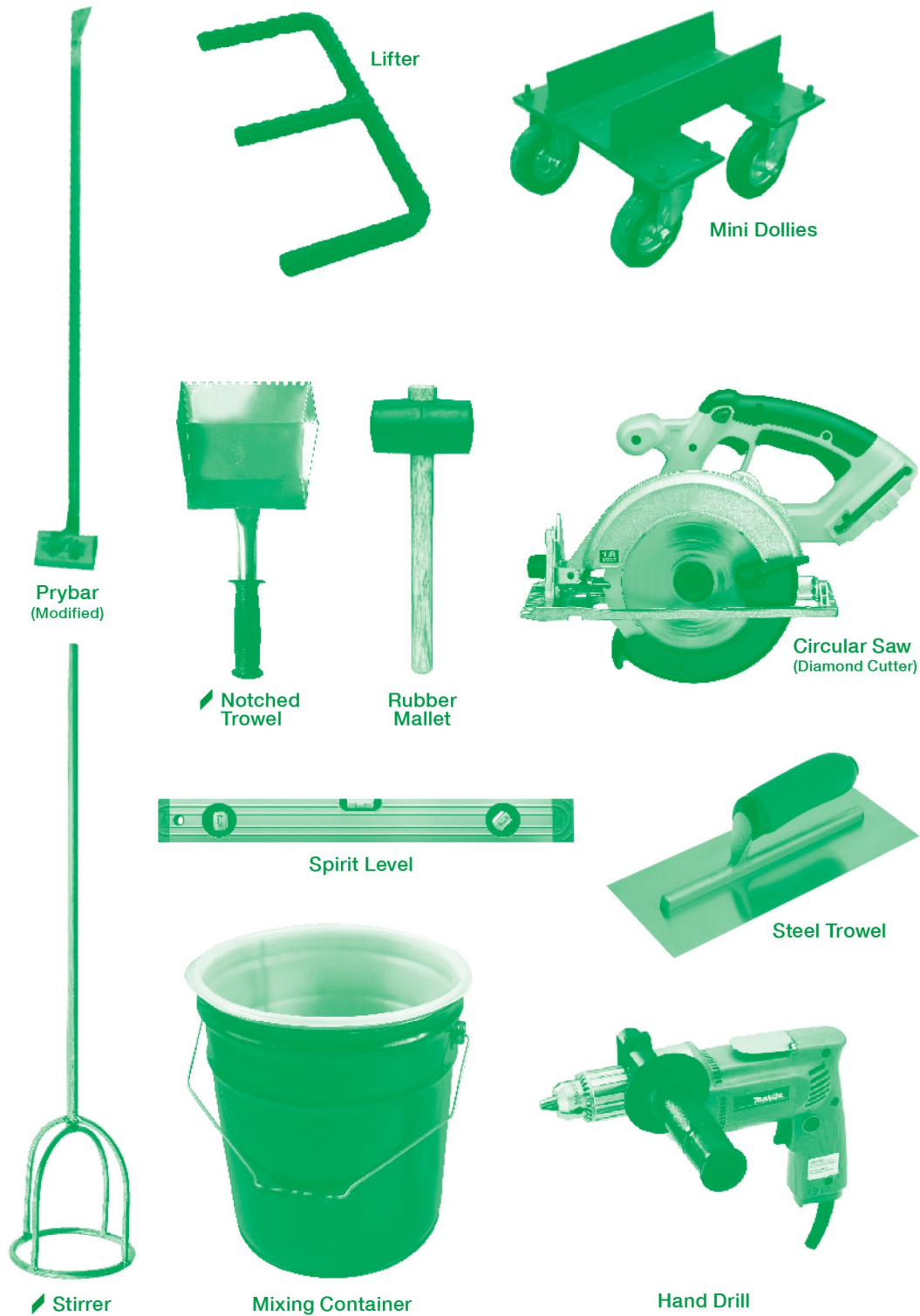
 V-Nail
(L)



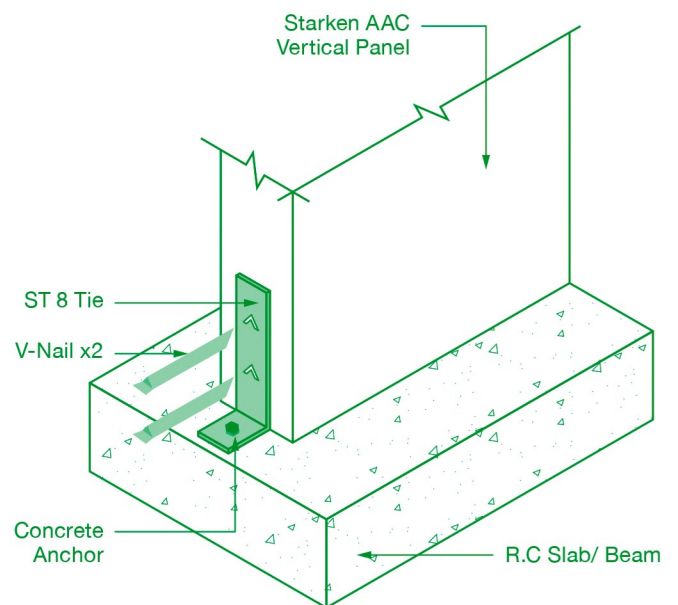
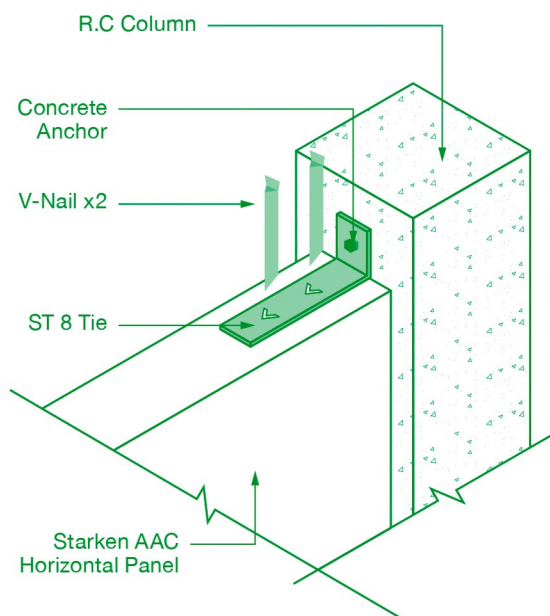
 V-Nail
(S)

Basic Installation Tools

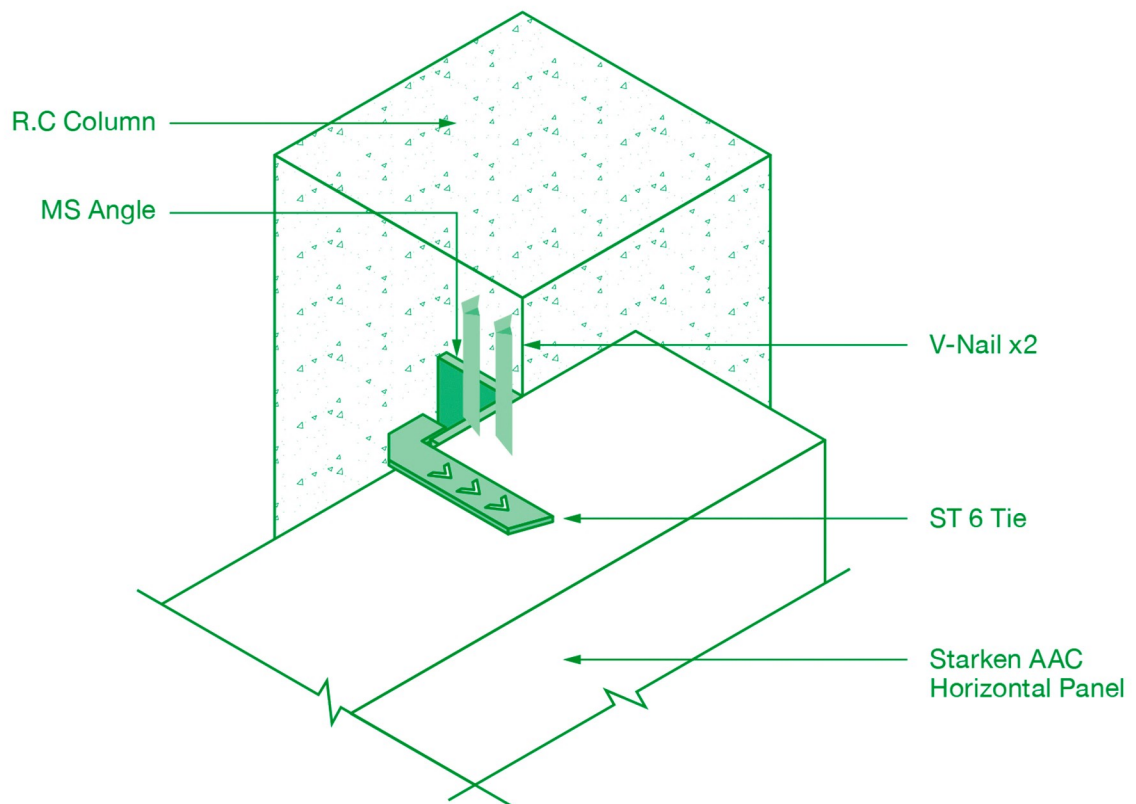
Note: 1. Tools marked with  are available from Starken AAC Sdn. Bhd.



ST 8 Tie & V-Nail Installation



ST 6 Tie & V-Nail Installation

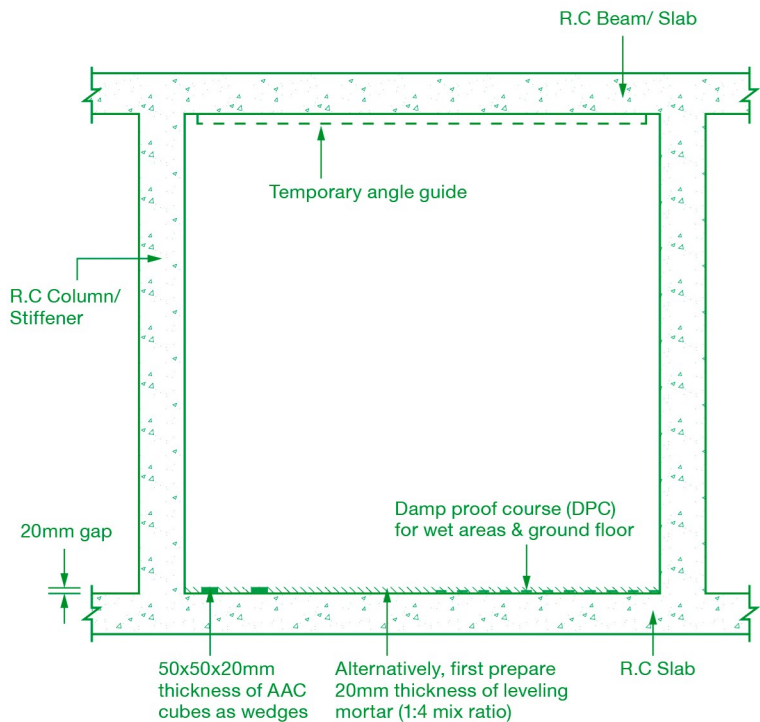


Installation Procedure

Vertical Panel Installation Procedure

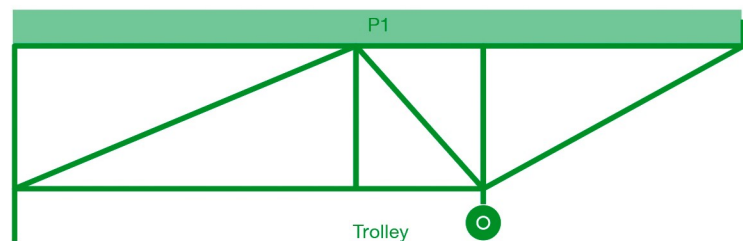
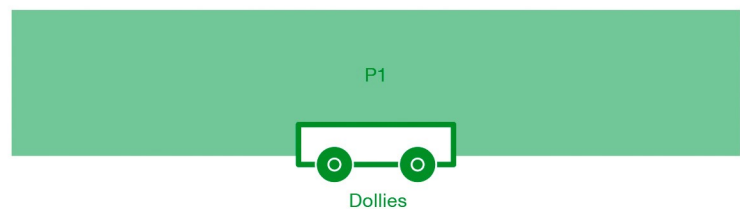
Step 1

- Setting up & fix temporary angle guide at the top.
- Cut AAC block to 50x50x20mm thickness cubes to be used as wedges.
Alternatively, first prepare 20mm thickness leveling mortar at base
- For wet areas & ground floor, install Damp Proof Course (DPC) prior to placing leveling mortar.



Step 2

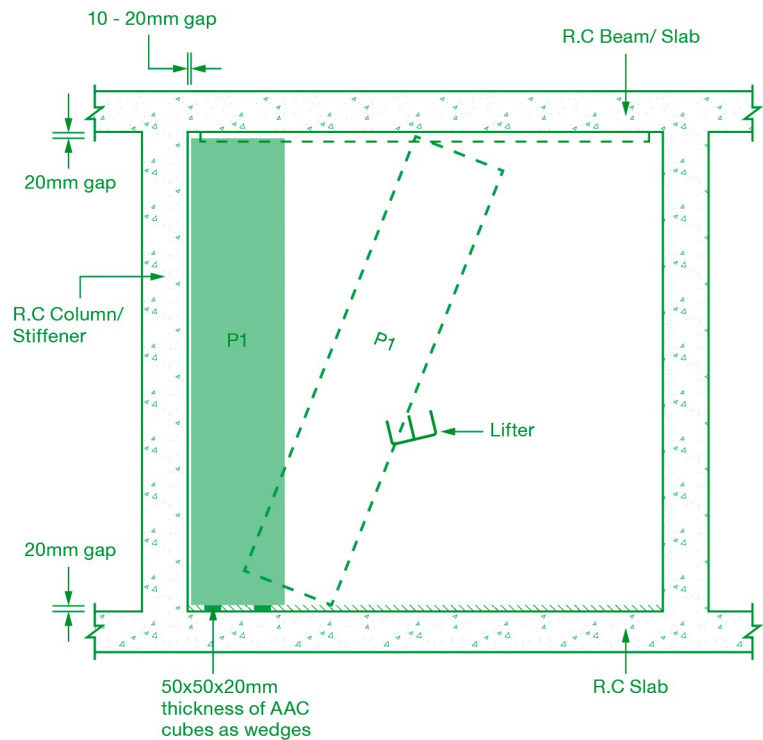
- Carefully, remove pallet strapping.
- Lift panel onto dollies/ trolley
- Transfer panel to work area.



Vertical Panel Installation Procedure

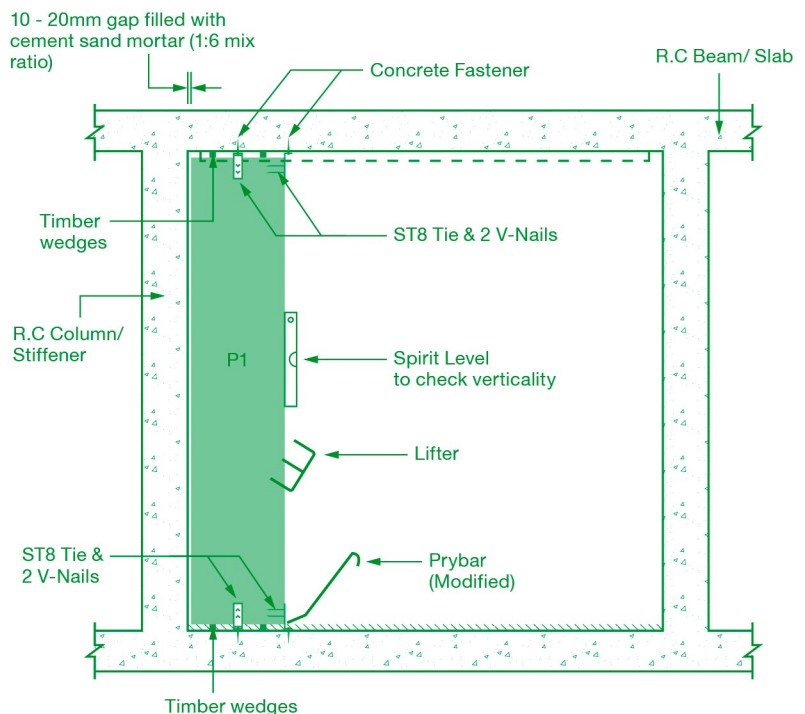
Step 3

- Lift panel with a lifter and wiggle it into position with 50x50x20mm thickness of AAC cubes at the bottom.
- Place panel against the temporary angle bracket guide (If installed).
- Allow 20mm gap at the top and 10mm gap along column/stiffener.



Step 4

- Adjust panel (P1) into position using prybar or panel lifter.
- Insert timber wedges firmly between floor slab/ beam & panel to firmly fix panel into position.
- Check vertically of panel.
- Fix ST8 tie to panel edge at top and base using 2 V-Nails.
- Anchor ST8 tie to slab and beam using concrete fastener.
- For first & last panel, fix ST8 tie to the front of panel at top and base using 2 V-Nails.
- For last panel, add ST8 with 2 V-Nails at mid-height and secured to RC Column with concrete fasteners.
- Anchor ST8 tie to slab & beam using concrete fastener.
- Remove 50x50x20mm AAC cubes from the base.



- Prepare & mix Thin Bed Adhesive (TBA).
- Apply TBA using a notched & steel trowel to side of panel (P1).
- Adjust TBA thickness using a steel trowel.



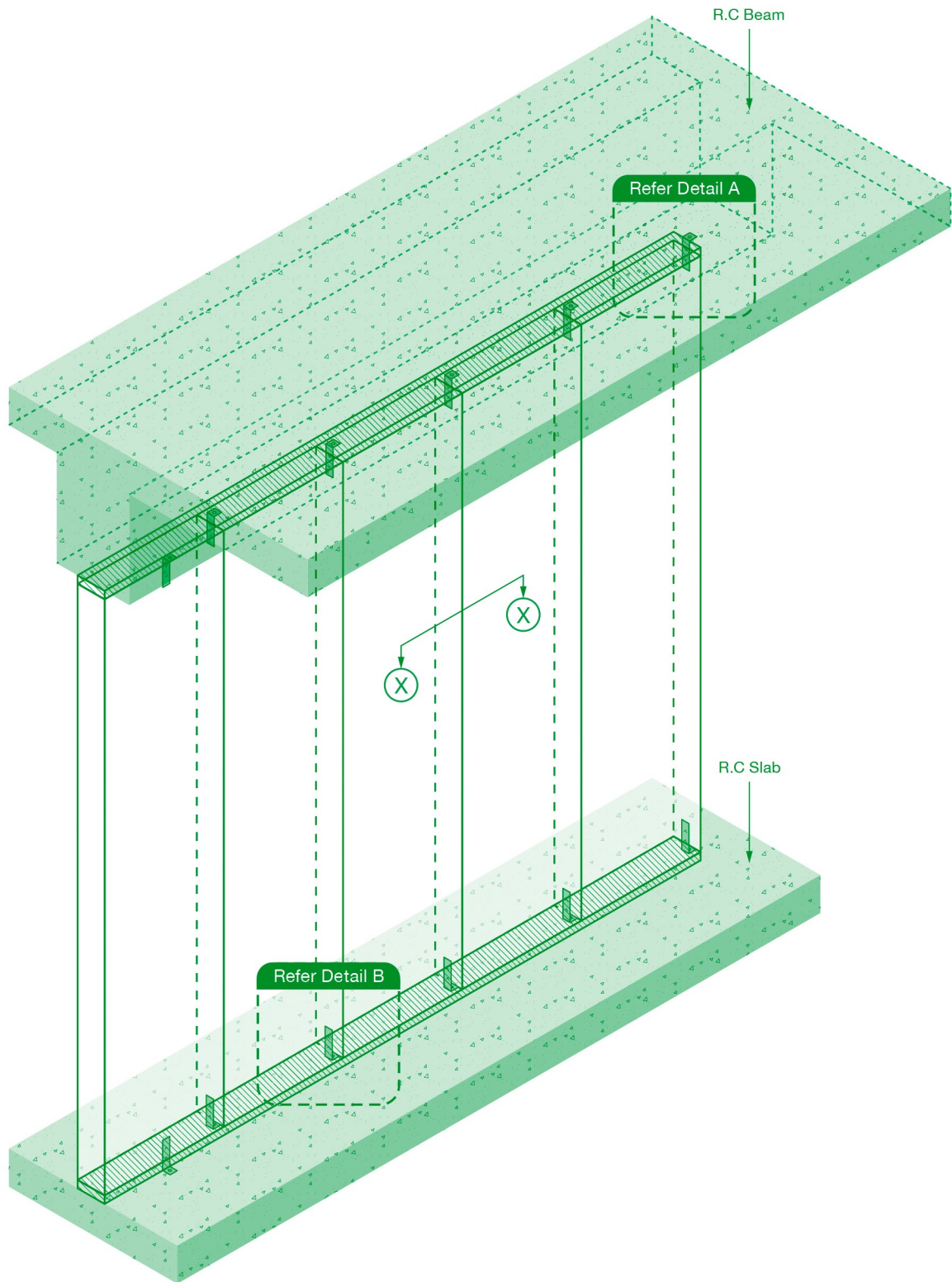
- a. Repeat panel installation sequence from Step 2 to Step 5 for subsequent panels.
- b. If required, cut the last panel to suit the width using a circular saw with a diamond bit cutter.
- c. Remove temporary angle bracket guide.
- d. Fill base, top & side gaps with weak mortar (1:6 mix ratio).
For non-fire walls, alternatively PU foam can be used to seal side & top gaps.
- e. Remove timber wedges (after ½ day) & patch with mortar.

The diagram illustrates a repair method for a concrete column. The column is divided into five vertical panels labeled P1, P2, P3, P4, and P5. The repair process involves the following steps:

- 10 - 20mm gap**: A gap is created at the top of the column.
- Remove temporary angle bracket guide**: The guide is removed after the repair.
- Fill gap with weak mortar (1:6 mix ratio)**: The gap is filled with weak mortar.
- R.C Beam/ Slab**: The repair is adjacent to the R.C Beam/ Slab.
- 20mm gap**: A gap is created at the bottom of the column.
- R.C Column/ Stiffener**: The repair is adjacent to the R.C Column/ Stiffener.
- Fill gap with weak mortar (1:6 mix ratio)**: The gap is filled with weak mortar.
- 20mm gap**: A gap is created at the bottom of the column.
- Remove timber wedges (after ½ day) & patch gap with mortar**: The timber wedges are removed and the gap is patched with mortar.
- 10 - 20mm gap**: A gap is created at the bottom of the column.
- ST8 Tie & 2 V-Nails**: The repair is secured with ST8 Tie and 2 V-Nails.

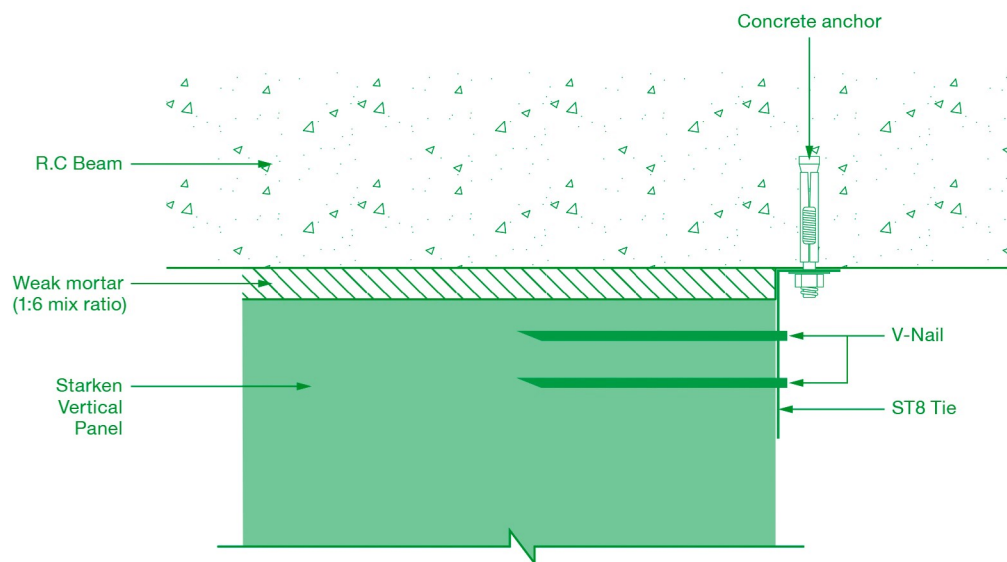
Vertical Installation

Vertical Installation

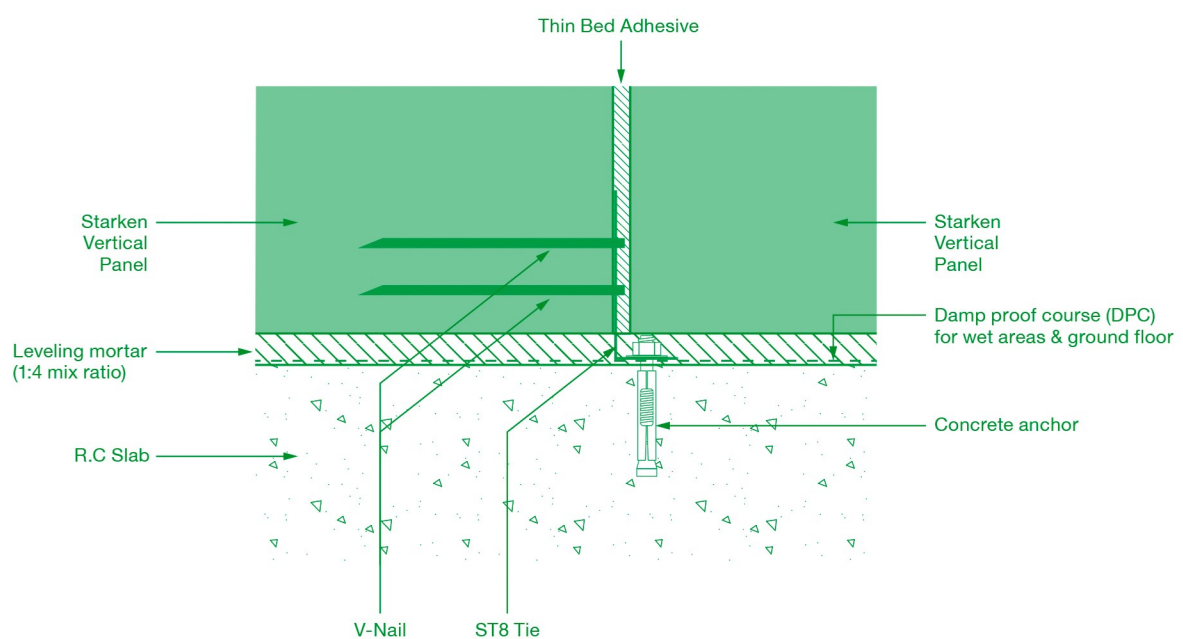


Vertical Installation

Detail A Starken Panel to R.C Beam Detail



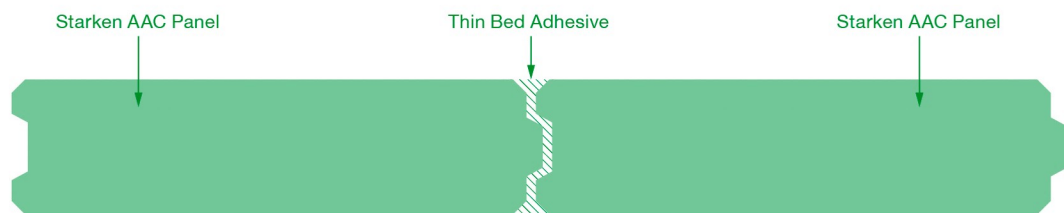
Detail B Starken Panel to R.C Slab Detail



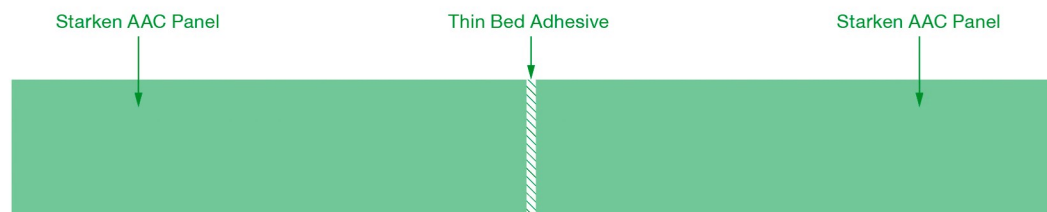
Vertical Installation



Thin Bed Adhesive between panels

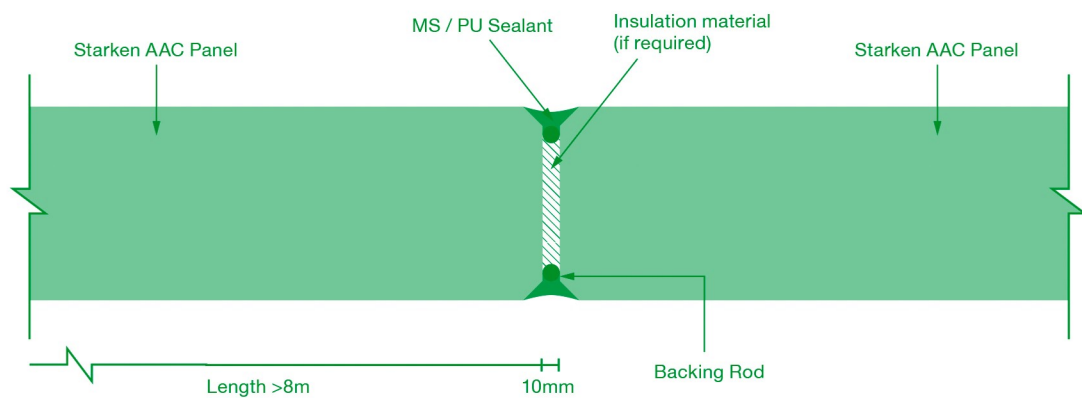


Tongue & Groove (FI) Profile



Flat (AA) Profile

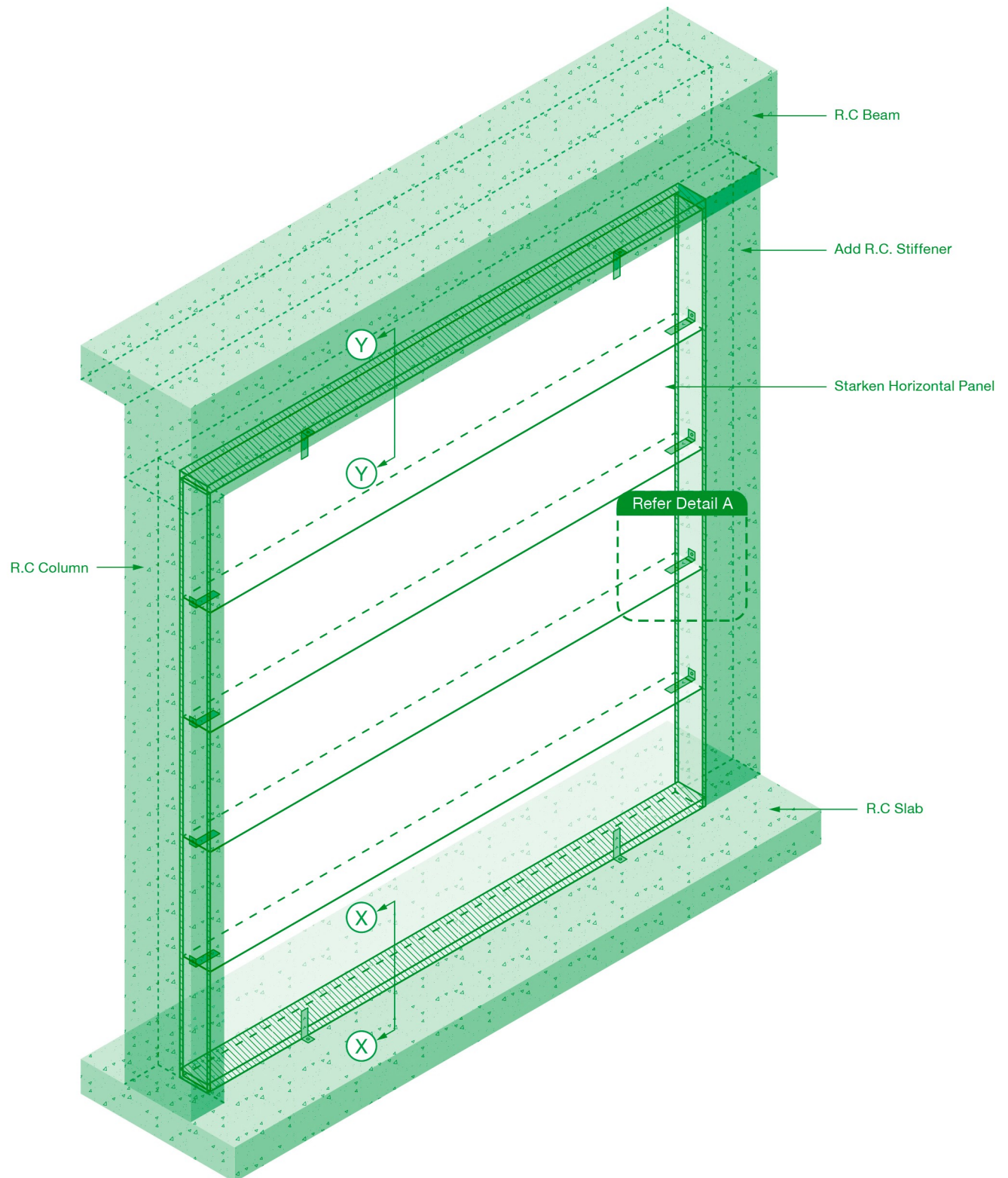
Expansion Joint (E.J)



Flat (AA) Profile

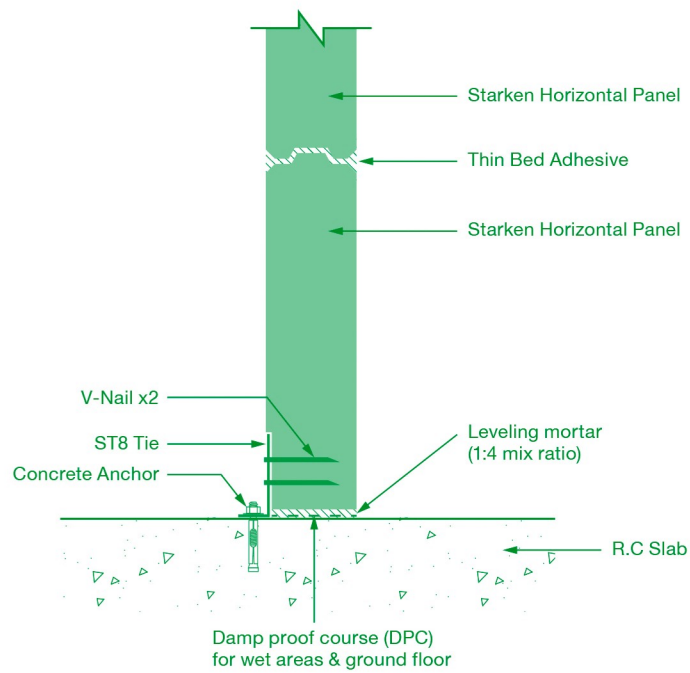
Horizontal Installation

Horizontal Installation

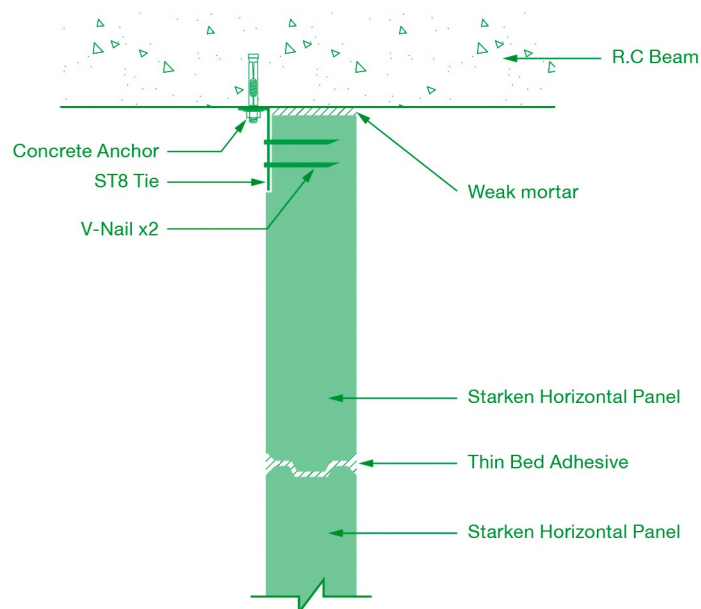


Horizontal Installation

Section
X-X

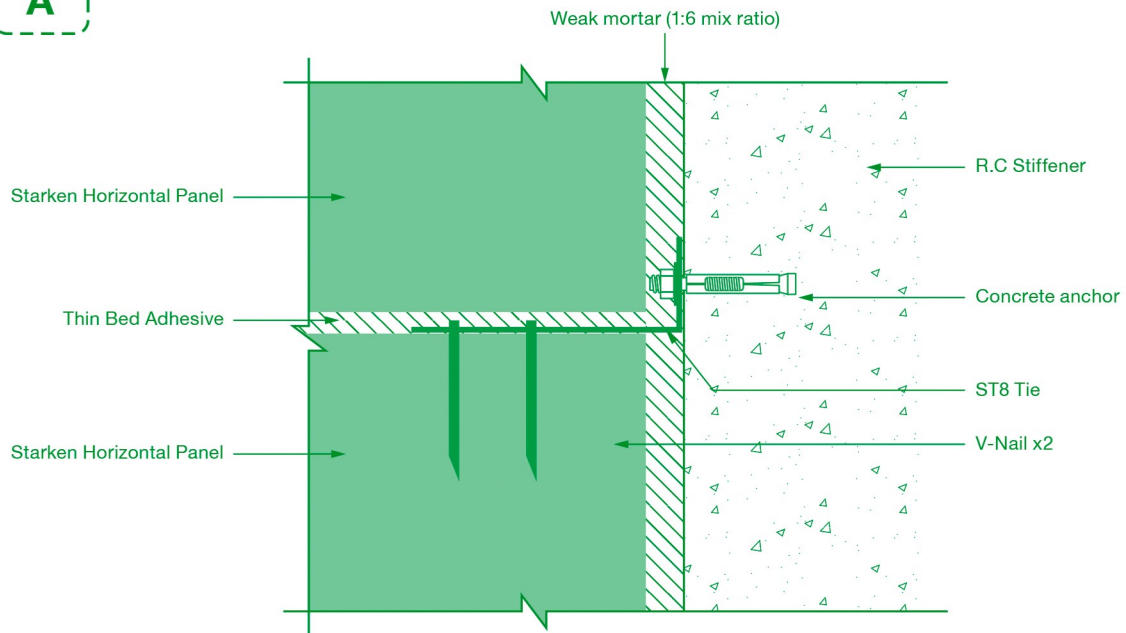


Section
Y-Y

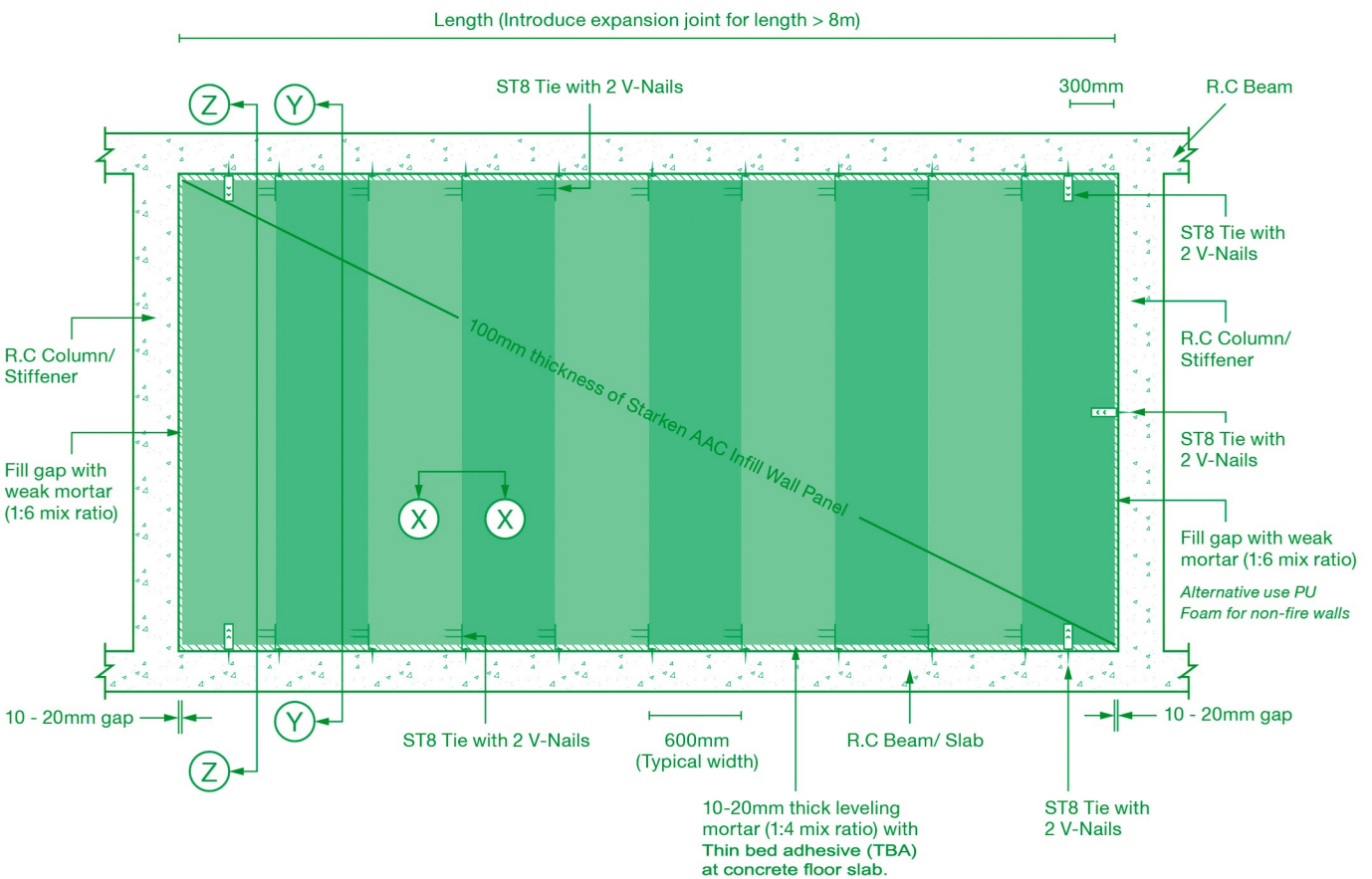


Horizontal Installation

Detail
A

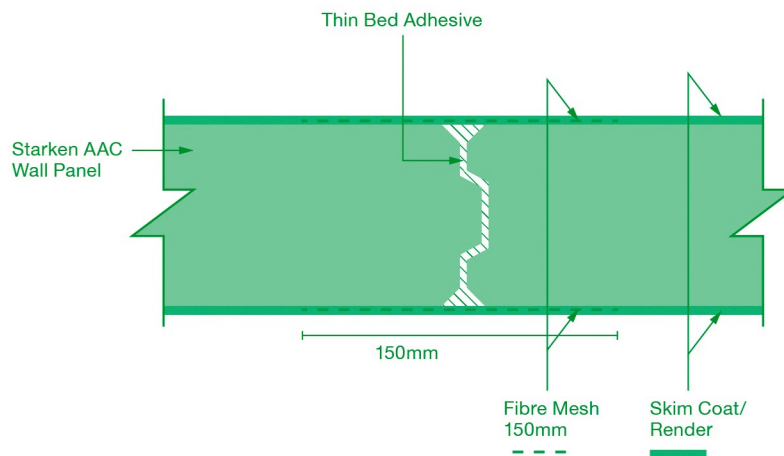


Internal Infill Vertical Wall Panel

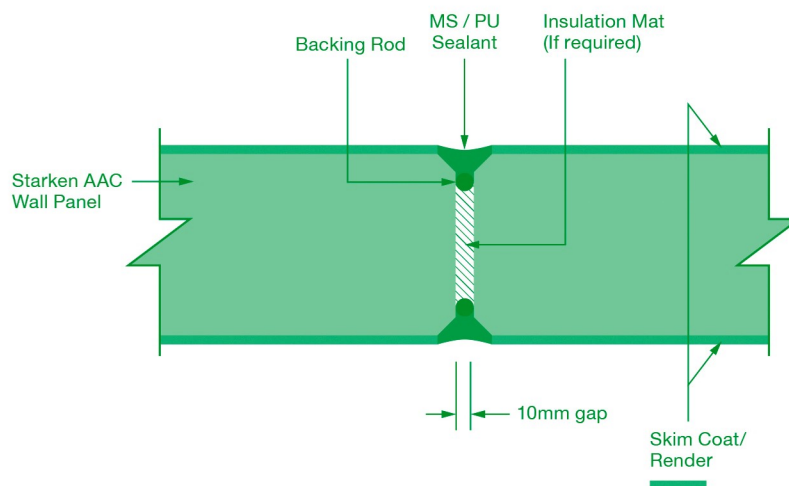


Internal Infill Vertical Wall Panel

Section
X-X

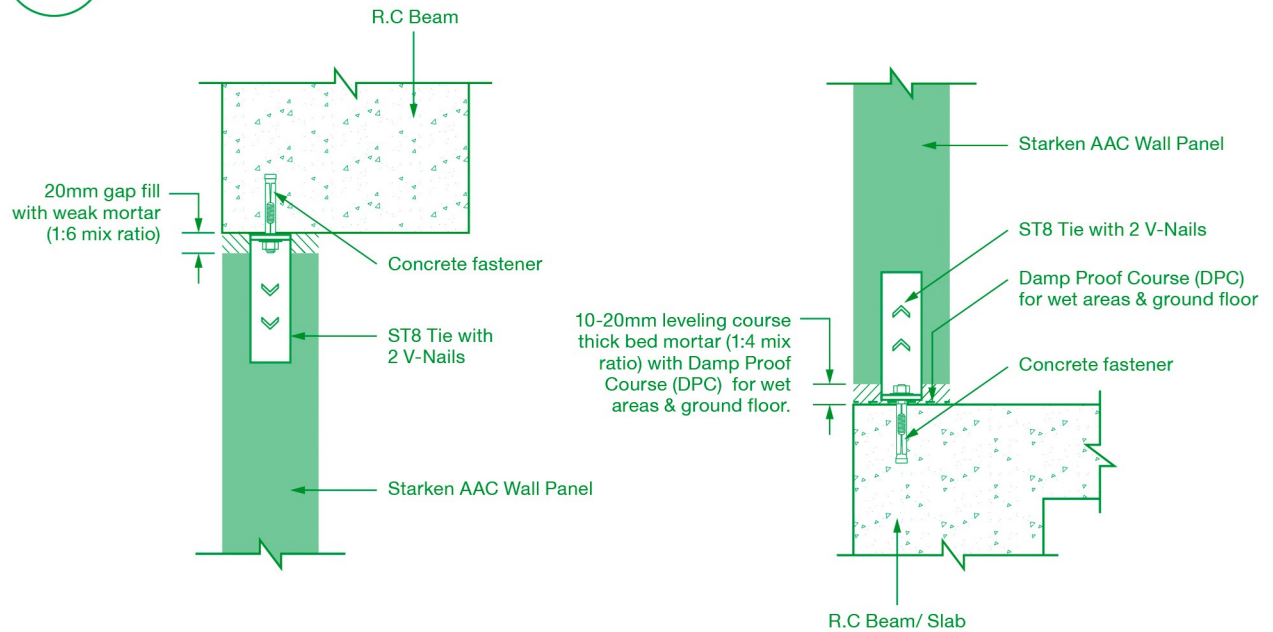


Expansion Joint (E.J)

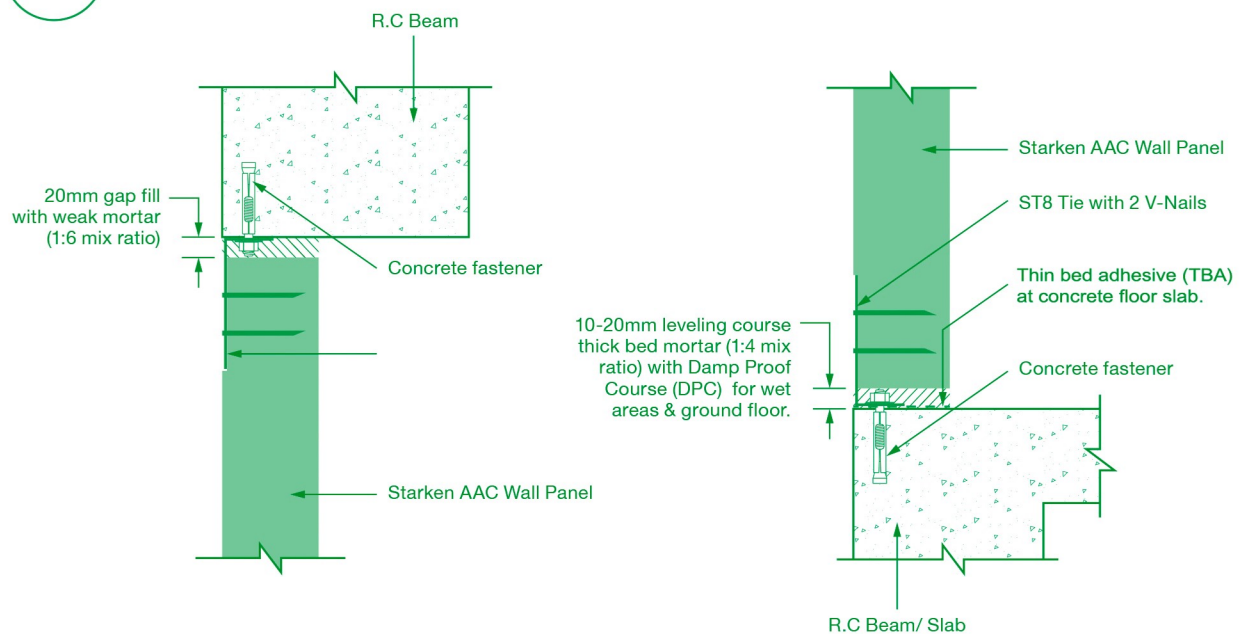


Internal Infill Vertical Wall Panel

Section
Y-Y



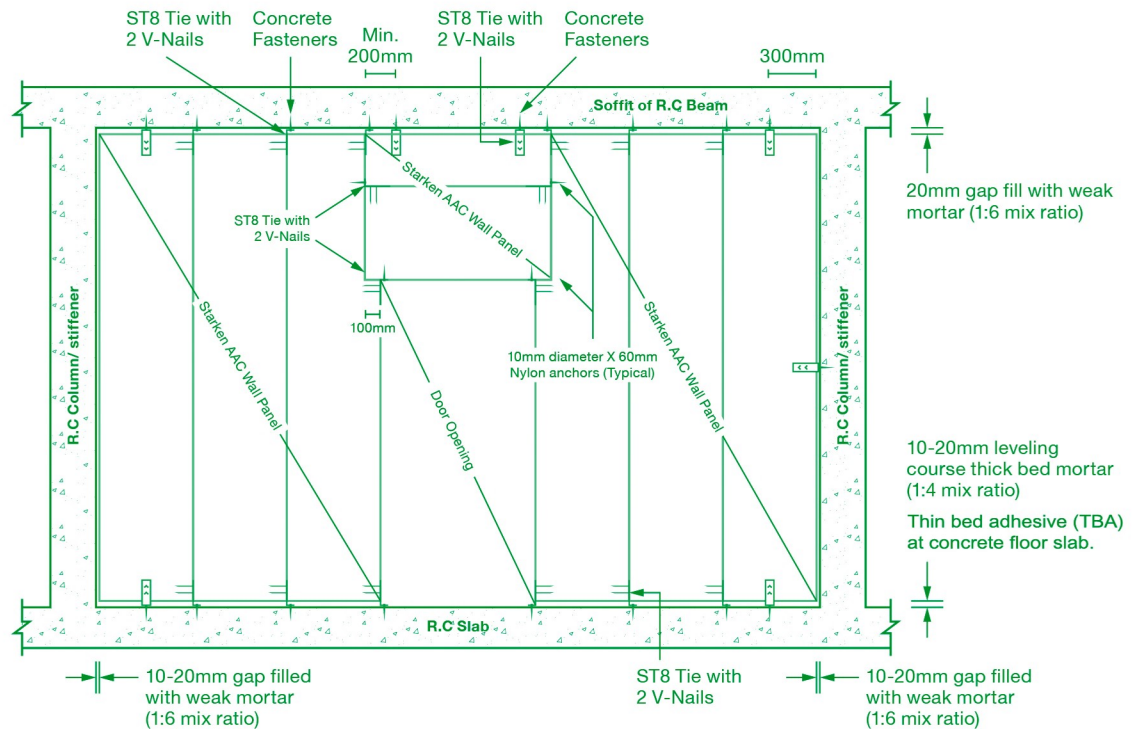
Section
Z-Z



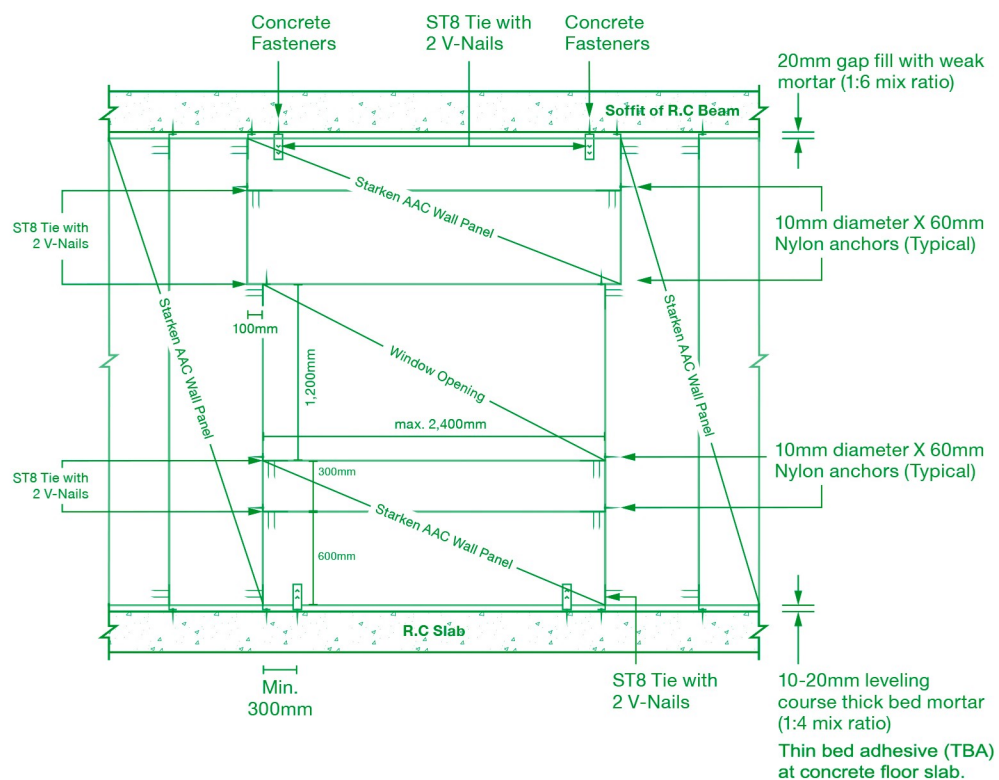
Door & Window Opening

Door & Window Opening

Door Opening Detail (Option 1)



Window Opening Detail (Option 1)



Specimen	S18 Tie with		Min.	S18 Tie with	
	3/4" N. H.	Concrete		3/4" N. H.	Concrete

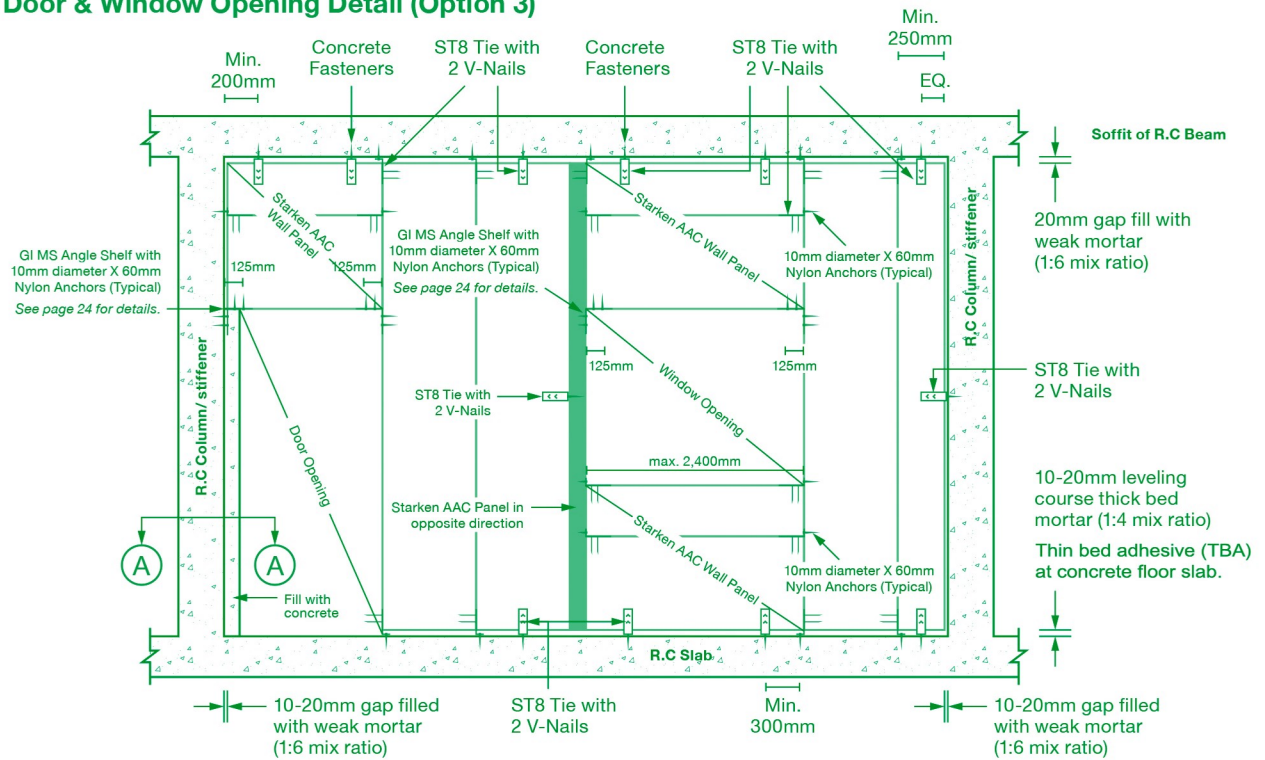


Concrete Footings	Steel Tie with SMA Nut	Concrete Footings
----------------------	---------------------------	----------------------

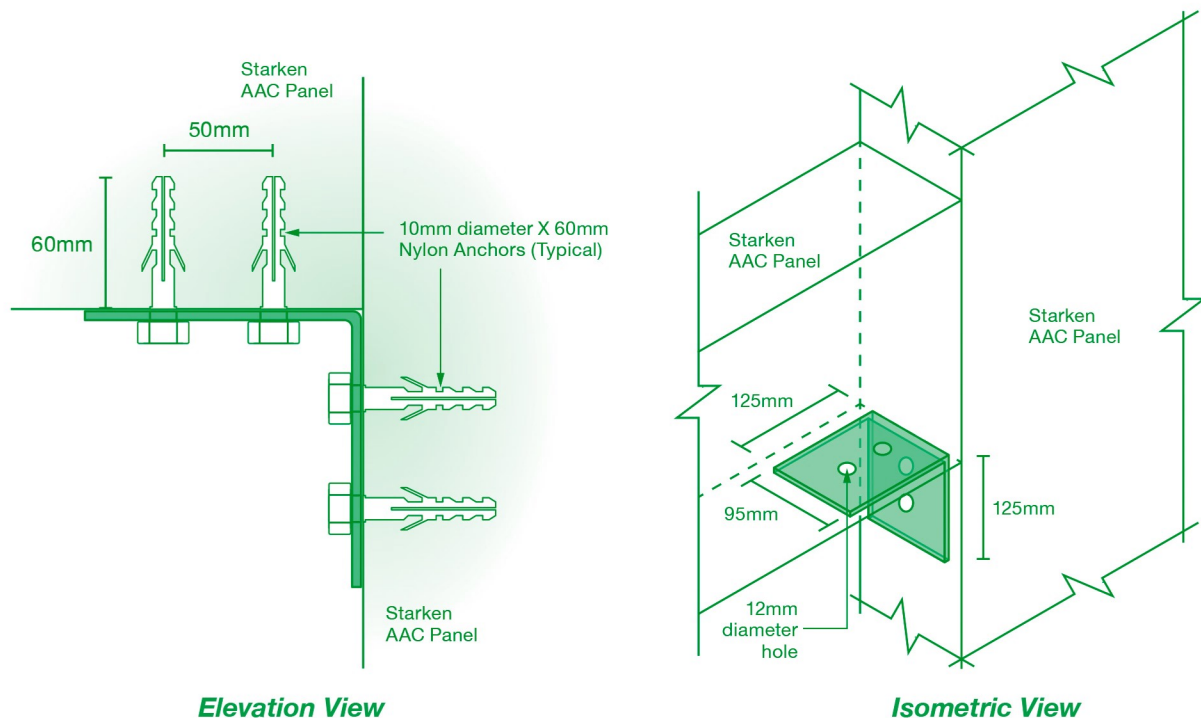


Door & Window Opening

Door & Window Opening Detail (Option 3)

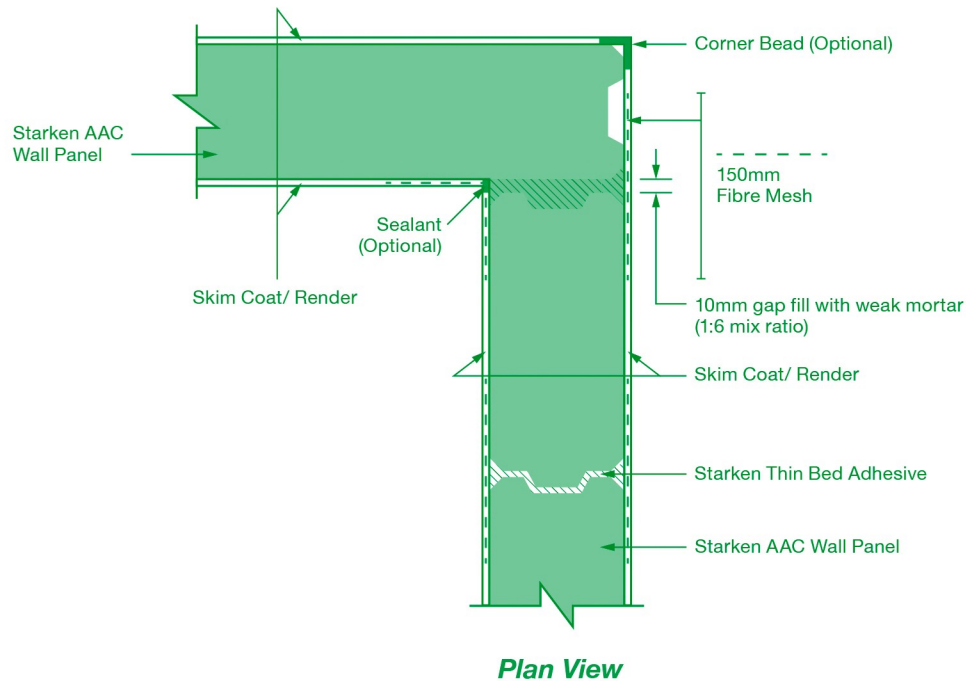


GI MS Angle Shelf Details

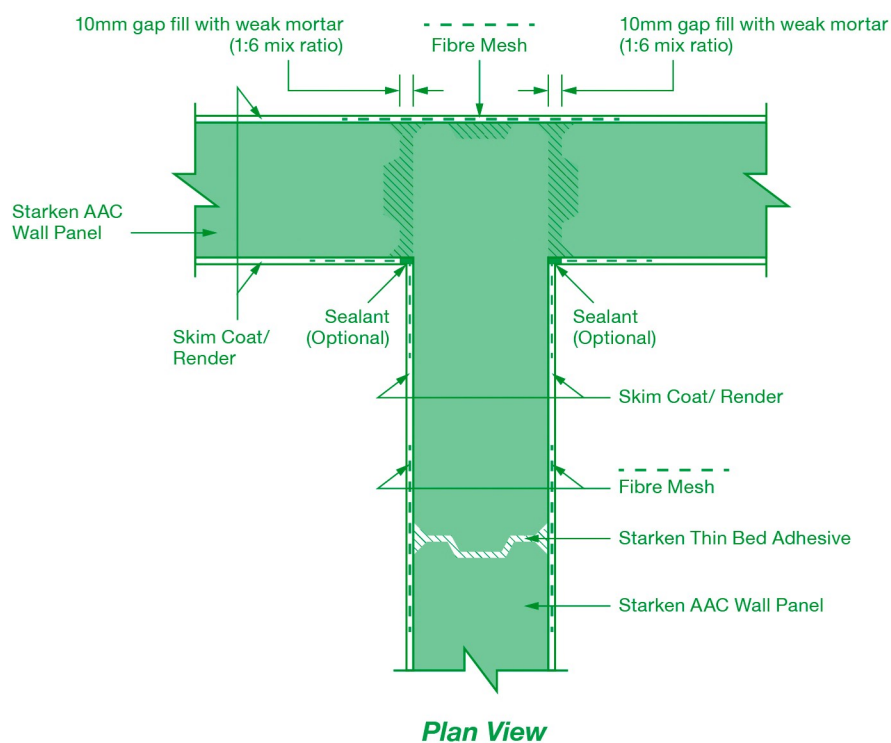


Door & Window Opening

Corner Detail

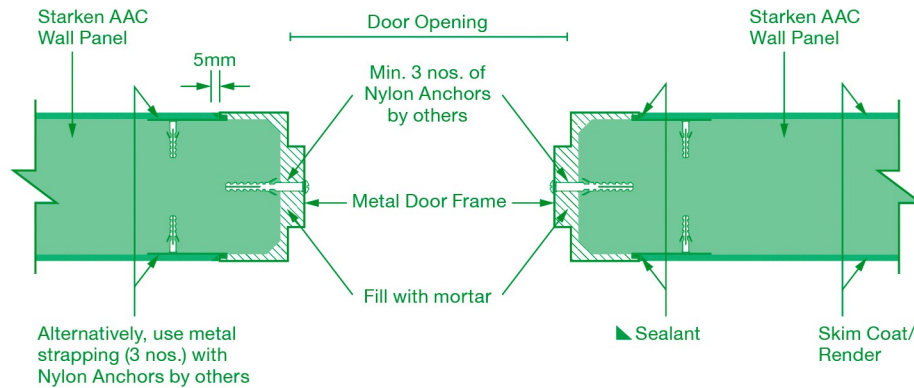


Intersection Detail

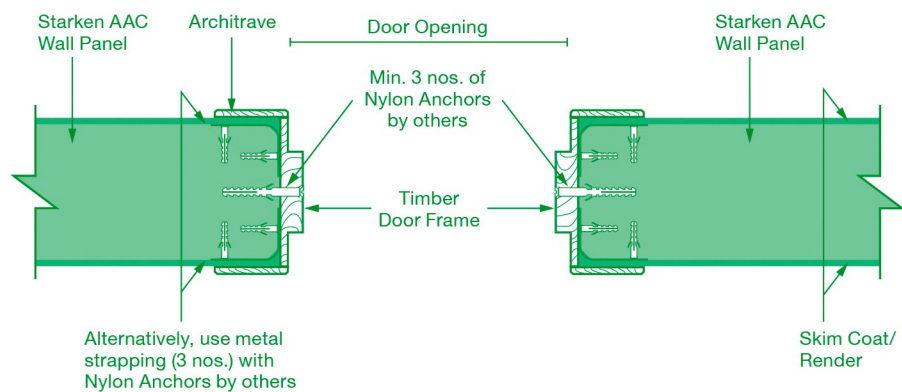


Door & Window Opening

Metal Door Frame Detail

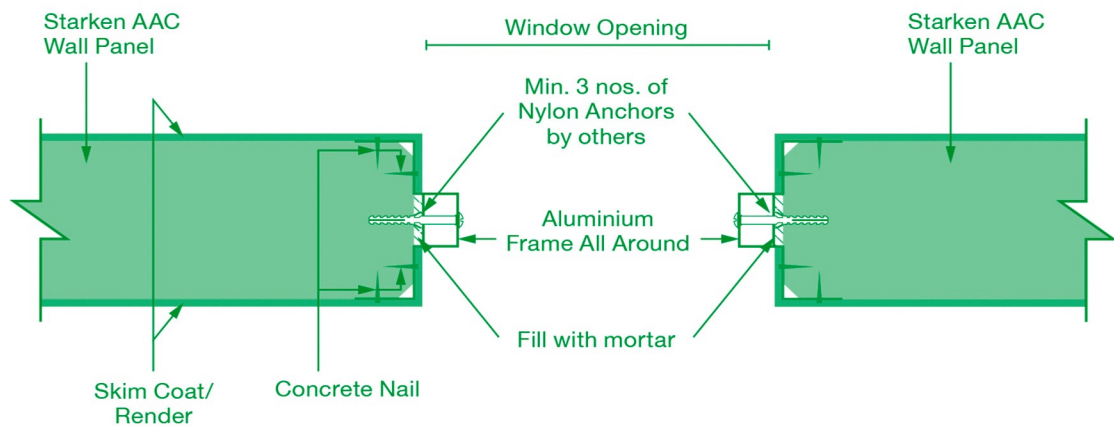


Timber Door Frame Detail

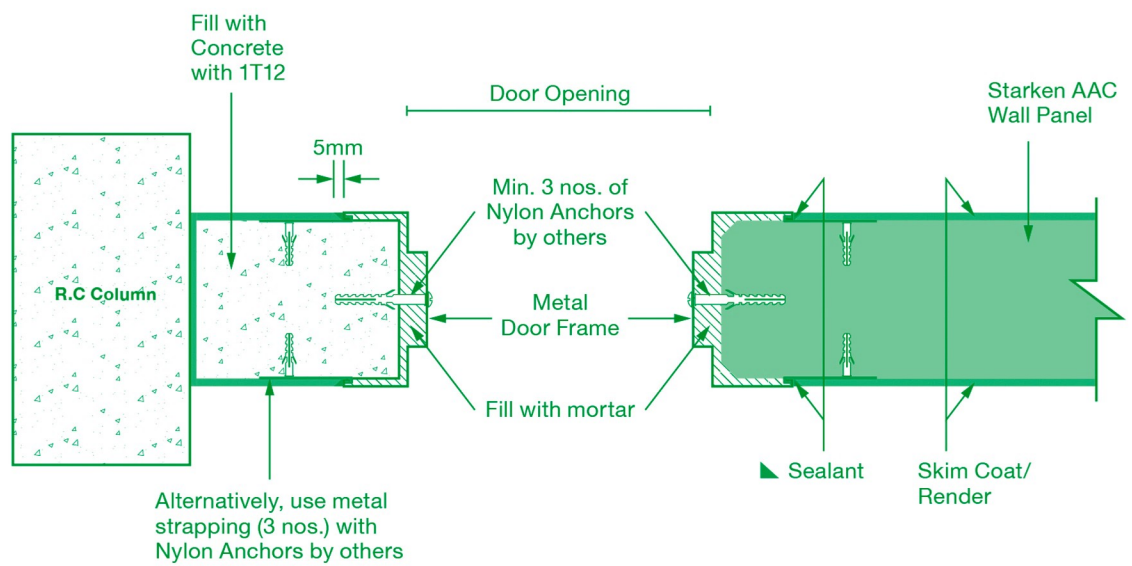


Door & Window Opening

Aluminium Window Frame Detail



Section
A-A

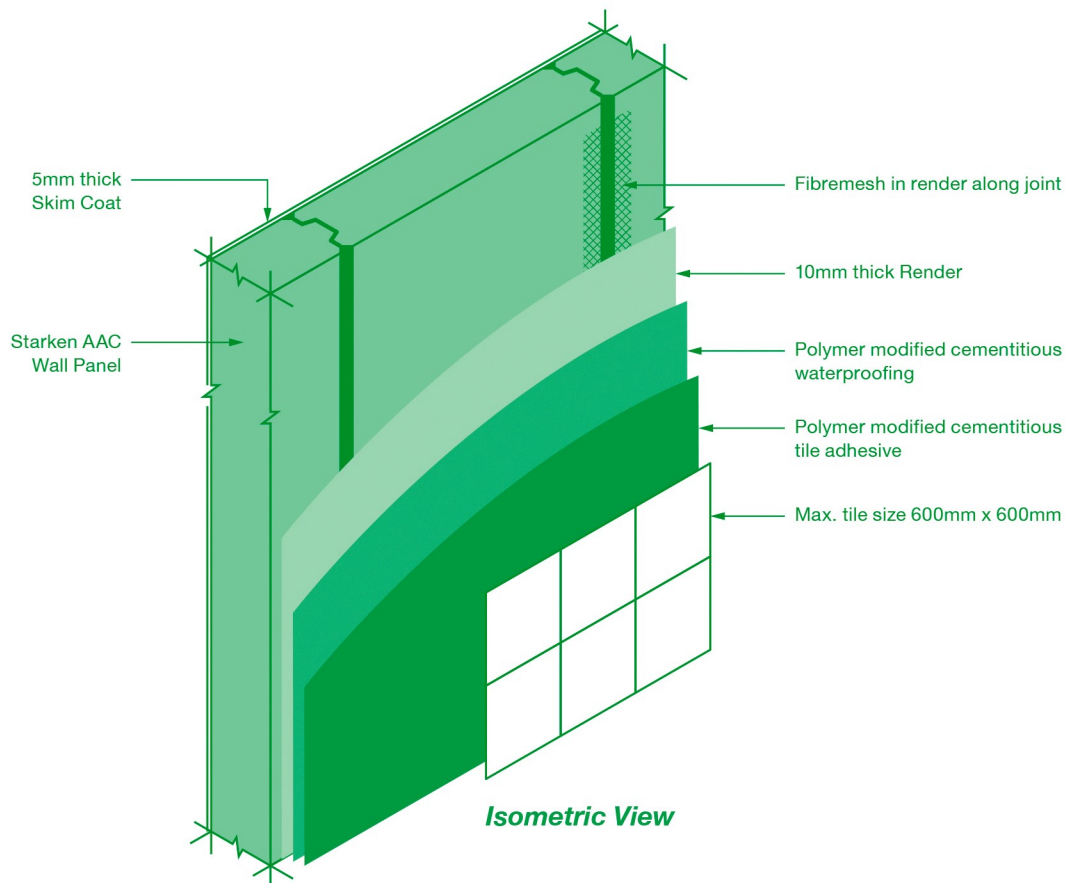
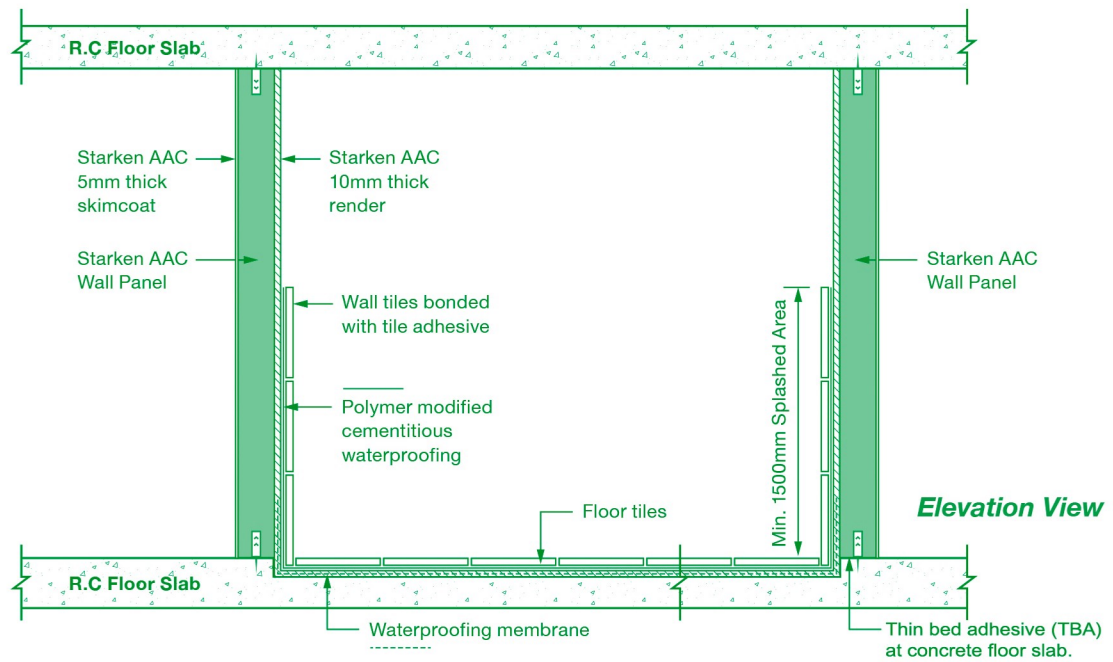


Bathroom Waterproofing

Bathroom Waterproofing

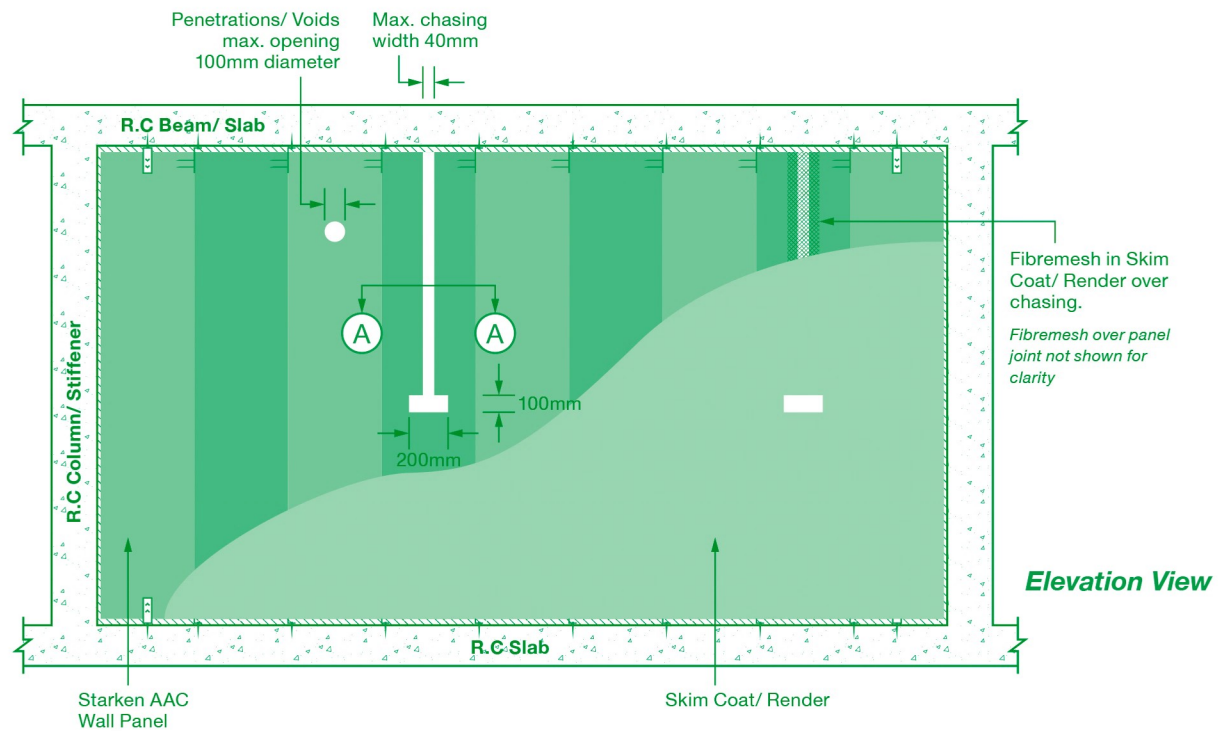
Typical Detail for Wet Area

Note: 1. For waterproofing application, refer to waterproofing manufacturer/ specialist.



Chasing Details

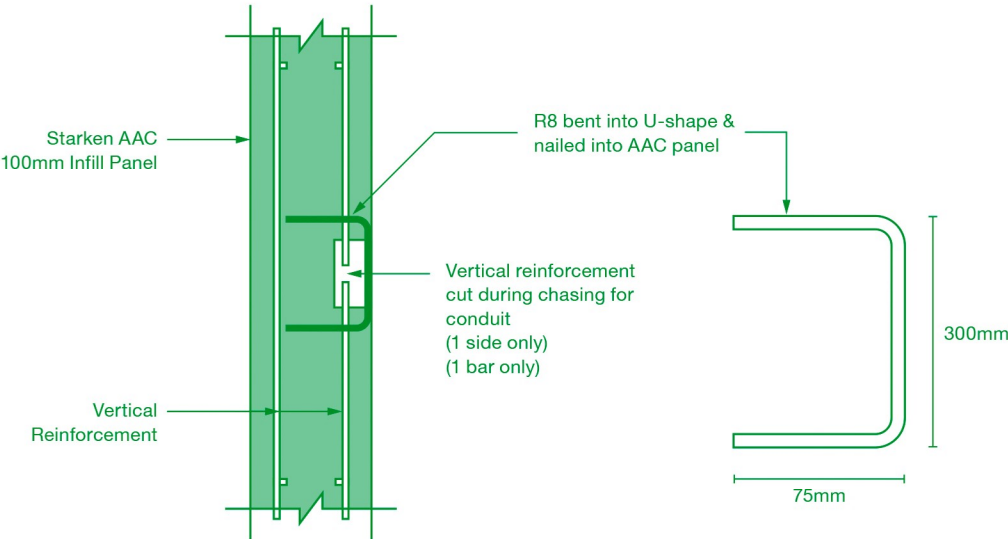
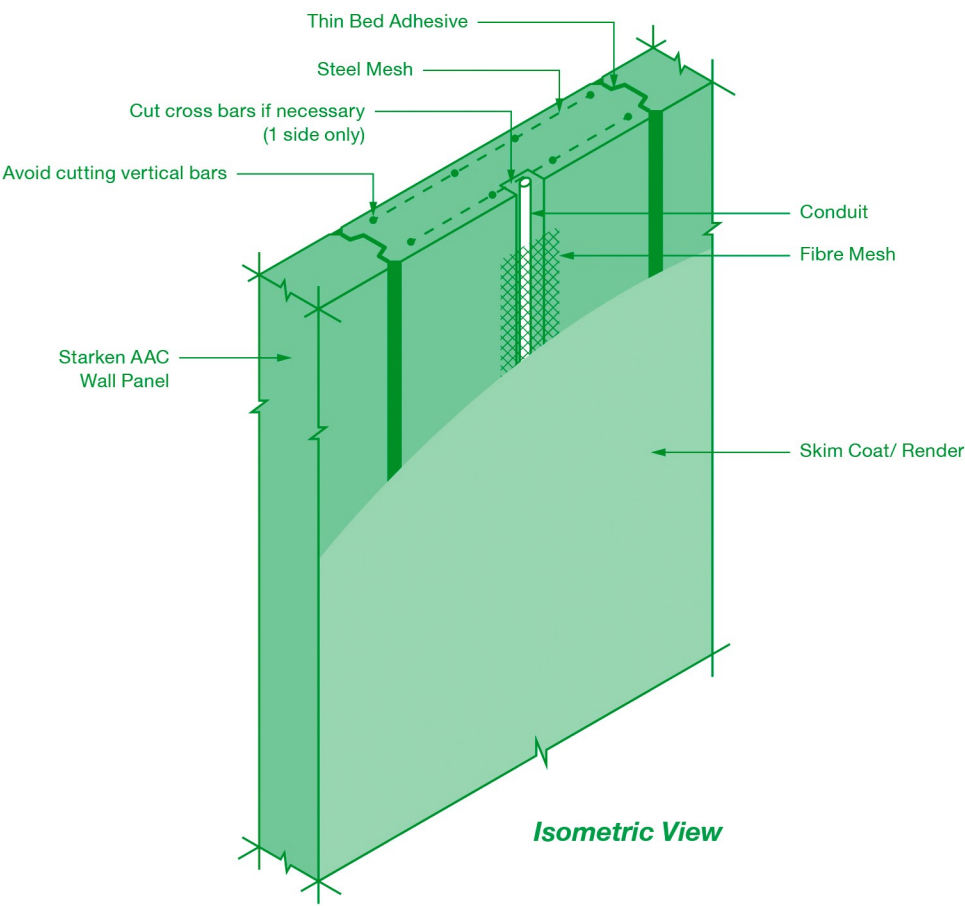
Chasing Details



Chasing Procedure

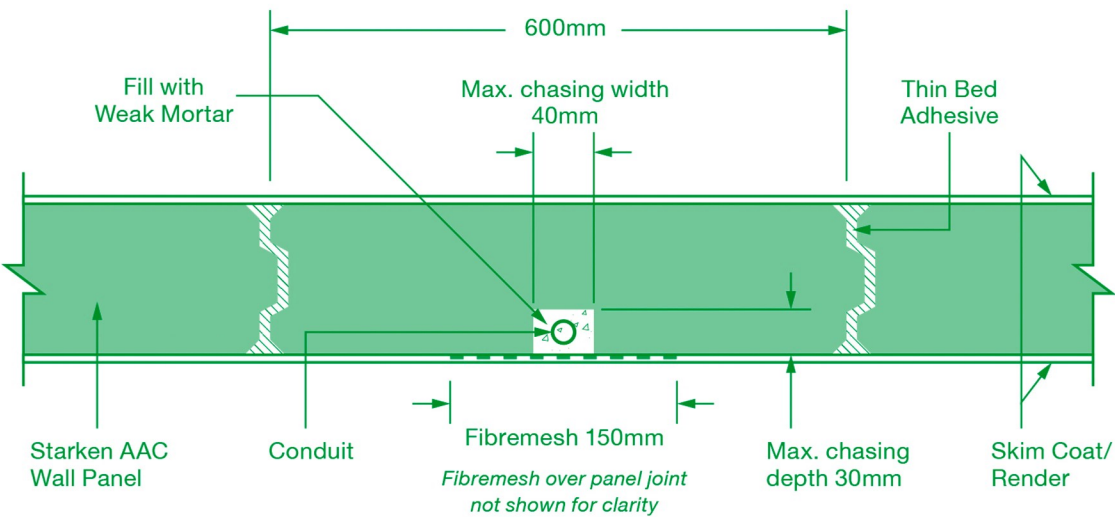
1. Locate the area to be chased.
2. Mark it with several closer lines with a marker.
3. Use a circular saw with a diamond bit cutter to cut the lines.
(Max. depth is 30mm, Max width is 40mm)
(Cut only 1 side of cross bars)
(Avoid cutting vertical bars. If not possible, stitch it back with R8)
4. Use a chisel or screwdriver to easily tap away the cut AAC.
5. Insert the conduits in the chased area.
6. Patch it back with a weak mortar (1:6 mix ratio)
7. Install fibremesh in skim coat/ render over the chased area.
8. For chasing sizes other than specified in this drawing, consult Starken Technical Department.

Chasing Details



Chasing Details

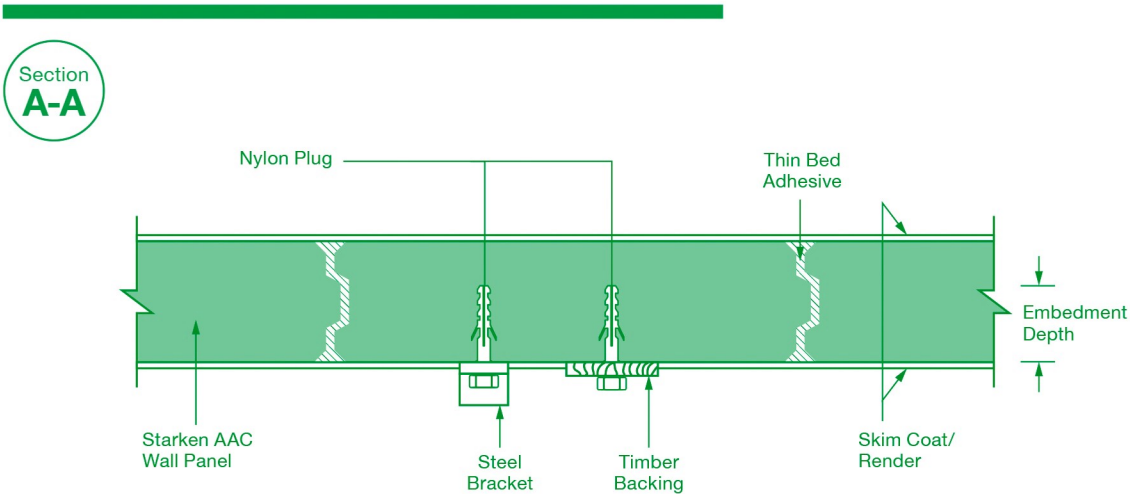
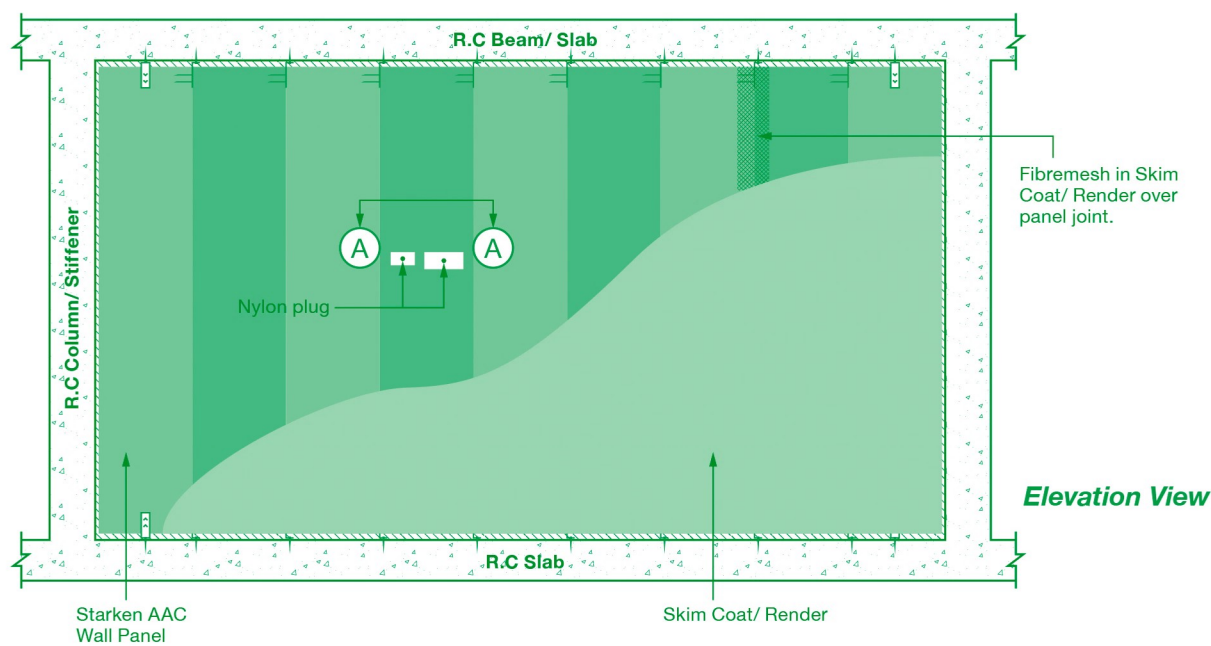
Section
A-A



Fixing Details

Fixing Details

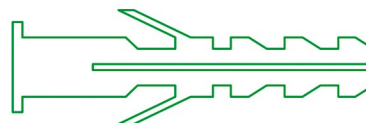
Typical Wall



Fixing Details

Step 1

Use correct type of nylon(Low & Medium weight duty) anchor and size



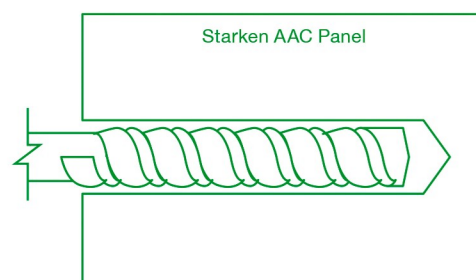
Step 2

Drill hole to correct size and depth
(Allowance shall be made for backing plates or shims).

Use electrical drill with steel drill bit.

Set the drill to standard setting.

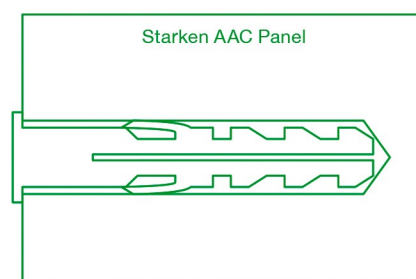
- *Do not use impact setting
- *Do not use concrete drill bit
- *Do not oversize the hole



Step 3

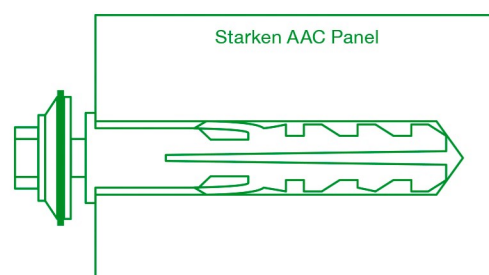
Clean the hole of any loose materials or dusts.

Insert anchor into hole.



Step 4

Position fixture/ equipment then insert steel bolt/
screw and tighten.



For further assistance, contact us at:



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