By	[redacted] **Ferrier Fire Ltd**
To	[redacted] **Expedite Projects**
Date	**09/10/2026**
Reference	**26051-FE01**
Project	**Southern Cross NH – Fire Engineering Assessment**

It is proposed to provide passive fire stopping to service penetrations in a firewall, which is part of the Oxygen tank structure. The site is located at the Southern Cross, North Harbour Hospital, [redacted]

Ferrier Fire limited have reviewed the passive fire products, type of service penetration and the firewall substrate, and confirm compliance.

The following support documents to support the PS1 is presented below and attached:

- Fire report for Oxygen Tank Structure by WSP. Revision 0 dated 12/02/2026.

- Typical penetrations with fire stopping treatment document.

- Data sheet for hollow masonry concrete block wall.

- Dricon technical data sheet or architectural mortar.

Yours sincerely,

[redacted] | ME (Fire), CPEng (Fire), CMEngNZ, MSFPE.
Fire Engineer
[redacted]

Ferrier Fire Limited. A New Zealand Limited Company. Company Number 6303989.

Expedite Projects

Southern Cross North Harbour - Oxygen Tank Structure

Fire Engineering Design

February 2026

Confidential

BCO10409140 Received by Auckland Council 16/02/2026

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Southern Cross North Harbour - Oxygen Tank Structure
Fire Engineering Design

Expedite Projects

WSP
Level 3 The Westhaven,
Auckland 1010
Auckland 1141

Tel: +64 9 355 9500
wsp.com

Rev	Date	Details
0	12/02/2026	Issue for Building Consent

	Name	Date	Signature
Prepared by:		12/02/2026	
Reviewed by:		13/02/2026	
Approved by:		13/02/2026	

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Table of contents

Executive summary ii

1 Building Description 1

1.1 General 1

1.2 Classified Use 1

1.3 Risk Group 1

1.4 Means of Compliance 1

2 Fire Resistant Ratings and Fire Safety Systems 2

2.1 Firecell Floor Area Limitation 2

2.2 Fire Safety Systems 2

2.3 Fire Resistant Ratings 2

3 Means of Escape 3

3.1 General 3

3.2 Number of Exits 3

3.3 Height and Width of Escape Routes 3

3.4 Length of Escape Routes 3

4 Foamed plastic and combustible insulation materials 5

5 External Spread of Fire 6

6 Prevention of Fire Occurring 7

Executive summary

The oxygen tank and associated valve enclosure is to be located within the Southern Cross North Harbour site, adjacent to the on-grade public carpark, as a standalone structure, remote from main hospital building.

This report presents the fire engineering design requirements for compliance with building code clauses C1 – C6. Note; compliance with the control of hazardous substances is not covered by this report, hence a separate report addressing the requirements under the Health and Safety at Work (Hazardous Substances) Regulations 2017 has been prepared by others. Requirements where identified within the hazardous substances have been incorporated within this fire engineering design in addition to the requirements as specified by C/AS1.

The requirements as identified are as summarised below:

- Fire rated construction as noted within section 2.3.
- Where applicable foamed plastics building materials or combustible insulating materials form part of a wall or ceiling system, the completed system shall achieve a Group Number that is equal or less than 3, and the foamed plastics shall comply with the flame propagation criteria as specified in Subsection 8.5.7 of the Building Product Specifications for the material being used.
- Electrical installations in the building shall comply with Building Code clause G9 Electricity.

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1 Building Description

1.1 General

The oxygen tank and associated valve enclosure is to be located within the Southern Cross North Harbour site, adjacent to the on-grade public carpark, as a standalone structure, remote from main hospital building.

1.2 Classified Use

The Oxygen Tank is classified as an Ancillary use; i.e. an ancillary building as defined by clause A1 of the Building Code; i.e. a building or use not for human habitation and which may be exempted from some amenity provisions, but which are required to comply with structural and safety-related aspects of the building code. Examples: a bridge, derrick, fence, free standing outdoor fireplace, jetty, mast, path, platform, pylon, retaining wall, tank, tunnel or dam.

The walls enclosing the oxygen tank and adjacent valve room enclosure are classified as an out-building, i.e., a building or use which may be included within each classified use but are not intended for human habitation and are accessory to the principal use of associated buildings. Examples: a carport, farm building, garage, greenhouse, machinery room, private swimming pool, public toilet, or shed.

1.3 Risk Group

Given the classified use of "outbuilding" the risk group within the walls enclosing the oxygen tank and adjacent valve room enclosure is classified risk group SH as defined by Acceptable Solution C/AS1.

1.4 Means of Compliance

This fire engineering design has utilised C/AS1 Second edition, Amendment 1, effective from the 28th July 2025 as the means of demonstrating compliance with building code clauses C1 – C6. Note, the control of hazardous substances is not covered by C/AS1, hence a separate report addressing the requirements under the Health and Safety at Work (Hazardous Substances) Regulations 2017 has been prepared by others. The requirements of this report[1] have been incorporated within this fire engineering design in addition to the requirements specified by C/AS1.

[1] Report titled "Southern Cross North Harbour Hospital [redacted] [redacted]" Prepared by Envirocom (NZ) Ltd, and dated 19/12/2025.

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2 Fire Resistant Ratings and Fire Safety Systems

2.1 Firecell Floor Area Limitation

There are no limitations on the firecell floor area for risk group SH.

2.2 Fire Safety Systems

Fire safety systems are not required for this building as per C/AS1 requirements for outbuildings given the lengths of dead end and total open paths do not exceed distances as within section 3.4.

2.3 Fire Resistance Ratings

There are no requirements for fire resistant ratings for this building as specified by C/AS1. However requirements as specified by the Health and Safety at Work (Hazardous Substances) Regulations 2017 report have been summarised below, with the height of fire rated walls to be 3 m above a potential source of release, i.e. above the valve group at the base of the LOX VIE vessel; refer the Health and Safety at Work (Hazardous Substances) Regulations 2017 report for specific details of the requirements of the construction of this wall.

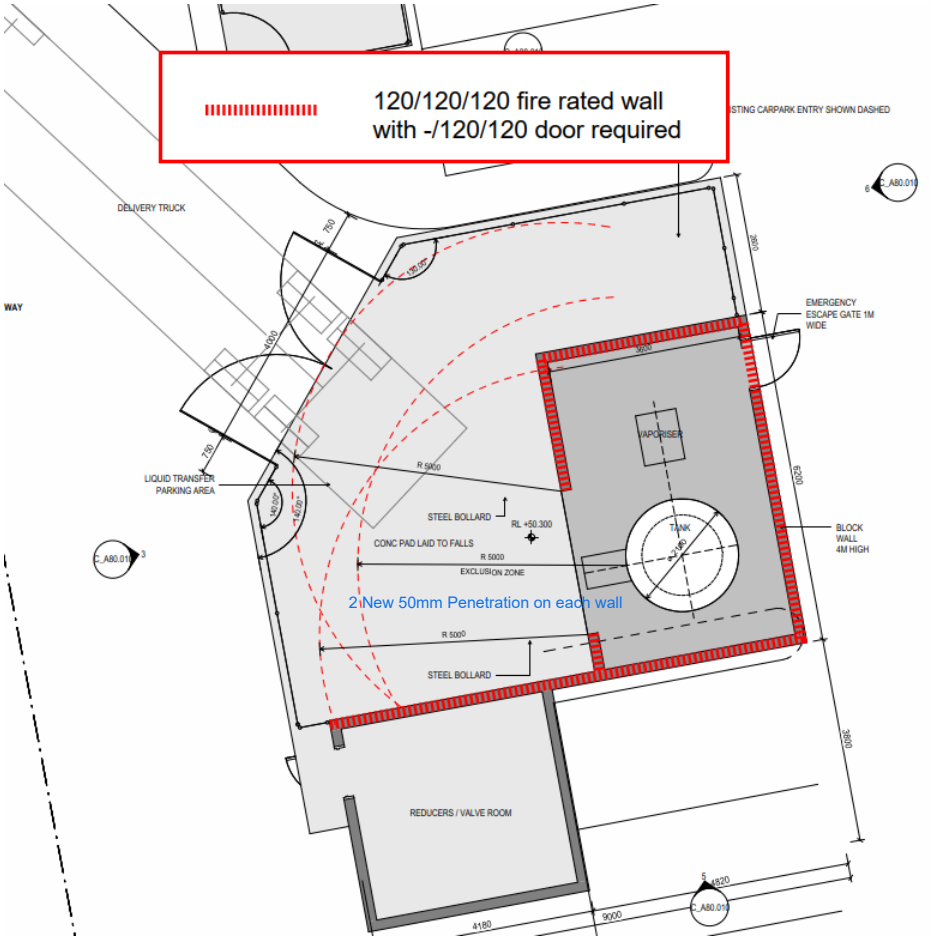


Figure 1: Required Fire Resistant Construction

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3 Means of Escape

3.1 General

Escape routes shall comply with clause D1 of the Building Code. Ramps, handrails, doors, vision panels, and openings shall comply with Acceptable Solution D1/AS1.

3.2 Number of Exits

A single exit is required from each of the oxygen tank compound and valve room for compliance with C/AS1. For the oxygen tank compound, the emergency egress door at the rear of the compound which allows direct egress to the outside as specified by the HSNO report is used for this purpose.

3.3 Height and Width of Escape Routes

The clear height within escape routes shall be no less than that required by Acceptable Solution D1/AS1. Doors are required to have a clear height of no less than 1955 mm for the required width of the opening.

All escape routes except doors shall have a minimum width of not less than 700mm. Doors shall provide an unobstructed opening of no less than 600 m, and when multi-leaf, have no single leaf less than 500 mm wide.

3.4 Length of Escape Routes

Given a single exit is available from each space and no fire alarm is provided, the travel distances from each space shall not be greater than 20m specified by C/AS1-Table 3.3.1.1.

Area considered	Maximum calculated egress travel distance	Maximum permitted single direction of travel (dead end open path) as specified by C/AS1	Egress travel distances as calculated compliant (y/n)
Oxygen tank compound	16m (path A → B as indicated within Figure 2)	20m	Yes
Valve enclosure	5m (path C → D as indicated within Figure 2)	20m	Yes

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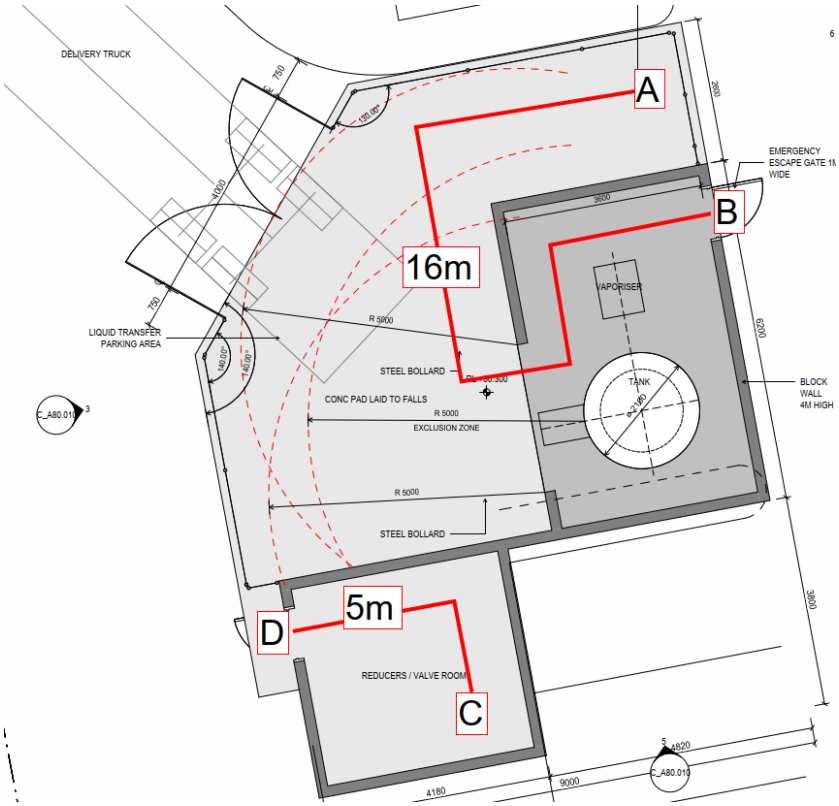


Figure 2: Calculated maximum egress travel distances

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4 Foamed plastic and combustible insulation materials

If foamed plastics building materials or combustible insulating materials form part of a wall or ceiling system, the completed system shall achieve a Group Number that is equal or less than 3, and the foamed plastics shall comply with the flame propagation criteria as specified in Subsection 8.5.7 of the Building Product Specifications for the material being used.

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5 External Spread of Fire

External walls are not required to be fire rated for compliance with C/AS1 given the building is remote from relevant boundaries, i.e. greater than 1m. Note that additional fire rated construction as specified by the Health and Safety at Work (Hazardous Substances) Regulations 2017 report and as summarised within section 2.

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6 Prevention of Fire Occurring

Electrical installations in the building shall comply with Building Code clause G9 Electricity.

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Expedite Project
Southern Cross North Harbour - Oxygen Tank Structure

Typical fire-stopping for services through a rigid fire-rated wall. Each service is proposed in a separate core hole. Dimensions below are from the supplied coordination note and must be checked against actual outside diameters.

Service	Proposed core	Typical treatment / confirmation needed
Cable - 10 mm	30 mm	Protecta FR Acrylic, FC113 candidate. 25 mm seal depth over minimum 48 mm of 35 kg/m3 mineral wool. Single cable <=21 mm OD; wall >=150 mm and density >=650 kg/m3. Confirm aperture classification and exposure direction against required FRR.
Gas pipe - 50 mm	70 mm	System selection pending pipe material and required fire rating. At 50 mm actual OD, this core gives a 10 mm radial gap. FC404 requires less than 10 mm; resolve before approval. FC117 is supplied as an alternative reference only.
Hose - 20 mm	25 mm	Confirm hose material and select an assessed system. FC404 does not cover an unidentified flexible hose. No approved treatment is assigned.

Key installation notes

1. Use the selected system exactly as approved, including backing, seal depth and treatment on each required face.
2. FC404 requires 30 mm minimum between **finished seals**; 30 mm between services alone may be insufficient. Verify spacing for all selected systems.
3. Check wall, services and openings before work. Photograph installation and record each penetration for QA, as-builts and PS3.

Before PS1 issue

Confirm site address, wall construction/thickness and required fire rating; identify the gas pipe and hose; resolve the gas-pipe gap and final system selections. The appointed PS1 author must approve the details and issue the signed PS1.

Status: For design review. Not for council lodgement or construction until the above items are resolved. This summary is not a signed PS1.

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Protecta FR Acrylic
Single Electrical Cable up to 21mm diam in 150mm Concrete Wall

warringtonfire
FAS 190390 Page 17, 8
AS1530.4-2014 AS4072.1-2005

System/FPA Register ID# FC113

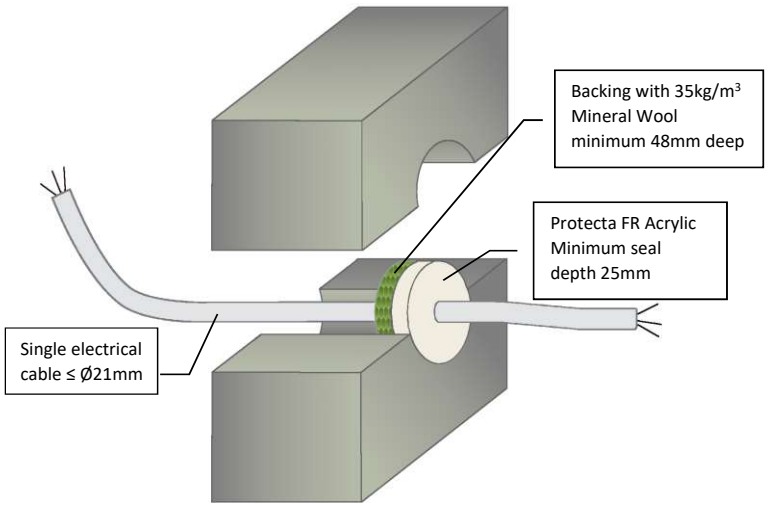
Products	Protecta FR Acrylic Mineral Wool
Application	Fire stopping of cables in rigid walls
Construction	Minimum wall thickness of 150mm and comprise concrete, aerated concrete or masonry, with a density of ≥ 650 kg/m³

Fire & Sound Classification

Maximum aperture 300x300mm	FRR -/240/60
Maximum aperture Ø87mm	FRR -/240/90
Maximum aperture 35x35mm	FRR -/240/120
ZERO smoke leakage up to 200Pa	
Sound reduction (seal only)	STC 62

Installation Instructions

1. Before installing Protecta® FR Acrylic ensure that the surface of all service penetrations and surrounding construction is free from all loose contaminants, dust and grease.
2. Where Protecta® FR Acrylic is to be installed against surfaces that cannot tolerate direct contact; appropriate surface preparation should be made (contact Polyseam for guidance in these cases). For paints sensitive to sealing compounds, priming with a PVA primer is recommended.
3. When installing any backing material, cut this slightly oversize and insert into the gap ensuring a tight friction fit. Ensure correct depth is achieved.
4. Fill the gap or joint with Protecta® FR Acrylic to the required depth.
5. Apply the sealant generously to prevent air bubbles. Finish the bead with a moist spatula, pallet knife or brush.
6. Protecta® FR Acrylic can be over-painted with most emulsion or alkyd (gloss) paints.



ETA 21-0035 FAS 190390 AS1530.4-2014 AS4072.1-2005

Protecta®
Polyseam Ltd, 15 St Andrews Road, Huddersfield, West Yorkshire, HD1 6SB
Tel: +44 (0) 148 4421036
Email:

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For all technical details on the products specified please refer to the technical data sheets that can be found on www.firestopcentre.co.nz

Signed and approved:

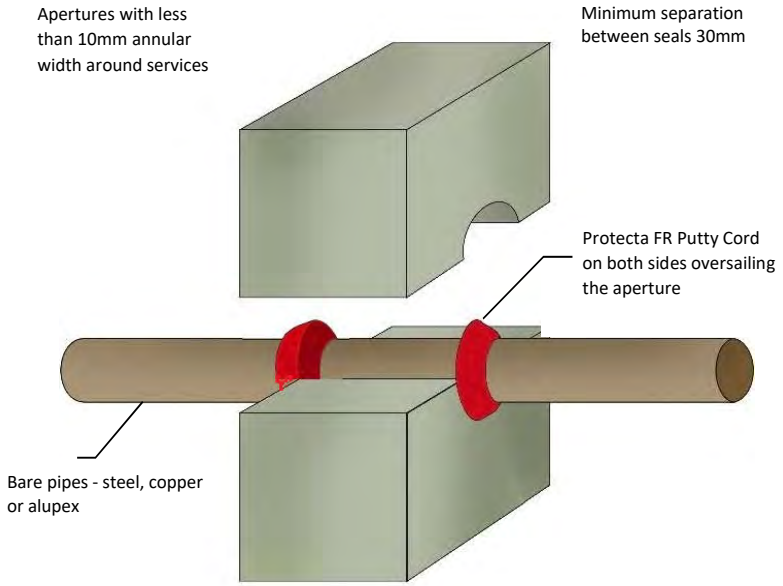
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Protecta FR Putty Cord - Concrete Wall Bare Pipe

Installation Instructions

11. **Preparation:** Before installing Protecta® FR Putty Cord, ensure the surface of all service penetrations and surrounding construction is wiped clean, dry, and free from loose contaminants, dust, oils, and grease.
22. **Positioning:** Place the Putty Cord around the services so that it seals the services to the wall completely.
23. **Sealing:** Press the Putty Cord into the wall and services with your thumbs to form a fillet or V-shaped joint, ensuring good contact all the way around. Required cone size: 15mm x 15mm
4. **Compatible Services:** Pipes may be Steel, Copper or Alupex (PEX-AL-PEX). Note that copper and alupex systems are AS1530 compliant only for closed systems.



UL Technical Assessment Report
No. 4791111748-1 Page 16
AS1530.4-2014 AS4072.1-2005

System FC404

Products	Protecta FR Putty Cord
Application	Fire stopping of bare pipes in rigid walls
Construction	Minimum wall thickness of 100mm

Fire & Sound Classification

Steel up to 22mm	FRR -/120/120
Steel 23-30mm	FRR -/120/45
Steel 30-324mm	FRR -/90/-
Copper 6mm	FRR -/120/120*
Copper 7-12mm	FRR -/120/60*
Copper 12-54mm	FRR -/90/-*
Alupex 16mm	FRR -/120/120*
Alupex 17-20mm	FRR -/120/60*
Alupex 20-75mm	FRR -/90/90*

* Closed systems only

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Signed and approved:

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Protecta FR Acrylic - Concrete Wall - Metal Pipe
Continuous Insulation Interrupted

warringtonfire
FAS 190390 Page 26, 49, 50, 8
AS1530.4-2014 AS4072.1-2005

System/FPA Register ID# FC117

Products Protecta FR Acrylic
Stone wool

Application Fire stopping of metal and alupex pipes in rigid walls

Construction Minimum wall thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a density of ≥ 650 kg/m³

Fire & Sound classification

See table for FRR ratings and aperture sizes

Wall thickness may be reduced to a minimum of 100mm with FRR of system reduced to FRR of the wall.

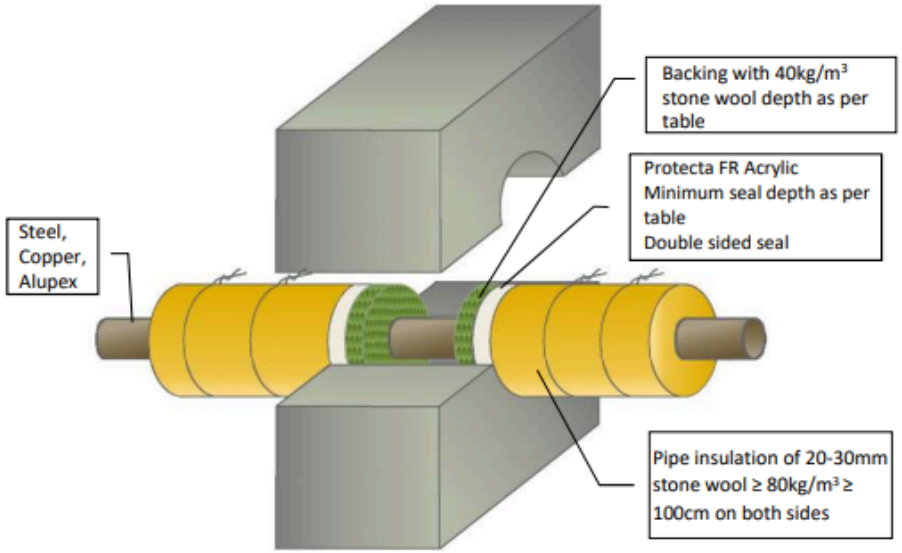
All systems shown may be applied to bare pipes with the Insulation rating reduced to zero

ZERO smoke leakage up to 200Pa

Sound reduction (seal only) STC 62

Installation Instructions

1. Before installing Protecta® FR Acrylic ensure that the surface of all service penetrations and surrounding construction is free from all loose contaminants, dust and grease.
2. Where Protecta® FR Acrylic is to be installed against surfaces that cannot tolerate direct contact; appropriate surface preparation should be made (contact Polyseam for guidance in these cases). For paints sensitive to sealing compounds, priming with a PVA primer is recommended.
3. As Protecta® FR Acrylic is water based, in cases where corrosion protection is a problem; some metals may require a barrier between the sealant and the metal surface prior to this installation.
4. When installing any backing material, cut this slightly oversize and insert into the gap ensuring a tight friction fit. Ensure correct depth is achieved.
5. Fill the gap or joint with Protecta® FR Acrylic to the required depth.
6. Apply the sealant generously to prevent air bubbles. Finish the bead with a moist spatula, pallet knife or brush.
7. Protecta® FR Acrylic can be over-painted with most emulsion or alkyd (gloss) paints.



Services	Aperture	Sealant	Backing	Classification
≤ Ø40mm Steel	300x300mm	15mm	20mm	FRR -/240/240
≤ Ø219mm Steel	300x300mm	15mm	30mm	FRR -/240/120
≤ Ø54mm Steel	300x300mm	12.5mm	12.5mm	FRR -/120/120
≤ Ø54mm Copper	300x300mm	12.5mm	12.5mm	FRR -/120/120
≤ Ø75mm Alupex	300x300mm	12.5mm	12.5mm	FRR -/120/120

ETA 21-0035 FAS 190390 AS1530.4-2014 AS4072.1-2005

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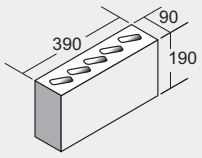
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+Hollow masonry

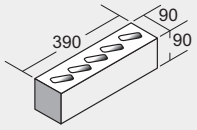
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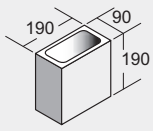
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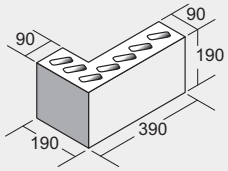
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H10.01
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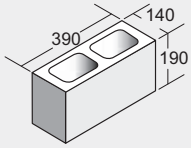


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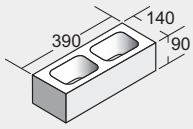


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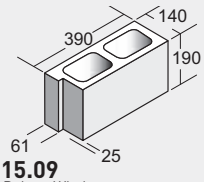
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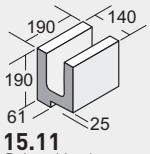
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Plain End Standard



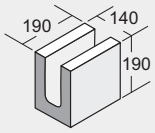
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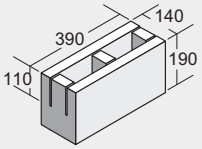
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Rebate Whole



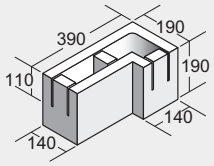
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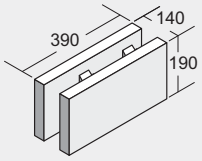
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Lintel and Half End-Closer



15.14
Knock-In Bond Beam

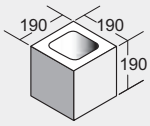


15.15
Right Hand Corner Bond Beam
(left hand also available)

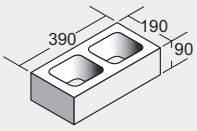


15.16
Open End Bond Beam
Depressed Web

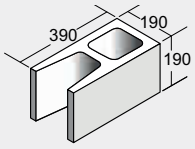
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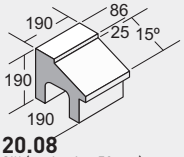
20.02
Half



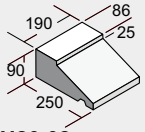
H20.04
Plain End Half High



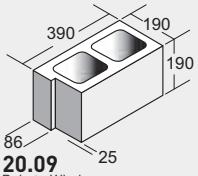
20.05
Open End



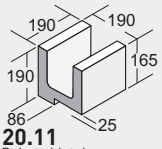
20.08
Sill (projecting 50mm)
(flush available in Auckland only)



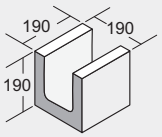
H20.08
Sill (projecting)



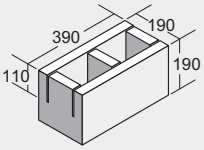
20.09
Rebate Whole



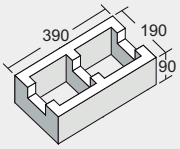
20.11
Rebate Lintel



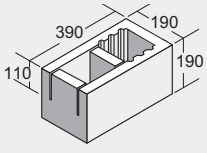
20.12
Lintel and Half End-Closer



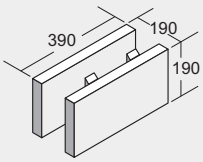
20.14
Knock-In Bond Beam



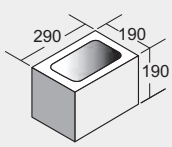
H20.14
Half High Bond Beam
(Available in Auckland only)



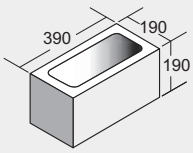
20.15
Corner Bond Beam



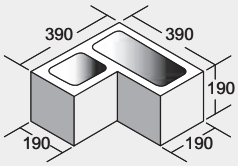
20.16
Open End Bond Beam
Depressed Web



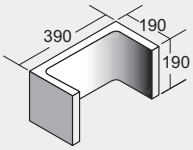
20.19
Three Quarter



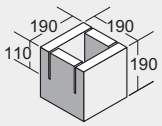
20.30
Standard Column



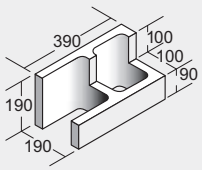
20.33
Pier
(available North island only)



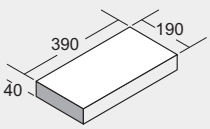
20.34
Pilaster 'C' Type



20.44
Knock-In Half Bond Beam
(available North island only)

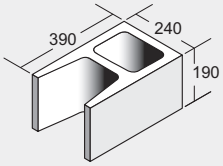


20.45
Header

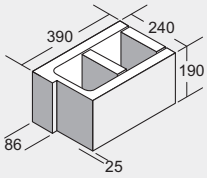


05.17
Capping

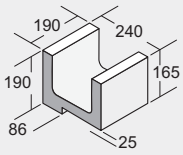
25 SERIES



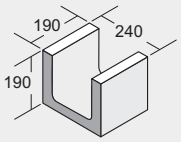
25.05
Open End and Plain End



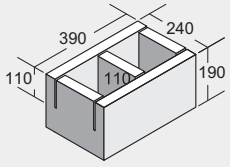
25.09 (North Island only)
Rebate Whole



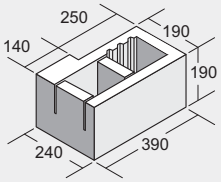
25.11 (North Island only)
Rebate Half



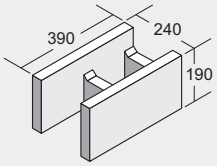
25.12
Lintel and Half-End Closer



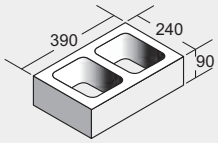
25.14
Knock-in Bond Beam



25.15
Left Hand Corner Bond Beam
(right hand also available)



25.16
Open End Bond Beam
Depressed Web



H25.04
Half High

USEFUL ESTIMATING DATA FOR HOLLOW MASONRY

BLOCKFILL VOLUME

15 SERIES	20 SERIES	25 SERIES
165 BLOCKS/M3	125 BLOCKS/M3	85 BLOCKS/M3

UNITS PER SQUARE METRE

10 SERIES	15 SERIES	20 SERIES	25 SERIES
12.5 UNITS			

Half High

10 SERIES	15 SERIES	20 SERIES	25 SERIES
25 UNITS			

HONING - Firth Masonry is manufactured across New Zealand, therefore variations regionally in colour and texture should be expected, please contact Firth for a local sample. To achieve consistent colour tone variation when laying, blending from multiple pallets is recommended. If honing natural grey masonry, there may be medium to extreme degrees of colour and exposed texture variation between blocks, which will appear throughout the finished wall.

FIRTH RECOMMENDS DRICON® TRADE MORTAR®

Dricon® Trade Mortar® is a combination of clean, graded sand; cement and plasterciser proportioned to give an ideal mortar for all types of masonry, brick and stonework. Dricon® Trade Mortar® is designed to meet NZS 4210:2001 compressive strength of 12.5 MPa after 28 days, guaranteeing the user a consistent mortar time after time. Dricon® Trade Mortar® is available in various colours and is packed in water resistant 30kg bags designed for convenience and easy handling. Dricon® Architectural Mortar is recommended for Architectural Masonry.



MORTAR MIX SPECIFICATIONS

Dricon® bagged mortar is recommended for quality control to ensure compliance with the code. Refer to the 'Concepts Designer Brick and Architectural Masonry' brochure for available colours. NZS4210 provides a guideline on site mortar mixes for various durability zones 1 & 4 (NZ 3604), NZS4210 recommends 3 parts by volume of correctly graded mortar sand; 1 part by volume of cement; 1/4 part by volume of hydrated lime or suitable plasticiser to manufacturers specifications. Approximately 750 standard block unit's may be laid with 1 cubic metre of mortar. The minimum requirement for Firth masonry is 12.5 Mpa. The volume of water, additives and mixing time, all need to be consistent to achieve a quality mortar of an even colour. See NZS4210 for full details and recommendations on other zones.

Firth Disclaimer: While every care has been taken to achieve an accurate representation, for best results compare or view actual product before purchasing. To ensure colour consistency we recommend purchasing products from one location. Expect colour variations when honing standard grey masonry. Concrete products may also display a "whitening" otherwise known as efflorescence. For further information about efflorescence please refer to the CCANZ information bulletin IB44.



CONCRETE & MASONRY PRODUCTS: A SUSTAINABLE BUILDING OPTION & SOLUTION

- Manufacturing plants operating in compliance with relevant legislation
- All products manufactured according to ISO9001
- Strong focus on reducing transport impacts
- Masonry products manufactured according to Lean principles
- Greenstar and environmental product options available
- Environmental Management Plans operative at all sites
- Effective acoustic barrier and fire resistant
- Longer and effective building life
- Demolished concrete can be recycled, reused or as clean ll
- Passive solar heated thermal mass provides energy eciencies
- Highly durable, low maintenance
- Rainwater and process water reused in most products

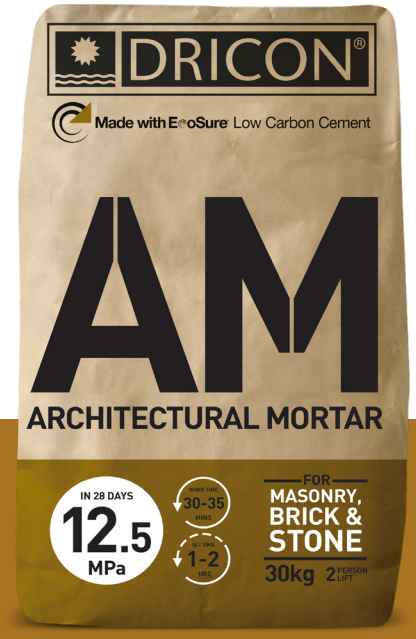
Firth Disclaimer: While every care has been taken to achieve an accurate representation, for best results compare or view actual product before purchasing. To ensure colour consistency we recommend purchasing products from one location. Expect colour variations when honing standard grey masonry. Concrete products may also display a "whitening" otherwise known as efflorescence. For further information about efflorescence please refer to the CCANZ information bulletin IB44.

0800 FIRTH 1 (347841)
FIRTH.CO.NZ

PRODUCTSPEC
productspec.net

masterspec
masterspec.net

Telarc. Integrated Systems Certification
ISO 9001
ISO 14001
ISO 45001



ARCHITECTURAL MORTAR®

FOR MASONRY, BRICK & STONE

WORK TIME **30-35** MINS

SET TIME **1-2** HRS

IN 28 DAYS **12.5** MPa

AVAILABLE SIZE: 30KG

YIELD PER 30KG BAG

VOLUME

0.016m³

This table has been calculated on the brick size as stated and should be used as a guide only.

AM BLOCKS 230 X 90 X 76mm	BLOCKS 20 SERIES 390 X 190 X 190mm
33-38	**21-26**

Dricon® Architectural Mortar is specially designed for use with water resistant blocks and brick veneers. It consists of a uniformly blended mixture of graded sands, EcoSure Low Carbon Cement, coloured oxides and specialised admixtures for a high level of workability and water resistance. Endorsed by the Brick and Blocklayers Federation and complies with NZS 4210:2001 for Masonry Construction. Dricon® Architectural Mortar comes in a small range of colours making it easy to match your brick selection. It can also be further enhanced by using Dricon® Concrete Treatment.

ENDORSED BY

Master Brick & Blocklayers

COMPRESSIVE STRENGTH

12.5MPa after 28 days.

WATER CONTENT

4.2 - 4.8 litres per bag

EQUIPMENT

Architectural Mortar is designed to be mixed in a concrete mixer and applied with a mason's trowel.

JUST ADD WATER

Pour 4.2 to 4.8 litres of water into the mixer then slowly add the bag of Architectural Mortar (water quantities will vary according to seasonal conditions and outside temperature, however, ensure that the water ratio for the given job at hand remains constant from bag to bag).

MIXING

Allow 5-6 minutes of mixing time to get the correct Architectural Mortar consistency.

TOPPING UP

It may be necessary to add small quantities of water to bring the mix up to its final desired level of workability.

TEST YOUR MIX

To test, scoop Architectural Mortar onto trowel, tap the bottom of trowel on hard surface then turn upside down. The Architectural Mortar should stick to the trowel.

LAYING

The board life of Architectural Mortar under normal weather conditions is on average 30-35 minutes. Architectural Mortar meets NZS 4210:2001 Masonry Construction Standard of 12.5MPa after 28 days.

ARCHITECTURAL MORTAR

DRICON® TECHNICAL DATA SHEET

ISO 9001
ISO 14001
ISO 45001

COLOURS



IMPORTANT VARIATION NOTICE

Mixing time, the amount of water used and tooling time will affect the final colour result. To ensure a uniform colour finish, Dricon® strongly recommend you purchase Coloured Trade Mortar from one location and from the same batch, as colour variations will occur due to the natural variance in raw materials. While every care has been taken to ensure an accurate representation, the colours shown here are subject to the limitations of the colour printing process.

PRODUCT INFORMATION

PACKAGING	Paper bag
SIZE	30kg
SHELF LIFE	12 Months from date of production
STORAGE	Keep in dry location free of moisture
COLOUR	Multiple colours available refer to our website
GRAIN SIZE	Up to 2.5mm
WATER DEMAND PER KG	0.14 to 0.16 litres
WET DENSITY	Approximately 1750 kg/m^3
WORK TIME	30-35 minutes
INITIAL SET TIME	1-2 hours
APPLICATION THICKNESS	No less than 5mm
APPLICATION TEMPERATURE	5 to 30°C
COMPRESSIVE STRENGTH 7 DAY	> 8 MPa
COMPRESSIVE STRENGTH 28 DAY	> 12.5 MPa
SAFETY INFORMATION	Refer to the Safety Data Sheet on our website

GENERAL INFORMATION

If only part of the bag is required, mix the entire contents of the bag together first in a dry state, return the unwanted portion to the bag or alternatively a dry sealed container, then follow the instructions.

All mortars and concrete products may exhibit a temporary 'whitening', otherwise known as efflorescence which neither affects strength nor durability.