Date: 11/03/2024

Dear Colette,

Whilst the concrete repairs undertaken at UCL's IOE differ from those detailed in Historic England's document on the Conservation of Concrete which primarily details the nature of repairs resultant of external damage, cracking, corrosion and water ingress, Overbury have looked to adopt elements from the report that were pertinent for the making good works they have undertaken. Specifically, as relates to the preference for retention of existing fabric and, where not possible, the maintenance of the original appearance by matching the aesthetics of original, exposed concrete.

As part of the works to the IOE, Overbury have formed, in accordance with Planning and Listed Consent, a number of new openings through concrete that have necessitated making good around.

The product selected for this was Fosroc Renderoc HB40 as the application was suitable to make good both vertical and horizonal surfaces at the depths required, for the specific criteria, to provide a best match to existing concrete in appearance, colour and look whilst also providing a robust, long-term solution. Please refer to the Renderoc HB40 data sheet for details.

Further to the application of the Fosroc Renderoc HB40, Overbury will apply an additional coat of Fosrsoc FCR which will achieve a smooth surface finish that matches that of the original concrete. Selected with the recommendation of the manufacturer, the product can be applied to a feather edge over both the existing Renderoc previously applied as well as small sections of the existing concrete itself (where this may occur in product application).This will provide a smooth and seamless finish between existing and 'made good' surfaces.

The Fosroc FCR will not visually affect the current 'look' of the Renderoc applied, however to ensure that Overbury achieve a finish that is acceptable to address all concerns from a heritage perspective, Following various trials the whole concrete repair area has been completed.

See below pictures of the completed concrete repair on both faces of the formed structural opening.

17 Gresse Street, London, W1T 1QL

Face 1:

17 Gresse Street, London, W1T 1QL

Face 2:

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FINAL REPORT

Report ID : 311757

Report Information

Submitting Organisation :	00109358 : Parchem Construction Supplies Pty Ltd
Account :	130335 : Parchem Construction Supplies Pty Ltd
AWQC Reference :	130335-2020-CSR-2 : Prod Test: Fosroc Renderoc HB40
Project Reference :	PT-4552
Product Designation :	Fosroc Renderoc HB40
Composition of Product :	Ordinary Portland Cement, Silca Sands and EVA Polymer.
Product Manufacturer :	Parchem Construction Supplies, Wyong, NSW, AUSTRALIA.
Use of Product :	In-Line/Cementitious Concrete Repair Product.
Sample Selection:	As provided by the submitting organisation.
Testing Requested :	**AS/NZS 4020 TESTING OF PRODUCTS FOR USE IN CONTACT WITH DRINKING WATER**
Product Type :	Composite
Samples :	Samples were prepared and controlled as described in Appendix A of AS/NZS 4020:2018
Extracts :	Extracts were prepared as described in Appendix/Clause C, D, E, F, G, H, 6.8.
Project Completion Date :	18-Jun-2021
Project Comment :	Product sample received in the week 15-Feb-2021 and testing commenced 29-Mar-2021.

THE RESULTS STATED IN THIS REPORT RELATE TO THE SAMPLE OF THE PRODUCT SUBMITTED FOR TESTING. ANY CHANGES IN THE MATERIAL FORMULATION, PROCESS OF MANUFACTURE, THE METHOD OF APPLICATION, OR THE SURFACE AREA-TO-VOLUME RATIO IN THE END USE, COULD AFFECT THE SUITABILITY OF THE PRODUCT FOR USE IN CONTACT WITH DRINKING WATER

Michael Glasson
APPROVED SIGNATORY

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Summary of Results

APPENDIX/CLAUSE	RESULTS
C – Taste	Passed at an exposure of 15000 mm² per Litre.
D – Appearance	Passed at an exposure of 15000 mm² per Litre.
E – Growth of Aquatic Micro-organisms	Passed at an exposure of 15000 mm² per Litre.
F – Cytotoxic Activity	Passed at an exposure of 15000 mm² per Litre.
G – Mutagenic Activity	Passed at an exposure of 15000 mm² per Litre.
H – Metals	Passed at an exposure of 15000 mm² per Litre.
6.8 – Organic Compounds	Passed at an exposure of 15000 mm² per Litre.

Test Methods

Test(s) in Appendix	AWQC Test Method	Reference Method
C	T0320-01	AS/NZS 4020:2018
D	TO029-01 & TO018-01	APHA 2120c & APHA 2130b
E	TO014-03	APHA 4500 O G
F	TM-001	AS/NZS 4020:2018
G	TM-002	AS/NZS 4020:2018
H	TIC-006	EPA 200.8

Organic Test Methods

Test(s) in Clause	Test Method	Reference Method
Clause 6.8	TMZ-M36	USEPA524.2
	EP239	USEPA521
	EP132-LL	USEPA_SW846-8270D
	EP075C	USEPA_SW846-8270D
	EP075ASIM	USEPA_SW846-8270D

Summary Comment : The compound was applied (to glass slides) and cured for 7 days at 20°C prior to testing (ratio of 200g to 31mL of drinking water). Sixteen sequential soakings were performed to obtain a pH < 9.0. In accordance with section A8 (Cementitious Products).

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CLAUSE 6.2 Taste

Sample Description	The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).
Extraction Temperature	20°C ± 2°C.
Test Method	Taste (Appendix C)
Test Information	
Scaling Factor	Not applicable.
Results	Not detected (sample and controls).
Evaluation	The product passed the requirements of clause 6.2 when tested at an exposure of 15000 mm ² per Litre.
Number of Samples	2.
Test Comment	The 24 hour extracts were not analysed in this test.

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CLAUSE 6.3 Appearance

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Appearance (Appendix D)

Scaling Factor Not applicable.

Results

	Test (- Blank)	Maximum Allowed	Units
Colour	<1	5	HU
Turbidity	<0.1	0.5	NTU

Evaluation The product passed the requirements of clause 6.3 when tested at an exposure of 15000 mm ² per Litre.

Number of Samples 1.

Test Comment Not applicable.

Andrew Paul Ford

Andrew Ford
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CLAUSE 6.4 Growth of Aquatic Micro-organisms

Sample Description

The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of test water.

Test Method

Growth of Aquatic Micro-organisms (Appendix E)

Inoculum

The volume of the inoculum was 100 mL

Scaling Factor

Not applicable.

Results

Mean Dissolved Oxygen	Control	7.2	mg/L
Mean Dissolved Oxygen Difference	Positive Reference	4.5	mg/L
	Negative Reference	0.1	mg/L
	Test	0.30	mg/L

Evaluation

The product passed the requirements of clause 6.4 when tested at an exposure of 15000 mm ² per Litre.

Number of Samples

1.

Test Comment

Not applicable.

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CLAUSE 6.5 Cytotoxic Activity

Sample Description	The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).
Extraction Temperature	20°C ± 2°C.
Test Method	Cytotoxic Activity (Appendix F)
Scaling Factor	Not applicable.
Results	Non-Cytotoxic (sample and controls).
Evaluation	The product passed the requirements of clause 6.5 when tested at an exposure of 15000 mm ² per Litre.
Number of Samples	1.
Test Comment	The test extracts and blank extracts were used to prepare nutrient growth medium and subsequently used to grow a cell line (ATCC Number CCL 81) in the analysis. In addition zinc sulphate (0.4 mmol) was used for the positive control in the analysis.

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CLAUSE 6.6 Mutagenic Activity

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Mutagenic Activity (Appendix G)

Scaling Factor Not applicable.

Results

Bacteria Strain	S9	Number of Revertants per Plate: Blank	Sample Extract	Positive Controls	
Salmonella typhimurium TA98	-	35, 35, 20	18, 28, 29	3237, 3751, 3787	NPD (20µg)
Mean ± Standard deviation		30.0 ± 8.7	25.0 ± 6.1	3591.7 ± 307.7	
	+	29, 26, 29	23, 25, 34	3089, 3388, 3697	2-AF (20µg)
Mean ± Standard deviation		28.0 ± 1.7	27.3 ± 5.9	3391.3 ± 304.0	
Salmonella typhimurium TA102	-	427, 447, 446	393, 367, 422	4903, 5263, 2855	Mitomycin C(10µg)
Mean ± Standard deviation		440.0 ± 11.3	394.0 ± 27.5	4340.3 ± 1298.9	
	+	540, 552, 564	540, 451, 512	2316, 1756, 2038	
Mean ± Standard deviation		552.0 ± 12.0	501.0 ± 45.5	2036.7 ± 280.0	

Comments S9 was used as the metabolic activator. NPD (4-nitro-o-phenylenediamine) and Mitomycin C are specific positive controls for strains TA98 - and TA102 (- and +) respectively, while 2-AF (2-aminofluorene) when used in conjunction with S9 is a positive control for TA98+.

Evaluation The product passed the requirements of clause 6.6 when tested at an exposure of 15000 mm ² per Litre.

Number of Samples 1.

Test Comment The differences in the mean number of revertants between the blank and test extracts do not exceed two standard deviations; accordingly there is no evidence of a mutagenic response.

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CLAUSE 6.7 Metals

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Metals (Appendix H)

Scaling Factor Not applicable.

Method of Analysis All methods used to determine concentrations of metals are based on those described in the US EPA method 200.8 Determination of Trace elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry. The methods have been adapted for the instrumentation in use at the Australian Water Quality Centre.
Concentration of the metals described in Table 2 of the AS/NZS 4020:2018 are determined as follows:
Aluminium, Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium and Silver by Inductively Coupled Plasma Mass Spectrometry.

Results

	Limit of Reporting mg/L	Blank mg/L	Test 1 mg/L	Test 2 mg/L	Max Allowed mg/L
Final Extract					
Aluminium	0.001	0.034	0.036	0.037	0.2
Antimony	0.0005	<0.0005	<0.0005	<0.0005	0.003
Arsenic	0.0003	<0.0003	<0.0003	<0.0003	0.01
Barium	0.0005	0.0244	0.0243	0.0240	0.7
Boron	0.020	0.091	0.092	0.078	1.4
Cadmium	0.0001	<0.0001	<0.0001	<0.0001	0.002
Chromium	0.0001	0.0002	0.0002	0.0002	0.05
Copper	0.0001	0.0696	0.0808	0.0814	2.0
Iron	0.0005	0.0081	0.0076	0.0072	0.3
Lead	0.0001	0.0004	0.0004	0.0004	0.01
Manganese	0.0001	0.0025	0.0023	0.0022	0.1
Mercury	0.00003	<0.00003	<0.00003	<0.00003	0.001
Molybdenum	0.0001	0.0002	0.0002	0.0002	0.05
Nickel	0.0001	0.0007	0.0006	0.0005	0.02
Selenium	0.0001	<0.0001	0.0001	0.0001	0.01
Silver	0.00003	<0.00003	<0.00003	<0.00003	0.1

Evaluation The product passed the requirements of clause 6.7 when tested at an exposure of 42000 mm ² per Litre.

Number of Samples 1.

Test Comment Not applicable.

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CLAUSE 6.8 Organic Compounds

Sample Description The sample consisted of two coated panels (each coated to one side) with dimensions 75 mm x 100 mm and providing a total surface area of approximately 15000 mm²/L. Extracts were prepared using 1000 mL volumes of pre-conditoning water(AI 12.6).

Extraction Temperature 20°C ± 2°C.

Test Method Organic Compounds (Clause 6.8). Max Allowed values are taken from the Australian Drinking Water Guidelines and Drinking-water Standards for New Zealand. Please note, some reported compounds have no guideline value.

Scaling Factor Not applicable.

Results

Organic Compound Nitrosamines	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
1-Nitrosopiperidine (NPip)	<0.003	<0.003	
1-Nitrosopyrrolidine (NPyr)	<0.01	<0.01	
Nitrosomorpholine (NMor)	<0.003	<0.003	
N-Nitrosodiethylamine (NDEA)	<0.01	<0.01	
N-Nitrosodimethylamine (NDMA)	<0.003	<0.003	0.1 µg/L
N-Nitrosodi-n-propylamine (NDPA)	<0.003	<0.003	
N-Nitrosomethylethylamine (NMEA)	<0.003	<0.003	

Organic Compound Phenols	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
2 4 5-trichlorophenol	<1.0	<1.0	
2 4 6-trichlorophenol	<1.0	<1.0	20 µg/L
2 4-dichlorophenol	<1.0	<1.0	200 µg/L
2 4-dimethylphenol	<1.0	<1.0	
2 6-dichlorophenol	<1.0	<1.0	
2-chlorophenol	<1.0	<1.0	300 µg/L
2-nitrophenol	<1.0	<1.0	
4-chloro-3-methylphenol	<1.0	<1.0	
m+p cresol	<2.0	<2.0	
o-cresol	<1.0	<1.0	
pentachlorophenol	<2.0	<2.0	9 µg/L
phenol	<1.0	<1.0	

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Organic Compound **Phthalate Esters**	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
Bis(2-ethylhexyl) phthalate	<10	<10	10 µg/L
Butyl benzyl phthalate	<2	<2	
Di(2-ethylhexyl) adipate	<2	<2	
Diethyl phthalate	<2	<2	
Dimethyl phthalate	<2	<2	
Di-n-butyl phthalate	<2	<2	
Di-n-octyl phthalate	<2	<2	

Organic Compound **Polycyclic Aromatic Hydrocarbons**	Blank µg/L	Test µg/L	Max Allowed
!External Lab Report No.	ES2107842	ES2107842	
Acenaphthene	<0.02	<0.02	
Acenaphthylene	<0.02	<0.02	
Anthracene	<0.02	<0.02	
Benzo(a)anthracene	<0.02	<0.02	
Benzo(a)pyrene	<0.005	<0.005	0.01 µg/L
Benzo(a)pyrene TEQ	<0.005	<0.005	
Benzo(b+j)fluoranthene	<0.02	<0.02	
Benzo(ghi)perylene	<0.02	<0.02	
Benzo(k)fluoranthene	<0.02	<0.02	
Chrysene	<0.02	<0.02	
Dibenzo(a-h)anthracene	<0.02	<0.02	
Fluoranthene	<0.02	<0.02	
Fluorene	<0.02	<0.02	
Indeno(123-cd)pyrene	<0.02	<0.02	
Naphthalene	<0.02	<0.02	
PAH - Total	<0.005	<0.005	
Phenanthrene	<0.02	<0.02	
Pyrene	<0.02	<0.02	

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Organic Compound **Volatile Organic Compounds GCMS**	Blank µg/L	Test µg/L	Max Allowed
1 1 1 2-Tetrachloroethane	<1	<1	
1 1 1-Trichloroethane	<1	<1	
1 1 2 2-Tetrachloroethane	<1	<1	
1 1 2-Trichloroethane	<1	<1	
1 1-Dichloropropene	<1	<1	
1 2 3-Trichlorobenzene	<1	<1	
1 2 3-Trichloropropane	<1	<1	
1 2 4-Trichlorobenzene	<1	<1	
1 2 4-Trimethylbenzene	<1	<1	
1 2-Dibromo-3-chloropropane	<1	<1	1 µg/L
1 2-Dibromoethane	<1	<1	1 µg/L
1 2-Dichlorobenzene	<1	<1	1500 µg/L
1 2-Dichloroethane	<1	<1	3 µg/L
1 2-Dichloropropane	<1	<1	
1 3 5-Trimethylbenzene	<1	<1	
1 3-Dichlorobenzene	<1	<1	
1 3-Dichloropropane	<1	<1	
1 4-Dichlorobenzene	<1	<1	40 µg/L
1,1-Dichloroethane	<1	<1	
1,1-Dichloroethene	<1	<1	30 µg/L
2,2-Dichloropropane	<1	<1	
2-Chlorotoluene	<1	<1	
4-Chlorotoluene	<1	<1	
4-Isopropyltoluene	<1	<1	
Benzene	<1	<1	1 µg/L
Bromobenzene	<1	<1	
Bromochloromethane	<1	<1	
Bromodichloromethane	26	25	60 µg/L
Bromoform	10	9	100 µg/L
Bromomethane	<4	<4	
Carbon tetrachloride	<1	<1	3 µg/L
Chlorobenzene	<1	<1	300 µg/L
Chloroethane	<4	<4	
Chloroform	17	18	400 µg/L
Chloromethane	<4	<4	
cis-1 3-Dichloropropene	<1	<1	
cis-1,2-Dichloroethene	<1	<1	
Dibromochloromethane	33	31	150 µg/L
Dibromomethane	<1	<1	
Dichlorodifluoromethane	<1	<1	
Dichloromethane	<4	<4	4 µg/L
Ethylbenzene	<1	<1	300 µg/L
Hexachlorobutadiene	<0.7	<0.7	0.7 µg/L
Isopropylbenzene	<1	<1	
m+p-Xylenes - Total	<2	<2	

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Organic Compound **Volatile Organic Compounds GCMS**	Blank µg/L	Test µg/L	Max Allowed
Naphthalene	<1	<1	
n-Butylbenzene	<1	<1	
n-Propylbenzene	<1	<1	
o-Xylene	<1	<1	
sec-Butylbenzene	<1	<1	
Styrene	<1	<1	30 µg/L
tert-Butylbenzene	<1	<1	
Tetrachloroethene	<1	<1	50 µg/L
Toluene	<1	<1	800 µg/L
Total 1 2-dichloroethene	<2	<2	60 µg/L
Total 1 3-dichloropropene	<2	<2	20 µg/L
Total Trichlorobenzene	<2	<2	30 µg/L
Total Xylene	<3	<3	600 µg/L
trans-1 3-Dichloropropene	<1	<1	
trans-1,2-Dichloroethene	<1	<1	
Trichloroethene	<1	<1	
Trichlorofluoromethane	<1	<1	
Trihalomethanes - Total	86	83	250 µg/L
Vinyl chloride	<0.3	<0.3	0.3 µg/L

Evaluation The product passed the requirements of clause 6.8 when tested at an exposure of 15000 mm² per Litre.

Number of Samples 1.

Test Comment Subcontracted testing conducted by ALS, Environmental Division, NATA accreditation no. 825 site no. 10911 and ALS Scoresby, NATA accreditation no. 992, site no. 989

Qiong Huang

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Fosroc® Renderoc FCR

FOSROC constructive solutions

Single component polymer modified fast setting cementitious fairing coat

Description and uses

Renderoc FCR is a ready-to-use blend of dry powders requiring only the site addition of clean water to produce a highly consistent fast setting cementitious fairing mortar. The material is based on a blend of cements, graded aggregates, special fillers and chemical additives to provide a material with good handling characteristics, while minimising water demand. The product exhibits excellent thermal compatibility with concrete and is designed for vertical and overhead use to infill honeycombing and voids from a feather edge up to 20 mm deep in the surface of concrete which is not trafficked.

Renderoc FCR has thixotropic and rapid setting properties, particularly suitable for fast repair / appearance improvement of precast concrete elements during manufacturing and is fully compatible with other Renderoc mortars and Dekguard coatings.

Advantages

- Polymer-modification provides extremely low permeability to water, carbon dioxide and chlorides
- Superb application performance
- Rapid setting
- Excellent bond to concrete
- One component, pre-bagged to overcome site-batched variations
- Contains no chloride admixtures

Properties

The following test results were obtained at water:powder ratio of 0.27 and at temperature of 20°C.

Test Method	Test result
Compressive strength (EN 12190:1999)	>20 MPa at 28 days
Bond strength by pull off (EN 1542:1999)	>0.8 MPa at 28 days
Chloride ion content (EN 1015-17:2000)	<0.03%
Open time	~15 minutes
Setting time (BS 4551 -14:1980)	Initial set: 40~65 minutes
Fresh wet density	1800~1950 kg/m^2
Build characteristics, hand applied: Minimum thickness: Maximum thickness:	 0.3 mm Up to 20 mm

Clarification of property values: The typical properties given above are derived from laboratory testing. Results derived from field applied samples may vary.

Specification Clause

The fairing coat shall be Renderoc FCR, a one component polymer modified rapid setting mortar for application thicknesses of between 0.3mm and 20mm. It shall be capable of use without independent priming and curing systems and shall be manufactured to produce a uniform, fair faced finish to concrete surfaces either as the surface finish or in preparation for application of a protective coating. The product shall be mixed, applied and cured in accordance with the manufacturer's written instructions to a correctly prepared substrate.

Application instructions

Preparation

Clean the surface and remove any dust, unsound material, plaster, oil, paint, grease, corrosion deposits or algae. Roughen the surface and remove any laitance by light scabbling or abrasive-blasting. Oil and grease deposits should be removed by steam cleaning, detergent scrubbing or the use of a proprietary degreaser.

Renderoc repair mortars require no additional preparation prior to the application of Renderoc FCR.

No independent priming system is required.

The cleaned areas should be blown clean with oil-free compressed air before continuing. All prepared areas should be saturated-surface-dry immediately before the application of Renderoc FCR, i.e. they should be thoroughly saturated with clean water and any residual surface water removed. Under severe drying conditions repeated soaking may be necessary to ensure the substrate is still saturated at the time of application.

Care should be taken and the work scheduled to ensure water does not run onto areas of recently applied Renderoc FCR less than 12 hours old.

Fosroc® Renderoc FCR

Mixing

Care should be taken to ensure that Renderoc FCR is thoroughly mixed. Small quantities (up to 10 kg) can be mixed by hand using a suitable mixing drum or bucket. Greater quantities should be mixed using a forced-action mixer. Mixing in a suitably sized drum using an approved Renderoc Mixing Paddle (MR4) in a slow speed (400/500 rpm) heavy-duty drill is an acceptable alternative.

Mixing warning

As with other 'one pack' repair mortars, Renderoc FCR may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing Instructions are strictly adhered to with particular emphasis on the quantity of water used and the time of the mixing operation.

If mixing small quantities, use a balance to weigh out the required quantity of Renderoc FC. Water must be measured in a proportion between 0.24 and 0.28 of the weight of the powder. (e.g. for 10kg powder, use between 2.4 and 2.8 litres of water.)

For larger volumes, place 6 to 7 litres of drinking quality water into the mixer and, with the machine in operation, add one full 25 kg bag of Renderoc FCR and mix for a minimum of 3 minutes (maximum 5 minutes). The water content can vary between 6 and 7 litres depending on the thickness being applied, but should not exceed 7 litres per 25 kg bag of Renderoc FCR. Do not subsequently re-temper with extra water.

Note: that in all cases Renderoc FCR powder must be added to water.

Application

Apply the mixed Renderoc FCR to the prepared substrate by steel trowel as a scrape coat of minimal thickness. It should be applied with the minimum of working and be allowed to partly set before finally trowelling to a smooth finish. If a very smooth finish is required, a small amount of water may be flicked on to the surface of the Renderoc FCR with a paint brush prior to final trowelling.

Do not proceed with the application when rainfall is imminent unless in a sheltered or protected situation.

Low temperature working

Normal precautions for winter working with cementitious materials should then be adopted. The material should not be applied when the substrate and/or air temperature is 5°C and falling. At 5°C static temperature or at 5°C and rising, the application may proceed. A longer set time of Renderoc FCR is expected in winter.

High temperature working

At ambient temperatures above 30°C, the material should be stored in the shade and cool water used for mixing.

Curing

Renderoc FCR does not require any form of curing in moderate ambient conditions, but under strong drying conditions curing may be necessary. In this case Renderoc FCR should be cured immediately after finishing in accordance with good concrete practice. The use of Nitobond AR, sprayed on to the surface of the finished Renderoc FCR in a continuous film, is recommended. Large areas should be cured as trowelling progresses (0.5 m2 at a time) without waiting for completion of the entire area. In very fast drying conditions, supplementary curing with polythene sheeting taped down at the edges should be used.

In cold conditions, the finished repair must be protected from freezing.

Overcoating with protective decorative finishes

Renderoc FCR can be overcoated with the Dekguard range of coatings or suitable alternatives. These products provide a barrier at the surface of the repair area and the concrete structure to limit the advance of chlorides and carbon dioxide, and to resist the weathering erosion. They also act as a decorative coating to improve the decorative and uniform appearance of the structure. The Dekguard products may be applied over the repair area without prior removal of the Nitobond AR curing membrane (if used). Other curing membranes must be removed prior to the application of Dekguard products.

Cleaning

Renderoc FCR should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically.

Estimating

Supply

Renderoc FCR:	25 kg bags
Nitobond AR:	5 and 25 litre drums

Fosroc® Renderoc FCR

Coverage and yield

Renderoc FCR:	Approx. 15.0 litres / 25 kg bag 3 m² at 5 mm thickness
Nitobond AR:	6 - 8 m² / litre

Notes: the actual yield per bag of Renderoc FCR will depend on the consistency used.

Limitations

Renderoc FCR should not be used when the temperature is below 5°C or above 35ºC. Due to the lightweight nature of Renderoc FCR, the product should not be used in areas subjected to traffic (in these circumstances, Renderoc S should be considered).

Renderoc FCR should not be exposed to moving water during application. Exposure to heavy rainfall prior to the final set may result in surface scour.

If any doubts arise concerning temperature or substrate conditions, consult the local Fosroc office.

Storage

The product has a shelf life of 12 months from the date of manufacture if kept in dry storage in the original, unopened bags. If stored at high temperatures and/or high humidity the shelf life may be reduced to less than 6 months.

Nitobond AR should be protected from frost.

Precautions

Health and safety

For further information refer to the appropriate Safety Data Sheets available at www.fosroc.com.

Fire

Renderoc FCR is non-flammable.

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