
Volume 3 of 3
Appendix E, F, G and H

Remediation Action Plan

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

Prepared for ESR Australia

Project 219609.01

12 December 2024

Appendix E

Site Photographs Extracted from DP (2024)



Photo 1: Administration Building and Ramp Down to Car Parking Area



Photo 2: Office and Visitor Car Parking at Main Site Entrance (Looking East)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	1
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 3: Car Parking Area and Retaining Wall Along Western Site Boundary (Looking South)

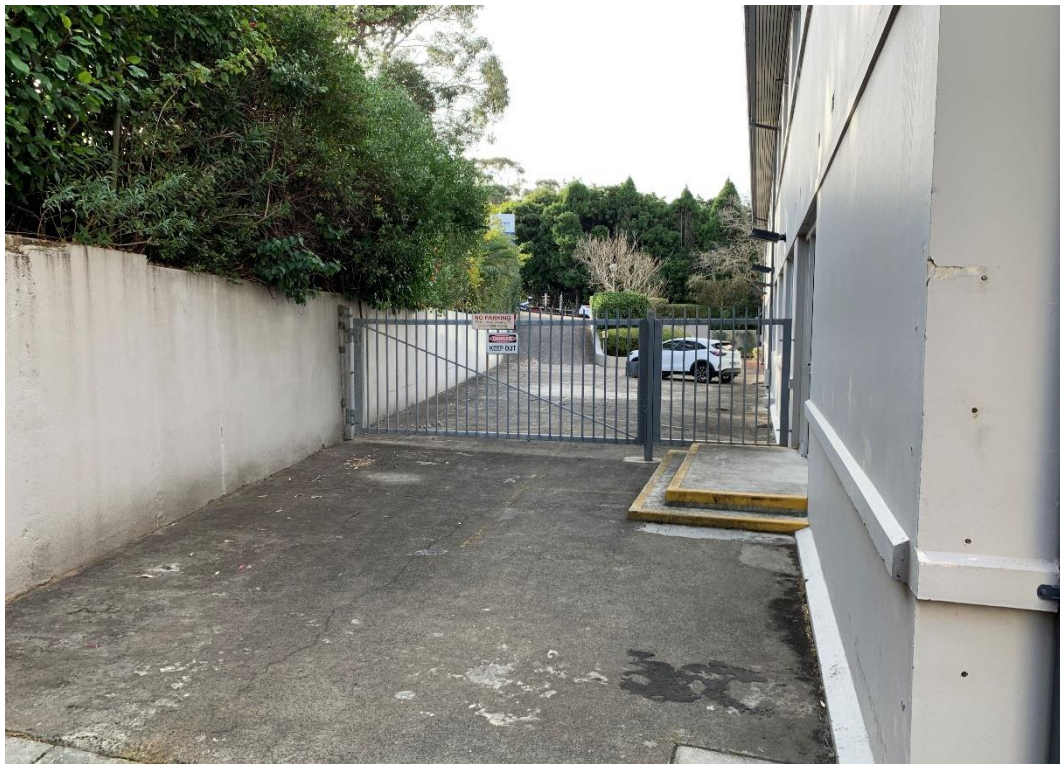


Photo 4: Car Parking Area and Retaining Wall Along Western Site Boundary (Looking North)



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 2

REV: 0



Photo 5: Waste Storage and Laboratory Sample Storage Area



Photo 6: Former Substation Area



Photo 7: Waste Storage, Former Substation, Resin Plant and Western AST Farm



Photo 8: Looking East Through Centre of Site with Offices and Laboratories on the Right and Alkyd Plant on the Left

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	4
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 9: Western Staff Car Park (Looking West Towards Substations and Stephen Road)



Photo 10: Western Staff Car Park (Looking North-West)



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT:

219609.01

PLATE No:

5

REV:

0



Photo 11: Western Staff Car Park (Looking North-East from Stephen Road)



Photo 12: Access Ramp to Staff Car Park (Looking South-West)



Photo 13: Access Ramp to Staff Car Park (Looking East Along Southern Boundary from Stephen Road)



Photo 14: Looking North with Alkyd Resin Plant on Right and Administration Building on Left



Photo 15: Northern Side Of Alkyd Resin Plant (Looking West Along Northern Boundary)



Photo 16: Alkyd Resin Plant Building - Storage Area at Northern End of Building (Looing West)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	8
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 17: Alkyd Resin Plant Building - Storage Area at Northern End of Building (Looing East)



Photo 18: Alkyd Resin Plant Thinning Room



Photo 19: Alkyd Resin Plant Thinning Room

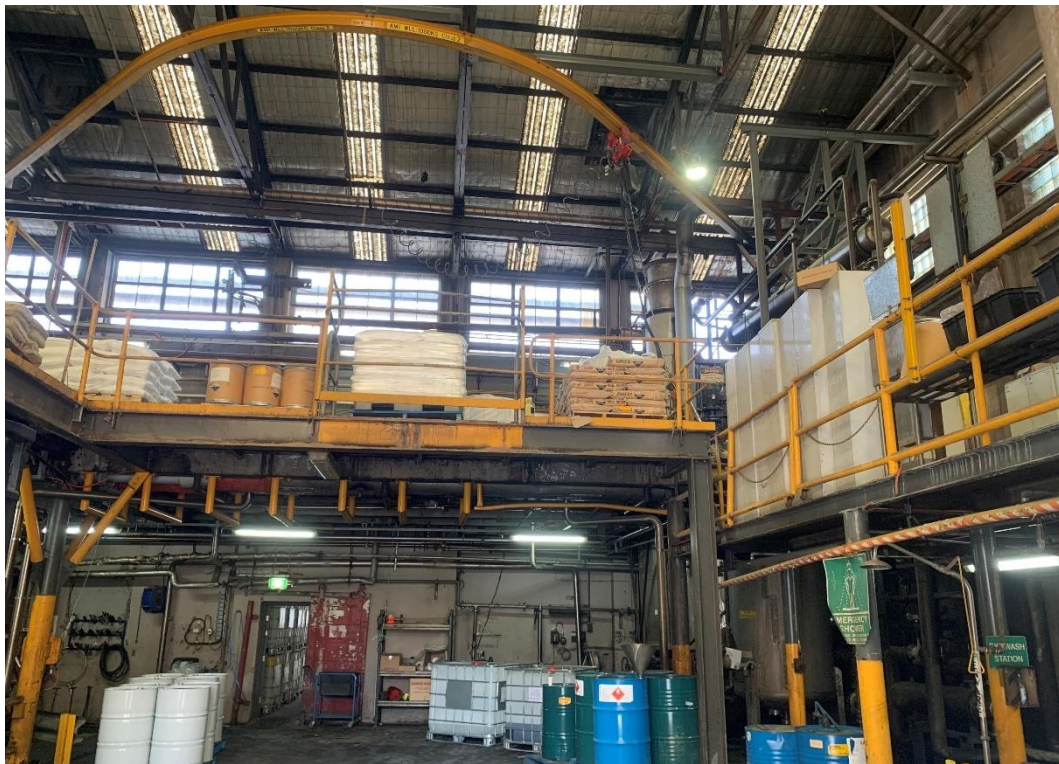


Photo 20: Alkyd Resin Plant Kettle Room

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	10
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 21: Alkyd Resin Plant Production and Storage Area (Looking Sout-West)



Photo 22: Alkyd Resin Plant Production and Storage Area (Looking West)



Photo 23: 6eee



Photo 24: 6eeee



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT:

219609.01

PLATE No:

12

REV:

0



Photo 25: Production Offices



Photo 26: Loading Dock at Western End of Laboratory and Raw Materials Storage Building

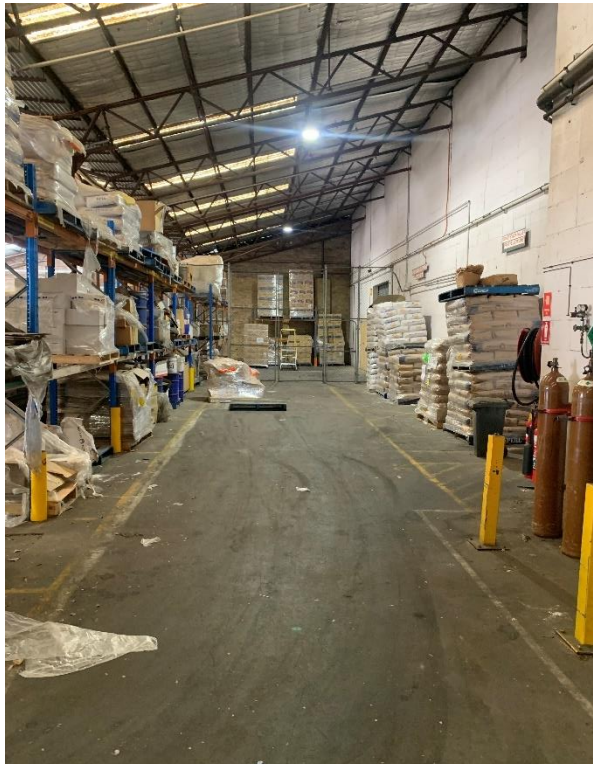


Photo 27: Raw Materials Storage Building (Looking West at BH311)



Photo 28: Raw Storage Building (Looking West)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	14
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 29: Raw Storage Building (Looking East)



Photo 30: Northern UST Farm and Associated Pump Room and Loading Area (Looking West)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	15
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 31: Northern UST Farm (Looking West)



Photo 32: North UST Farm Pump Room Building, Loading Area and Area of Redundant USTs



Photo 33: Northern UST Farm Pump Room



Photo 34: Area of Redundant UST Adjacent to the Northern UST Pump Room



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 17

REV: 0



Photo 35: Area of Redundant UST Adjacent to the Northern UST Pump Room



Photo 36: Area of Redundant UST Adjacent to the Northern UST Pump Room

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	18
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 37: Eastern Side of the Central AST Farm (Looking North Towards BH336)



Photo 38: South Side of the Central AST Farm

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	19
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 39: Emulsions Plant Control Room Building and Northern UST Farm Pump Room



Photo 40: Corridor Between Emulsions Plant Control Room and Production Buildings



Photo 41: Emulsions Plant Building (Looking West)



Photo 42: Emulsions Plant Building (East)



Photo 43: Emulsions Plant Building (East)



Photo 44: Between Emulsions Plant and Storage Buildings (Looking South)



Photo 45: Between Emulsions Plant and Storage Buildings (Looking North)



Photo 46: Entrance to the Western Side of the Emulsions Plant Storage Building

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	23
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 47: Central UST Farm Between Emulsions and Beckamine Plants (Looking East)



Photo 48: Central UST Farm Between Emulsions and Beckamine Plants (Looking East)



Site Photographs

Proposed Industrial Development
49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 24

REV: 0



Photo 49: Beckamine Plant (Looking North-West)



Photo 50: Beckamine Plant (West)



Photo 51: Beckamine Plant (West)



Photo 52: Beckamine Plant (East)



Photo 53: Beckamine Plant (East)

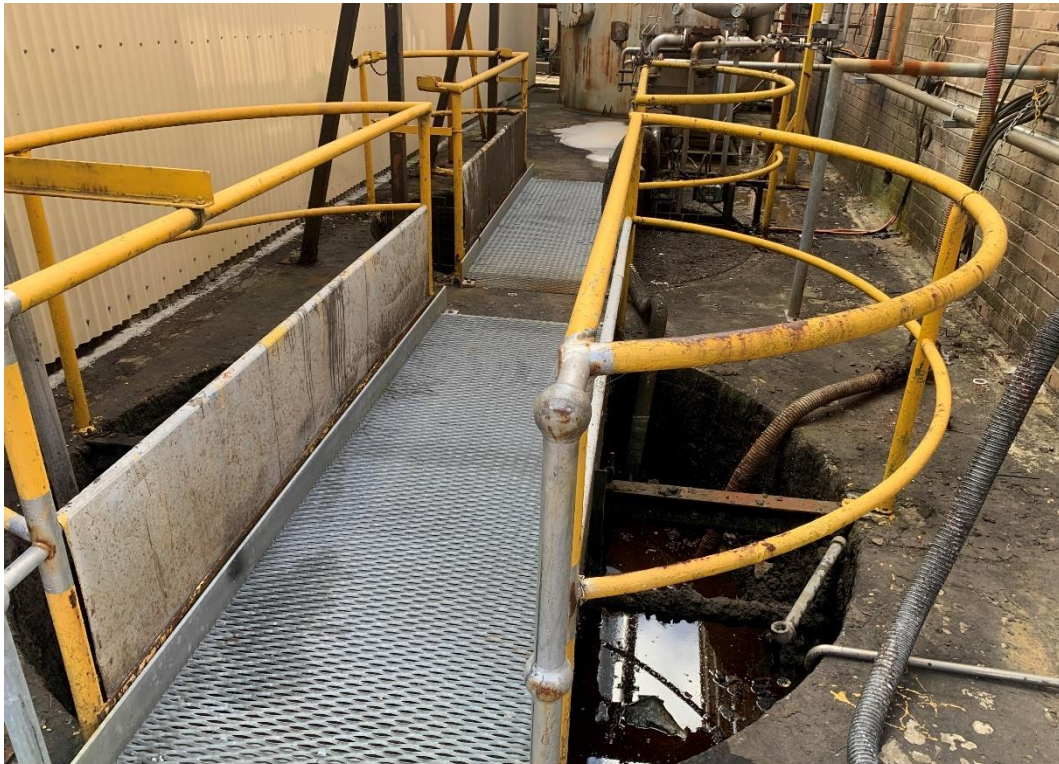


Photo 54: Beckamine Plant Inground Holding Tanks



Photo 55: Brick Building - Storage and Water Plant Room



Photo 56: Brick Building - Storage and Water Plant Room



Photo 57: Cooling Tower In Central Area of Site



Photo 58: Drum Storage Building (East)



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 29

REV: 0



Photo 59: Unsealed Area Between Production Office and Drum Storage Building



Photo 60: Drum Storage Building (West)



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT:

219609.01

PLATE No:

30

REV:

0



Photo 61: Drum Storage Building (South-Western Corner - BH315)



Photo 62: Boundary Remediation System - Wells and Soil Vapour Treatment System (Looking West)



Photo 63: Groundwater Remediation System (Looking North)



Photo 64: Groundwater Remediation System



Photo 65: Boundary Remediation System - Soil Vapour Treatment System



Photo 66: Boundary Remediation System and Southern Boundary (Looking East)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	33
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 67: Northern End of Emulsions Plant Storage Building (Looking South-West)



Photo 68: Poisons and Corrosive Storage Area (west)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	34
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 69: Poisons and Corrosive Storage Area (east)



Photo 70: Emulsions Plant Storage Building (Central Area)



Photo 71: Emulsions Plant Storage Building (Central) Area



Photo 72: Emulsions Plant Storage Building ASTs (Looking East)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	36
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		

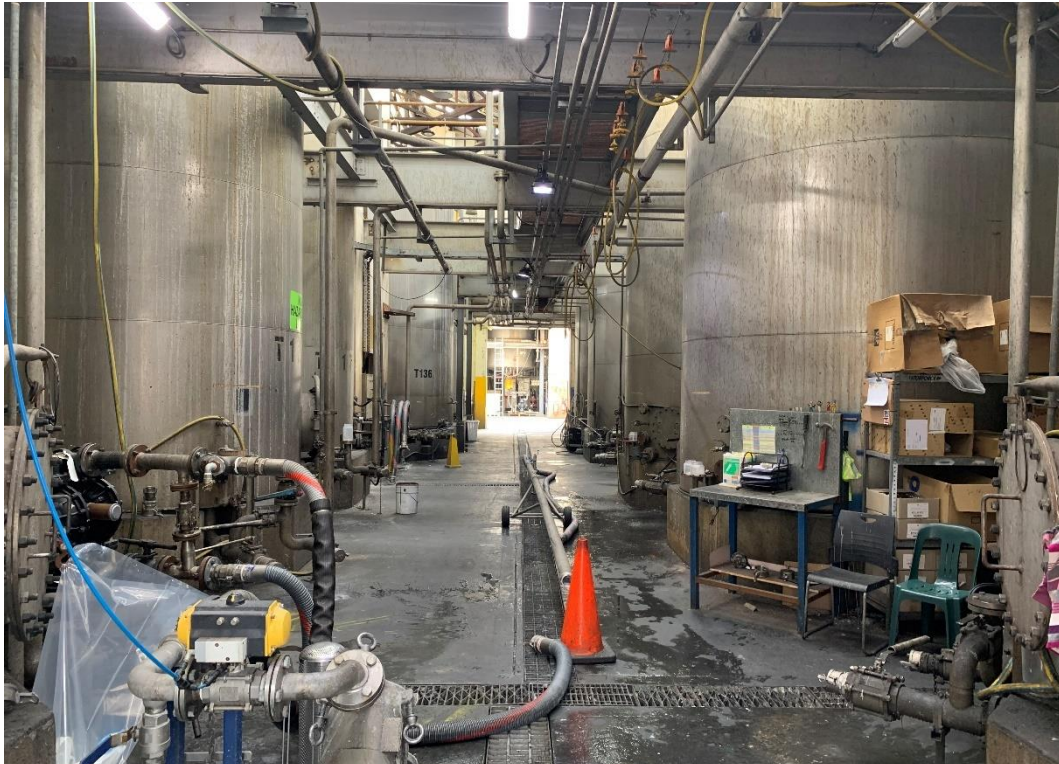


Photo 73: Emulsions Plant Storage Building ASTs (Looking West)



Photo 74: Southern End of Emulsions Plant Storage Building - AST and IBCs



Photo 75: Southern End of Emulsions Plant Storage Building - IBCs



Photo 76: Hard Resin Plant Building - Blending Plant (Looking South-East)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	38
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 77: Hard Resin Plant Building - Blending Plant (West)



Photo 78: Hard Resin Plant Building



Photo 79: Hard Resin Plant Building



Photo 80: Undercover Storage Area South of the Hard Resin Plant



Photo 81: External Storage Area South of the Hard Resin Plant



Photo 82: Hard Resin Plant, Liquid Nitrogen AST, Corrosives Storage Room and Truck Loading Area (Looking West)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	41
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 83: Storage and Truck Loading Area East of the Hard Resin Plant Building



Photo 84: Hard Resin Plant Building Storage Area

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	42
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 85: Hard Resin Plant Building - Soils Excavated from Spill Area Associated with the Nuodex Plant



Photo 86: Corrosives Storage Room (Looking West)



Photo 87: Corrosives Storage Room (Looking East)



Photo 88: Truck Loading and Turning Area (Looking South-East Towards the Coal Pier Road Driveway Entrance)



Photo 89: Truck Loading and Turning Area and External Bunded Storage Area South of Nuodex Plant (Looking East)



Photo 90: Truck Loading Area (Looking North-East Towards Nuodex Plant)



Photo 91: 29a Bunded Fill Point On East Side of Emulsions Plant Storage Building (Looking South)



Photo 92: Looking North Between the Emulsions Plant Storage Building and Engineering Workshop



Site Photographs

Proposed Industrial Development
49-61 Stephen Road, Banksmeadow

CLIENT ESR Australia

PROJECT: 219609.01

PLATE No: 46

REV: 0



Photo 93: Fire Sprinkler and Hydrant Pump Room



Photo 94: Fire Sprinkler and Hydrant Pump Room (Looking East Along Northern Boundary)



Photo 95: Engineering Workshop (Looking South)



Photo 96: Engineering Workshop External Area (Looking East)



Photo 97: Area Between Forklift Maintenance Area and Engineering Workshop (BH320)

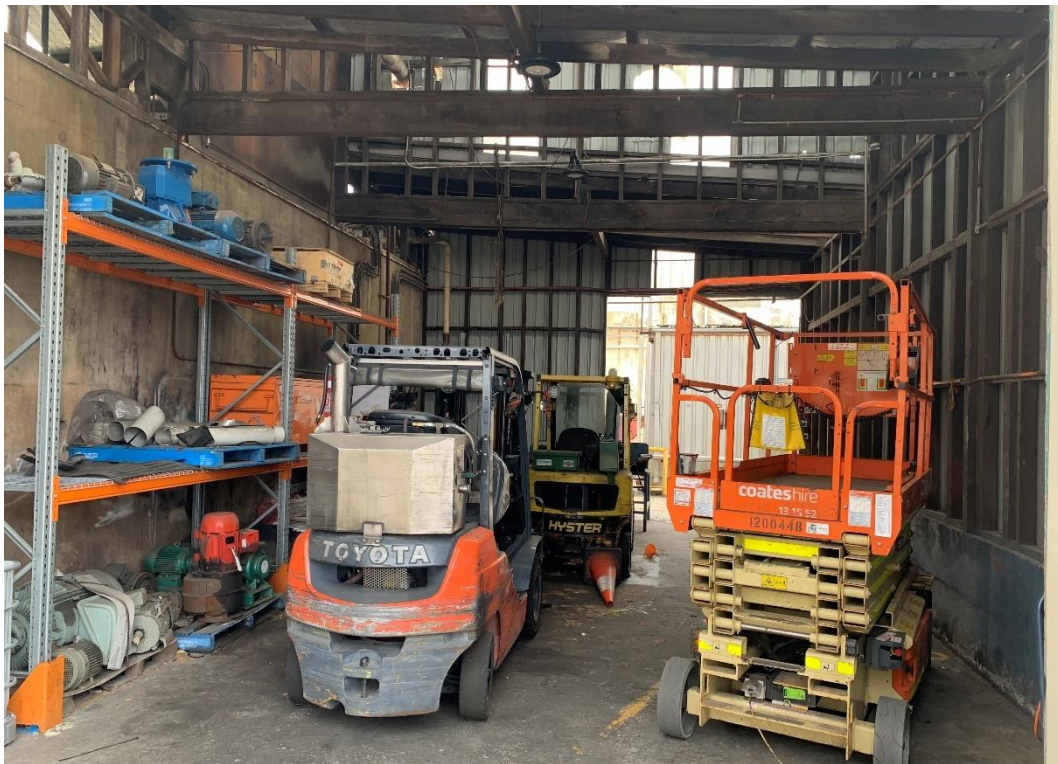


Photo 98: Forklift Maintenance Area

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	49
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 99: Boiler House



Photo 100: North-Eastern Corner of Site and Wastewater Treatment Plant



Photo 101: North-Eastern AST Farm



Photo 102: Storage Area and Eastern Car Park (Looking South-West)



Photo 103: Eastern Staff Car Park (Looking West)



Photo 104: Eastern Staff Car Park and Storage Area (Looking North-West)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	52
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 105: Eastern Storage Area (Looking North-West)



Photo 106: Storage Area East of the Boiler House (Looking East)



Photo 107: Eastern Staff Car Park, Storage and AST Area (Looking North)



Photo 108: North-Eastern Site Boundary (Looking North)



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 54

REV: 0



Photo 109: Looking West Through Centre of the Site from the Nuodex Plant



Photo 110: Nuodex Plant (East)



Photo 111: Nuodex Plant (West)



Photo 112: South-Eastes (Nuodex Plant) AST Farm (Looking East)



Photo 113: South-East (Nuodex Plant) AST Farm (Looking West)



Photo 114: Grassed Area to the South-East of the Nuodex Plant (near BH328 and JBMW06)



Photo 115: Nuodex Plant Spill Area Barricaded Off (Looking West)



Photo 116: Nuodex Plant Spill Area Initial Excavation - Eastern Grass Area

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	58
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 117: Nuodex Plant Spill Area Backfilled and Covered with Plastic and Gravel



Photo 118: Eastern Grassed Area (Looking North)



Photo 119: Eastern Grassed Area (Looking South-East)



Photo 120: Eastern Grass Area and North-Eastern Site Boundary (Looking East Towards Access Gate for Stormwater Pits)



Photo 121: Vacant Fenced Area Off Eastern Access Driveway (Looking East)



Photo 122: Vacant Fenced Area Off Eastern Access Driveway (Looking South)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	61
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 123: Eastern Access Driveway Off Coal Pier Road (Looking East)



Photo 124: Stormwater Interception Pit, Disposal Point and Overflow Basin



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 62

REV: 0



Photo 125: Stormwater First Flush Pit Overflow Basin (Looking South-East)



Photo 126: Eastern Site Boundary Looking From Coal Pier Road



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT: 219609.01

PLATE No: 63

REV: 0



Photo 127: Adjacent Industrial Properties to the East (Looking North-East Towards Coal Pier Road)



Photo 128: Adjacent Industrial Properties to the East (Looking East South-East Towards Coal Pier Road)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	64
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		



Photo 129: Adjacent Industrial Property to the South (Looking East from Stephen Road)

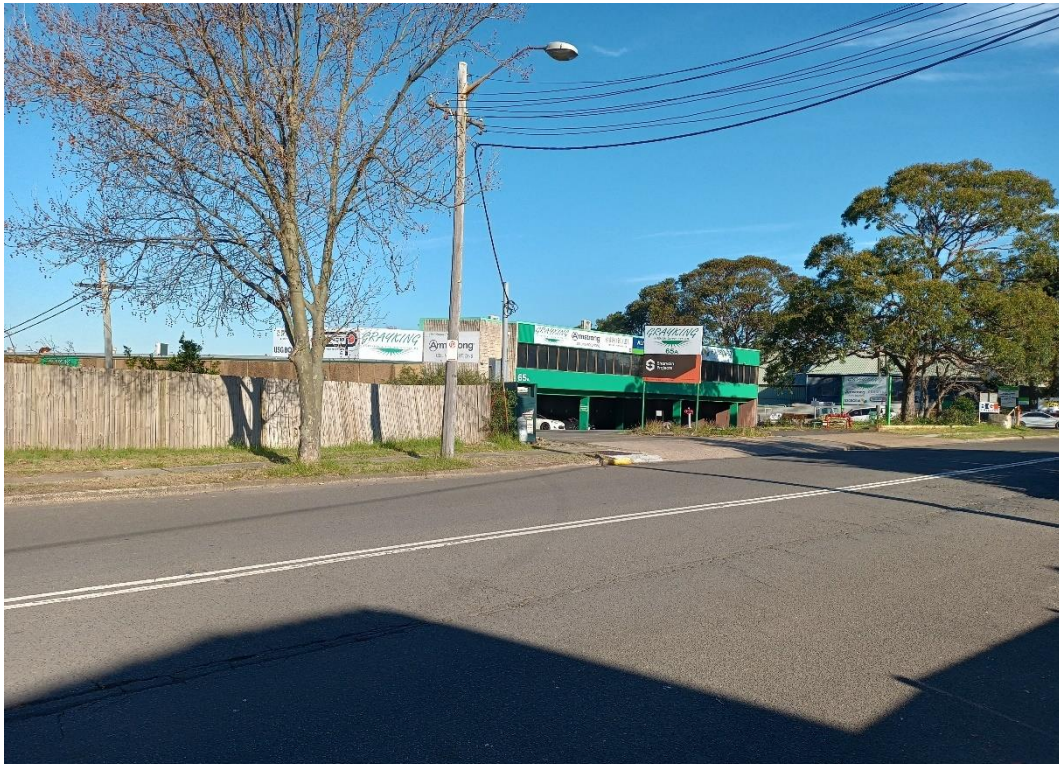


Photo 130: Industrial Properties to the South



Site Photographs

Proposed Industrial Development

49-61 Stephen Road, Banksmeadow

CLIENT

ESR Australia

PROJECT:

219609.01

PLATE No:

65

REV:

0



Photo 131: Western Site Boundary and Stephen Road (Looking North)



Photo 132: Main Site Entrance Off Stephen Road



Photo 133: Stephen Road with Adjacent Industrial Property on the Right and Residential Properties on Left (Looking North)

	Site Photographs		PROJECT:	219609.01
	Proposed Industrial Development		PLATE No:	67
	49-61 Stephen Road, Banksmeadow		REV:	0
	CLIENT	ESR Australia		

Appendix F

Example Geotextiles

MASTATEX™ Orange

Warning Layer Geotextile

Technical Specifications



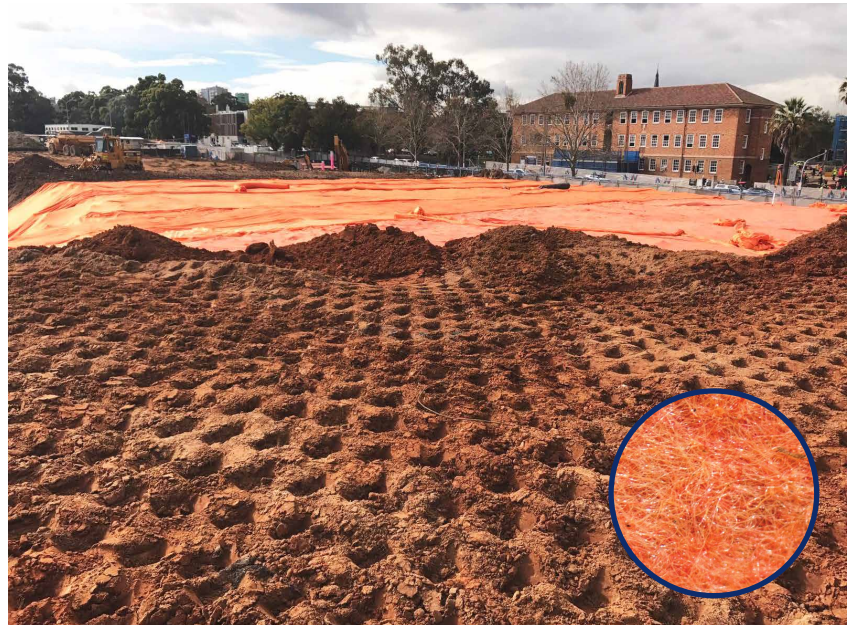
GEO MASTA™

DESCRIPTION

mastaTEX[™] GFO is a high quality staple fiber geotextile, designed for separating contaminated and non-contaminated soils. Due to its bright Orange coloring, mastaTEX[™] GFO is most commonly used as a warning layer in areas liable to future excavations. mastaTEX[™] GFO provides the same performance as other geotextiles in the mastaTEX[™] range.

APPLICATIONS

- ✓ Segregation of contaminated soil
- ✓ Filtration
- ✓ Warning Layer



SPECIFICATIONS

	TEST METHOD	UNIT	VALUES
INDEX PROPERTIES			
Material			Polyester (PET)
Grab Tensile Strength	AS 3706.2B	N	500
Wide Strip Tensile Strength	AS3706.2A	kN/m	8.1
Mass	AS 3760.1	gsm	140
TYPICAL HYDRAULIC PROPERTIES MEAN			
Pore Size	AS 3706.7	µm (Microns)	120
Nominal Flow Rate	AS 3706.9	l/m ² /s	240
DIMENSIONS			
Width		m	6
Length		m	150
Roll Diameter		m	400

DISCLAIMER - The information presented in this document is to the best of our knowledge accurate. This content does not take into account the particular environment and conditions that may be present at your site. Specific site conditions vary and may alter the performance and durability of this product and in exceptional case make it absolutely unsuitable. we cannot accept liability for the in-situ performance, loss or damage from the use of the information presented in this document. If your project or job demands accuracy to a certain degree of tolerance, you are responsible to advise us before ordering the product. We then can appropriately inform you whether or not the product will meet your needs and required tolerances. This information should only be used a guide only and in all cases we recommend that you consult a qualified engineer before proceeding in the install of the product. © Copyright GEOmasta[®] Ltd & Jaybro. All rights reserved. We reserve the right to change the product specifications at any time.

SYDNEY

29 Penelope Crescent
Arndell Park NSW 2148

MELBOURNE

27 Tullamarine Park Road
Tullamarine VIC 3043

MELBOURNE EAST

Factory 3, 1364 Heatherton Road
Dandenong VIC 3175

BRISBANE

71 Lavarack Avenue
Eagle Farm QLD 4009

CANBERRA

3 Daly Street,
Queanbeyan West NSW 2620

NEWCASTLE

100 Glenwood Drive
Thornton NSW 2322

COFFS HARBOUR

Unit 5, 22 Isles Drive
Coffs Harbour NSW 2450

ADELAIDE

391 Churchill Road,
Kilburn SA 5084

PERTH

Unit 1/94 Beringarra Avenue,
Malaga WA 6090

AUCKLAND (NZ)

Unit 2, 25 Allright Place,
Mount Wellington Auckland 1060

UNDERSTANDING AUSTRALIAN GEOTEXTILE STANDARDS

NSW

**ROADS & MARITIME SERVICES (RMS)
QA SPECIFICATION R63 GEOTEXTILES
(SEPARATION AND FILTRATION)**
May 2013 Edition 4 / Revision 0

RMS R63 is the NSW Main Roads specification documentation to which all Geotextile products are to be tested and approved before use on road and bridgeworks.

Clause 2 Material Requirements specifies the minimum requirements for the raw material quality, manufacturing processes, product testing & certification.

Clause 3 Storage, Packaging, Identification and Delivery specifies the method in which the product must be packaged, stored, marked and delivered.

Clause 4 Construction Requirements covers general site preparation, installation and site requirements.

Jaybro Geosynthetics recommend the client read and understand Clause 4 and all subsequent annexures prior to installation.

QLD

**TRANSPORT AND MAIN ROADS (TMR) MRTS27
GEOTEXTILES SEPARATION AND FILTRATION**
June 2009

Clause 6 Material Requirements specifies the minimum requirements for the raw material quality, manufacturing processes, product testing & certification.

Clause 7 Storage, Packaging and Identification specifies the method in which the product must be packaged, stored and marked.

Clause 8 Delivery and Product Compliance covers requirements for ordering and delivery of geotextiles.

Clause 9 Construction Requirements covers general site preparation, installation and site requirements.

Clause 10 Acceptance criteria details the requirements by the contractor for onsite testing and sampling.

Jaybro Geosynthetics recommend the client read and understand MRTS27 prior to installation.

VIC

VICROADS 210 – GEOTEXTILES IN EARTHWORKS
December 2014

This section covers the requirements for the supply, handling and placing of geotextiles as listed below or used as a separation layer, or as a separation and filtration layer, in earthworks at locations shown on the drawings or specified.

210.03 Properties of Geotextiles. General; specifies material properties and manufacturing process.

Robustness; outlines how the geotextiles are to be classified according to the G Rating

Equivalent Opening Size; specifies pore size for use as a filtration material

UV Radiation Stabilisation; The geotextile shall be stabilised against deterioration due to ultra-violet radiation such that when tested in accordance with AS 3706.11 Standard

Testing; All testing shall be performed by laboratories with third party accreditation to ISO/IEC 17025 by a signatory to the International Laboratories Accreditation Cooperation (ILAC) scheme, e.g. by NATA (National Association of Testing Authorities, Australia)

Jaybro Geosynthetics recommend the client read and understand VR210.04 and all subsequent annexures prior to installation



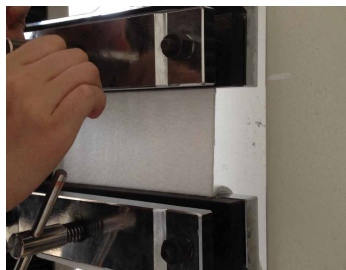
WHAT IS NATA?

National Association of Testing Authorities is the authority responsible for the accreditation of laboratories, inspection bodies, calibration services, producers of certified reference materials and proficiency testing scheme providers throughout Australia. It is also Australia's compliance monitoring authority for the OECD Principles of GLP. All State Standards specify geotextile testing must be completed by a NATA accredited laboratory.

TEST METHODS



AS 3706.1
MASS & THICKNESS



AS 3706.2A
WIDE STRIP TENSILE STRENGTH



AS 3706.2B
GRAB TENSILE STRENGTH



AS 3706.9
PERMITTIVITY



AS 3706.7
PORE SIZE



AS 3706.3
TRAPEZOIDAL TEAR STRENGTH



AS 3706.4
CBR BURST STRENGTH

SYDNEY

29 Penelope Crescent
Arndell Park NSW 2148

MELBOURNE

27 Tullamarine Park Road
Tullamarine VIC 3043

MELBOURNE EAST

Factory 3, 1364 Heatherton Road
Dandenong VIC 3175

BRISBANE

71 Lavarack Avenue
Eagle Farm QLD 4009

CANBERRA

3 Daly Street,
Queanbeyan West NSW 2620

NEWCASTLE

100 Glenwood Drive
Thornton NSW 2322

COFFS HARBOUR

Unit 5, 22 Isles Drive
Coffs Harbour NSW 2450

ADELAIDE

391 Churchill Road,
Kilburn SA 5084

PERTH

Unit 1/94 Beringarra Avenue,
Malaga WA 6090

AUCKLAND (NZ)

Unit 2, 25 Allright Place,
Mount Wellington Auckland 1060

TECHNICAL DATA SHEET:
TYPICAL VALUES

BIDIM®

**Nonwoven
Geotextiles**

**bidim geotextile is the
most well known nonwoven
geotextile product on the
market today.**

bidim leads the way in terms of technical performance and versatility and has applications in virtually every civil engineering construction project.

bidim nonwoven geotextiles provide an effective, economical solution to a range of engineering problems including weak soil, rutted and cracked roads and liquid and gas leaks from landfill sites.

bidim nonwoven geotextiles provide excellent filtration, separation and cushioning properties and feature a strong three-dimensional structure with high elongation. bidim nonwoven geotextiles also have a high melting point and high UV resistance.

All bidim nonwoven geotextiles are manufactured in Australia to ISO 9001 standards and are supported by a rigorous MQA process as well as being designed to meet the requirements of Australian and New Zealand road and rail authorities.



SECTOR SUITABILITY

GEOFABRICS®
Smarter Infrastructure



Roads



Rail



Coastal



Waste



Mining



Civic &
Landscaping



Ports &
Aviation



Water



Primary
Industries



Sports &
Recreation



Slopes &
Walls



Building

BIDIM NON WOVEN GEOTEXTILES - A12 - A64 TYPICAL VALUES

Technical Data

TEST	STANDARD	UNITS	A12		A14		A24		A34		A44		A64	
Mechanical Properties														
Wide Strip Tensile Strength (MD/XMD)	AS3706.2	kN/m	8.0	8.0	11.0	11.0	14.0	14.0	18.5	18.5	26.5	26.5	37.5	37.5
Wide Strip Toughness (MD/XMD)	AS3706.2	kJ/m²	1.5	1.5	3.1	3.1	2.7	2.7	3.5	3.5	4.8	4.8	8.2	8.2
Grab Tensile Strength (MD/XMD)	AS3706.2	N	500	500	720	720	850	850	1,270	1,270	1,850	1,850	2,620	2,620
Trapezoidal Tear Strength (MD/XMD)	AS3706.3	N	200	200	300	300	345	345	440	440	590	590	830	830
CBR Burst Strength	AS3706.4	N	1,500		2,000		2,500		3,400		4,650		6,400	
G Rating	Austrorads	-	1,200		1,550		1,900		2,510		3,500		5,100	
Hydraulic Properties														
Pore Size (095)	AS3706.7	µm	130		110		80		75		75		75	
Permittivity	AS3706.9	s ⁻¹	3.40		3.20		2.65		1.75		1.35		0.90	
Coefficient of Permeability	AS3706.9	m/s x10 ⁻⁴	43		43		43		43		43		43	
Flow Rate @ 100mm Head	AS3706.9	l/m²/sec	340		320		265		175		135		90	

The typical values published in this leaflet are to the best of our knowledge true and correct. The product specification may change at any time without prior notice. No warranty is expressed or implied. Manufactured by Geofabrics Australasia Pty Ltd in a facility certified to the ISO 9001 Quality Management System Standard.

IMPORTANT NOTICE - DISCLAIMER - The information contained in this brochure is general in nature. In particular the content of this brochure does not take account of specific conditions that may be present at your site. Site conditions may alter the performance and longevity of the product and in extreme cases may make the product wholly unsuitable. Actual dimensions and performance may vary. If your project requires accuracy to a certain specified tolerance level you must advise us before ordering the product from us. We can then advise whether the product will meet the required tolerances. Where provided, installation instructions cover installation of product in site conditions that are conducive to its use and optimum performance. If you have any doubts as to the installation instructions or their application to your site, please contact us for clarification before commencing installation. This brochure should not be used for construction purposes and in all cases we recommend that advice be obtained from a suitably qualified consulting engineer or industry specialist before proceeding with installation. © Copyright held by Geofabrics Australasia Pty Ltd. All rights are reserved and no part of this publication may be copied without prior permission. Published March 2019.

Appendix G

Example Sealants

Fosroc® Nitoseal® PU250



constructive solutions

(Replaces Emer-Seal PU25)

High performance, polyurethane joint sealant for vertical interior and exterior applications

Uses

Sealing joints in concrete panels, fibrous cement products, external cladding panels, blockwork and brickwork. Also in sealing joints around aluminium and timber door and window frames and between metal.

Advantages

- Excellent primerless adhesion to concrete, timber, masonry, bricks, aluminium, metal and ceramics
- Low stringing
- Low odour
- Weather resistant
- Easy to gun out

Description

Nitoseal PU250 is a high performance elastomeric joint sealant based on polyurethane technology. Nitoseal PU250 uses a cure system reacting on exposure to atmospheric moisture. When cured it forms a waterproof and durable seal, which makes it ideal for exterior applications.

Design Criteria

Nitoseal PU250 may be applied in joints between 10mm and 35mm wide.

Specification Clause

Where so indicated on the drawings, joints are to be sealed using Fosroc Nitoseal PU250, a one part polyurethane joint sealant as supplied by Fosroc. The sealant must be capable of $\pm 25\%$ joint movement, have an elongation at break greater than 500%, Shore A hardness in the range of 20 - 30 and an elastic modulus at 100% elongation of 0.20 - 0.30MPa.

Joints must be prepared and primed where required in accordance with the current technical data sheet.

The product manufacturer must be accredited to ISO 9001. The sealant and associated materials must be installed by an experienced contractor.

Properties

Data quoted are typical for this product but do not constitute a specification.

Form:	Smooth, non-slump paste
Movement accommodation factor:	$\pm 25\%$ (total 50%)
Tack-free time:	90 mins (+/- 10 mins) at 23°C, 50% RH
Cure speed:	3mm / day 23°C 50% RH
Typical hardness Shore 'A' (ISO 868):	25 (+/-5)
100% Modulus (ISO 8339):	0.20 - 0.30 MPa
Elongation at break:	>500%
Continuous service temperature range:	Minus 40°C to + 70°C
VOC content:	103.6g / litre

Application Instructions

Preparation

The joint surfaces must be thoroughly dry, clean and frost free. Remove all dirt, laitance, loose materials and foreign matter. Remove all rust, scale and protective lacquers from metal surfaces. Non-porous surfaces should be degreased using Fosroc Solvent 10.

In all joints a bond breaker must be used to prevent sealant contact with the back of the joint, to allow optimum sealant performance.

In shallow joints self-adhesive polyethylene bond breaker tape should be used to eliminate adhesion to the base of the joint (3 sided adhesion).

Deep joints should incorporate a backing strip such as Expandafoam Backing Rod or Hydrocell to support the sealant while also acting as a bond breaker.

Priming requirements

Good adhesion can be gained to clean, dry, uncontaminated concrete, timber, metals, ceramics, brickwork and most coating surfaces without the use of primers. On some surfaces however, adhesion may be improved by the use of a primer. Where doubt exists over the suitability of the substrate for unprimed adhesion, site trials should be conducted in conjunction with priming advice from Fosroc. In most applications optimum adhesion to concrete and other porous materials can be achieved using Primer 21. Primer 13 must be used on concrete in applications subject to semi-permanent or long term water immersion. For non-porous materials such as aluminium, stainless steel and galvanised metals, refer to Fosroc for specific advice.

Fosroc®

Nitoseal® PU250

Gun Loading

Nitoseal PU250 is applied using a suitable sealant gun. Insert the sausage into the gun, cut a slit in the top of the sausage, replace the end cap and nozzle and apply the sealant.

Application

Extrude the sealant firmly into joint to ensure complete contact with joint faces. Smooth finish if necessary with a suitable spatula. Do not spray detergent solution on to the sealant surface as this will promote surface blisters.

Cleaning

Clean tools immediately after use with Fosroc Solvent 10.

Limitations

Do not apply Nitoseal PU250 to bituminous surfaces nor allow bitumen to contact Nitoseal PU250. Nitoseal MB175 is recommended for these applications (refer to Nitoseal MB175 TDS).

Paintability - although polyurethane sealants will generally accept painting with acrylic coatings, it is possible for plasticisers to migrate over time and stain the surface of the coating. Fosroc does not recommend painting over Nitoseal PU250 and recommends the use of Nitoseal MS250 in these applications.

Supply

Nitoseal PU250 is supplied in 600 ml foil sausages.

Nitoseal PU250 Concrete Grey	FC920112-600ML
------------------------------	----------------

Coverage:

As a guide, one 600 ml sausage will seal 3 metres of 20mm x 10mm joint

Storage

Shelf life is 15 months when kept in its original, un-opened packaging and stored in dry conditions between +10°C and 25°C with 55% relative humidity, away from direct sunlight and moisture.

Important notice

A Safety Data Sheet (SDS) is available from the Fosroc website. Read the SDS and TDS carefully prior to use as application or performance data may change from time to time. In emergency, contact any Poisons Information Centre (phone 13 11 26 within Australia) or a doctor for advice.

Product disclaimer

This Technical Data Sheet (TDS) summarises our best knowledge of the product, including how to use and apply the product based on the information available at the time. You should read this TDS carefully and consider the information in the context of how the product will be used, including in conjunction with any other product and the type of surfaces to, and the manner in which, the product will be applied. Our responsibility for products sold is subject to our standard terms and conditions of sale. Parchem does not accept any liability either directly or indirectly for any losses suffered in connection with the use or application of the product whether or not in accordance with any advice, specification, recommendation or information given by it.



constructive solutions

Sold under license from Fosroc International Limited.
Fosroc and the Fosroc logo are trade marks of Fosroc International Limited, used under license.

Parchem Construction Supplies Pty Ltd

7 Lucca Road, Wyong NSW 2259

Ph: 1800 812 864

www.fosroc.com.au

ABN 80 069 961 968

Distributed in New Zealand by: Concrete Plus Ltd

150 Hutt Park Road Gracefield Ph: 0800 657 156

www.fosroc.co.nz

NZBN 9429033691282

Appendix H

Data Quality Objectives and Data Quality Indicators

1. Data Quality Objectives

The objective of the validation plan is to assess whether the remedial works have been appropriately completed, assess the resultant suitability of the site for the intended industrial warehouse land use, and to provide information on contamination / environmental impacts which have the potential to result from the works.

The validation assessment is to be conducted with reference to the seven step data quality objectives process (DQO) as outlined in the National Environment Protection Council (NEPC) 'National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)' (NEPC, 2013) and described below.

Table 1: Data Quality Objectives

Step	Summary
1: State the problem	The site requires remediation and validation of the remediation works in order to render it suitable for the proposed industrial warehouse development (commercial / industrial land use). The objective of the validation plan is to confirm the successful implementation of this remediation action plan (RAP).
2: Identify the decisions / goal of the remediation	The conceptual site model (CSM) identifies contamination at the site which poses potentially unacceptable risks to human health. The decision is to determine the site is suitable for the proposed industrial warehouse development (commercial / industrial land use) following remediation of the site, and that remaining soils meet the established remediation acceptance criteria (RAC) and /or retained contamination has been managed per appropriate mitigation measures (e.g. capping) and /or the Environmental Consultant (in agreement with the Site Auditor) has assessed that the risk of retained contamination does not pose and unacceptable risk to site users or the environmental now or into the future.
3: Identify the information inputs	Relevant inputs to the decision include: • The CSM identifying contaminants of potential concern (CoPC) and affected media; • Results analysed for the relevant CoPC using NATA accredited laboratories and methods, where possible; • Field and laboratory quality assurance / quality control (QA / QC) data to assess the suitability of the environmental data for the validation assessment; • Results compared with the RAC; • Field observations and field screening results (e.g. photoionisation detector results); • Assessments of imported aggregates, soils, landscaping products, etc.; • Inspections and construction QA for the containment cell; • Inspections of the maker layer and capping; • Review of the survey of the installed capping; • An enforceable long term environmental management plan (LTEMP) that has been prepared for implementation post construction to allow future use of the land for the proposed industrial warehouse development; and

Step	Summary
	Details of the as constructed development.
4: Define the study boundaries	The lateral boundaries of the site are shown on Drawing 1, Appendix A1. The vertical boundaries are to the extent of contamination impact as determined from the information in the previous investigations used to inform the RAP and site observations and validation testing during works.
5: Develop the analytical approach (or decision rule)	The decision rule is: - Remediated and validated soils meet the RAC; and / or - The construction of mitigation measures to the requirements outlined in the RAP (e.g. construction of the capping layer with the minimum thickness); and / or - Remediated and validated soils that do not meet the RAC and have not been subject to mitigation measures have been subject to a wholistic assessment and confirmed by the Environmental Consultant to not pose an unacceptable risk to site users or the environment now or into the future for the site's use and this assessment has been reviewed and agreed by the Site Auditor.
6: Specify the performance or acceptance criteria	Baseline condition: Contamination exists above adopted RAC, poses a risk to site users and / or the environment or mitigation measures have not been constructed in accordance with this RAP (null hypothesis). Alternative condition: Contamination is within the RAC, does not pose a risk to site users and / or the environment, and / or the mitigation measures have been constructed in accordance with this RAP (alternative hypothesis). Unless conclusive information from the collected validation data (and supported by data from early investigations, where appropriate) is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.
7: Optimise the design for obtaining data	Sampling design and procedures to be implemented to optimise data collection for achieving the DQO include the following: - Sampling frequencies in accordance with the RAP, namely Sections 10, 15 and 20; - Analysis for the CoPC at NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis where possible (not including on-site testing); - Adequately experienced environmental scientists / engineers conduct the field work and sample analysis interpretation; - Visual inspections, field screening and validation sampling by the Environmental Consultant in accordance with the RAP; and - Surveys in accordance with Sections 10 and 20 of the RAP.

2. Data Quality Indicators

The reliability of field procedures and analytical results are to be assessed against the following data quality indicators as outlined in NEPC (2013):

- Completeness: A measure of the amount of usable data from a data collection activity;
- Comparability: The confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: The confidence (qualitative) of data representativeness of media present on-site;
- Precision: A measure of variability or reproducibility of data; and
- Accuracy: A measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Methods of Achievement
Completeness	Target sample locations based on the requirements of the remediation as informed by the RAP and project works.
	Preparation of field notes, sample location plan and chain of custody records.
	Preparation of field soil and soil vapour sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for CoPC identified for the specific sampling event (e.g. soil vapour contaminant).
	Completion of chain of custody documentation.
	Laboratory results certificates provided by NATA accredited laboratories.
	Satisfactory frequency and results for field and laboratory quality control QC samples (as discussed below in Section 3).
Comparability	Use of appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced samplers used.
	Test methods the same or similar between laboratories with off-site laboratories NATA accredited.
	Satisfactory results for field and laboratory quality control samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed representative of the target media and complying with the DQO.
	Samples extracted and analysed within recommended holding times.
	Samples analysed in accordance with the chain of custody documentation.
Precision	Field staff following standard operating procedures for the project.
	Acceptable relative percentage difference between original samples and replicates.
	Satisfactory results for all other field and laboratory quality control samples.

Data Quality Indicator	Methods of Achievement
Accuracy	Field staff following standard operating procedures for the project.
	Satisfactory results for field and laboratory quality control samples.

3. Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data QA / QC procedures and results for the sampling and analysis is to be undertaken. Reference should be made to the field work methodology and the laboratory results / certificates of analysis when assessing this.

Table 3: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria
Analytical laboratories used for off-site analysis	NATA accredited.
Holding times	Conformance with recommended holding times for the subject contaminant.
Intra-laboratory replicates	5% of primary samples; <50% RPD (organics); <30% RPD (inorganics).
Inter-laboratory replicates	5% of primary samples; <50% RPD (organics); <30% RPD (inorganics).
Trip spikes	1 per six sample batches (general); 1 per three sample batches (where volatile contaminants are the main contaminant of concern); 60-140% recovery. Note: Does not include soil vapour batches or for asbestos samples.
Trip blanks	1 per six sample batches (general); 1 per three sample batches (where volatile contaminants are the main contaminant of concern); <LRL. Note: Does not include soil vapour batches or for asbestos samples.
Rinsates	1 per sampling media (where re-useable sampling equipment is used); <LRL. Note: Does not include soil vapour batches.
Soil vapour canister vacuum integrity	+/- 3 in Hg" of laboratory measured pressures prior to sampling and analysis.
Soil vapour shut-in tests	For each soil vapour sample (excludes any passive air sampling); Acceptable vacuum held for minimum 30 second.

Item	Evaluation / Acceptance Criteria
Soil vapour shroud test	Each day of soil vapour sampling; All samples <10 % of laboratory analysed shroud sample. Note: DP would recommend a target of 1%.
Laboratory / reagent blanks	1 per batch; <LRL.
Matrix spikes	1 per lab batch; 60-140% recovery.
Surrogate spikes	For all organics analysis; 60-140% recovery.
Control samples	1 per lab batch; 60-140% recovery.
Standard operating procedures	Adopting the standard operating procedures for the project. for all aspects of the sampling field work.

Notes: C = compliance; PC = partial compliance; NC = non-compliance; RPD = relative percentage difference; LRL = laboratory reporting limit.