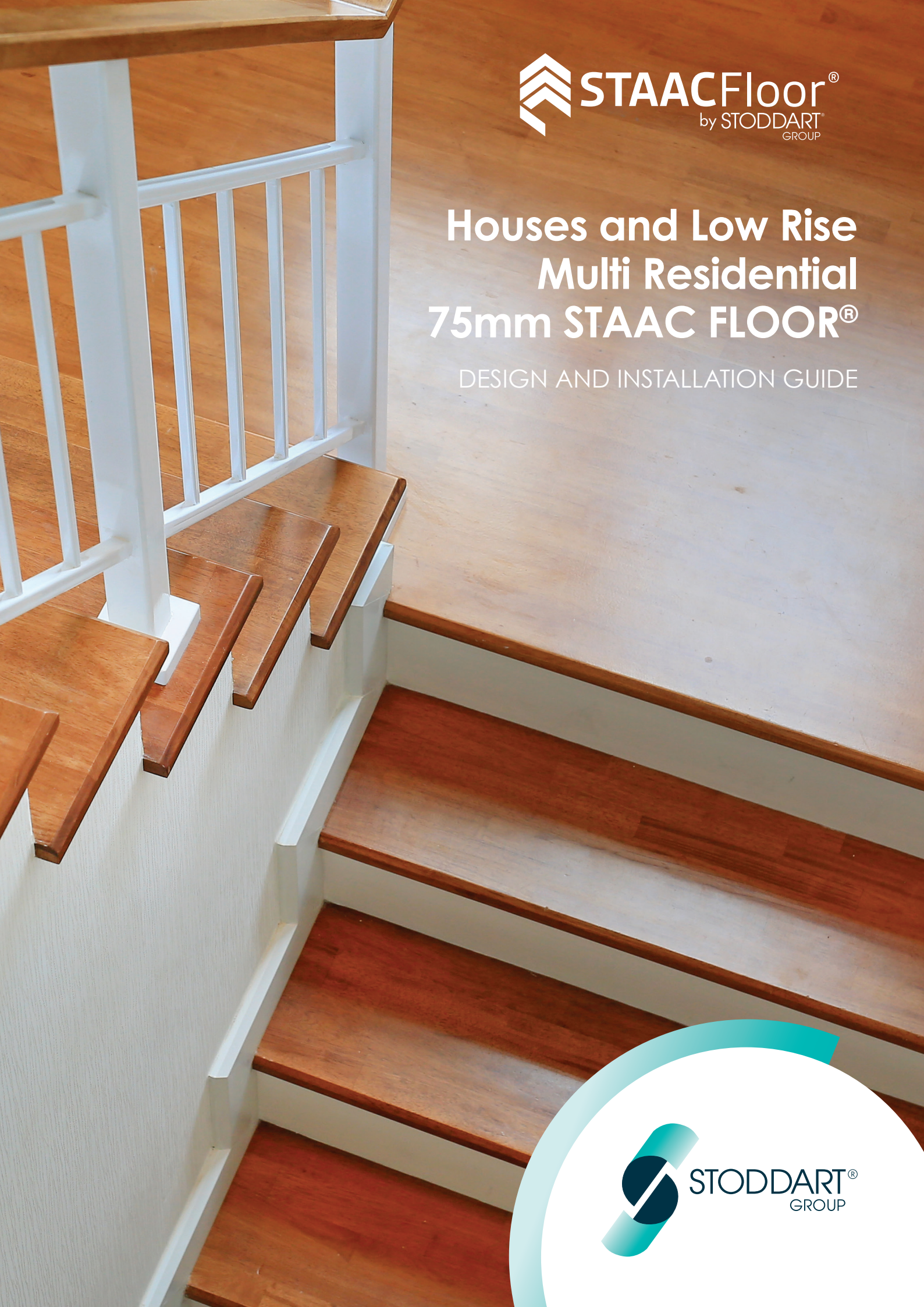


STAACFloor® by STODDART® GROUP

Houses and Low Rise Multi Residential 75mm STAAC FLOOR®

DESIGN AND INSTALLATION GUIDE

STODDART® GROUP

CONTENTS

CodeMark Australia | CMI CERTIFICATION Certificate CM40283

1. INTRODUCTION

The 75mm STAAC FLOOR® system consists of steel reinforced Autoclaved Aerated Concrete panels with a tongue and groove interlocking feature along it's longitudinal edges.

The standard size of the STAAC FLOOR® panel is 1800mm long by 600mm wide, which is designed to suit either 450mm or 600mm joist spacing, making STAAC FLOOR® a robust and versatile system for residential construction.

STAAC FLOOR® is non-combustible and manufactured in Australia. AAC is a well-known building material higly regarded for it's exceptional thermal performance. Distinctively, the high-performance values of the STAAC FLOOR® system mean airborne noise such as footfall from upper floors is minimised and there's no floor squeak, often found with particleboard and timber flooring.

STAAC FLOOR® is the ideal system to construct a fully compliant, high performing and solid floor, that meets the National Construction Codes of Australia (NCC). Section 3 provides a summary of performance conformances of 75mm STAAC FLOOR® for flooring application to NCC Volumes 1 and 2. It is aimed to ease the workload of Building Certifiers by clearly and transparently demonstrating how STAAC FLOOR® satisfies the performance requirements of the NCC through either Deemed-to-Satisfy provisions, performance solutions or the combination of both.

Test reports by NATA accredited laboratories, expert evaluation statements and technical data are referenced in Section 3 and may be provided upon request.

75mm steel reinforced STAAC FLOOR® panel supplied in a length of 1800mm by 600mm wide with a tongue and groove profile.

2. COMPLIANCE WITH THE NATIONAL CONSTRUCTION CODE OF AUSTRALIA (NCC)

All building solutions for use as walls and floors etc. must comply with the regulations outlined in the NCC or other authority.

The NCC is a performance based document, and is available in two volumes which align with two groups of 'Class of Building':

- Volume 1 – Class 2 to Class 9 Buildings; and
- Volume 2 – Class 1 & Class 10 Buildings & Housing Provisions

Each volume presents regulatory performance requirements for different building solutions for various classes of buildings and performance provisions.

These Performance Provisions include: Structure, Fire Resistance, Waterproofing, Sound Transmission & Insulation and Energy Efficiency.

This guide presents tables, charts and information necessary to assist in the design of a floor incorporating STAAC FLOOR® that complies with the Performance Requirements of the NCC. The designer must check the adequacy of the building solution for Performance Requirements outlined by the appropriate authority.

STAAC FLOOR® has been Codemark® certified for non load-bearing floor applications. Table 2.1 and Table 2.2 below summarise the relevant NCC clauses which STAAC FLOOR® complies with. The documentation that provides evidence of suitability may be available upon request.

2.1 COMPLIANCE WITH AS 5146 REINFORCED AUTOCLAVED AERATED CONCRETE

STAAC FLOOR® products conform with the Australian Standard for Reinforced Autoclaved Aerated Concrete (AAC), AS 5146. The set of AS 5146 standards comprise of 3 parts:

- AS 5146 Part 1 – Structures
- AS 5146 Part 2 – Design
- AS 5146 Part 3 – Construction

These Standards were referenced in the NCC, making compliant AAC products Deemed-to-Satisfy (DTS) building materials. AS 5146.3:2018 – Construction, Section 6 contains details for reinforced AAC floors in houses, low-rise multi-residential and commercial buildings considered a DTS building system.

This provides the endorsement and confidence to regulatory and building certification bodies that the STAAC FLOOR® is a NCC compliant construction system.

2.2 SUMMARY OF COMPLIANCE TO NCC FOR 75MM STAAC FLOOR®

Table 2.1 Summary of Compliance to NCC Volume 1

NCC 2022 VOL. 1			
	CLAUSE	**APPLICATION**	**EVIDENCE OF SUITABILITY**
PERFORMANCE REQUIREMENT(S)	F7P1	Sound Transmission - Floors	A5G3(1)(e). Reports from accredited Professional Engineer.
DEEMED-TO-SATISFY PROVISION(S)	S1C3	Fire-Resisting Construction where an FRL of no more than 90/90/90 (from a fire source above the floor) is required – limited to floors	A5G3(1)(d) Reports from accredited test laboratories.
	J4D7	Energy Efficiency – Floors (Refer A3)	A5G3(1)(e) Reports from Professional Engineers.

Table 2.2 Summary of Compliance to NCC Volume 2

NCC 2022 VOL. 2			
	CLAUSE	**APPLICATION**	**EVIDENCE OF SUITABILITY**
PERFORMANCE REQUIREMENT(S)	Not applicable		
DEEMED-TO-SATISFY PROVISION(S)	S1C3	Fire-Resisting Construction where an FRL of no more than 90/90/90 (from a fire source above the floor) is required – limited to floors	A5G3(1)(d) Reports from accredited test laboratories.
	9.4.2(1)(b)	Separating Floors where an FRL not less than 30/30/30 when tested from the underside is required	A5G3(1)(d) Reports from accredited test laboratories.
	13.2.6	Energy efficiency – Floors	A5G3(1)(e) Reports from Professional Engineers.

2.3 INTERTENANCY FLOORS

Floors constructed between separate tenancies are required to achieve a minimum acoustic and fire performance as detailed below.

2.4 ACOUSTIC PERFORMANCE

For Class 2 and 3 Buildings with floors separating sole occupancies the following minimum acoustic requirements are described in the NCC in part F7:

- Airborne Sound Transmission: $R_w + C_{tr} \geq 50$
- Impact Sound Transmission: $L_{n,w} \leq 62$

Or, measured in-situ performance of:

- Airborne Sound Transmission: $D_{nt,w} + C_{tr} \geq 45$
- Impact Sound Transmission: $L_{nt,w} \leq 62$

2.5 FIRE PERFORMANCE

For Class 2 and 3 Buildings with floors separating sole occupancies the following fire requirements are described in the NCC:

- FRL: 90/90/90 (Structural Adequacy/ Integrity/Insulation)

3. MATERIAL PROPERTIES

Material Properties are determined in accordance with AS 5146 Parts 1 & 2 - Reinforced Autoclaved Aerated Concrete.

3.1 PHYSICAL PROPERTIES

- **Thickness:** 75mm, tolerance: ±1.5mm
- **Standard Width:** 600mm, tolerance: ±1.5mm
- **Standard Length:** 1800mm, tolerance: ±5mm
- **Edge Straightness Deviation (max.)**: ±1.5mm
- **Reinforcement:** 4 x 5mm diameter steel mesh
- **Nominal Dry Density** = 510 kg/m^3
- **Average working density** = 689 kg/m^3 at 35% moisture content
- **Average service life density** = 561 kg/m^3 at 10% moisture content

3.2 STRENGTH PROPERTIES

- **Characteristic Compressive Strength of AAC, f 'm** = 2.8 MPa
- **Average Compressive Strength of AAC** = 3.2 MPa
- **Characteristic Modulus of Rupture, f 'ut** = 0.6 MPa

3.3 ACOUSTIC PROPERTIES

- **Panel only with no plasterboard or other lining:** Rw = 36dB, Rw+Ctr = 33dB.
  (State Acoustic Logic Report ATF-676)

3.4 THERMAL PROPERTIES

- **R-Value of 75mm STAAC FLOOR® panel with no plasterboard or other lining** = 0.375m^2.K/W
  (14% moisture content)

3.5 FIRE HAZARD INDICES

AAC products are categorised as material group No. 1 in accordance to Specification C1.10 of NCC 2019 Vol. 1 and the following early fire hazard indices, determined in accordance with AS1530.3:1999.

- **Ignitability Index:** 0
- **Spread of Flame Index:** 0
- **Heat Development Index:** 0
- **Smoke Development Index:** 0-1

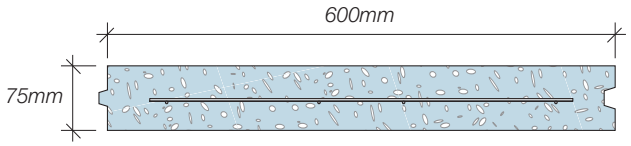
4. SYSTEM COMPONENTS

4.1 STAAC FLOOR PANEL

The STAAC FLOOR® panel is available in a stock length of 1800mm x 600mm width, with a mass of up to 56kg/ panel. Where necessary, panels can be cut on-site using a circular saw with diamond tipped cutting blade. The minimum recommended width of a cut panel is 270mm width and 900mm in length.

The panels are screw fixed and bonded to all floor joists except at panel butt joints. At butt joints, panels are fixed using two beads of adhesive, and the screws may be omitted. For further information on fixing STAAC FLOOR® panels, please refer to relevant construction details outlined in this guide.

Figure 4.1 Typical cross section of STAAC FLOOR® panel



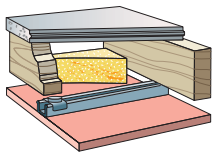
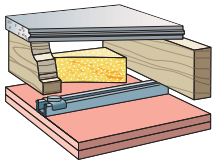
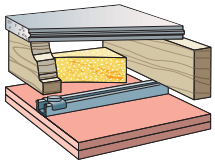
4.2 FLOOR COVERINGS

A range of floor coverings can be installed over the STAAC FLOOR® panels, such as direct stick tiles, carpet and underlay, topping slab and tiles, timber (floating or on battens) and vinyl over masonite.

4.3 CEILING SYSTEMS

The underside of STAAC FLOOR® can be lined with proprietary ceiling systems. These ceiling systems can consist of combinations of components, such as furring channel, clips, suspended steel framing, insulation and plasterboard. Refer to manufacturer's publication for guidance on ceiling systems that will suit your needs. Some common ceiling systems integrating STAAC FLOOR® are detailed in the table below:

Table 4.1 Ceiling Systems

CEILING SYSTEM DESCRIPTION	COMPONENTS
	▶ Screw fix furring channel fixing clip to every joist at 600mm maximum centres. ▶ Clip fixed furring channel at 600mm maximum centres, secure into fixing clip. ▶ 90mm R2.0 glasswool batt insulation. ▶ 1 layer x 13mm plasterboard fixed to furring channel.
	▶ Screw fix furring channel fixing clip to every joist at 600mm maximum centres. ▶ Clip fixed furring Channel at 600mm maximum centres, secure into fixing clip. ▶ 90mm R2.0 glasswool batt insulation. ▶ 2 layer x 13mm fire rated plasterboard fixed to furring channel.
	▶ Screw fix furring channel fixing clip to every joist at 600mm maximum centres. ▶ Clip fixed furring Channel at 600mm maximum centres, secure into fixing clip. ▶ 90mm R2.0 glasswool batt insulation. ▶ 2 layer x 16mm fire rated plasterboard fixed to furring channel.

NOTE: Refer to ceiling plasterboard system manufacturer's publication for fixing and component details

4.4 TIMBER & STEEL SUPPORT SYSTEMS

Timber or steel floor framing can be used to support the STAAC FLOOR® panels. The allowable spacing of the joists is 450mm or 600mm only. The joists, bearers and other supports must be sized in accordance with the framing manufacturer's recommendations. Where steel joist framing is used it must be ensured that the STAAC FLOOR® panels have full contact with the bearing surface of each steel joist.

NOTE: The designer must allow at least 51kg/m2 for the self weight of the STAAC FLOOR® panel. A minimum joist flange width of 45mm is required.

4.5 CSR ADHESIVE

CSR Adhesive (supplied in 20kg bags) is used for gluing the panels together at all joints. Typically, panel joints are 2-3mm thick. Sufficient pressure is to be applied to the joint to ensure full coverage of adhesive in the joint. Adhesive must be mixed as per instruction shown on the bag / manufacturer's literature.

4.6 CONSTRUCTION ADHESIVE

A 5mm (minimum) bead of Fuller Max Bond construction adhesive is applied to the top of the joists. Where panel ends butt together over a common joist, two beads of adhesive must be applied. Ensure the surface is free of coatings and loose material that may inhibit bond.

4.7 FASTENERS

The correct sized fasteners for the construction of the floor systems must always be used. Fasteners must be installed as per construction details in Section 14.

FIXING STAAC FLOOR TO:	FASTENER
Timber joist	14-10 x 100mm MP Bugle Head type 17 Screws or equivalent.
Steel joist bmt 1.2 to 1.9mm	14-10 x 95mm Hex Head Self-tapping Screws or equivalent (no EDPM seal)

NOTE: Equivalent screw must have equal or bigger gauge, equivalent TPI and equal or appropriately longer length.

4.8 CAULKING

The STAAC FLOOR® system requires that all gaps at openings, penetrations and control joints be caulked to provide an airtight floor system that maintains acoustic, thermal, vermin and fire resistance performance. All gaps must be carefully and completely filled with an appropriate flexible polyurethane sealant, installed in accordance with the sealant manufacturer's specifications.

4.9 PATCH

Minor chips or damage to panels are to be repaired using Patch, which is available in 10kg bags.

4.10 ANTI-CORROSION PROTECTION PAINT

Reinforcement exposed when panels are cut must be coated with a liberal application of anti-corrosion protection paint.

4.11 TOOLS & EQUIPMENT

The basic tools required to install STAAC FLOOR® System are:

- **Stirrer** – fitted to an electric drill, the stirrer is used to mix the mortar / adhesive / render in a mixing bucket.
- **Notched trowel**
- **Sand float** – used to remove excess adhesive and smooth joints between panels.
- **Levelling plane**
- **Power drill** – with clutch control
- **Power saw with diamond tipped cutting blades**
- **Dust extraction system** – must comply with class M or H requirement of AS 60335.2.69
- **Power screw gun**
- **Sockets for screws**
- **Personal Protective Equipment (PPE)** – such as goggles, ear muffs/plugs and fit tested face mask are a mandatory requirement when cutting the STAAC FLOOR® panels.

5. INSTALLATION GUIDELINES

STAGE	INSTALLATION STEPS	DIAGRAM
1	**FLOOR FRAMING PREPARATION** ▶ Check floor framing is complete and within level tolerances. ▶ Provide set-out chalk lines, as required. ▶ Provide temporary installation platform where necessary. Ensure floor framing has adequate strength to support bundles of STAAC FLOOR® panels. ▶ Position panel bundles on the floor framing.	
2	**PANEL INSTALLATION** ▶ Panels are to be installed in a stretcher bond pattern, with a minimum overlap of 1 joist space and not less than 450mm. ▶ Use lifting handles or trolley to move the panels to installation area. Apply a 5mm min. bead of construction adhesive to top of joists in accordance with manufacturer's instructions, and apply CSR Adhesive to appropriate panel edges. Panels must be installed with minimal horizontal sliding on the joists to ensure a good bond. Force the tongue and groove joint closed as the panel is rolled and lowered onto the joists. Ensure all joints are tight and that adhesive makes full contact along all joints. ▶ Screw fix panel to the joists as required. ▶ Repeat the above process and remove excess adhesive.	
3	**PENETRATION DETAILING** ▶ Install blocking to support panels with penetrations or corner notching. Refer to Section 14 for relevant blocking details.	
4	**FLOOR FINISHES** ▶ Sweep the floor surface to remove debris and loose particles. ▶ Fill joints and screw holes with adhesive. ▶ Ensure perimeter is not chipped. Install floor covering in accordance with manufacturer's specifications. **NOTE:** Ensure panel moisture content is within limits outlined by the floor covering manufacturer.	

6. DESIGN RESPONSIBILITIES

The STAAC FLOOR® System has been developed based upon numerous tests and assessments by design consultants.

Tests were conducted at NATA accredited testing laboratories. Reports were issued to document the performance of the floor in accordance with the relevant Australian Standards including AS 5146.1 & .2 as referenced in the NCC 2022. Consultants were engaged to provide their professional opinions based on the information in these reports (estimates of laboratory performance). The performance levels documented in this guide are either what is reported in a test or the documented opinion of consultants.

Performance in projects is typically the responsibility of design consultants, builders and certifiers. Any party using the information contained in this guide or supplied by Stoddart Group in the course of a project must satisfy themselves that it is true, current and appropriate for the intended application, consequently accepting responsibility for its use. It is the responsibility of the architectural designer and engineering parties to ensure that the details in this design guide are appropriate for the intended application. The recommendations in this guide are formulated along the lines of good building practice, but are not intended to be an exhaustive statement of all relevant data.

7. FLOOR PERFORMANCE FOR COMMON FLOOR COVERS

Table 7.1 Floor Performance

FLOOR COVER	APPLICATION	ACOUSTIC			THERMAL	
		Rw	Rw+Ctr	Lnw	R-value up	R-value down
CARPET	Ground Floor	37	33	45	1.46 (0.87)	1.58 (0.92)
	2nd Storey	59	53	30	3.18	3.47
VINYL SHEET WITH MASONITE	Ground Floor	38	34	76	1.18 (0.59)	1.3 (0.64)
	2nd Storey Floor	60	53	59	2.9	3.19
TIMBER ON BATTENS	Ground Floor	37	33	80	1.43 (0.84)	1.59 (0.93)
	2nd Storey Floor	59	53	59	3.16	3.49
TIMBER FLOATING FLOOR	Ground Floor	37	33	77	1.33 (0.74)	1.45 (0.79)
	2nd Storey Floor	60	53	58	3.05	3.34
CERAMIC TILES	Ground Floor	38	34	82	1.19 (0.6)	1.31 (0.65)
	2nd Storey Floor	58	52	69/59**	2.91	3.2

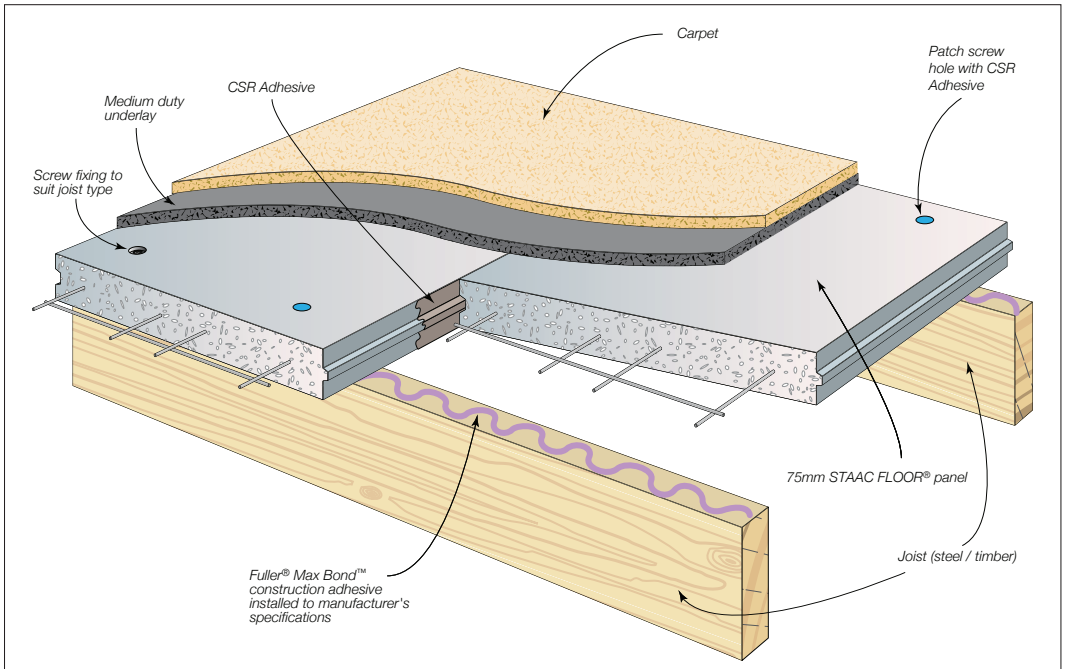
NOTES:

1. FRL: 90/90/90 for ground floor with fire from above and 90/90/90 for 2nd storey with fire from below. Minimum 2 layers of 16mm fire rated ceiling plasterboards to achieve 90mins FRL.
2. Ceiling insulation: 90mm R2.0 glasswool batt.
3. R-Value in ( ) is for unenclosed ground floor.
4. See ceiling specification to achieve the required performance values.
5. Combined floor and ceiling system thermal values are opinions determined for internal conditions above and internal conditions below.
6. Airflow direction - Up = Summer, Down = Winter.
7. Where steel framed joists are used, values for 'R-value up' and 'R-value down' should be reduced by 10% e.g. R-value of 3.00 results in R-value of 2.70 after the 10% reduction.
8. For detailed information on ceiling systems, please refer to manufacturer's specification.
9. ** with min. 4.5mm rubber underlay.

7.1 CARPET

Recommended for: Rigid, lightweight floor system with high impact sound insulation.

Figure 7.1 STAAC FLOOR® system with carpet

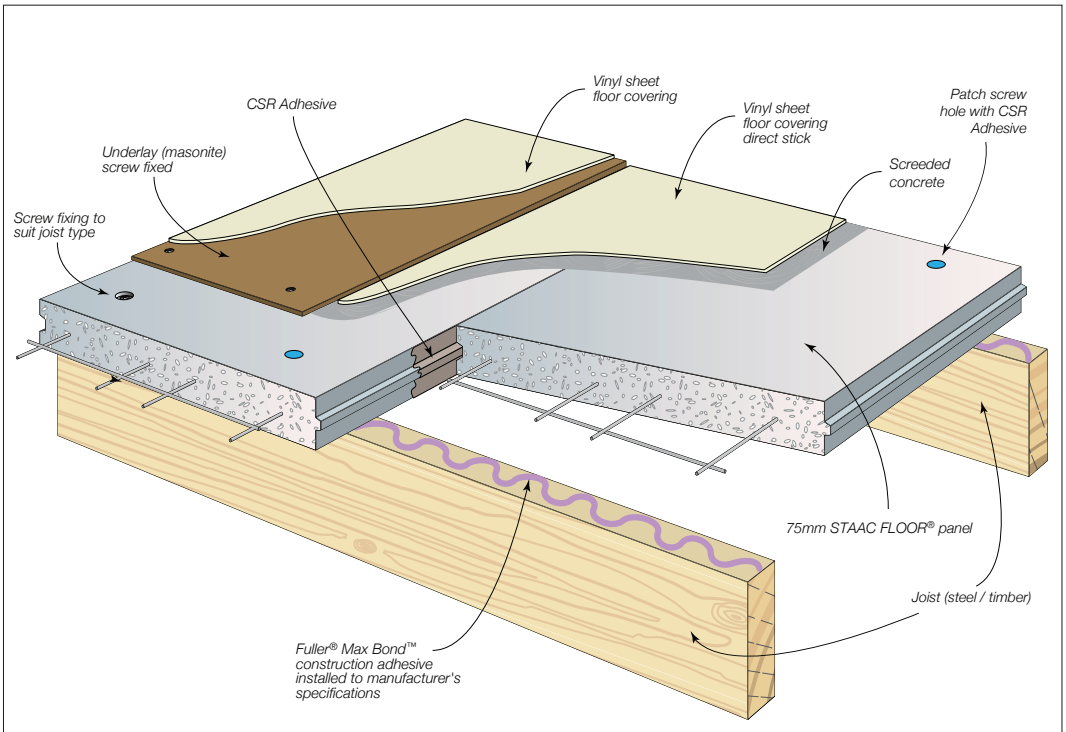


NOTE: Patching of recesses at fixings or localised chipping may be required prior to installation of floor coverings.

7.2 VINYL SHEET WITH MASONITE

Recommended for: Rigid, lightweight floor system with good thermal insulation and vinyl floor covering.

Figure 7.2 STAAC FLOOR® system with vinyl sheet floor covering

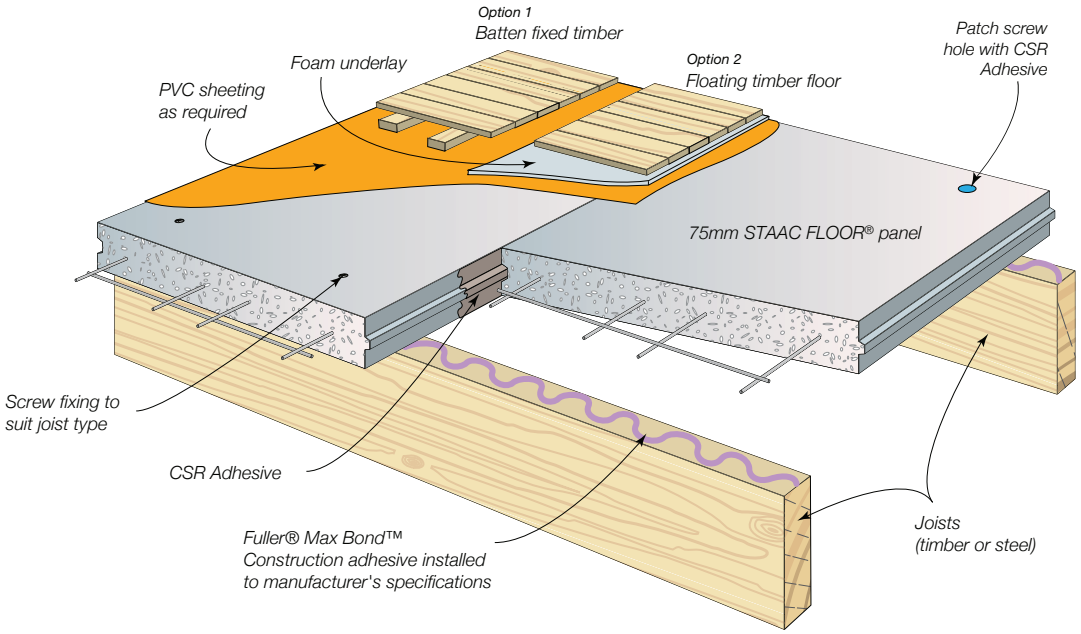


NOTE: Patching of recesses at fixings or localised chipping may be required prior to installation of floor coverings.

7.3 TIMBER / ENGINEERED TIMBER FLOORS

Recommended for: Rigid, lightweight floor system with excellent thermal insulation and decorative timber flooring.

Figure 7.3 STAAC FLOOR® system with timber flooring

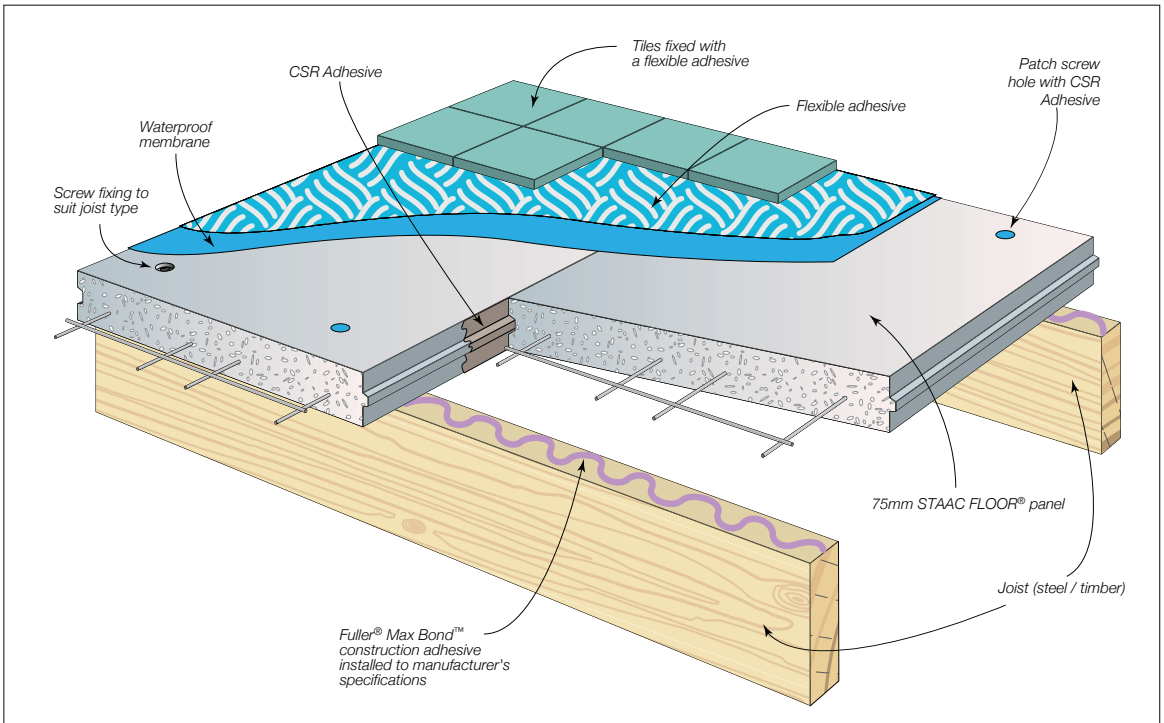


NOTE: Patching of recesses at fixings or localised chipping may be required prior to installation of floor coverings.

7.4 CERAMIC TILES

Recommended for: Rigid, lightweight floor system for wet areas while maintaining a high level of thermal insulation.

Figure 7.4 STAAC FLOOR® system with 8mm ceramic tiles



NOTE: Patching of recesses at fixings or localised chipping may be required prior to installation of floor coverings.

8. STRUCTURAL DESIGN

STAAC FLOOR® systems can support a maximum uniformly distributed load of 5kPa, or concentrated (point) load of 1.8kN over a load area of 350mm2 (with joists at 450mm or 600mm centres only) or 3.9kN over a load area of 10,000mm2. For loads outside this range, contact Stoddart Cladding team for design advice.

The designer should specify the magnitude of the gaps between the STAAC FLOOR® panel and structure. This gap will allow movement to release any confining stresses due to movement of the supporting structure.

9. FIRE PERFORMANCE DESIGN

Australian building regulations express the fire performance of a floor/ceiling with the rating system called the 'Fire Resistance Level' (FRL).

The FRL rating of the systems detailed in this guide are opinions issued by the CSIRO based on test results.

Testing has been conducted in accordance with the Australian Standard AS1530: Part 4 'Fire Resistance Tests of Elements of Building Construction'.

The FRL rating consists of three performance criteria, structural adequacy / integrity / insulation. The STAAC FLOOR® system achieves fire resistance of 90/90/90 minutes from a fire source above the floor. For fire resistance to a fire source below the floor a fire rated ceiling system must be installed.

10. ACOUSTIC DESIGN

Floor systems, consisting of STAAC FLOOR® and other products, have been laboratory tested to establish their airborne and impact sound insulation characteristics. A laboratory test involves the installation of a system between two massive concrete rooms, which are normally isolated from one another, so that only the direct transmission is via the system.

10.1 TESTING AND ASSESSMENT

All test reports quoted in this guide have been issued by CSIRO or other NATA Registered Laboratories. Testing has been conducted in accordance with the relevant Australian Standard at the time of testing. The acoustic values determined by PKA Acoustic Consulting are predicted utilising laboratory test data, in-situ test data, computer modelling, and expert judgement in building acoustics. The accuracy of predictions compared to laboratory test data is within expected tolerance of ±2db.

10.2 PERFORMANCE - LABORATORY VS FIELD

When selecting the appropriate STAAC FLOOR® system, the designer or specifier must be aware that the laboratory Rw values are always better than the field measured values (Dntw). This is due to the field conditions, such as flanking paths, air leaks, floor frame construction type and stiffness, etc. which can be introduced by careless building design or construction. To avoid significant reductions in acoustic performance, published construction details must be followed completely. Independent, specific advice and confirmation should be sought for specific projects where the presence of flanking paths or any other acoustic effect may affect field performance. Typically, the field performance of a system will be 2 to 5 Rw units lower than the laboratory performance. An allowance should be made for this by the acoustic consultant during the selection of the floor system. Placement of insulation in the ceiling cavity enhances the sound insulation performance of a floor/ceiling system. A carpet/underlay floor covering incorporated with STAAC FLOOR® will provide the best impact sound resistance. For multi-tenancy buildings, providing a control joint at the party wall will break a flanking path and maintain acoustic amenity. Refer to ceiling system manufacturer's installation detail for optimal acoustic performance.

11. THERMAL PERFORMANCE

Thermal performance is concerned with the energy retention or loss characteristics of a building system.

One of the primary design objectives in planning a cost-effective building is to provide a comfortable living/working environment for the building's inhabitants. Exploiting the inherent thermal qualities of AAC enables the designer to achieve this objective.

11.1 R-VALUE RATING

The energy demand can be minimised by controlling the heat transfer, which is heat flowing from a hot region to a colder region, through a building system. The thermal resistance of a building system is expressed as the R-Value. The R-Value of the system is the sum of the R-Values of the individual components.

11.2 THERMAL MASS & INSULATION PROPERTY

Several comparative studies have been conducted to investigate the benefits of incorporating AAC products in place of conventional systems or thermal mass. Typically, AAC floors provide a comfortable living environment with lower heating and cooling requirements. Smaller space is required for mechanical equipment, especially in regions of mainly cold weather.

The benefit of thermal mass is that it tends to buffer the effects of external temperature swings. Thermal mass coupled with the insulation quality of AAC, which impedes the flow of heat through the floor, gives an excellent barrier to variable outside elements.

11.3 THERMAL INTEGRITY

Poor thermal integrity, due to poor construction practices can significantly affect comfort, as poor sealing and gaps allow air to infiltrate as drafts. The inherent construction tolerances of STAAC FLOOR® provides a floor with a low infiltration rate and good thermal integrity.

12. DURABILITY

Where STAAC FLOOR® is installed in a multi-residential/ commercial applications, the STAAC FLOOR® panels must be suitably protected against construction traffic during construction to maintain the long-term durability and integrity of the panels.

It is the responsibility of the builder to provide and maintain such protective coverings to the panels until such time that the finished floor coverings are installed.

Using STAAC FLOOR® for commercial floors requires a different set of criteria. Please consult Stoddart Cladding office for advise on durability and protection of the STAAC FLOOR® panels during construction.

Stoddart Group does not recommend AAC Panel be exposed to the elements for more than 3 months to avoid deterioration of the panels and system components, else a membrane coating or 2 coats of undiluted primer is recommended to minimize deterioration to the STAAC Floor.

13. DESIGN CONSIDERATIONS

13.1 SUPPORT FRAMING

Support framing systems including steel, composite steel/timber joists, laminated timber joists, and trussed plywood web joists may be used without reducing the system FRL rating for a fire source 'from above'. The design of joists must allow for temperature effects. Alternative support framing systems may affect acoustic performance, and advice from an acoustic consultant is recommended.

13.2 PENETRATION RESTRICTIONS

Where penetrations are required to accommodate services, such as waste pipe-work, water pipe-work, and air conditioning ductwork, etc. STAAC FLOOR® can accommodate an 80mm maximum circular penetration without a reduction in structural performance. Multiple penetrations in the same panel are to be in a straight line, parallel to the long edge of the panel. For large or clustered multiple penetrations, additional joists or bridging should be included for support of the panel in this area. Refer to the 'Penetration & Notching Details' section of this guide. All penetrations are a potential source for water ingress or air leaks, and should be sealed with an appropriate flexible fire rated sealant or fire collar.

13.3 CONTROL JOINT LAYOUT

Control joints are a necessary part of the STAAC FLOOR® system. Control joints are designed to relieve stress due to movement of the structural system, and to control the location where movement can occur without a detrimental effect on the floor finish. Recommended locations for control joints are:

- At a maximum spacing of 6000mm.
- Over lines of support for the joists. Refer to control joint details in Section 14
- Located at changes in joist orientation

13.4 WET AREA FLOOR CONSTRUCTION

All wet areas require a waterproof membrane layer over the STAAC FLOOR® panel. Waterproofing membranes must be nominated by the designer or specifier, and installed in accordance with manufacturer's recommendations.

13.5 SERVICEABILITY BEHAVIOUR

The deflection limits of the floor are governed by the adopted joist size. As a guide, the following typical deflection limits provide acceptable behaviour and dynamic response:

- Permanent actions (dead load): span/300 or maximum 2mm.
- Imposed actions (live load): span/360 or maximum 1.7mm.
- Permanent actions + imposed actions: span/400.
- Dynamic Response: Maximum 2mm under a 1kN concentrated load.

NOTE: The designer should select appropriate deflection limits to suit individual projects.

13.6 CONCENTRATED LOADS

For concentrated loadings, such as a loadbearing wall or point loads, the Engineer must ensure additional joists or blocking are provided beneath the STAAC FLOOR® panels. This will reduce the localised bearing stress, which must be limited to 1.0MPa.

13.7 BRACING WALLS

For bracing walls parallel to joists, a joist must be positioned beneath the wall. For bracing walls perpendicular to joists, blocking must be positioned beneath the wall. Blocking must have a minimum width of 45mm. Bearing stress in the AAC must be limited to 1.0MPa.

13.8 PANEL SUPPORT

All STAAC FLOOR® panels are to start and finish on a joist. Panel end/butt joints must be located on a joist.

14. CONSTRUCTION DETAILS

14.1 FIXING DETAILS

Figure 14.1.1 STAAC FLOOR® Panel Fixing Overview

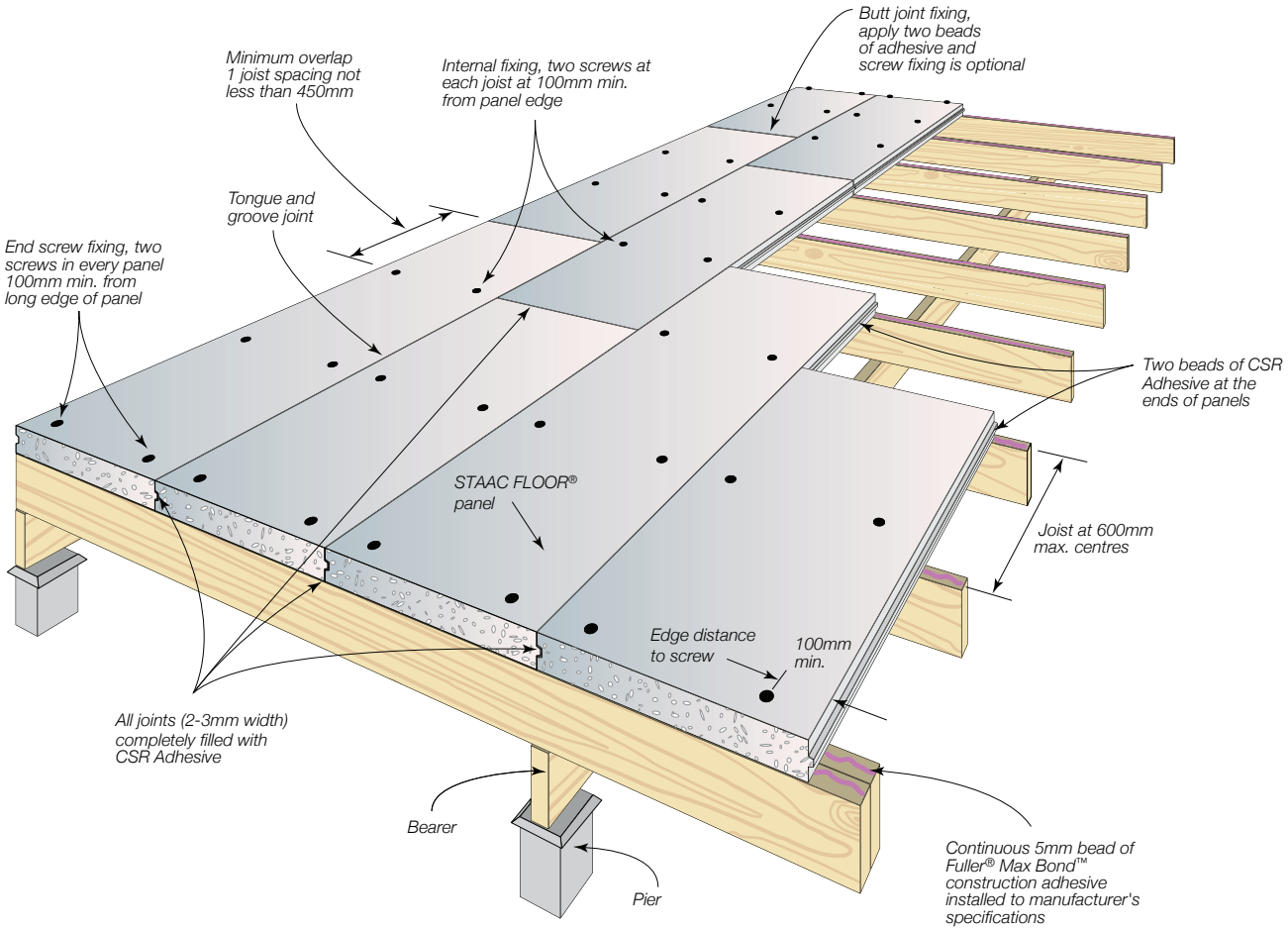


Figure 14.1.2 Fixing Layout

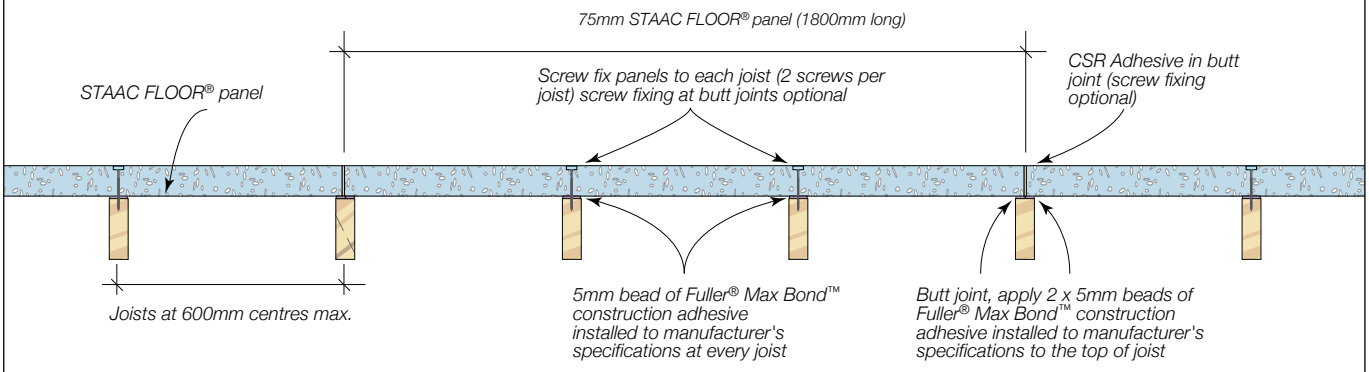


Figure 14.1.3 Fixing of STAAC FLOOR® Panel to Timber Joists

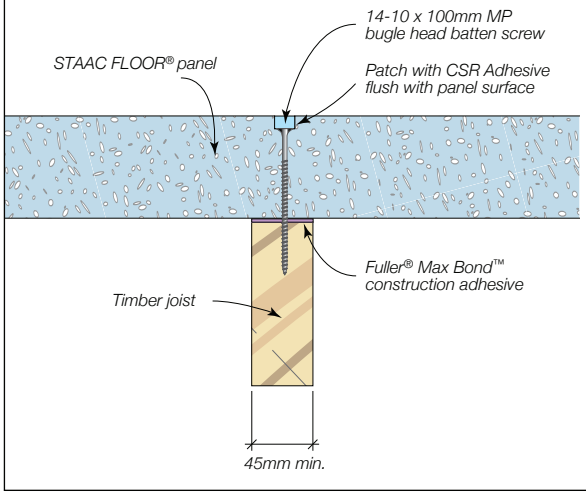


Figure 14.1.4 Fixing at End of STAAC FLOOR® Panel to Timber Joists

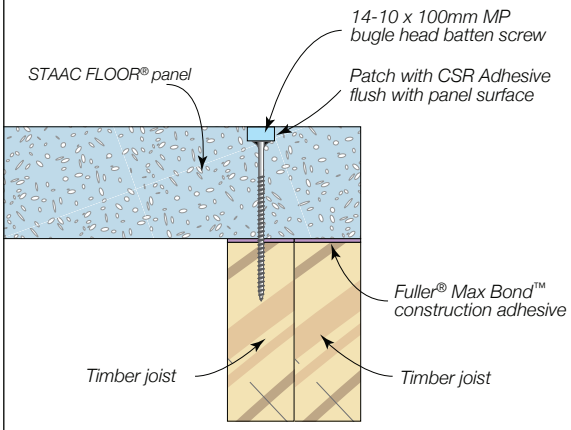


Figure 14.1.5 Fixing of STAAC FLOOR® Panel to Steel Joists

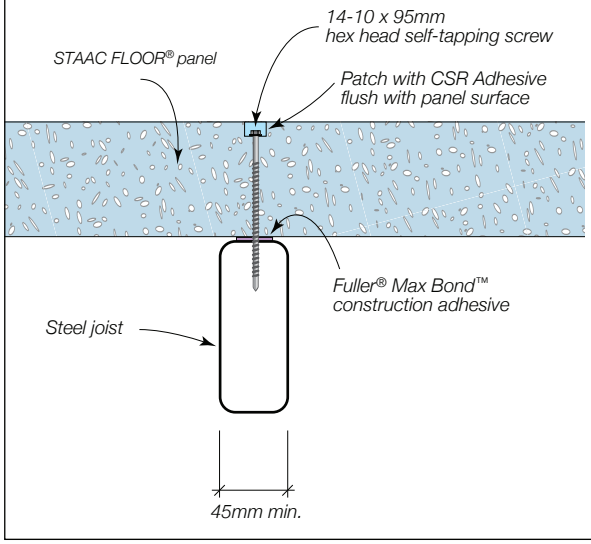


Figure 14.1.6 Fixing to Timber Joists at change in Joist Orientation

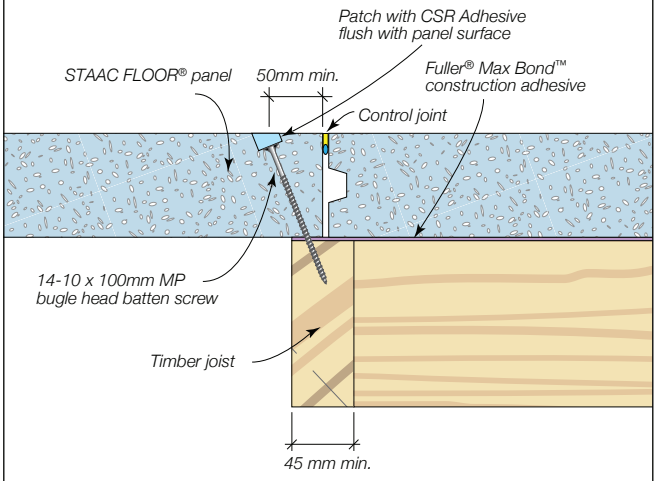
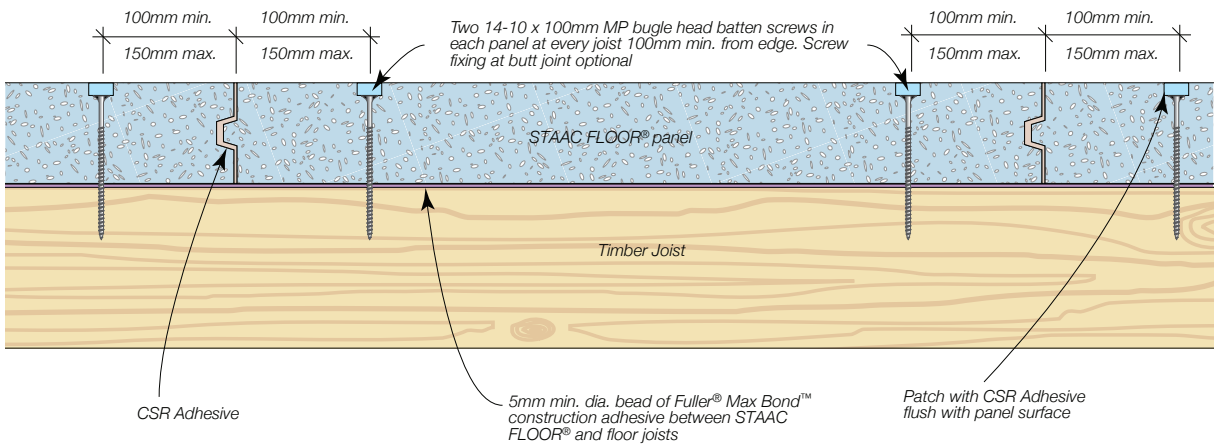


Figure 14.1.7 Fastener edge distance requirement



14.2 CONTROL JOINT DETAILS

Figure 14.2.1 Recommended Control Joint Location for Eccentric Loadbearing Wall

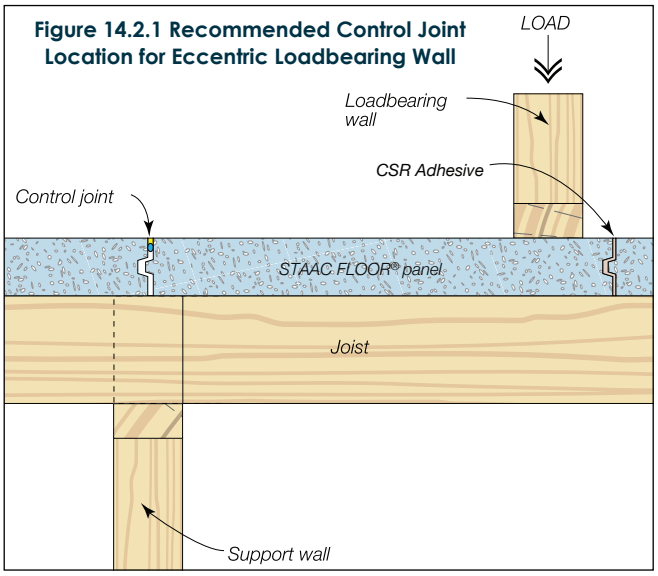


Figure 14.2.2 Recommended Control Joint Location for change in Joist Orientation

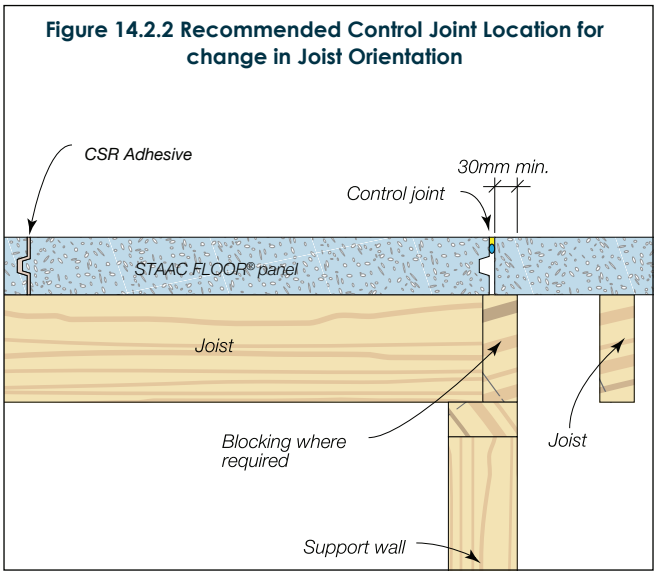


Figure 14.2.3 Control Joint Over Bearer / Support Wall

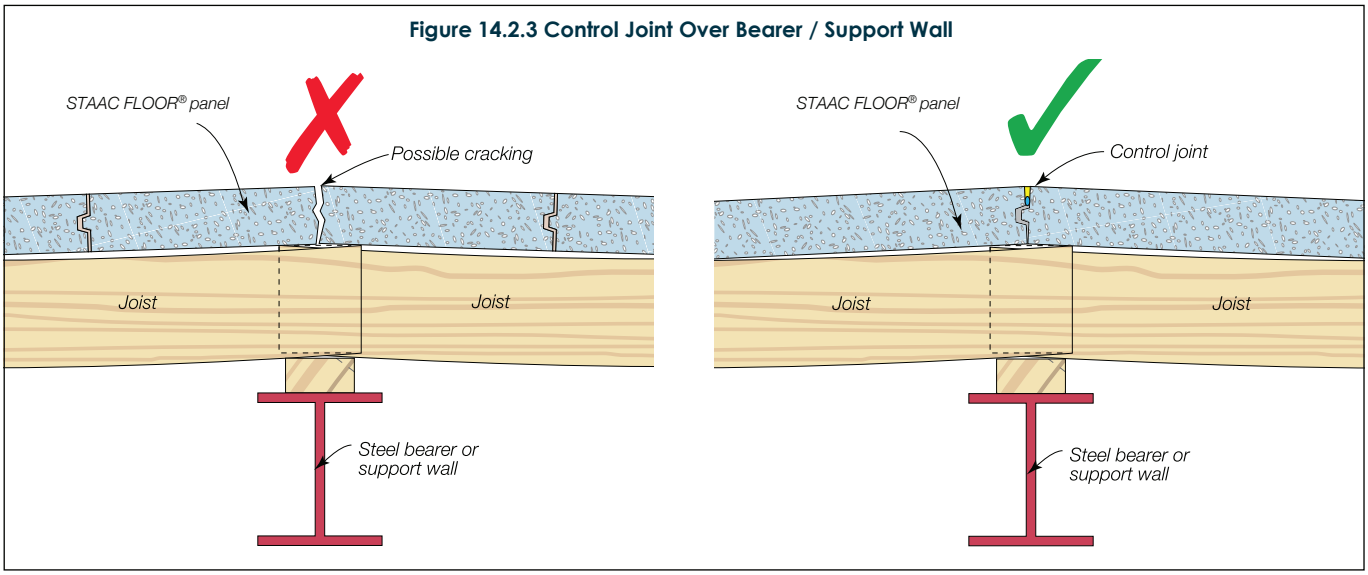


Figure 14.2.4 Control Joint Detail - Flushed end

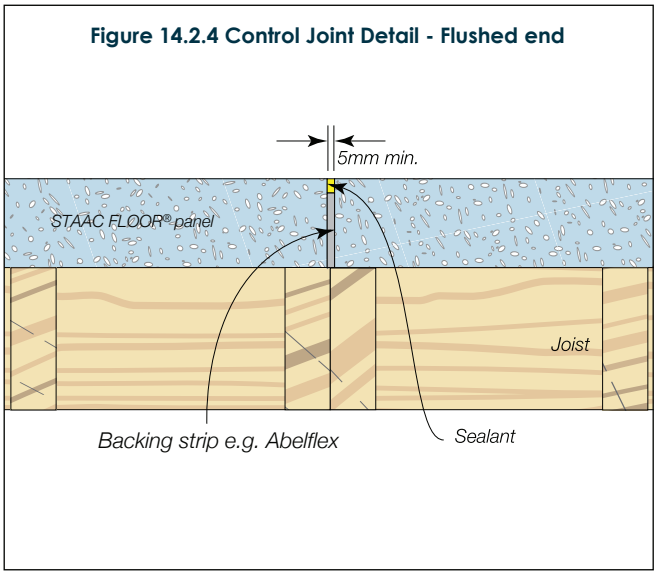
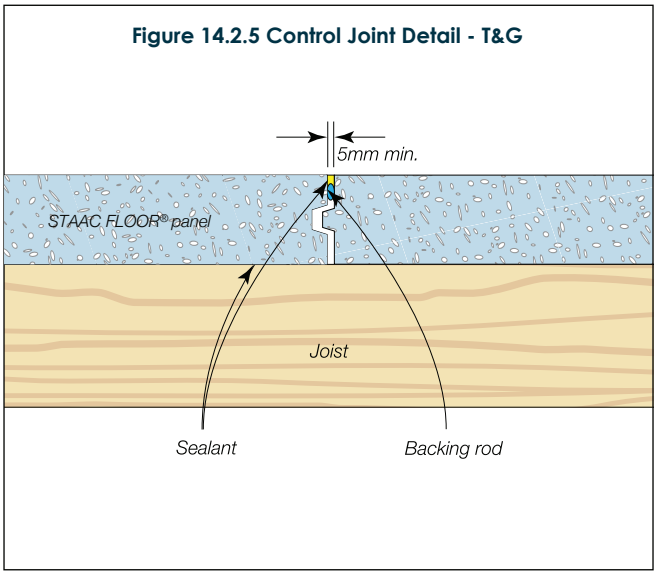


Figure 14.2.5 Control Joint Detail - T&G



14.3 CONSTRUCTION DETAILS

Figure 14.3.1 Edge Blocking Detail Between Joists

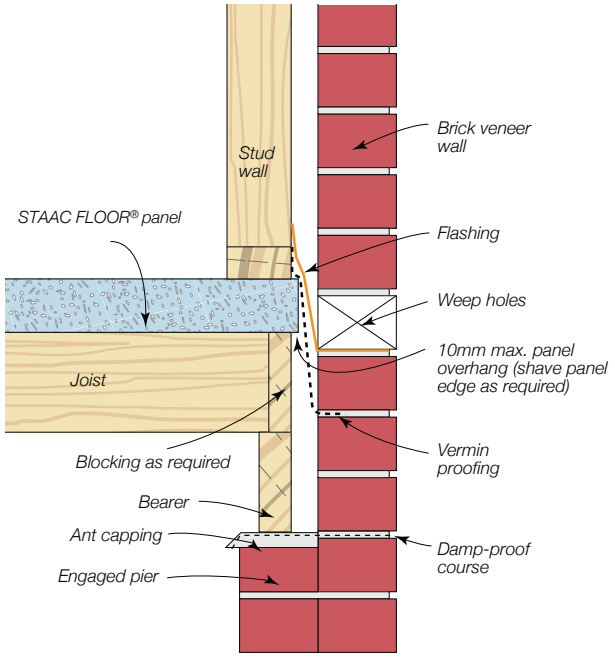


Figure 14.3.2 Edge Blocking Detail Between joints, with STAAC FLOOR® and STAAC WALL® Low Rise External Wall System

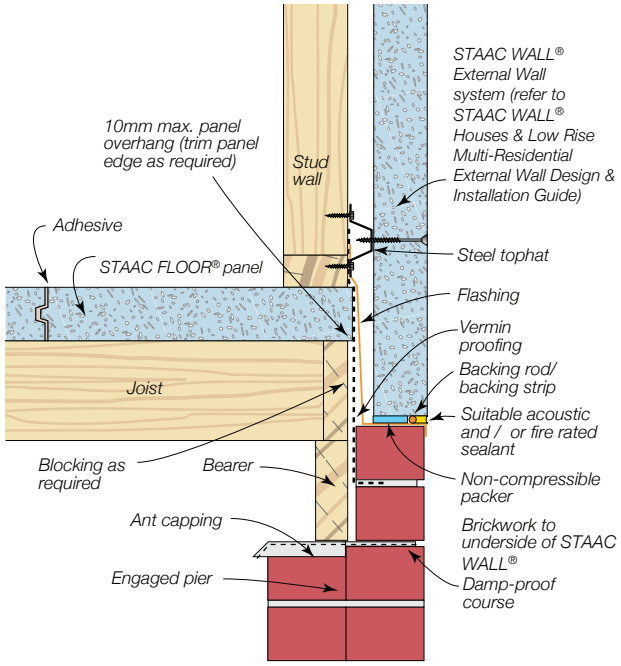


Figure 14.3.3 Construction Detail at Cantilevered Joist

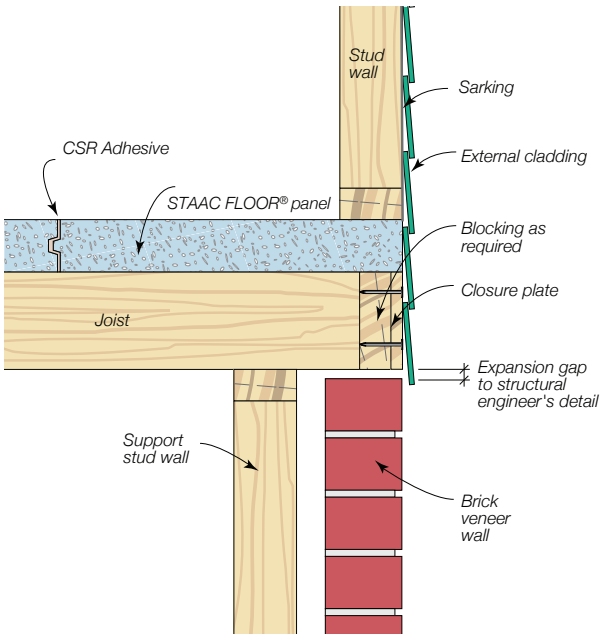


Figure 14.3.4 STAAC FLOOR® End Support Detail

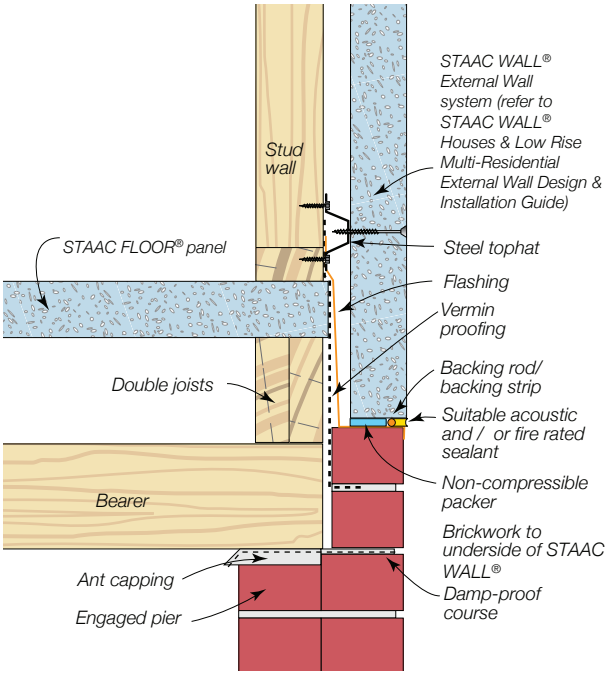


Figure 14.3.5 Typical Bottom Plate Fixing for Non-bracing Partition Walls

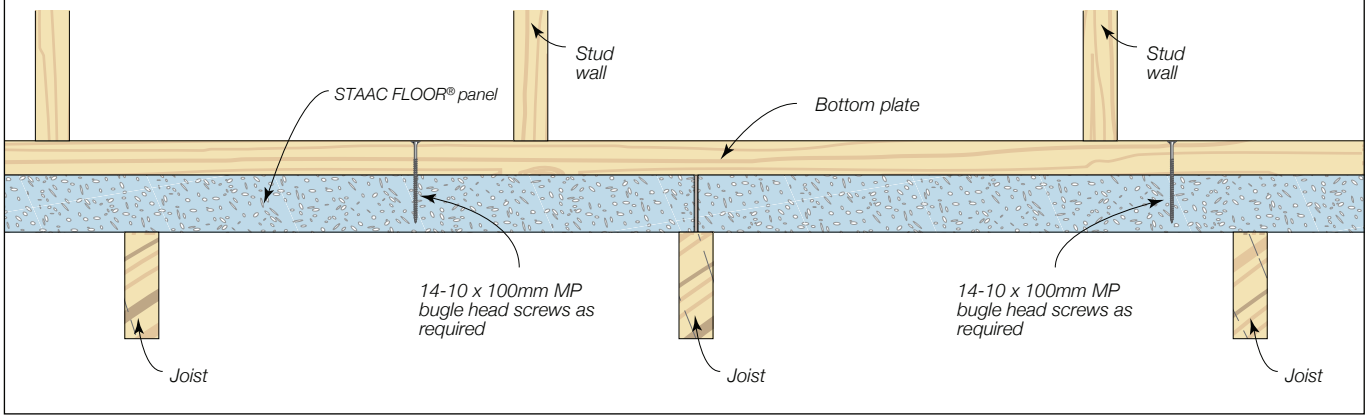


Figure 14.3.6 Joists Blocking Detail Under Loadbearing Walls Running Perperndicular to Joists

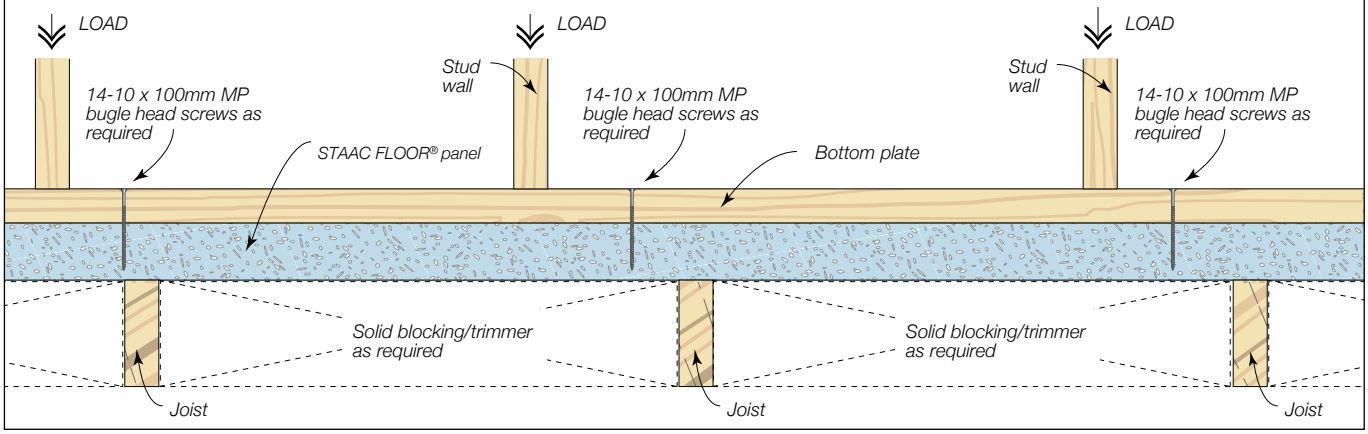


Figure 14.3.7 Bottom Plate Stiffening at Concentrated Load

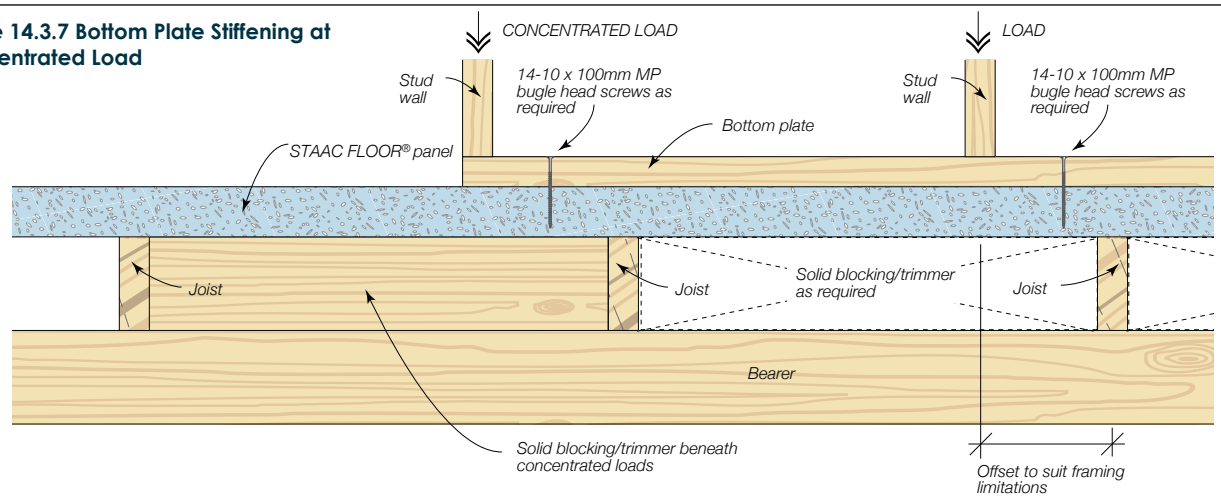
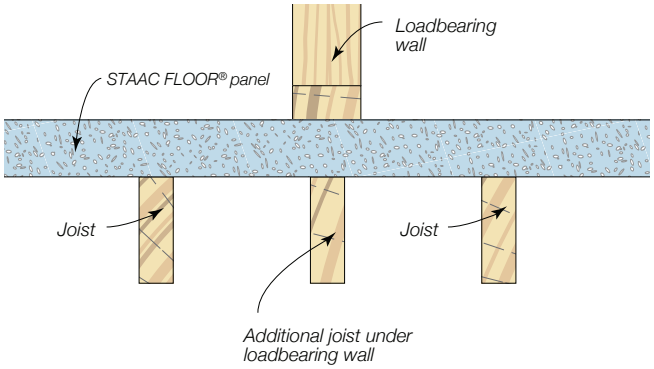


Figure 14.3.8 Additional Support Detail Under Loadbearing Wall Parallel to Joists



14.4 UPPER FLOOR CONSTRUCTION DETAILS

Figure 14.4.1 Fitted Flooring with External Loadbearing Wall

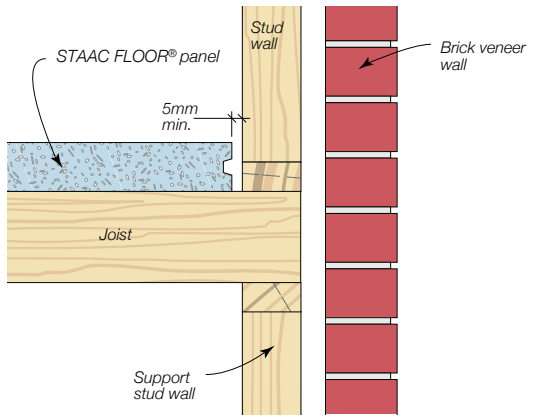


Figure 14.4.2 STAAC FLOOR® End Support for Fitted Flooring

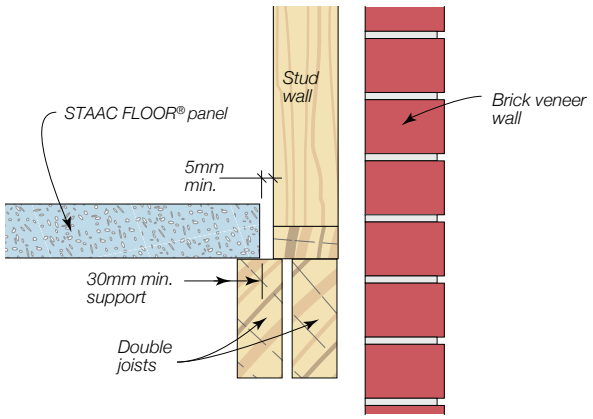


Figure 14.4.3 Fitted Bearing Blocking

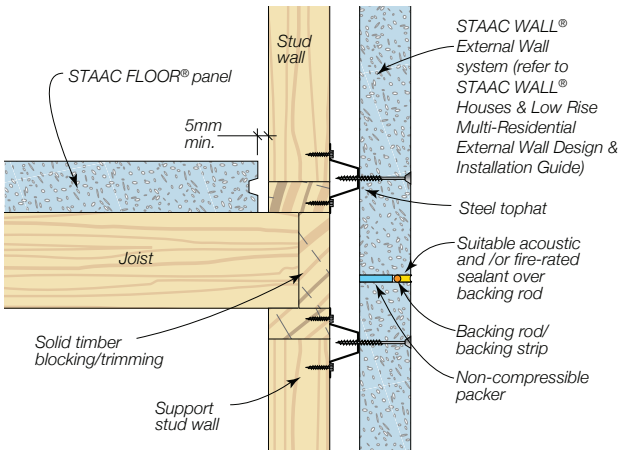


Figure 14.4.4 Platform Flooring with External Loadbearing Wall

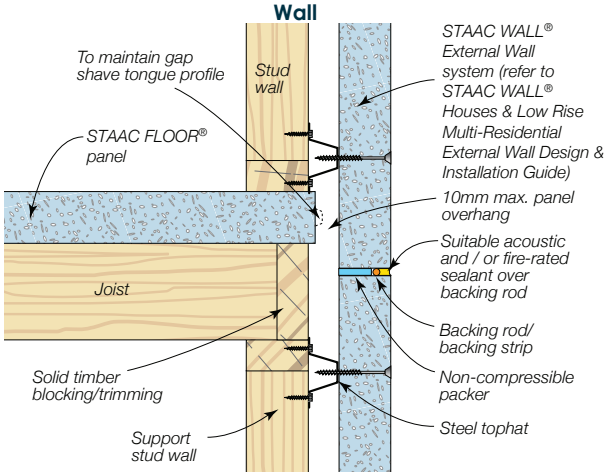


Figure 14.4.5 Fitted Flooring with Internal Loadbearing Wall

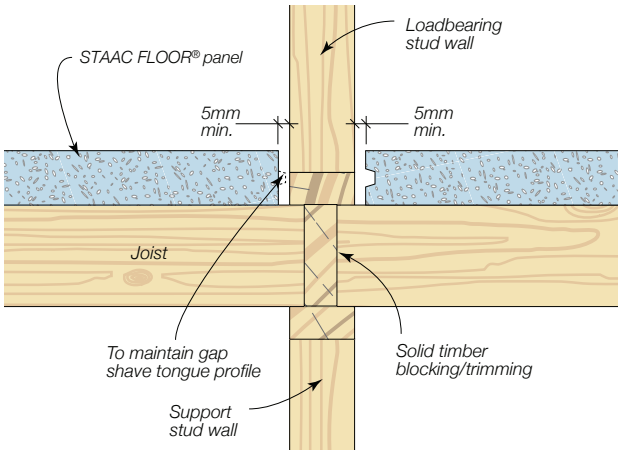
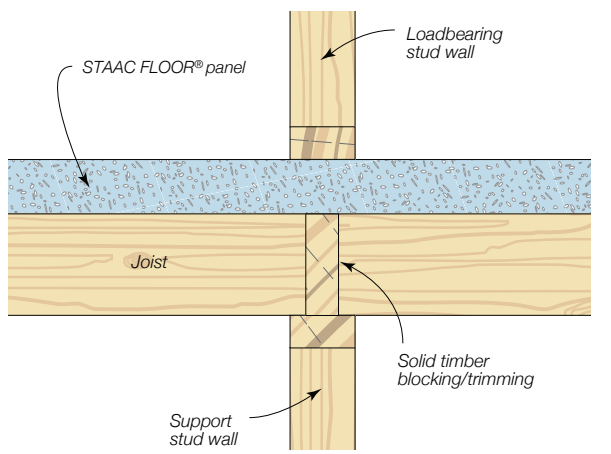


Figure 14.4.6 Platform Flooring with Internal Loadbearing Wall



14.5 HOLD-DOWN/BRACING WALL DETAILS

Figure 14.5.1 Hold-down of External Bracing Wall Over Support Wall

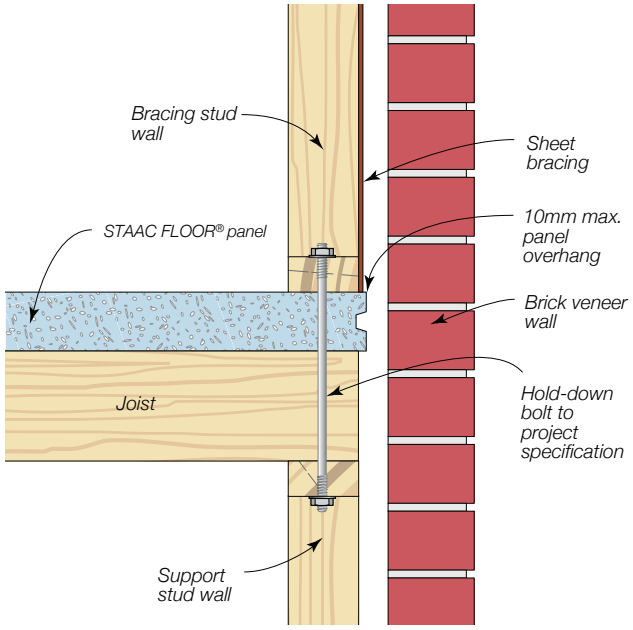


Figure 14.5.2 Hold-down of External Bracing Wall Over Bearer

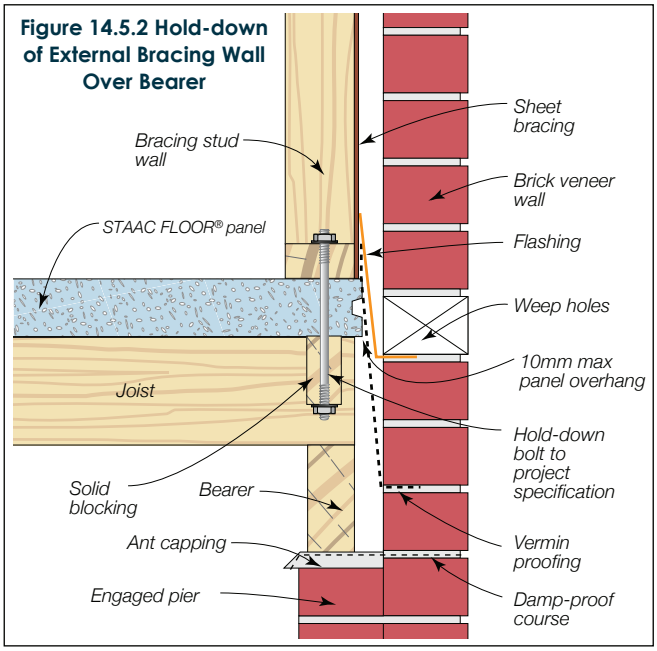


Figure 14.5.3 Hold-down of External Bracing Wall Parallel to Joists

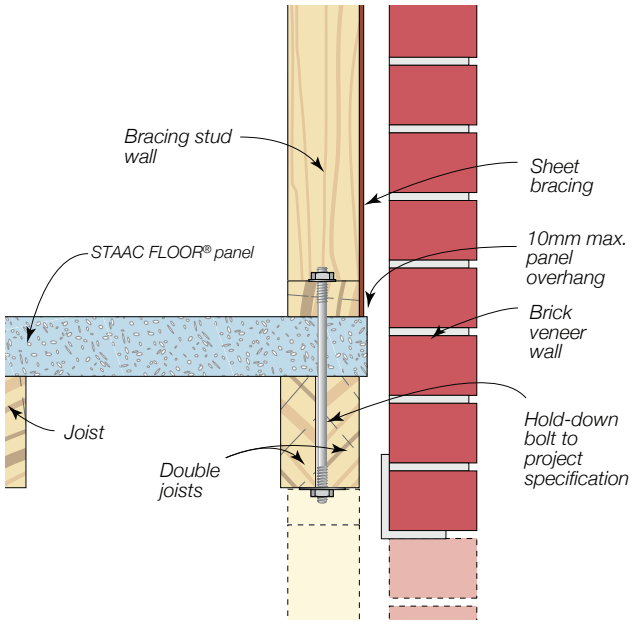


Figure 14.5.4 Hold-down of Internal Bracing Wall Perpendicular to Joists

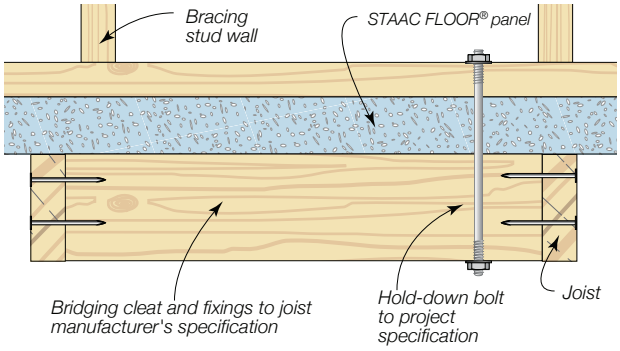
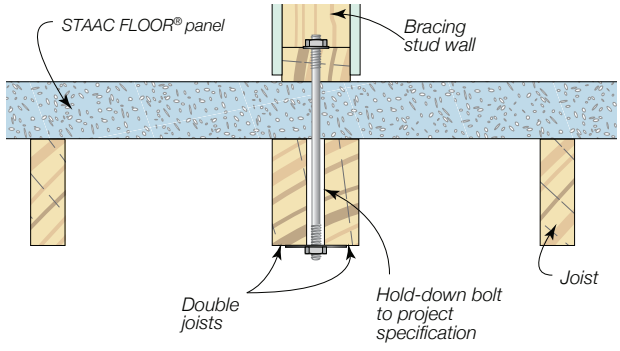


Figure 14.5.5 Hold-down of Internal Bracing Wall Parallel to Joists



14.6 PENETRATIONS AND NOTCHING DETAILS

Figure 14.6.1 Typical Penetration

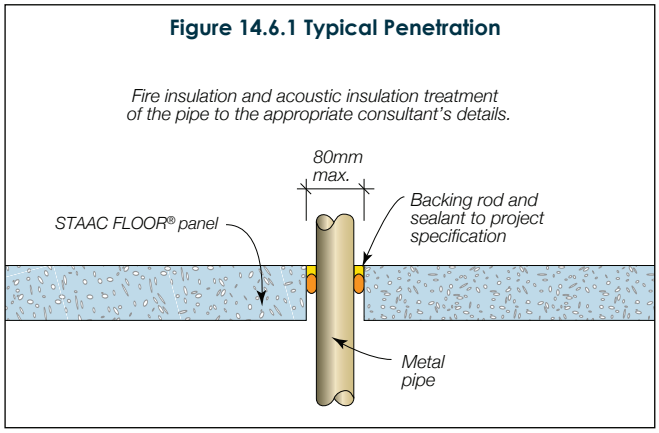


Figure 14.6.2 Large Penetration and Blocking

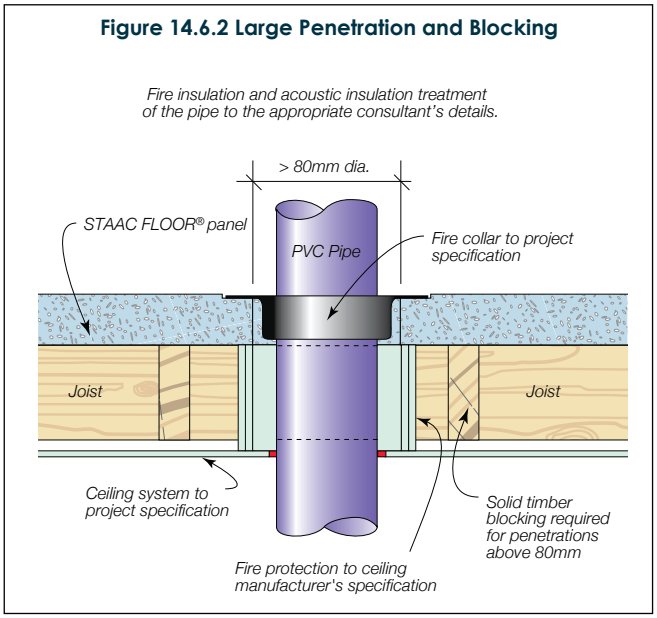


Figure 14.6.3 Blocking Detail for Corner Notching

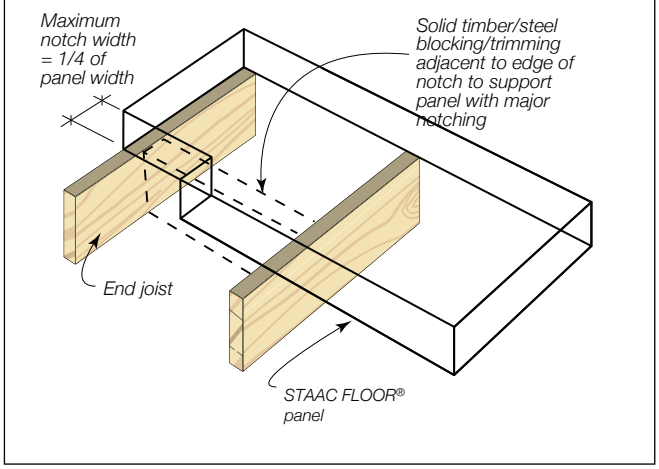
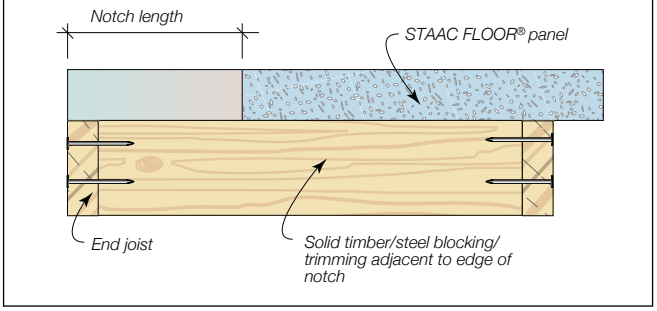


Figure 14.6.4 Blocking Detail for Corner Notching



14.7 WET AREA DETAIL

Figure 14.7.1 In-situ-formed Wet Area

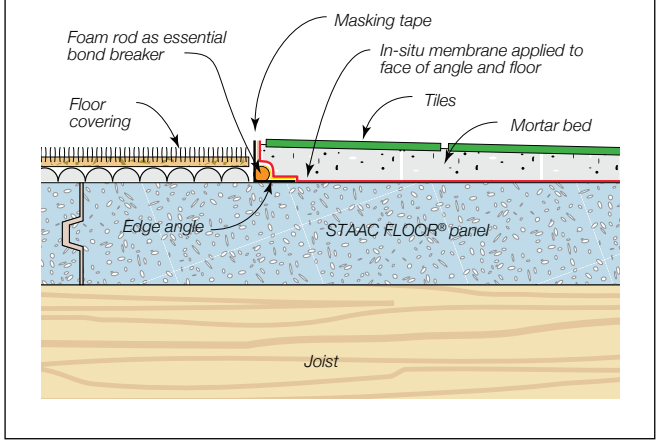
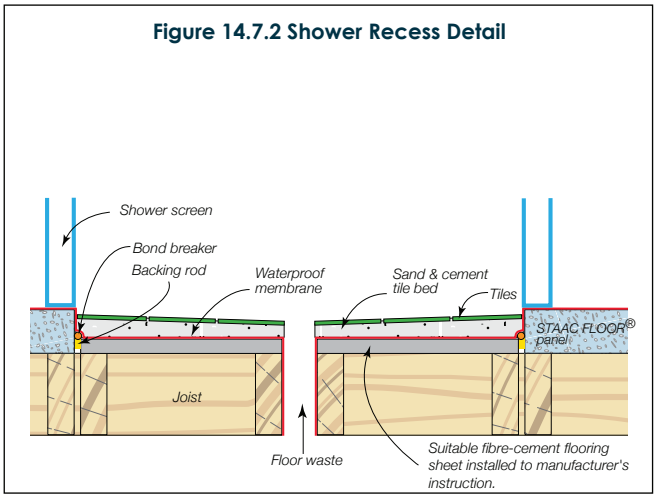


Figure 14.7.2 Shower Recess Detail



14.8 BALCONY AND STAIRCASE DETAILS

Figure 14.8.1 Step-down Balcony with Cantilevered Joist

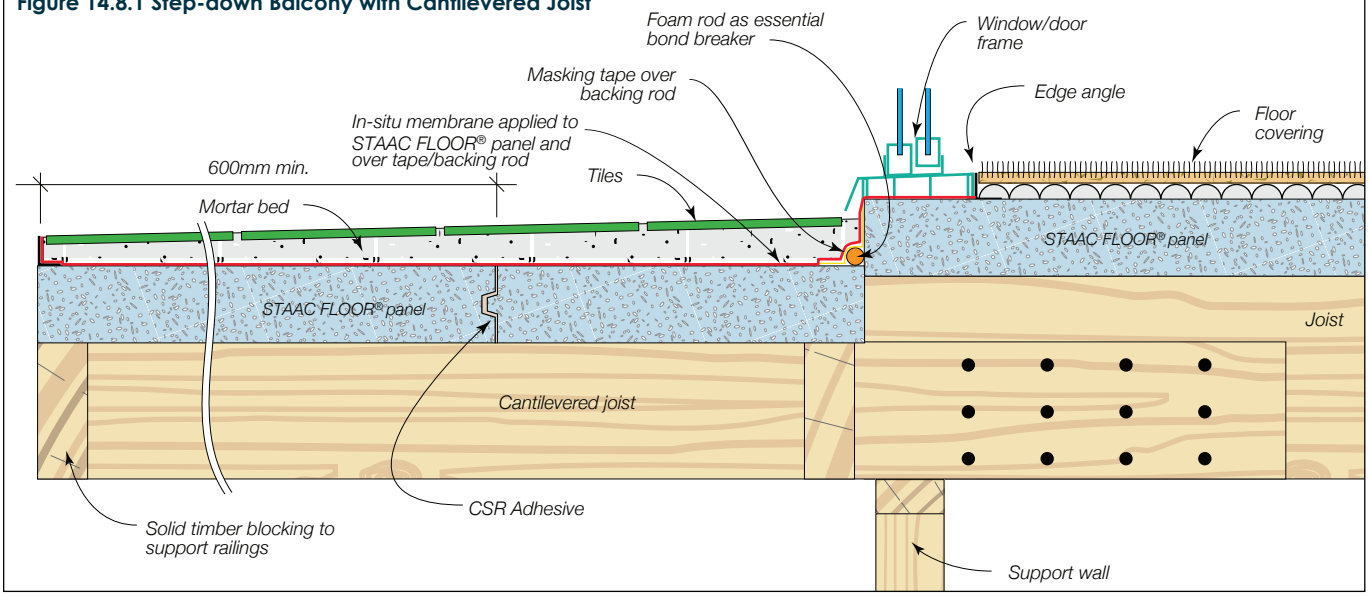


Figure 14.8.2 In-line Balcony with Cantilevered Joist

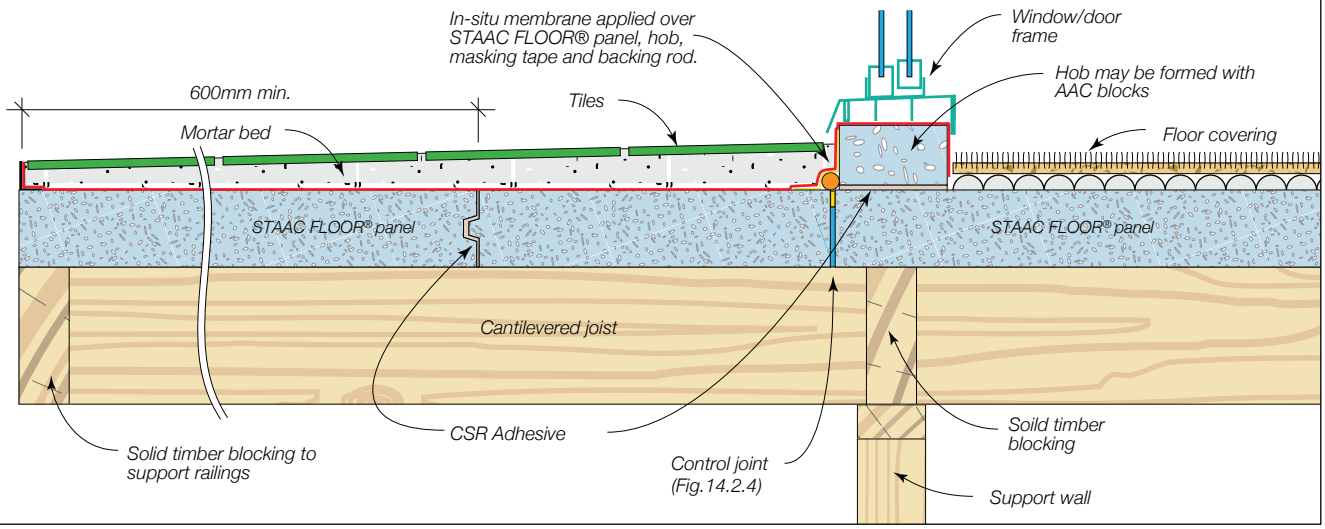
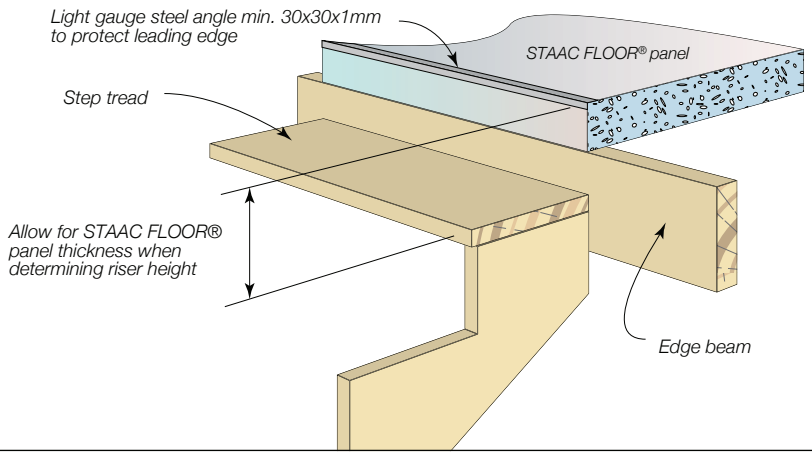


Figure 14.8.3 Staircase Layout



15 DELIVERY, STORAGE & HANDLING

15.1 UNLOADING PANEL PACKS

Panel packs should only be unloaded and moved with approved lifting devices. Before use, the lifting devices should be checked for the required lifting tags. Packs should be unloaded as close as possible to the intended installation area. This will increase work efficiency and minimise the need for secondary lifting.

NOTE: Secondary handling increases the risk of panel damage. The repair of damage sustained during lifting and moving is the responsibility of the lifter. Where damage is excessive, the panels must be replaced.

15.2 STORAGE

All materials must be kept dry and preferably stored undercover. Care should be taken to avoid sagging or damage to ends, edges and surfaces.

All STAAC FLOOR® products must be stacked on edge and properly supported off the ground, on a level platform. Panel bundles can be stacked two high. The project engineer should be consulted as to the adequacy of the structure to support the stacked bundles.

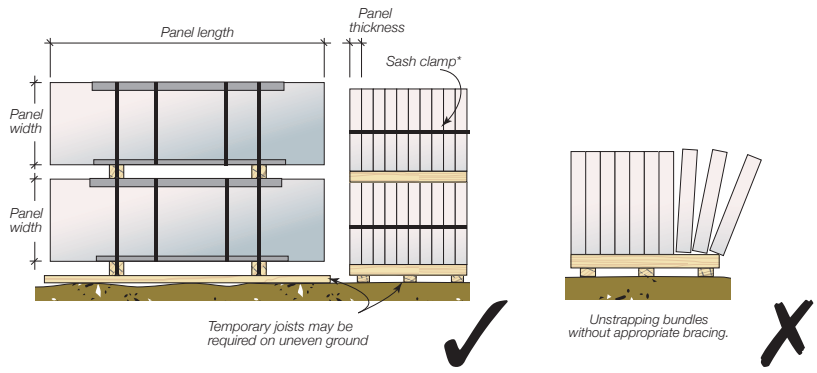
If outside, STAAC FLOOR® panels must be stored off the ground and protected from the weather. Only single bundles positioned on the ground can be opened. To provide a level surface, we recommend placing temporary joists beneath the supporting cleats.

When storing, the panel orientation must be horizontal with the long edge supported to timber bearers.

15.3 UNSTRAPPING PACKS

Ensure appropriate bracing is installed to packs prior to removal of strapping to prevent panels from falling. Panels can be held together with sash clamps, ratchet straps or stabilising bars.

Figure 15.1 Stacking packs of STAAC FLOOR® panels



15.4 HANDLING

Moving and handling STAAC FLOOR® panels should be done as much as possible using mechanical aids such as forklifts, cranes or panel lifting trolleys. Manual handling where people physically move a panel should be kept to a minimum, with the weight being supported by an individual kept as small as possible. Any concerns regarding the weight to be handled should be discussed with the panel installation supervisor.

Follow the suggestions below to avoid injuries to installation personnel:

- Use mechanical lifting / support equipment, such as trolleys, forklifts, cranes and levers.
- Manual lifting and moving of panels should be done with coordinated team work.
- Keep the work place clean to reduce the risk of slips, trips and falls, which can cause injury.
- Plan the sequence of installation to minimise panel movements and avoid unnecessary lifts.
- Train employees in good lifting techniques to minimise the risk of injury.
- Lift panels only from the edges and not to be handled flat.

15.5 HEALTH, SAFETY & PERSONAL PROTECTIVE EQUIPMENT (PPE)

Always wear gloves when handling panels, AAC is produced from cement and may cause skin irritation.

Approved fit tested respirators to AS/NZS 1715 and AS/NZS 1716 and safety eyewear to AS 1336 must be worn at all times when cutting and chasing AAC material. Check the STAAC FLOOR® Material Safety Data Sheets for material safety information.

15.6 CUTTING

Cutting of cement based products may cause dust, which contains respirable crystalline silica, with the potential to cause bronchitis, silicosis and lung cancer after repeated and prolonged exposure. When using power or hand tools on AAC products, wear a fit tested P1 or P2 respirator and eye protection. When cutting, routing or chasing AAC products with power tools, use dust extraction equipment that complies with M or H class requirements of AS/NZS 60335.2.69-2017 and wear hearing protection. Wet cutting may be mandatory in certain Australian States. Please confirm with local work safe authority on cutting / chasing requirement for AAC products. Refer to the appropriate STAAC FLOOR® MSDS for further information.

Reinforcement exposed during cutting must be coated with a liberal application of STAAC FLOOR® recommended Anti-corrosion protection paint.

16. APPENDIX: REFERENCING CODES AND STANDARDS

- AS 3566.1 - 2002 - Self-drilling screws for the building and construction industries Part 1: General requirements and mechanical properties
- AS 5146.1: 2015 – Reinforced Autoclaved Aerated Concrete Part 1: Structures (Incorporating Amendment No.1)
- AS 5146.2: 2018 – Reinforced Autoclaved Aerated Concrete Part 2: Design
- AS 5146.3: 2018 – Reinforced Autoclaved Aerated Concrete Part 3: Construction
- AS/NZS 1170.2: 2021 Structural design actions Wind actions
- AS/NZS 1336:2014 Eye and face protection – Guidelines
- AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment
- AS/NZS 1716:2012 Respiratory protective devices
- AS/NZS 4600: 2018 Cold-formed steel structures
- AS/NZS 4859.1:2018 Thermal insulation materials for buildings General criteria and technical provisions
- NASH Hand book – Design of residential & low-rise steel framing
- NASH Standard – Residential and low-rise steel framing Part 1: Design Criteria
- NASH Standard – Residential and low-rise steel framing Part 2: Design Solutions
- National Construction Code 2022 Volume One: Building Code of Australia - Class 2 to Class 9 Buildings
- National Construction Code 2022 Volume Two & Housing Provisions - Class 1 and 10 Buildings

37 Gravel Pit Rd, Darra QLD 4076
P. (07) 3725 5935 / stoddartgroup.com.au

STODDART® GROUP

VERSION NO 1.0 JUL 2023 **STODDARTGROUP_75MM_STAACFLOOR_MANUAL_JUL2023**