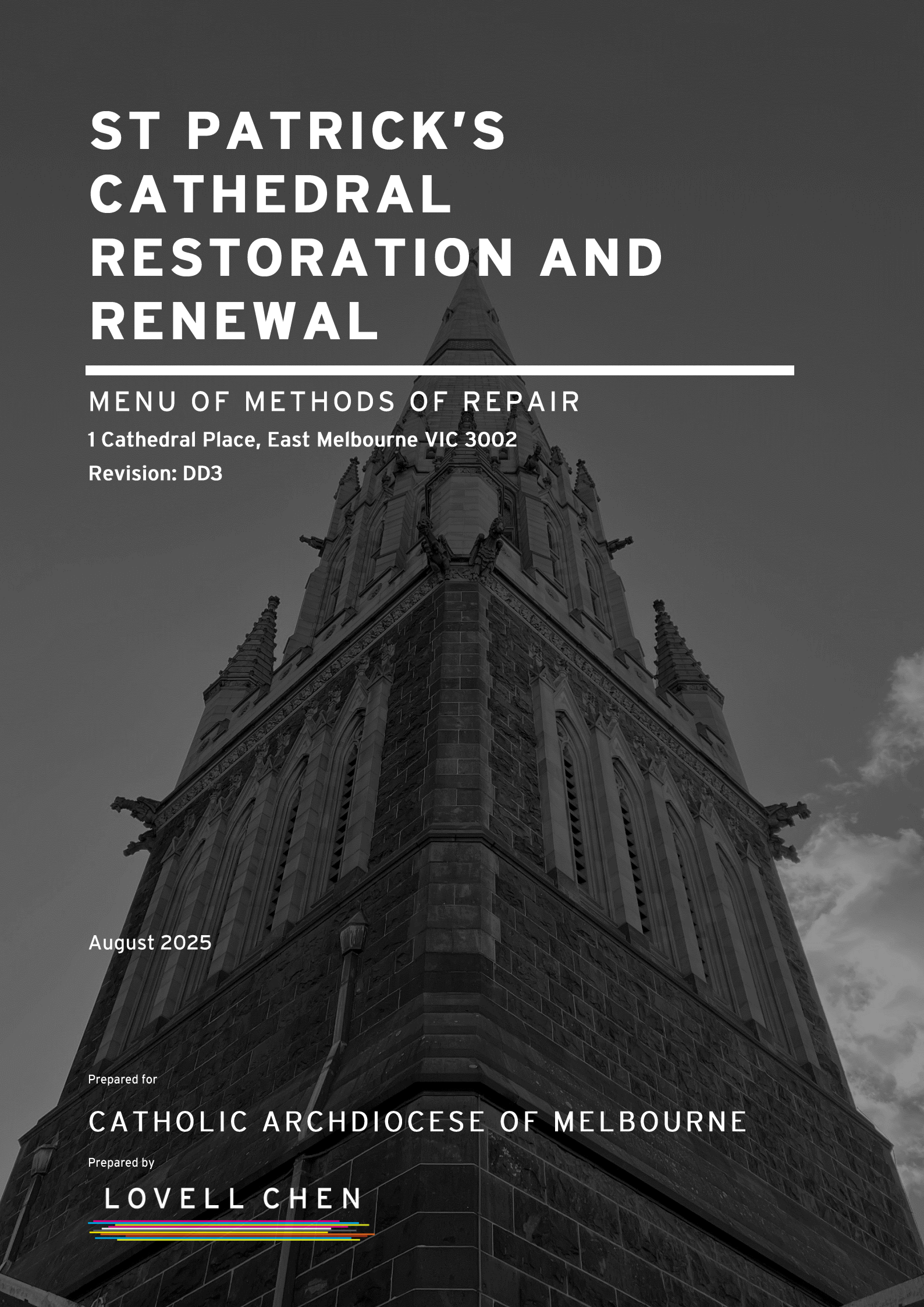
ST PATRICK'S CATHEDRAL RESTORATION AND RENEWAL

MENU OF METHODS OF REPAIR

1 Cathedral Place, East Melbourne VIC 3002

Revision: DD3



August 2025

Prepared for

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Project Name	St Patrick's Cathedral – Restoration and Renewal		
File Name	Menu of Methods of Repair	Project Number	20240322

Date Issued	Status	Revision	Checked
20/08/2024	Preliminary	P1	SH
21/02/2025	Preliminary – 50% DD	DD1	WJ
05/05/2025	Preliminary – 70% DD	DD2	WJ
08/08/2025	Heritage Victoria Submission	DD3	SH

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GENERAL WORKS REPAIRS

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G1 Façade cleaning

Undertake separate samples of cleaning to both sandstone and bluestone substrates in-situ to the satisfaction of the Architect. The agreed sample shall be the method for which cleaning shall be undertaken and assessed. Undertake testing from lower temperature/pressure to higher.

Wash down all façade surfaces to remove organic growth, lichen, moss, vegetation, guano and debris using a nylon stiff bristle brush, low pressure warm water and disinfectant. Apply to trees and plant growth a weed killer that does not contain glyphosate. Once plant has died remove plant along with root stock.

Treat organic growth to stonework with applied chemical SCP Blue Quadrant Disinfectant Cleaner (quaternary ammonium compound) in diluted solution of 1:10 and wash down facades with pressure water from 300PSI to 800PSI max, at 60°C to 90°C max combined with scrubbing with a nylon brush to remove debris where needed. Working from top to bottom. Undertake spot test with PH strips to confirm the substrate is neutralised to PH7.

All waste must be contained, collected and disposed of in an approved manner and in accordance with EPA. Provide warning notices to conspicuous positions where necessary to warn the public and other tradesmen of the operations.

G2 Remove redundant fixtures and fittings

Demolish all redundant services, fixtures and fittings from facades, including (but not limited to) brackets, lighting, lighting cables, bolts, pipes, conduits, sealants, timber and the like.

Where holes are to stonework, patch repair holes with colour-matched mortar containing Abilox pigments as per repair code **G5 - Pigmented mortar mix repair**. Provide samples of mortar to match the colour of existing stone to the approval of the Architect. Where holes are larger than 30mm diameter cut out and install indent repair to match existing adjacent stone as specified.

G3 Remove embedded item

Remove embedded metal or timber item, where required cut out surrounding stone or mortar to allow embedded items to be removed. Clean with compressed air or water.

Where hole is to stonework patch repair pinning holes with colour-matched mortar containing Abilox pigments, as per repair code **G5 - Pigmented mortar mix repair**. Provide samples of mortar to match the colour of existing stone to the approval of the Architect. Where holes are larger than 30mm diameter cut out and install indent repair to match existing adjacent stone in source and colour.

CODE	WORKS

G4 Pigmented mortar mix repair

Undertake mortar repair samples in-situ to match adjacent colour, texture and physical characteristics to the satisfaction of the Architect. The agreed sample shall be the method for which mortar repair works shall be undertaken and assessed. Prepare three different colours per material for review and approval by the Architect.

Carry out mortar repair to areas of masonry, ensuring arrises and mouldings are restored to match existing adjacent. Where required, build up an armature of stainless steel screws and wire into substrate to allow arrises and mouldings to be restored. Apply mortar mix to the armature forming required profiles. Mortar colour is assumed to be achieved from sands and additional natural pigment if required. Ensure mortar colour matches adjacent material.

G5 Poultice efflorescence

Remove any loose sand or salts from surface with a stiff bristle non-ferrous brush to provide a sound surface. After preparation, apply one coat of Westox Cocoon by trowel or spray at the rate of 6 to 7kg of mixed material per square metre as per manufacturer's instructions. This will provide a wet film thickness of approximately 10mm. Leave each application for a minimum of 14 days before removal unless directed otherwise by the manufacturer.

To remove Westox Cocoon (normally after 2 to 6 weeks), simply peel from the substrate and dispose of removed material to an appropriate land fill area.

If allowed to dry, the Westox Cocoon will peel off and any residue will wash off with water. Flush machinery thoroughly with clean water after spraying. Allow for full repointing to the area of the degraded mortar.

G6 Gutter and copper roof cleaning

Wash down all gutter and roof surfaces to remove organic growth, lichen, moss, vegetation, guano and debris using a nylon stiff bristle brush, low pressure warm water.

G7 Pin and epoxy seal slate louvre

Carefully epoxy seal lifting slate to seal all gaps and make watertight. If crack is severe and slate is dislodging, carefully drill from slate to sandstone reveal on both sides. Supply and install grade 316 stainless steel threaded pin and epoxy into hole. Recess pin approximately 6mm below surface, plug with pigmented mortar render to give continuous outer appearance to match the existing profile and colour as per repair code **G5 - Pigmented mortar mix repair**. . Items are to be fixed a minimum of 50mm into sound substrate below.

Where material is loose/delaminated, remove all and dress off slate.

SANDSTONE REPAIRS

CODE	WORKS

SS1 Carve and install new flat stone / block replacement

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone.

Carefully demolish existing decayed and/or damaged stone, do not damage adjacent stones nominated for retention. Carve and install new stone with mouldings, profiles, depth and the like to match the existing details. Install new stone with all new bedding mortar, allowing for grade 316 stainless steel dowels, armatures and the like. Do not feather new work into existing, undertake all sweetening required to install blocks. All sizes are to be confirmed on site following access via the scaffold, core hole tests and the like.

SS2 Sandstone indent repair - flat

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone.

Carve and install new indents in specified stone. Carve or cut indents from new stone and install grade 316 stainless steel dowels with epoxy to fix new stone indents into position. All mouldings and profiles are to match existing adjacent. Submit samples of work for approval prior to fixing in place.

Indents to be cut flush and tight without joints. Do not feather new work into existing, undertake all sweetening required to install indents. All sizes are to be confirmed on site following access via the scaffold, core hole tests and the like.

SS3 Carve and install new moulded stone / block replacement

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone.

Carefully demolish existing decayed and/or damaged stone, do not damage adjacent stones nominated for retention. Carve and install new stone with mouldings, profiles and the like to match the existing details. Install new stone with all new bedding mortar, allowing for grade 316 stainless steel dowels, armatures and the like. Do not feather new work into existing, undertake all sweetening required to install blocks. All sizes are to be confirmed on site following access via the scaffold, core hole tests and the like.

CODE	WORKS

SS4 Sandstone indent repair - moulded

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone.

Contractor to produce shop drawings of each individual moulded stone indent for review prior to carving. Carve and install new indents in specified stone, to match existing adjacent moulding profile. Carve or cut indents from new stone and install grade 316 stainless steel dowels with epoxy to fix new stone indents into position. All mouldings and profiles are to match existing adjacent. Submit samples of work for approval prior to fixing in place.

Indents to be cut flush and tight without joints. Do not feather new work into existing, undertake all sweetening required to install indents. All sizes are to be confirmed on site following access via the scaffold, core hole tests and the like.

SS5 Sandstone crack repair

Clean out cracks with a compressed air, inject and fill with the specified epoxy resin. Do not drill holes into crack. Where stone is detached, install stainless steel dowels for reinforcing with mixture of stone dust or mineral pigment with epoxy resin. Pigmented epoxy resin to finish at least 5mm below outer surface.

Where cracking has occurred on vertical surfaces or the underside of horizontal surfaces, inject from above, providing damming to the face of the crack to prevent the resin leaching through onto the face of the stonework. The damming is to be mixture of stone dust or mineral pigment with epoxy resin to form a past to match the colour and texture of the existing stonework. Install masking to crack prior to damming to protect the block from any resin spillage or seepage, blocks showing such evidence shall be replaced at the Contractors expense. Pigmented epoxy resin to finish at least 5 mm below outer surface.

Fill rest of the crack with approved mortar mix to match adjacent colour, finish and texture of adjacent material.

SS6 Pin and inject delaminating stone

Drill hole into stonework item with a maximum 6mm diameter into sound substrate and clean out with compressed air. Supply and install grade 316 stainless steel threaded pin and epoxy into hole. Recess pin approximately 6mm below surface, plug with pigmented mortar render to give continuous outer appearance to match the existing profile and colour. Items are to be fixed a minimum of 50mm into sound substrate below.

CODE	WORKS

SS7 Consolidate stone

Remove extent of delamination to casehardening by hand scabbling the stone and rubbing back surface with carborundum to stable material. Scabbling is to be limited to crumbling fabric only.

Undertake stone consolidation samples in pre-determined area to the satisfaction of the Architect to determine the approved method. The test area should confirm the sequence of the preparation of the substrate prior to consolidation of the stone. Trial to be completed with 3 no. minimum types of consolidant to determine most appropriate product.

Before stone consolidation, undertake preparation of the substrate by carefully brushing off loose dirt and biological growth with a stiff nylon brush, remove all staining / residue. Apply salt removal poultice as per repair code G4 Poultice efflorescence. The test area will confirm the sequence of the proposed methodology before stone consolidation. Protect area against direct sunlight and moisture prior to treatment, and ensure the area being consolidated is protected against rain and sun during the following three days after application.

Impregnate stone with approved ethyl silicate consolidant in accordance with the manufacturer's guideline. Apply wet-on-wet with consolidant until fully saturated. Solution can be applied directly onto the stone on air-dry and absorbent substrate using a paint brush or hand spray pump. Avoid run-off onto surrounding material. Allow two applications. Allow a minimum of two weeks following application before carrying out any further applications.

SS8 Repoint sandstone

Provide samples of sandstone mortar for approval by the Architect prior to undertaking works. Samples to include:

- 0.5 x lineal meter on loose board, to determine mix and pigment
- 1 x lineal meter in-situ, to determine match with adjacent pointing

Rake out decayed and damaged mortar from joints by hand, do not widen joints, do not use grinders. Clean out open joints with compressed air. Repoint the joint in specified mortar mix to match existing adjacent mortar in colour and texture.

To minimise cleaning of the stone, do not smear excess mortar over the face of the stone. Ensure works are undertaken with care not to cause damage or additional cleaning of stone.

Sandstone joints are to be recessed 2mm back from the face of the stone and to be brushed back to expose the aggregate and give a weathered finish to match the existing adjacent in finish and profile. Do not widen joints.

BLUESTONE REPAIRS

CODE	WORKS

BS1 Repoint bluestone

Provide samples of bluestone mortar for approval by the Architect prior to undertaking works. Samples to include:

- 0.5 x lineal meter on loose board, to determine mix and pigment
- 1 x lineal meter in-situ, to determine match with adjacent pointing

Rake out decayed and damaged mortar from joints by hand, do not widen joints, do not use grinders. Clean out open joints with compressed air. Repoint the joint in specified mortar mix to match existing adjacent mortar in colour and texture.

To minimise cleaning of the stone, do not smear excess mortar over the face of the stone. Ensure works are undertaken with care not to cause damage or additional cleaning of stone. Bluestone joints are to be recessed 2mm back from the face of the stone and to be brushed back to expose the aggregate and give a weathered finish to match the existing adjacent in finish and profile. Do not widen joints.

BS2 Indent Repair

Carve and install new indents in specified stone to match existing rusticated stone finish. Carve or cut indents from new stone and install grade 316 stainless steel dowels with epoxy to fix new stone indents into position. All mouldings and profiles are to match existing adjacent. Submit samples of work for approval prior to fixing in place.

Indents to be cut flush and tight without joints. Do not feather new work into existing, undertake all sweetening required to install indents. All indent sizes are to be confirmed on site following access via the scaffold or the like.

BS3 Bluestone crack repair

Clean out cracks with a compressed air, inject and fill with the specified epoxy resin. Do not drill holes into crack. Where stone is detached, install stainless steel dowels for reinforcing with mixture of stone dust or mineral pigment with epoxy resin. Pigmented epoxy resin to finish at least 5mm below outer surface.

Where cracking has occurred on vertical surfaces or the underside of horizontal surfaces, inject from above, providing damming to the face of the crack to prevent the resin leaching through onto the face of the stonework. The damming is to be mixture of stone dust or mineral pigment with epoxy resin to form a past to match the colour and texture of the existing stonework. Install masking to crack prior to damming to protect the block from any resin spillage or seepage, blocks showing such evidence shall be replaced at the Contractors expense. Pigmented epoxy resin to finish at least 5 mm below outer surface.

Fill rest of the crack with approved mortar mix to match adjacent colour, finish and texture of adjacent material.

CODE	WORKS

BS4 Flat bluestone indent (honed)

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new basalt stone.

Carefully demolish existing decayed and/or damaged stone, do not damage adjacent stones nominated for retention. Carve and install new stone with mouldings, profiles, depth and the like to match the existing details. Install new stone with all new bedding mortar, allowing for grade 316 stainless steel dowels, armatures and the like. Do not feather new work into existing, undertake all sweetening required to install blocks. All sizes are to be confirmed on site following access via the scaffold, core hole tests and the like.

BS5 Moulded bluestone indent (honed)

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone.

Contractor to produce shop drawings of each individual moulded stone indent for review prior to carving. Carve and install new indents in specified stone, to match existing adjacent moulding profile. Carve or cut indents from new stone and install grade 316 stainless steel dowels with epoxy to fix new stone indents into position. All mouldings and profiles are to match existing adjacent. Submit samples of work for approval prior to fixing in place.

Indents to be cut flush and tight without joints. Do not feather new work into existing, undertake all sweetening required to install indents. All sizes are to be confirmed on site following access via the scaffold, core hole tests and the like.

MARBLE REPAIRS

CODE	WORKS

MB1 Repoint marble

Provide samples of bluestone mortar for approval by the Architect prior to undertaking works. Samples to include:

- 0.5 x lineal meter on loose board, to determine mix and pigment
- 1 x lineal meter in-situ, to determine match with adjacent pointing

Rake out decayed and damaged mortar from joints by hand, do not widen joints, do not use grinders. Clean out open joints with compressed air. Repoint the joint in specified mortar mix to match existing adjacent mortar in colour and texture.

To minimise cleaning of the stone, do not smear excess mortar over the face of the stone. Ensure works are undertaken with care not to cause damage or additional cleaning of stone. Marble joints are to be flush with the face of the stone and retain a smooth finish throughout the stone.

Do not widen joints.

MB2 Crack injection to marble

Clean out cracks with a compressed air, inject and fill with the specified pigmented epoxy resin. Do not drill holes into crack. Where stone is detached, install stainless steel dowels for reinforcing with mixture of stone dust or mineral pigment with epoxy resin

Pigmented epoxy resin to finish at least 5mm below outer surface.

Where cracking has occurred on vertical surfaces or the underside of horizontal surfaces, inject from above, providing damming to the face of the crack to prevent the resin leaching through onto the face of the stonework. The damming is to be mixture of stone dust or mineral pigment with epoxy resin to form a past to match the colour and texture of the existing stonework. Install masking to crack prior to damming to protect the block from any resin spillage or seepage, blocks showing such evidence shall be replaced at the Contractors expense. . Inform architect following epoxy injection to determine if pigmented mortar repair is required to crack.

If required, fill rest of the crack with approved mortar mix to match adjacent colour, finish and texture of adjacent material.

PAINTING REPAIRS

CODE	WORKS

P1 Prepare and paint metalwork (external)

Prior to painting works, treat areas of exposed metal with phosphoric neutraliser and spot prime with zinc rich primer, ensuring paint manufacturer can provide warranties for all coats.

Prepare and paint all metal work in accordance with the specification. Remove loose, rusted and flaking metal material with a non-ferrous still bristle brush and spot prime with zinc rich primer. All preparation is to be undertaken in accordance with AS 4361.1 and AS4361.2 guide to hazardous paint management. Apply minimum of one full primer coat and two finishing coats as specified and in accordance with the paint manufacturer's specification.

P2 Prepare and paint timberwork

Prepare and paint all timber work in accordance with the specification. Remove all loose and flaked paint, fill and patch all holes, dints and the like, sand and prepare to receive paint. Prime all exposed timber. All preparation is to be undertaken in accordance with AS 4361.1 and AS4361.2 guide to hazardous paint management. Apply paint system with a minimum of two finishing coats and in accordance with the paint manufacturer's specification in selected colour and finish as per the Architect's specification.

P3 Prepare and repaint external cast iron downpipe

Prepare and repaint all cast iron downpipes accordance with the specification. Remove all loose and flaked paint. Apply paint system in accordance with the paint manufacturer's specification. All preparation is to be undertaken in accordance with AS 4163.2 1998 Guide to Lead Paint Management.

P4 Prepare and paint hard plaster

Prepare and paint all hard plaster walls in accordance with the specification. Carefully clean down walls/ceilings from water marks and water-borne debris as per repair codes **INT4 & INT5**. Contain water run-off so that other areas are not affected. Do not over-wash, and do not use chlorine-based bleach. Wipe off all residues at completion of cleaning. Prepare existing painted plaster by removing all loose and flaked paint from wall (unless otherwise specified as per repair code **INT5**), fill and patch repair and sand back to sound surface finish. Do not feather paint edges. Apply paint system, allowing for a minimum of the coats and dwell times inbetween. All preparation is to be undertaken in accordance with AS 4163.2 1998 Guide to Lead Paint Management.

ROOF AND RAINWATER GOODS REPAIRS

CODE	WORKS

RW1 Replace lead sheet flashing

Cut out damaged lead sheet flashing to reglet, remove all the lead sheet including wedges, clips, nails and the like. Where welted, carefully unfold the welt ensuring that the adjacent sheet does not fatigue because of the works. Install a new lead sheet, dress down and fix with clips, threaded copper nails and re-mortar to match existing adjacent. Where nominated form and reinstate folded welt and dress down. Apply two coats of patinating oil lead work. Apply one coat prior to folding the welt and second coat at completion of works.

LEADED GLASS WINDOW WORKS

This methodology is to be read in conjunction with Almond Glass' *Stained Glass Audit Report Combined 231127.* Full extent of stained glass window repairs is to be confirmed with Almond Glass and the Architect following full site access.

Qualification: Use only an appropriately experienced and qualified stained/leaded glass conservator to undertake the stained/leaded glass window conservation/restoration works. Preferred contractor:

- Almond Glassworks

  Email: bruce@almond-glass.com / Phone: +613 95685307

  Website: www.almond-glass.com

CODE	WORKS
LGW1	**Retain stained glass window on site, localised repair and gentle clean** Hand wash all stained glass windows to remove any deposits of soot, dust and other particulates. Undertake trial using first pure distilled water. If water alone is insufficient, use de-ionised detergent with neutral pH. Prior to cleaning, confirm the stability of the paint surface. If required, undertake delicate cleaning with cotton swabs. Do not damage painted surfaces of glass. Do not rub too vigorously that damage may occur. Do not use bristle or wire brushes. Remove drops of modern paint where required. Replace isolated pieces of broken glass to match opacity, colour, thickness, texture, pattern and other aesthetic characteristics of existing glass. Where existing painted/enamel surfaces, apply new painted/enamel paint to match existing detail, colour and finish. Repair glass cracks using appropriate techniques. Make good saddle bars. Replace lead/copper tie where required. Prepare and paint. Make good lead flashing Full extent of repair works as per Almond Glass report.

METAL WORKS REPAIRS

CODE	WORKS

M1 Clean back brass to bare metal and protect

Note: Cleaning of brass is a highly specialised skill. Contractor is to allow to engage a properly qualified sub-contractor to undertake the works

Undertake sample of cleaning work to original brass work in-situ to determine correct methodology. Contractor is to allow for up to 3 samples to be completed for review and approval by the Architect.

Using a light metal de-greaser, clean back brass using a soft cloth or soft bristled brush to remove surface contaminants. Clean down with distilled water and hold for inspection.

If degreaser does not remove surface contaminants from brass, contractor is to carefully undertake localised samples using varied levels of both abrasive powder and high grit sand paper to determine the correct method without damaging the brass. Samples to be inspected and approved by Architect prior to application wholesale. If higher grit sand paper returns no result, contractor is to use progressively rougher sandpaper until the desired finish is achieved. Allow to apply isopropyl alcohol to the brass to ensure a clean surface free of contaminants.

Following cleaning of the brass to the required finish, apply brass wax polish (***Renaissance Wax Polish)*** to metalwork wholesale.

Apply protective lacquer to brass following cleaning a waxing to prevent tarnishing. In-situ trials are to be completed to the satisfaction of the Architect prior to commencing full scope of works.

Contractor is to provide a supply of brass wax and lacquer to the client, to allow for periodic waxing every 6 months to ensure desired finish is maintained.

M2 Remove, retain, clean and reinstate existing copper bird proofing

Carefully pry full extent of copper sheet from stonework in full pieces, avoid bending that may cause copper to snap. Removal is to be done carefully to ensure fixing points do not pull away stone.

Using a soft bristle brush, clean all debris from copper work, ensuring all nails, welts and sheets are maintained in good condition.

Using new copper nails, refix copper plates back to original position, reusing existing fixing points throughout (do not make new fixing points). If required, fill existing fixing points with mortar mix as approved in **G5 – Pigmented Mortar Mix Repair** to allow nails a solid fixing point, and install copper welts to cover fixing points. Copper plate is to be installed flat so as to not allow any water beneath.

INTERNAL WORKS

CODE	WORKS

INT1 Poultice efflorescence

Prior to poultice works architect and conservator are to inspect substrate and paint finish and provide direction.

Undertake samples in situ to determine correct product, methodology and dwell times, for review and approval by the Architect prior to undertaking full scope of works.

Remove any loose sand or salts from hard plaster with a stiff bristle non-ferrous brush to provide a reasonably sound surface. After preparation, apply one coat of Westox Cocoon by trowel or spray at the rate of 6 to 7kg of mixed material per square metre. This will provide a wet film thickness of approximately 10mm. Leave each application for a minimum of 14 days before removal unless directed otherwise by the manufacturer.

To remove Westox Cocoon (normally after 2 to 6 weeks), simply peel from the substrate and dispose of removed material to an appropriate land fill area.

If allowed to dry, the Westox Cocoon will peel off and any residue will wash off with water. Flush machinery thoroughly with clean water after spraying. Allow for full repointing to the area of the degraded mortar.

To stonework, undertake additional cleaning in accordance with **INT2,** as required.

INT2 Clean stonework

Undertake localised cleaning samples to determine the methodology for the full extent of works, to the satisfaction of the architect. Allow to undertake samples for each type of stain, noting that each different stain may require different methodologies, to be reviewed and approved by the Architect. Sample will be used as the baseline finish for the remainder of the works. Allow to only use water-based products.

Brush surface with a soft bristled brush to removal all dust and debris, and lightly clean with deionised water. Allow to dry, and clean further with detergent, warm water and a soft nylon bristle brush. Allow to dry.

Apply specified organic solvent cleaning agent (allow to use Westox *Cocoon*) to stained area and clean away with deionised water, capturing all run off and disposing off-site. Allow for a 2 week dwell time, until the applies poultice detaches from the surface.

Architect to inspect cleaned surface upon completion. If stain remains, undertake cleaning process again until stain is removed without adversely affecting the substrate.

INT3 Clean decorative treatment to hard plaster

Undertake localised cleaning samples to determine the methodology for the full extent of works, to be reviewed and approved by the Architect prior to commencing full scope of works. If cleaning samples begin to stain or otherwise damage the distemper finish, works are to stop and architect and conservator invited to site to review and provide direction.

CODE	WORKS

Where particulate matter remains following light brushing using a soft bristle brush, clean surface using a slightly damp soft sponge using deionised water. Ensure all run off is captured and moisture is allowed to dry out.

INT4 Clean water staining to substrate

Undertake localised cleaning samples to determine the methodology for the full extent of works, to the satisfaction of the architect.

Undertake localised moisture readings to the surface to determine if water ingress is ongoing. If moisture remains in the surface, undertake poultice efflorescence in accordance with **INT1.**

Following removal of moisture and salts from the surface, locally clean the surface in accordance with **INT3.**

INT5 Treat blistering/delaminating paint treatment to re-adhere to substrate

Prior to paint treatment works architect and conservator are to inspect substrate and paint finish and provide direction. Methodology and material is to be tailored to each damaged area, with each individual area requiring specific methods.

Undertake localised treatment samples to determine the methodology for each type of works, to the satisfaction of the architect, prior to the commencement of the full scope of works.

Where delamination of distemper finish is severe, use a solution of 1% funori to relax the existing paint finish back into position, followed by a light application of sturgeon glue to re-adhere the distemper back to the substrate.

Prepare and paint any lost areas of distemper finish to match existing adjacent mix and finish.

If relaxation of distemper damages the paint finish, works are to stop and architect and conservator to confirm correct course of action

INT6 Inject cracks to hard plaster

Methodology is to be read in conjunction with conservator's investigation report.

Specific methodology for crack repairs to be discussed on-site with contractor, architect and conservator, noting each repair may be tailored to the individual repair. Undertake samples of plaster injection repair in-situ to the satisfaction of the architect to determine the approved methodology. The agreed sample shall be the method to which plaster injection repair works are to be undertaken and assessed.

Carefully drill 3mm holes on a grid of 200mm across the area of detachment and along lower edge. Use manual drill to control speed. Remove internal dust and debris by vacuum cleaning. Identify non required exit points/cracks and fill with plaster prior to grouting. Inject approved grout (assume Mapei Antique F21 or Kremer PLM-A) slowly via drilled holes or crack line from bottom to top (to expel air pockets) using a large syringe

CODE	WORKS

fitted with large suitable needle. Monitor the amount of grout to avoid excessive uptake. Any escaped grout must be cleaned off immediately with a damp sponge. Carry out grouting in several applications to avoid build-up of internal pressure. Repair hairline cracks and drilled holes with approved plaster to match existing adjacent finish. Where plaster is crazing, allow to apply a thin skim coat to full extent of repair area prior to repainting works.

INT7 Repoint sandstone

Provide samples of sandstone mortar for approval by the architect prior to undertaking works. Samples to include:

- 0.5 x lineal meter on loose board, to determine mix and pigment
- 0.5 x lineal meter in-situ, to determine match with adjacent pointing

Rake out decayed and damaged mortar from joints by hand, do not widen joints, do not use grinders ort any machinery. Clean out open joints with compressed air. Repoint the joint in specified mortar mix to match existing adjacent mortar in colour, texture and profile.

To minimise cleaning of the stone, do not smear excess mortar over the face of the stone. Ensure works are undertaken with care not to cause damage or additional cleaning of stone.

INT8 Replace sandstone (flat)

Undertake localised core hole samples to stone nominated for demolition to determine stone type and depth.

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone. Carefully demolish existing decayed and/or damaged stone, do not damage adjacent stones nominated for retention. Carve and install new stone to match the existing details, sizes, finish and depth. Depth is to match existing stone, noting depths may differ pending stone core sample results.

Install new stone with all new bedding mortar, allowing for grade 316 stainless steel dowels, armatures and the like. Do not feather new work into existing, undertake all sweetening required to install blocks. All sizes are to be confirmed on site following access via the scaffold or the like.

Repoint stone as specified to match existing adjacent.

INT9 Replace sandstone (moulded)

Undertake localised core hole samples to stone nominated for demolition to determine stone type and depth.

Record existing profiles and dimensions to produce templates and to prepare shop drawings for new stone. Carefully demolish existing decayed and/or damaged stone, do not damage adjacent stones nominated for retention. Carve and install new stone with

CODE	WORKS

mouldings, profiles and the like to match the existing details. Depth is to match existing stone, noting depths may differ pending stone core sample results.

Install new stone with all new bedding mortar, allowing for grade 316 stainless steel dowels, armatures and the like. Do not feather new work into existing, undertake all sweetening required to install blocks. All sizes are to be confirmed on site following access via the scaffold or the like.

Repoint stone as specified to match existing adjacent.

INT10 Indent sandstone (flat)

Demolish existing damaged portion of stone as nominated, noting that damage may extend beyond visible cracking and require further investigation following localised demolition.

Carve and install new indents in specified stone. Carve or cut indents from new stone and install grade 316 stainless steel dowels with epoxy to fix new stone indents into position.

Indents to be cut flush and tight without joints. Do not feather new work into existing, undertake all sweetening required to install indents. All indent sizes are to be confirmed on site following access via the scaffold or the like.

Repoint mortar joints where applicable (noting body of stone is to be knife jointed), as specified to match existing adjacent.

INT11 Indent sandstone (moulded)

Demolish existing damaged portion of stone as nominated, noting that damage may extend beyond visible cracking and require further investigation following localised demolition.

Carve and install new indents in specified stone. Carve or cut indents from new stone and install grade 316 stainless steel dowels with epoxy to fix new stone indents into position. All mouldings and profiles are to match existing adjacent. Submit samples of work for approval prior to fixing in place.

Indents to be cut flush and tight without joints. Do not feather new work into existing, undertake all sweetening required to install indents. All indent sizes are to be confirmed on site following access via the scaffold or the like.

Repoint mortar joints where applicable (noting body of stone is to be knife jointed), as specified to match existing adjacent.

INT12 Remove embedded item

Remove embedded metal or timber item, where required cut out surrounding hard plaster or masonry to allow embedded items to be removed. Clean with compressed air or water.

Where holes are to hard plaster, patch repair render to match original. Where moulded, re-form profile in-situ to match original profile. Build up render in three or more coats and

CODE	WORKS

give finish to match existing. Ensure each render coat is given sufficient time to cure before application of the next coat. Ensure coats key into coat below.

Where holes are to masonry substrate carry out pigmented mortar repair with approved colour matched mortar mix. Provide samples of colour matched mortar for review and approval by the architect. Where holes are larger than 30mm in diameter to brickwork, cut out and replace the brick with salvaged brick to match existing.

INT13 Pigmented mortar mix repair

Undertake mortar repair samples for each individual substrate in-situ to match adjacent colour, texture and physical characteristics to the satisfaction of the architect. The agreed sample shall be the method for which mortar repair works shall be undertaken and assessed. Prepare three different colours per substrate.

Carry out mortar repair to areas of masonry work ensuring arrises and mouldings are restored. Where required, build up an armature of stainless steel screws and wire into substrate ensuring arrises and mouldings are restored. Apply mortar mix to the armature forming required profiles. Mortar colour is assumed to be achieved from sands and additional natural pigment if required. Ensure mortar colour matches adjacent material.

INT14 Repoint bluestone

Provide samples of bluestone mortar for approval by the architect prior to undertaking works. Samples to include:

- 0.5 x lineal meter on loose board, to determine mix and pigment
- 1 x lineal meter in-situ, to determine match with adjacent pointing

Rake out decayed and damaged mortar from joints by hand, do not widen joints, do not use grinders. Clean out open joints with compressed air. Repoint the joint in specified mortar mix to match existing adjacent mortar in colour and texture.

To minimise cleaning of the stone, do not smear excess mortar over the face of the stone. Ensure works are undertaken with care not to cause damage or additional cleaning of stone.

Sandstone joints are to be recessed 2mm back from the face of the stone and to be brushed back to expose the aggregate and give a weathered finish to match the existing adjacent in finish and profile. Do not widen joints.

INT15 Repoint marble and alabaster

Provide samples of marble and alabaster pointing mortar for approval by the architect prior to undertaking works. Samples to include:

- 0.5 x lineal meter on loose board, to determine mix and pigment
- 1 x lineal meter in-situ, to determine match with adjacent pointing

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Sample process is to continue until a perfect match to the existing pointing mortar is achieved.

Rake out decayed and damaged mortar from joints by hand, do not widen joints, do not use grinders. Clean out open joints with compressed air. Repoint the joint in specified mortar mix to match existing adjacent mortar in colour and texture.

To minimise cleaning of the stone, do not smear excess mortar over the face of the stone. Ensure works are undertaken with care not to cause damage or additional cleaning of stone.

INT16 Replace tiles

Tile source, colours, laying methodology to be confirmed. Contractor is to allow to undertake full dilapidation survey/scan to ensure existing tile layout is recorded accurately. Survey to be reviewed and approved by Architect prior to any further works.

Prior to commencement of works, Architect is to confirm areas of original tiles to be protected in-situ and carefully cut from floor in full pieces for replication. Allow to retain a minimum of 10 original tiles per shape and colour. Contractor is to send original retained tiles to manufacturer for matching, and provide multiple samples of matching tiles (allow minimum 5 sample trials per tile) for review and approval by the architect.

In stages, carefully lift all existing geometric tiles from the existing substrate, ensuring no damage to the substrate or adjacent fabric. Substrate is to be inspected by Architect and structural engineer while exposed. Where cracks are present in substrate, structural engineer is to provide in-situ repair methodology. Allow to re-screed full extent of Cathedral to create homogenous substrate.

Allow to take samples of existing mortar mix to match ratios and materials.

Following approval of both the replacement tiles and substrate, lay all new tiles to match existing in traditional wet-bedding method, to match existing mix if possible.

Allow to introduce new expansion joints to floor tiles wholesale, location, material and size to be confirmed.

Finish and slip rating to be confirmed.

INT17 Repair and re-finish pews

Label each individual pew to the church with a small, metal plate tacked to the seat underside, to ensure all pews are returned to their existing position. Contractor is to provide a full dilapidation survey (including drawing) noting pew label/number, location and finish for future works.

Pews are to be periodically removed in stages (to be confirmed) off-site for repairs as required, cleaning and re-finishing.

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Once off-site, Architect is to inspect and assess for damage and repair works. Where timber is rotting/damaged beyond repair, cut out damaged timber and splice in new section to match existing timber species (Oregon/Kauri), profile and the like.

Varnished pews

Remove all soiling and staining to the pews, and remove varnish to pew wholesale. Where stain has been lost to timber underneath, allow to re-stain full extent of pew. Following review and approval by Architect, apply shellac finish to whole pew

Shellac pews

To pews with an existing shellac finish, locally remove staining and soiling using a mineral spirit/water solution (ratio to be confirmed). Following review and approval by Architect, apply new finish coat of shellac to pew wholesale.

INT18 Clean marble and alabaster

Methodology is to be read in conjunction with conservator's investigation report.

Undertake localised cleaning trials in situ to determine correct method for cleaning each individual substrate. Note there may be multiple cleaning methods for one element showing varied levels of damage/grime. Allow for a minimum of 3 trials per substrate, for review and approval prior to proceeding with the full scope of works.

Alabaster

Following review and approval of cleaning methodology, clean full extent of alabaster tabernacle and throne as per conservator's advice, using a deionised water poultice and soft brush.

Marble (Emperor Red & Belgian Royal Rouge)

As per conservator's scope, structural engineer is to inspect the main altar to assess footings and bearing capacity of the marble following moisture retention. Source of water is to be confirmed and addressed prior to any repair works.

Following leak source rectification, undertake sampling of poultice application to draw moisture and salts out of marble. Allow to leave altar to dry out prior to any further works.

Following review and approval of cleaning methodology, clean full extent of marble as per conservator's advice, using a deionised water poultice and soft brush.

INT19 Clean timber ceiling and trusses

Contractor is to provide full access to ceiling, trusses and moulded elements at height. Protect spaces beneath with tarps and the like prior to cleaning to prevent excessive dust movement. Full extent of timber ceiling, trusses, moulded timber work and associated spaces is to be carefully vacuumed to remove all dust and particulate material, and inspected by Architect to determine if further cleaning is required.

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If further cleaning is needed, undertake samples of cleaning with a damp cloth using water only. If water in ineffective, a solution of alcohol/water is to be sampled and approved. Wipe down all surfaces to remove any remaining dust and particulate material to the satisfaction of the Architect.

INT20 Localised plain or flat hard plaster repair

Prior to undertaking repairs, architect is to review area in-situ and confirm extent of repair and repair type. Works to be undertaken in accordance with repairs **INT3**, **INT4** and **INT5** to retain as much original decorative treatment as possible.

Clean out area with compressed air to remove all dust and debris. Inject perimeter of area, working from the top down, with Westox RAP Primer and adhesive following curing time in accordance with manufacturer's specification. For masonry walls allow to dampen wall with water prior to commending any inject of Westox RAP. Form new plaster with render coat, set coat and finish coat as specified. Make pattern from original undamaged moulding. Finish to an even surface free from irregularities and consistent in finish to existing plaster. Finish new plaster to blend in with retained surrounding plasterwork.