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APPENDIX A: EZI-SPEC
BRANZ Appraisal Certificate
SHEET REVISIONS

June 2009

SF5: Minimum ground clearance changed to 150mm.
SF6: Minimum ground clearance changed to 150mm.
SF15: 7.5mm minimum reveal liner gap added.
  Air seal over PEF rod 7 foam note added.
  10mm minimum flashing cover to joinery note added.
SF16: 7.5mm minimum reveal liner gap added.
  Air seal over PEF rod 7 foam note added.
  10mm minimum flashing cover to joinery note added.
  Protecto tape around entire opening note added.
SF22: 12mm minimum gap added.
SF26: Ribbon plate upsized to 75x50mm.
SF27: 35 & 50mm minimum overlap of flashing to cladding dimension added.
SF29: Refer to NZBC E2/AS1 Paragraph 9.9.10.2 for the performance of the waterproofing
  membrane note added.
  Liquid membrane to carry 200mm under metal cap & 50mm onto wall.
SF30: Flashing overlap to roofing note added.
  Upstand and cladding clearance to roof flashing dimensions added.
SF31: Minimum flange size dimension added.
SF43: New sheet added.
SF44: New sheet added.
SF45: New sheet added.
INTRODUCTION

DESCRIPTION AND STRUCTURE OF THIS MANUAL

This manual, when used in conjunction with the New Zealand Building Code, (NZBC), sets down the construction requirements for Superform POLY Block structures.

The first part of the manual outlines the Superform POLY Block system, the Superform POLY Block fire rated system and gives the Superform POLY Block product information. The scope and structural design information is also described.

Section A of the manual gives specific requirements and properties of the different components that make up the Superform POLY Block system. When used with the exterior wall claddings and internal linings stated as approved in this section, the Superform POLY Block system will satisfy the performance requirements of the NZBC.

Section B of the manual covers the requirements for buildings which are not subject to specific design. This section has been included to provide sufficient information to permit a building to be constructed without the need for specific design.

Section C of the manual covers a description of the Superform POLY Block Fire Rated System including BRANZ Fire Resistance Rating and specific requirements.

Section D of the manual covers construction issues and requirements when using the Superform POLY Block system. This section covers details used in the construction of non-specifically designed Superform POLY Block buildings.

Appendix A - BRANZ Appraisal.

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“The products, methods and inventions described, illustrated and portrayed in this manual are the subject of New Zealand Patent Application No. 264355 and New Zealand Registered Design No. 26151, 26379, 26380”.

SUPERFORM POLY BLOCK SYSTEM

The Superform POLY Block blockwall system represents an exciting engineering development in New Zealand. It has been designed to conform to, and comply with, New Zealand building codes, practices and construction methods, and offers excellent insulation properties for a wide range of projects. Previous uses have included housing, in-ground basements, swimming pools, multi-storey buildings, motel units and hotels.

The inherent ability to act as permanent formwork makes the Superform POLY Block system a cost effective, energy efficient and versatile building solution, providing scope for
the designer to incorporate features such as curved profiles for archways and circular window openings.

The Superform POLY Block system consists of factory produced, expanded polystyrene (EPS) modules which snap together on site to form hollow interlocking blocks.

Thermo Plastic PP spacer ties are inserted into each E.P.S. face shell and the interlocking blocks are stacked and filled with reinforced concrete to form solid core, permanently insulated concrete foundations, walls or other structures.

An exterior cladding system and interior lining system is then installed to complete the system. The exterior claddings and interior linings must comply with the relevant clauses of the NZBC. Approved systems are given in Section A of this manual.

**SUPERFORM POLY BLOCK FIRE RATED SYSTEM**

The Superform POLY Block Fire Rated system consists of the Superform POLY Block system but also includes a specific proprietary product for both the exterior finish and interior lining, thereby allowing it to be used in applications where a demonstrated fire performance is required. The fire rated system can also be used as a complete and finished wall system in its own right.

**ADVANTAGES OF THE SUPERFORM POLY BLOCK SYSTEM**

- **Excellent insulation**
  - both sound and thermal insulation properties provided by the polystyrene blocks are superb and exceed those provided by most other cladding systems.

- **Positive interlocking**
  - provides added stability.

- **Non modular construction is easy**
  - design does not have to be set out to modular sizes.

- **Environmentally friendly**
  - No CFC’s.

- **Mechanical fixing**
  - screw fixing directly into Thermo Plastic PP spacer ties.

- **Flat polystyrene sheets**
  - save storage space. E.g. 10m$^2$ wall = 1m$^3$ only of materials. Freight costs are more than halved using this assembled on site system.

- **Thermo Plastic PP ties**
  - (inserted during installation)
  - avoid the inconvenience of lifting blocks over vertical steel bars.
  - eliminate unsightly rust stains.
PRODUCT INFORMATION

COMPOSITION

The Superform POLY Block system is based on EPS (Expanded Polystyrene) blocks, injection moulded from fire retardant polystyrene beads. The formed blocks are Grade H EPS, manufactured to a finished density of 24-26 kg/m³. Manufacturing Quality Control ensures each block is visually checked for fill, fusion and cooling completion.

The blocks are connected by a continuous series of interlocking grooves and ribs.

Superform POLY Blocks are intended for use in the construction of reinforced concrete walls, as permanent formwork. This innovative building system provides excellent thermal and acoustic insulation properties.

THE TYPICAL SUPERFORM POLY BLOCK
DIMENSIONS POLY BLOCK

The standard polystyrene face shell gives a wall coverage of 1500mm long and 300mm high. Thermo Plastic PP spacer ties are inserted into each polystyrene face shell to form block modules. Each block is connected to the previous course by the interlocking of continuous ribs and grooves.

THE TYPICAL SUPERFORM POLY BLOCK

* Note: Typical block shown is 150mm concrete infill (250mm wide). Also available are infill sizes varying from 100mm (200mm wide) to 300mm (400mm wide) in thickness.
DIMENSIONS MOULDED BLOCK

The standard polystyrene face shell gives a wall coverage of 1350mm long and 300mm high. Thermo Plastic PP spacer ties are moulded into each polystyrene face shell to form block modules. Each block is connected to the previous course by the interlocking of continuous ribs and grooves.

THE TYPICAL SUPERFORM MOULDED BLOCK

* Note: Moulded block available in 150mm concrete infill only (250mm wide).
DIMENSIONS PANEL BLOCK

The standard polystyrene face shell gives a wall coverage of 2400mm or 2700mm long and 300mm high. Thermo Plastic PP spacer ties are inserted into each polystyrene face shell to form block modules. Each block is connected to the previous course by the interlocking of continuous ribs and grooves.

THE TYPICAL SUPERFORM PANEL BLOCK

* Note: Typical block shown is 150mm concrete infill (250mm wide). Also available are infill sizes varying from 100mm (200mm wide) to 300mm (400mm wide) in thickness.
DIMENSIONS CORNER BLOCK

The standard polystyrene face shell gives a wall coverage of 850mm long and 300mm high. Thermo Plastic PP spacer ties are inserted into each polystyrene face shell to form block modules. Each block is connected to the previous course by the interlocking of continuous ribs and grooves.

THE TYPICAL SUPERFORM CORNER BLOCK

* Note: Typical block shown is 150mm concrete infill (250mm wide) made from the outer and the inner corner block shells. The outer shell of the block is also available to form infill sizes varying from 100mm (200mm wide) to 300mm (400mm wide) in thickness, the standard Poly block is used to form the inside walls.
A range of spacer ‘ties’ are available to provide an innovative solution to the construction of different wall thicknesses, using the same standard polystyrene face shell. The reinforced concrete solid wall formed is constructed to three wall thicknesses: 100mm, 150mm and 200mm.

**MASS**

The Superform POLY Block system with cladding and lining, (i.e., EPS blocks, concrete infill, and assuming an external plaster finish and 9.5 mm plasterboard internal lining) weighs:
- 290kg/m² for 100mm concrete infill,
- 420kg/m² for 150mm concrete infill, and
- 540kg/m² for 200mm concrete infill.

Note: These weights are calculated using a concrete density of 2440kg/m³.
DESIGN INFORMATION

DESIGN CODES REFERENCED

This manual references the following design guides. Abbreviations made by this manual are listed below:

<table>
<thead>
<tr>
<th>Design Code</th>
<th>Abbreviation used by this manual</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZS 3604 : 1999</td>
<td>NZS 3604</td>
<td>Timber Framed Buildings</td>
</tr>
<tr>
<td>AS/NZS 1170 : 2002</td>
<td>AS/NZS 1170</td>
<td>Structural Design Actions</td>
</tr>
<tr>
<td>NZS 3109 : 1997</td>
<td>NZS 3109</td>
<td>Specification for Concrete Construction</td>
</tr>
<tr>
<td>NZS 3101: 1995</td>
<td>NZS 3101</td>
<td>Concrete Structures Standard</td>
</tr>
<tr>
<td>NZS 4218 : 2004</td>
<td>NZS 4218</td>
<td>Energy efficiency-small building envelope</td>
</tr>
</tbody>
</table>

SCOPE

This manual provides structural design information, detailing and construction practices which can be used for designing Superform POLY Block wall systems for buildings within the following limitations:

a) Non-specific designed buildings:

Single-Storey Buildings:

Walls, ground floor connections and roof connections are constructed in accordance with the non-specific design details in the Superform POLY Block Manual. Ground floor slab, timber walls and roof framing is constructed in accordance with NZS 3604. Non Specific structural data is given in Section B.

Two-Storey Buildings:

The first floor is timber frame construction in accordance with NZS 3604. The upper storey walls may be either Superform POLY Block walls, built in accordance with the non-specific design details in the Superform POLY Block Manual, or light timber frame walls, constructed in accordance with NZS 3604. Lower storey walls, floor connections and roof connections are constructed in accordance with the non-specific design details in the Superform POLY Block Manual and the ground floor slab and roof framing is constructed in accordance with NZS 3604. Non Specific structural data is given in Section B.

b) Part non-specific designed buildings:

Two-storey buildings where a concrete suspended first floor is constructed to a specific design, but where remaining building elements are subject to the non-specific design details in the Superform POLY Block Manual.

Conditions Applying to a) and b)
i) A maximum inter-storey height of 3.0m.

ii) A maximum height from ground to the highest point on roof of 10.0m.

iii) A maximum roof plane slope of 45° to the horizontal.

iv) Buildings are to be category 2 buildings as described in table 3.1 of AS/NZS 1170.0.

v) A maximum design windspeed (V's) for the building of VH (very high), as defined in section 5.2 of NZS 3604.

vi) A maximum snow load as specified in AS/NZS 1170.3 of 0.5kPa.

vii) Suspended concrete floors are to have a maximum mass of 490kg/m²

viii) Suspended timber floors and roof shall be of light timber construction complying with the relevant requirements of NZS 3604.

ix) Maximum suspended floor imposed live load of 1.5kPa or a concentrated live load of 1.8 kN. (No allowance has been made for floor loads greater than 1.5kPa such as balconies)

x) Site requirements as per NZS 3604 Section 3.

xi) Each part of the building or structure shall be within the limitations stated by the relevant section or tables of this manual.

c) Non Specific Designed Retaining wall structures.

These are detailed in Section B along with the design assumptions and scope.

d) Specific Designed Structures.

Superform POLY Block walls can be used in structures which are subject to specific design, including multi-storey buildings, swimming pools, fire places, chimneys or barbeques. The cladding system and weather tightness details relating to specifically designed structures also require specific design.

For specific structural design this manual should be used in conjunction with AS/NZS 1170 and NZS 3101.

**CONCRETE REQUIREMENTS**

All concrete work shall comply with the provisions of NZS 3109, “Specification for Concrete Construction.”

Concrete must be Special or High grade, have a minimum compressive strength of 20 MPa at 28 days and a slump of 100mm - 150mm with a maximum aggregate size of 13mm. Expansive admixtures must not be used.

**REINFORCING REQUIREMENTS**

All reinforcing shall comply with the provisions of NZS 3109, “Specification for Concrete Construction.” Reinforcement shall be either Grade 300E or 500E as appropriate.
SECTION A: SUPERFORM POLY BLOCK SYSTEM

GENERAL

The Superform POLY Block system consists of the hollow interlocking Superform EPS blocks filled with reinforced concrete to form solid core, permanently insulated concrete foundations, walls or other structures. Suitable claddings, linings and detailing as specified in this manual complete the system.

PROTECTION OF SUPERFORM POLY BLOCKS

Superform POLY Blocks must be protected from sunlight, mechanical damage, water and weathering, by an approved external cladding system and internal lining system, (see below), within three months of installation.

The EPS must not be exposed to tar, organic solvents, or saturated hydrocarbons.

External claddings and internal linings shall be as specified under the External claddings and Internal linings headings of Section A.

Solvent based products, (e.g. solvent based adhesives), must not be used on the EPS blocks.

DURABILITY

When used and installed in accordance with the limitations and instructions of this manual, the various components of the Superform EPS Block system can be expected to meet the New Zealand Building Code (NZBC) Durability requirement B2.3.1(a), of 50 years provided the Superform EPS Block Shell is lined or clad as detailed in this manual, within three months of blocks being exposed and all protective linings, coating systems and seals are correctly maintained.

EPS does not rot and does not embrittle with age except that exposure to UV radiation results in a yellowing and embrittlement of the surface. If this occurs, loose material must be removed by sanding. The surface must then be washed down thoroughly prior to the finishing surface being applied.
MAINTENANCE

External cladding systems must be maintained in accordance with the respective manufacturer's instructions and all damage repaired promptly to ensure the ongoing weathertight properties of the cladding system and performance of the block system. In addition to these system specific requirements, the following general maintenance procedures must also be implemented.

Any dirt accumulation or organic growth that may occur should be regularly removed from the external surface by cleaning with warm water and detergent and a soft bristled broom.

Solvent based cleaners must not be used.

The external cladding system should be checked yearly for damage to the system itself, deterioration of seals and possible water entry at junctions and joints. Any damage which does occur must be repaired in accordance with the manufacturer's instructions. Where exterior plaster finish systems are used, it may be necessary to recoat the Rockcote texture with Armourglaze in accordance with the manufacturer’s instructions after 8 - 15 years to restore the visual appearance.

FIRE

General Properties
If the EPS is exposed to excessive heat, it will shrink and melt away from the heat source.

Although the EPS used contains a fire retardant it will still burn if exposed to a source of heat such as flues, wall ovens and heaters. In such situations adequate shielding must be provided so that the E.P.S. block is not subjected to temperatures above 50°C and the Superform POLY Block lined to prevent direct exposure.

Fire Walls
Superform POLY Block walls when clad and lined as detailed in Section C of the manual, can be used as fire walls in residential, commercial and industrial applications.

The Superform POLY Block Fire Rated System can provide a FRR (Fire Resistance Rating) of up to 240/240/240.
**Spread Of Fire**

The exterior cladding system must comply with NZBC C3 for the required application, in addition to the other relevant sections of the NZBC, e.g., B1, B2, C1, E2 and F2.

The FRR of Superform POLY Block walls lined both sides with 9.5mm Standard Gib® remains unchanged when the walls are constructed in accordance with the details contained in the Marshall Day Acoustics Report No.’s 98210 A1, 98210 A2, or 98210 A3, provided that the additional lining fixings required for a FRR are met.

The Superform POLY Block Fire Rated System described in Section C using the Rockcote Insulating Wall Cladding System finished with Rockcote Primer/Sealer and Rockcote Armourglaze provides the following AS 1530:3 indices:

<table>
<thead>
<tr>
<th>Property</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignitability</td>
<td>0</td>
</tr>
<tr>
<td>Spread of flame</td>
<td>0</td>
</tr>
<tr>
<td>Heat evolved</td>
<td>0</td>
</tr>
<tr>
<td>Smoke developed</td>
<td>5</td>
</tr>
</tbody>
</table>

(see NZBC definitions C2, C3, C4)

For a full description of the system and an opinion provided by BRANZ, please refer to Section C.

**EXTERNAL CLADDINGS**

The Superform POLY Block system relies on the external finish to protect the polystyrene blocks from weathering and mechanical damage, and to prevent the entry of external moisture into the building.

Claddings approved for use are the Rockcote Literock solid plaster system, Rockcote insulating wall cladding system and brick veneers. Stone veneers can be used but will require specific engineering design and detailing.

Alternative exterior cladding and finishing systems must be fit for purpose and must comply with the relevant provisions of the New Zealand Building Code, (sections B1, B2, C1, C3, E2, F2). Demonstration that a cladding is suitable for use over the Superform POLY Block system can be by an appraisal from a reputable organisation.

In all cases the manufacturer’s installation, application and maintenance instructions must be followed with particular attention given to the following areas:

- Fixing, weathering, flashing and sealing systems at door and window openings, junctions with other materials and any other penetrations of the exterior envelope. uPVC or aluminium flashings are required at all door and window openings. These may need to be in place prior to filling blocks with concrete. Sealant details at flat sills must not be used. The need for head flashings will depend on the configuration and design of the detail but are strongly recommended in all circumstances.
- The ground/ foundation/ floor/ wall interface. Particular care needs to be given to ensure that minimum distances between ground and floor level, as stated in NZS 3604 are met.
• External plaster systems are installed and cured within the temperature limitations, climatic and curing conditions set by the manufacturer. For polymer-modified, fibreglass-reinforced, cement-based plasters the temperature range will typically be between 10°C and 30°C.
• The finished external plaster system is sealed and protected from the weather with a coating system which must not form a vapour barrier.

Superform POLY Blocks forming basement walls below grade must be protected from ground moisture by a damp proof membrane (DPM). It is critical that the DPM is sealed in accordance with the manufacturer’s instructions for tanking applications and that the resulting installation forms a continuous barrier to water or moisture penetration. A suitable means of preventing damage to the membrane such as a fibre-cement sheet must be placed, prior to backfilling. Subsoil drainage must be supplied behind all basement and retaining walls.

INTERNAL LININGS

The Superform POLY Block system relies on the internal lining to protect the polystyrene blocks from mechanical damage, enclose services and to provide the desired interior aesthetic effect.

Linings approved for use are standard Gib® plasterboard and Gib® Fyreline. Gib® Aqualine wet area systems can be used in wet areas.

Internal linings must be fit for purpose and must comply with the relevant provisions of the New Zealand Building Code, (sections B1, B2, C1, C3, E3, F2). Demonstration that a lining is suitable for use over the Superform POLY Block system can be by an appraisal from a reputable organisation.

In all cases the manufacturer’s installation, application and maintenance instructions must be followed with particular attention given to the suitability of the glue for fixing to EPS. See the “Fixing” section of this manual.

FIXING

Internal sheet linings must be screw and adhesive fixed in place. Sheet linings are fixed to the Thermo Plastic PP spacer ties using Gypsum dry wall, 32mm x 6 gauge coarse threaded screws. Adhesives must be fit for purpose and compatible with the EPS such as FOSROC Panelbond or Selleys Liquid Nails.

Where a FRR is not required, screws must be spaced a maximum of 750mm horizontally and 600mm vertically. Perimeter screws must be no closer than 12mm and no further than 150mm from lining sheet edges.

Where a FRR is required, screws must be spaced at maximum 300mm centres around the lining sheet perimeter edges and at maximum 450mm centres within the body of the sheet. See Section C for the full lining and fixing details.
The adhesive must be applied in accordance with the adhesive manufacturer’s instructions or to a maximum of 250mm centres horizontally and vertically either as daubs approximately 25mm diameter and 10mm thick, or as 10mm diameter beads 50mm long.

**ADHESIVES**

Adhesives used for the fixing of internal linings must be suitable for use on EPS blocks.

Solvent based adhesives must not be used on EPS blocks.

**THERMAL PROPERTIES**

The Superform POLY Block system using a gib board internal lining and Rockcote external cladding has a thermal resistance of approximately 2.7m² °C/W as calculated using NZS 4218.

**Internal Moisture**

The excellent thermal insulation properties of the Superform POLY Block system ensures that when used with both an adequate level of ventilation and an appropriate level of ceiling / roof insulation, the Superform POLY Block system will satisfy the internal moisture provisions of NZBC Clause E3.3.1. Appropriate or adequate levels of ventilation and insulation are provided in the NZBC Acceptable Solution E3/AS1. (External cladding and finish systems must not form a vapour barrier.)

**Energy Efficiency**

Buildings constructed using the Superform POLY Block system are able to meet the performance requirements for energy efficiency as required by NZBC Clause H 1.3.1 and H1.3.2. It should be noted that compliance with NZBC H1 will also include a large number of other factors resulting from the design of the building, all of which have an effect on the energy efficiency of a building.

**ACOUSTICS**

The Superform POLY Block system provides excellent sound insulation and meets the performance requirements of NZBC G6.3.1 for intertenancy walls. This approved acoustic system easily achieves the Minimum Sound Transmission Class 55 when constructed in accordance with the details contained in the Marshall Day Acoustics Report Numbers 98210A1, 98210A2 or 98210A3. These reports are available from Rafel International Limited on request. Sound rated wall systems ranging from low STC values to in excess of STC62 are available. Examples of typical STC ratings achievable for various methods of wall construction as tested are shown on the following page.
WALL SECTION STC RATINGS FOR VARIOUS METHODS OF CONSTRUCTION

STC 52
- 9.5mm standard Gib Board, screw fixed at 600crs
- 150mm concrete infill
- EPS face shell
- Airgap
- Spacer tie

STC 54
- 9.5mm standard Gib Board, screw fixed at 600crs
- 150mm concrete infill
- EPS face shell
- Spacer tie
- Imm thick Rockcote acrylic texture
- 5mm Skimcote plaster

STC 55
- 9.5mm standard Gib Board, screw fixed at 600crs
- 100mm concrete infill
- EPS face shell
- Polyester (Autex AAB32-25)
- Spacer tie

STC 58
- 9.5mm standard Gib Board, screw fixed at 600crs
- 200mm concrete infill
- EPS face shell
- Polyester (Autex AAB32-25)
- Spacer tie
- 63mm wide steel studs
- 13mm Noiseline Gib Board
- 9.5mm standard Gib Board, screw fixed at 600crs
- EPS face shell
- 150mm concrete infill
- R1.8 Pink Batts or R1.8 Autex Greenstuff

STC 62
- 9.5mm standard Gib Board, screw fixed at 600crs
- Polyester (Autex AAB32-25)
- EPS face shell
- 100mm concrete infill
- Rondo channel fixed to ST001 resilient mounts screwed to spacers at 1200crs horiz, 600crs vert.
- Spacer tie

STC 68

NOTES:
- Actual STC ratings achieved may vary from that shown above due to other influencing factors such as ceiling and floor construction
- Soundseal sealant is used at all edges and the Gib Board is to be stopped in accordance with normal trade practices.
Superform POLY Blocks are able to withstand the pressure of a continuous concrete pour in lifts of 900mm to a maximum pour height of 3000mm.

The blocks are laid in a stretcher bond pattern.

The interlocking EPS blocks act as permanent formwork for concrete interior and exterior walling, resulting in an insulated load bearing, or non-load bearing reinforced concrete wall.

Loads from other parts of the building structure and fixtures must be transferred directly to the reinforced concrete walls without imposing loads on the polystyrene shell.

Structural connections for roofs and floors and lateral support of the tops of walls must be designed appropriately to resist the imposed loads. Walls are to be adequately anchored to floors, roofs, columns, pilasters, buttresses and intersecting walls.
SECTION B: NON SPECIFIC DESIGN STRUCTURAL DATA

DEFINITIONS

Light roof: A roof and ceiling (cladding, lining, insulation, services) having a mass not exceeding 20 kg/m².

Heavy roof: A roof and ceiling (cladding, lining, insulation, services) having a mass not exceeding 60 kg/m².

Light wall cladding: An external wall having a mass not exceeding 50 kg/m².

Internal timber frame partitions: An internal partition having a mass not exceeding 30 kg/m².

Lintel or floor beam span: Span of opening between concrete supports.

Suspended Concrete Floor: A specifically designed concrete floor system including superimposed dead loads with a mass not exceeding 490 kg/m².

Tanking: Tanking as labeled in the Superform POLY Block construction details shall consist of a waterproofing membrane (DPM) against the EPS block with a suitable protection sheet over, (i.e. polystyrene or proofex sheet). DPM’s must meet the performance requirements of NZBC E2/AS1, clause 12.2.

Sealants: Sealants approved for use in Superform POLY Block construction must meet the requirements of Section A.

GENERAL

Single-storey buildings designed using the non-specific design section of the Superform POLY Block Manual shall consist of:

1. Foundations as specified in details shown in Section D SF4-SF13 (pages 9-18).

2. Ground floor must be concrete slab on grade constructed in accordance with Clause 7.5.8 of NZS 3604, except the minimum thickness shall be 100mm. The ground floor slab shall be connected to the walls as shown in details shown in Section D SF4-SF13 (pages 9-18).

3. External walls shall be either 200, 250 or 300mm thick Superform POLY Block walls constructed in accordance with the Superform POLY Block Manual. The bottom storey of two-storey buildings must have a minimum thickness of 250mm. Upper walls shall be no thicker than the wall below.
4. Internal walls shall be either Superform POLY Block walls or timber walls constructed in accordance with NZS 3604. Internal to External wall connections shall be in accordance with details shown in Section D SF34 and SF36 (pages 39 and 41).

5. The roof shall be timber framed and constructed in accordance with NZS 3604. The connection of the roof to Superform POLY Block walls shall be in accordance with details shown in Section D SF27, SF28, SF32 and SF33.

Two-storey buildings shall consist of the above clauses 1 to 5 plus the following:

6. Suspended first floors shall be either concrete to specific design or timber floors in accordance with NZS 3604.

   The connections of suspended floors to Superform POLY Block walls must comply with details shown in Section D SF23-SF25 (pages 28-30).

7. First-floor walls shall be either Superform POLY Block walls, no thicker than the wall below or timber walls in accordance with NZS 3604.

   First floor internal Superform POLY Block walls must be directly supported by Superform POLY Block walls below. Suspended first floors supporting Superform POLY Block or load bearing walls must be specifically designed.

8. Ground floor walls of two-storey buildings with specifically designed suspended concrete floors that are required to retain soil shall be in accordance with sheets shown in Section B Ret 3 and Ret 3a (pages 8-9).

9. Building lateral stability shall be checked in accordance with NZS 3604 except that bracing units required under earthquake shall be obtained from Section B Bracing 1-8a (pages 17-29). Bracing units provided by Superform POLY Block walls are given on Section B pages 31-32.

10. Bond beams shall be constructed within the walls as detailed on pages 39-40.
MINIMUM REINFORCEMENT

Unless otherwise stated, the tables and details shown in this manual, suitable for use in non specific design applications, are all based on the following minimum reinforcement requirements:

Main Wall Reinforcing:

100mm Thick Concrete Infill

<table>
<thead>
<tr>
<th></th>
<th>Grade 300 Reinforcing</th>
<th>Grade 500 Reinforcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>D10 at 300 crs</td>
<td>H10 at 300crs</td>
</tr>
<tr>
<td>Horizontal</td>
<td>D10 at 300 crs</td>
<td>H10 at 300crs</td>
</tr>
</tbody>
</table>

150mm Thick Concrete Infill

<table>
<thead>
<tr>
<th></th>
<th>Grade 300 Reinforcing</th>
<th>Grade 500 Reinforcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>D10 at 200 crs</td>
<td>H10 at 300crs</td>
</tr>
<tr>
<td>Horizontal</td>
<td>D12 at 300 crs</td>
<td>H12 at 300crs</td>
</tr>
</tbody>
</table>

200mm Thick Concrete Infill

<table>
<thead>
<tr>
<th></th>
<th>Grade 300 Reinforcing</th>
<th>Grade 500 Reinforcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>D12 at 200 crs</td>
<td>H12 at 300crs</td>
</tr>
<tr>
<td>Horizontal</td>
<td>D16 at 300 crs</td>
<td>H16 at 300crs</td>
</tr>
</tbody>
</table>

- Minimum reinforcing bar lap distances are:  
  - 60dB for H bars  
  - 35dB for D bars

TRIMMER BARS

All openings are to have trimmer bars extending 1000mm past the corners of the openings as follows:

100mm Thick Concrete Infill 1 D or H16  
150mm Thick Concrete Infill 2 D or H16  
200mm Thick Concrete Infill 2 D or H16

NZS 3109 Concrete Construction

Covers, reinforcement hooks and bends, reinforcement material specifications shall be in accordance with NZS 3109.
**Detail is applicable for 100mm, 150mm, 200mm concrete infill Superform POLY Blocks**

**TYPE 1**

**DESIGN ASSUMPTIONS**

- **Site requirements**
  Site requirements are to be in accordance with NZS 3604
- **Safety from Falling**
  The safety from falling requirements must comply with the NZBC
- **Connections to the Wall**
  Connections to the wall will require specific design and must meet the relevant performance requirements of the New Zealand Building Code
- **Surcharges**
  If loads from structures or vehicles occur within distance (H) of the wall or on top of the wall specific design will be required
- **Load Case**
  This design assumes that the cantilevered retaining wall is subjected to active earth pressures (ie retaining wall moves away the soil retained)
- **No allowance has been made for seismic soil loads**

**MATERIALS**

- **Soil types**
  Retaining walls have been designed assuming a cohesionless soil with an angle of internal friction equal to 25° and a unit weight of 16kN/m³
- **Concrete Footings**
  Concrete shall comply with NZS 3109 for concrete having a minimum compressive strength of 20NPa at 28 days.
- **Foundation Bearing Pressure**
  Ultimate foundation bearing pressure to be a minimum of 300kPa.

**CONSTRUCTION**

- **Compaction**
  Compaction forces from machinery are not included in the design.
- **Reinforcing**
  Vertical reinforcing bars are to be placed in the centre of the Superform POLY Blocks & tied to starter & horizontal bars. Lap distances shall be 35 times bar diameter for D bars, 60 times bar diameter for H bars.
- **Control Joints**
  Provide control joints in the same position as the exterior cladding control joints. Refer to approved proprietary control joint detail. Lap horizontal bars 600mm. Wrap bars on one side of the control joint with Denso tape.

**SUPERFORM POLY BLOCK**

**TYPE 1 RETAINING WALL**

(See also Sheet RET.1a)
### TYPE 1.

#### RETAINING WALL TABLE FOR 100mm CONC. INFILL

<table>
<thead>
<tr>
<th>H (mm)</th>
<th>L (mm)</th>
<th>K (mm)</th>
<th>Vertical Reinforcing</th>
<th>Horizontal Reinforcing</th>
<th>Longitudinal Found. steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 900</td>
<td>500</td>
<td>0</td>
<td>H10–Ø300crs</td>
<td>H10–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>900–1200</td>
<td>750</td>
<td>0</td>
<td>H10–Ø300crs</td>
<td>H10–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1200–1500</td>
<td>1000</td>
<td>100</td>
<td>H12–Ø300crs</td>
<td>H10–Ø300crs</td>
<td>4/H12</td>
</tr>
<tr>
<td>1500–1800</td>
<td></td>
<td></td>
<td>Requires specific engineering design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800–2100</td>
<td></td>
<td></td>
<td>Requires specific engineering design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2100–2400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### RETAINING WALL TABLE FOR 150mm CONC. INFILL

<table>
<thead>
<tr>
<th>H (mm)</th>
<th>L (mm)</th>
<th>K (mm)</th>
<th>Vertical Reinforcing</th>
<th>Horizontal Reinforcing</th>
<th>Longitudinal Found. steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 900</td>
<td>500</td>
<td>0</td>
<td>H10–Ø300crs</td>
<td>H12–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>900–1200</td>
<td>600</td>
<td>0</td>
<td>H10–Ø300crs</td>
<td>H12–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1200–1500</td>
<td>850</td>
<td>50</td>
<td>H10–Ø300crs</td>
<td>H12–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1500–1800</td>
<td>1100</td>
<td>200</td>
<td>H12–Ø300crs</td>
<td>H12–Ø300crs</td>
<td>4/H12</td>
</tr>
<tr>
<td>1800–2100</td>
<td>1400</td>
<td>325</td>
<td>H12–Ø200crs</td>
<td>H12–Ø300crs</td>
<td>5/H12</td>
</tr>
<tr>
<td>2100–2400</td>
<td></td>
<td></td>
<td>Requires specific engineering design</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### RETAINING WALL TABLE FOR 200mm CONC. INFILL

<table>
<thead>
<tr>
<th>H (mm)</th>
<th>L (mm)</th>
<th>K (mm)</th>
<th>Vertical Reinforcing</th>
<th>Horizontal Reinforcing</th>
<th>Longitudinal Found. steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 900</td>
<td>500</td>
<td>0</td>
<td>H12–Ø300crs</td>
<td>H16–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>900–1200</td>
<td>500</td>
<td>0</td>
<td>H12–Ø300crs</td>
<td>H16–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1200–1500</td>
<td>700</td>
<td>0</td>
<td>H12–Ø300crs</td>
<td>H16–Ø300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1500–1800</td>
<td>950</td>
<td>150</td>
<td>H12–Ø300crs</td>
<td>H16–Ø300crs</td>
<td>4/H12</td>
</tr>
<tr>
<td>1800–2100</td>
<td>1200</td>
<td>275</td>
<td>H12–Ø250crs</td>
<td>H16–Ø300crs</td>
<td>5/H12</td>
</tr>
<tr>
<td>2100–2400</td>
<td>1500</td>
<td>400</td>
<td>H18–Ø300crs</td>
<td>H16–Ø300crs</td>
<td>6/H12</td>
</tr>
</tbody>
</table>

# concrete infill thickness
(100, 150 or 200mm)

Must be level for a minimum distance = H

Protect top of wall with approximately a 30mm concrete coving with exterior cladding over

Reinforcing as per Sheet Ret.2a

Exterior cladding, refer to Section A this manual. provide control joints as per the manufacturer's specification

100% NovaFlow pipe to a minimum gradient of 1:150 with no fines aggregate wrapped in filter cloth. Discharge into main stormwater system or as determined by territorial authority

Longitudinal reinforcing as per Sheet Ret.2a

**TYPE 2**

### DESIGN ASSUMPTIONS

- **Site requirements**
  Site requirements are to be in accordance with NZS 3604
- **Safety from Falling**
  The safety from falling requirements must comply with the NZBC
- **Connections to the Wall**
  Connections to the wall will require specific design and must meet the relevant performance requirements of the New Zealand Building Code
- **Surcharges**
  If loads from structures or vehicles occur with in distance (H) of the wall or on top of the wall specific design will be required
- **Load Case**
  This design assumes that the cantilevered retaining wall is subjected to active earth pressures (ie retaining wall moves away the soil retained)
- **No allowance has been made for seismic soil**

### MATERIALS

- **Soil Types**
  Retaining walls have been designed assuming a cohesionless soil with an angle of internal friction equal to 25° and a unit weight of 18kN/m³
- **Concrete Footings**
  Concrete shall comply with NZS 3109 for concrete having a minimum compressive strength of 20MPa at 28 days.
- **Foundation Bearing Pressure**
  Ultimate foundation bearing pressure to be a minimum of 300kPa.

### CONSTRUCTION

- **Compaction**
  Compaction forces from machinery are not included in the design.
- **Reinforcing**
  Vertical reinforcing bars are to be placed in the centre of the Superform POLY Block & tied to starter & horizontal bars. Lap distances shall be 35 times bar diameter for D bars, 60 times bar diameter for H bars.
- **Poly styrene**
  Provide control joints in the same position as the exterior cladding control joints. Refer to approved proprietary control joint detail. Lap horizontal bars 600mm. Wrap bars on one side of the control joint with Denso tape.
## RETAINING WALL TABLE FOR 100mm CONC. INFILL

<table>
<thead>
<tr>
<th>H (mm)</th>
<th>L (mm)</th>
<th>Vertical Reinforcing.</th>
<th>Horizontal Reinforcing.</th>
<th>Longitudinal Found. steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 900</td>
<td>500</td>
<td>H10 – @ 300crs</td>
<td>H10 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>900–1200</td>
<td>650</td>
<td>H10 – @ 300crs</td>
<td>H10 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1200–1500</td>
<td>850</td>
<td>H12 – @ 300crs</td>
<td>H10 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1500–1800</td>
<td>1050</td>
<td>Requires specific engineering design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800–2100</td>
<td>1250</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2100–2400</td>
<td>1450</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## RETAINING WALL TABLE FOR 150mm CONC. INFILL

<table>
<thead>
<tr>
<th>H (mm)</th>
<th>L (mm)</th>
<th>Vertical Reinforcing.</th>
<th>Horizontal Reinforcing.</th>
<th>Longitudinal Found. steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 900</td>
<td>500</td>
<td>H10 – @ 300crs</td>
<td>H12 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>900–1200</td>
<td>700</td>
<td>H10 – @ 300crs</td>
<td>H12 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1200–1500</td>
<td>900</td>
<td>H10 – @ 300crs</td>
<td>H12 – @ 300crs</td>
<td>4/H12</td>
</tr>
<tr>
<td>1500–1800</td>
<td>1150</td>
<td>H12 – @ 300crs</td>
<td>H12 – @ 300crs</td>
<td>4/H12</td>
</tr>
<tr>
<td>1800–2100</td>
<td>1400</td>
<td>H12 – @ 200crs</td>
<td>H12 – @ 300crs</td>
<td>5/H12</td>
</tr>
<tr>
<td>2100–2400</td>
<td>1700</td>
<td>H16 – @ 200crs</td>
<td>H12 – @ 300crs</td>
<td>6/H12</td>
</tr>
</tbody>
</table>

## RETAINING WALL TABLE FOR 200mm CONC. INFILL

<table>
<thead>
<tr>
<th>H (mm)</th>
<th>L (mm)</th>
<th>Vertical Reinforcing.</th>
<th>Horizontal Reinforcing.</th>
<th>Longitudinal Found. steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 900</td>
<td>550</td>
<td>H12 – @ 300crs</td>
<td>H16 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>900–1200</td>
<td>750</td>
<td>H12 – @ 300crs</td>
<td>H16 – @ 300crs</td>
<td>3/H12</td>
</tr>
<tr>
<td>1200–1500</td>
<td>950</td>
<td>H12 – @ 300crs</td>
<td>H16 – @ 300crs</td>
<td>4/H12</td>
</tr>
<tr>
<td>1500–1800</td>
<td>1200</td>
<td>H12 – @ 300crs</td>
<td>H16 – @ 300crs</td>
<td>5/H12</td>
</tr>
<tr>
<td>1800–2100</td>
<td>1500</td>
<td>H12 – @ 250crs</td>
<td>H16 – @ 300crs</td>
<td>6/H12</td>
</tr>
<tr>
<td>2100–2400</td>
<td>1850</td>
<td>H16 – @ 200crs</td>
<td>H16 – @ 300crs</td>
<td>7/H12</td>
</tr>
</tbody>
</table>
BASEMENT RETAINING WALL

1:20

DESIGN ASSUMPTIONS
Refer to Ret. 1

- Load Case
  This design assumes that the cantilevered retaining wall is subjected to at rest earth pressures

ADDITIONAL REQUIREMENTS:
- Maximum span of roof = 12.0m.
- Maximum tributary width of concrete floor = 3.0m
- Maximum wall height above basement = 3.0m (single storey)

MATERIALS
Refer to Ret. 1

CONSTRUCTION
Refer to Ret. 1
**DESIGN ASSUMPTIONS**

**CONSTRUCTION**

- **Compaction:**  Compaction forces from machinery are not included in the design.

- **Reinforcing:**  Vertical reinforcing bars are to be placed in the centre of the Superform POLY Block & tied to starter & horizontal bars, this may be done as shown on details SF40–SF41. Lap distances shall be 35 times bar diameter for D bars, 60 times bar diameter for H bars.

---

**BASEMENT RETAINING WALL**

**TYPICAL BASEMENT RETAINING WALL FOR 100mm**
**CONCRETE INFILL WITH CONCRETE FLOOR ABOVE**

<table>
<thead>
<tr>
<th>Wall Height (mm)</th>
<th>Height Retained (mm)</th>
<th>Vertical Reinforcing.</th>
<th>Horizontal Reinforcing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400</td>
<td>2100</td>
<td>H12–@200crs.</td>
<td>H10–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1800</td>
<td>H12–@300crs.</td>
<td>H10–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1500</td>
<td>H10–@300crs.</td>
<td>H10–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1200</td>
<td>H10–@300crs.</td>
<td>H10–@300crs.</td>
</tr>
</tbody>
</table>

**TYPICAL BASEMENT RETAINING WALL FOR 150mm**
**CONCRETE INFILL WITH CONCRETE FLOOR ABOVE**

<table>
<thead>
<tr>
<th>Wall Height (mm)</th>
<th>Height Retained (mm)</th>
<th>Vertical Reinforcing.</th>
<th>Horizontal Reinforcing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400</td>
<td>2400</td>
<td>H12–@200crs.</td>
<td>H12–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>2100</td>
<td>H12–@300crs.</td>
<td>H12–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1800</td>
<td>H10–@300crs.</td>
<td>H12–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1500</td>
<td>H10–@300crs.</td>
<td>H12–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1200</td>
<td>H10–@300crs.</td>
<td>H12–@300crs.</td>
</tr>
</tbody>
</table>

**TYPICAL BASEMENT RETAINING WALL FOR 200mm**
**CONCRETE INFILL WITH CONCRETE FLOOR ABOVE**

<table>
<thead>
<tr>
<th>Wall Height (mm)</th>
<th>Height Retained (mm)</th>
<th>Vertical Reinforcing.</th>
<th>Horizontal Reinforcing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400</td>
<td>2400</td>
<td>H12–@300crs.</td>
<td>H16–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>2100</td>
<td>H10–@250crs.</td>
<td>H16–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1800</td>
<td>H10–@300crs.</td>
<td>H16–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1500</td>
<td>H10–@300crs.</td>
<td>H16–@300crs.</td>
</tr>
<tr>
<td>2400</td>
<td>1200</td>
<td>H10–@300crs.</td>
<td>H16–@300crs.</td>
</tr>
</tbody>
</table>
CROSS SECTION THROUGH TYPICAL SUPERFORM POLY BLOCK BEAMS
(SEE LINTELS 2 & 3)

**DESIGN ASSUMPTIONS**

1. Where non uniform loads occur, or where uniform loads exceed 1.5kPa, on a floor beam specific engineering design is required.
2. Where floor systems cantilever over a floor beam specific engineering design is required.
3. Where roof loads act on a floor beam through a load bearing wall specific engineering design is required.

4. Suspended concrete floor defines a concrete floor having a mass not exceeding 490kg/m²

5. Timber floor in accordance with NZS 3604. Concrete floor must be subject to specific design.

**CONSTRUCTION**

- Full soffit support and falsework propping is required during construction.
- Main longitudinal bars are to extend a minimum of 35 times the bar diameter past the wall opening for D bars, and 60 times the bar diameter for H bars.
## LINTEL 2: SUPERFORM POLY BLOCK WALL SYSTEM AS FLOOR BEAMS

**TIMBER FLOOR**: Maximum tributary width of loading \((L_T) = 4.5\) m

### 100mm CONCRETE INFILL

<table>
<thead>
<tr>
<th>Span</th>
<th>2-H10 150crs</th>
<th>2-H10 150crs</th>
<th>2-H10 150crs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>2m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>3m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>4m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
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</table>

### 150mm CONCRETE INFILL

<table>
<thead>
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<th>2-H10 150crs</th>
<th>2-H12 150crs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>2m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>3m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>4m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
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### 200mm CONCRETE INFILL

<table>
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<tbody>
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<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>2m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>3m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
<tr>
<td>4m</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
<td>R10 @ 150crs</td>
</tr>
</tbody>
</table>

---

**SUPERFORM POLY BLOCK BEAM TABLE**

FOR SUPPORTING TIMBER FLOOR ONLY

(See also Sheet LINTEL 1)

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POWELL FENWICK CONSULTANTS LIMITED

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RAFEL International Ltd

LINTEL 2

Section B 11
**LINTEL 3 : SUPERFORM POLY BLOCK WALL SYSTEM AS FLOOR BEAMS**

**CONCRETE FLOOR :** Maximum tributary width of loading \( L_T \) = 3.0m

<table>
<thead>
<tr>
<th>Span</th>
<th>100mm CONCRETE INFILL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1m</td>
<td>2–H10 R10–@150crs</td>
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<tr>
<td></td>
<td>2–H10 R10–@150crs</td>
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<tr>
<td></td>
<td>2–H12 R10–@150crs</td>
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<tr>
<td>2m</td>
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<tr>
<td></td>
<td>2–H16 R10–@150crs</td>
</tr>
<tr>
<td>3m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2–H16 R10–@150crs</td>
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<tr>
<td></td>
<td>2–H16 R10–@150crs</td>
</tr>
<tr>
<td>4m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2–H20 R10–@150crs</td>
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</table>

<table>
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<tr>
<td></td>
<td>2–H10 R10–@150crs</td>
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<td>2–H12 R10–@150crs</td>
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<tr>
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<tr>
<td></td>
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<tr>
<td></td>
<td>2–H16 R10–@150crs</td>
</tr>
<tr>
<td>4m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2–H25 R10–@150crs</td>
</tr>
<tr>
<td></td>
<td>2–H20 R10–@150crs</td>
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<table>
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<tbody>
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<tr>
<td></td>
<td>2–H12 R10–@150crs</td>
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<tr>
<td>2m</td>
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</tr>
<tr>
<td></td>
<td>2–H16 R10–@150crs</td>
</tr>
<tr>
<td>4m</td>
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<tr>
<td></td>
<td>2–H25 R10–@150crs</td>
</tr>
<tr>
<td></td>
<td>2–H20 R10–@150crs</td>
</tr>
</tbody>
</table>
LINTEL 4 : SUPERFORM POLY BLOCK SYSTEM AS LINTELS

CROSS SECTION THROUGH TYPICAL SUPERFORM POLY BLOCK LINTELS (SEE LINTELS 5, 6 & 7)

DESIGN ASSUMPTIONS

1. Where non uniform loads occur, or where uniform loads exceed 1.5kPa on a lintel specific engineering design is required.
2. Where floor systems cantilever over a lintel specific engineering design is required.
3. 3000mm maximum wall height above two storey lintel.
4. Maximum wall thickness above two storey lintels is 150mm infill.
5. Suspended concrete floor defines a concrete floor having a mass not exceeding 490kg/m²
6. Timber floor in accordance with NZS 3604. Concrete floors must be subject to specific design

CONSTRUCTION

• Full soffit support and falsework propping is required during construction.
• Main longitudinal bars are to extend a minimum of 35 times the bar diameter past the wall opening for Ø bars, and 60 times the bar diameter for H bars.
### Lintel 5: Superform Poly Block System as Lintels

**SINGLE STOREY CONSTRUCTION – LIGHT ROOF**

<table>
<thead>
<tr>
<th>Span</th>
<th>100mm Concrete Infill</th>
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<tbody>
<tr>
<td>1.2</td>
<td>2-H10 R10@150crs</td>
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<tr>
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<td>2-H10 R10@150crs</td>
</tr>
<tr>
<td></td>
<td>2-H12 R10@150crs</td>
</tr>
</tbody>
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<table>
<thead>
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<td>2-H10 R10@150crs</td>
</tr>
<tr>
<td></td>
<td>2-H12 R10@150crs</td>
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<table>
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<tr>
<td></td>
<td>2-H12 R10@150crs</td>
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---

**Superform Poly Block Lintel Table for Supporting Roof Only Single Storey Construction**

(See also Sheet Lintel 4)
## Lintel 6: Superform Poly Block System as Lintels

### Single Storey Construction – Heavy Roof

<table>
<thead>
<tr>
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</thead>
<tbody>
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<td>2-H12 R10@150crs</td>
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<td>2-H10 R10@150crs</td>
<td>2-H12 R10@150crs</td>
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<td>2-H12 R10@150crs</td>
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<td>2-H12 R10@150crs</td>
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<tr>
<td>2.4</td>
<td>2-H16 R10@150crs</td>
<td>2-H16 R10@150crs</td>
<td>2-H12 R10@150crs</td>
</tr>
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<td>3.0</td>
<td>2-H20 R10@150crs</td>
<td>2-H16 R10@150crs</td>
<td>2-H12 R10@150crs</td>
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<td>2-H20 R10@150crs</td>
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### Supporting Roof Only

(See also Sheet Lintel 4)
## LINTEL 7: SUPERFORM POLY BLOCK SYSTEM AS LINTELS
### TWO STOREY CONSTRUCTION - LIGHT ROOF

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### 100mm CONCRETE INFILL

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<td>2.4</td>
</tr>
<tr>
<td>3.0</td>
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<td>3.6</td>
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### 150mm CONCRETE INFILL

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### 200mm CONCRETE INFILL

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SUPERFORM POLY BLOCK LINTEL TABLE
FOR SUPPORTING CONCRETE FLOOR & ROOF
TWO STOREY CONSTRUCTION

(See also Sheet LINTEL 4)
## LINTEL 8: SUPERFORM POLY BLOCK SYSTEM AS LINTELS
### TWO STOREY CONSTRUCTION – HEAVY ROOF

<table>
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<th>Span</th>
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<th>150mm CONCRETE INFILL</th>
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<td>2–H12 R10–@150crs</td>
</tr>
<tr>
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<td>2–H12 R10–@150crs</td>
<td>2–H12 R10–@150crs</td>
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<td>2–H16 R10–@150crs</td>
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<td>200mm CONCRETE INFILL</td>
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**SUPERFORM POLY BLOCK LINTEL TABLE**

**FOR SUPPORTING CONCRETE FLOOR & ROOF**

**TWO STOREY CONSTRUCTION**

(See also Sheet LINTEL 4)
**LINTEL 9 : SUPERFORM POLY BLOCK SYSTEM AS LINTELS**
**TWO STOREY CONSTRUCTION – LIGHT ROOF**

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</tbody>
</table>

**SUPERFORM POLY BLOCK LINTEL TABLE**
**FOR**
**SUPPORTING TIMBER FLOOR & ROOF**
**TWO STOREY CONSTRUCTION**

(See also Sheet LINTEL 4)
**LINTEL 10: SUPERFORM POLY BLOCK SYSTEM AS LINTELS**  
**TWO STOREY CONSTRUCTION - HEAVY ROOF**

<table>
<thead>
<tr>
<th>Span</th>
<th>100mm CONCRETE INFILL</th>
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R10@150crs | 2-H10  
R10@150crs | 2-H12  
R10@150crs |  |
| 1.6  | 2-H12  
R10@150crs | 2-H10  
R10@150crs | 2-H12  
R10@150crs |  |
| 2.0  | 2-H16  
R10@150crs | 2-H12  
R10@150crs | 2-H16  
R10@150crs |  |
| 2.4  | 2-H20  
R10@150crs | 2-H16  
R10@150crs | 2-H16  
R10@150crs |  |
| 3.0  | 2-H20  
R10@150crs | 2-H16  
R10@150crs | 2-H16  
R10@150crs |  |
| 3.6  | 2-H20  
R10@150crs | 2-H16  
R10@150crs | 2-H16  
R10@150crs |  |

<table>
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R10@150crs | 2-H12  
R10@150crs |  |
| 1.6  | 2-H16  
R10@150crs | 2-H10  
R10@150crs | 2-H12  
R10@150crs |  |
| 2.0  | 2-H16  
R10@150crs | 2-H16  
R10@150crs | 2-H12  
R10@150crs |  |
| 2.4  | 2-H20  
R10@150crs | 2-H16  
R10@150crs | 2-H16  
R10@150crs |  |
| 3.0  | 2-H20  
R10@150crs | 2-H20  
R10@150crs | 2-H20  
R10@150crs |  |
| 3.6  | 2-H20  
R10@150crs | 2-H20  
R10@150crs | 2-H20  
R10@150crs |  |

<table>
<thead>
<tr>
<th>Span</th>
<th>200mm CONCRETE INFILL</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1.2  | 2-H10  
R10@150crs | 2-H10  
R10@150crs | 2-H12  
R10@150crs |  |
| 1.6  | 2-H16  
R10@150crs | 2-H12  
R10@150crs | 2-H12  
R10@150crs |  |
| 2.0  | 2-H20  
R10@150crs | 2-H16  
R10@150crs | 2-H12  
R10@150crs |  |
| 2.4  | 2-H25  
R10@150crs | 2-H20  
R10@150crs | 2-H16  
R10@150crs |  |
| 3.0  | 2-H25  
R10@150crs | 2-H20  
R10@150crs | 2-H20  
R10@150crs |  |
| 3.6  | 2-H25  
R10@150crs | 2-H20  
R10@150crs | 2-H20  
R10@150crs |  |
BRACING DESIGN ASSUMPTIONS AND PHILOSOPHY

To simplify this section of the manual we have assumed an approximately even distribution of bracing walls at 6.0 metre centres each way. Buildings which are heavily braced on one side and lightly on the other side can suffer damage through torsional movement under wind or earthquake forces. Bracing walls should be located as close as possible to the outside corners of the building. If there is any doubt as to the lateral stability of the structure a structural engineer should be consulted. The bracing demand for wind loads shall be determined from NZS 3604 as applicable for your region.

Structural Diaphragms
For bracing line systems as defined by NZS 3604 Superform POLY Block walls must be connected to a structural diaphragm. The structural diaphragm provides part of the system for spanning lateral earthquake and wind loads to adjacent supporting systems. The structural diaphragm must comply with NZS 3604, floor diaphragms in accordance with clause 7.3 and ceiling diaphragms in accordance with clause 13.5 except that nail fixing of the structural diaphragm sheet material to wall stringers shall be 3.55mm diameter nails at 100mm centres. Connections shall be in accordance with details shown in Section D SF22 and SF23 (pages 27 and 28). Specifically designed concrete floors may also be used as structural diaphragms.

Bond Beams
All Superform POLY Block walls shall be constructed with bond beams at floor and roof diaphragm level to provide part of the system for spanning lateral earthquake and wind loads to adjacent supporting systems. For bond beams spanning further than the tabulated values specific engineering design is required.

For low wind to high wind zones as specified by NZS 3604 a seismic hazard factor “Z” of 0.2 for designing bond beams is suitable. For very high wind zones a seismic hazard factor “Z” of 0.26 shall be used to design bond beams. For wind speeds greater than very high specific design is required.

Where suspended concrete floors are used as structural diaphragms, greater distances can be spanned between adjacent supporting systems. Specific engineering design is required where spans are greater than the tabulated values.
BRACING CALCULATION – WORKED EXAMPLE

Situation
single storey building
light roof
25° max roof slope
internal timber frame partitions
located in Christchurch

From BRACING REQUIREMENT TABLE

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Location of Storey</th>
<th>Maximum slope of Roof</th>
<th>Minimum number of bracing units per square metre of floor area (B_z)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT ROOF</td>
<td>Single Storey</td>
<td>Infill Thickness (Internal timber frame partitions) (Internal Superform POLY Block walls)</td>
<td></td>
</tr>
<tr>
<td>25°</td>
<td>100mm</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>150mm</td>
<td>75</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>200mm</td>
<td>90</td>
<td>155</td>
</tr>
<tr>
<td>45°</td>
<td>100mm</td>
<td>60</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>150mm</td>
<td>80</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>200mm</td>
<td>95</td>
<td>160</td>
</tr>
</tbody>
</table>

From HAZARD FACTOR DIAGRAM
refer to Bracing 2 & 3 (pages 18 & 19) for diagrams

Bracing Units required = B_z x Z

From BRACING REQUIREMENT TABLE \( B_z = 75 \)
From HAZARD FACTOR DIAGRAM \( Z = 0.22 \)

Earthquake Bracing Units required = \( 75 \times 0.22 = 16.5 \) Bracing Units /m²
For buildings located within this shaded region, please contact Superform head office or a Structural Engineer for the appropriate hazard factor.
BRACING 1: MINIMUM BRACING UNIT REQUIREMENTS FOR EARTHQUAKE

The tabulated figures are for a storey height of 2.4m. Where storey heights exceed 2.4m, the minimum bracing units per square metre of floor area are to be multiplied by the following values:

storey height 2.8m ......... 1.1
storey height 3.0m ......... 1.2

*SINGLE STOREY BUILDING*

- These tables are to be used in conjunction with NZS 3604 – Bracing approach

**DESIGN ASSUMPTIONS**

1. In an earthquake the ground motion can be in any direction. It is the same building weight which gets rocked around, therefore the bracing units requirements are the same in both the along and across directions.

2. In the case of a heavy roof the roof plan area must be used in determining the total bracing units required.

3. Superform POLY Block walls with heavy, (brick or stone) veneers require specific design.
These tables are to be used in conjunction with NZS 3604 – Bracing approach

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Location of Storey</th>
<th>Maximum slope of Roof</th>
<th>Minimum number of bracing units per square metre of floor area ($\beta_4$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT ROOF</td>
<td>Single Storey</td>
<td>Infill Thickness (Internal timber frame partitions)</td>
<td>(Internal Superform POLY Block walls)</td>
</tr>
<tr>
<td></td>
<td>25°</td>
<td>100mm</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>100mm</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm</td>
<td>130</td>
</tr>
<tr>
<td>HEAVY ROOF</td>
<td>Single Storey</td>
<td>Infill Thickness (Internal timber frame partitions)</td>
<td>(Internal Superform POLY Block walls)</td>
</tr>
<tr>
<td></td>
<td>25°</td>
<td>100mm</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>100mm</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm</td>
<td>170</td>
</tr>
</tbody>
</table>
BRACING 2 : MINIMUM BRACING UNIT REQUIREMENTS FOR EARTHQUAKE

The tabulated figures are for a storey height of 2.4m. Where storey heights exceed 2.4m, the minimum bracing units per square metre of floor area are to be multiplied by the following values:
storey height 2.8m .......... 1.1
storey height 3.0m .......... 1.2

TWO STOREY BUILDING
SUSPENDED TIMBER FLOOR
TOP STOREY OF LIGHT WEIGHT CONSTRUCTION

- These tables are to be used in conjunction with NZS 3604 – Bracing approach

DESIGN ASSUMPTIONS

1. In an earthquake the ground motion can be in any direction. It is the same building weight which gets rocked around, therefore the bracing units requirements are the same in both the along and across directions.

2. In the case of a heavy roof the roof plan area must be used in determining the total bracing units required.

3. Superform POLY Block walls with heavy, (brick or stone) veneers require specific design.

4. Upper level bracing is to be designed to NZS 3604.

5. Upper level bracing is to be designed to single storey bracing demand.
**BRACING 2a : MINIMUM BRACING UNIT REQUIREMENTS FOR EARTHQUAKE**

- These tables are to be used in conjunction with NZS 3604 – Bracing approach

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Location of Storey</th>
<th>Maximum slope of Roof</th>
<th>Minimum number of bracing units per square metre of floor area ($B_1$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Internal timber frame partitions)</td>
</tr>
<tr>
<td>LIGHT ROOF</td>
<td>Lower Storey</td>
<td>25°</td>
<td>100mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45°</td>
<td>100mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200mm conc infill</td>
</tr>
<tr>
<td>HEAVY ROOF</td>
<td>Lower Storey</td>
<td>25°</td>
<td>100mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45°</td>
<td>100mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150mm conc infill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200mm conc infill</td>
</tr>
</tbody>
</table>
BRACING 3 : MINIMUM BRACING UNIT REQUIREMENTS FOR EARTHQUAKE

The tabulated figures are for a storey height of 2.4m. Where storey heights exceed 2.4m, the minimum bracing units per square metre of floor area are to be multiplied by the following values:
- Storey height 2.8m .......... 1.1
- Storey height 3.0m .......... 1.2

TWO STOREY BUILDING
SUSPENDED CONCRETE FLOOR
TOP STOREY OF LIGHT WEIGHT CONSTRUCTION

- These tables are to be used in conjunction with NZS 3604 – Bracing approach

DESIGN ASSUMPTIONS

1. In an earthquake the ground motion can be in any direction. It is the same building weight which gets rocked around, therefore the bracing units requirements are the same in both the along and across directions.

2. In the case of a heavy roof the roof plan area must be used in determining the total bracing units required.

3. Suspended Concrete Floor defines a concrete floor having a mass not exceeding 490kg/m²

4. Superform POLY Block walls with heavy, (brick or stone) veneers require specific design.

5. Upper level bracing is to be designed to NZS 3604
These tables are to be used in conjunction with NZS 3604 – Bracing approach

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Location of Storey</th>
<th>Maximum slope of Roof</th>
<th>Minimum number of bracing units per square metre of floor area ($B_2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LIGHT ROOF</strong></td>
<td>Lower Storey</td>
<td>25°</td>
<td>(Internal timber frame partitions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>285</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>305</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>330</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Internal Superform POLY Block walls lower storey only)</td>
<td>330</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45°</td>
<td>285</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>335</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>430</td>
</tr>
<tr>
<td><strong>HEAVY ROOF</strong></td>
<td>Lower Storey</td>
<td>25°</td>
<td>(Internal timber frame partitions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>315</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>340</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>360</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Internal Superform POLY Block walls lower storey only)</td>
<td>365</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45°</td>
<td>325</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>375</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>425</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>470</td>
</tr>
</tbody>
</table>
BRACING 4 : MINIMUM BRACING UNIT REQUIREMENTS FOR EARTHQUAKE

The tabulated figures are for a storey height of 2.4m.
Where storey heights exceed 2.4m, the minimum bracing units per square metre of floor area are to be multiplied by the following values:
storey height 2.8m .......... 1.1
storey height 3.0m .......... 1.2

**TWO STOREY BUILDING**
**SUSPENDED TIMBER FLOOR**
TOP STOREY OF EXTERNAL SUPERFORM POLY BLOCK WALLS

- These tables are to be used in conjunction with NZS 3604 – Bracing approach

**DESIGN ASSUMPTIONS**

1. In an earthquake the ground motion can be in any direction. It is the same building weight which gets rocked around, therefore the bracing units requirements are the same in both the along and across directions.

2. In the case of a heavy roof the roof plan area must be used in determining the total bracing units required.

3. Superform POLY Block walls with heavy, (brick or stone) veneers require specific design.
These tables are to be used in conjunction with NZS 3604 – Bracing approach.

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Location of Storey</th>
<th>Maximum slope of Roof</th>
<th>Minimum number of bracing units per square metre of floor area ($B_3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT ROOF</td>
<td>Lower Storey</td>
<td>25° 100mm conc infill</td>
<td>(Internal timber frame partitions) 240</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>310</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>380</td>
</tr>
<tr>
<td></td>
<td>45° 100mm conc infill</td>
<td>245</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>150mm conc infill</td>
<td>315</td>
<td>535</td>
</tr>
<tr>
<td></td>
<td>200mm conc infill</td>
<td>385</td>
<td>675</td>
</tr>
<tr>
<td>HEAVY ROOF</td>
<td>Lower Storey</td>
<td>25° 100mm conc infill</td>
<td>(Internal timber frame partitions) 270</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>340</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>415</td>
</tr>
<tr>
<td></td>
<td>45° 100mm conc infill</td>
<td>285</td>
<td>430</td>
</tr>
<tr>
<td></td>
<td>150mm conc infill</td>
<td>355</td>
<td>575</td>
</tr>
<tr>
<td></td>
<td>200mm conc infill</td>
<td>425</td>
<td>715</td>
</tr>
</tbody>
</table>
BRACING 5: MINIMUM BRACING UNIT REQUIREMENTS FOR EARTHQUAKE

The tabulated figures are for a storey height of 2.4m. Where storey heights exceed 2.4m, the minimum bracing units per square metre of floor area are to be multiplied by the following values:
storey height 2.8m ........ 1.1
storey height 3.0m ........ 1.2

TWO STOREY BUILDING
SUSPENDED CONCRETE FLOOR
TOP STOREY OF EXTERNAL SUPERFORM POLY BLOCK WALLS

- These tables are to be used in conjunction with NZS 3604 - Bracing approach

**DESIGN ASSUMPTIONS**

1. In an earthquake the ground motion can be in any direction. It is the same building weight which gets rocked around, therefore the bracing units requirements are the same in both the along and across directions.

2. In the case of a heavy roof the roof plan area must be used in determining the total bracing units required.

3. Suspended Concrete Floor defines a concrete floor having a mass not exceeding 490kg/m²

4. Superform POLY Block walls with heavy, (brick or stone) veneers require specific design.
These tables are to be used in conjunction with NZS 3604 – Bracing approach.

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>Location of Storey</th>
<th>Maximum slope of Roof</th>
<th>Minimum number of bracing units per square metre of floor area ($B_3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT ROOF</td>
<td>Lower Storey</td>
<td>25°</td>
<td>(Internal timber frame partitions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>380</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>525</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45°</td>
<td>(Internal Superform POLY Block walls lower storey only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>455</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>525</td>
</tr>
<tr>
<td>HEAVY ROOF</td>
<td>Lower Storey</td>
<td>25°</td>
<td>(Internal timber frame partitions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>410</td>
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<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>485</td>
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<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>555</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45°</td>
<td>(Internal Superform POLY Block walls lower storey only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100mm conc infill</td>
<td>425</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150mm conc infill</td>
<td>495</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200mm conc infill</td>
<td>565</td>
</tr>
</tbody>
</table>

BRACING UNITS TABLE FOR TWO STORY BUILDING SUSPENDED CONCRETE FLOOR TOP STOREY OF EXTERNAL SUPERFORM POLY BLOCK WALLS (See also Sheet BRACING 8)
**BRACING VALUES PROVIDED BY SUPERFORM POLY BLOCK WALLS (BU’S)**

For bracing walls connected to structural diaphragms with M12 bolts at 900mm centres.

### Wall Infill Thickness 100mm to 200mm

<table>
<thead>
<tr>
<th>Wall Hgt (mm)</th>
<th>0.8</th>
<th>1.2</th>
<th>1.6</th>
<th>2.0</th>
<th>2.4</th>
<th>2.8</th>
<th>3.2</th>
<th>3.6</th>
<th>4.0</th>
<th>4.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>110</td>
<td>220</td>
<td>220</td>
<td>330</td>
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<td>440</td>
<td>440</td>
<td>560</td>
<td>560</td>
<td>560</td>
</tr>
<tr>
<td>1000</td>
<td>110</td>
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<td>220</td>
<td>330</td>
<td>330</td>
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<td>440</td>
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<tr>
<td>1800</td>
<td>110</td>
<td>220</td>
<td>220</td>
<td>330</td>
<td>330</td>
<td>440</td>
<td>440</td>
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For bracing walls connected to structural diaphragms with M12 bolts at 600mm centres.

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BRACING VALUES PROVIDED BY SUPERFORM POLY BLOCK WALLS (BU’S)

For bracing walls connected to structural diaphragms with M12 bolts at 400mm centres.

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For bracing walls connected to a concrete floor structural diaphragm with H12@600crs.

### BRACING VALUES PROVIDED BY SUPERFORM POLY BLOCK WALLS (BU'S)

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**BRACING VALUES PROVIDED BY SUPERFORM POLY BLOCK WALLS (BU’S)**

For bracing walls connected to a concrete floor structural diaphragm with H12@450crs.

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</table>
MAXIMUM BOND BEAM SPAN – WORKED EXAMPLE

Situation
150 concrete infill
450 deep bond beam
located in Christchurch
bond beam at first floor diaphragm level with Superform POLY Block walls above & below

PLAN

BOND BEAM \( (L_b) \)
length required = 6000

ELEVATION

walls (upper storey)
Bond beam
Superform POLY Block walls (lower storey)
transverse wall

From HAZARD FACTOR DIAGRAM
refer to Bracing 2 & 3 (pages 22 & 23) for diagrams

From MAXIMUM BOND BEAM SPAN TABLE
refer to Bond Beam 1a (page 21) for table

<table>
<thead>
<tr>
<th>Type/Depth</th>
<th>Rein. No. &amp; size</th>
<th>Wall Infill Thickness</th>
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</thead>
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<td>2-H12</td>
<td>1060 1140 1160</td>
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<tr>
<td></td>
<td>2-H16</td>
<td>1290 1470 1550</td>
</tr>
<tr>
<td>Inter/450</td>
<td>2-H10</td>
<td>900 930 940</td>
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<td></td>
<td>2-H12</td>
<td>1080 1140 1150</td>
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<tr>
<td></td>
<td>2-H16</td>
<td>1390 1510 1570</td>
</tr>
<tr>
<td>Inter/600</td>
<td>3-H10</td>
<td>1100 1150 1160</td>
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<tr>
<td></td>
<td>3-H12</td>
<td>1310 1390 1420</td>
</tr>
<tr>
<td></td>
<td>3-H16</td>
<td>1650 1820 1910</td>
</tr>
</tbody>
</table>

All ties to be R10@150crs

bond beam units required \( (L_bZ) = L_b \times Z \)
\( = 6000 \times 0.22 \)
\( = 1320 \)

refer to Span table for values greater than \( L_bZ \)
This shows the 450 deep beam, 150 thick infill with 2-H16 bars would be the most economical option
## Maximum Bond Beam Spans

<table>
<thead>
<tr>
<th>Type/Depth</th>
<th>Reinf. No. &amp; Size</th>
<th>Wall Infill Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>100mm</td>
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<tr>
<td>Top/300</td>
<td>2–H12</td>
<td>1300</td>
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<td>2–H16</td>
<td>1570</td>
</tr>
<tr>
<td>Top/450</td>
<td>2–H12</td>
<td>1320</td>
</tr>
<tr>
<td></td>
<td>2–H16</td>
<td>1670</td>
</tr>
<tr>
<td>Top/600</td>
<td>3–H10</td>
<td>1330</td>
</tr>
<tr>
<td></td>
<td>3–H12</td>
<td>1580</td>
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<tr>
<td></td>
<td>3–H16</td>
<td>2070</td>
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<tr>
<td>Inter/300</td>
<td>2–H12</td>
<td>1060</td>
</tr>
<tr>
<td></td>
<td>2–H16</td>
<td>1290</td>
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<tr>
<td>Inter/450</td>
<td>2–H10</td>
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<td>2–H12</td>
<td>1080</td>
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<td>2–H16</td>
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<tr>
<td>Inter/600</td>
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</tr>
<tr>
<td></td>
<td>3–H12</td>
<td>1310</td>
</tr>
<tr>
<td></td>
<td>3–H16</td>
<td>1650</td>
</tr>
</tbody>
</table>

**Top:** bond beam with Superform POLY Block wall below and timber framed wall or roof above.

**Inter:** bond beam at first floor diaphragm level with Superform POLY Block walls above and below.

**NOTE:**
The length of bond beam permitted is obtained by multiplying the actual length of the bond beam required \( L \) by the HAZARD FACTOR \( Z \) and comparing with larger values shown in the table above.

\[ L_b Z > L Z \]

**Allowances:** For heights between bond beams or bond beams and foundations of 2.6m to 3.0m decrease the allowable span by 10%.
SECTION C: SUPERFORM POLY BLOCK

FIRE RATED SYSTEM

DESCRIPTION

The Superform POLY Block Fire Rated System is based on the concrete infill Superform POLY Block system as described in Section A and includes specific lining systems as specified below.

Linings are to be fixed as described under the external cladding and internal lining headings of this section.

FIRE RESISTANCE RATING

The external 150mm Superform POLY Block fire rated system has been tested by BRANZ in accordance with AS 1530:4 and will achieve the following fire resistance ratings, (FRR).

<table>
<thead>
<tr>
<th>Superform POLY Block Wall Thickness</th>
<th>Lining Description</th>
<th>FRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mm concrete infill</td>
<td>13mm Gib® Fryreline to each face.</td>
<td>240/240/240</td>
</tr>
<tr>
<td>150mm concrete infill</td>
<td>10mm Gib® Fryreline to each face.</td>
<td>240/240/240</td>
</tr>
<tr>
<td>150mm concrete infill</td>
<td>10mm standard Gib® Fryreline to each face and Rockcote to other face. Fire exposure from either face.</td>
<td>240/240/240</td>
</tr>
<tr>
<td>150mm concrete infill</td>
<td>Rockcote to each face.</td>
<td>240/240/240</td>
</tr>
<tr>
<td>100mm concrete infill</td>
<td>13mm Gib® Fryreline to each face.</td>
<td>240/240/240</td>
</tr>
<tr>
<td>100mm concrete infill</td>
<td>10mm standard Gib® Fryreline to each face.</td>
<td>240/240/180</td>
</tr>
<tr>
<td>100mm concrete infill</td>
<td>10mm standard Gib® Fryreline to each face &amp; Rockcote to other face. Fire exposure from either face.</td>
<td>240/240/180</td>
</tr>
<tr>
<td>100mm concrete infill</td>
<td>Rockcote to each face.</td>
<td>240/240/120</td>
</tr>
</tbody>
</table>

SPREAD OF FIRE

Superform POLY block walls may be used in buildings wherever the internal lining requirements of Table 6.2 and Table 6.3 and external cladding requirements of Table 7.5 of the NZBC C/AS1 are met.

The internal Surface Finish requirements as indicated in Table 6.2 of the NZBC C/AS1 are a function of the purpose group and location of the building element. The level of Protection from Ignition as indicated in Table 6.3 of the NZBC C/AS1 is a function of the purpose group and application of the building element.

The external finish requirements as indicated in Table 7.5 of the NZBC C/AS1 are a function of the surface finish type, building height, distance from the relevant boundary and the cladding properties.
The Rockcote Plaster system as described below, when installed on the Superform POLY Block system, gives the following AS 1530.3 fire indices:

- Ignitability: 0
- Spread of flame: 0
- Heat evolved: 0
- Smoke developed: 5

Any penetration passing through the fire rated wall must be fire stopped to a FRR of no less than that required for the building element to which it is installed. In multi storey buildings (more than two floors) fire stopping is required at each floor level at the junction of the floor and external wall.

**EXTERNAL CLADDING**

The Rockcote Plaster System has been appraised by BRANZ (Appraisal Certificate No 193B (1999)) as being suitable for plastering over EPS blocks and as meeting the relevant requirements of the New Zealand Building Code.

The Rockcote Plaster system is a polymer-modified, fibreglass-reinforced, cement-based plaster system supplied by Rockcote Architectural Coatings NZ Ltd. It is to be used and installed in accordance with the conditions of the Appraisal Certificate listed above. It is available in several finishes but only the following is to be used as part of the Superform POLY Block fire rated system.

- Basecoat layer of Rockcote plaster reinforced with fiberglass mesh.
- Top coat of Rockcote Plaster.
- Finishing – Rockcote Plaster / sealer (1 coat) and Rockcote Armourglaze (2 coats).


**INTERNAL LINING**

Standard 10mm, 13mm Gib® board and 13mm Gib® Fyreline have been appraised by BRANZ as being fit for purpose and as meeting the relevant requirements of the New Zealand Building Code.

The internal lining is fixed to the EPS panels using Fosroc Panel Bond or Selleys Liquid Nails adhesive in beads at 250mm centres. The linings are also screw fixed into the Superform POLY Block Thermo Plastic PP ties to achieve a FRR. Gypsum dry wall coarse thread screws, 32mm x 6 gauge are required at maximum 300mm centres around the sheet edges and at maximum 450mm centres horizontally and vertically within the body of the sheet. The Gib® Board sheet edge distance is a minimum of 12mm. Each Thermo Plastic PP tie provides a 30mm by 220mm surface for screw fixing. Finishing of the Gib® Board or Fyreline is in accordance with the Winstone Wallboards Limited technical literature.

**LIMITATIONS**

The maximum vertical loading allowed on Superform POLY Block Fire Walls is 60KN/m.
SECTION D: CONSTRUCTION INFORMATION

All Superform POLY Blocks shall be installed by a person experienced in this type of work, or it is important that the builder is familiar with the construction procedures detailed below. Full guidance, technical assistance and a training video is available from Rafel International Limited or approved agents.

HANDLING AND STORAGE

The lightweight nature of Superform POLY Blocks allows for ease of handling and construction on site. Care must be taken to protect edges and corners from damage, during storing and laying.

Ensure blocks are protected from sunlight and are stored in a clean, dry environment.

INSTALLATION

Laying of Superform POLY Blocks.
Blocks are laid on a level footing base or floor slab. The base must be level to within ± 5mm in 5m.

Spacer tie bridges are to be inserted into each polystyrene face shell to form block modules. There is provision for 10 ties to be inserted into each 1.5 metre long Superform POLY Block face shell. All 10 ties must be inserted in the slots provided.

The blocks can be cut with a hot wire or saw to all non-modular sizes.

Care should be taken to ensure the first course of base blocks are set plumb to avoid the need for later adjustment. Tolerances shall be in accordance with NZS 3109.

Locate the base blocks positively in position using an approved foam bond. The slab must be dry and the manufacturer’s instructions for use are to be followed. Foam bonds approved for use are FOSROC Foambond, Ramset Fomoplus, and Superform Superfoam or equivalent (See Details SF5-SF14 Section D pages 10-19).

For concrete slab on ground construction there are two standard procedures:

A horizontal construction joint is formed a slab thickness below the top of the foundation block, at the top of the foundation level. Starter bars for the floor slab and wall are placed. The foundation is then poured. The floor slab is poured over the foundation level and against the exterior face shell. Wall construction then proceeds. (See details SF5-SF8 Section D pages 10-13).

The second method is similar to that above except the horizontal construction joint is formed beneath the floor slab at the top of the first or second foundation block. (See details SF9-SF13 Section D pages 14-18).
Subsequent blocks are placed accurately to interlock into the block courses below and butt up against each other so that true wall dimensions are obtained.

Horizontal bars may be tied to vertical bars to assist with holding blocks in position as the wall rises.

Blocks must be placed over the vertical interlocking sections of the blocks below, in a stretcher bond pattern.

Work proceeds to the top plate level or to the level of the first wall pour depending on the stage of the construction sequence. After the top course is laid, the wall is rechecked for line, level and plumb and adjusted if necessary.

The top bar is tied into the top tie to stop lifting of the blocks during pouring and to ensure the central position of the vertical bars.

Door and window openings are formed as the wall laying proceeds.

**Forming Curved Walls** (See SF37 Section D page 42)
Curved walls with a minimum radius of 3m can easily be formed by cutting the inside block face short by the difference between the arc of the outside block face, and the arc of the inside block face, forming the curved wall. Care needs to be taken to ensure that the interlocking castellations on the blocks still intermesh between courses. Strips of 12mm ply or customwood 200mm wide, are screwed to every second course on the outside face of the curve, this ensures that a true curve is formed and avoids faceting of the blocks. Refer to SF37 for detailed diagram.

**Door and Window Openings** (See SF15-SF22 Section D pages 20-27)
Blocks are cut horizontally or vertically to coincide with door and window openings or top plate and wall ends. Timber framing is installed as temporary formwork to the opening head. The cut blocks provide side forms for lintel beams over door and window openings.

Care must be taken when setting out the window openings to allow the clearances as specified in the window details see SF15 Section D (page 20). This shows the need to add to the stated window size.

1. **Window height plus 95mm for Sill Option SF15.**
   This allows for a piece of rough sawn 100 to 150 wide x 25mm thick H3.1 treated continuous timber head packer, fitted in the opening and fixed to H3.1 treated timber blocks set into the concrete.
   The sill has a 100 to 150 wide x 50mm thick H3.1 treated continuous timber sill packer, fitted in the opening and fixed to H3.1 treated timber blocks set into the concrete and 10mm packing top and bottom is allowed as needed.
   Packing of 10mm top and bottom is allowed as needed.

2. **Window width plus 75mm for Jamb detail SF16.**
   This allows for a piece of rough sawn 100 to 150 wide x 25mm thick H3.1 treated continuous timber jamb packers, fitted in the opening and fixed to H3.1 treated timber stop ends in the block work.
   Packing of 10mm to either side is allowed as needed.
Open block ends are formed and braced, using EPS stop ends.

Block stop ends are available to be inserted where required at window and door openings and corners.

At corners and at wall intersections the blocks are butted and not overlapped as this allows the walls to be plumbed when the bracing system is fitted to the blocks.

Archways are formed in walls by cutting the archway out, placing a thin flexible material (e.g., 24 gauge sheet metal) against the soffit of the arch and positioning the cut out section back under the arch to provide support during concrete placement, and initial curing.

Shaping of sills, jambs and heads and the insertion of flashings may be required prior to the placement of concrete, depending on the joinery, cladding and lining systems used.

H3.1 treated fixing blocks or batten must be fixed in place prior to pouring to enable the fixing of door and window reveals.

**Bracing and Alignment**

The erected blocks are braced at corners, at 700crs along the wall and either side of window and door openings to provide security against wall movement from wind and construction loads (See drawing SF38 on page 43 Section D).

Ensure the appropriate bracing system is in place prior to and during the placement of concrete and for at least three days after the placement of the concrete.

Advice regarding temporary works such as bracing is available from a Superform POLY Block Technical Adviser.

**Concreting**

Special care is to be taken to ensure no debris is dropped in the wall cavity. Any debris at the base of the wall is to be removed via clean out ports cut in the polystyrene prior to pouring.

All concrete should be supplied from an approved high or special graded ready mix concrete plant.

Concrete strength must not be less than 20MPa High Grade concrete and have a slump of 100-120mm when consolidation is by mechanical vibration and 130-150mm when concrete is consolidated by hand methods.

Concrete should contain aggregate up to 13mm maximum size. Plasticiser/ water reducing agents may be used subject to approval from a Superform POLY Block Technical Adviser.

Expansion admixtures and super plasticisers must not be used.

The flow of concrete must be directed at the sides of the block modules to minimise possible block blowouts.

Concrete can be placed by skip and flexible hose or pump/hand placement methods.

The concrete is consolidated by striking the blocks with the hand or suitable implement which will not damage the blocks and also by rodding the concrete within the blocks.
Mechanical vibrators may be used but care must be taken to ensure that a maximum pour rate of 900mm per lift is maintained when vibrating. The vibrator head size is to be a maximum of 25mm.

To minimise the risk of blow out, pours must be carried out in lifts of no greater than 900mm of height per hour up to 3.0m. Each lift being poured, and the lift directly below the lift being poured, must be consolidated.

Each lift must have gone plastic before the next lift is poured on top.

Between pours a construction joint is formed 20mm below the top of the blocks. Reinforcing steel must be in place to provide a continuous connection. Construction joints are to be wire brushed to achieve a suitable roughness.

A guide rail is used to keep the top of the blocks straight.

**Bolt Fixings**

Bolts, straps and fixings for all structural and non-structural fittings should be embedded in the wet concrete rather than anchored in drilled holes after the concrete has been poured.

Any fixings to be cast in should have polystyrene removed so as to provide a 50mm concrete cover around the fixing. The length of fixings must allow for the thickness of the polystyrene to ensure the minimum embedment, as required by details in this Manual or by specific design, is maintained in the body of the wall.

Insert hold down bolts for the top plate.

Internal timber frame walls joining exterior Superform POLY Block system walls are connected by fixing the end stud against timber blocks bolted to the concrete infill via cast in M12 bolts. (See detail SF 36 as shown in Section D page 41).

Internal Superform POLY Block walls joining exterior Superform POLY Block walls are connected by forming a continuous concrete infill joint and providing L shaped reinforcing bars with adequate returns. A vertical reinforcing bar must be placed at the inside bend of the L bars. (See detail SF35 as shown in Section D page 40).

**Services And Wall Penetrations**

Chases, holes, cut-outs and recesses for small size services such as electrical wiring and piping up to 40mm diameter can be located against the concrete in slots cut into the Superform POLY Block external polystyrene skins.

Small size services are fixed to the concrete with U clamps and tappets.

Larger services up to 100mm diameter can be located in ducts passing directly through the Superform POLY Block walls. The ducts must not be located within 400mm of a lintel, beam or bond beam, and reinforcing cover of 50mm must be maintained.

Any penetrations outside this scope must be specifically designed.

Wall penetrations for services and ventilation can be made by cutting through the Superform POLY Block polystyrene face shell. Where this procedure is used, the casting holes should be covered to prevent them being filled with concrete.
The plasticiser in PVC sheathed electrical cables can migrate. PVC sheathed electrical cables must therefore be contained within plastic conduit or laid without conduit in oversize channels cut back to the concrete core. The conduit or the cables must be fixed at regular centres to the concrete core.

**Provision for fittings and cabinet joinery.**
Ensure that adequate fixing for kitchen and bathroom joinery, and all household fittings such as towel rails, shower mixers and laundry taps, etc, is provided at appropriate locations on the internal wall face by removing portions of the internal EPS face shell and replacing with solid timber blocks before pouring. Fix the blocks to the concrete infill as shown on SF16 Section D (page 21) using appropriate mechanical fixings. These connections can carry a combined load of 25kg shear and 5kg tension.

**INSPECTIONS**
Before pouring of concrete begins, the Engineer is to be notified and given reasonable opportunity to enable inspection of the reinforcing as fixed and to ensure that the work is carried out according to the intended design.

Where required, the Local Authority Inspector must also be notified.

**EXTERNAL CLADDINGS AND INTERNAL LININGS**
Requirements for claddings and linings are outlined under section A of the manual. All claddings and linings must be used and installed in accordance with the manufacturers instructions as well as any conditions or limitations imposed by either Rafel International Ltd or by the issuers of an appraisal of such a cladding or lining system.

External walls can be clad 7 days after pouring of the wall. The internal walls can be clad immediately after the external cladding is complete.

If yellowing or embrittlement of the E.P.S. block occurs due to exposure to U.V. radiation, loose material must be removed with a hard bristled brush followed by sanding. The surface must be washed down thoroughly prior to the finishing surface being applied.

Due to the benefits of more effective curing of the poured concrete within Superform POLY Blocks, it is recommended that plastering should not commence within 6-8 weeks of the walls being poured depending on the ambient conditions. It is also recommended that the owner/builder contact the plasterer in this regard prior to plastering commencing. **NOTE:** If inclement weather is evident or expected, the top of the poured wall should be covered. eg polythene or similar.

**CONSTRUCTION DETAILS**
Sheets SF5 to SF42 (pages 10-47) of the appendix show details for non specific design house construction.

**SUPERFORM SOLAR STORAGE WALLS**
To form solar storage walls, assemble the Superform POLY Blocks by using one POLY Block shell that has a smooth face to both sides along with the standard face shell. Lay the blocks with the smooth face shell towards the side of the wall that will act as a solar storage
THE SUPERFORM POLY BLOCK

General Assembly

Thermo Plastic PP Spacer Ties.

EPS End Shell.

EPS Face Shell.

Standard Block

EPS Face Shell with smooth internal surface.

Thermo Plastic PP Spacer Ties.

Standard EPS Face Shell.

Smooth Face Block

SUPERFORM POLY BLOCK UNIT

POWELL FENWICK CONSULTANTS LIMITED

Your quality engineering partner.

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SF1

Section D 6
PLAN

SIDE ELEVATION

END ELEVATION
(With Stop End Inserted)

* Typical block shown is 150mm concrete infill (250 wide)
  Also available are - 100mm concrete infill (200 wide)
  - 200mm concrete infill (300 wide)
PLAN

SIDE ELEVATION

END ELEVATION

END ELEVATION (With Stop End Inserted)

* Typical block shown is 150mm concrete infill (250 wide).
  Also available are - 100mm concrete infill (200 wide)
  - 200mm concrete infill (300 wide)
CORNER BLOCK PLAN
1:10

SUPERFORM MOULDED BLOCK UNIT DIMENSIONS
CUT ON, FROM STANDARD
250MM BLOCK 600MM LONG

CUT TWO, FROM STANDARD
250MM BLOCK 250MM LONG
PRE-ASSEMBLY

ASSEMBLED WITH 3/90 X 3.15 NAILS
**SUPERFORM MOULDED 300 CORNER BLOCK CONSTRUCTION**

**FIRST CUT - LONG SIDE**

**SECOND CUT - SHORT SIDE**

**PRE-ASSEMBLY**

**ASSEMBLED WITH 3 / 90 X 3.15 NAILS**

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Section D
**FOUNDATION/SLAB DETAIL**

1:10

**NOTE:** All details indicate minimum reinforcement requirements
Refer to SF4 foundation for paved ground

**DESIGN ASSUMPTIONS**

- maximum span of roof = 12.0m
- maximum tributary width of concrete floor = 3.0m
- maximum wall height 5.0m (2 storey)
  3.0m (single storey)
- ground bearing of 300kPa in accordance with
  NZS 3604
- well drained soil conditions in accordance with
  NZBC
FOUNDATIONS/SLAB DETAIL
1:10

**NOTE:** All details indicate minimum reinforcement requirements

Refer to SF3 foundation for natural ground

**DESIGN ASSUMPTIONS**
- Maximum span of roof = 12.0m
- Maximum tributary width of concrete floor = 3.0m
- Maximum wall height = 5.0m (2 storey)
  - 3.0m (single storey)
- Ground bearing of 300kPa in accordance with NZS 3604
- Well drained soil conditions in accordance with NZBC
Refer to Rockcote manual for cavity details

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

40mm or 60mm polystyrene. Position framing to suit

uPVC starter strip, forming a drip edge to be mechanically fixed to ties

Typical timber stud wall as per NZS 3604 H3.1 treated

Bottom plate fixing to slab in accordance NZS 3604
DPC under bottom plate

Floor slab, mesh in accordance with NZS 3604 with 30mm top cover

100-300mm min. Hardfill with no fines

2/D12 with D10@600 centres floor starters, 600 into floor

#Min. depth = 150mm (2 storey)
#Min. depth = 100mm (single storey)

#Min. width = 450mm (2 storey)
#Min. width = 300mm (single storey)

FOUNDATION/SLAB DETAIL

1:10

NOTES: All details indicate minimum reinforcement requirements
Refer to SF6 Foundation for Paved Ground

DESIGN ASSUMPTIONS
- Maximum span of roof = 12.0m
- Maximum wall height 5.0m (2 storey), 3.0m (single storey)
- Ground bearing of 300kPa in accordance with NZS 3604
- Well drained soil conditions in accordance with NZBC
Refer to Rockcote manual for cavity details

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

40mm or 60mm polystyrene. Position framing to suit

uPVC starter strip, forming a drip edge to be mechanically fixed to ties

PAVED GROUND

Typical timber stud wall as per NZS 3604 H3.1 treated

Bottom plate fixing to slab in accordance NZS 3604

DPC under bottom plate

Floor slab, mesh in accordance with NZS 3604 with 30mm top cover

100-300mm min. Hardfill with no fines

2/D12 with D10@600 centres
floor starters, 600 into floor

Min. depth = 150mm (2 storey)
Min. depth = 100mm (single storey)

D.P.M.

Nuplex tanking, stone chip with protection sheet below ground level lap 50mm behind exterior cladding

Continuous approved foam bond under to level first course

Min. width = 450mm (2 storey)
Min. width = 300mm (single storey)

10MPa Site Concrete

Chalkline

FUNDATION/SLAB DETAIL

1:10

NOTE: All details indicate minimum reinforcement requirements
Refer to SF5 foundation for natural ground

DESIGN ASSUMPTIONS

• maximum span of roof = 12.0m
• maximum wall height 5.0m (2 storey)
• 3.0m (single storey)
• ground bearing of 300kPa in accordance with NZS 3604
• well drained soil conditions in accordance with NZBC

SUPERFORM POLY BLOCK FOOTING
ROCKCOTE OVER TIMBER FRAMING – OPTION 1
(FOR PAVED GROUND OUTSIDE)
Form 75 deep key by removing polystyrene prior to pouring floor, or provide D10@600 centres floor starters, 600 into floor.

**Nuplex tanking stone chip with protection sheet below ground level**

**DPM crimp over foundation when backfilling**

**DPM**

**10-100mm min. Hardfill with no fines**

**Chalkline**

**D.P.M.**

**10Mpa Site Concrete**

**Bottom plate fixing to slab in accordance NZS 3604**

**DPC under bottom plate**

**Typical timber stud wall as per NZS 3604**

**Design Assumptions - poorly drained site (otherwise as below)**

- **Min. depth = 150mm (2 storey)**
- **Min. depth = 100mm (single storey)**

- **Min. width = 450mm (2 storey)**
- **Min. width = 300mm (single storey)**

**Foundation/Slab Detail**

1:10

**Note:** All details indicate minimum reinforcement requirements

**Design Assumptions**

- Well drained soil conditions in accordance with NZEB
- Maximum span of roof = 12.0m
- Maximum wall height 5.0m (2 storey)
- Maximum wall height 3.0m (single storey)
- Ground bearing of 300kPa in accordance with NZS 3604

**Superform Poly Block Footing**

**Rockcote over timber framing – Option 2**

(for unpaved & paved ground outside)

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SF9
FOUNDATION/SLAB DETAIL

1:10

NOTES:
All details indicate minimum reinforcement requirements
All brick veneer to meet the relevant performance requirements of the New Zealand Building Code
Refer to SF9 Foundation for Paved Ground

DESIGN ASSUMPTIONS
- maximum span of roof = 12.0m
- maximum wall height 5.0m (2 storey)
  3.0m (single storey)
- veneer detailing at openings and eaves shall comply with NZS 3604
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC
Building Paper
Brick veneer, max. height as per NZS 3604
Provide weep holes at every third vertical mortar joint
PAVED GROUND
Nuplex tanking with protection sheet
Remove side of Superform POLY Block once concrete has set, cut off tie

Typical timber stud wall as per NZS 3604
H3.1 treated
DPC under bottom plate
2/D12 with D10@600 centres
Floor starters, 600 into floor
Floor slab, mesh in accordance with NZS 3604 with 30mm top cover

100-300mm min. Hardfill with no fines
D.P.M.
Chalkline
10MPa Site Concrete
Continuous approved foam bond under to level first course

#Min. depth = 150mm (2 storey)
#Min. depth = 100mm (single storey)
#Min. width = 450mm (2 storey)
#Min. width = 300mm (single storey)

FOUNDATION/SLAB DETAIL
1:10

NOTES:
All details indicate minimum reinforcement requirements
All brick veneer to meet the relevant performance requirements of the New Zealand Building Code
Refer to SFB Foundation for Natural Ground

DESIGN ASSUMPTIONS:
- maximum span of roof = 12.0m
- maximum wall height 5.0m (2 storey)
  3.0m (single storey)
- veneer detailing at openings and eaves shall comply with NZS 3604
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC

SUPERFORM POLY BLOCK FOOTING
BRICK VENEER OVER TIMBER FRAMING – OPTION 2
(FOR PAVED GROUND OUTSIDE)
FOUNDATION/SLAB DETAIL

1:10

NOTE: All details indicate minimum reinforcement requirements

DESIGN ASSUMPTIONS
- maximum span of roof = 12.0m
- maximum wall height 5.0m (2 storey)
  3.0m (single storey)
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC
2 coats of Mulseal
10mm brick cavity
Veneer ties
Brick veneer, max. height as per NZS 3604
Provide weep holes at every third vertical mortar joint
Plaster to sloping plinth
UNPAVED GROUND
Nuplex tanking, with protection sheet
Vertical reinforcing with a 150 return
300 Superform POLY Block Unit

interior linings, refer to Section A this manual
Superform POLY Block Units
Skirting and interior lining fixing blocks, H3.1 treated. Fix using galvanised 100mm nails skew nailed through timber & cast in concrete infill @ 500 centres
Floor slab, mesh in accordance with NZS 3604 with 30mm top cover

100-300mm min. Hardfill with no fines
D.P.M.
2/D12 with D10@600 centres floor starters, 600 into floor
#Min. depth = 150mm(2 storey)
#Min. depth = 100mm(single storey)
10MPa Site Concrete Continuous approved foam bond under to level first course
#Min. width = 450mm(2 storey)
#Min. width = 350mm(single storey)

FOUNDATION/SLAB DETAIL
1:10

NOTES: All details indicate minimum reinforcement requirements
All brick veneer to meet the relevant performance requirements of the New Zealand Building Code
Refer to SF9 Foundation for Paved Ground

DESIGN ASSUMPTIONS
- maximum span of roof = 12.0m
- maximum tributary width of concrete floor = 3.0m
- maximum wall height 5.0m (2 storey)
  3.0m (single storey)
- veneer detailing at openings and eaves shall comply with NZS 3604
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC
INTERNAL SUPERFORM WALL FOUNDATION
1:10

NOTE: All details indicate minimum reinforcement requirements

DESIGN ASSUMPTIONS
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC

minimum width = 350mm (single storey)
minimum width = 500mm (two storey with suspended timber floor to NZS 3604)
minimum width = 700mm (two storey with suspended concrete floor)
Superform POLY Block Units

Exterior cladding,
Rockcote or similar
approved coating, refer
to coating manuals

uPVC corner strip
Double layer of mesh

5 degrees slope
to form drip edge

10mm min cover

Aluminium window joinery

140x25 H3.1 timber
packer (continuous)

Powder coated aluminium
flashings tappet fix to concrete

 Rebated reveal
H3.1 packer to suit

ALUMINIUM WINDOW HEAD DETAIL

1:5

Aluminium window joinery
offset 5mm from flashing
to allow ventilation

uPVC flashing

5mm unsealed
30° pitch

Shaped polystyrene

Double layer of mesh
Exterior cladding,
Rockcote or similar
approved coating, refer
to coating manuals

Superform POLY Block Units

45x45 H3.1 timber blocks @ 600crs with 25x8mm
key one end. Length block to suit width of
concrete infill. Fix using 100mm galvanised nails
skew nailed to timber & cast in concrete infill

NOTE:
Corner sill & head
soakers are to be
installed

ALUMINIUM WINDOW SILL DETAIL

1:5

Interior linings, refer to
Section A this manual

Airseal over
PEF rod & foam

7.5mm min.

Rebated reveal

Superform POLY Block Opening

Window Opening + 9mm

Superform POLY Block Opening

Window Opening + 8mm

Interior linings, refer to
Section A this manual

Protecto tape along
sill & 100mm min
up each jamb

Protecto tape

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SUPERFORM POLY BLOCK
WINDOW DETAILS

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Section D 20
70x45 H3.1 timber blocks @ 600crs (to suit window manufacturer's specification) with 25x8mm keys each end. Length of block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill.

Superform POLY Block Units

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

double layer of mesh around corner

uPVC corner strip

uPVC corner soaker 10mm min cover

Fill 5mm gap between flashing and window profile with 5mmx5mm bead of approved sealant

Aluminium window joinery

Interior linings, refer to Section A this manual

140x25 H3.1 timber packer (continuous)

Airseal over PEF rod and foam

7.5 min

Rebated reveal

H3.1 packer to suit

Protecto tape around entire opening

**ALUMINIUM WINDOW JAMB DETAIL**

1:5

NOTE - Windows and joinery to be confirmed with the window manufacturer.
2 coats of Mulseal
20mm cavity

Brick veneer, maximum height as per NZS 3604
Protecto tape
Weep hole every 3rd vertical mortar joint
Angle to NZS 3604

Brick slip, glue fix to angle with Nuplex Lockfast
Durabond powder with synthetic latex or Laticrete system

Aluminium window joinery
Flashing and corner soaker to be installed
Aluminium window joinery

ALUMINIUM WINDOW HEAD DETAIL
1:5

Aluminium window joinery

Powder coated aluminium flashing extending up under aluminium sill extrusion. Corner soaker to be installed
15° pitch

Brick Veneer, maximum height as per NZS 3604
Superform POLY Block Units
Veneer ties as E2, NZ Building Code
2 coats Mulseal
20mm cavity

70x45 H3.1 timber blocks @ 600cs with 25x8mm keys each end. Length block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill

ALUMINIUM WINDOW SILL DETAIL - OPTION 1
1:5

H3.1 packer to suit
Airseal over PEF rod and foam
Rebated reveal
Protecto tape
140x25 H3.1 timber packer

Interior linings, refer to Section A this manual
Concrete infill
70x45 timber block
Refer notes below
140x45 H3.1 timber packer
Airseal over PEF rod and foam
Rebated reveal
H3.1 packer to suit
Protecto tape
ALUMINIUM WINDOW JAMB DETAIL

1:5

NOTE - All brick veneer to meet the relevant performance requirements of the New Zealand Building Code
70x45 H3.1 timber blocks @ 600crs (to suit window manufacturer’s specification) with 25x8mm keys each end. Length of block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill.

Superform POLY Block Units
Exterior cladding, Rockcote or similar approved coating, refer to coating manuals
uPVC corner strip
Double layer of mesh
5 degrees slope to form drip edge or rebate
Powder coated aluminium flashings tappet fix to concrete
Timber window joinery

INTERIOR LININGS, refer to Section A this manual
End soaker to be installed
PEF rod & foam
H3.1 packer to suit
140x25 H3.1 timber packer (continuous)

TIMBER WINDOW HEAD DETAIL
1:5

Timber window frame
30° pitch
10° min.
Shaped polystyrene
Double layer of mesh
Exterior cladding, refer to Rockcote manual
Superform POLY Block Units

H3.1 packer to suit
PEF rod & foam
Protecto tape
ex. 140x45 H3.1 timber packers
Interior linings, refer to Section A this manual

TIMBER WINDOW SILL DETAIL
1:5

45x45 H3.1 timber blocks @ 600crs with 25x8mm key one end. Length block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill.

SUPERFORM POLY BLOCK
WINDOW DETAILS

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Section D 24
70x45 H3.1 timber blocks @ 600crs (to suit window manufacturer's specification) with 25x8mm keys each end. Length of block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill.

Superform POLY Block Units

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Double layer of mesh

70x70 uPVC

uPVC jamb flashing

Fill 5mm gap between timbers with 5mmx5mm bead of approved sealant

Timber window joinery

Interior linings, refer to Section A this manual

140x25 H3.1 timber packer (continuous)

Airseal over PEF rod and foam

H3.1 packer to suit

Protecto tape

TIMBER WINDOW JAMB DETAIL

1:5

NOTE - Windows and joinery to be confirmed with the window manufacturer.
70x45 H3.1 timber blocks @ 600crs with 25x8mm keys each end. Length block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill

Superform POLY Block Units

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Double layer of mesh

Powder coated aluminium flashing

70x70 uPVC

5 degrees slope to form drip edge

Colorsteel head flashing with corner soaker to be installed

DOOR HEAD

DOOR JAMB

70x45 H3.1 timber blocks @ 600crs with 25x8mm keys each end. Length block to suit width of concrete infill. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill

Superform POLY Block Units

Exterior cladding, refer to Rockcote manual

uPVC flashing into rebate in reveal

sealant or foam backed mesh angle

H3.1 packer to suit

Timber frame

Rebated reveal

Airseal over PEF rod and foam

Concrete infill

DOOR DETAILS

Interior linings, refer to Section A this manual

Reinforcing steel for lintel beam. Refer to the relevant design table

Return wall vertical steel ISO horizontally at the top of the door

H3.1 packer to suit

Airseal over PEF rod and foam

Rebated reveal

Door frame

NOTE - Doors and joinery to be confirmed with the manufacturer

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Section D 26
Superform POLY Block Units

Concrete Infill

Interior linings, refer to Section A this manual

appropriate mechanical fixing loading capacity - 25kg shear 5kg tension

WALL FIXING BLOCK
1:5

200 deep concrete nib
deeding

12

deck joist

Stringer, refer to NZS3604 for details

12mm x 150 long timber packer at bolt fixings

50x3 thick EPDM washer

WALL FIXING BLOCK TO DECK
1:5
wall to enclosed deck similar
TIMBER FLOOR/WALL DETAIL - OPTION 1

JOIST SUPPORTED BY THE WALL
(TIMBER FLOOR SYSTEM IN ACCORDANCE WITH NZS 3604)

TIMBER FLOOR/WALL DETAIL - OPTION 2

JOIST SUPPORTED BY THE WALL
(TIMBER FLOOR SYSTEM IN ACCORDANCE WITH NZS 3604)
TIMBER FLOOR/WALL DETAIL

1:10
JOIST PARALLEL TO WALL
(TIMBER FLOOR SYSTEM IN ACCORDANCE WITH NZS 3604)

Concrete infill

Construction Joint

Superform POLY Block Units

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Floor ties to be D10 @600mm maximum centres or to specific design whichever is the greatest. Lap distance 450mm

Floor mesh, 30mm cover

Concrete topping

Suspended concrete floor system to Engineer’s design

Interior linings, refer to Section A this manual

Timber stringer, Mechanically fix to the concrete infill with M12 bolts @ 900mm maximum centres. Minimum embedment of 100mm into concrete, alternatively T12/40 Trubolts can be used @ 900mm maximum centres.

3.55mmØ nails 90mm long nailed into ribbon board at 100mm centres

Blocking

Joist

3/100x3.75mm nails per block

25x1mm galvanised strap with 4/30x2.5mm nails per end

4/100 skew nails per block

Joist depth hole 100mm wide to be cut in the Superform POLY Block wall at appropriate centres. The horizontal position of the hole is to be between the uPVC spacers. The position of the hole vertically is determined by the floor height

CONCRETE FLOOR/WALL DETAIL

1:10
DETAIL FOR 50mm DECREASE
IN WALL THICKNESS

1:10
Multigrip connection to wall fixing plate

250x40 fixing plate, bolted at 750 maximum centres using a 12mm cast in galvanised bolt (150 embedded) with 35mm x 35mm x 3mm galvanised washer

75x50 ribbon plate, bolted @ 750 maximum centre using a 12mm cast in galvanised bolt (100 embedment) with 35mm x 35mm x 3mm galvanised washer

Malthoid strip between timber and concrete

Superform POLY Block Unit

Concrete infill

Bond beam/Lintel reinforcing Refer to the lintel design table for the steel requirements

Interior linings, refer to Section A this manual

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

EAVES DETAIL
1:10
REVERSE SLOPE EAVES

1:10

Soffit linings and appropriate flashing must be installed on completion of plastering.
PARAPET WITH CAPPING

1:5

Continuous metal cap flashing fixed through sides
Concrete infill
Fixing as for E2
Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Underlay to provide separation of metal capping & concrete
Parapet top to fall
Colorsteel capping
Superform POLY Block Unit

5° pitch
Z
Z

PARAPET/HANDRAIL OPTION

1:5

Double layer of mesh
Parapet top to fall
Protecto tape wrapped over parapet and onto end wall
Superform POLY Block Unit

10° pitch
55

Concrete infill
Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Approved reinforced membrane coating applied prior to final finish coat of paint
Superform POLY Block — Unit

Top of parapet wall to have an approved metalcap flashing on a liquid membrane to comply with NZ Building Code E2 ensure liquid membrane carries 200mm under metal cap & 50mm onto wall

Protecto tape to be installed prior to plastering

Waterproof membrane on top

10° pitch

Liquid waterproof membrane or purpose made flashing over Superform POLY Block and over Rockcote cladding

Handrail fixings must be installed on the face of the wall. Do not install fixings directly through the top

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

NOTE: refer to NZBC E2/AS1 Paragraph 9.9.10.2 for the performance requirements of the waterproofing membrane
Protecto tape over roof flashing

Roof flashing 2 ridges lap min

Gutter with stop 10mm finished plaster system

Kickout formed in flashing

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Superform POLY Block Units
Concrete infill

Pipe or other penetration

Superform POLY Block Unit

Exterior cladding. Rockcote or similar approved coating, refer to coating manuals

10mm x 6mm deep sealant bead on foam bond breaker

5° min.

25

100

Flange fixed by Plumber. If no flange is fitted, a reinforced liquid membrane is to be installed around pipe

Proteco tape around pipe prior to plastering

PIPE PENETRATION

1-5
**CLADDING DETAIL**

1:10

**NOTE:** All details indicate minimum reinforcement requirements
Refer to SF4 foundation for paved ground

**DESIGN ASSUMPTIONS**
- maximum span of roof = 12.0m
- maximum tributary width of concrete floor = 3.0m
- maximum wall height 5.0m (2 storey)
- 3.0m (single storey)
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC
CLADDING DETAIL

1:10

NOTE: All details indicate minimum reinforcement requirements
Refer to SF4 foundation for paved ground

DESIGN ASSUMPTIONS
- maximum span of roof = 12.0m
- maximum tributary width of concrete floor = 3.0m
- maximum wall height 5.0m (2 storey)
  3.0m (single storey)
- ground bearing of 300kPa in accordance with NZS 3604
- well drained soil conditions in accordance with NZBC
**BATTENS FIXED VERTICAL OR HORIZONTAL**

**Battens at 600crs**
Fix battens to Thermo Plastic PP Spacer Ties with 8 gauge x 75mm Surefix screws at 300crs. Stainless steel screws are to be used in coastal areas, refer to tables in E2 in the New Zealand Building Code.

**Battens at 1200crs**
Fix battens to Thermo Plastic PP spacer Ties with 8 gauge x 75mm Surefix screws at 150crs. Stainless steel screws are to be used in coastal areas, refer to tables in E2 in the New Zealand Building Code.

**HORIZONTAL METAL PROFILED CLADDING**

1:5

- DPC strip
- Horizontal profiled metal cladding
- 8 gauge Surefix screws
- H3.1 vertical timber battens
- Mulseal or approved membrane coating
- Concrete infill
- Thermo Plastic PP Spacer Ties
- Superform POLY Block Units

**VERTICAL METAL PROFILED CLADDING**

1:5

- DPC strip
- H3.1 horizontal timber battens
- 8 gauge Surefix screws
- Mulseal or approved membrane coating
- Vertical profiled metal cladding
- Concrete infill
- Thermo Plastic PP Spacer Ties
- Superform POLY Block Units
EXTERIOR SUPERFORM POLY BLOCK TO INTERNAL SUPERFORM POLY BLOCK WALL DETAIL
1:10

Interior linings, refer to Section A
Wall reinforcing
Concrete Infill
Superform POLY Block Units

PLY strengthening screw fix to ties for pouring remove before cladding
Concrete Infill
150 return
Exterior cladding, refer to Rockcote manual

CORNER DETAIL
1:10
**INTERNAL TIMBER TO EXTERNAL SUPERFORM**

**POLY BLOCK WALL DETAIL**

1:10

Wall reinforcing
Concrete infill

Superform POLY Block Units
Exterior cladding, refer Rockcote or similar approved coating, refer to coating manuals

Interior linings, refer to Section A this manual

150 long hole cut into Superform POLY Block face shell at bolt centres

M12 galvanised bolt @ 800 centres, maximum

H3.1 treated 90x45 block, 100 long @800 centres set in before pouring. Fix using 100mm galvanised nails skew nailed to timber & cast in concrete infill

**MALTHOID STRIP BETWEEN TIMBER AND CONCRETE**

**INTERNAL TIMBER TO EXTERNAL SUPERFORM**

1:10 **POLY BLOCK WALL – ALTERNATIVE DETAIL**

Wall reinforcing
Concrete infill

Superform POLY Block Units
Exterior cladding, refer Rockcote or similar approved coating, refer to coating manuals

Interior linings, refer to Section A this manual

M12 galvanised bolt @ 800 centres, maximum

Timber wall framing
NZS 3604
All blocks to be laid in a stretcher bond pattern

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Superform POLY Block Units

Wall reinforcing

Polypropylene Spacer Ties

TYPICAL CURVED WALL DETAIL

1:10

Cut ends of Unit to suit radius

make 12mm sawcut between spacers

CUTTING OF SUPERFORM POLY BLOCK UNIT FOR CURVED WALL

1:10
Main bracing upright drilled at centres to suit block configuration
Length 2.45m or with extension 2.95m
set at 700mm centres

Super screws (40x8) into Thermoplastic
block ties on every course

Superform Panel block wall
thread adjusted rod

Plank

Scaffold bar 1.8 high

Scaffold upright

Heavy wall tube brace

Lower scaffold bar at 800mm high

1300

Dynabolt (40x8) to brace foot
1) Superform blocks are erected with wire ties looping around starter bars and penetrating internal face of wall.

2) Vertical reinforcing bars are dropped down the wall, ensuring the bar is contained within the wire loop and base of the bar is above the concrete floor.

3) The wire is twisted closed with a cordless drill or similar.

4) The wire is trimmed as required.
1) Superform blocks are erected with 50Ø PVC or polythene tubes, 50mm long tied to the starter bar.

2) Vertical reinforcing bars are dropped down the wall, ensuring the bar is contained within the PVC tube.

wire ties to ensure tubes are secured half way up starter bars
ISOMETRIC VIEW

vertical reinforcing bar

lap length to suit bar size

cone-shaped recess
cast-in slab

start bar

SECTION A-A

place vertical bar ensuring the base of the bar fits into the cone-shaped recess

slab is cast with cone-shaped recesses at each starter, as shown

wall starter bar, cast-in foundation/slab
**SUPERFORM POLY BLOCK**

**METERBOX OPTION 1**

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**METERBOX HEAD & JAMB FLASHING DETAIL**

1:5

- Superform POLY Block Units
- Exterior cladding, Rockcote or similar approved coating, refer to coating manuals
- vPVC corner strip
- Double layer of mesh
- 5 degrees slope to form drip edge or rebate
- Powder coated aluminium flashings screw fix to timber
- Seal & rivet angle to meterbox & to flashing

---

**METERBOX SILL FLASHING DETAIL**

1:5

- Superform POLY Block Units
- Exterior cladding, Rockcote or similar approved coating, refer to coating manuals
- vPVC corner strip
- Double layer of mesh
- Powder coated aluminium flashings screw fix to timber
- Seal & rivet angle to meterbox & to flashing

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Interior linings, refer to Section A this manual

H3.1 Timber packer to suit

End soaker to be installed

PEF road & foam

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**SF43**

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Section D 48
Superform POLY Block Units

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

uPVC corner strip

Double layer of mesh

5 degrees slope to form drip edge or rebate

Seal & rivet angle to meterbox

Silaflex AT sealant

Interior linings, refer to Section A this manual

H3.1 Timber packer to suit

ALTERNATIVE METERBOX DETAIL

1:5
VERTICAL CONSTRUCTION JOINT

1:10

Refer to Rockcote manual for cavity details

Floor system

HORIZONTAL CONSTRUCTION JOINT

1:10

Exterior cladding, Rockcote or similar approved coating, refer to coating manuals

Superform POLY Block Units
APPENDIX A

EZI-SPEC

SUPERFORM BLOCKWORK

1. PRELIMINARY AND GENERAL

Refer to the Preliminary and General Clauses of this Specification and the General and Special Conditions of Contract which are equally binding on all trades. This section of the Specification shall be read in conjunction with all other sections.

2. EXTENT OF WORK

This Section of the Contract consists of the supply, fabrication, reinforcement, and concrete grout filling of the Superform polystyrene block walls shown on the drawings.

3. INSTALLATION

All work is to be carried out in accordance with the Superform POLY Block Manual. The following procedures are emphasised:

Laying of Superform POLY Blocks.

Blocks are laid on a level footing base or floor slab. The base must be level to within ±5mm in 5m. Spacer tie bridges are to be inserted into each polystyrene face shell to form block modules. There is provision for 10 ties to be inserted into each 1.5 metre long Superform POLY Block face shell. All 10 ties must be inserted in the slots provided. The blocks can be cut with a hot wire or saw to all non-modular sizes. Care should be taken to ensure the first course of base blocks are set plumb to avoid the need for later adjustment. Tolerances shall be in accordance with NZS 3109. Locate the base blocks positively in position using an approved foam bond. The slab must be dry and the manufacturer’s instructions for use are to be followed. Foam bonds approved for use are FOSROC Foambond, Ramset Fomoplus, and Superform Superfoam (See Details Superform POLY Block Manual).
Blocks are placed accurately, in a stretcher bond pattern, to interlock into the block courses below and butt up against each other so that true wall dimensions are obtained. Horizontal bars are tied to vertical bars to assist with holding blocks in position as the wall rises. Work proceeds to the top plate level or to the level of the first wall pour depending on the stage of the construction sequence. After the top course is laid, the wall is rechecked for line, level and plumb. Adjust if necessary. The top bar is tied onto the plastic tie to stop lifting of the blocks during pouring and to ensure the central position of the vertical bars. Door and window openings are formed as the wall laying proceeds.

**Forming Curved Walls**

Curved walls with a minimum radius of 3m can easily be formed by cutting the inside block face short by the difference between the arc of the outside block face, and the arc of the inside block face, forming the curved wall. Care needs to be taken to ensure that the interlocking castellations on the blocks still intermesh between courses. Strips of 12mm ply or customwood 200mm wide, are screwed to every second course on the outside face of the curve, this ensures that a true curve is formed and avoids faceting of the blocks.

**Door and Window Openings** *(See Details Superform POLY Block Manual).*

Blocks are cut horizontally or vertically to coincide with door and window openings or top plate and wall ends. Timber framing is installed as temporary formwork to the opening head. The cut blocks provide side forms for lintel beams over door and window openings. Care must be taken when setting out the window openings to allow the clearances as specified in the window details *(See Details Superform POLY Block Manual).* This shows the need to add to the stated window size. Open block ends are formed and braced, using EPS stop ends. Block stop ends are available to be inserted where required at window and door openings and corners. At corners and at wall intersections the blocks are butted and not overlapped as this allows the walls to be plumbed when the bracing system is fitted to the blocks. Archways are formed in walls by cutting the archway out, placing a thin flexible material (e.g., 24 gauge sheet metal) against the soffit of the arch and positioning the cut out section back under the arch to provide support during concrete placement, and initial curing. Shaping of sills, jambs and heads and the insertion of flashings may be required prior to the placement of concrete, depending on the joinery, cladding and lining systems used.

H3.1 treated fixing blocks or batten must be fixed in place prior to pouring to enable the fixing of door and window reveals.

**Bracing and Alignment**

The erected blocks are braced at corners, at 900crs along the wall and either side of window and door openings to provide security against wall movement from wind and construction loads *(See Details Superform POLY Block Manual).* Ensure the appropriate bracing system is in place prior to and during the placement of concrete and for at least three days after the placement of the concrete. Advice regarding temporary works such as bracing is available from a Superform POLY Block Technical Adviser.
Concreting

Special care is to be taken to ensure no debris is dropped in the wall cavity. Any debris at the base of the wall is to be removed via clean out ports cut in the polystyrene prior to pouring.

All concrete should be supplied from an approved high or special graded ready mix concrete plant. Concrete strength must not be less than 20MPa High Grade concrete and have a slump of 100-120mm when consolidation is by mechanical vibration and 130-150mm when concrete is consolidated by hand methods. Concrete should contain aggregate up to 13mm maximum size. Plasticiser/ water reducing agents may be used subject to approval from a Superform POLY Block Technical Adviser. Expansion admixtures and super plasticisers must not be used. The flow of concrete must be directed at the sides of the block modules to minimise possible block blowouts. Concrete can be placed by skip and flexible hose or pump/hand placement methods. The concrete is consolidated by striking the blocks with the hand or suitable implement that will not damage the blocks and also by rodding the concrete within the blocks. Mechanical vibrators may be used but care must be taken to ensure that a maximum pour rate of 900mm per lift is maintained when vibrating. The vibrator head size is to be a maximum of 25mm. The wall shall be poured to a maximum pour height of 3.6m, in lifts of a maximum of 900mm. Each lift shall be allowed to achieve initial set. Before the subsequent lifted is placed. The two lifts are to be vibrated together to ensure a wall construction without cold joints is formed. Between pours a construction joint is formed 20mm below the top of the blocks. Reinforcing steel must be in place to provide a continuous connection. Construction joints are to be wire brushed to achieve a suitable roughness.

Bolt Fixings

Bolts, straps and fixings for all structural and non-structural fittings should be embedded in the wet concrete rather than anchored in drilled holes after the concrete has been poured. Any fixings to be cast in should have polystyrene removed so as to provide a 50mm concrete cover around the fixing. The length of fixings must allow for the thickness of the polystyrene to ensure the minimum embedment, as required by details in this Manual or by specific design, is maintained in the body of the wall. Insert hold down bolts for the top plate. Internal timber frame walls joining exterior Superform POLY Block system walls are connected by fixing the end stud against timber blocks bolted to the concrete infill via cast in M12 bolts. (See Details Superform POLY Block Manual) Internal Superform POLY Block walls joining exterior Superform POLY Block walls are connected by forming a continuous concrete infill joint and providing L shaped reinforcing bars with adequate returns. A vertical reinforcing bar must be placed at the inside bend of the L bars. (See Details Superform POLY Block Manual)

Services And Wall Penetrations

Chases, holes, cut-outs and recesses for small size services such as electrical wiring and piping up to 40mm diameter can be located against the concrete in slots cut into the Superform POLY Block external polystyrene skins. Small size services are fixed to the concrete with U clamps and tappets. Larger services up to 100mm diameter can be located in ducts passing directly through the Superform POLY Block walls. The ducts must not be located within 400mm of a lintel, beam or bond beam, and reinforcing cover of 50mm must be maintained.
Any penetrations outside this scope must be specifically designed. Wall penetrations for services and ventilation can be made by cutting through the Superform POLY Block polystyrene face shell. Where this procedure is used, the casting holes should be covered to prevent them being filled with concrete. The plasticiser in PVC sheathed electrical cables can migrate. PVC sheathed electrical cables must therefore be contained within plastic conduit or a PVC tolerant non migratory TFS PVC sheath cable where direct contact with polystyrene may occur or laid without conduit in oversize channels cut back to the concrete core. The conduit or the cables must be fixed at regular centres to the concrete core.

**Provision for fittings and cabinet joinery.**

Ensure that adequate fixing for kitchen and bathroom joinery, and all household fittings such as towel rails, shower mixers and laundry taps, etc, is provided at appropriate locations on the internal wall face by removing portions of the internal EPS face shell and replacing with solid timber blocks before pouring. Fix the blocks to the concrete infill as shown in the Superform POLY Block Manual. These connections can carry a combined load of 25kg shear and 5kg tension.

**INSPECTIONS**

Before pouring of concrete begins, the Engineer is to be notified and given reasonable opportunity to enable inspection of the reinforcing as fixed and to ensure that the work is carried out according to the intended design. Where required, the Local Authority Inspector must also be notified.