

**NEW
MODEL
BUILD
ING**

DETAILS

NEW MODEL BUILDING

DETAILS

Version 1.0

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DISCLAIMER

The New Model Building is a set of design principles that demonstrates a methodology for building mid-rise residential properties using a low-carbon engineered timber structure. This has been prepared for Build by Nature in collaboration with other professionals including structural engineers and fire specialists. All involved have exercised reasonable skill and care to develop a methodology that performs to the relevant standards, UK Building Regulations and NHBC technical standards current at the time of writing, if correctly implemented.

These details and supporting information are provided on an 'as is', 'with all faults' basis, and no warranties, guarantees, conditions or other terms are given or implied.

This study was prepared for Built by Nature and is not to be relied upon by any third party. The use of this methodology and information does not relieve any consultant of their responsibility to ensure the suitability, performance, compliance and robustness of their designs and we expressly exclude liability to any party for any loss or damage (whether direct or indirect, and whether or not foreseeable) arising from the use of the following information.

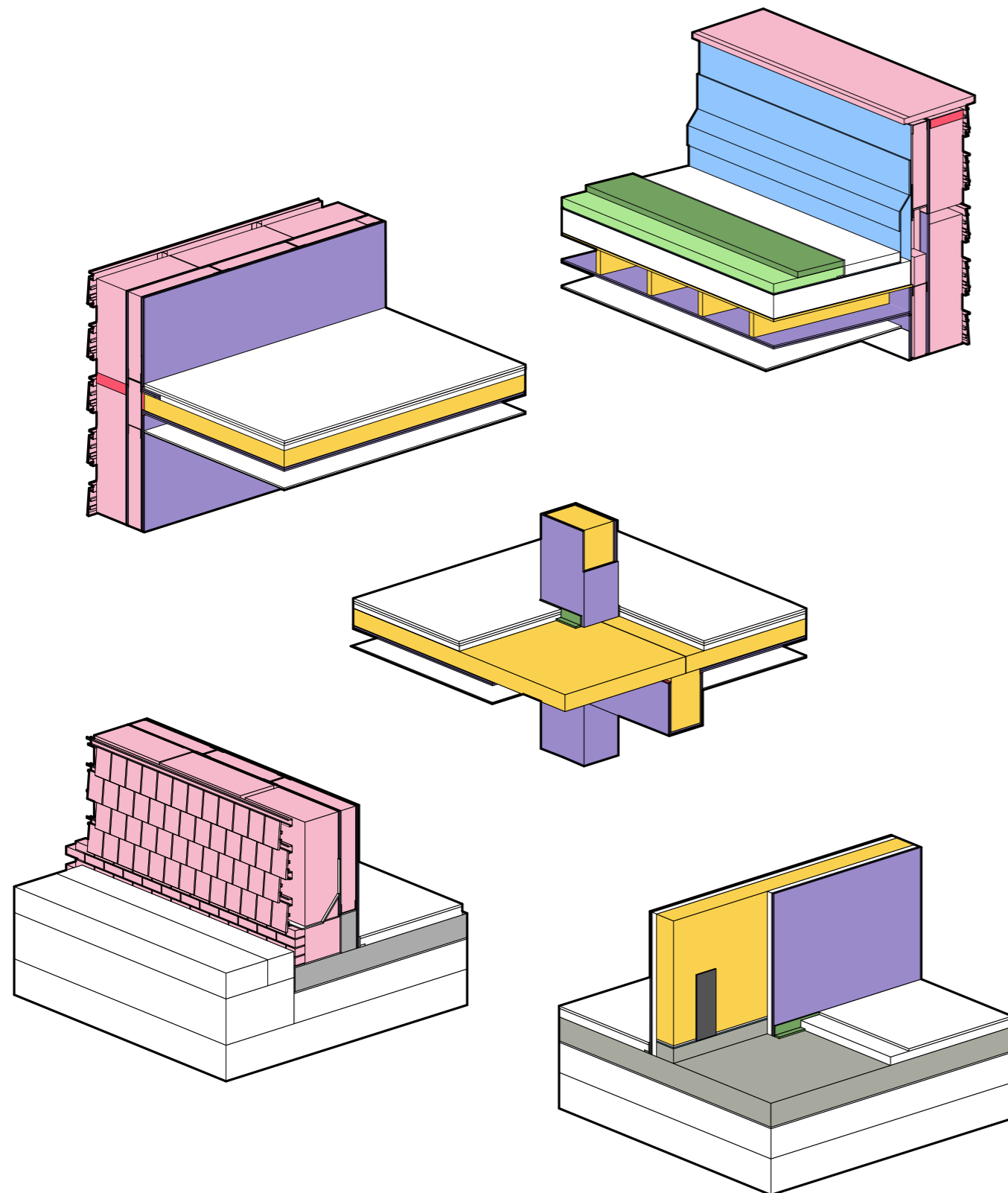


WAUGH THISTLETON ARCHITECTS

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INTRODUCTION



OVERVIEW

The New Model Building (NMB) comprises three documents:

The Guide is an overview of the New Model Building methodology.

The Details brings together the requirements described by Waugh Thistleton, Buro Happold and UCL in the philosophy reports in an easily accessible format which can be used by teams to inform the design of their buildings.

The Evidence is the full documentation submitted to and pre-assessed by NHBC in support of the New Model Building. It is made up of three separate documents: Waugh Thistleton's Design Philosophy, Buro Happold's Structural Design Philosophy and UCL's Fire Strategy Report.

THE DETAILS

In this document we have taken the details required to deliver a New Model Building and identified the requirements for each as set out in the evidence documents. The details are grouped into:

- External Wall
- Internal Structure
- Ground Slab
- Roof
- Balcony
- Penetrations

The details describe the key interfaces pre-assessed by NHBC and are accompanied with checklists that highlight the important considerations that need to be addressed, providing designers, developers and contractors with an easy-to-use document which will help them successfully deliver a New Model Building.

The Performance Specification is included at the rear of the document. This lists the items labelled in the details and provides their performance requirements. The required performance of the materials is stated and not individual products to allow for flexibility in procurement.

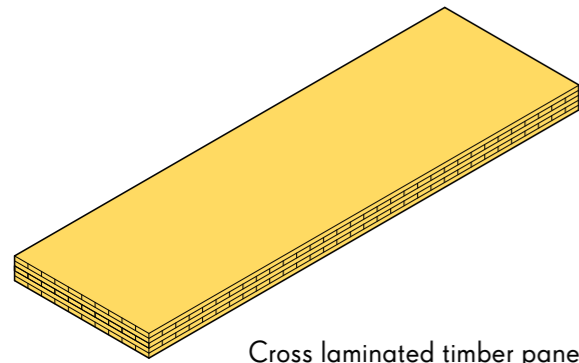
The architects, structural and fire engineers, and designers for a project delivered in line with the New Model Building approach will need to carry out a fully detailed design and provide a complete set of drawings, specifications, and fire strategy which is specific to their project. The Detail Guide should be viewed as supplementary guidance, which does not replace existing standards but helps to fast track the process of approval with NHBC.

OVERVIEW**STRUCTURAL DESIGN APPROACH**

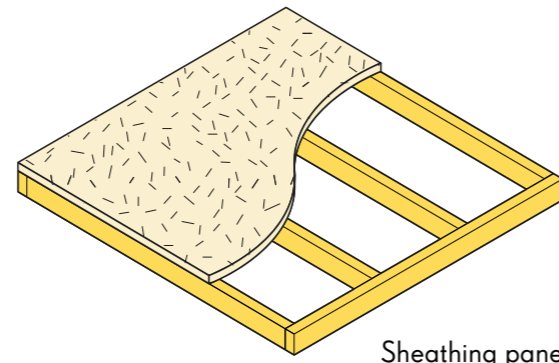
The New Model Building structural design approach outlines the key considerations when using mass timber for the primary structure:

- Concrete ground bearing or suspended ground floor slab
- Façade is non structural
- Simply supported timber floors spanning between vertical supports
- Downstand beams may be required to support high perimeter or interior loads
- Columns/walls supported directly on appropriately designed foundations
- Vertical support formed of timber walls or timber beam elements supported on timber or steel columns
- Columns/walls supported directly on appropriately designed foundations
- Lateral loads on façades transferred by overall diaphragm action of the floors to stability elements
- Vertical loads from façades and associated support systems resisted at each floor level, bottom supported and restrained by the slab at the head
- Lateral stability system comprises lateral load-resisting construction around the cores

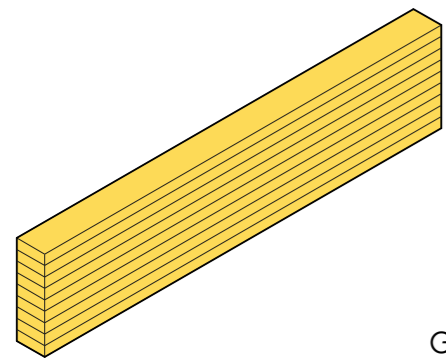




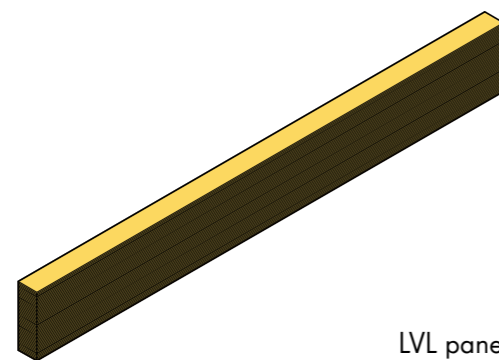
Cross laminated timber panel



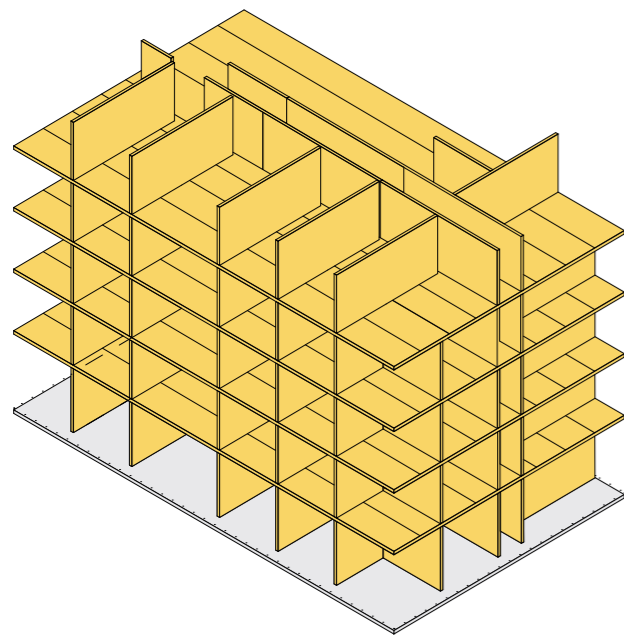
Sheathing panel



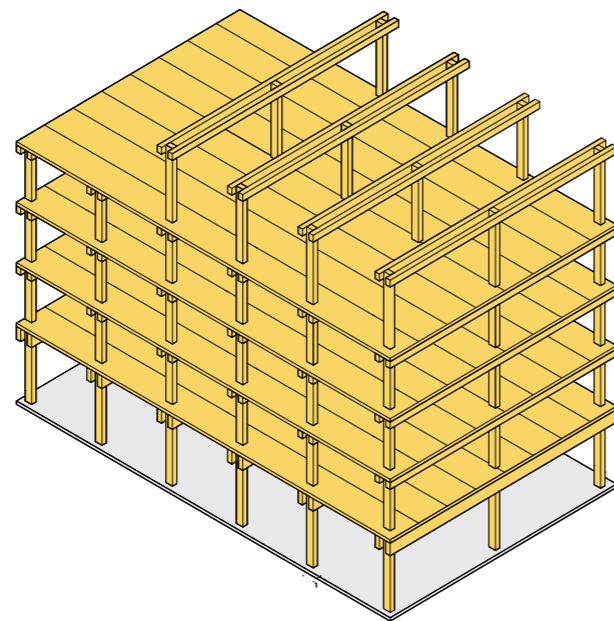
Glulam panel



LVL panel



Panelised timber system



Post and beam timber system

DEFINITIONS

Air and vapour control layer (AVCL) - Continuous layer of impermeable material to prevent the movement of air and water vapour.

Balcony - Accessible external amenity platform over an open space above ground level, with direct access from a building.

CLT / Cross laminated timber - Structural timber boards stacked in perpendicular layers and glued together under high pressure.

External wall - As defined in Building Regulations Approved Documents B with additional detailed clarification for the NMB to be the build-up from the internal finished face of the plasterboard to the outside face of the cladding material or any protruding cills.

Flat roof - A roof with a maximum slope of less than 10 degrees from the horizontal.

Glulam / Glue laminated timber - Manufactured by bonding together layers of parallel timber lamellae, with ends finger jointed

LSF - Light steel frame. Construction framing members made from cold-formed profiles 0.5-4.0mm thick.

LVL / Laminated Veneer Lumber - Thin rotary cut veneers bonded together under pressure using water-resistant adhesive to form columns and beams.

NMB - New Model Building.

Pitched roof - A roof with a slope of greater than 10 degrees from the horizontal.

Sheathing - Board applied to the outside of the steel frame (installed where required by the design).

Terrace - External surface for amenity use, above an internal space, above ground level and with direct access from a building.

The New Model Building Design documents should be read alongside all relevant Building Regulations and Approved Documents, British Standards and NHBC Technical Standards 2023.

Designers must also refer to the following guidance:

GENERAL

- TRADA's National Structural Timber Specification for Building Construction Version 2.0.
- TRADA CrossLaminated Timber Design and Performance
- SCI Technical Report EDo17 Design and Installation of Light Steel External Wall Systems

STRUCTURE

- Building Regulations (England) Approved Document Part A
- Building Regulations (England) Approved Document Part B
- BS EN 1990: (Eurocode 0) Basis of structural design - UK National Annex
- BS EN 1991: (Eurocode 1) Actions on structures - UK National Annex
- BSEN 1992: (Eurocode 2) Design of concrete structures - UK National Annex
- BS EN 1993: (Eurocode 3) Design of steel structures - UK National Annex
- BS EN 1995: (Eurocode 5) Design of timber structures - UK National Annex
- NHBC Standards and Technical Requirements Chapter 2.1 sections R3 (materials) and R5 (competent designer) and all other relevant NHBC technical guidance notes

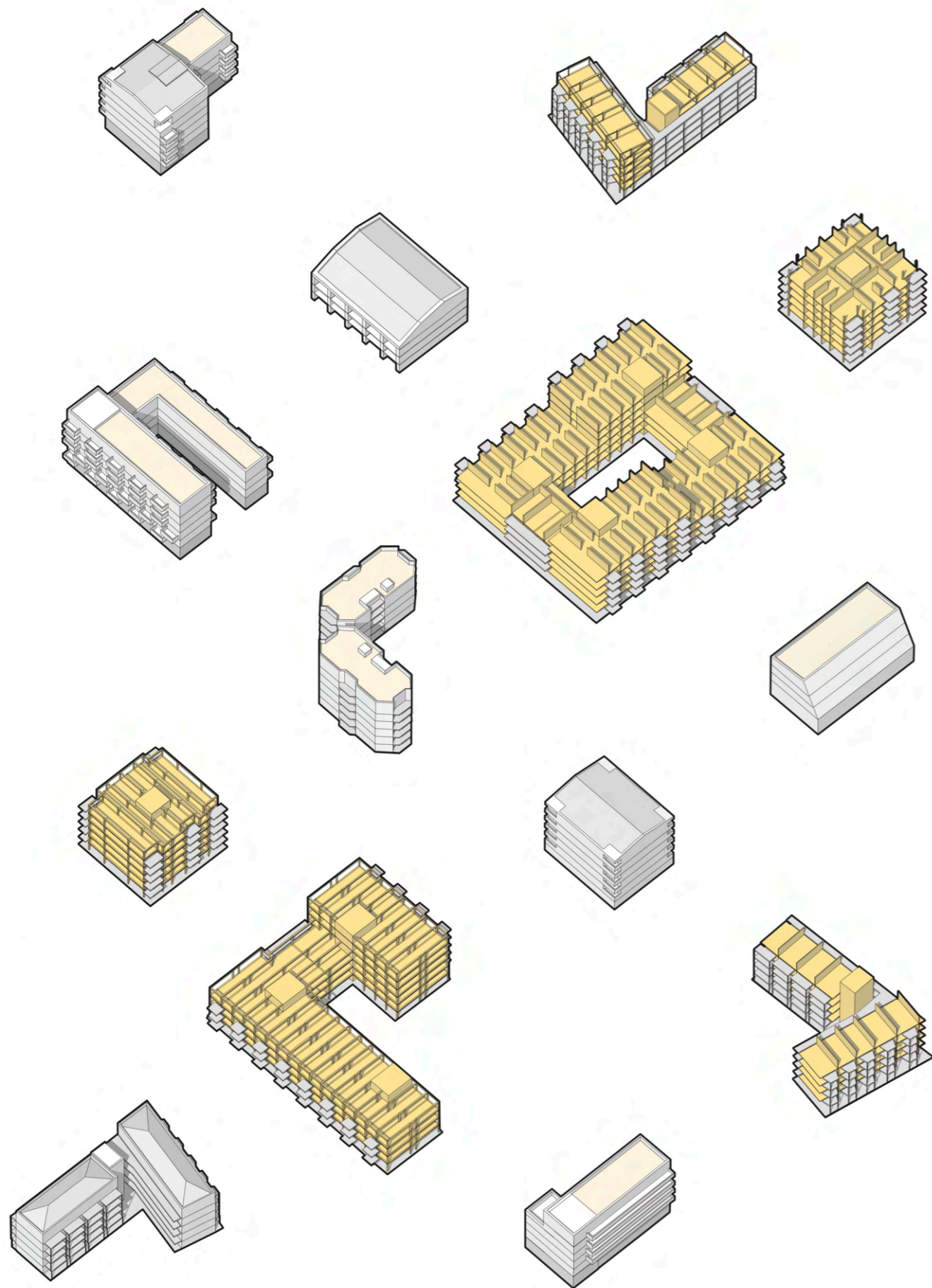
STANDARDS AND CODES OF PRACTICE

FIRE

- STA Structural Timber Buildings Fire Safety In Use Guidance Volume 6 - Mass Timber Structures; Building Regulation compliance B3(1) STA Fire Safety and Guidance Project Version 2.1 May 2023
- STA 16 Steps to Fire Safety. Promoting good practice on construction sites. Version 4.3 October 2017

MOISTURE MANAGEMENT

- Swedish Wood/TDUK's Moisture-proof CLT Construction without a Full Temporary Shelter Edition 1:2022
- STA Moisture Management Strategy, Process Guidance for Structural Timber Buildings, Version 1.0, July 2022
- STA Advice Note 14 - Robustness of CLT Structures - Part 1 - Key Principles for Moisture Durability
- STA Technical Note 23 - Durability by Design – Mass Timber Structures – STA 2021
- STA Technical Note 24 - Moisture Protection During Construction - STA 2020



APPLICABLE BUILDINGS

The use of the New Model Building Design methodology is limited to the following:

TPOLOGY	Residential dwellings in accordance with 'Table 0.1 Classification of purpose groups' as found in Approved Document B (fire safety) volume 1: Dwellings, 2019 edition incorporating 2020 amendments
UPPER FLOOR USE	Multi-occupancy residential
GROUND FLOOR USE	Multi-occupancy residential, Retail, F&B, Plantrooms & Storage, Office
BASEMENTS/ PODIUMS/ UNDERCROFTS	Not applicable – assumed alternative non-combustible construction to be used for any below ground level elements
HEIGHT	Less than 18m, measured in accordance with Diagram D4 as found in Approved Document B (fire safety) volume 1: Dwellings, 2019 edition incorporating 2020 amendments
SPRINKLERS	Sprinklers should be installed throughout the building in accordance with Approved Document B (fire safety) volume 1: Dwellings, 2019 edition incorporating 2020 amendments
COMPARTMENT	The minimum fire resistance of compartments should be 60 minutes, in accordance with 'Table B4 Minimum periods of fire resistance as found in Approved Document B (fire safety) volume 1: Dwellings, 2019 edition incorporating 2020 amendments
LOCATION	England and Wales
CONSEQUENCE CLASS	Class 1, zA or zB
FIRE PROTECTION STRATEGY	Full encapsulation by plasterboard or other fire-resistant system to K260
MAXIMUM FIRE PERIOD	60 minutes
EXPOSED TIMBER	No visually exposed timber
SERVICE CLASS	(BS EN 1995) – Service Class 1 only

STRUCTURAL COMPONENTS

The New Model Building approach is based on the following primary structural components:

ELEMENT	APPLICABLE STRUCTURAL SYSTEMS
FLOORS	Cross laminated timber slabs except under bathrooms/utility rooms where a joisted and decked solution is also acceptable.
SUPERSTRUCTURE	Cross laminated timber walls, glue-laminated timber beams and glue-laminated columns or combinations of these. Steel beams and columns may be used but and should be encapsulated for fire protection.
PODIUMS	Assumed to be from non-combustible material e.g steel, concrete masonry etc.
ROOFS	Cross laminated timber (laid to fall) or timber joists/sheathing.
STABILITY SYSTEM	Concrete, cross laminated timber or braced steel stability core incorporating the vertical circulation for the building.
STAIR	Timber, steel or concrete to the designers preference.
FAÇADE	Lightweight (not precast concrete or solid masonry), non-structural facades supported at every level.
BALCONIES	Balconies of non-combustible construction can be used and included in the design.
PARAPET WALLS	Roof level parapet wall can be included if required and included in the design allowance.
TERRACES	No specific assumption has been made regarding terraces, but these can be incorporated if they do not change the overall compliance and principles of the NMB.
CANOPY ROOF	Canopy roof of non-combustible construction can be used but needs to be included in the design allowance.
VISUALLY EXPOSED TIMBER	Not applicable, all timber to be encapsulated.
COMBUSTIBLE MATERIALS WITHIN FAÇADE	No – All structural timber elements (floors, beams, walls, columns etc) to be kept inboard of the external wall, up to and including any wall linings.

MATERIALS SPECIFICATION

GENERAL

All timber to be sustainability sourced timber to FSC/PEFC or other globally recognised responsible sourcing accreditation.

Timber elements to be in accordance with relevant BS standard as follows:

- Glulam in accordance with BS EN 14080:2013
- Solid section timber in accordance with BS EN 14081:2016
- OSB in accordance with BS EN 300:2006
- Plywood in accordance with BS EN 636:2012
- LVL in accordance with BS EN 14374:2004
- Cross laminated timber in accordance with BS EN 16351:2021

PERMANENT AND VARIABLE LOADING

The New Model Building approach has been developed on the basis of loadings and their combinations as defined in the UK NA to BS EN 1990 and BS EN 1991.

The approach is applicable to any wind, snow and live loadings as defined in these codes, provided the structure sizing is done to suitably resist these loads. The timber structure should be designed and detailed to provide sufficient robustness against disproportionate collapse in accordance with the Building Regulations Part A.

SERVICEABILITY LIMITS

The NMB approach has been developed on the basis that serviceability limits as defined in the UK NA to BS EN 1995 for the timber elements and BS EN 1993 for the concrete elements, and to generally meet NHBC Standard requirements, whichever is more onerous. Vibration for floors should be assessed and designed out in accordance with UK NA to BS EN 1995.

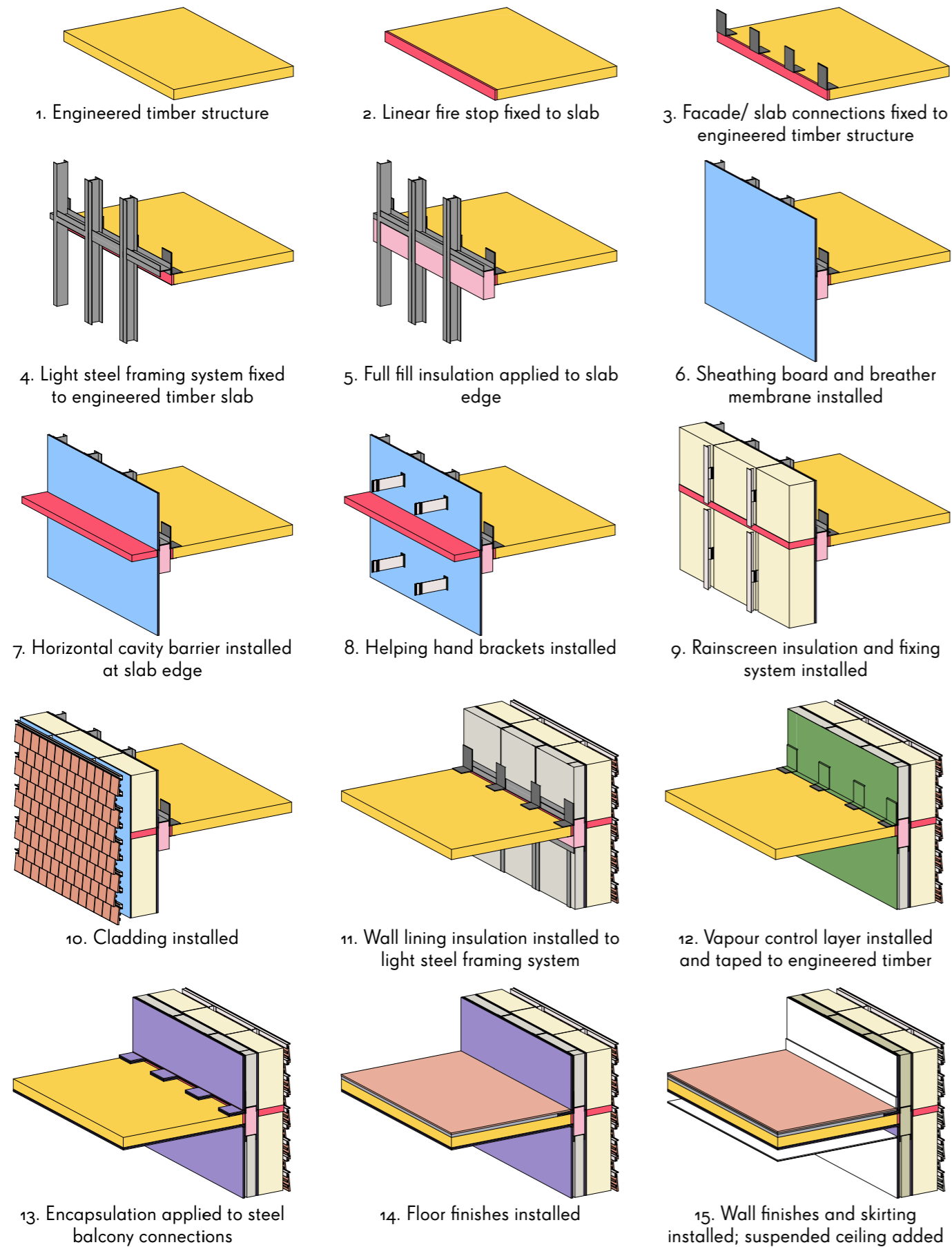
SPECIFICATION, ACCURACY AND TOLERANCE

The timber structure tolerances (both fabrication and erection) and overall design and performance must be in accordance with the current version of the National Structural Timber Specification, BS 5606:2022 and the BS 8000 series.

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EXTERNAL WALLS

GENERAL APPROACH

The design utilises a non-combustible external wall system (EWS) constructed from materials as defined in Approved Document Part B, Requirement B4: External fire spread - Regulation 7 – Materials and workmanship. In line with this, all materials within the external wall system are of European Classification A2-s1, do or A1, or better, classified in accordance with BS EN 13501.

The EWS is not designed to be load-bearing and is constructed from a continuous LSF system, supported from the floor slab, with a ventilated rain-screen cladding system.

All primary structural elements must sit inboard of the external wall. The external wall is defined as the build-up from the internal finished face of the plasterboard to the outside face of the cladding material or any protruding cills.

To allow for a wide range of cladding materials, the external finish of the New Model Building is not defined within the philosophy. Any rain-screen cladding system can be used if designed in accordance with NHBC Technical Standards 2023 and BS 8200:1985 Code of Practice for the Design of Non-loadbearing External Vertical Enclosures of Buildings. Example materials that could be applied include non-combustible lightweight cladding such as brick slips, clay tiles or fibre cement panels.

SEQUENCING

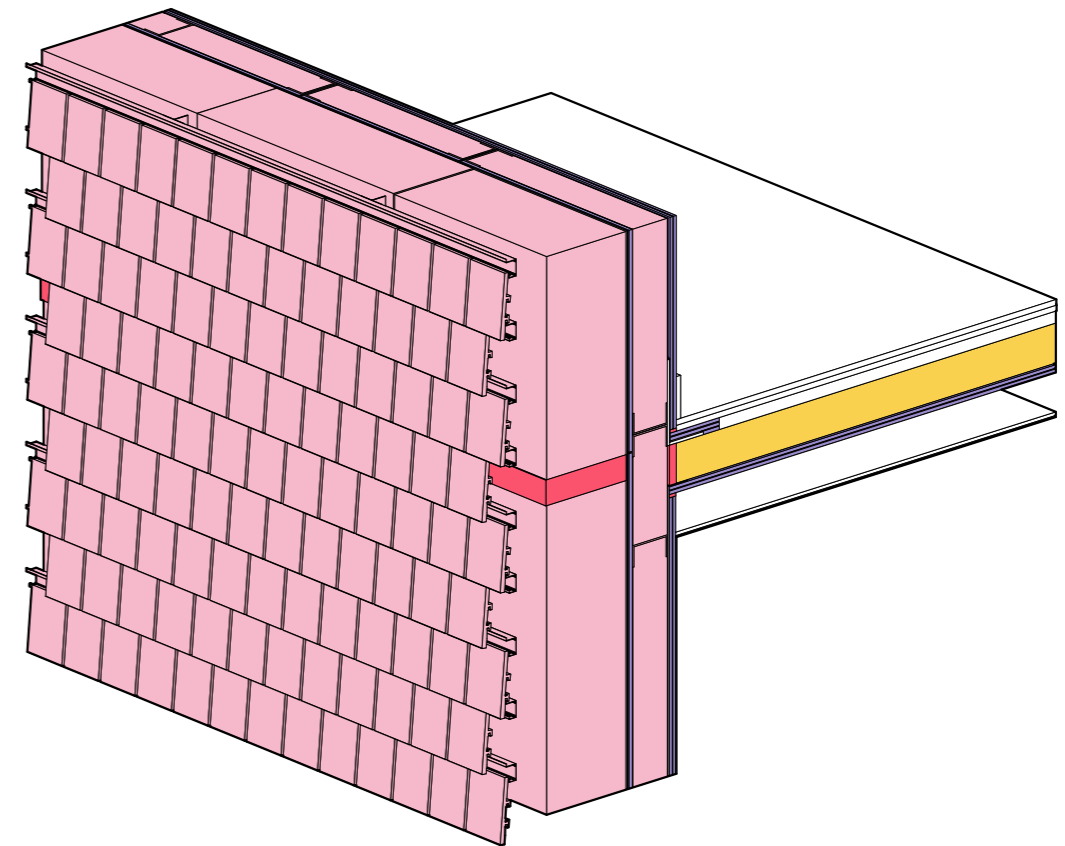
The principles for connecting the EWS to the structure are illustrated in the details and the sequencing of works is illustrated in the sequencing diagrams to the left.

GENERAL CHECKLIST

The below principles should be applied to all details.

REF	ITEM	<input checked="" type="checkbox"/>
1	Ensure all elements in the external wall are of A2-s1-do or better in accordance with BS EN 13501 unless excluded via Regulation 7(3).	<input type="checkbox"/>
2	Use a non load-bearing continuous LSF system supported from the top of the floor slab.	<input type="checkbox"/>
3	Use a ventilated rainscreen cladding system.	<input type="checkbox"/>
4	Provide fire test data of External wall construction showing REI 60 from outside and inside.	<input type="checkbox"/>
5	Internal wall lining boards provide finish encapsulation to the external wall system. External wall build-up and products specified must demonstrate fire performance of REI 60 minutes.	<input type="checkbox"/>
6	Provide an airtight vapour control layer, AVCL, to the internal lining of the EWS.	<input type="checkbox"/>
7	Ensure the AVCL will be sealed against the engineered timber to ensure continuous airtightness across the external wall.	<input type="checkbox"/>
8	All joints and penetrations in the AVCL should be lapped and taped in accordance with the manufacturer's guidance.	<input type="checkbox"/>
9	Adhesive tapes (or sealants) should be used to seal window/door frames and membrane interfaces. NHBC Technical Standards 2023 and BS 8200:1985 Code of Practice.	<input type="checkbox"/>
10	Close all cavities at the top and bottom of walls, as well as around openings and penetrations, and at separating walls and floors.	<input type="checkbox"/>
11	Install breather membrane to the outside of the sheathing board. This should protect the sheathing board during construction.	<input type="checkbox"/>
12	Rainscreen insulation should be resilient to moisture to allow the breather membrane to be installed behind.	<input type="checkbox"/>
13	Parapet walls, lift overruns and any other such walls that enclose the building must be constructed as external walls.	<input type="checkbox"/>

OVERVIEW



KEY COMPONENTS

	Mass timber primary structure		A2-s1,do Non-loadbearing external wall construction
	K2 REI 60 Encapsulation to timber		Fire cavity barriers

KEY DETAILS

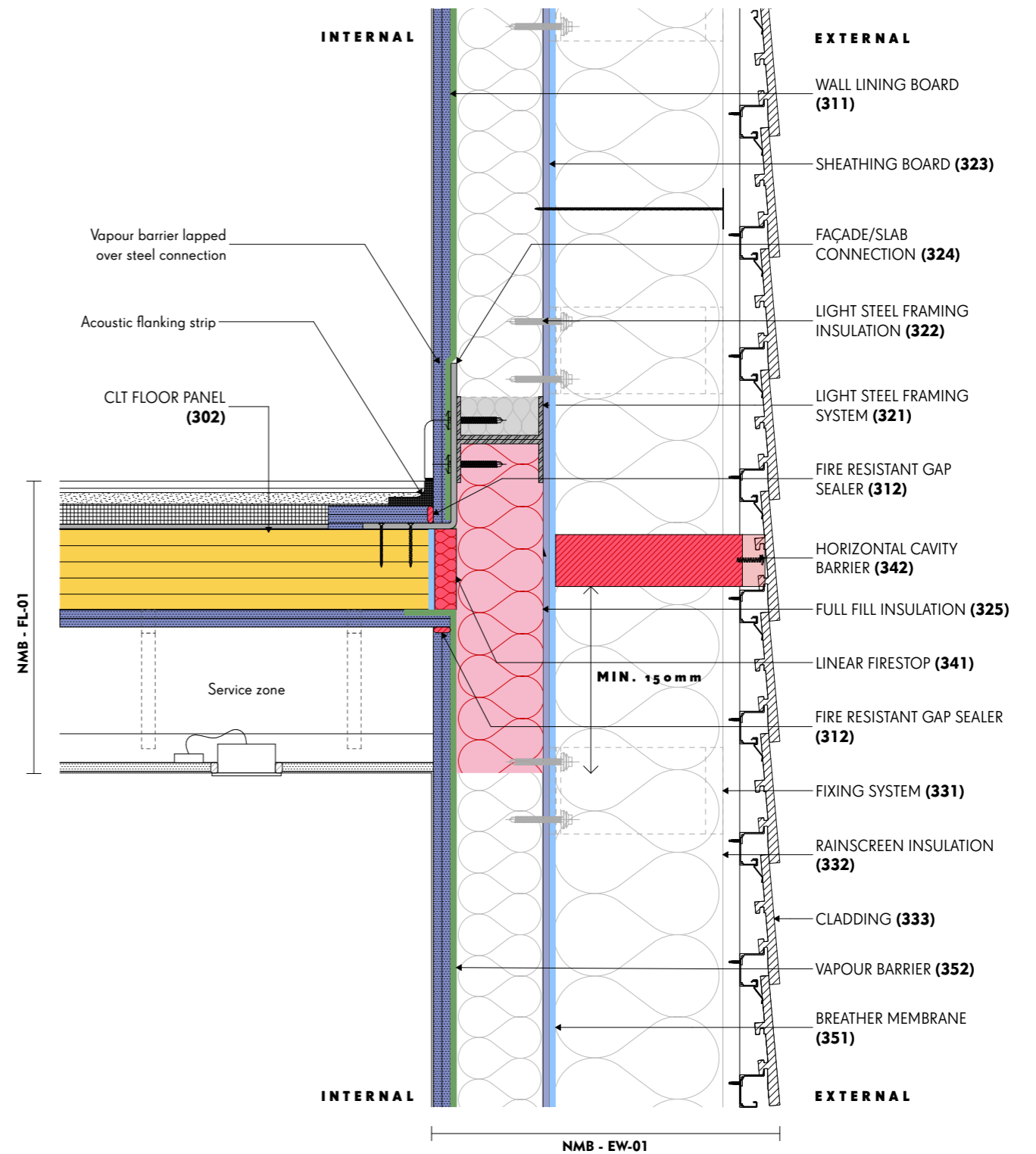
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Typical window	p. 39 - 43
Full height window	p. 41 - 43

CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
2	End-grain sealant is to be provided to all slab and wall edges. (203)	<input type="checkbox"/>
3	Linear firestop is to be provided to wall and slab edge to seal any potential gaps between LSF system and mass timber elements. (341)	<input type="checkbox"/>
4	Full-fill mineral wool insulation to LSF framing over the party floor. Insulation is to be installed to the ceiling soffit level to allow for visible checking onsite. (325)	<input type="checkbox"/>
5	Plasterboard junctions are to be set out so intumescent sealants will not fall out with gravity. (312)	<input type="checkbox"/>
6	Steel fixings into CLT floor slab to be encapsulated. (324)	<input type="checkbox"/>
7	Horizontal cavity barrier to be rated for 60 mins. (342)	<input type="checkbox"/>
8	Horizontal cavity barrier to have intumescent specified for the required cladding cavity. (342)	<input type="checkbox"/>
9	Ensure the AVCL will be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>

SLAB EDGE SECTION

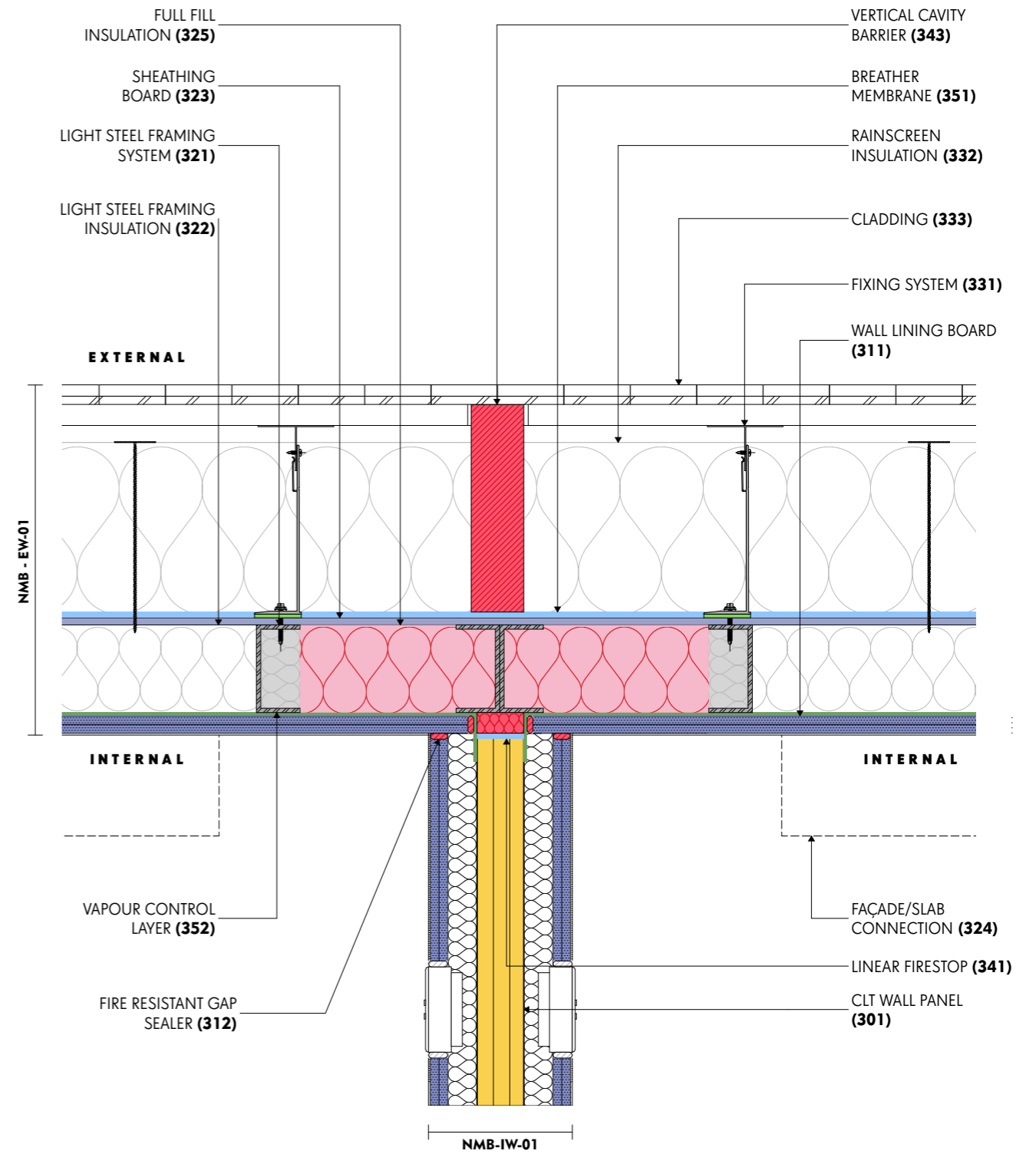


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
2	End-grain sealant is to be provided to all slab and wall edges. (203)	<input type="checkbox"/>
3	Linear firestop is to be provided to wall and slab edge to seal any potential gaps between LSF system and mass timber elements. (341)	<input type="checkbox"/>
4	Intumescent sealants are to be installed at plasterboard junctions. (312)	<input type="checkbox"/>
5	Full-fill mineral wool insulation to LSF framing over party wall junction. Insulation to be installed between vertical studs to prevent insulation from moving. (325)	<input type="checkbox"/>
6	Vertical cavity barrier to be aligned with internal compartmentation and rated for 60 mins. (343)	<input type="checkbox"/>
7	Vertical cavity barrier to be full-fill to the rear of cladding with zero gaps. (343)	<input type="checkbox"/>
8	Ensure the AVCL will be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>

SLAB EDGE PLAN

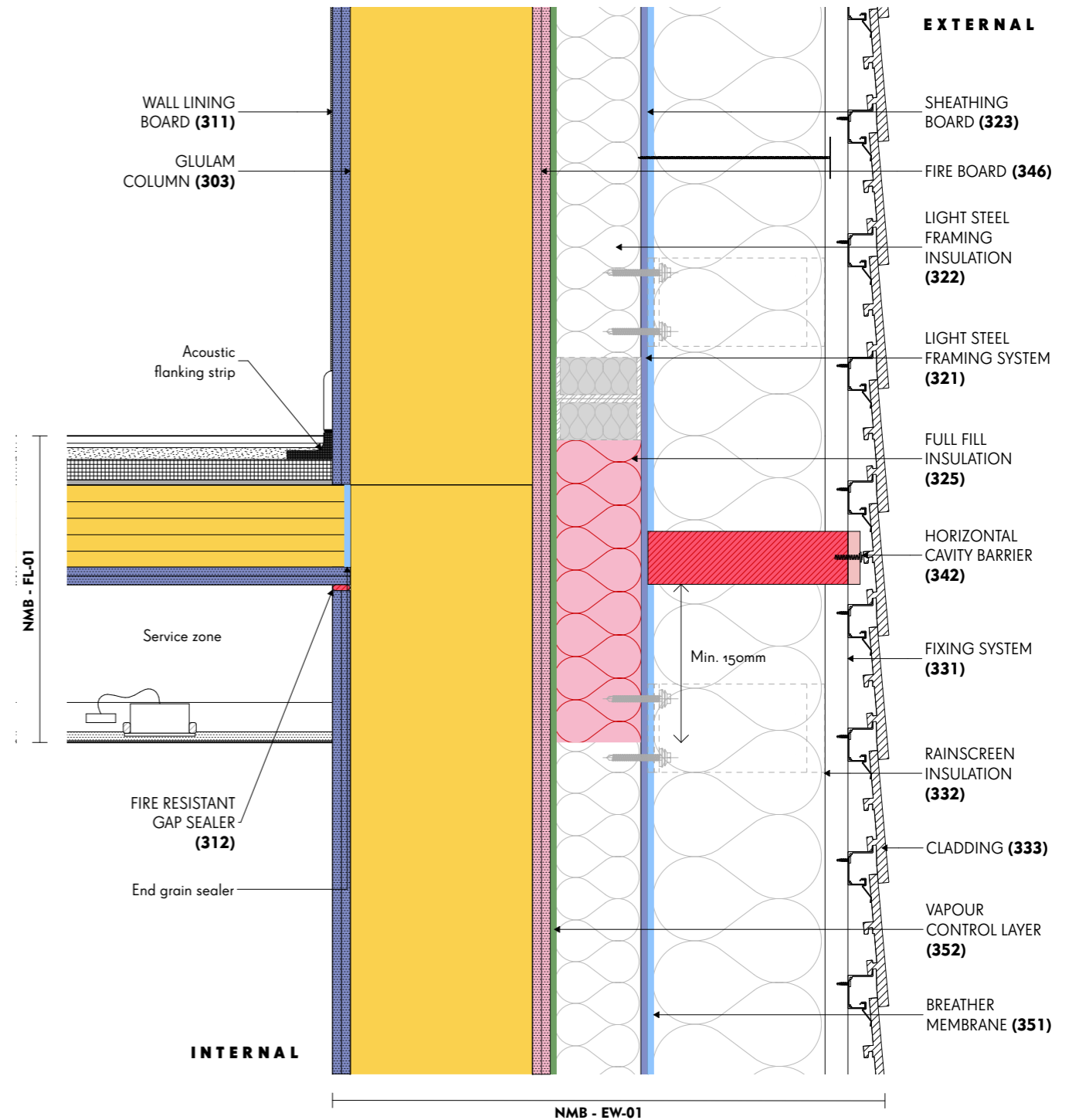


CHECKLIST

Please refer to the performance specification information (p. 108 - 115) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Encapsulation to exterior faces of columns are to be provided with a board suitable for external use. (346)	<input type="checkbox"/>
2	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
3	Ensure the AVCL will be sealed against the engineered timber column and floor slab to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>
4	Encapsulation to column to be installed prior to the internal lining of the external wall. (311)	<input type="checkbox"/>
5	End-grain sealant is to be provided to all slab, column and wall edges. (301&303)	<input type="checkbox"/>
6	Full-fill mineral wool insulation to LSF framing over the party floor. Insulation is to be installed to the ceiling soffit level to allow for visible checking onsite. (325)	<input type="checkbox"/>
7	Plasterboard junctions to be set out so intumescent sealants will not fall out with gravity. (312)	<input type="checkbox"/>
8	Horizontal cavity barrier to be rated for 60 mins. (342)	<input type="checkbox"/>
9	Horizontal cavity barrier to have intumescent specified for the required cladding cavity. (342)	<input type="checkbox"/>

JUNCTION WITH COLUMN SECTION

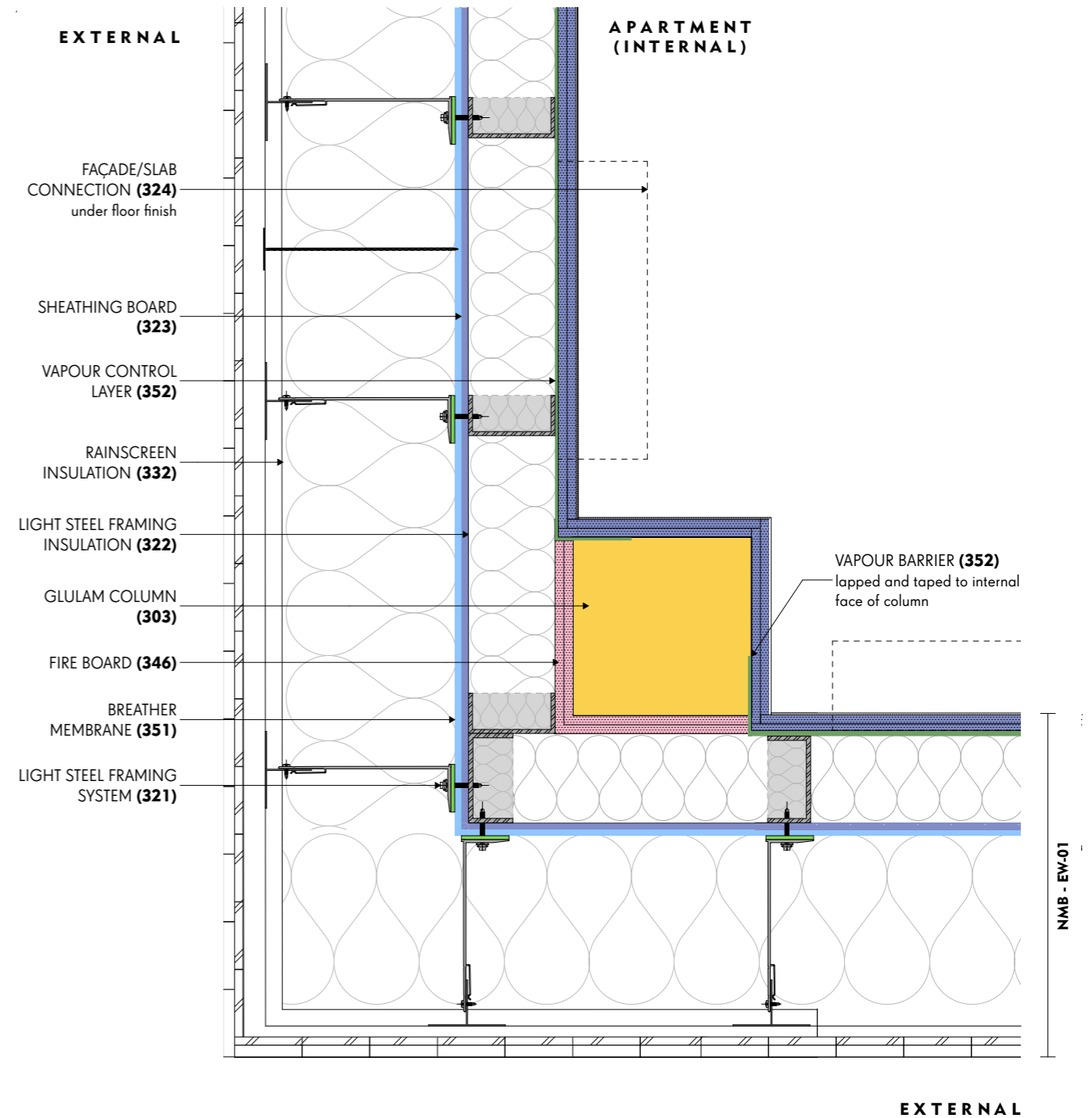


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Encapsulation exterior faces of columns are to be provided with a board suitable for external use. (346)	<input type="checkbox"/>
2	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
3	Encapsulation to column to be installed prior to the internal lining of the external wall. (311)	<input type="checkbox"/>
4	Encapsulation to exterior faces of columns are to be provided with a board suitable for external use. (346)	<input type="checkbox"/>
5	Exterior wall lining and external encapsulation to column define the line of the external wall. (346)	<input type="checkbox"/>
6	End-grain sealant is to be provided to all slab and wall edges. (301)	<input type="checkbox"/>
7	Linear firestop to be provided to wall and slab edge to seal any potential gaps between LSF system and mass timber elements. (341)	<input type="checkbox"/>
8	Intumescent sealants are to be installed at plasterboard junctions.	<input type="checkbox"/>
9	Full-fill mineral wool insulation to LSF framing over party wall junction. Insulation to be installed between vertical studs to prevent insulation from moving.	<input type="checkbox"/>
10	Vertical cavity barrier to be aligned with internal compartmentation and rated for 60 mins.	<input type="checkbox"/>
11	Vertical cavity barrier to be full-fill to the rear of cladding with zero gaps.	<input type="checkbox"/>
12	Ensure the AVCL will be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>

JUNCTION WITH COLUMN PLAN

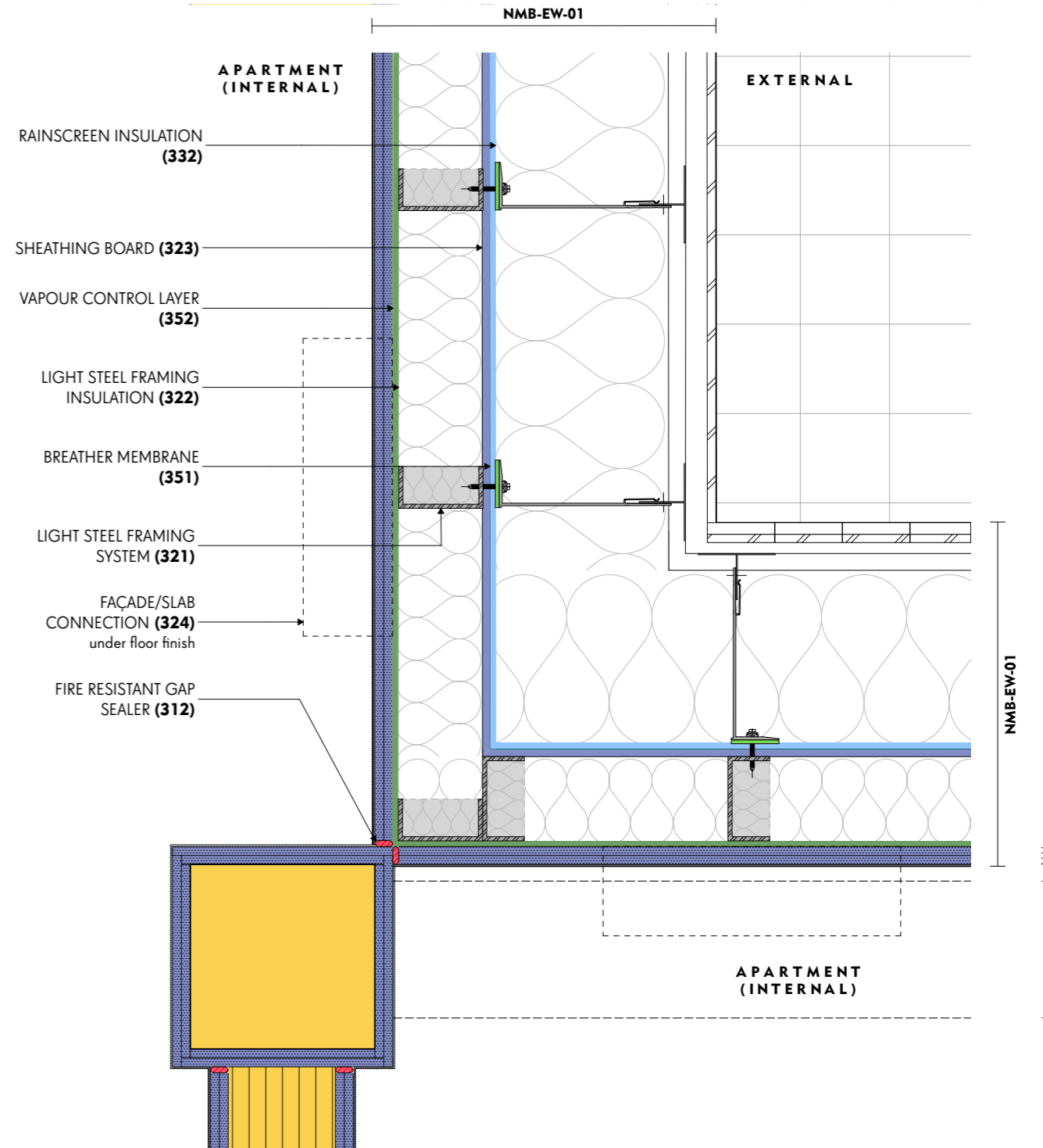


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
2	Encapsulation to column to be installed prior to the internal lining of the external wall. (311)	<input type="checkbox"/>
3	Intumescent sealants are to be installed at plasterboard junctions.	<input type="checkbox"/>
4	Ensure the AVCL will be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>

JUNCTION WITH COLUMN - INTERNAL CORNER PLAN

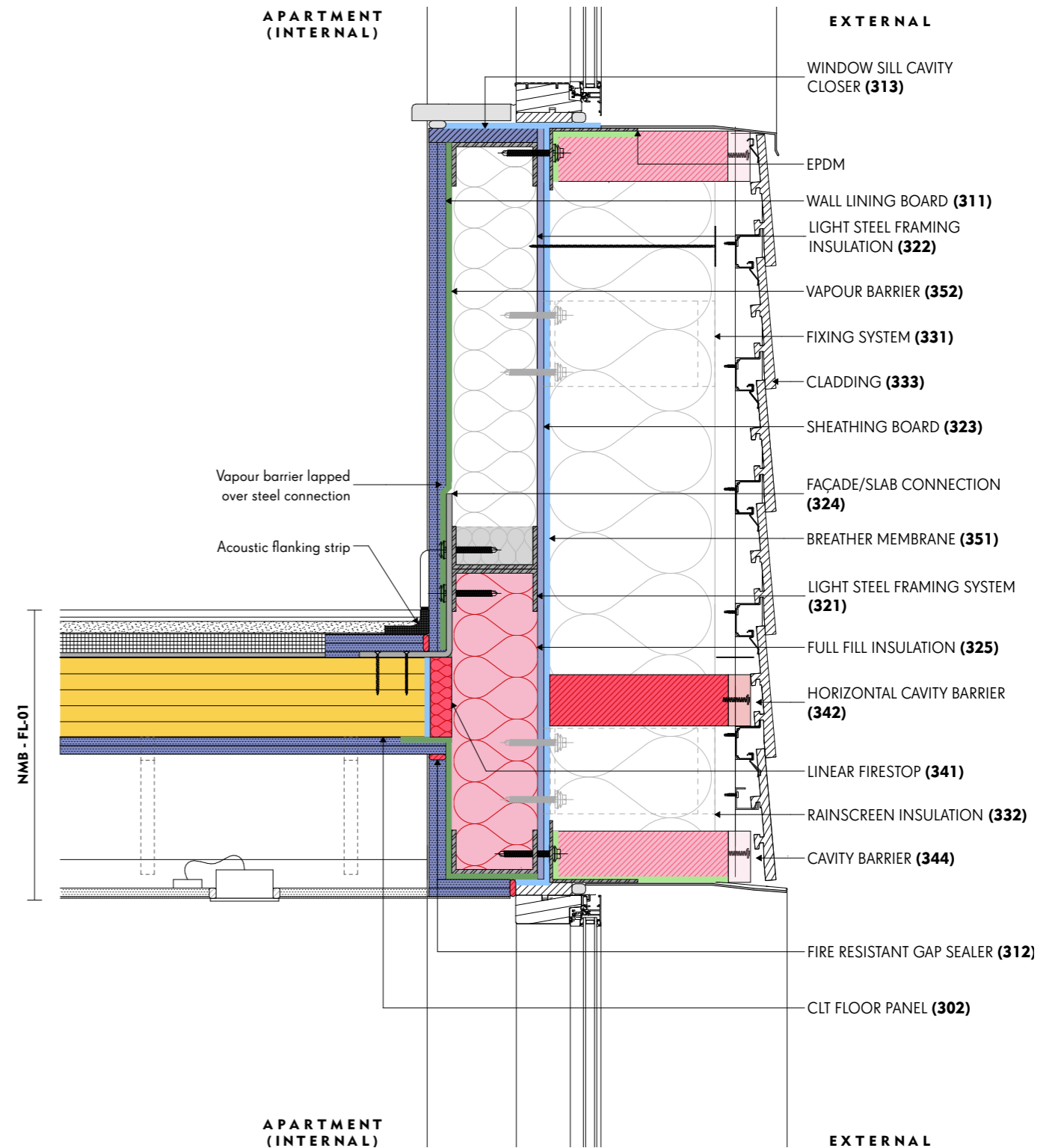


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	60 min rated cavity barriers to be provided to all windows. (344)	<input type="checkbox"/>
2	Water and airtight membrane seal to between window frame and outer face to be installed prior to cavity barrier installation.	<input type="checkbox"/>
3	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
4	End-grain sealant is to be provided to all slab and wall edges. (301)	<input type="checkbox"/>
5	Linear firestop to be provided to wall and slab edge to seal any potential gaps between LSF system and mass timber elements. (341)	<input type="checkbox"/>
6	Full-fill mineral wool insulation to LSF framing over the party floor. Insulation is to be installed to the ceiling soffit level to allow for visible checking onsite. (325)	<input type="checkbox"/>
7	Plasterboard junctions are to be set out so intumescent sealants will not fall out with gravity. (312)	<input type="checkbox"/>
8	Steel fixings into CLT floor slab to be encapsulated. (324)	<input type="checkbox"/>
9	Horizontal cavity barrier to be rated for 60 mins. (342)	<input type="checkbox"/>
10	Horizontal cavity barrier to have intumescent specified for the required cladding cavity. (342)	<input type="checkbox"/>
11	AVCL to be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>

TYPICAL WINDOW SECTION

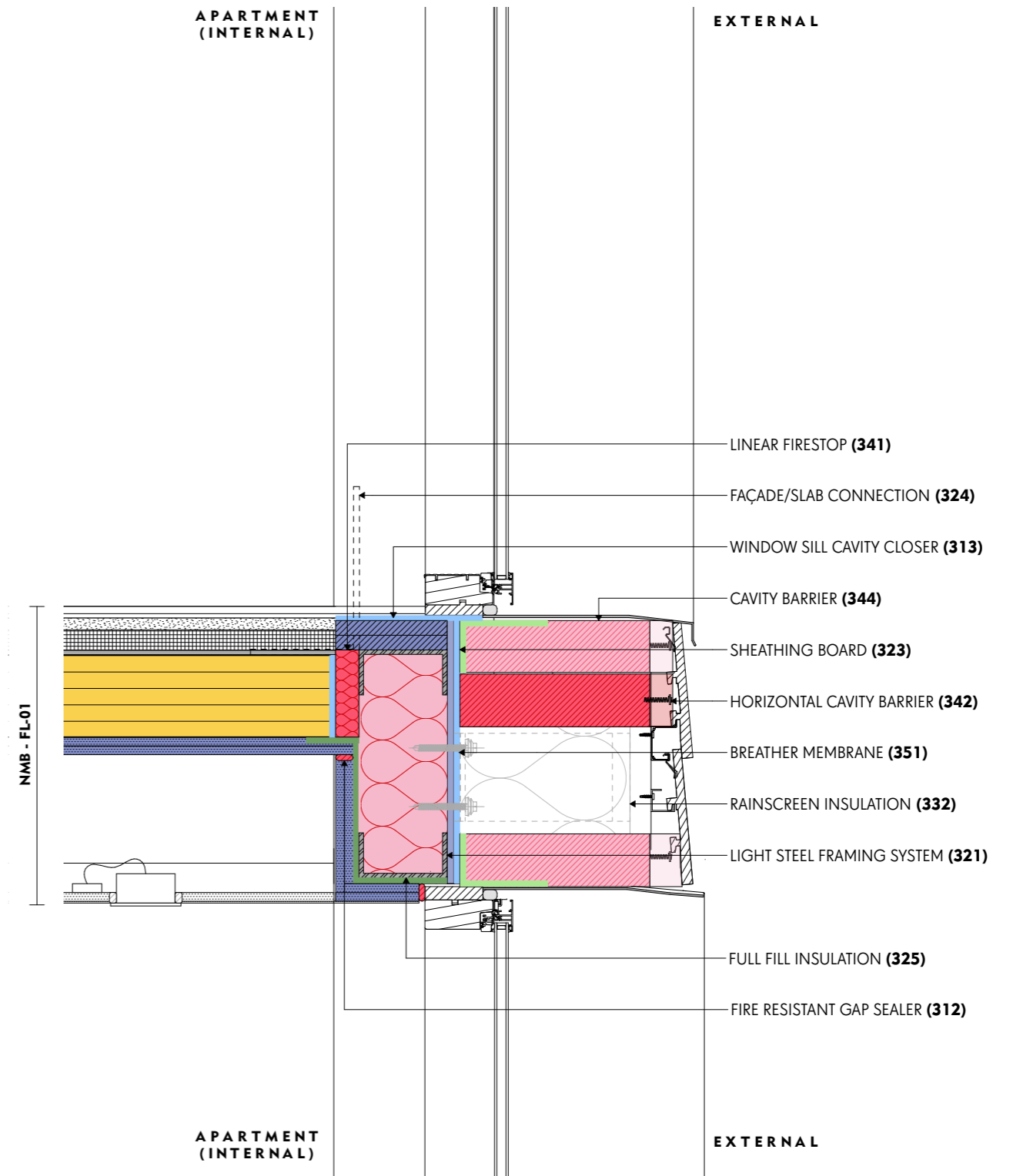


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	60 min rated cavity barriers to be provided to all windows. (344)	<input type="checkbox"/>
2	The cavity barrier to the window to be coordinated with the horizontal compartmentation cavity barrier and cladding fixing system. (342)	<input type="checkbox"/>
3	Water and airtight membrane seal to between window frame and outer face to be installed prior to cavity barrier installation.	<input type="checkbox"/>
4	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
5	End-grain sealant is to be provided to all slab and wall edges. (301)	<input type="checkbox"/>
6	Linear firestop to be provided to wall and slab edge to seal any potential gaps between LSF system and mass timber elements. (341)	<input type="checkbox"/>
7	Full-fill mineral wool insulation to LSF framing over the party floor. Insulation is to be installed to the ceiling soffit level to allow for visible checking onsite. (325)	<input type="checkbox"/>
8	Plasterboard junctions to be set out so intumescent sealants will not fall out with gravity. (312)	<input type="checkbox"/>
9	Steel fixings into CLT floor slab to be encapsulated. (324)	<input type="checkbox"/>
10	Horizontal cavity barrier to be rated for 60 mins. (342)	<input type="checkbox"/>
11	Horizontal cavity barrier to have intumescent specified for the required cladding cavity. (342)	<input type="checkbox"/>
12	AVCL to be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>

FULL HEIGHT WINDOW SECTION

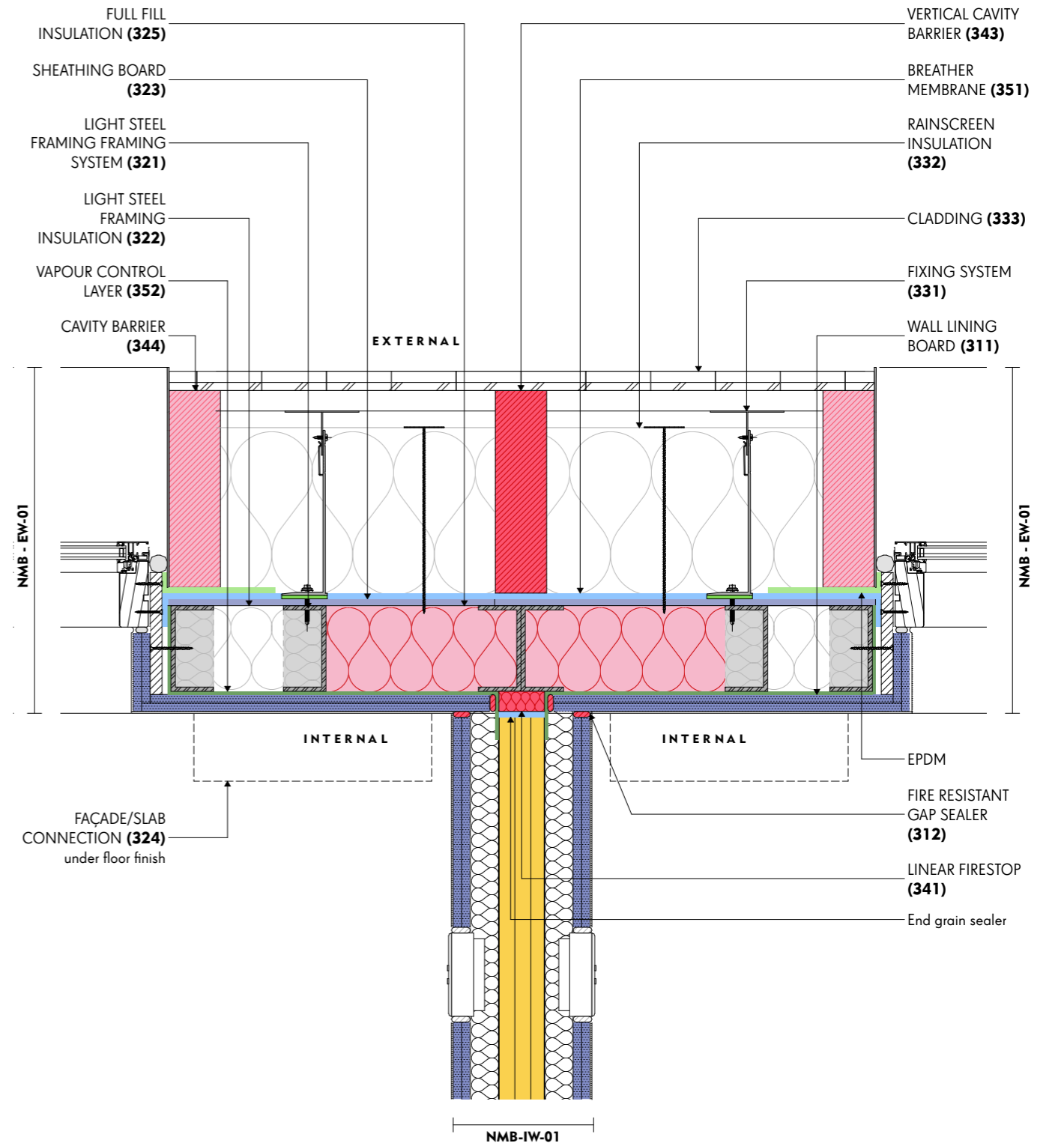


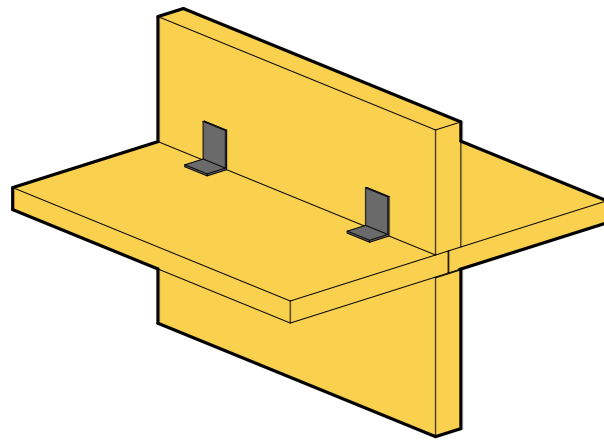
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

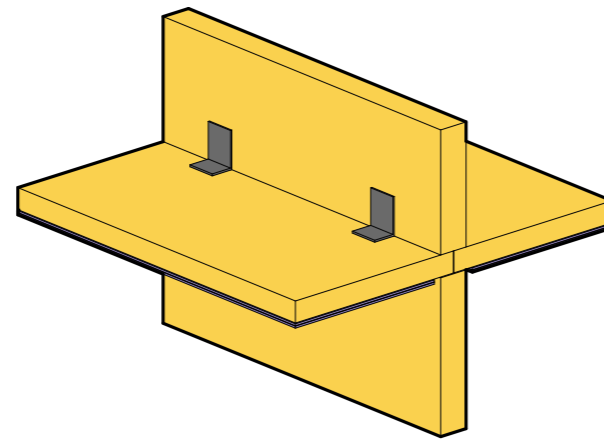
REF	ITEM	
		✓
1	60 min rated cavity barriers to be provided to all windows. (344)	○
2	Water and airtight membrane to seal between window frame and outer face to be installed prior to cavity barrier installation.	○
3	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	○
4	End-grain sealant is to be provided to all slab and wall edges. (301)	○
5	Linear firestop to be provided to wall and slab edge to seal any potential gaps between LSF system and mass timber elements. (341)	○
6	Intumescent sealants are to be installed at plasterboard junctions. (312)	○
7	Full-fill mineral wool insulation to LSF framing over party wall junction. Insulation to be installed between vertical studs to prevent insulation from moving. (325)	○
8	Vertical cavity barrier to be aligned with internal compartmentation and rated for 60 mins. (343)	○
9	Vertical cavity barrier to be full-fill to the rear of cladding with zero gaps. (343)	○
10	Ensure the AVCL will be sealed against the engineered timber to ensure continuous airtightness across the external wall. (352)	○

TYPICAL WINDOW PLAN

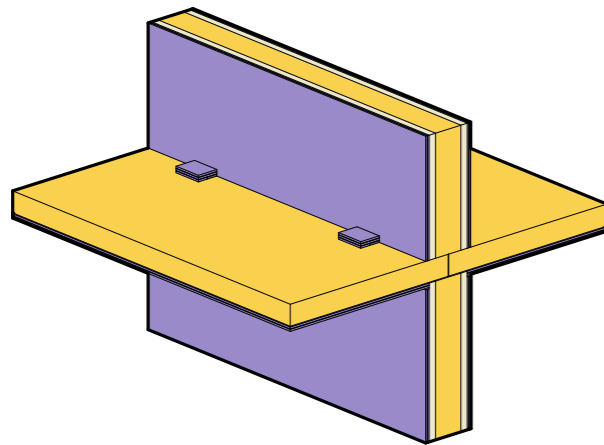




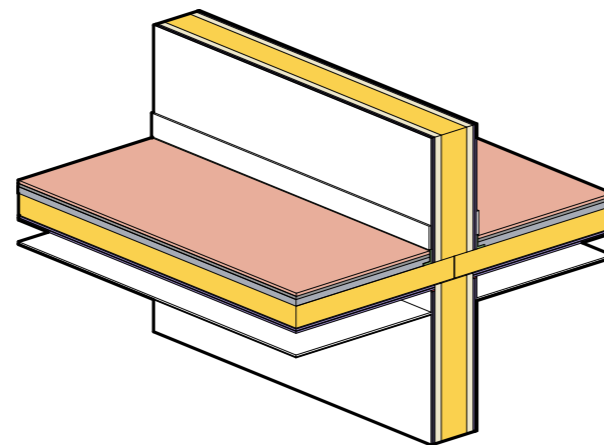
1. Install mass timber elements and tape joints



2. Install K2 lining to soffits; install first fix services



3. Install K2 lining to walls



3. Install finishes to walls and false ceiling if required

INTERNAL STRUCTURE

GENERAL APPROACH

The New Model Building uses a combination of internal load-bearing walls, floors, columns and beams constructed from engineered timber. These are fully encapsulated with gypsum board applied to achieve K2-60 classification with a maximum temperature limit of 200 degrees C. All structural timber elements to achieve REI 60 classification in accordance with BS EN 13501-2.

The encapsulation is fixed directly to the soffit before services are installed. This is to provide a robust layer of fire protection to the CLT slab. Light fittings and services must be installed in a suspended ceiling so they do not impact the performance of the encapsulation.

Test data from plasterboard manufacturers demonstrates that wall penetrations such as sockets do not affect the performance of the encapsulation, therefore encapsulation to timber walls and columns can be installed with a service void behind.

The designer must ensure all internal load-bearing walls, floors, columns and beams meet the relevant codes and standards.

ENGINEERED TIMBER PERFORMANCE CRITERIA

General performance criteria for engineered timber can be found in TRADA's National Structural Timber Specification for Building Construction Version 2.0.

Further guidance and requirements can be found in the following documents:

- Minimum dimensions of timber sections: In accordance with BS EN 1995-1-1.
- Vibration performance: In accordance with BS 6472-1.
- Design life: In accordance with BS EN 1990:Category 4.
- Wood preservation: DIN 68800
- Procurement: CLT should be obtained from well-managed forests and/or plantations in accordance with PEFC or FSC accreditation schemes.

Use timber products only within the limits recommended by their manufacturer. Do not use timber products that are damaged or apparently defective.

FABRICATION TOLERANCES FOR ENGINEERED TIMBER

- Nominal dimensions of materials: The Harmonised Technical Specifications lists tolerances of nominal dimensions of timber products.
- Dimensions of elements: Table 2 in prEN 14732 Timber structures. Structural prefabricated wall, floor and roof elements. Requirements lists production tolerances of elements and openings.

ENGINEERED TIMBER ERECTION

Setting-out

Setting-out the building in accordance with BS 5964-1. Building setting out and measurement. Methods of measuring, planning and organisation and acceptance criteria. Measure any deviations relative to this system.

Handling and storage

Handle and store components safely and in a manner that minimises the risk of damage. Follow the method of handling and storage in the erection method statement.

Alignment of the structure

Align each part of the timber structure and stair within tolerances as soon as practicable after it has been erected. Do not make permanent connections between panels or elements until a sufficient amount of the structure or stair has been aligned, levelled, plumbed and temporarily connected to ensure that components will not be displaced during subsequent erection or alignment of the remainder of the structure or stair.

Take due account of the effects of temperature on the structure/stair and on tapes and instruments when measurements are made for setting out, during erection, and for subsequent dimensional checks. The reference temperature is 20°C.

Connections

Make permanent connections as work progresses to ensure that the structure remains correctly aligned, levelled and plumbed.

Damaged components

Assemble the structure in such a way that over-stressing of its members or connections is avoided. Replace members which are warped, split or badly fitting at the joints.

INTERNAL STRUCTURE

Remedial works

Employer to obtain the structural engineer's and architect's acceptance of remedial work.

If it is unacceptable to perform remedial work on site, modify or replace defective components before dispatch to site.

LININGS AND FINISHES

Internal load-bearing walls should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a maximum temperature limit of 200 degrees C.

STA publication Vol 6 Fire Safety; Section 2.6.2 Encapsulation advocates a limiting temperature behind the inner lining of 200°C. The New Model Building performance specification for plasterboard reflects this requirement.

For minimum specification requirements as defined by the New Model Building design, refer to (310) in Fire Performance Specification.

TIMBER PRESERVATION

Preservation against moisture

The structural timber frame must be protected from moisture during construction and throughout the building's life.

Moisture management in design, during construction and during the life of the building is described in the Design Philosophy Document within the Evidence document.

MOISTURE PROTECTION OF STRUCTURAL TIMBER

Once timber products absorb water above the intended in-service moisture content, then loss of strength, dimensional changes and a higher likelihood of decay will occur. Different structural timber products and species behave differently.

The designer should consider how to reduce the risk of damage from moisture through all project stages. Early consideration of how to minimise moisture damage while the building is in use can reduce the likelihood and severity of leaks and related damage.

DETAILING, DURABILITY, STRUCTURAL INTEGRITY AND ROBUSTNESS

The NMB approach has been developed based on the following assumptions on detailing:

- All timber elements are kept within a Service Class 1 environment throughout their life (Dry and heated)
- No external timber or timbers at risk of wetting (service class 2 or 3)
- All ground floor perimeter timber walls/columns are to be stopped a minimum 150mm above the external ground level.
- All internal timber walls and columns to separate from the supporting slab/foundation with an appropriate DPC layer in accordance with NHBC TG No: 6.3/03

MOISTURE MANAGEMENT THROUGH DESIGN

During the design process, designers must pay careful attention to the detailing of areas at highest risk of leaks/moisture damage, such as: roofs; 'wet' areas with active plumbing fixtures; areas in contact with the ground floor slab and connections and fixings. Protection from moisture can be provided through a range of measures, from careful detailing and preventive designs to including practical measures for leak detection such as automatic cut-off valves. A vapour control layer must be provided to all walls and ceilings unless condensation risk analysis shows it is not required.

Further information can be found regarding roofs, ground floor details and penetrations in their respective sections.

INTERNAL STRUCTURE

'WET' AREAS

The design team should identify all areas in the building with active plumbing fixtures or appliances. Typically, these include bathrooms and kitchens, but also additional areas such as utility cupboards, cleaning facilities and cycle/refuse stores.

Protection and risk reduction strategies need to be implemented in all identified wet areas, some possible mitigations measures are outlined below:

Localised timber joist construction : Install a timber joisted floor locally throughout the wet area. This reduces the risk of structural damage, improves drying times and allows for simplified remediation if needed.

Or at least two of the following strategies should be adopted to ensure the use of timber is kept within Service Class 1:

Tanking membrane : Install a tanking membrane to a minimum of 1200mm AFFL throughout the wet area with a full height tanking membrane applied to areas of heavy exposure such as showers and baths. Additional protection can be provided by linking the tanking membrane to a gully that connects with the main waterproofing line e.g., tiles and grout with sanitary fixtures and bathroom furniture installed above. This mitigates the risk of water damage should a tap or pipe leak or an element overflow.

System leak detection monitor : A 'smart' leak detection monitor should be installed to the mains water connection, monitoring the building's water flow and pressure. A valve associated with the monitor will automatically shut off the supply should a leak be detected to reduce consequential damage. Leak detection to be in accordance with BS EN 13160-1:2016 Leak detection systems.

Local leak detection system : A 'smart' leak detection needs to be installed in all high risk locations, such as under/near plumbing fixtures. When water or high humidity occurs, sensors set off a physical alarm or trigger an alert sent via WiFi to the building management system. Detectors connected to mains power with battery back up must be used to ensure continuity of protection. Leak detection to be in accordance with BS EN 13160-1:2016 Leak detection systems.

Ventilation zone : Provide provision for a 50mm ventilation zone to allow any moist timber to dry out.

Preservative treatment : Apply a service class 2 treatment to WPA guidance. Timber elements can be factory treated or treatment can be site applied. Information on treatment needs to be sent and confirmed with NHBC prior to application and installation.

MOISTURE MANAGEMENT DURING CONSTRUCTION

When designers/developers submit an application to NHBC using the New Model Building Philosophy they must incorporate a Risk Assessment and Method Statement (RAMS) to outline the design, methods, and requirements for protecting the system from weather exposure and mechanical damage during storage, transportation and installation.

Engineered timber is vulnerable to moisture damage during construction from several sources: precipitation, humidity, ambient sources, and mechanical, plumbing and fire protection. The project team must ensure that as part of the RAMS an on-site moisture management control plan (MMCP) is provided before construction, for use during fabrication, delivery to site, erection and delivery phases. MMCPs must be specific to the project. MMCPs must be developed in conjunction with the timber supplier and project engineer.

Refer to the following guidance for details of what should be included in an MMCP:

- TRADA's National Structural Timber Specification, Section 4.7: Moisture Content Control Plan
- Swedish Wood/TDUKs Moisture-proof CLT construction without a full temporary shelter Edition 1:2022
- STA Moisture management strategy, process guidance for structural timber buildings, Version 1.0, July 2022
- STA Technical Note 23 - Durability by design – mass timber structures – STA 2021-<https://members.structuraltimber.co.uk/get-download/16129>
- STA Technical Note 24 - Moisture protection during construction

The MMCP should include moisture management statements that will include but not be limited to a methodology for the following, where relevant:

- Removing free water and snow immediately e.g. by brushing or hoovering water off the timber
- The design of temporary weather protection to avoid the risk of standing water on tops of volumetric units.
- Specification of sheeting for damp-proofing must be breathable. Membranes must be specified to ensure they are fit for purpose and achieve compliance with NHBC Technical Requirement R4 c) iii) proper protection during storage and v) protection against weather during construction (including excessive heat, cold, wetting or drying)
- A statement on the maximum duration that temporary water protection measures can be applied. Exposure time limits for protection materials e.g. unit wrappings, breather membranes, roof membranes shall be controlled for both external storage and following installation until permanent claddings are installed.

INTERNAL STRUCTURE

- Details of any temporary openings that may be required in the protection layers e.g. for lifting installation/connection of units.
- How water can escape and how ventilation can be implemented in conjunction with regular quality assurance checks.
- CLT elements with high moisture content must dry out, moisture checks must be conducted on an ongoing basis. The surface moisture content should be no more than 18 % prior to enclosure.
- Damp-proofing of end-grain wood, element joints and connections.
- The process for ensuring the continuity of temporary weathering post installation and quality assurance checks.
- How seals between units and sealing around lifting points are installed.
- The choice of protection materials shall be suitable for use in cold or wet conditions.
- Ensure UV exposure of protective membranes does not cause degradation

ON-SITE MOISTURE MEASUREMENTS

The expected moisture content of mass timber in the finished building is in the range of 14-18%. The moisture content of engineered timber elements must be recorded in an on-site moisture monitoring document. This must include a matrix of components and their target moisture contents at key milestones. Most notably during the build and particularly before the components is covered.

Refer to BM Trada's WIS 4-14 Moisture in timber and BS EN 13183-2:2002 for further information on moisture measurement and Swedish Wood/TDUKs Moisture-proof CLT construction without a full temporary shelter Edition 1:2022 for instruction on the type of moisture probes to use and how to use them.

TIMBER INSTALLATION PROGRAMME AND CRITICAL FOLLOW-ON TRADES

The construction programme should ensure engineered timber is covered as soon as installation is complete. The contractor should allow for the provision of interim protection should any unforeseen changes to the programme occur, such as delays to follow-on subcontractor packages or the completion of engineered timber installation ahead of programme.

TEMPORARY PROTECTION CONSIDERATIONS

The timber structure should be protected from moisture caused by adverse weather conditions. The MMCP should specify the type of protection chosen for the building phase and an estimate on the necessary protection duration. Options for protection include:

- Providing a high level temporary shelter that covers all exposed timber
- Applying a temporary waterproofing membrane to the engineered timber prior to installation suitable to protect for short periods of time. Base protection should be lapped up one side only to allow moisture to drain. Note, temporary membranes do not preclude the need for testing elements for moisture content during construction.
- Loose laid sheeting protection can be used for short periods of time to provide interim protection, for example overnight protection while installing a roofing membrane, however it is not a suitable measure for longer durations as can cause moisture to build underneath.
- Providing solutions for water to naturally drain and avoid ponding due to deflection and removing standing water.
- Ensuring all areas are allowed to dry and moisture content to return to below 18% before works continue and made weather tight.

END GRAIN PROTECTION

The end grain of engineered timber can be vulnerable to moisture damage. Applying a coloured end grain sealer to all cut openings and penetrations protects from moisture ingress:

- Apply a coloured end-grain sealer to end grain surfaces of engineered timber before delivery to site.
- When on site, apply additional coloured end grain sealer to prevent the ingress of water into engineered timber products that will be exposed in the permanent works. Areas of application include: bases of all wall panels at all levels and external ends of floor and roof panels.
- Apply the end grain sealer at the ends of the elements and continue along the adjacent face by at least 50mm.
- Further protection is provided through taping joints with waterproofing/air tightness tape to prevent water from tracking to unprotected end grain.

INTERNAL STRUCTURE

MOISTURE MANAGEMENT POST COMPLETION

Occupants must be aware of the risks and seek assistance if any leaks or damage from moisture is found. In most cases if moisture is discovered early and is allowed to dry out, the timber will be undamaged.

REMEDIATION STRATEGY

If engineered timber is found to have been exposed to moisture, the affected area should be assessed to determine the extent of any damage and a suitable remediation strategy. The assessment should consider the following:

- Total area of engineered timber exposed to moisture
- How long the engineered timber has been exposed to moisture
- Depth of moisture exposure to the engineered timber elements
- Presence of mould or decay to the engineered timber
- Ability to dry the affected area, including factors such as site access, exposure, reliance on secondary contractors etc.

In many cases, allowing the timber to dry to a moisture content of <20% will be sufficient and the engineered timber will not need to be replaced, however if the assessment recommends repair or replacement, this work should be carried out by a contractor familiar with the material. Methods for this will depend on the extent of the damage, but will typically include:

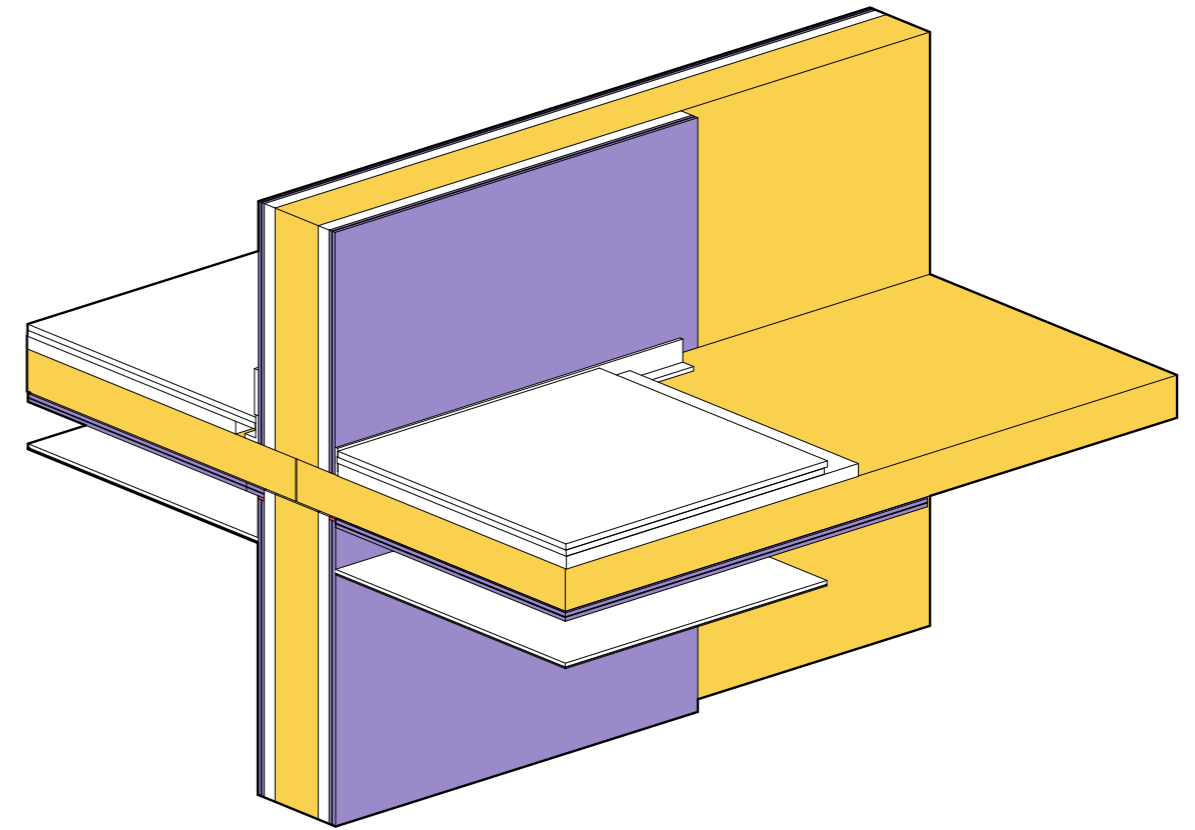
- Surface lamella damage: rout and infill with locally supplied plywood or chipboard with a suitable structural assessment.
- Multi-lamella damage: rout and infill with locally supplied plywood or CLT panel board with a suitable structural assessment.
- Large scale multi-lamella damage: partial or full panel replacement with a suitable structural assessment.

GENERAL CHECKLIST

The below principles should be applied to all details.

REF	ITEM	<input checked="" type="checkbox"/>
1	Internal load-bearing walls should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C.	<input type="checkbox"/>
2	Vibration for floors should be assessed and designed out in accordance with UK NA to BS EN 1995.	<input type="checkbox"/>
3	Fire test data should also be provided to demonstrate REI 60 performance of the encapsulation system.	<input type="checkbox"/>
4	If the site is located in an area with a high risk of House Longhorn Beetles and additional measures are required in accordance with Approved Document A, then a preservative such as - Imprägnierung Klasse 2 zum Schutz vor Pilz- und Insektenbefall entsprechend DIN 68800 should be applied to the timber.	<input type="checkbox"/>
5	Frame to be designed in accordance with performance criteria for engineered timber to TRADA's National Structural Timber Specification for Building Construction Version 2.0.	<input type="checkbox"/>
6	Timber must be sourced from well-managed forests and/or plantations in accordance with PEFC or FSC accreditation schemes.	<input type="checkbox"/>
7	Basis of loadings and their combinations as defined in the UK by NA to BS EN 1990 and BS EN 1991.	<input type="checkbox"/>
8	The timber structure should be designed and detailed to provide sufficient robustness against disproportionate collapse in accordance with the Building Regulations Part A.	<input type="checkbox"/>
9	Demonstrate moisture protection during construction.	<input type="checkbox"/>
10	Demonstrate moisture protection methods during the use of the building.	<input type="checkbox"/>
11	Provide at least two methods of protection and risk reduction strategies to all identified wet areas.	<input type="checkbox"/>
12	The designer must ensure each element of the internal load bearing walls, floors, columns and beams meets the relevant codes and standards.	<input type="checkbox"/>
13	End grain sealant to all penetrations and edges of element.	<input type="checkbox"/>
14	Acoustic performance is project specific. Designers must therefore ensure that the floor meets the applicable British Standards and local planning guidance on acoustic performance.	<input type="checkbox"/>

OVERVIEW



DESCRIPTION

- Mass timber primary structure
- K2 REI 60 Encapsulation to timber

KEY DETAILS

Core junction with floor

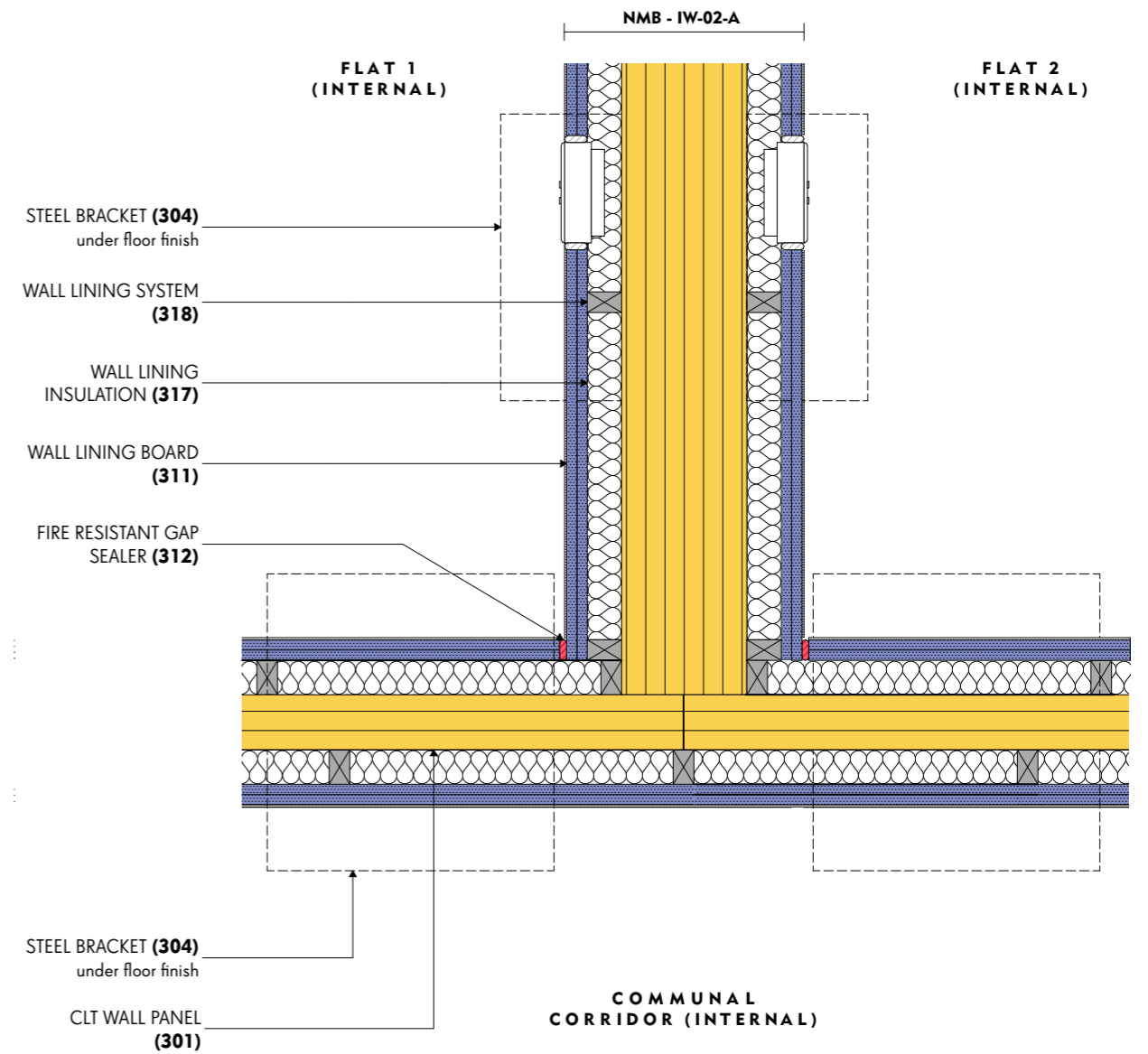
P. 57 - 59

CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Internal load-bearing walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C (311).	<input type="checkbox"/>
2	Design team to establish acoustic requirements and provide evidence of wall and floor performance.	<input type="checkbox"/>
3	The size and location of voids and insulation (317) used to provide service zones and meet acoustic requirements must be in accordance with K2-60 encapsulation limitations.	<input type="checkbox"/>
4	Encapsulation must be continuous. If fixing brackets (304) cause obstructions these must be over boarded with encapsulation. Recessed brackets can be used to simplify encapsulation installation.	<input type="checkbox"/>
5	Intumescent sealants are to be installed at plasterboard junctions (312).	<input type="checkbox"/>
6	Sockets can be surface mounted or recessed using REI 60 tested back boxes in accordance with plasterboard manufacturer details.	<input type="checkbox"/>

CORE JUNCTION WITH FLOOR PLAN

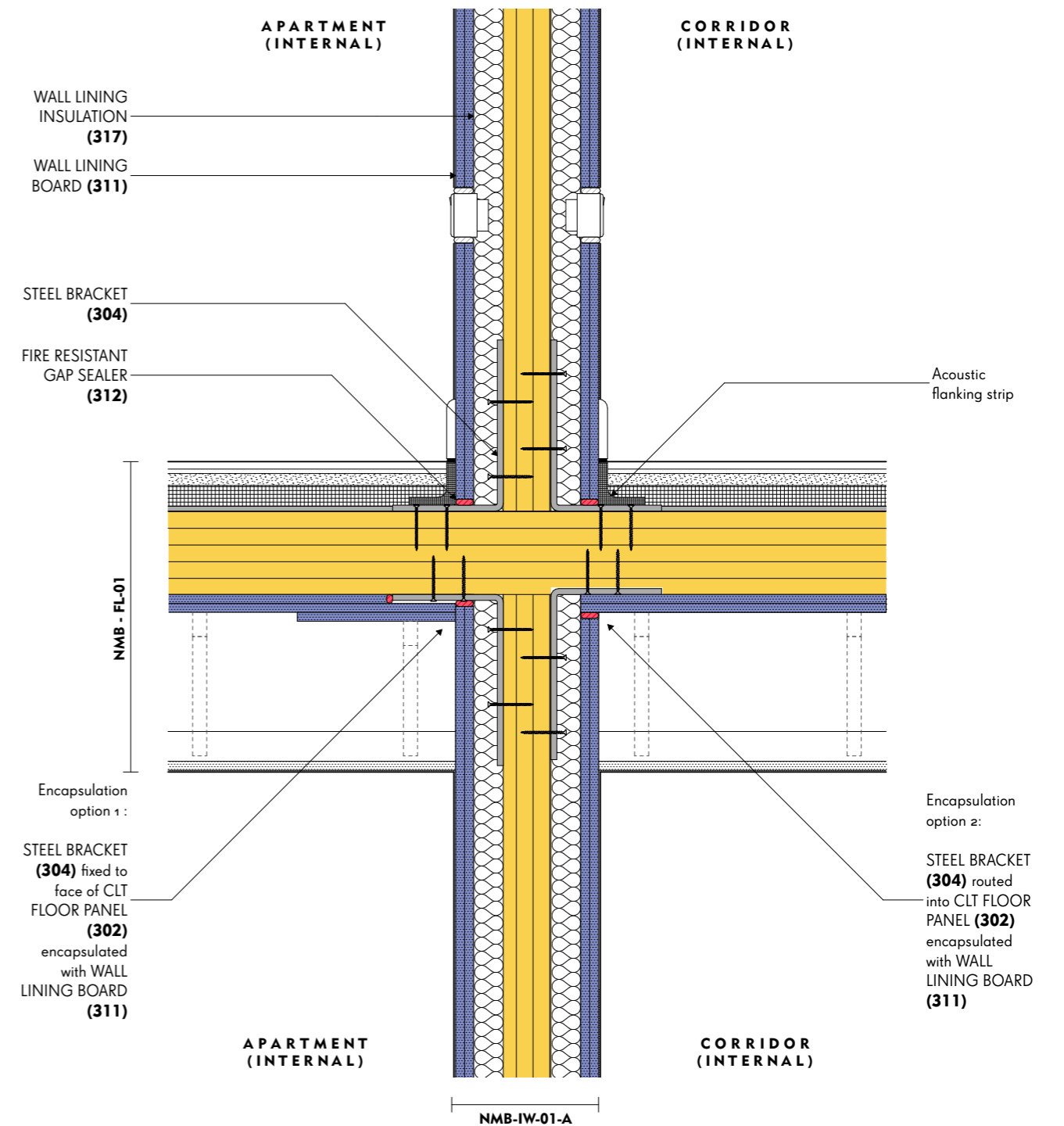


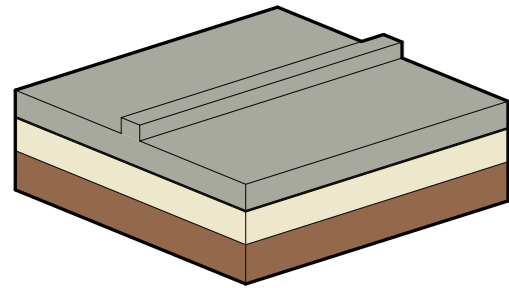
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

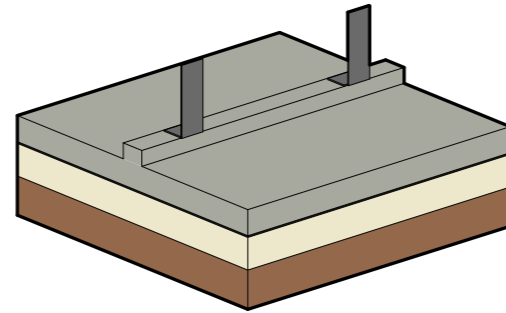
REF	ITEM	<input checked="" type="checkbox"/>
1	Internal load-bearing timber walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C (311).	<input type="checkbox"/>
2	Soffit to all floor slabs (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a maximum limit temperature of 200 degrees C (311).	<input type="checkbox"/>
3	Design team to establish project acoustic requirements and provide evidence of wall and floor construction.	<input type="checkbox"/>
4	The size and location of voids and insulation (317) used to provide service zones and meet acoustic requirements must be in accordance with K2-60 encapsulation limitations.	<input type="checkbox"/>
5	Encapsulation must be continuous. If fixing brackets (304) causes obstructions these must be over boarded with encapsulation. Recessed brackets can be used to simplify encapsulation installation.	<input type="checkbox"/>
6	Plasterboard junctions are to be set out so intumescent sealants will not fall out with gravity (312).	<input type="checkbox"/>
7	Sockets can be surface mounted or recessed using REI 60 tested back boxes in accordance with plasterboard manufacturer details.	<input type="checkbox"/>

CORE JUNCTION WITH FLOOR SECTION

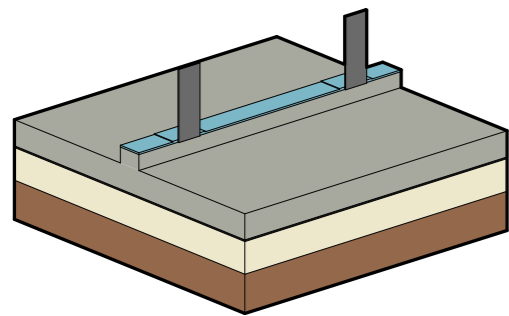




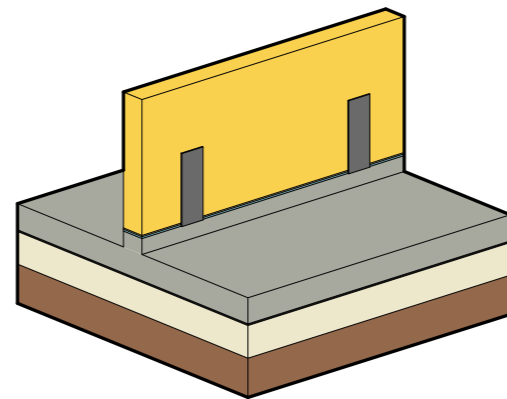
1. Install ground floor slab and internal upstands



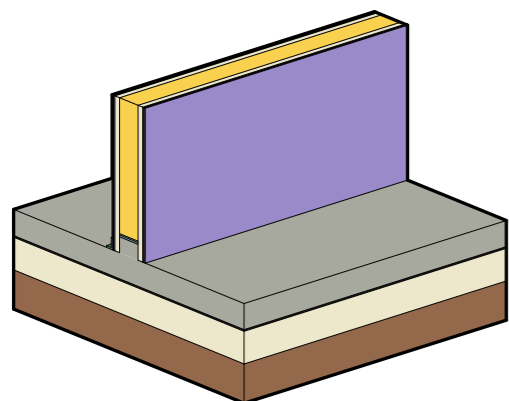
2. Install fixing brackets



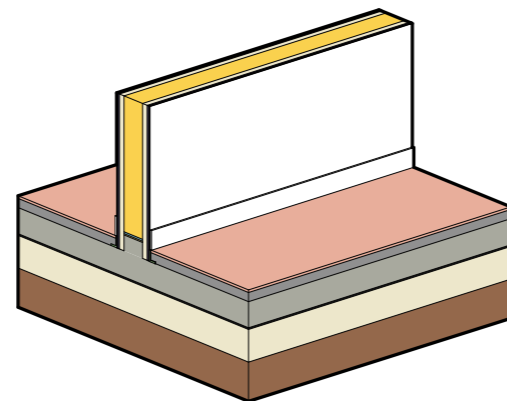
3. Install DPC to upstand



4. Install mass timber elements with end grain sealant pre-applied to the base if the element



5. Install K2 encapsulation to timber elements



6. Install floor and wall finishes

GROUND SLAB

GENERAL APPROACH

The interface with the ground floor slab is a high risk area in all buildings regardless of the material used for the superstructure. Particular attention needs to be paid where mass timber meets the ground. The New Model Building addresses the key risk details at the base of an external wall and the base of an internal structural timber element.

EXTERNAL WALL INTERFACE

The external wall interface with the ground must provide a robust barrier to prevent moisture from entering the building. The New Model Building system does not permit timber to be installed as part of the external wall system, therefore this detail needs to satisfy all of NHBC's standard technical requirements which include:

- All framing elements are required to sit on an upstand with a minimum of 150mm above external ground level.
- External ground should fall away from the property with sufficient perimeter drainage.

INTERNAL STRUCTURE INTERFACE

Where engineered timber internal load bearing walls or columns are in contact with the ground floor slab the bottom of the timber must be on or above the internal finished floor level on a brick, block, or concrete upstand to prevent undetected moisture building up underneath floor finishes and affecting the timber. A DPC and end grain sealant must be installed to prevent moisture from wicking into the timber.

Note: end grain sealers are not waterproof and do not prevent timber from absorbing moisture, they merely slow the process, elevating timber to above finished floor level reduces the risk of the timber coming into contact with moisture.

SEQUENCING

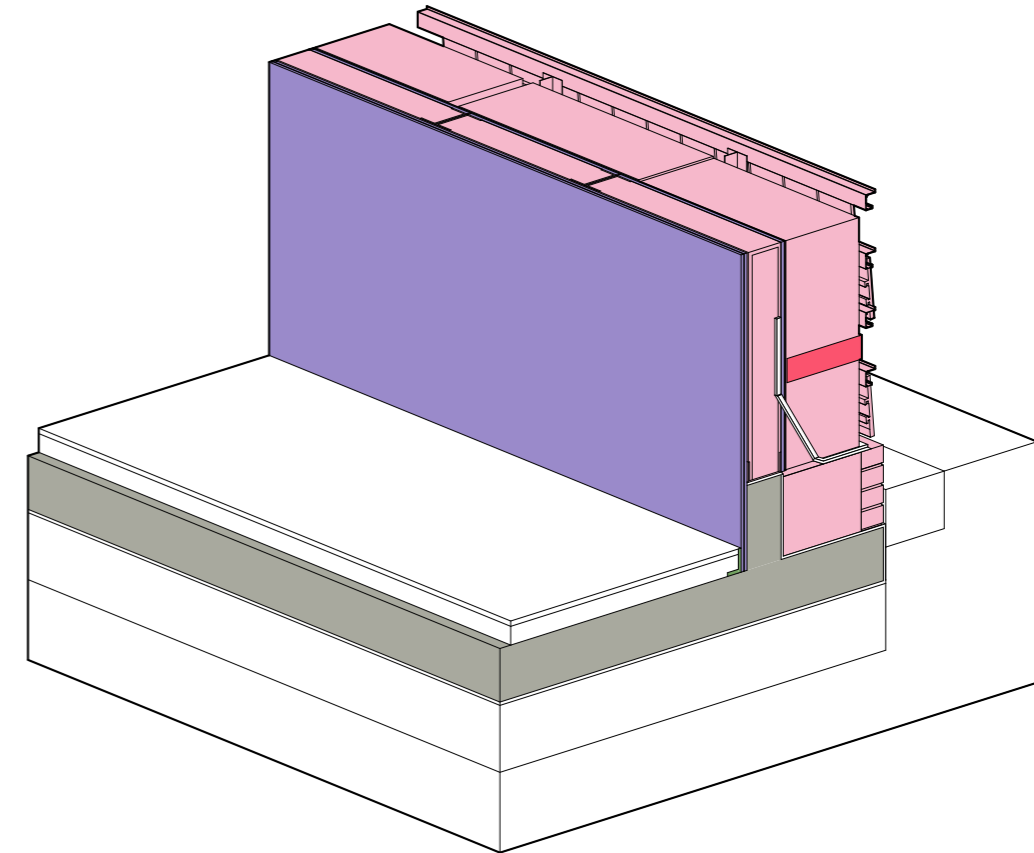
The principles for installing an upstand and connecting a mass timber element to the ground floor slab have been illustrated in the details and sequencing diagrams.

GENERAL CHECKLIST

The below principles should be applied to all details.

REF	ITEM	<input checked="" type="checkbox"/>
EXTERNAL		
1	Ensure all elements in the external wall are of A2-s1,-d or better in accordance with BS EN 13501 unless excluded via Regulation 7(3).	<input type="checkbox"/>
2	External wall elements to use a non-load bearing continuous LSF system supported from the top of the floor slab above and sit on a continuous upstand.	<input type="checkbox"/>
3	All external wall construction to have a minimum upstand height of 150mm above external ground level.	<input type="checkbox"/>
4	DPM waterproofing membrane to form a continuous waterproofing barrier and be connected to the DPC to the top of the upstand.	<input type="checkbox"/>
5	All joints and penetrations in the DPM should be lapped and taped in accordance with the manufacturer's guidance.	<input type="checkbox"/>
6	Localised drainage provided to all level access thresholds to NHBC requirements.	<input type="checkbox"/>
7	Provide fire test data of external wall construction showing REI 60 from outside and inside.	<input type="checkbox"/>
8	External cladding system to use a ventilated cavity.	<input type="checkbox"/>
9	Close all cavities at the top and bottom of walls, around openings and penetrations, and at separating walls and floors.	<input type="checkbox"/>
10	Cladding specification - to a height of 1.5m above ground - will need to be suitable for Use Class A (publicly accessible, vandal prone) or B (not vandal prone) and meet the requirements of NHBC Technical Standards 2023 and BS 8200:1985 Code of Practice.	<input type="checkbox"/>
INTERNAL		
11	Where engineered timber internal load bearing walls or columns are in contact with the ground floor slab the bottom of the timber must be at or above the internal finished floor level on a brick, block or concrete upstand.	<input type="checkbox"/>
12	DPC to be installed to upstand and end grain sealant applied to the end of all timber elements. (301&303)	<input type="checkbox"/>

OVERVIEW



DESCRIPTION

<input type="checkbox"/>	Ground floor slab and upstand	<input type="checkbox"/>	A2-s1,d0 Non-loadbearing external wall construction
<input type="checkbox"/>	K2 REI 60 Encapsulation to timber	<input type="checkbox"/>	Fire cavity barriers

KEY DETAILS

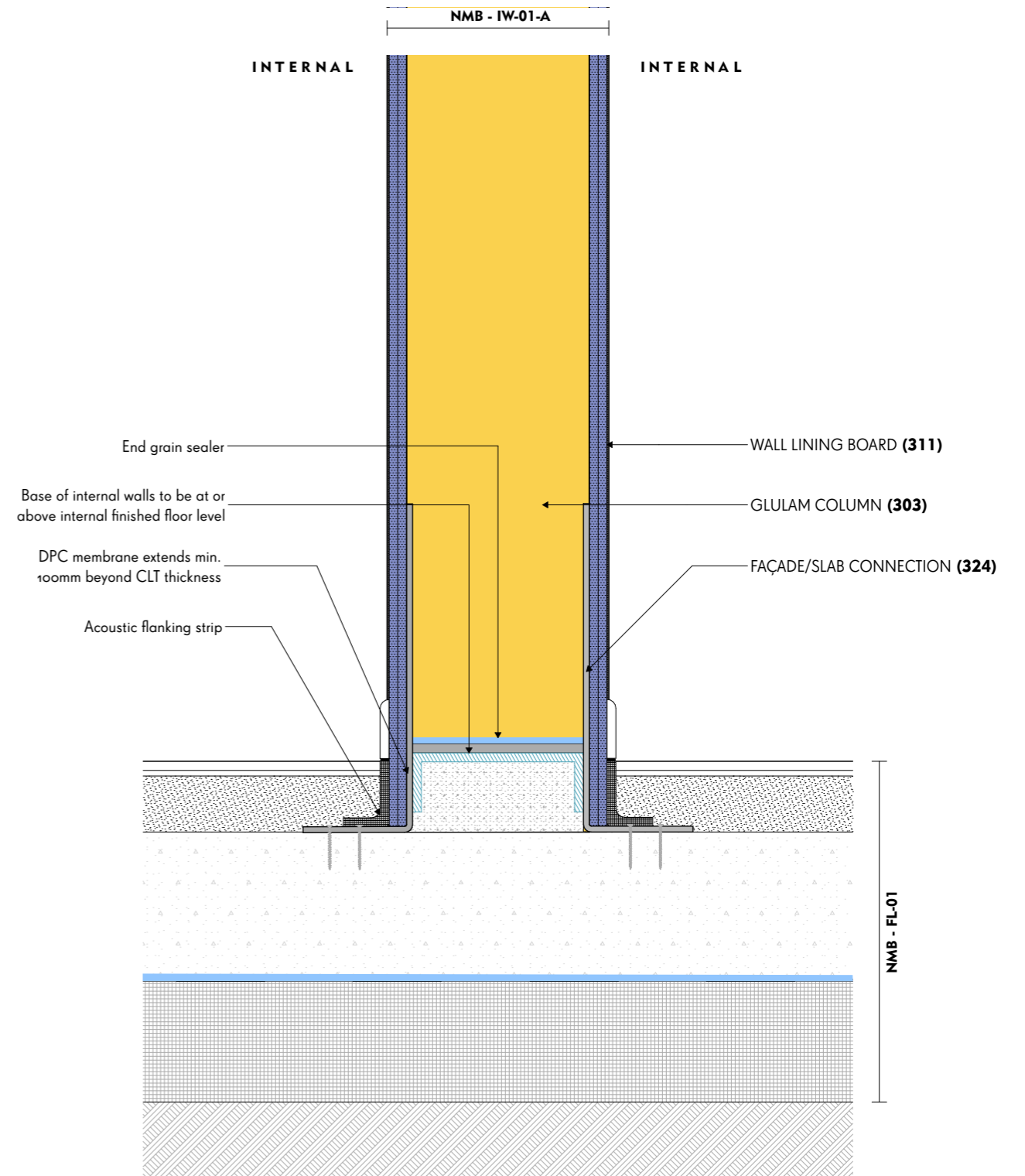
Junction with glulam column	p. 65
Junction with CLT wall	p. 67
Junction with external wall	p. 69

CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Where engineered timber internal load-bearing walls or columns are in contact with the ground floor slab the bottom of the timber must be at or above the internal finished floor level on a brick, block or concrete upstand.	<input type="checkbox"/>
2	DPC to be installed to upstand and protrude 100mm beyond the edge of the timber element.	<input type="checkbox"/>
3	End grain sealant applied to the end of all timber elements. (301&303)	<input type="checkbox"/>
4	Internal load-bearing walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C (311) .	<input type="checkbox"/>
5	The size and location of voids and insulation (317) used to provide service zones and meet acoustic requirements must be inline with K2-60 encapsulation limitations.	<input type="checkbox"/>
6	Encapsulation must be continuous. If fixing brackets (304) causes obstructions these must be over boarded with encapsulation. Recessed brackets can be used to simplify encapsulation installation.	<input type="checkbox"/>

JUNCTION WITH GLULAM COLUMN

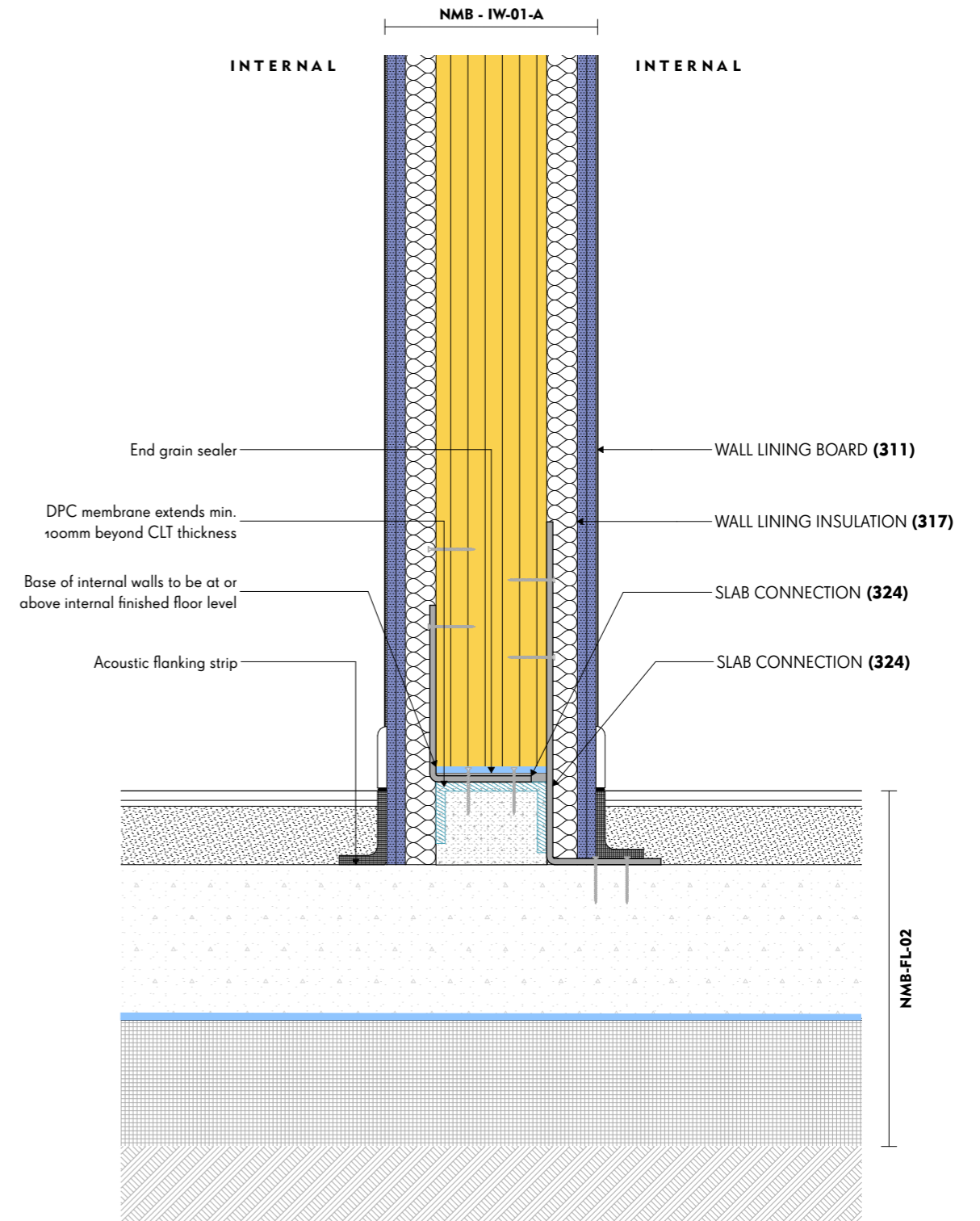


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Engineered timber internal load-bearing walls or columns must be at or above the internal finished floor level on a brick, block or concrete upstand.	<input type="checkbox"/>
2	DPC to be installed to upstand and protrude 100mm beyond the edge of the timber element.	<input type="checkbox"/>
3	End grain sealant must be applied to the end of all timber elements. (301&303)	<input type="checkbox"/>
4	Internal load-bearing walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311) .	<input type="checkbox"/>
5	The size and location of voids and insulation (317) used to provide service zones and meet acoustic requirements must be in line with K2-60 encapsulation limitations.	<input type="checkbox"/>
6	Encapsulation must be continuous. If fixing brackets (304) cause obstructions these must be over boarded with encapsulation. Recessed brackets can be used to simplify encapsulation installation.	<input type="checkbox"/>

JUNCTION WITH CLT WALL/ COLUMN

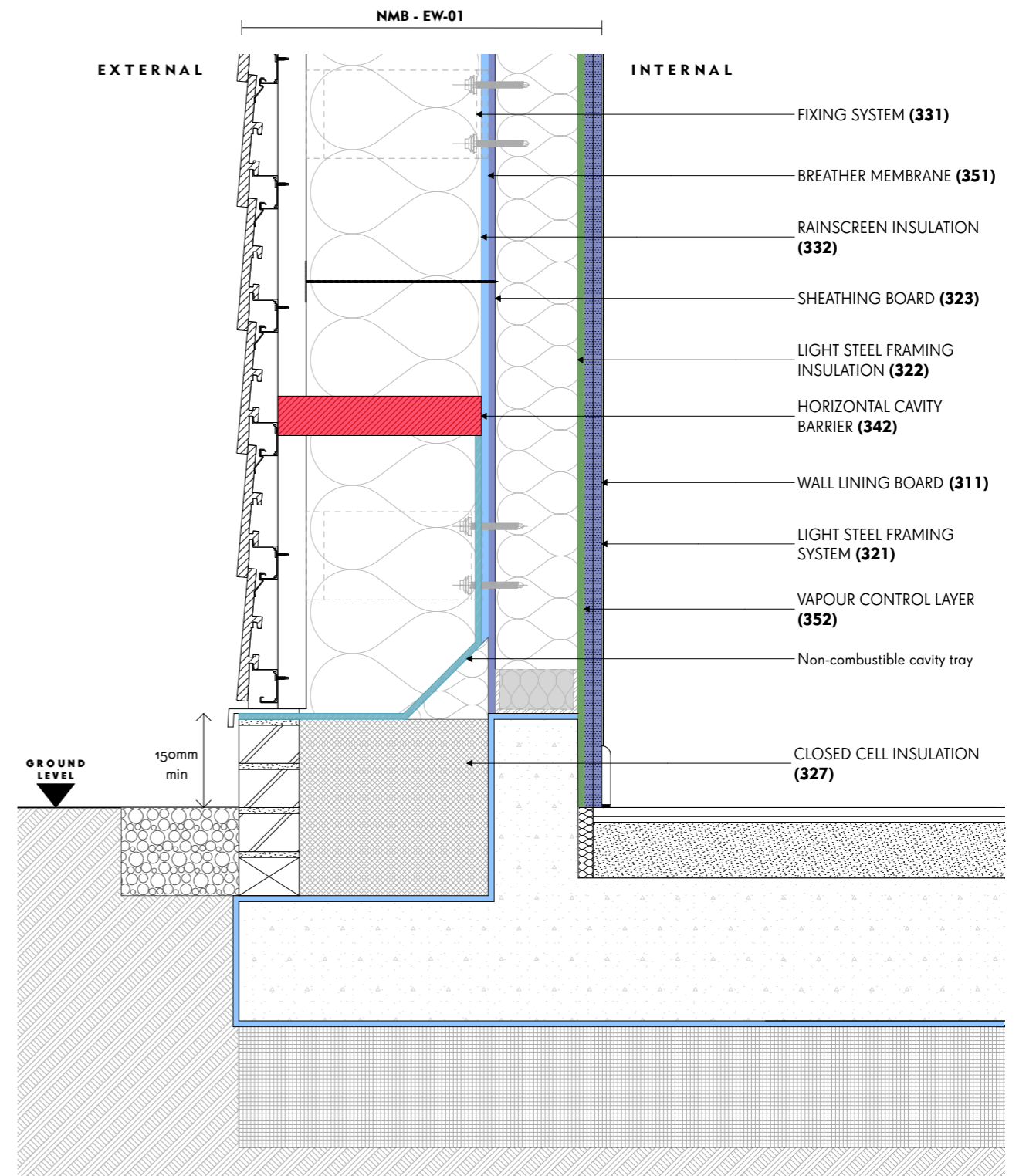


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Cladding specification - to a height of 1.5m above ground - will need to be suitable for Use Class A (publicly accessible, vandal prone) or B (not vandal prone) and meet the requirements of NHBC Technical Standards 2023 and BS 8200:1985 Code of Practice.	<input type="checkbox"/>
2	Ensure all elements in the external wall are of A2-s1,do or better in accordance with BS EN 13501 unless excluded via Regulation 7(3).	<input type="checkbox"/>
3	External wall elements to use a non-load-bearing continuous LSF system supported from the top of the floor slab above and sit on a continuous upstand.	<input type="checkbox"/>
4	All external wall construction to have a minimum upstand height of 150mm above external ground level.	<input type="checkbox"/>
5	DPM waterproofing membrane to form a continuous waterproofing barrier and be connected to the DPC at the top of the upstand.	<input type="checkbox"/>
6	All joints and penetrations in the DPM should be lapped and taped in accordance with the manufacturer's guidance.	<input type="checkbox"/>
7	Provide localised drainage to all level access thresholds to NHBC requirements.	<input type="checkbox"/>
8	Provide fire test data of external wall construction showing REI 60 from outside and inside. (323)	<input type="checkbox"/>
9	Close all cavities at the top and bottom of walls, around openings and penetrations, and at separating walls and floors. (333&342)	<input type="checkbox"/>
10	Internal wall lining boards provide finish encapsulation to the external wall system. External wall build-up and products specified must demonstrate fire performance of REI 60 minutes. (318)	<input type="checkbox"/>
11	Provide an airtight vapour control layer to the internal lining of the EWS. (352)	<input type="checkbox"/>

JUNCTION WITH EXTERNAL WALL



ROOF

GENERAL APPROACH

The New Model Building approach has two roof construction options: flat roofs (<100 roof angle) or pitched roofs (>100 roof angle). Flat roofs must be constructed from a lightweight timber roof system, whereas pitched roofs can be either constructed from CLT panels or a lightweight timber roof system.

If the overall building height exceeds 15 metres, all roof decking within 1.5m of any separating walls must be non-combustible in accordance Approved Document B (Diagram 8.2).

All parapet walls are to be constructed from non-combustible materials and considered as external walls. They must therefore not be constructed from CLT or other timber components.

Proprietary waterproofing systems applied to roofs and terraces should be expected to fail during the building's lifespan, therefore the design must prevent an accumulation of standing water. The designer needs to consider ways to ensure the early detection of moisture. Examples of this include:

- Provision of overflow outlets to all roof areas to discharge standing water.
- Provide small pilot holes in the roof/terrace structure at the lowest point of deflection. This can alert building occupiers to standing water leaks more quickly.
- Provide inspection holes under parapet gutters.

SEQUENCING

1. Produce/consult the comprehensive on-site Risk Assessment and Method Statement (RAMS) and moisture management control plan (MMCP) refer to Waugh Thistleton NMB Design Philosophy Document in the Evidence book for guidance on content of the RAMS and MMCP.
2. Construct structural roof decking.
3. Measure for moisture, refer to Waugh Thistleton NMB Design Philosophy Document in the Evidence book for methods of on-site moisture monitoring methods.
4. Apply roof build-up in a way that the area covered remains protected and water can not track back into the covered areas.

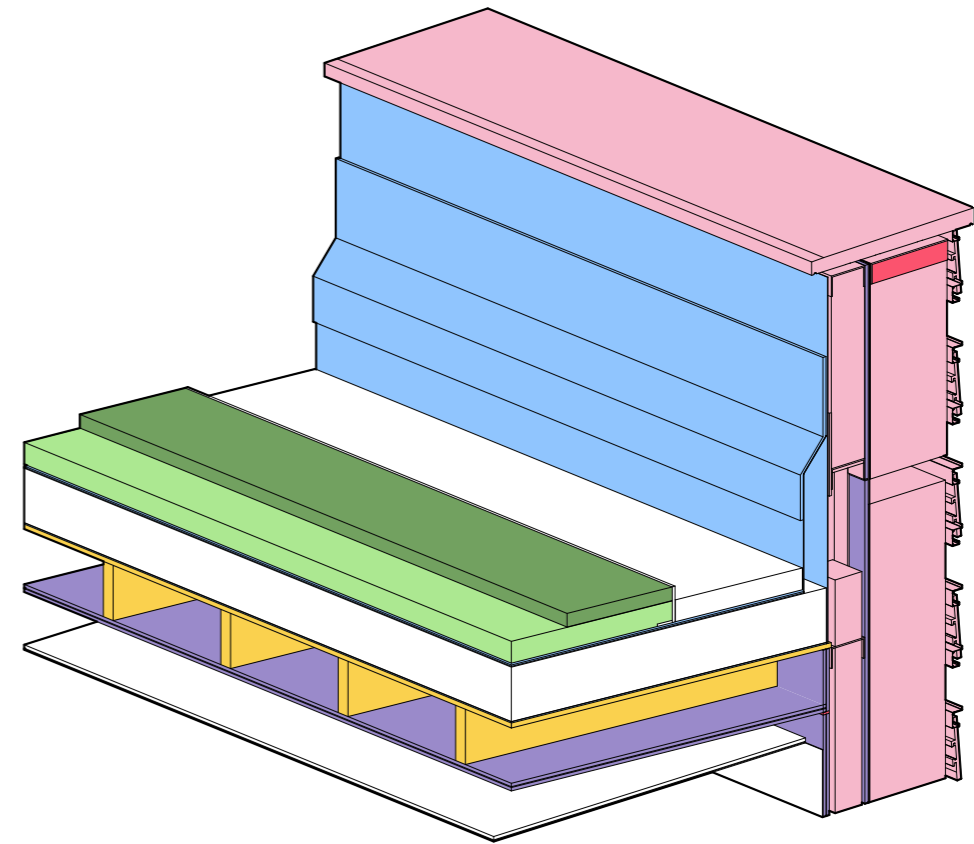


GENERAL CHECKLIST



The below principles should be applied to all details.

REF	ITEM	<input checked="" type="checkbox"/>
1	All timber is to be tested to <18% moisture content prior to installation of any coverings.	<input type="checkbox"/>
2	Parapet walls, lift overruns and other protruding vertical elements must not be constructed from CLT or other timber components.	<input type="checkbox"/>
3	For CLT roof decks a minimum roof angle of 1:5.5/10° is required.	<input type="checkbox"/>
4	Other lightweight roof systems must allow for a minimum fall of 1:40/1.5° so water can run off.	<input type="checkbox"/>
5	Terraces must be constructed from a lightweight system and allow for a minimum fall of 1:40/1.5° so water can run off.	<input type="checkbox"/>
6	If the overall building height exceeds 15 metres, all roof decking within 1.5m of any separating walls must be non-combustible in accordance with Approved Document B (Diagram 5.2).	<input type="checkbox"/>
7	Condensation risk analysis must be carried out for the construction build-up of all timber roofs and terraces, analysing the type, thickness and location of the insulation material.	<input type="checkbox"/>
8	Proprietary waterproofing systems applied to roofs and terraces should be expected to fail during the building's lifespan. As such the designer needs to consider ways to ensure the early detection of moisture and prevent standing water.	<input type="checkbox"/>
9	The roof and/or terrace must be protected from moisture during construction and throughout the building's life.	<input type="checkbox"/>
10	The specification of roof coverings should be in accordance with AD Part B and as designated by BS 9991:2015 Table 8 or equivalent European classifications.	<input type="checkbox"/>

OVERVIEW



DESCRIPTION

 Mass timber primary structure	 A2-s1,do Non-loadbearing external wall construction
 K2 REI 60 Encapsulation to timber	 Fire cavity barriers
 Waterproofing strategy	 Roof finishes

KEY DETAILS

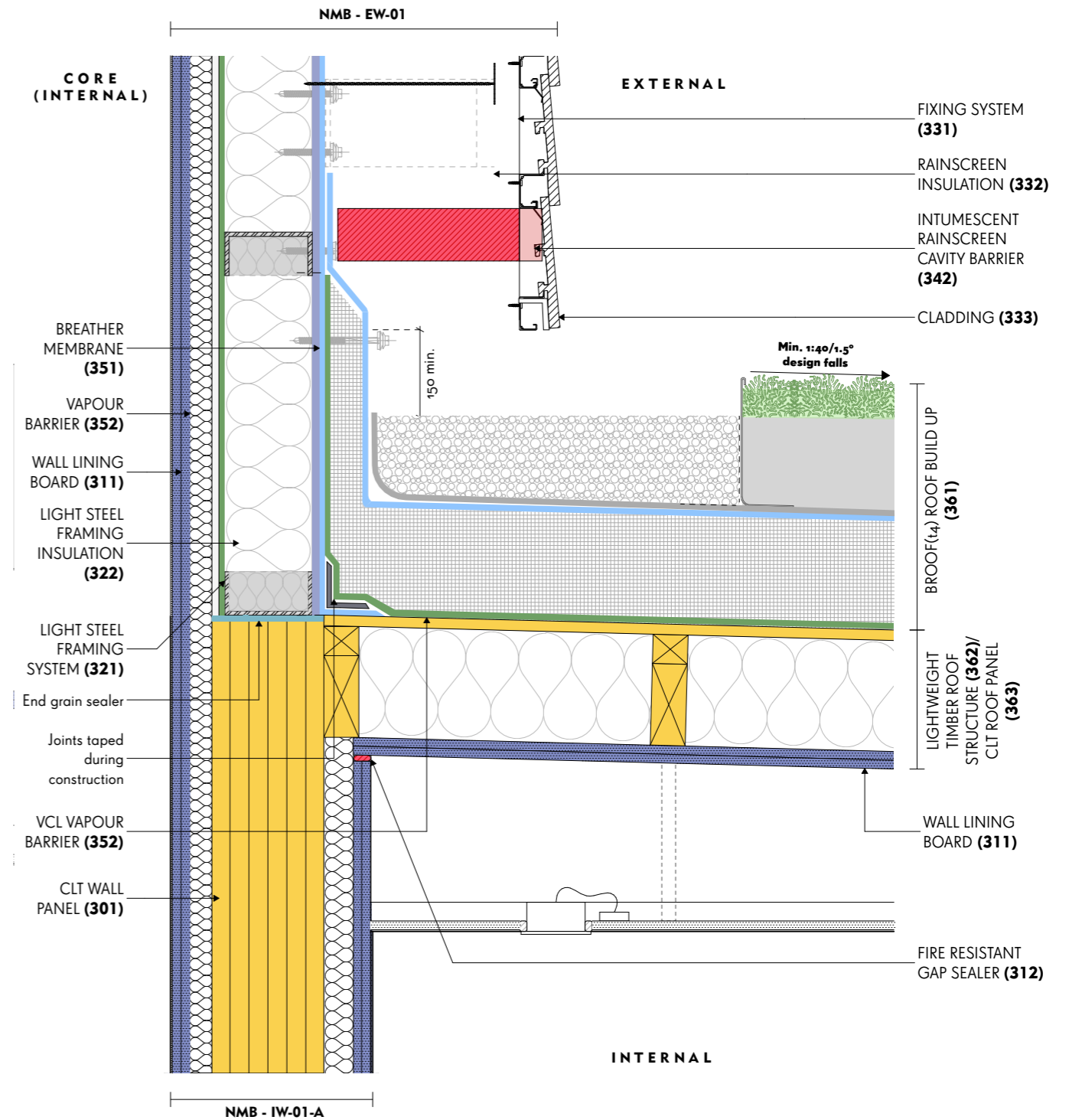
Junction with core	p. 75
Parapet junction	p. 77
Junction with external wall	p. 79
Junction with party wall	p. 81

CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	All timber is to be tested to be <18% moisture content dry prior to installation of any coverings. (362&363)	<input type="checkbox"/>
2	Parapet walls, lift overruns and other protruding vertical elements must not be constructed from CLT or other timber components. (NMB EW-01)	<input type="checkbox"/>
3	For CLT roof decks a minimum roof angle of 1:5.5/10° is required. (363)	<input type="checkbox"/>
4	Other lightweight roof systems must allow for a minimum fall of 1:40/1.5° so water can run off. (362)	<input type="checkbox"/>
5	Terraces must be constructed from a lightweight system and allow for a minimum fall of 1:40/1.5° so water can run off.	<input type="checkbox"/>
6	End-grain sealant is to be provided to all slab and wall edges. (203)	<input type="checkbox"/>
7	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
8	Intumescent sealants are to be installed at plasterboard junctions. (312)	<input type="checkbox"/>
9	Close all cavities at the top and bottom of walls, as well as around openings and penetrations, and at separating walls and floors. (333&342)	<input type="checkbox"/>
10	Proprietary waterproofing systems applied to roofs and terraces should be expected to fail during the building's lifespan, as such the designer needs to consider ways to ensure the early detection of moisture and prevent standing water. (361)	<input type="checkbox"/>
11	The specification of roof coverings should be in accordance with AD Part B and as designated by BS 9991:2015 Table 8 or equivalent European classifications. (361)	<input type="checkbox"/>

JUNCTION WITH CORE

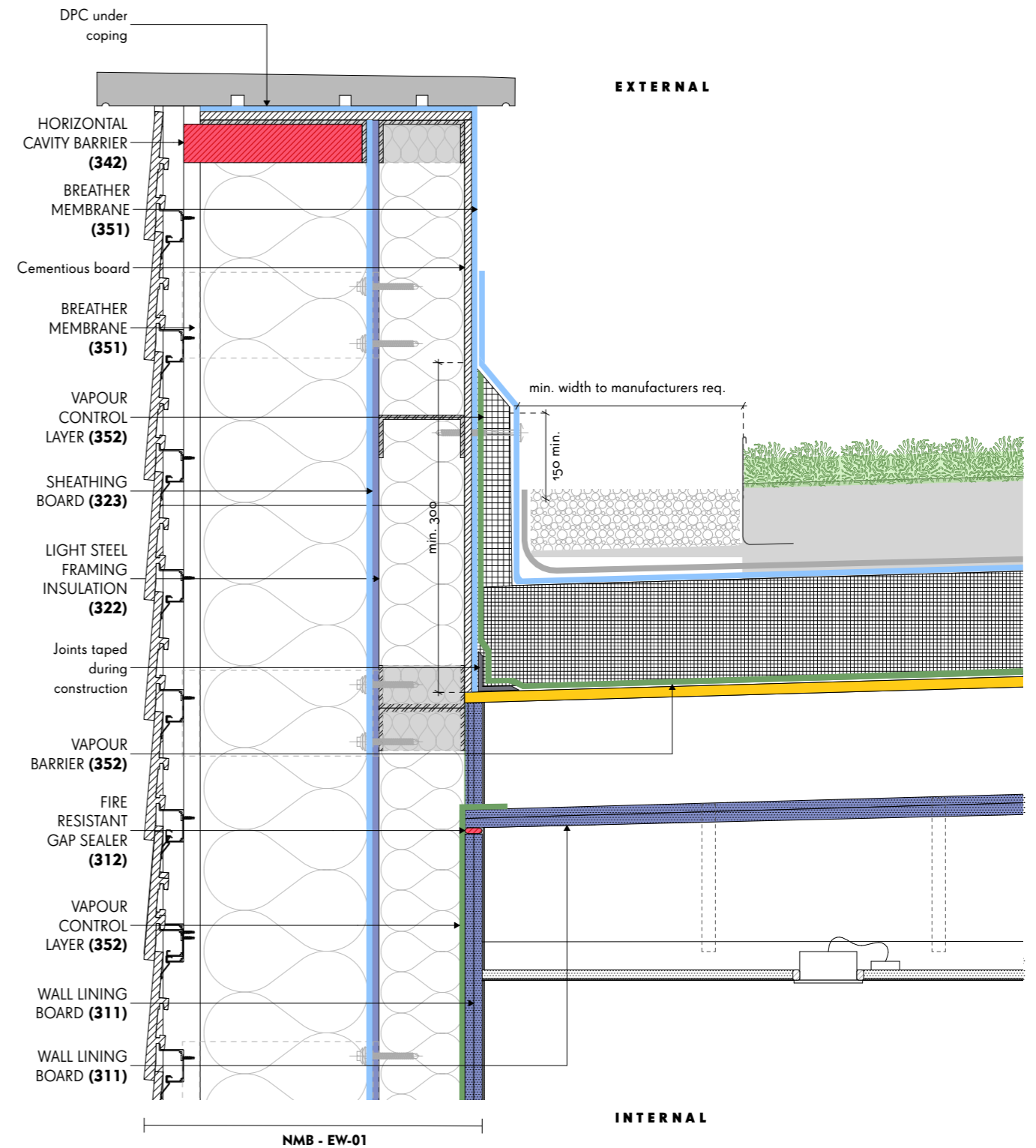


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	All timber is to be tested to <18% moisture content prior to installation of any coverings. (362&363)	<input type="checkbox"/>
2	Parapet walls, lift overruns and other protruding vertical elements must not be constructed from CLT or other timber components. (NMB EW-01)	<input type="checkbox"/>
3	For CLT roof decks a minimum roof angle of 1:5.5/10° is required. (363)	<input type="checkbox"/>
4	Other lightweight roof systems must allow for a minimum fall of 1:40/1.5° so water can run off. (362)	<input type="checkbox"/>
5	Terraces must be constructed from a lightweight system and allow for a minimum fall of 1:40/1.5° so water can run off.	<input type="checkbox"/>
6	End-grain sealant is to be provided to all slab and wall edges. (203)	<input type="checkbox"/>
7	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
8	Intumescent sealants are to be installed at plasterboard junctions. (312)	<input type="checkbox"/>
9	Close all cavities at the top and bottom of walls, around openings and penetrations, and at separating walls and floors. (333&342)	<input type="checkbox"/>
10	Proprietary waterproofing systems applied to roofs and terraces should be expected to fail during the building's lifespan, as such the designer needs to consider ways to ensure the early detection of moisture and prevent standing water. (361)	<input type="checkbox"/>
11	The specification of roof coverings should be in accordance with AD Part B and as designated by BS 9991:2015 Table 8 or equivalent European classifications. (361)	<input type="checkbox"/>

PARAPET JUNCTION

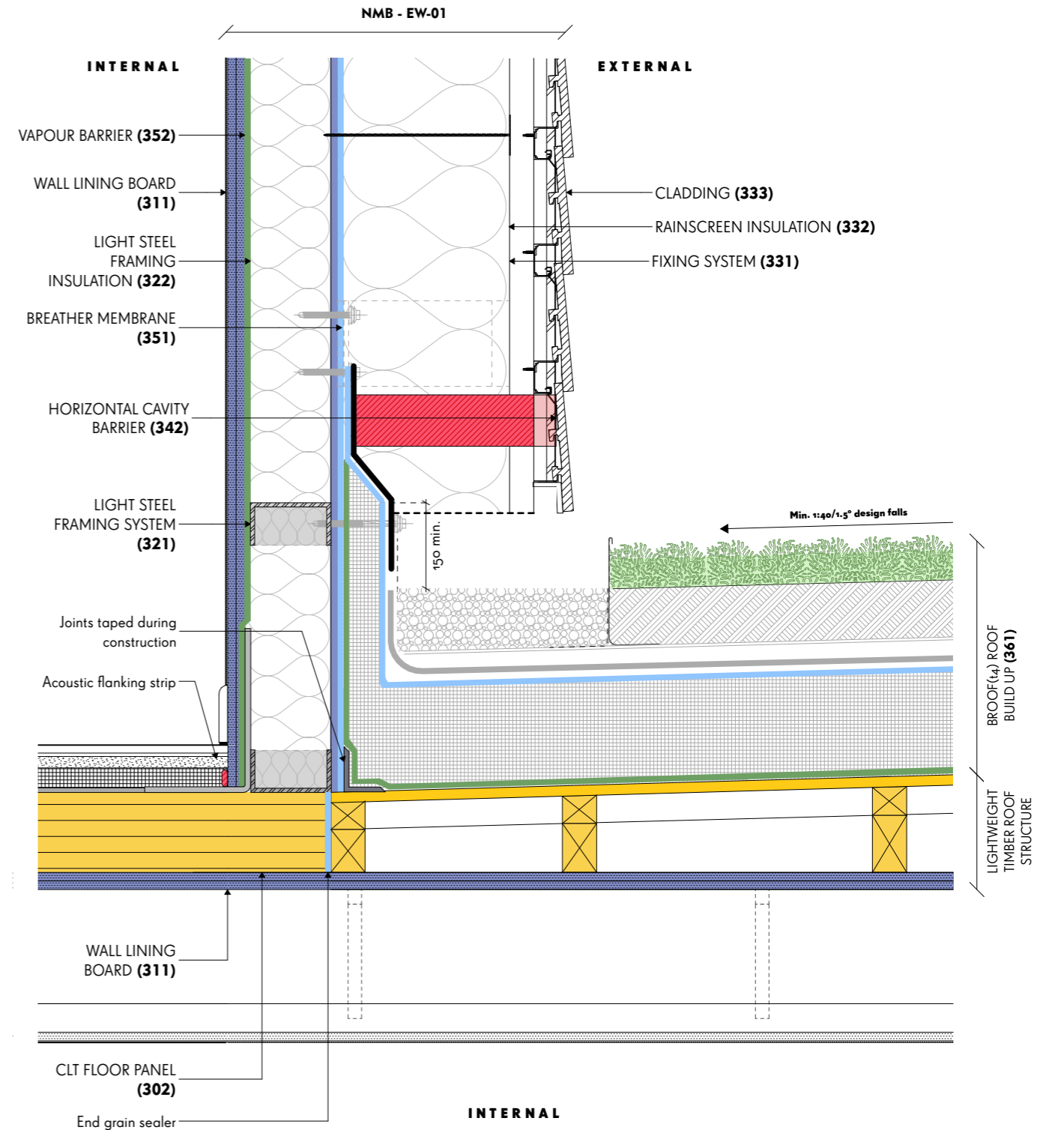


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	All timber is to be tested to be <18% moisture content dry prior to installation of any coverings. (362&363)	<input type="checkbox"/>
2	Parapet walls, lift overruns and other protruding vertical elements must not be constructed from CLT or other timber components. (NMB EW-01)	<input type="checkbox"/>
3	For CLT roof decks a minimum roof angle of 1:5.5/10° is required. (363)	<input type="checkbox"/>
4	Other lightweight roof systems must allow for a minimum fall of 1:40/1.5° so water can run off. (362)	<input type="checkbox"/>
5	Terraces must be constructed from a lightweight system and allow for a minimum fall of 1:40/1.5° so water can run off.	<input type="checkbox"/>
6	End-grain sealant is to be provided to all slab and wall edges. (203)	<input type="checkbox"/>
7	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
8	Intumescent sealants are to be installed at plasterboard junctions. (312)	<input type="checkbox"/>
9	Close all cavities at the top and bottom of walls, around openings and penetrations, and at separating walls and floors. (333&342)	<input type="checkbox"/>
10	Proprietary waterproofing systems applied to roofs and terraces should be expected to fail during the building's lifespan, as such the designer needs to consider ways to ensure the early detection of moisture and prevent standing water. (361)	<input type="checkbox"/>
11	The specification of roof coverings should be in accordance with AD Part B and as designated by BS 9991:2015 Table 8 or equivalent European classifications. (361)	<input type="checkbox"/>

JUNCTION WITH EXTERNAL WALL

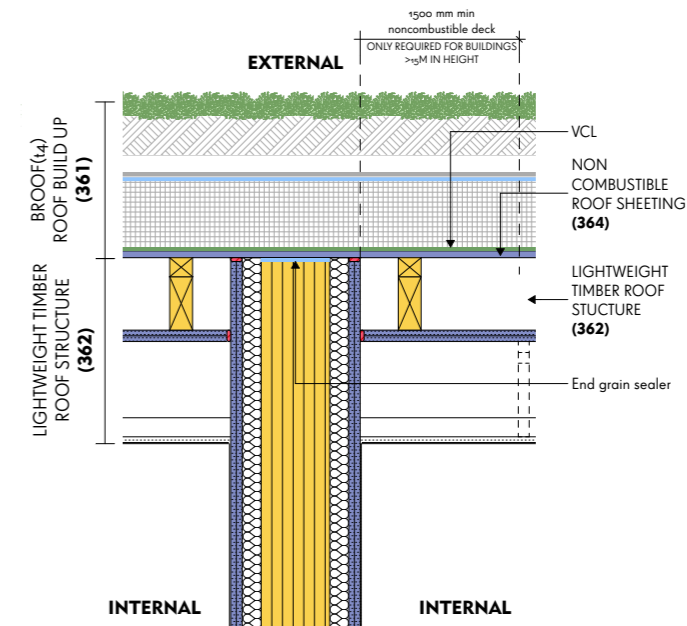


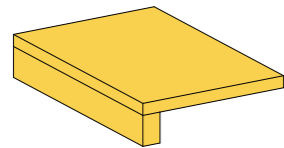
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

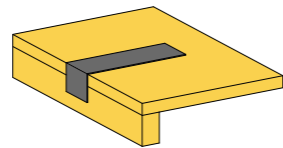
REF	ITEM	<input checked="" type="checkbox"/>
1	If the overall building height exceeds 15 metres, all roof decking within 1.5m of any separating walls must be non-combustible in accordance with Approved Document B (Diagram 5.2). (364)	<input type="checkbox"/>
2	All timber is to be tested to <18% moisture content prior to installation of any coverings. (362&363)	<input type="checkbox"/>
3	For CLT roof decks a minimum roof angle of 1:5.5/10° is required. (363)	<input type="checkbox"/>
4	Other lightweight roof systems must allow for a minimum fall of 1:40/1.5° so water can run off. (362)	<input type="checkbox"/>
5	Terraces must be constructed from a lightweight system and allow for a minimum fall of 1:40/1.5° so water can run off.	<input type="checkbox"/>
6	End-grain sealant is to be provided to all slab and wall edges. (203)	<input type="checkbox"/>
7	Encapsulation to all timber elements to be REI 60 and K2-60. (311)	<input type="checkbox"/>
8	Intumescent sealants are to be installed at plasterboard junctions. (312)	<input type="checkbox"/>
9	Proprietary waterproofing systems applied to roofs and terraces should be expected to fail during the building's lifespan, as such The designer needs to consider ways to ensure the early detection of moisture and prevent standing water. (361)	<input type="checkbox"/>
10	The specification of roof coverings should be in accordance with AD Part B and as designated by BS 9991:2015 Table 8 or equivalent European classifications. (361)	<input type="checkbox"/>

JUNCTION WITH PARTY WALL

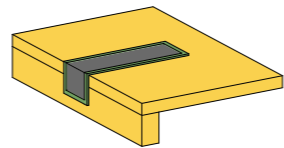




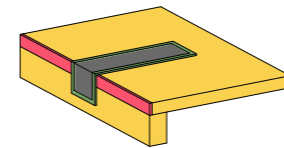
1. Engineered timber structure



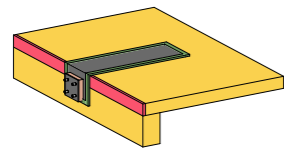
2. Steel balcony bracket fixed to engineered timber structure



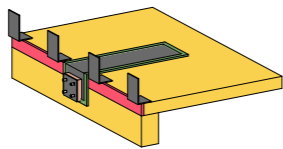
3. Liquid waterproofing sealant applied to steel balcony bracket



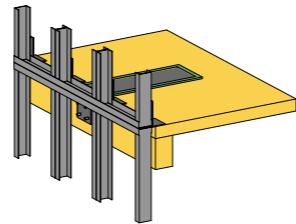
4. Linear firestop fixed to slab



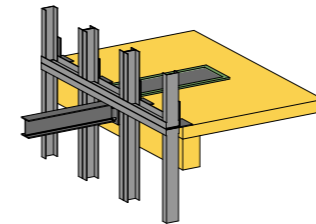
5. Thermally broken balcony connector fixed to steel balcony



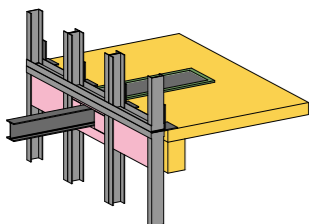
6. Facade/ slab connections fixed to engineered timber structure



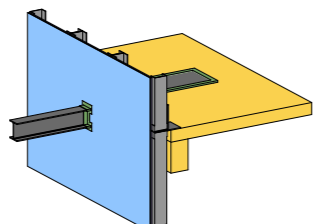
7. Light steel framing system fixed to engineered timber slab



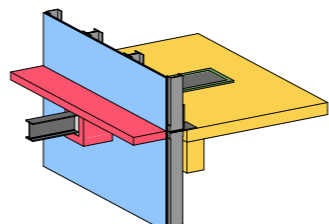
8. Balcony fixing installed



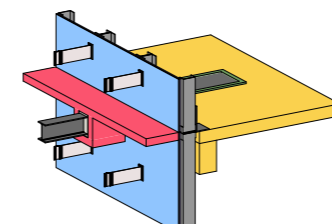
9. Full fill insulation applied to slab edge



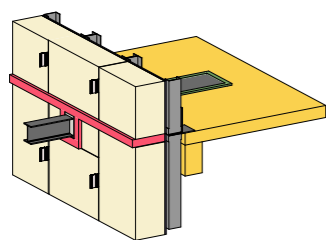
10. Sheathing board added; breather membrane installed



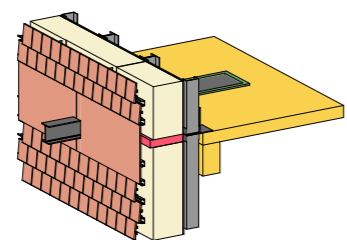
11. Cavity barriers installed at slab edge and surrounding balcony fixing filled with mineral wool



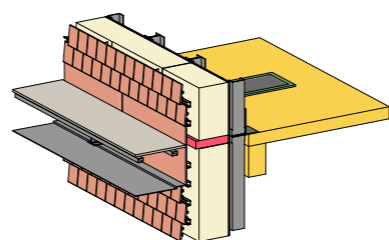
12. Helping hand brackets installed



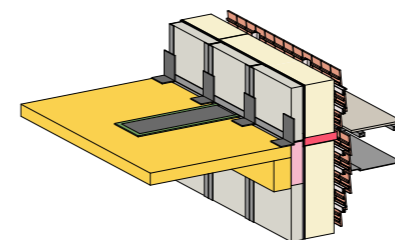
13. Rainscreen insulation installed; fixing system installed



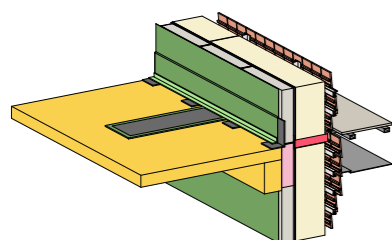
14. Cladding and fascia board installed



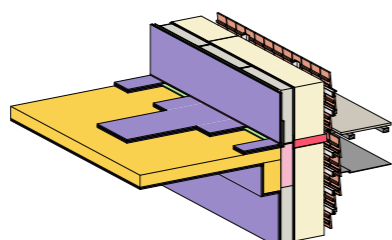
15. Prefabricated balcony installed



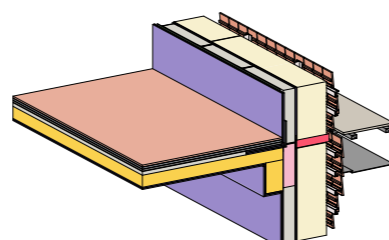
16. Wall lining insulation installed to light steel framing system



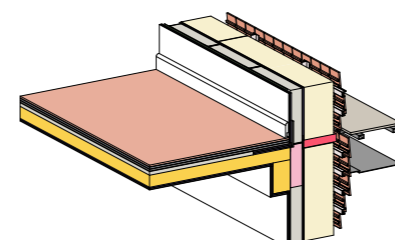
17. Vapour control layer installed and taped to engineered timber



18. Encapsulation applied to steel



19. Floor finishes installed



20. Wall finishes and skirting installed

BALCONY

GENERAL APPROACH

Where required, the New Model Building uses prefabricated steel balconies, either fixed to the engineered timber structure or as independent steel structures. The design of these is not specific to the system and the designer should ensure compliance with all relevant standards and guidance.

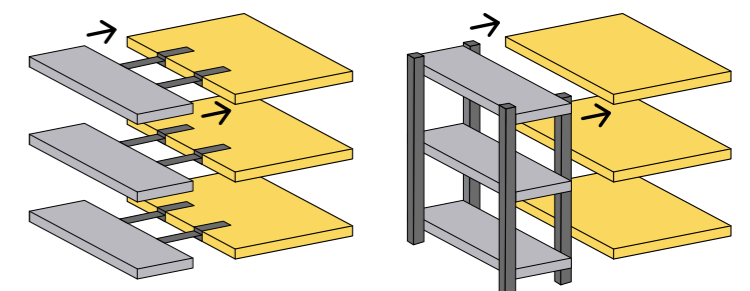
Following the principles shown in the details, designers should ensure the steel balcony bracket is fully encapsulated with gypsum board to achieve K2-60 classification in accordance with BS EN 13501-2 and surrounded by cavity barriers with infilled mineral wool insulation.

Balcony connections that fix back to the internal structure can be at risk of providing a path for moisture to track to the internal structure. To mitigate this risk, liquid waterproofing must be applied to the balcony brackets and additional barriers provided at key junctions, for example at the thermal break. All balcony connections should be thermally broken with evidence of performance and condensation risk analysis.

SEQUENCING

The principles for connecting the balcony to the structure are illustrated in the sequencing diagrams to the left.

CONNECTION SYSTEMS



System 1: balcony connected back to floor slab

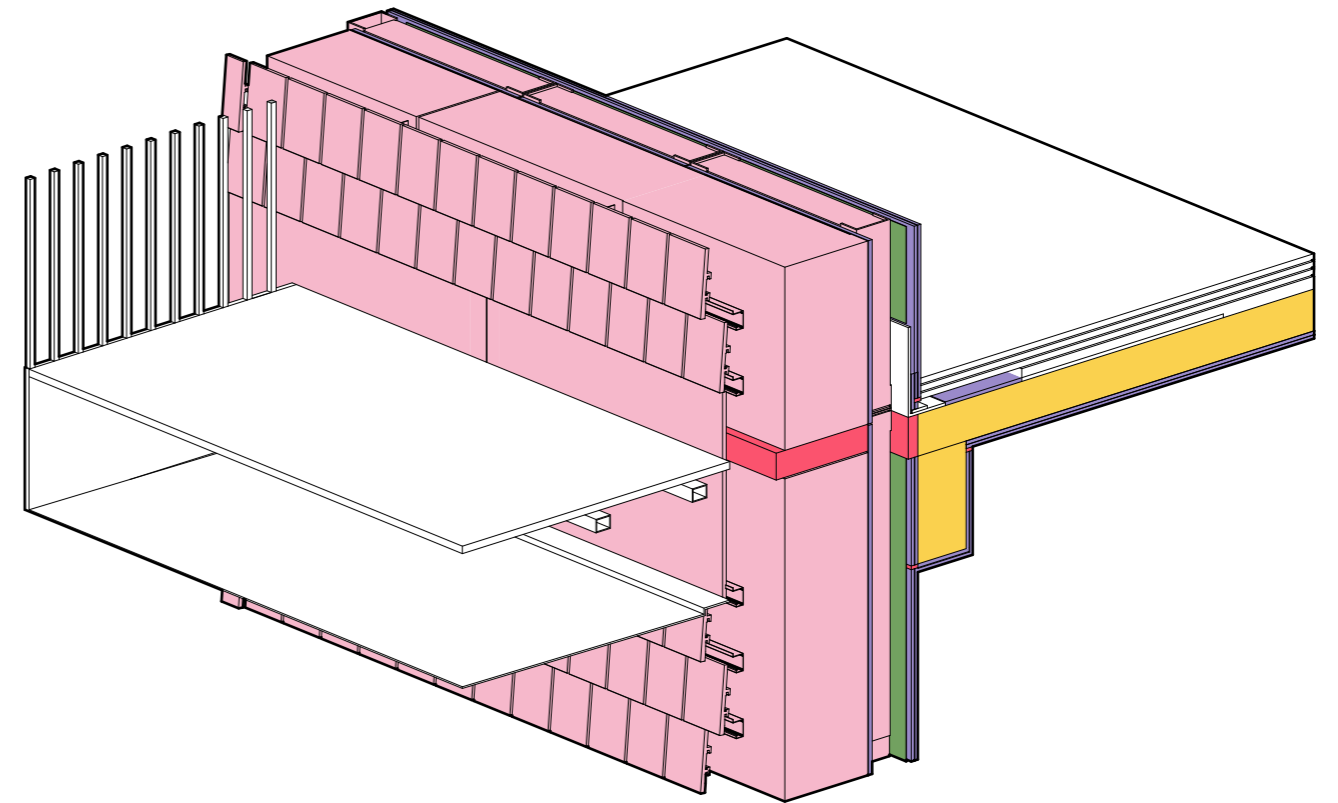
System 2: structurally independent balcony system

GENERAL CHECKLIST

The below principles should be applied to all details.

REF	ITEM	<input checked="" type="checkbox"/>
1	Balconies are to be fixed with steel fixings either back to the engineered timber or as an independent structure.	<input type="checkbox"/>
2	Balcony brackets are to be wetproofed to mitigate the risk of moisture tracking back to the structure.	<input type="checkbox"/>
3	The sequence of installing balconies and providing moisture protection is to be coordinated between design and construction teams.	<input type="checkbox"/>
4	All internal balcony brackets should be fully encapsulated with K2-60 protection.	<input type="checkbox"/>
5	Cavity fire barriers are to be provided around primary brackets and coordinated with barriers for compartmentation to provide a continuous line of compartmentation.	<input type="checkbox"/>
6	Bracketry to be sealed to sheathing board and breather membrane.	<input type="checkbox"/>

OVERVIEW



DESCRIPTION

<input type="checkbox"/> Mass timber primary structure	<input type="checkbox"/> A2-s1,do Non-loadbearing external wall construction
<input type="checkbox"/> K2 REI 60 Encapsulation to timber	<input type="checkbox"/> Fire cavity fire barriers

KEY DETAILS

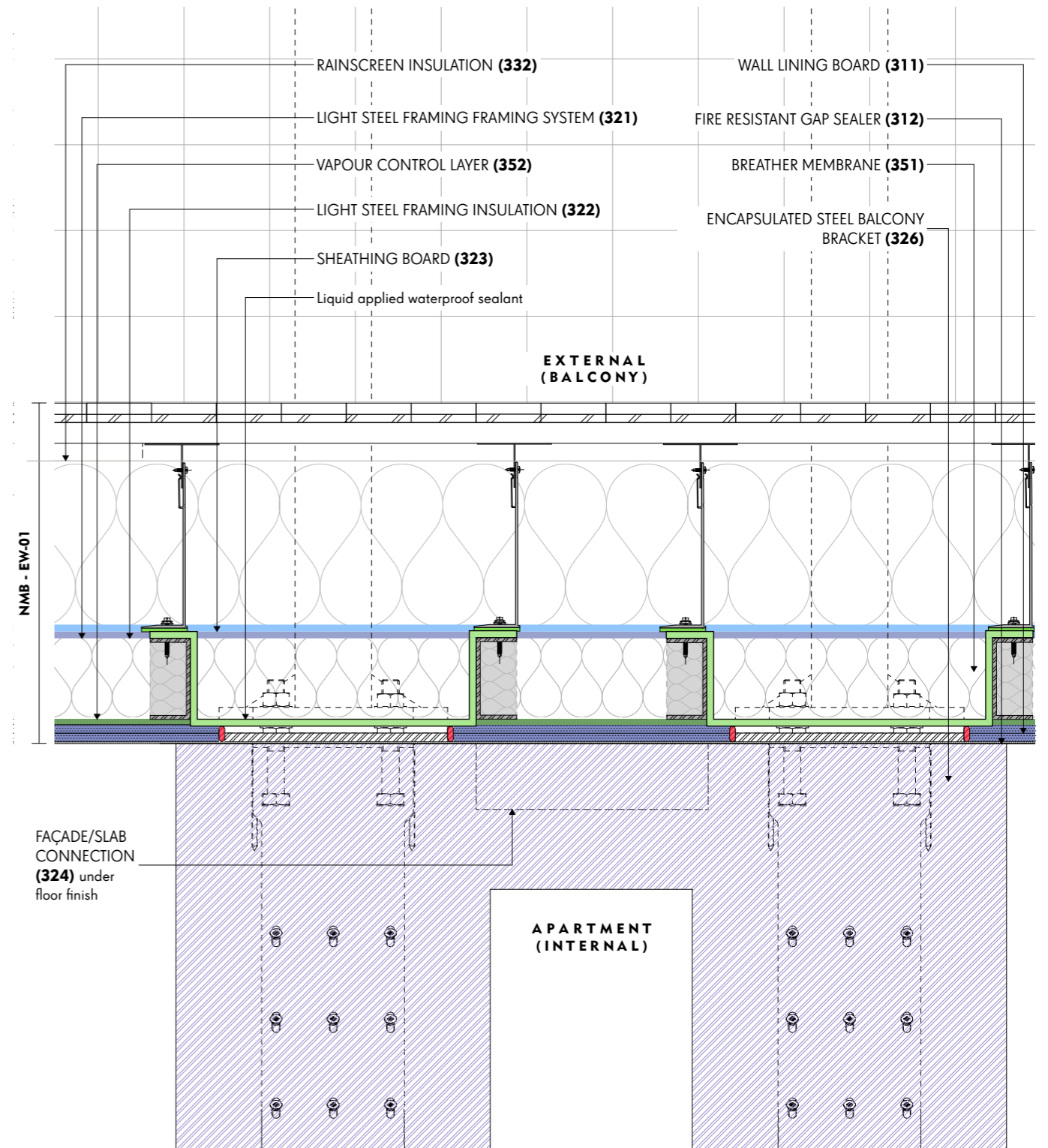
Typical balcony connection	p. 87 - 89
External door threshold	p. 91 - 93

CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Balcony connections are to be coordinated with façade slab connections. (324)	<input type="checkbox"/>
2	All balcony and façade connections to be encapsulated. (326)	<input type="checkbox"/>
3	Liquid-applied waterproofing sealant to be applied to fixings to ensure water does not track back into the primary structure.	<input type="checkbox"/>
4	Balcony to be thermally broken. Calculations to be undertaken by the design team	<input type="checkbox"/>
5	Bracketry to be sealed to sheathing board and breather membrane.	<input type="checkbox"/>

TYPICAL BALCONY CONNECTION PLAN

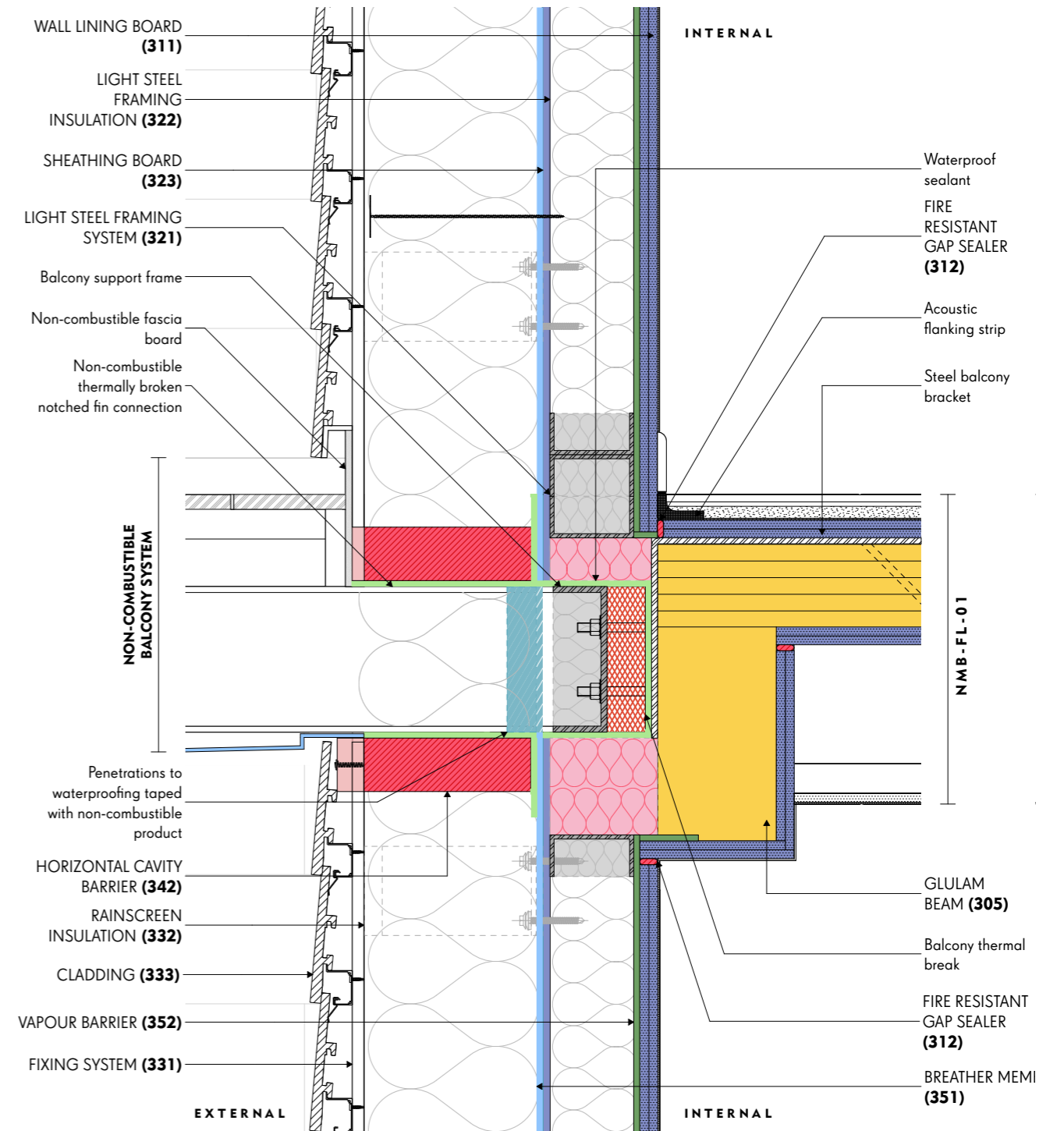


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	
		✓
1	Balcony brackets are to be waterproofed and mitigate the risk of moisture tracking back to the structure.	○
2	The sequence of installing balconies and providing moisture protection to be coordinated between design and construction teams.	○
3	Linear fire stops are to be installed to fill any voids between the structure and bracketry.	○
4	All internal balcony brackets should be fully encapsulated with K2-60 protection. (326)	○
5	Cavity fire barriers are to be provided around primary brackets and coordinated with barriers for compartmentation to provide a continuous line of compartmentation. (324)	○
6	Bracketry to be sealed to sheathing board and breather membrane. (323)	○

TYPICAL BALCONY CONNECTION SECTION

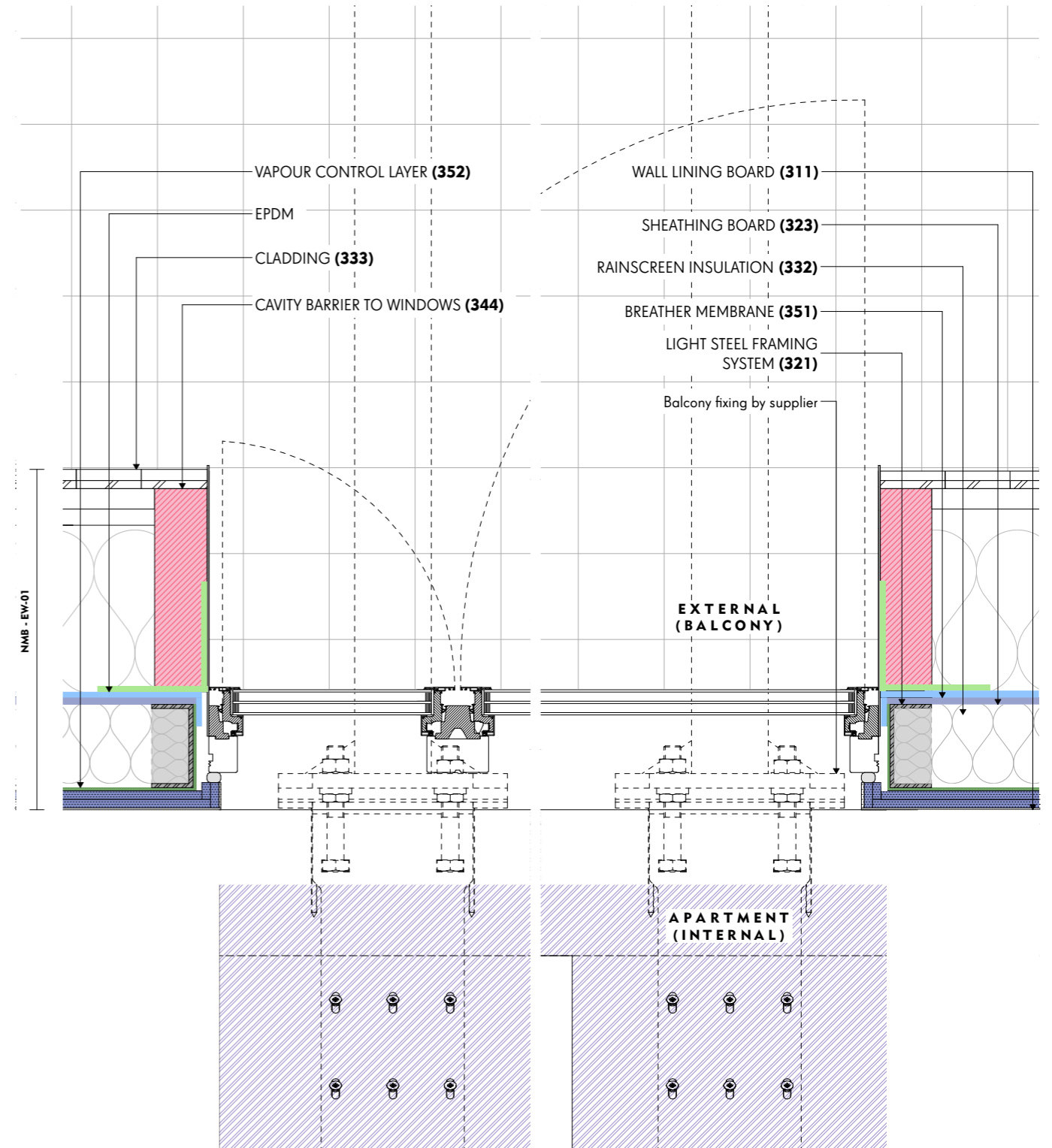


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Balcony brackets are to be wetproofed to mitigate the risk of moisture tracking back to the structure.	<input type="checkbox"/>
2	The sequence of installing balconies and providing moisture protection to be coordinated between design and construction teams.	<input type="checkbox"/>
3	All internal balcony brackets should be fully encapsulated with K2-60 protection. (326)	<input type="checkbox"/>
4	Cavity fire barriers to be provided around primary brackets and coordinated with barriers for compartmentation to provide a continuous line of compartmentation. (324)	<input type="checkbox"/>
5	Cavity fire barriers to doors and windows to be coordinated with cavity barriers to primary brackets to ensure a continuous line of compartmentation. (344)	<input type="checkbox"/>
6	Balcony bracketry to be coordinated with door openings and façade connectors.	<input type="checkbox"/>

EXTERNAL DOOR THRESHOLD PLAN

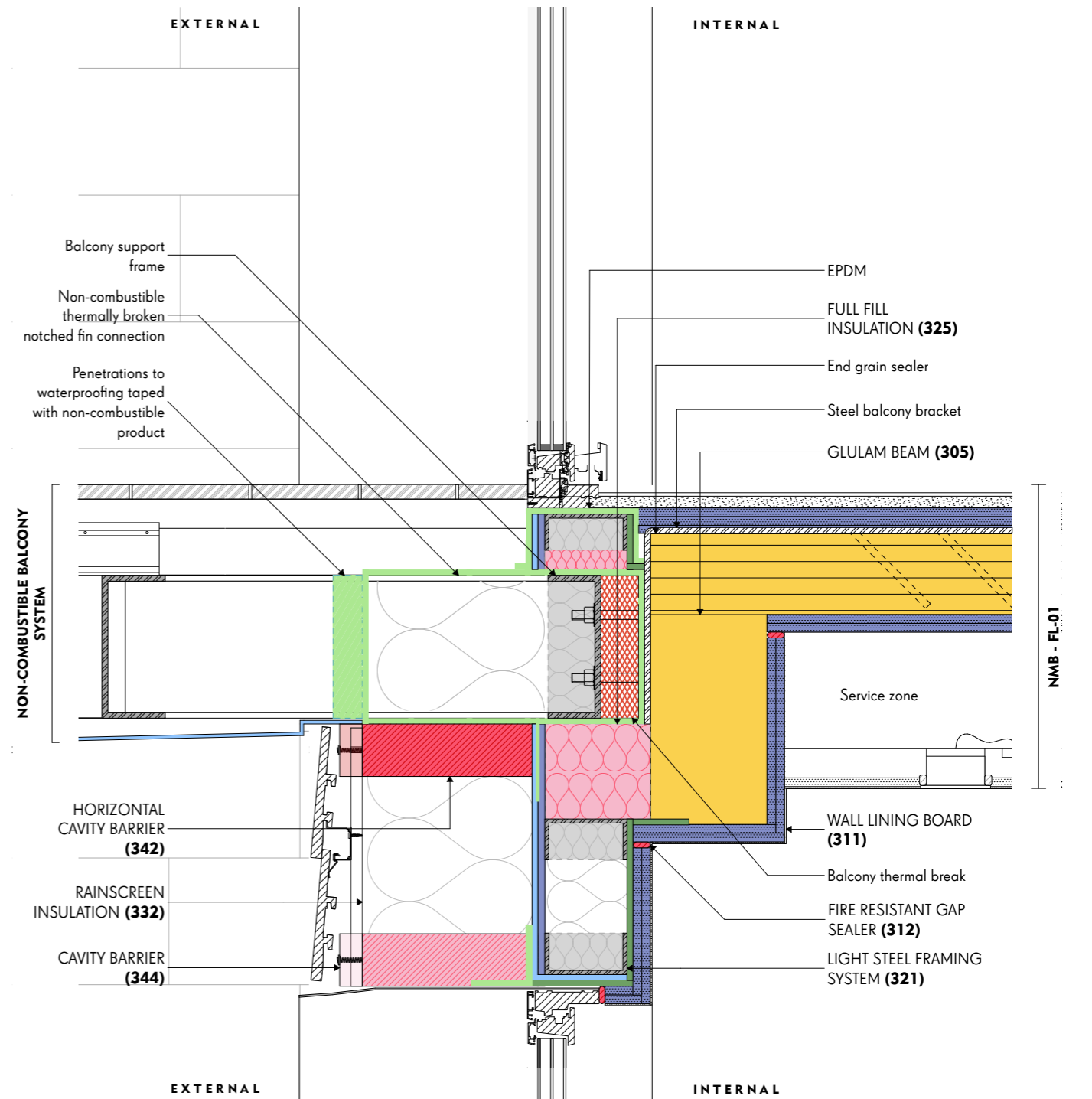


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Balcony brackets are to be waterproofed to mitigate the risk of moisture tracking back to the structure.	<input type="checkbox"/>
2	The sequence of installing balconies and providing moisture protection to be coordinated between design and construction teams.	<input type="checkbox"/>
3	Linear fire stops to be installed to fill any voids between structure and bracketry.	<input type="checkbox"/>
4	All internal balcony brackets should be fully encapsulated with K2-60 protection. (326)	<input type="checkbox"/>
5	Cavity fire barriers to be provided around primary brackets and coordinated with barriers for compartmentation to provide a continuous line of compartmentation. (324)	<input type="checkbox"/>
6	Cavity fire barriers to doors and windows to be coordinated with cavity barriers to primary brackets to ensure a continuous line of compartmentation.	<input type="checkbox"/>
7	Bracketry to be sealed to sheathing board and breather membrane. (323)	<input type="checkbox"/>
8	Balcony bracketry to not obstruct waterproofing to door threshold.	<input type="checkbox"/>
9	Balcony bracketry to be coordinated with door openings and façade connectors.	<input type="checkbox"/>

EXTERNAL DOOR THRESHOLD SECTION



PENETRATIONS

GENERAL APPROACH

In general, penetration locations and sizes should be coordinated to minimise the amount and size of openings and voids that need to be filled.

Typical penetrations shown in the standard details demonstrate example methods for fire stopping to ensure the fire performance of the wall/floor is maintained around the opening. On each project, the designer must seek confirmation from the manufacturer that the specified fire-stopping products are suitable to be used in each application and will achieve the required 60 minutes REI fire performance. This could be through following manufacturer's standard details or through project-specific, bespoke fire engineering judgements.

SEQUENCING

Careful attention and coordination need to be applied to each penetration. A typical construction sequence could be:

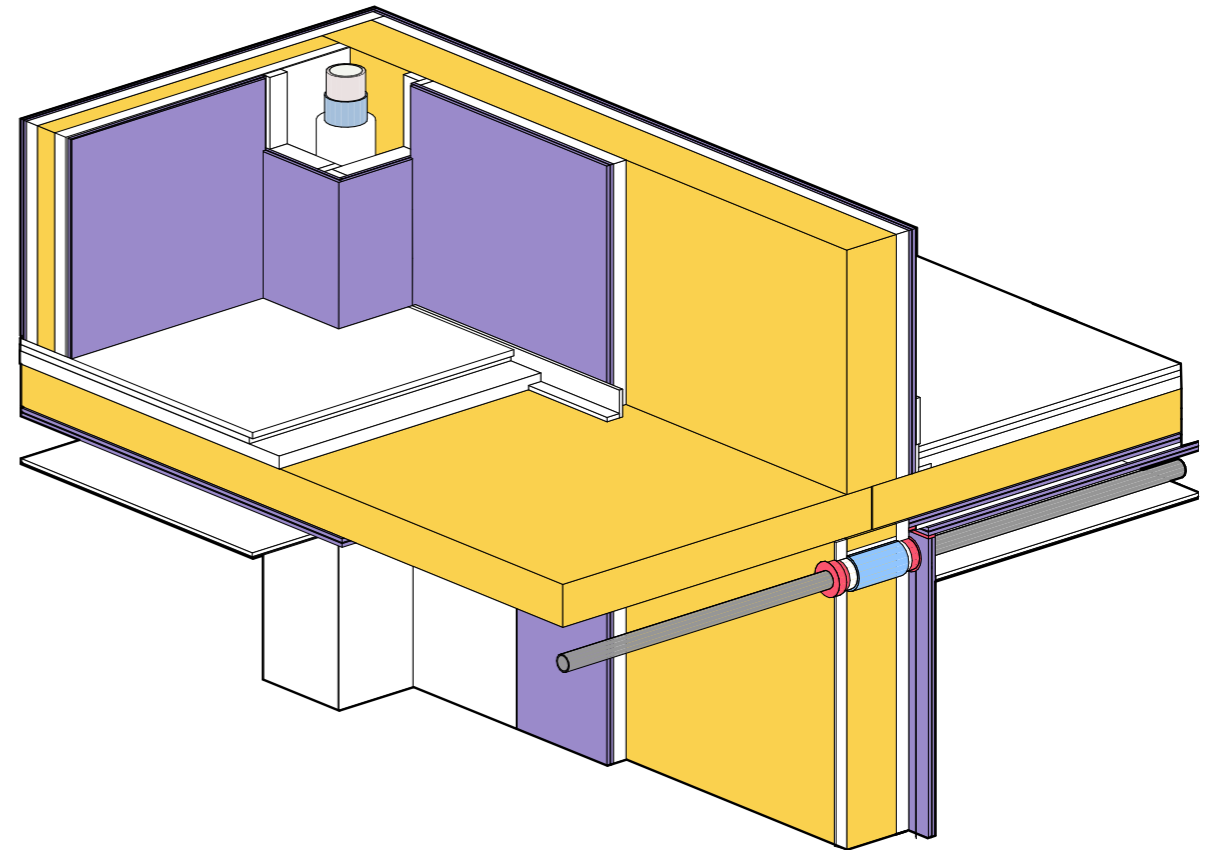
1. CLT erected
2. Penetration to have end grain sealant applied if not applied off-site
3. Penetration to be covered during construction until services are to be installed.
4. Service pipework installed.
5. Weatherproofing to be installed to servicing and penetrations.
6. Encapsulation to timber applied and sealed to pipework.
7. Voids between pipework and mass timber elements to be backfilled with mineral wool.
8. Fire stopping products to be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.

GENERAL CHECKLIST

The below principles should be applied to all details.

REF	ITEM	<input checked="" type="checkbox"/>
1	Material of pipework / service to be identified for each penetration.	<input type="checkbox"/>
2	Fire-stopping product to be suitable for size and material of pipe	<input type="checkbox"/>
3	End-grain sealant to be applied to all openings in mass timber elements.	<input type="checkbox"/>
4	Fire stopping product to be installed at compartment line and to be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
5	All remaining voids between pipework/service and mass timber to be filled with mineral wool.	<input type="checkbox"/>

OVERVIEW



DESCRIPTION

- Mass timber primary structure
- K2 REI 60 Encapsulation to timber

KEY DETAILS

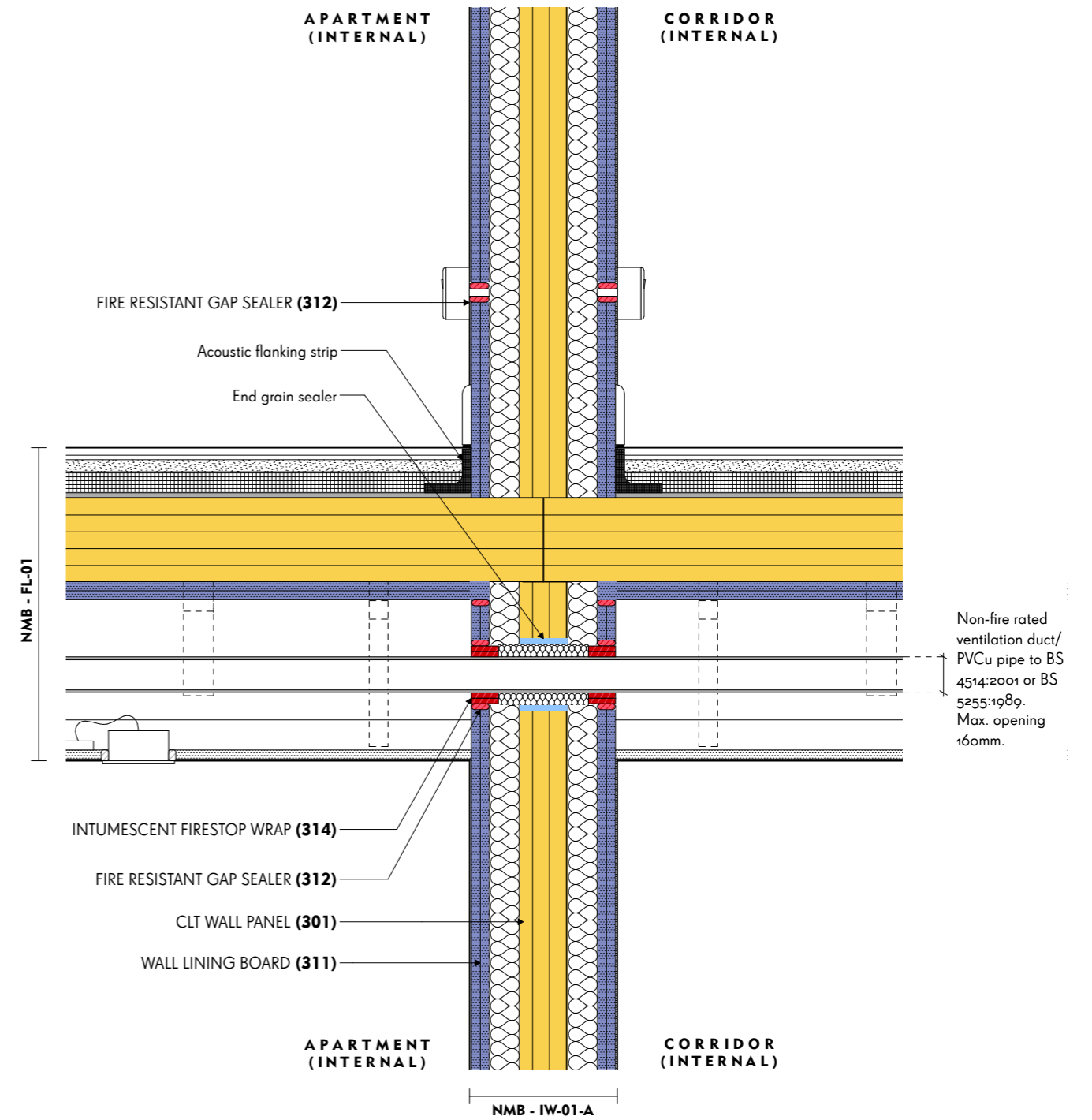
Penetration to party wall	p. 99
Penetration to shaft	p.101
Penetration to internal walls/slab	p.103- 105
Penetration to façade	p.107-109
Penetrations to roof	p.111-113

CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Material of pipework/service to be identified for each penetration.	<input type="checkbox"/>
2	Fire-stopping product to be suitable for size and material of pipe. (314)	<input type="checkbox"/>
3	End-grain sealant is to be applied to all openings in mass timber elements. (301&302)	<input type="checkbox"/>
4	Mineral wool to be provided in voids around pipework/service and mass timber voids.	<input type="checkbox"/>
5	Fire stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
6	Internal load-bearing timber walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311)	<input type="checkbox"/>
7	Soffit to all floor slabs (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311)	<input type="checkbox"/>

PENETRATION TO PARTY WALL

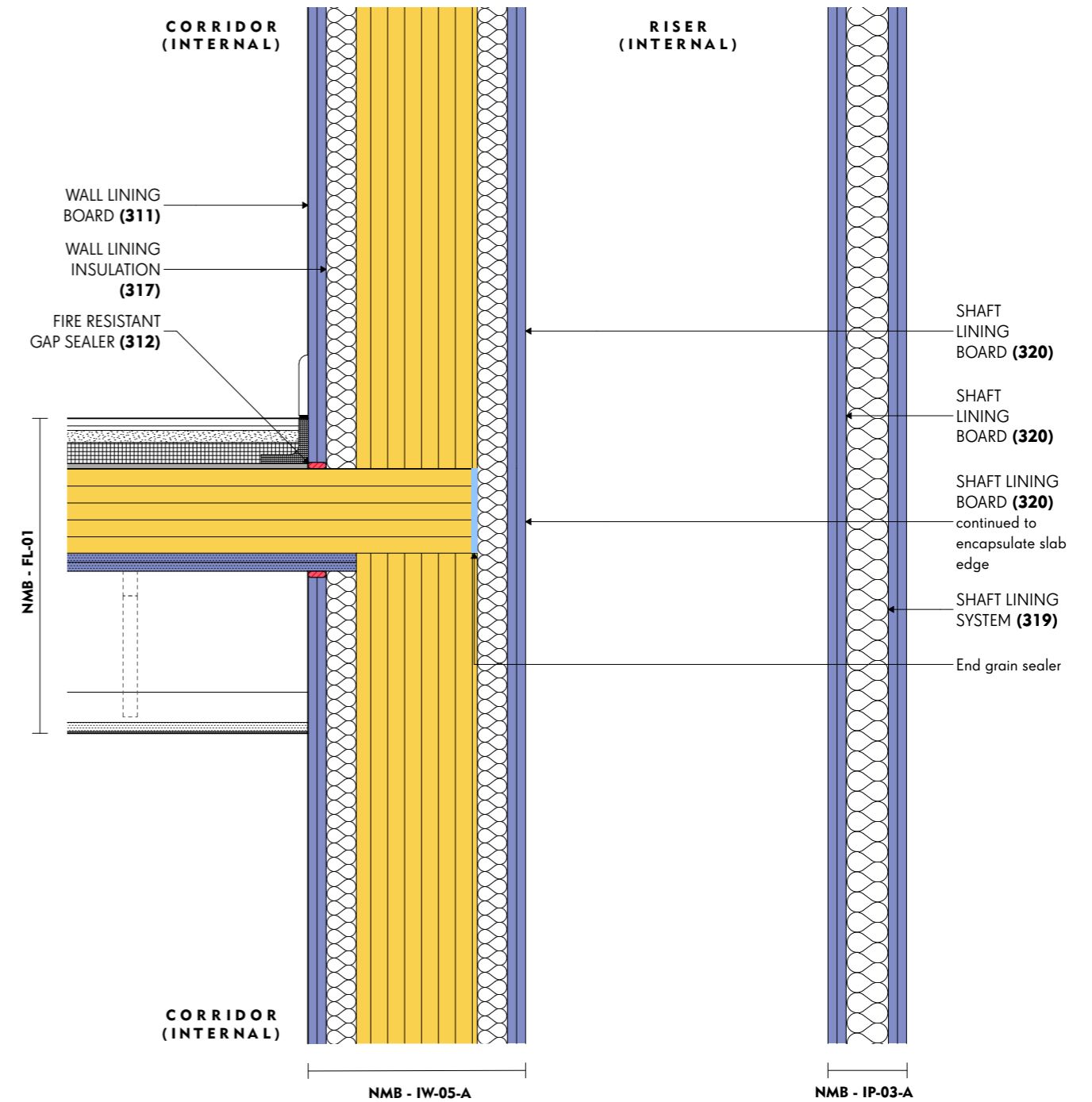


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Internal load-bearing timber elements (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311&320)	<input type="checkbox"/>
2	Line of encapsulation to be continuous with no areas of exposed timber.	<input type="checkbox"/>
3	Non-loadbearing shaft wall linings to be designed to suit compartmentation requirements. (320)	<input type="checkbox"/>
4	Soffit to all floor slabs (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311)	<input type="checkbox"/>
5	End-grain sealant is to be applied to all openings in mass timber elements. (302)	<input type="checkbox"/>

PENETRATION TO SHAFT



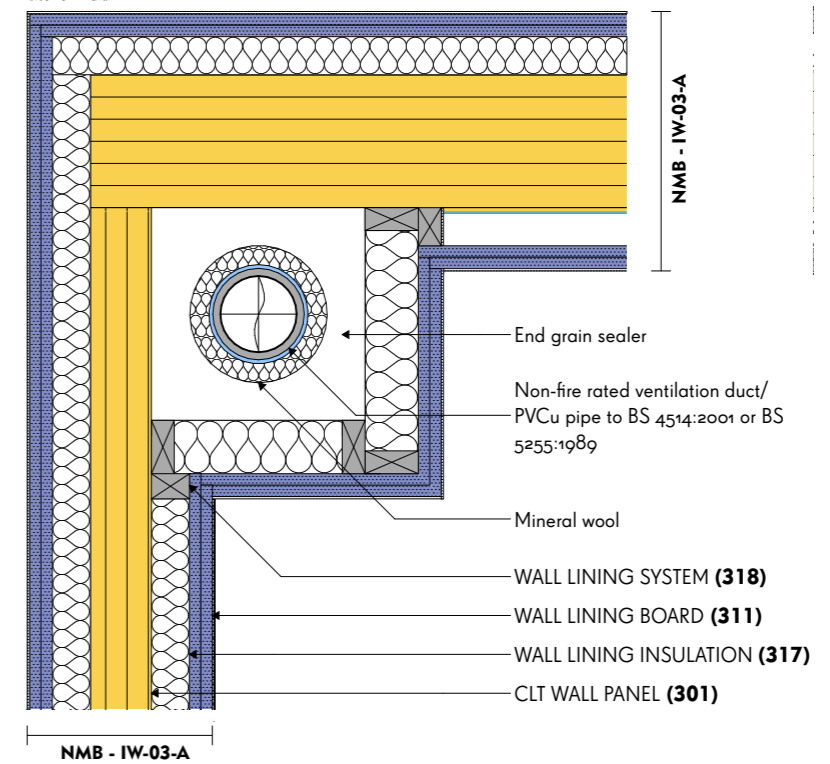
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

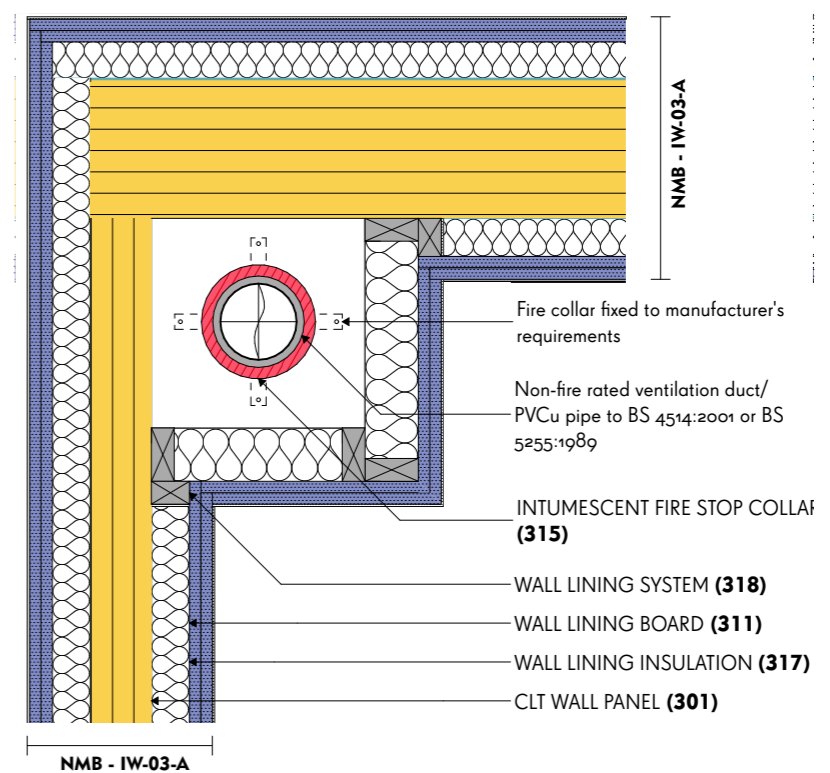
REF	ITEM	<input checked="" type="checkbox"/>
1	Material of pipework/service to be identified for each penetration.	<input type="checkbox"/>
2	Fire-stopping product to be suitable for size and material of pipe. (314)	<input type="checkbox"/>
3	End-grain sealant is to be applied to all openings in mass timber elements. (301&302)	<input type="checkbox"/>
4	Fire-stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
5	Mineral wool to be provided in voids around pipework/service and mass timber voids.	<input type="checkbox"/>
6	Internal load-bearing timber walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311)	<input type="checkbox"/>
7	K2-60 encapsulation to be used to box in services to ensure all mass timber elements and openings are fully encapsulated.	<input type="checkbox"/>
8	Soffit to all floor slabs (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a max limit temperature of 200 degrees C. (311)	<input type="checkbox"/>

PENETRATION TO INTERNAL WALLS / SLAB

PLAN



REFLECTED CEILING PLAN



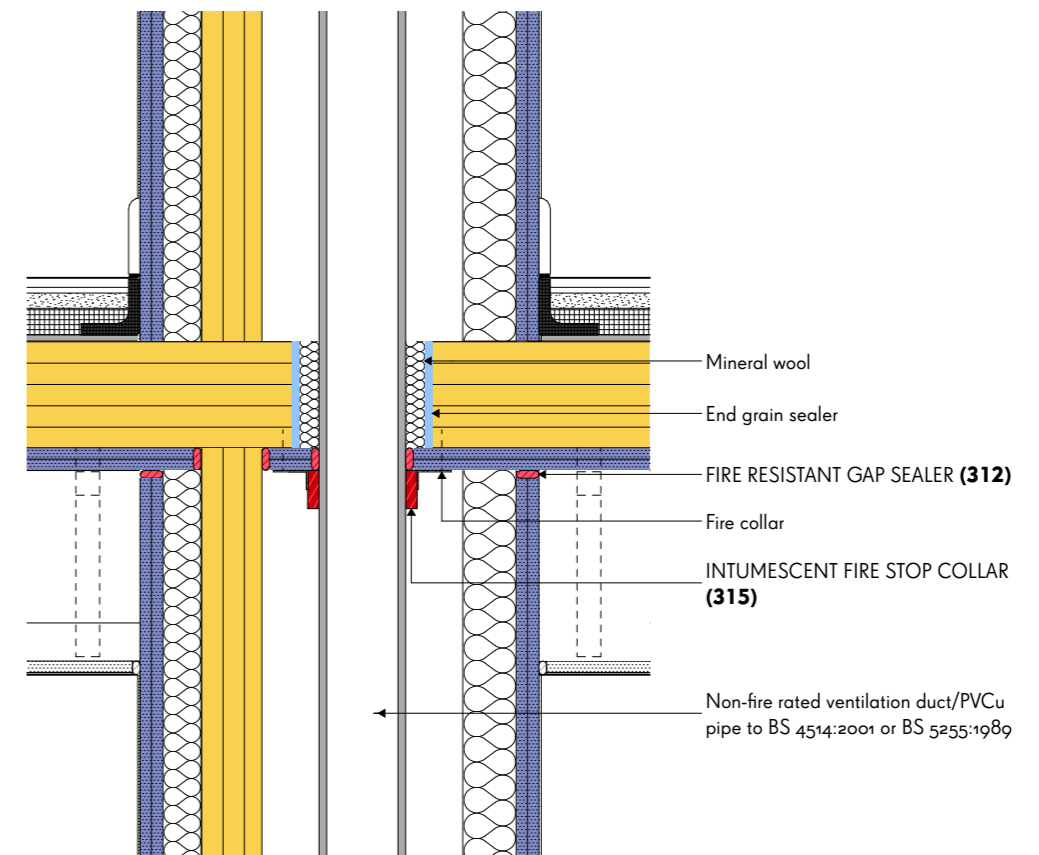
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Material of pipework/service to be identified for each penetration.	<input type="checkbox"/>
2	Fire-stopping product to be suitable for size and material of pipe. (314)	<input type="checkbox"/>
3	End-grain sealant is to be applied to all openings in mass timber elements. (301&302)	<input type="checkbox"/>
4	Mineral wool is to be provided in voids around pipework/service and mass timber voids.	<input type="checkbox"/>
5	Fire-stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
6	Internal load-bearing timber walls (302) should be fully encapsulated with gypsum board applied to achieve K2-60 classification in accordance with BS EN 13501-2 with a maximum limit temperature of 200 degrees C. (311) .	<input type="checkbox"/>
7	K2-60 encapsulation to be used to box in services to ensure all mass timber elements and openings are fully encapsulated.	<input type="checkbox"/>

PENETRATION TO INTERNAL WALLS / SLAB

SECTION



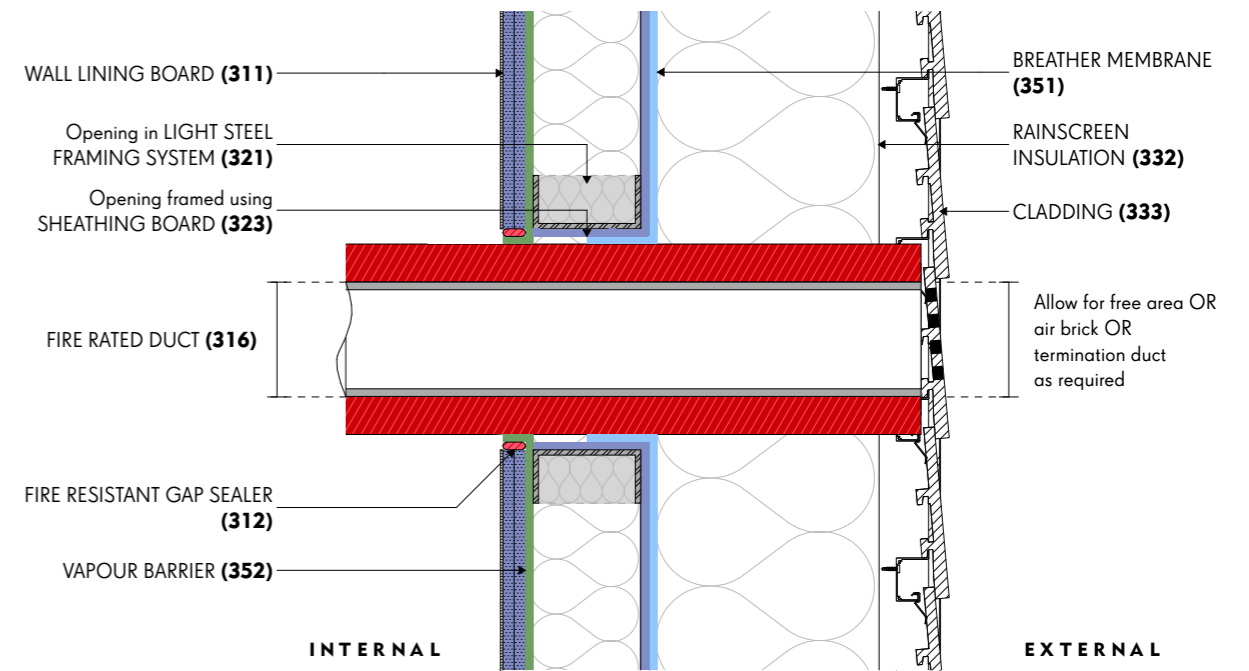
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Material of pipework/service to be identified for each penetration.	<input type="checkbox"/>
2	Fire-stopping product to be suitable for size and material of pipe. (314)	<input type="checkbox"/>
3	End-grain sealant to be applied to all openings in mass timber elements. (301+302)	<input type="checkbox"/>
4	Fire-stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
5	Full-fill mineral wool insulation to LSF framing around service penetrations. (325)	<input type="checkbox"/>
6	Cavity barriers rated to REI 60 to be installed around service penetrations if fire rated ducts and collars are not installed. (343)	<input type="checkbox"/>
7	Ensure the AVCL will be sealed against the service penetrations to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>
8	Voids between internal lining and service penetrations to be sealed with intumescent gap sealer. (312)	<input type="checkbox"/>

PENETRATION TO FAÇADE

WITH FIRE RATED DUCT



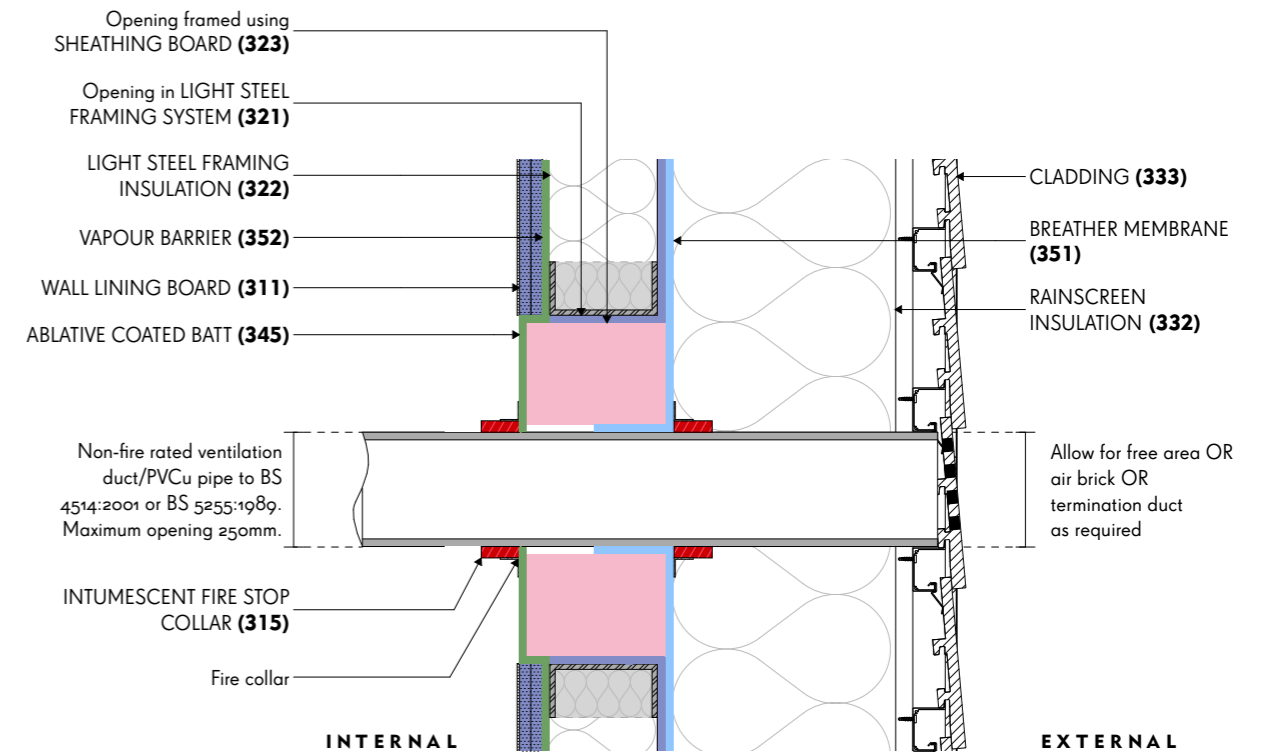
CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

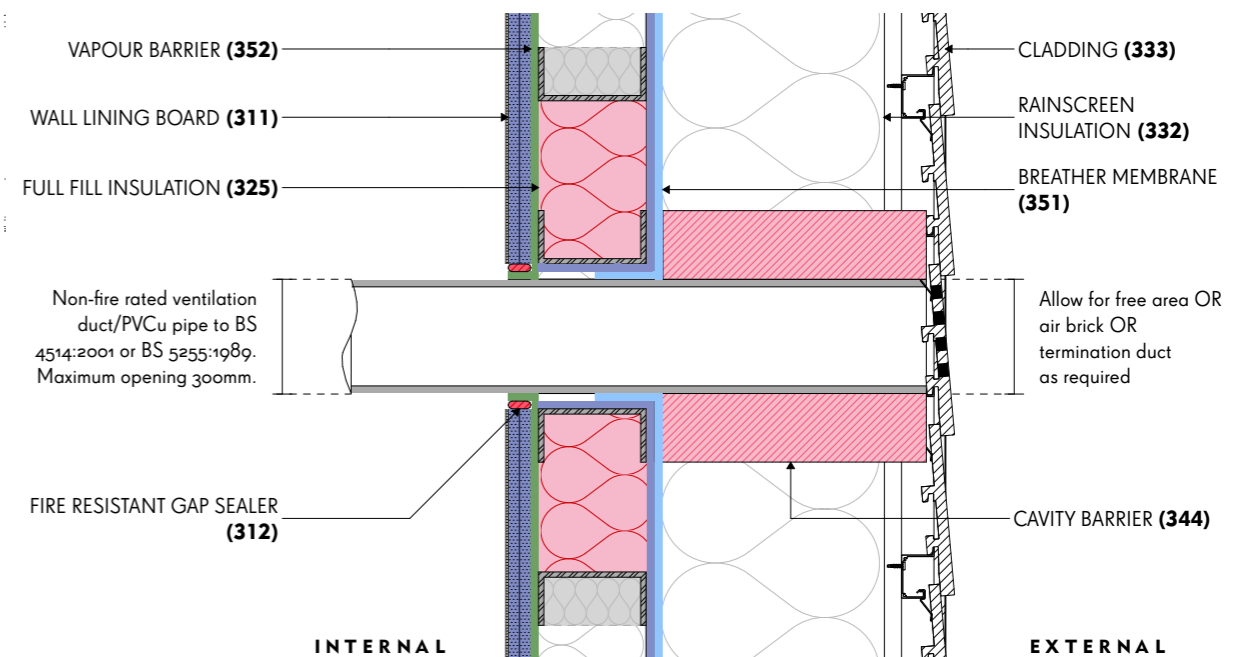
REF	ITEM	
		✓
1	Material of pipework/service to be identified for each penetration.	○
2	Fire-stopping product to be suitable for size and material of pipe. (314)	○
3	End-grain sealant to be applied to all openings in mass timber elements. (301+302)	○
4	Fire-stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	○
5	Full-fill mineral wool insulation to LSF framing around service penetrations. (325)	○
6	Cavity barriers rated to REI 60 to be installed around service penetrations if fire rated ducts and collars are not installed. (343)	○
7	Ensure the AVCL will be sealed against the service penetrations to ensure continuous airtightness across the external wall. (352)	○
8	Voids between internal lining and service penetrations to be sealed with intumescent gap sealer. (312)	○

PENETRATION TO FAÇADE

PROPRIETARY FIRE COLLAR



CAVITY CLOSED LOCALLY

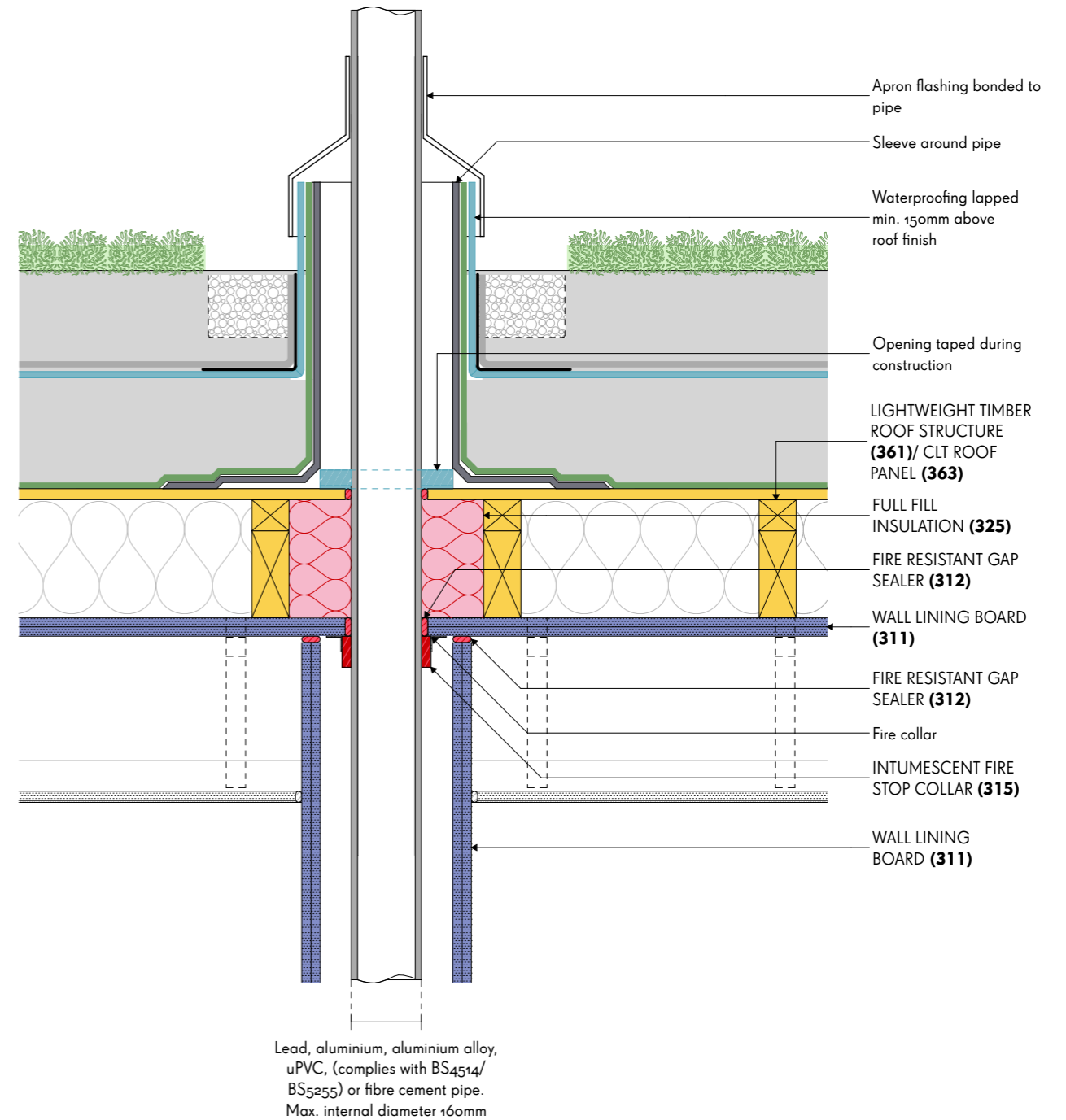


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Service to be sealed and taped with water-resistant tape during construction.	<input type="checkbox"/>
4	Service penetration is to be taped and sealed to the structural deck. (361 & 363)	<input type="checkbox"/>
5	Material of pipework/service to be identified for each penetration.	<input type="checkbox"/>
6	Fire-stopping product to be suitable for size and material of pipe. (314)	<input type="checkbox"/>
7	End-grain sealant is to be applied to all openings in mass timber elements. (301&302)	<input type="checkbox"/>
8	Fire-stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
9	Full-fill mineral wool insulation to LSF framing around service penetrations. (325)	<input type="checkbox"/>
10	Voids within roof construction around service to be filled with mineral wool insulation.	<input type="checkbox"/>
11	Ensure the AVCL will be sealed against the service penetrations to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>
12	Voids between the internal lining and service penetrations to be sealed with intumescent gap sealer. (312)	<input type="checkbox"/>

PENETRATION TO ROOF SOIL VENT PIPE

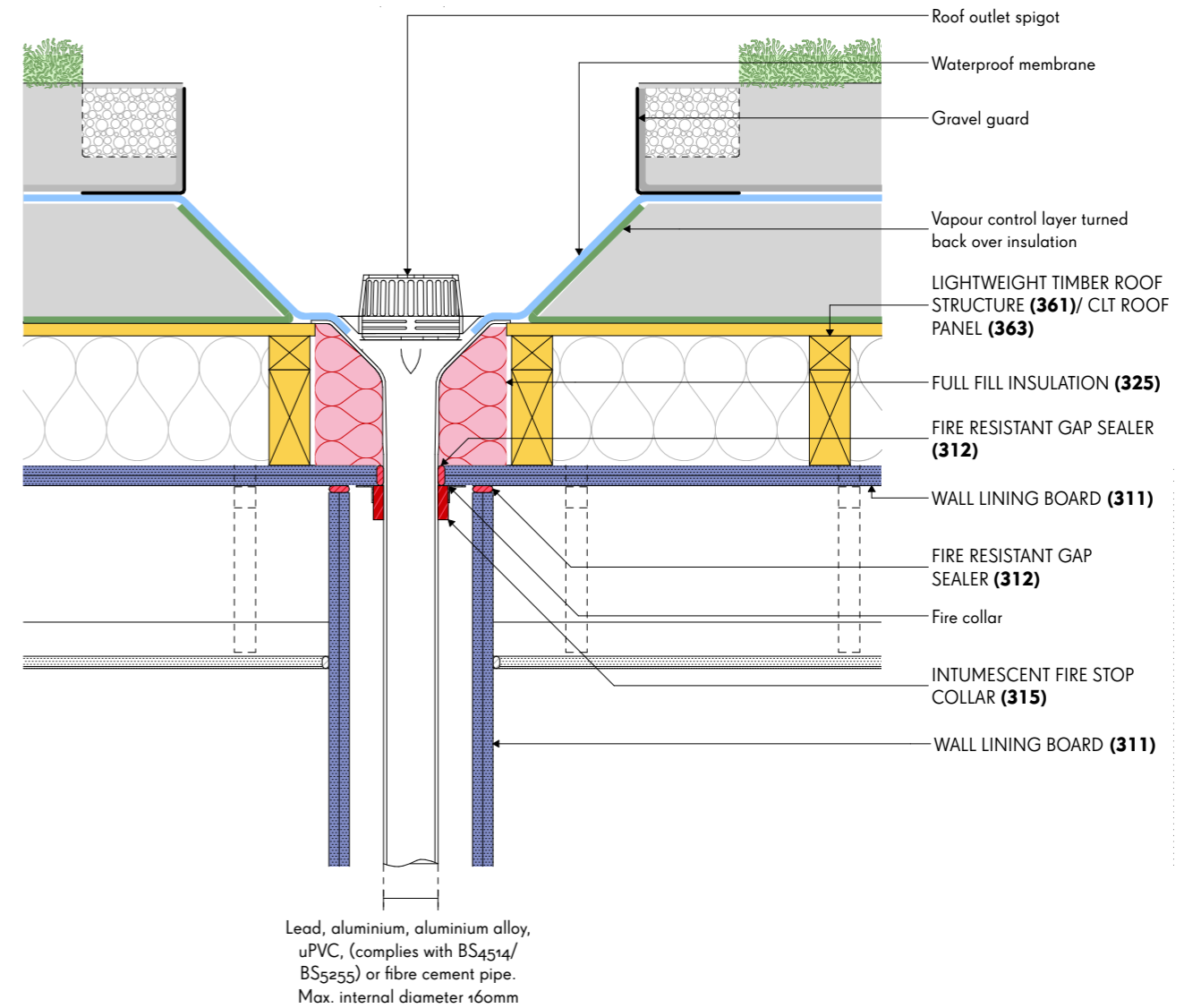


CHECKLIST

Please refer to the performance specification information (p. 116 - 119) for the relevant listed item numbers.

REF	ITEM	<input checked="" type="checkbox"/>
1	Material of pipework/service to be identified for each penetration.	<input type="checkbox"/>
2	Fire-stopping product to be suitable for size and material of pipe. (314)	<input type="checkbox"/>
3	End-grain sealant is to be applied to all openings in mass timber elements. (301&302)	<input type="checkbox"/>
4	Fire-stopping product to achieve the required 60 minutes REI fire performance and be installed to manufacturers' requirements to match standard detail or project-specific bespoke engineering judgements.	<input type="checkbox"/>
5	Full-fill mineral wool insulation to LSF framing around service penetrations. (325)	<input type="checkbox"/>
6	Voids within roof construction around service to be filled with mineral wool insulation.	<input type="checkbox"/>
7	Ensure the AVCL will be sealed against the service penetrations to ensure continuous airtightness across the external wall. (352)	<input type="checkbox"/>
8	Voids between the internal lining and service penetrations to be sealed with intumescent gap sealer. (312)	<input type="checkbox"/>

PENETRATION TO ROOF RAINWATER PIPE



PERFORMANCE SPECIFICATION

SPECIFICATION REFERENCES

SPECIFICATION REFERENCE			PRODUCT INFORMATION			
GROUP NO.	GROUP NAME	PRODUCT NO.	PRODUCT NAME	LOCATION	DESCRIPTION	DIMENSION
300	INTERNAL STRUCTURE	301	CLT wall panel	All internal structural walls (fully encapsulated)	Cross laminated timber wall panels	Varies
		302	CLT floor panel	All intermediary floor slabs (fully encapsulated)	Cross laminated timber floor panels	Varies
		303	Glulam column	Throughout internally (fully encapsulated)	Glulam timber column	Varies
		304	Steel bracket	Internal structural panels	Steel anchor bolts and straps connecting timber elements	Varies
		305	Glulam beam	Throughout internally (fully encapsulated)	Glulam timber beam	Varies
310	INTERNAL FINISHES	311	Wall lining board	To internal face of all external walls and providing encapsulation to CLT internal walls	Wall lining board	Minimum 2 layers
		312	Fire resistant gap sealer	At head and base junctions to wall lining boards	Flexible firestop sealant for sealing ceiling/wall joints	N/A
		313	Cavity closer	Installed to LFS void to close the cavity beneath window sills	Calcium silicate, cement-based or gypsum-based board	Minimum 12mm thick
		314	Intumescent firestop wrap	Installed around combustible pipe penetrations	Intumescent, flexible firestop wrap strip	Varies
		315	Intumescent firestop collar	Installed around combustible pipe penetrations	Intumescent fire collar	Varies
		316	Fire rated duct	To service penetrations in external façade, as required	Heating, Ventilation and Air Conditioning (HVAC) system either constructed from or encapsulated with fire rated ductwork insulation	Varies
		317	Wall lining insulation	Installed between studs to partition walls as required	Acoustic insulation for drylining partition systems	Varies
		318	Wall lining system	Supporting wall lining board to CLT internal walls where acoustic insulation is required	Studwork wall framing system to support wall lining board	Varies
		319	Shaft lining system	Service riser	Wall framing system providing non loadbearing partition to service riser	Varies
		320	Shaft lining board	To internal face of smoke shafts and service risers	Shaft lining board	Minimum 2 layers
320	EXTERNAL STRUCTURE	321	Light steel framing system	To all external walls	Light steel framing system (LFS) for load-bearing and non-load-bearing applications	1.2-3mm to BS EN 1993-1-2: 2005 Eurocode 3
		322	Light steel framing system insulation	Within stud void of LSF in all external walls	Stone/glass mineral wool slab insulation suitable for use in steel frames	Varies, dependent on required u-value
		323	Sheathing board	To all external walls	Cement bonded particle board	Varies
		324	Connection to slab		Bespoke steel angle bracket	Varies
		325	Full fill insulation	At slab edge aligning with fire compartment within stud void of LFS in all external walls	Full fill stone mineral wool slab insulation suitable for use in steel frames	Varies, fulfill to fit LFS void
		326	Balcony connection	At all balconies	Bespoke steel balcony connection	Varies
		327	Closed cell insulation	At junction of GF slab and external façade	Closed cell perimeter insulation suitable for use below DPC	Varies

FIRE PERFORMANCE		
FIRE RESISTANCE	REACTION TO FIRE	FIXING METHOD
N/A – fire resistance is provided through encapsulation	Euroclass D-s2, d0 in accordance with BS EN 113501-1	Steel anchor bolts and straps screw fixed to CLT panel
N/A – fire resistance is provided through encapsulation	Euroclass D-s2, d0 in accordance with BS EN 113501-1	Steel anchor bolts and straps screw fixed to CLT panel
N/A – fire resistance is provided through encapsulation	Euroclass D-s2, d0 in accordance with BS EN 113501-1	Steel anchor bolts and straps screw fixed to CLT panel
N/A – fire resistance is provided through encapsulation	N/A	Screw fixed to timber elements
N/A – fire resistance is provided through encapsulation	Euroclass D-s2, d0 in accordance with BS EN 113501-1	Steel anchor bolts and straps screw fixed to CLT panel
60 minutes, K2 class in accordance with BS EN 13501-2	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fix to LFS/wall lining system
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	N/A
30 minutes integrity, 15 minutes insulation	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to LFS
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Installed inside the wall build up
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Collar is securely fastened to the substrate by means of fire rated fixings to suit the substrate and installed through the fixing tabs.
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to CLT ceiling panel
N/A	N/A	Suspended within the partition with angle fixed through head track as required
N/A	N/A	Mechanically fixed to CLT
N/A	N/A	Mechanically fixed to CLT
60 minutes	Euroclass A1 in accordance with BS EN 13501-1	Mechanically fix to shaft lining system
N/A	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Supported at slab edge by connections outlined below (321 CONNECTION TO SLAB)
N/A	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to sheathing board using metal fixings to centre of panel and polypropylene to edges. Minimum of one non-combustible fixing per 1m2 or per insulation batt, whichever is the lesser, provided in addition to other fixings.
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fix to LFS
N/A – fire resistance is provided through encapsulation	N/A	Mechanically fixed to CLT floor slab
N/A – provides extra protection to the slab edge through non-combustible material properties and thermal resistance. Refer to Fire Philosophy Manual for further information.	Euroclass A2-s1, d2 or better in accordance with BS EN 13501-1	Insulation slab impoed onto steel fixing brackets which are mechanically fixed to CLT slab
N/A	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to CLT floor slab
N/A	Euroclass A2-s1, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to concrete upstand

SPECIFICATION REFERENCES

SPECIFICATION REFERENCE			PRODUCT INFORMATION			
GROUP NO.	GROUP NAME	PRODUCT NO.	PRODUCT NAME	LOCATION	DESCRIPTION	DIMENSION
33°	CLADDING SYSTEM	331	Fixing system	Cladding support system	Thermally broken aluminium hanging support system	Varies
		332	Rainscreen insulation	Installed as part of ventilated rainscreen system	Dual density stone/glass mineral wool slab insulation suitable for rainscreen systems and resilient to moisture	Varies, dependent on required u-value
		333	Cladding	External cladding	Rainscreen cladding fixed to cladding support system	Varies
34°	PASSIVE FIRE PROTECTION	341	Linear firestop	To end grain of slab edges	Linear mineral wool firestop product	150mm, use up to 3 layers for to provide min. 5% compression
		342	Horizontal cavity barrier	To align with horizontal fire compartment in all external walls	Open state stone mineral wool intumescent cavity barrier for rainscreen systems	Varies, max. 25mm between cavity barrier and back of cladding panel
		343	Vertical cavity barrier	To align with vertical fire compartment in all external walls	Stone mineral wool vertical cavity barrier suitable for use with steel frame walls	Varies, fulfill cavity from sheathing board to back of cladding panel
		344	Cavity barrier to windows	To surround of all windows	Open state stone mineral wool intumescent cavity barrier for rainscreen systems	Varies, max. 25mm between cavity barrier and back of cladding panel
		345	Ablative coated batt	Installed at service penetrations to external walls	Mineral wool insulation, pre-coated on both sides with ablative coating	Varies
		346	Fire board	Applied to external face of glulam columns	Calcium silicate or cement-based board suitable for external use	Varies
		35°	MEMBRANES	351	Breather membrane	Applied to outer face of sheathing board at all external walls
		352	Vapour control layer	Applied to internal lining of all external walls	Fire retardant airtight vapour control layer (AVCL)	Varies
36°	ROOF SYSTEM	361	Roof build up	Roof system to all areas	Roof covering to suit project requirements	Varies
		362	Lightweight timber roof structure	Roof structure for roofs with minimum fall of 1:40/1.50	Timber decking board with timber joists	Varies
		363	CLT roof panel	Roof structure for roofs with minimum fall of 1:5.5/100	Cross laminated timber roof panels	Varies
		364	Non-combustible roof sheeting	Encapsulating exterior face of roof structure for buildings >15m in height, installed 1.5m either side of compartment walls	Non-combustible cement bonded particle board suitable for exterior use in horizontal application	Varies

FIRE PERFORMANCE		
FIRE RESISTANCE	REACTION TO FIRE	FIXING METHOD
N/A	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to sheathing board
N/A	Euroclass A2-s1, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to sheathing board using metal fixings to centre of panel and polypropylene to edges. Minimum of one non-combustible fixing per 1m2 or per insulation batt, whichever is the lesser, provided in addition to other fixings.
N/A	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to cladding support system
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed using suitable fixings e.g. steel self-tapping screws or hammer fix anchors
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to L-shaped metal brackets that are fixed to the sheathing board
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Flanges of the cavity barrier fixed to sheathing board using staples or clout nails
30 minutes integrity, 15 minutes insulation	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to L-shaped metal brackets that are fixed to the sheathing board
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to sheathing board using metal fixings to centre of panel and polypropylene to edges. Minimum of one non-combustible fixing per 1m2 or per insulation batt, whichever is the lesser, provided in addition to other fixings.
60 minutes	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to glulam column
N/A	B-s1, d0 or better in accordance with BS EN 13501-1	Mechanical fixings to LFS. A rubber or EPDM washer should sit between fixings and the membrane. Tape and lap joints to ensure continuous coverage.
N/A	B-s1, d0 or better in accordance with BS EN 13501-1	Mechanical fixings to LFS. A rubber or EPDM washer should sit between fixings and the membrane. Tape and lap joints to ensure continuous coverage.
BROOF (t4) in accordance with BS EN 13501-5, B	N/A	Varies dependent on system
N/A – fire resistance is provided through encapsulation	Euroclass D-s2, d0 in accordance with BS EN 113501-1	Varies dependent on system
N/A – fire resistance is provided through encapsulation	Euroclass D-s2, d0 in accordance with BS EN 113501-1	Steel anchor bolts and straps screw fixed to CLT panel
N/A	Euroclass A2-s3, d2 or better in accordance with BS EN 13501-1	Mechanically fixed to roof deck

EXTERNAL WALL BUILD-UPS

WALL TYPE: NMB - EW-01

Location: External / Apartment

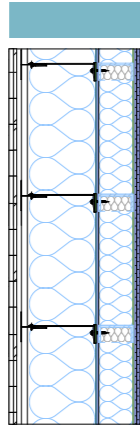
Fire performance: 60 minutes REI

Thermal location: External / Internal (heated)
Thermal performance: To meet project requirements, AD Part L as minimum

Airtightness: To meet project requirements, AD Part L as minimum
Minimum sound reduction: To meet project requirements, BS 8233:2014 as minimum

Notes: -

- (varies) Cladding (333)
- 65 mm Fixing system (331)
- 300 mm Rainscreen insulation (332)
- 1 mm Breather membrane (320)
- 12 mm Sheathing board (323)
- 150 mm Light steel framing system (321) with insulation (322)
- 1 mm Vapour barrier (322)
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 3 mm Skim and point



WALL TYPE: NMB - IW-01-A

Location: Apartment / Apartment (Internal)

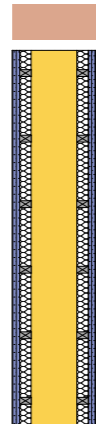
Fire performance: K₂ 60 max temp 200°C + REI 60

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A (target)
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- 3 mm Skim and point
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 50 mm Wall lining system (318) with insulation (317) between studs
- (varies) CLT wall panel (301)
- 50 mm Wall lining system (318) with insulation (317) between studs
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 3 mm Skim and point



WALL TYPE: NMB - IW-02-A

Location: Apartment / Apartment (Internal)

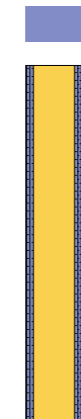
Fire performance: K₂ 60 max temp 200°C + REI 60

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- 3 mm Skim and point
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- (varies) CLT wall panel (301)
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 3 mm Skim and point



WALL TYPE: NMB - IW-03-A

Location: Apartment / Apartment (Internal)

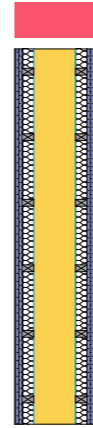
Fire performance: K₂ 60 max temp 200°C + REI 60

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- 3 mm Skim and point
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 50 mm Wall lining system (318) with insulation (317) between studs
- 2 mm Robust waterproofing layer, installed to min. 1.2m AFFL
- (varies) CLT wall panel (301)
- 2 mm Robust waterproofing layer, installed to min. 1.2m AFFL
- 50 mm Wall lining system (318) with insulation (317) between studs
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 3 mm Skim and point



WALL TYPE: NMB - IW-04-A

Location: Apartment / Apartment (Internal)

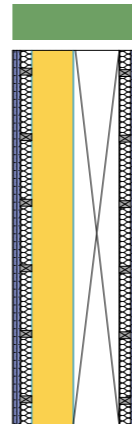
Fire performance: K₂ 60 max temp 200°C + REI 60

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A (target)
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: Applies to areas of boxing out (SVP/RWP)

- 3 mm Skim and point
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 50 mm Wall lining system (318) with insulation (317) between studs
- 2 mm Robust waterproofing layer, installed to min. 1.2m AFFL
- (varies) CLT wall panel (301)
- 2 mm Robust waterproofing layer, installed to min. 1.2m AFFL
- 200 mm Servicing void for SVP
- 50 mm Wall lining system (318) with insulation (317) between studs
- 15 mm Wall lining board (311)
- 15 mm Wall lining board (311)
- 3 mm Skim and point



WALL TYPE: NMB - IW-05-A

Location: Service Riser

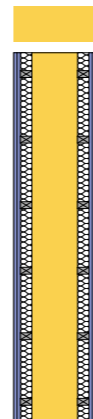
Fire performance: K₂ 60 max temp 200°C + REI 60

Thermal location: Internal (unheated) / Internal (unheated)
Thermal performance: N/A
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- 15 mm Shaft lining board (320/311)
- 15 mm Shaft lining board (320/311)
- 50 mm Shaft lining system (319)
- (varies) CLT wall panel (301)
- 50 mm Shaft lining system (319)
- 15 mm Shaft lining board (320/311)
- 15 mm Shaft lining board (320/311)



WALL TYPE: NMB - IP-01-A

Location: Apartment / Apartment (Internal)

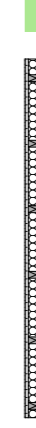
Fire performance: 30 minutes REI

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: Patressing not illustrated

- 3 mm Skim and point
- 13 mm Wall lining board
- (varies) Wall lining system with insulation between studs
- 13 mm Wall lining board
- 3 mm Skim and point



WALL TYPE: NMB - IP-02-A

Location: Apartment / Apartment (Bathroom)

Fire performance: 30 minutes REI

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A
Airtightness: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: Patressing not illustrated

- 3 mm Skim and point
- 13 mm Wall lining board
- (varies) Wall lining system with insulation between studs
- 13 mm Wall lining board
- 3 mm Robust self adhesive waterproofing membrane
- 11 mm Bathroom wall finish, e.g. tiles



WALL TYPE: NMB - IP-03-A

Location: Service Riser

Fire performance: 60 minutes REI

Thermal location: Internal (unheated) / Internal (unheated)
Thermal performance: N/A
Airtightness: N/A

Minimum sound reduction: N/A

Notes: Patressing not illustrated

- 15 mm Shaft lining board (320/311)
- 15 mm Shaft lining board (320/311)
- (varies) Shaft lining system (319)
- 15 mm Shaft lining board (320/311)
- 15 mm Shaft lining board (320/311)



WALL TYPE: NMB - IP-04-A

Location: Apartment / Apartment (Storage)

Fire performance: No Rating

Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A
Airtightness: N/A

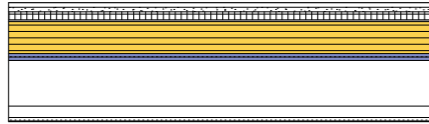
Minimum sound reduction: N/A

Notes: -

- 3 mm Skim and point
- 13 mm Wall lining board
- (varies) Wall lining system with insulation between studs
- 13 mm Wall lining board
- 3 mm Skim and point



FLOOR BUILD-UPS



FLOOR TYPE: NMB - FL-01

Location: Apartment / Apartment (Party Floor)

Fire performance: 60 minutes REI

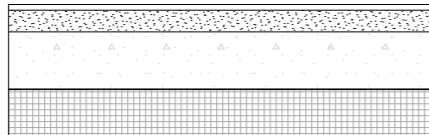
Thermal location: Internal (heated) / Internal (heated)
Thermal performance: N/A

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- 20 mm Internal floor finish allowance
- 20 mm Screedboard
- 35 mm Rigid insulation with underfloor heating
- 8 mm Acoustic matting
- (varies) CLT floor panel (302)
- 15 mm Wall lining board (31)
- 15 mm Wall lining board (31)
- 200 mm Services zone
- (varies) Suspended ceiling support system
- 15 mm Wall lining board
- 3 mm Skim and paint

Optional



FLOOR TYPE: NMB - FL-02

Location: Ground Floor Slab

Fire performance: No Rating

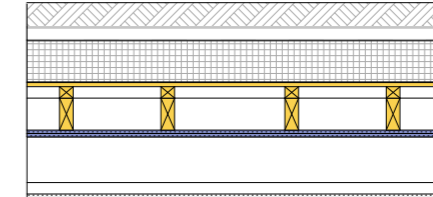
Thermal location: External / Internal (heated)
Thermal performance: To meet project requirements, AD Part L as minimum

Minimum sound reduction: N/A

Notes: -

- 25 mm Internal floor finish allowance
- (varies) Screed (bonded)
- (varies, 100mm min.) Reinforced concrete (in-situ) to S.E. design and specification
- 3 mm Waterproof membrane to specialist supplier/subcontractor specification
- 205 mm Rigid closed cell insulation

ROOF BUILD-UPS



ROOF TYPE: NMB - RF-01

Location: Roofs with minimum fall of $\geq 1:40/1:5$ degrees

Fire performance: BROOF T(4); Min. 30 minutes REI where part of a means of escape.

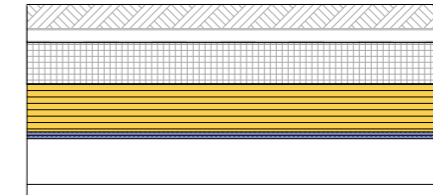
Thermal location: External / Internal (heated)
Thermal performance: To meet project requirements, AD Part L as minimum

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- (varies) BROOF (14) roof build up (361)
- (varies) Lightweight roof structure (362)
- 15 mm Wall lining board (31)
- 15 mm Wall lining board (31)
- 200 mm Services zone
- (varies) Suspended ceiling support system
- 15 mm Wall lining board
- 3 mm Skim and paint

Optional



ROOF TYPE: NMB - RF-02

Location: Roofs with minimum fall of $\geq 1:5/1:10$ degrees

Fire performance: BROOF T(4); Min. 30 minutes REI where part of a means of escape.

Thermal location: External / Internal (heated)
Thermal performance: To meet project requirements, AD Part L as minimum

Minimum sound reduction: To meet project requirements, AD Part E as minimum

Notes: -

- (varies) BROOF (14) roof build up (361)
- (varies) CLT roof panel (363)
- 15 mm Wall lining board (31)
- 15 mm Wall lining board (31)
- 200 mm Services zone
- 50 mm Suspended ceiling support system
- 15 mm Wall lining board
- 3 mm Skim and paint

Optional

APPENDIX

REFERENCES

The following open source guidance documents are referenced in the text above. It is up to the user of this guide to ensure that they refer to the current version of each document listed below:

GENERAL

- TRADA's National Structural Timber Specification For Building Construction Version 2.0.
- TRADA Cross-laminated Timber Design and Performance
- SCI Technical Report EDo17 Design and Installation of Light Steel External Wall Systems

FIRE

- STA Structural Timber Buildings Fire Safety In Use Guidance Volume 6 - Mass Timber Structures; Building Regulation compliance B3(1) STA fire safety and guidance project Version 2.1 May 2023
- STA 16 Steps to fire safety. Promoting good practice on construction sites. Version 4.3 October 2017

MOISTURE MANAGEMENT

- Swedish Wood/TDUKs Moisture-proof CLT construction without a full temporary shelter Edition 1:2022
- STA Moisture management strategy, process guidance for structural timber buildings, Version 1.0, July 2022
- STA Advice Note 14 - Robustness of CLT Structures - Part 1 - Key principles for moisture durability
- STA Technical Note 23 - Durability by design – mass timber structures – STA 2021
- STA Technical Note 24 - Moisture protection during construction - STA 2020

PHOTO CREDITS

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WAUGH THISTLETON ARCHITECTS