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3. GENERAL REQUIREMENTS

1 GENERAL

1.1 GENERAL

All work under this contract must be carried out in strict accordance with the details shown on each individual Schedule of Works specification and drawings for that particular contract, with the requirements of the General Conditions of Contract and to the satisfaction of the Principal's Representative / Conservation Architect.

The contract consists of a Lump Sum Tender Contract for the External Repairs at Dubbo Railway Station and Station Masters Residence, as specified and shown on the drawings.

All work is to be carried out in accordance with the drawings and specification.

1.2 REFERENCED DOCUMENTS

Current editions

General: Use referenced documents, which are editions, with amendments, current one month before the closing date for commencement of work, except where other editions or amendments are required by statutory authorities.

Contractual relationships

Responsibilities and duties of the principal, contractor and contract administrator are not altered by requirements in referenced documents.

General standards

Refer to relevant standards.

1.3 INTERPRETATION

General

Unless the context otherwise requires, the following definitions apply:

- Supply: "Supply", "furnish" and similar expressions mean, "supply only".
- Provide: "Provide" and similar expressions mean "supply and install".
- Approved: "Approved", "reviewed", "directed", "rejected", "endorsed" and similar expressions mean "approved (reviewed, directed, rejected, endorsed) in writing by the Principal".
- Give notice: "Give notice", "submit", "advise", "inform" and similar expressions mean "give notice (submit, advise, inform) in writing to the Principal".
- Obtain: "Obtain", "seek" and similar expressions mean "obtain (seek) in writing from the Principal".
- Proprietary: "Proprietary" mean identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Samples: Includes samples, prototypes and sample panels.
- The Contractor means whoever is carrying out the work.

- Principal's Representative : Contract Manager from RailCorp.
- Heritage Architect / Conservation Architect : Heritage Specialist appointed by RailCorp.
- Superintendent : Principal's site representative appointed by RailCorp.

Maintenance period

Co-extensive with the defects liability period.

1.4 SCHEDULE OF WORKS, PRICES AND COMPLETION TIME

The Schedule of Works and Prices is to form part of the contract.

Prices in the Schedule include allowance for materials, demolition, waste, transport, labour overhead and profit. All waste, or materials or equipment which is no longer serviceable or are not required by the Principal, are to become the property of the Contractor and must be removed from the Site, unless otherwise specified.

The appropriate prices in the Schedule will apply in respect of substitutions to, variations to, additions to, deductions from or omissions from any Works Order issued under the contract.

The Department reserves the right to invite written quotations for any works, or group of works that may be included in the Schedule.

The Contractor shall execute the work under the Lump Sum Tender contract to Practical Completion by the date specified.

1.5 SITE SAFETY MANAGEMENT PLAN

The Contractor will need to incorporate and take into consideration operational procedures in relation to the Station in the "Site Specific Safety Management Plan". The Contractor is to prepare and issue the "Site Specific Safety Management Plan" for Dubbo Railway Station and Station Masters Residence, to the Principal's Representative, and gain acceptance prior to commencement of works on site.

1.6 WORK HOURS

Works shall not be carried out outside the normal working hours being:

- Monday to Friday, 7:30am to 5:00pm
- Saturday, 7:30am to 3:00pm.

During construction of the works, materials and the work are to be made secure so as any item cannot be removed, damaged or vandalized, etc.

The Contractor shall discuss with the Principal's Representative any item that he feels he is unable to secure at the conclusion of work in a satisfactory manner, for RailCorp to make alternative arrangements.

Note: The Contractor is not responsible for costs arising from damage to any work that the Contractor has left in a secure state.

1.7 SPECIAL SECURITY ARRANGEMENTS

During the period of the contract, particularly any works to doors and windows, the Contractor has to ensure absolute security is maintained.

1.8 CLEANING AND CARE OF PROPERTY, ETC.

The Contractor is responsible for the clean up of work related to trade waste inside and outside the building.

The Contractor shall employ a professional cleaner to ensure this task is done to the satisfaction of the Principal's Representative. All cleaning necessary for the satisfactory completion of the Works is to be allowed for fully in the tendered lump sum.

If the cleaning work is not carried out to the satisfaction of the Principal's Representative and in accordance with his instructions an independent cleaner will be engaged to carry out the work. All costs incurred by this independent cleaner will be deducted from the contract.

1.9 NOTICE AND PERMITS

The Contractor shall comply with all such Ordinances, Regulations and By-Laws as shall be binding upon RailCorp in relation to the Works, and shall give all notices and obtain all permits and pay all fees necessary in connection therewith.

1.10 SITE AMENITIES

The Contractor is responsible for providing his own site amenities, lunchroom, storage, toilets etc. Use of existing facilities to be negotiated with the Principal's Representative.

1.11 OCCUPIED DWELLINGS

The Contractor shall comply with the following when carrying out work on occupied dwellings:

- If there are circumstances where entry is refused to carry out work, contractors are to leave the site and contact the Principal's Representative immediately.
- In vacant dwellings programmed for construction on related works, contractors may come across situations where there are illegal occupants within the dwelling. If this occurs contractors are to leave the site and contact the Principal's Representative immediately.
- Contact occupants before proceeding entering the property.
- There may be hazardous buildup of rubbish in some properties. Where this occurs removal or relocation should be undertaken with care.
- Contractors should never work alone in occupied dwellings.
- Arrange access with the occupants of RailCorp dwellings for any construction and maintenance work which require the activities to be carried out from the inside of the dwelling (Note: In some cases seven days notice may be required).

1.12 SCOPE OF WORK**Outline**

The works shall comprise the provision of all materials, labour, transport, tools, plant, applications, payment of fees and everything else necessary for the construction, installation, testing, commissioning, twelve (12) months maintenance and defects liability of the works as detailed in this specification, together with all minor and incidental work not specifically mentioned herein, to the true intent and meaning of this specification and the accompanying drawings.

The works of the Contract include but are not necessarily limited to the following:

Dubbo Railway Station

General

- The scope of works includes those items indicated on all drawings and in the specification.
- Reinstate all missing air vents with new cast iron units to match the original. Retain and re-use all existing cast iron air vents into existing locations.
- Unblock, clean, and test all drainage lines and pits on the property. Maintain during the contract.
- Provide synthetic stone repair to all items identified on the drawings and as specified.
- Remove inserts in stone and synthetic stone patch as specified and as indicated on the drawings.
- Provide new stone replacement and indent stone replacement to all items identified on the drawings and as specified.
- Provide a new damp proofing course (DPC) across both skins of stonework, ensure complete horizontal coverage. External skin DPC to be polyethylene or other approved continuous material, install during stone replacement works. Internal skin to have chemical DPC, provide gravity feed system similar or equal to "Tech-Dry". Install from external face during replacement of external stone units. The gravity feed damp course fluid to be Silane Siloxane impregnated into mortar joints between stones in accordance with Tech-Dry installation requirements. Both damp proofing courses to overlap to ensure full coverage. Locate the DPC at the base of all the walls in the first horizontal bed joint above the external ground level or as directed by the principal's representative. Repair all damage caused by insertion of DPC.
- Remove / dismantle all items necessary to undertake the works and reinstate all on completion.
- Re- direct all service lines as required to undertake the works.
- Redirect service line located in stone O62 at the East end of the South Elevation, re-locate entry point below stone Q38.
- Provide all items and works as indicated on the engineer's drawings.
- Remove the grated drainage adjacent the northern elevation of the railway station, located on the platform. Provide a new grated drain and drainage as indicated on the drawings. Connect all adjacent downpipes into new drain. Reinstate and repair the concrete paving to match the existing on completion of the drainage works.
- Alter existing grated drainage at downpipes and extend existing downpipes to discharge into grated drains. Refer to drawings.
- Core hole through concrete paving and extend existing downpipes to discharge into existing drains, in two locations.
- Provide scaffolding as specified

Scope: Dubbo Railway Station Master's Residence

- The scope of works includes those items indicated on all drawings and in the specification.
- Reinstall all missing air vents with new cast iron units to match the original. Retain and re-use all existing cast iron air vents into existing locations.
- Provide four new openings in sub floor walls for cross ventilation, as indicated on the engineer's drawings.
- Unblock, clean, and test all drainage lines and pits on the property. Maintain during the contract.
- Provide synthetic stone repair to all items identified on the drawings and as specified.
- Remove inserts in stone and synthetic stone patch as specified and as indicated on the drawings.
- Provide new stone replacement and indent stone replacement to all items identified on the drawings and as specified.
- Provide a new damp proofing course (DPC) across both skins of stonework, ensure complete horizontal coverage. External skin DPC to be polyethylene or other approved continuous material, install during stone replacement works. Internal skin to have chemical DPC, provide gravity feed system similar or equal to "Tech-Dry". Install from external face during replacement of external stone units. The gravity feed damp course fluid to be Silane Siloxane impregnated into mortar joints between stones in accordance with Tech-Dry installation requirements. Both damp proofing courses to overlap to ensure full coverage. Locate the DPC at the base of all the walls in the first horizontal bed joint above the external ground level or as directed by the principal's representative. Repair all damage caused by insertion of DPC.
- Carefully lift off the top brickwork portion of chimneys from top down to stonework in one piece (by crane), replace chimney stone units and reinstall intact top brickwork portion of chimney, make good any damage to chimney during process.
- Provide new lead flashings around base of chimneys. Make good to roofing in area of chimney disturbance.
- Remove / dismantle all items necessary to undertake the works and reinstall all on completion.
- Provide all items and works as indicated on the engineer's drawings.
- Provide new sub surface drainage and membrane around residence as indicated on the drawings. Connect sub surface drainage to existing stormwater drainage lines.
- Re-direct all service lines as required to undertake the works.
- Reinstall all paving around building on completion of drainage works.
- Provide drainage where required to ensure that all existing condensate pipes and downpipes drain into the stormwater system.
- Provide new stormwater drainage lines from downpipes of shed (located adjacent residence) to existing stormwater system.

- Re grade existing ground levels around building to ensure all surface water drains away from building without pounding. Reinstall / provide new grass and shrubs to disturbed areas.
- Relay / redirect all water sprinklers to ensure that water is not sprayed on the building and paved areas.
- Provide scaffolding as specified

1.13 TENDER DRAWINGS

General

The drawings supplied with the specification at the time of tendering are to be considered as diagrammatic and approximate only. These drawings, however, together with the specification, are intended to be mutually explanatory and to show the scope of the work required. All work set forth by one, if not by the other, shall be fully executed.

List of Drawings / Documents

Drawings accompanying this part of the specification and forming part of the work are listed below.

Architectural: **Dubbo Railway Station**

- A00** Passenger Station – Main Building – Site Plan
- A03** Passenger Station – Main Building – South Elevation - West end
- A04** Passenger Station – Main Building – South Elevation – East end
- A05** Passenger Station – Main Building – East Elevation & Verandah Elevations
- A06** Passenger Station – Main Building – North Elevation
- A07** Passenger Station – Main Building – West Addition

Dubbo Station Master's Residence

- A05** Station Master's Residence – East Elevation
- A06** Station Master's Residence – North Elevation
- A07** Station Master's Residence – West Elevation
- A08** Station Master's Residence – South Elevation

Engineering: **Dubbo Railway Station & Station Master's Residence**

- 05.56.11** Station masters Residence & Railway Station Dubbo – Notes
- 05.56.12** Station masters Residence & Railway Station Dubbo – Platform Drainage
- 05.56.13** Station masters Residence & Railway Station Dubbo – Platform Drainage
- 05.56.14** Station masters Residence & Railway Station Dubbo – Subsoil Drainage
- 05.56.15** Station masters Residence & Railway Station Dubbo – Sub Soil Drainage

SERVICES SEARCH RESULTS - Document with a total of 22 pages.

1.14 ADDITIONAL WORK

Due to the continued deterioration of the building fabric further work may be uncovered which requires additional repair not covered by the scope of works. Allow to advise Principal and gain approval prior to starting any additional works.

Technical information supplied by the successful Tenderer will become part of the contract documents.

1.15 DILAPIDATION RECORD**Requirement**

Record the condition of the works area prior to work commencement. The Principal's Representative shall be notified in writing of any defects. Defects not recorded and notified prior to work commencement shall be deemed to be the Contractor's responsibility and shall be made good at the Contractor's own costs.

Joint Inspection

Before commencement of work on site, arrange a joint inspection with the Conservation Architect and Principal's Representative.

Records

Make written and photographic records of the condition of the buildings in this contract and adjoining properties, structures, facilities, surfaces, etc., which are in a damaged condition or may be damaged during the Works. Furnish one endorsed copy of each record to the Principal's Representative and keep another set on the Site.

Damage Assessment

Use the dilapidation record amongst other things as a means of assessing the responsibility for damage and/or making good arising out of the performance or work under the contract. Keep a copy of the record on site, and make it available for inspection when required.

2 QUALITY**2.1 QUALITY ASSURANCE****Inspection and Test Plans Schedule**

Prepare and use Inspection and Test Plans (ITP) for the following activities. Incorporate the listed Hold and Witness Points, which require attendance by the Principal's Representative and the Conservation Architect.

Contractor must maintain the Inspection and Test Plans Schedule during the contract period. The Inspection and Test Plans Schedule must be progressively signed off by the Contractor and the Principal's Representative, as each of the Hold Points and Witness Points are attended and to the satisfaction of the Conservation Architect and the Principal's Representative.

INSPECTION AND TEST PLANS SCHEDULE

SPEC'N SECTION	ACTIVITY REQUIRING INSPECTION	STAGE OF WORK REQUIRING INSPECTION	HOLD POINT (H) OR WITNESS POINT (W)	ATTENDANCE BY CONTRACTOR (C) PRINCIPAL'S REPRESENTATIVE (PR) / SUPERINTENDENT (S)
3	Site meeting, to clarify scope and heritage intent for scaffold.	Prior to commencement of work & approvals	H	C, PR / S
3	Scaffold design to be issued to Superintendent for acceptance	Prior to erection of scaffold.	H	C, PR / S
3	Scaffold design to be issued to Principal's Representative	Prior to erection of scaffold.	H	C, PR / S
3	Undertake joint inspection & submit dilapidation record as specified in section 3.1.15	Prior to commencement of work.	H	C, PR / S
4	Site meeting, to clarify scope and heritage intent for demolition.	Prior to commencement of work.	H	C, PR / S
4	Inspect demolished materials.	Prior to disposal.	W	C & S
5	Site meeting to clarify scope and heritage intent for stonework & Synthetic stone repair	Prior to commencement of work.	H	C, PR / S
5	Site investigation of chimneys to residence	Prior to commencement of works & after erection of scaffold	H	C, PR / S
5	Submit stone sample as for Clause 5.2.3, for approval	Prior to commencement of work.	H	C, PR / S
5	Inspect replacement stone units & indents completed in yard.	Prior to transport to site	H	C, PR / S
5	Inspect replacement stone units & indents on site .	Prior to fixing	H	C, PR / S
5	Mortar & elastomeric sealant pointing & repointing samples for approval	Prior to commencement of work.	H	C, PR / S
5	Inspect existing pointing removal & joint preparation for pointing & repointing	Prior to commencement of work.	H	C, PR / S
5	Submit synthetic stone repair colour control samples as for Clause 6.3, for approval	Prior to commencement of work.	H	C, PR / S
5	Submit all Synthetic stone reinforcement details for approval	Prior to commencement of work.	H	C, PR / S

5	Inspection of sub-base prepared for synthetic stone repair and stainless steel reinforcement in position	Prior to application of synthetic stone mortar mix.	H	C, PR / S
5	Inspection of all synthetic stone repair.	At completion of works.	W	C, PR / S
5	Stonework items.	At completion of work.	W	C, PR / S
6	Site meeting to clarify scope and heritage intent for metal fixtures (cast iron vents, etc.)	Prior to commencement of work.	H	C & S
7	Site meeting to clarify scope and heritage intent for stormwater drainage.	Prior to commencement of work.	H	C, PR / S
7	Testing of drainage system.	At completion of works.	W	C & S
8	Site meeting to clarify scope and heritage intent for landscaping work.	Prior to commencement of work.	H	C, PR / S
9	Site meeting to clarify scope and heritage intent for paving.	Prior to commencement of work.	H	C & S
9	Inspection of paving	At completion of works.	W	C, PR / S
COMPLETION OF ALL WORKS (IF PROGRESSIVE REMOVAL OF SCAFFOLD IS NECESSARY, THEN INSPECTION OF COMPLETED WORK SHOULD BE CARRIED OUT PROGRESSIVELY.)		Prior to removal of scaffold.	H	C, PR / S

2.2 INSPECTION

Notice

The Contractor is responsible for all OH&S and quality issues on site. Contractor's site supervisor / foreman is to be on site each day. Contractor's site supervisor to inspect work prior to pre-handover inspections and to aim for nil defects.

Witness Points: The Contractor is to give notice to the Principal's Representative at the stage of work when the Witness point items listed in the schedule require inspection (one inspection per item).

Hold Points: The Contractor is to give notice to the Principal's Representative at the stage of work when the Hold point items listed in the schedule require inspection. Do not conceal those parts of the works or proceed without approval (one inspection per item).

Minimum notice for inspections to be made: 5 working days for on-site inspections.

Concealed services: Give notice so that inspection may be made of services to be concealed.

2.3 SAMPLES

Timing

Delays: Coordinate submissions of related samples. Do not cause delays by making late submissions or submitting inadequate samples.

Quantity

General: Submit a sample of each designated item and 2 copies of supporting documentation. Include any ancillary items.

Identification

Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include pertinent contract document references. Include service connection requirements and product certification. Identify non-compliances with project requirements, and characteristics that may be detrimental to successful performance of the completed work.

Approval

General: Do not commence work affected by samples until the samples have been approved. Submit further samples as necessary.

Retention

Keep approved samples in good condition on site, until practical completion.

Incorporation

Incorporate in the works samples that have been approved for incorporation. Do not incorporate other samples.

Criteria

Match approved samples throughout the works.

3 HERITAGE CLAUSES

3.1 HERITAGE SIGNIFICANCE

Dubbo Railway Station and Dubbo Station Master's Residence are listed on **The State Heritage Register**. It is of major heritage significance and is an excellent example of its type and construction, built in 1881. Works to the building should involve minimum changes to, and be performed without causing any damage to, the existing fabric or surroundings. The contractor is responsible for gaining all approvals relating to the works.

3.2 HERITAGE APPROACH TO REPAIRS

THE WORK IS TO BE DONE WITH THE OBJECTIVE OF LEAVING INTACT AS MUCH AS PRACTICALLY POSSIBLE OF THE EXISTING BUILDING FABRIC. WHERE ITEMS ARE TO BE REPLACED THEY ARE TO MATCH THOSE OF THE EXISTING UNLESS SPECIFIED OTHERWISE. ALL ITEMS REPAIRED OR REPLACED ARE TO MATCH THE ORIGINAL OR EARLY ITEMS (UNLESS APPROVED BY CONSERVATION ARCHITECT) IN SIZE, PROFILE AND MATERIAL.

SHOULD ANY DOUBT EXIST OVER SPECIFIC ITEMS REGARDING THIS APPROACH, THE CONSERVATION ARCHITECT SHOULD BE CONTACTED.

3.3 PROTECTION

Provide and maintain all necessary protection against the ongoing work to avoid damage to the building, contents or landscape. Allow to make good any damage caused during the works on completion at no additional cost.

3.4 ORDER OF WORK

For external repairs organise the order of work to take place from the top down.

3.5 INSPECTION OF THE SITE

Inspect the site and ascertain all factors affecting execution of the works.

3.6 APPROVED SUB-CONTRACTORS

All trades involved in the repair works must be carried out by sub-contractors and personnel experienced and skilled in the type of work specified.

Submit for approval prior to commencement of work a list of personnel proposed to be used for the work, complete with details of experience, previous work on heritage buildings, etc. List referees who can establish that the nominees have executed the same work to that specified. This information will be taken into account when assessing tenders. Any changes to the nominated sub-contractors as listed under schedule of proposed selected contractors require approval by the Principal's Representative.

3.7 STOCKPILE OF SALVAGED MATERIALS

All material specified or directed to be salvaged during the demolition work shall be carefully stored on site in a secure area protected from the weather as appropriate to the items concerned. Exact extent and location of this compound are to be confirmed prior to commencement of the works.

3.8 CONTROL OF ORGANIC GROWTH

Any organic growth present on chimneys or walls of the buildings (eg. annuals, weeds, figs etc) are to be treated with a proprietary biocide based on a quaternary ammonium compound and incorporating tributyl tin oxide or other proven long-lasting biocide. Apply the biocide with a pneumatic garden-type sprayer to saturate the affected areas without causing splashing or spray drift onto other area. Operators are to be provided with suitable protective clothing. Do not spray in the immediate vicinity of unprotected people. This work should be carried out early in the contract to allow sufficient time for the plants to die and dry out before carefully removing with minimum damage to the masonry.

3.9 ACCESS FOR WORK AND THE USE OF SCAFFOLDING**Requirement**

The Contractor is to provide scaffold access to carry out the works including works to chimneys and wall faces. The access provided shall be adequate for the type of work including levels of each lift and size. Provide for the support of materials needed for each type of work. If scaffolding is used for access it must be used in accordance with general requirements contained in this clause and comply with AS 4576. Ensure that the scaffold is secure from unauthorised access. The Contractor is responsible for obtaining all approvals, permits and certifications necessary for the scaffolding. The Contractor is to submit copies of each to the Principal's Representative throughout the works. Scaffold design to be issued to the Principal's Representative for acceptance prior to scaffold erection.

All scaffold is to comply with AS 4576. Access to each level is to be by stair with ladder access only in locations as approved by Principal's Representative.

Protection

All work shall be performed without causing any damage to the existing fabric. Make good any such damage to match existing at no cost to the client. Provide all necessary protection of building surfaces from damage resulting from the provision, use and removal of all scaffolding and hoists etc.

Isolate points of contact or potential contact with the façade. Tubes shall be wrapped in carpet or spaced with non-staining plastic coated timber blocks.

Do not attach scaffold directly to stonework or brickwork. Use ties through semi-open windows breaking no glass and seal the openings against dust and weather. Tie in using well-padded tube kept clear of any joinery, architraves etc. bearing against timber pads onto the plaster. Fit temporary plywood weather protection panels over the open window area. Cut neat holes in panel to take scaffold tube and provide an approved weather seal.

Provide sole plates to scaffolding legs so as to cause no damage to the original paving.

Materials

Scaffolding components shall be free of rust and cleaned free of mortar, concrete and debris from other jobs.

3.10 ARCHAEOLOGICAL RELICS

If any excavation is to be carried out, the Contractor shall engage an archaeologist with a watching brief or other requirement as directed by the NSW Heritage Office, and obtain an excavation permit from the NSW Heritage Office prior to the commencement of excavation.

If any relic (as defined in the Heritage Act 1977) is found during the works, notify the Principal's Representative and Conservation Architect at once and stop work until the relics are assessed.

3.11 MANDATORY HERITAGE WORK INDUCTION

Contractor is to ensure that all workers carrying out work under this Contract have attended a mandatory heritage induction by the Heritage Architect before commencing work on site.

END OF SECTION - GENERAL REQUIREMENTS

4. DEMOLITION

1 GENERAL

1.1 CROSS REFERENCES

Extent of Work

Work to include all necessary demolition to carry out and complete the works to:

Dubbo Railway Station & Station Master's Residence

The works include but are not necessarily limited to the following;

The contractor is to:

- (a) Allow for removal of redundant services, eg. piping and fixings in areas approved by the Principal's Representative / Heritage Architect.
- (b) Any items listed in Scope of Works 3.1.12. and on the drawings.

General

Refer to the *General Requirements* section.

Related sections

Refer to the following sections:	Section 3:	General Requirements
	Section 5:	Stonework
	Section 14:	Drainage
	Section 15:	Landscape

1.2 STANDARD

General

Demolition: To AS 2601.

2 QUALITY

2.1 INSPECTION

Give sufficient notice so that inspection can be made at the stages indicated in the inspection and test plans schedule located in section 3.2.1 for witness and hold points.

3 MATERIALS AND COMPONENTS

3.1 DEMOLISHED MATERIALS

Demolished materials

Re-use: If it is proposed to re-use demolished materials in the works, submit proposals.

Salvage: Recover without damage materials to be salvaged and re-used with the works.

Removal: Only remove demolished materials from the site after the Principal's Representative / Heritage Architect has inspected them for possible re-use or storage. Do not burn or bury on site.

- Transit: Prevent spillage of demolishing materials in transit.

The contractor is responsible to remove from the site all materials not required by the Principal's Representative / Heritage Architect for re-use or storage. The contractor is to keep the site clean on a daily basis.

4 EXECUTION

4.1 SUPPORT

Temporary support

Existing buildings: Until permanent support is provided, provide temporary support for sections of existing buildings which are to be altered and which normally rely for support on work to be demolished.

Adjacent structures: Provide supports to adjacent structures where necessary, sufficient to prevent damage resulting from the works.

- Lateral supports: Provide lateral support of at least that given by the structure to be demolished, using shoring or other approved method.
- Vertical supports: Provide vertical support where necessary using piling, underpinning or other approved method.

4.2 PROTECTION

Weather protection

If walls or roofs are opened for alterations, additions or the surfaces of adjoining buildings are exposed, provide temporary covers to prevent water penetration. Provide covers to protect existing plant and equipment and materials intended for re-use.

Dust protection

Provide dust-proof screens, bulkheads and covers to protect existing finishes and the immediate environment from dust and debris.

Security

If a wall or roof is opened for repair, provide security against unauthorised entry to the building. The building is to be secured at the completion of each day's work.

4.3 DEMOLITION

Explosives

Do not use explosives.

4.4 HAZARDOUS MATERIALS

Hazardous materials

Give notice immediately hazardous materials or conditions are found, including the following:

- Asbestos or material containing asbestos.
- Flammable or explosive liquids or gases.
- Toxic, infective or contaminated materials.
- Radiation or radioactive materials.

- Noxious or explosive chemicals.
- Tanks or other containers used for storage of explosive, toxic, infective or contaminated substances.

5 COMPLETION

5.1 COMPLETION**Support**

Temporary support: Clear away after stabilization of element and leave in a sound condition.

END OF SECTION - DEMOLITION

5. STONEMASONRY

1 GENERAL ---

1.1 CROSS REFERENCES

Extent of Work

The works include but are not necessarily limited to the following;

The stonemasonry referred to in this section includes, but is not necessarily limited to, the following items and related subsections;

- Provision of scaffold access for work areas to comply with all current standards and regulations. Includes all approvals, permits and traffic control.
- Stonemasonry – Subsections 5.1, 5.3, 5.4 & 5.6. Shop Drawings are required for all works in this contract.
- Sandstone Supply – Subsection 5.2. Replacement to be 'Consolidated' sandstone.
- Stone Processing – Subsection 5.3.
- Stonemasonry – Subsection 5.4. Cutting out and removal of stone and stone for stone indents, inserts and units to be replaced;
- Pointing and Repointing – Subsection 5.5. All defective joints to the work area.
- Synthetic Stone Repair – Subsection 5.6. Synthetic stone repair including injection repairs, mortar repairs etc.

All work indicated and listed on drawings and as indicated in the Scope of Works 3.1.12

General

Refer to the *General Requirements* section.

Related sections

Refer to the following sections:	Section 3:	General Requirements
	Section 4:	Demolition
	Section 6:	Metal Fixtures
	Section 9:	Paving

1.2 STANDARD

General

STANDARD: AS3700: Masonry in Buildings, (known as the SAA Masonry Code).
Masonry units: To match existing original.

1.3 QUALITY

INSPECTION

REQUIREMENTS: Co-ordinate with the Principal's Representative so that all work may be inspected in stages as hereinafter specified in the relevant specification subsections and indicated on the inspection test plan schedule.

Notice

Witness points: If notice of inspection is to be given in respect of parts of the works, advise if and when those parts are to be carried out.

Hold points: If notice of inspection is to be given in respect of parts of the work, do not carry out those parts without approval.

Concealed Work: Give notice so that inspection may be made of those works to be concealed.

TESTS**Notice**

General: Give sufficient notice so that designated tests may be witnessed.

Hold points: Do not carry out designated tests without approval.

Minimum notice for tests to be witnessed:

- 3 working days for site tests; and
- 5 working days for local pre-delivery tests.

Testing Authorities

General: Except for site tests, have tests carried out by authorities accredited by NATA to test in the relevant field. Co-operate as required with testing authorities.

Site tests: Use instruments calibrated by authorities accredited by NATA.

Reports

General: Submit copies of test reports, including certificates for type tests, showing the observations and results of tests and compliance or non-compliance with requirements.

Number of copies of test certificates: two.

SAMPLES

REQUIREMENTS: Provide samples as specified for each of the requirements of the Stonework Subsections. Refer to each Subsection.

Timing: Co-ordinate submissions of related samples. Do not cause delays by making late submissions or submitting inadequate samples.

Quantity: Submit a sample of each designated item and 2 copies of supporting documentation. Include ancillary items.

Identification: Identify the project, subcontractor or supplier, manufacturer, product and include pertinent document references.

Approval: Do not commence work affected by samples until the samples have been approved. Submit further samples as necessary.

Retention: Keep: approved samples in good condition on site, until practical completion.

Incorporation: Incorporate in the works samples which have been approved for incorporation. Do not incorporate other samples.

Criteria: Match approved samples throughout the works.

APPROVED CONTRACTOR AND SUBCONTRACTOR

REQUIREMENT: All work shall be carried out only by approved contractors and/or approved personnel experienced in the type of work specified.

ASSOCIATED DRAWINGS

REQUIREMENT: Check dimensions on site before proceeding with the work.

The associated drawings are inserted as pages within the specification. The associated drawings are diagrammatic only. Obtain measurements and other information necessary to carry out the work specified. Where the work includes alterations to existing work, verify the dimensions of the existing work before proceeding, and notify discrepancies as required by the Contract. The Contractor shall be responsible for the accuracy of the stone set out and shall make good any inaccuracy at his own cost, to the satisfaction of the Principal's representative.

SHOP DRAWINGS

REQUIREMENTS: Where work is specified to have shop drawings. Submit them to the Principal's representative prior to the commencement of the works all in compliance with the requirements of the contract.

HERITAGE WORK REQUIREMENTS

REQUIREMENTS: Dubbo Railway Station and Dubbo Station Master's Residence are listed on **The State Heritage Register**. All work shall be performed and completed without any damage to the heritage fabric of the building.

The Contractor and sub-Contractor shall be familiar with current conservation philosophy of the ICOMOS Burra Charter and the NSW Heritage Act.

The project will be carried out in consultation with the Local council Heritage Adviser, the NSW Heritage Office and access to the site of accredited representatives of these bodies is to be provided by the Contractor.

CONTRACTORS SITE AREA AND SITE RESTRICTIONS

REQUIREMENTS: The building will be occupied and in use throughout the duration of the contract. The Contractor is to liaise with the Station Master at Dubbo and the Principal's Representative, regarding maintaining access during the construction period.

Program all work to avoid nuisance and disruption to the occupants and the public against noise, dust, dirt, water and other nuisance.

PROTECTION GENERALLY

REQUIREMENTS: Provide all necessary footpath hoardings and protection against ongoing work to exclude damage to the building.

Protect from all ongoing work all stonework and carved stonework, all adjacent roof area and other building features.

WORK PROGRAM

REQUIREMENTS: The Contractor shall submit the intended work program containing sequence and staging of the works upon award of the contract.

The program is to be based on a five day working week Monday to Friday inclusive. Due allowance to be made for all generally recognised holidays observed in the building trade.

LOCAL COUNCIL APPROVALS

REQUIREMENTS: The Contractor is to liaise with Dubbo Council, obtain and pay for all scaffold, crane and traffic permits and all other statutory obligations required by Council and all other relevant agencies.

Traffic access to the Station is to be maintained during the currency of the contract except where a permit has been obtained from the relevant authorities and Principal's representative for temporary closure.

2 STONE SUPPLY

2.1 SCOPE

REQUIREMENT: Replacement stone is to be 'Consolidated' sandstone sourced from Department of Commerce, Heritage & Building Services, Alexandria NSW
Contact person Paul Thurlow Ph 9565 9000.

Tenderers are to base their tender costs on the following stone supply rates which are fixed for all tenderers.

An allowance of up to 10 weeks lead time is required by the selected Contractor prior to collection of stone. Selected Contractor is to provide a written request including a cutting schedule for any sawn six sided units.

Consolidated sandstone can be purchased by the Contractor at the following rates. Note that the prices do not include GST and do not include delivery.

- Consolidated sandstone in slab form (unfinished) from quarry block, diamond wire saw finish two sided at \$1,750 per m3
- Consolidated sandstone in sawn six sided units at \$5,100 per m3

The Contractor is responsible for the collection and delivery of the stone from the stone processing yard at Burrows Road Alexandria NSW to the site.

2.2 STONEMWORK CONSULTANTS

For the purpose of this contract, the Principal's representative may nominate stonemwork consultants to advise RailCorp in the selection, inspection, testing and approval or rejection of stone.

2.3 SAMPLES

The Contractor is to submit a sample which represents the texture and colour range of the stone required for this project. Stone to be supplied shall match the sample.

2.4 INSPECTION

The Contractor is to permit access to the stone proposed to be supplied at any time during the course of the contract to the Principal's Representative.

When requested, samples are to be taken from blocks nominated by the Principal's Representative for laboratory testing or petrographic analysis. The Contractor is to schedule this in the work program.

Only stone which meets the requirements outlined below in this specification is acceptable as being eligible for this Contract.

2.5 STONE SELECTION

PHYSICAL PROPERTY ASSESSMENT

Causes for rejection of stone relating to physical property assessment include:

- (a) Any stone which cannot be identified as coming from the nominated stockpile or quarry area.

- (b) Stone will be rejected where any observable inclusions, defects or surface treatment known to affect the appearance, structural performance and or durability of the stone occur.

Causes for rejection of stone include:

- (a) Any stone with excessive colour variation. Some colour variation is acceptable.
- (b) Any stone which is excessively colour banded. Some colour banding is acceptable.
- (c) Any stone with blotchy or linear rust-coloured iron stains.
- (d) Any stone which changes colour unpredictably.
- (e) Any stone with tea leaf detrimental to its appearance.
- (f) Any stone with heavy iron inclusions or kidney, detrimental to its appearance.
- (g) Any stone which has been stained, bleached, or treated with colouring agents or chemical oxidising agents.
- (h) Any stone showing signs of major petrographic variation indicative of possible structural weakness. Examples include mineralogical change (ie presence of mica or shale beds) and physical change (ie visible porosity and/or distinct grain size variation).
- (i) Any stone displaying black line.
- (j) Any stone with clay or shale inclusions.
- (k) Any stone with soft or hard sandballs.
- (l) Any stone with heavy concentrations of quartz pebble.
- (m) Any stone with open or healed joints.
- (n) Any stone with stress release or seismic induced fractures.
- (o) Any stone with any visible planes of weakness.
- (p) Any stone to which acid has been applied ***in any concentration at any time.***

2.6 QUALITY CONTROL

VISUAL INSPECTION

Before processing all slabs may be visually inspected by the Principal's Representative. Those which do not conform to the above specifications will be rejected. An equal volume is to be replaced by the Contractor.

If, during the processing, some unacceptable inclusion or defect is discovered within the mass, the relevant volume is to be replaced without cost to the Principal by the Contractor.

2.7 DELIVERY

It will be the responsibility of the Contractor to ensure the delivery of material acceptable within the terms of this specification.

3 STONE PROCESSING

3.1 GENERAL

STONE PROCESSING REQUIREMENT: This subsection of the specification includes;

- Site inspection and documentation;
- Working new stone by machine profiling and banker masonry;
- Provision of finishes to new stone units to match existing stone finishes;
- Protection of new stone replacement units for fixing on site.

3.2 BANKER MASON

REQUIREMENT: All processing work shall be supervised by an experienced banker mason or equal and all processing work shall be carried out by Banker Masons or equal experienced personnel in profile cutting etc.

The term "Banker Mason" shall mean a Mason who is skilled in cutting intricate forms of stonework such as mouldings, decoration, complex finishes and the like.

IDENTIFICATION: Before commencing stonework submit the names and details of the qualifications of the Banker Masons proposed to be used on the Work.

3.3 BANKER MASONS SITE VISIT

REQUIREMENT: At the commencement of the Contract, the Contractor shall allow for all Banker Masons employed on the project to visit the building site so that they may be acquainted with the work at first hand, and be acquainted with the following items;

- The history of the building;
- The techniques used by the original masons;
- The working of the stone and how the tools were used to achieve the variety of finishes on the building.

The aim being to achieve harmonious finishes to match those existing or to be replaced.

3.4 INSPECTIONS

REQUIREMENT: The proposed work shall be jointly inspected in detail by the Contractors' Nominated Representative and the Principal's Representative or Heritage Architect, to confirm the work on each stone, and in each location.

REQUIREMENT: The Contractor shall coordinate with the Principal's Representative so that stonework may be inspected in the following stages. Give sufficient notice so that the following may be inspected;

- i) All stones to be replaced or indented prior to cutting out and/or dismantling, to confirm the works. (Hold point)
- ii) Items to be built-in located in their correct positions including damp-proof courses, flashings, bolts, cramps, brackets, structural metalwork, rainwater goods, air vents, and the like. (Witness point)

- iii) Replacement Stone units and indents completed, in the yard ready for fixing on site. (Hold point)
- iv) Replacement stone units and indents delivered on site.

Note

- 1. The Contractor shall allow the Principal's Representative access for the duration of the contract to inspect the masonry works.
- 2. Final sized stone units and indents shall be inspected in a free standing condition so that all surfaces (with exception of the bed) are visible.
- 3. The Contractor is to notify one week in advance about delivery time to the site.

3.5 DETAILED SITE INSPECTION

REQUIREMENT: The Contractors nominated Stonemason shall jointly inspect in detail, the building façade stonework with the Principal's Representative to confirm the details, sizes, fixings and finishes of all replacement stone units, indents and inserts to be replaced, prior to cutting out/or dismantling of the existing stonework.

3.6 SHOP DRAWINGS

Requirements:

- A) Where stonework is specified to have shop drawings. Submit them prior to the commencement of the works all in compliance with the requirements of the relevant sections of the specification and the relevant Stonework clauses as hereinafter specified.
- B) The Contractor shall provide shop drawings based on the Principal's contract documents and on the Contractor's own site surveys and measurements.

The drawings shall show the following where applicable:

- i) Stonework setting out.
- ii) Stones to be removed and order of removal, with position and identifying number of each stone to be reused. Stones to be numbered in courses from the top.
- iii) Drawings to be 1:10 scale. Details to include the type of finish or finishes that applies to each type of new or reworked stone according to its form and location.
- iv) Methods of installation and fixing of each type of stone.
- v) Details of lifting methods of each type of stone.
- vi) Temporary propping and support details.
- vii) Fittings and accessories, if any, associated with the stone replacement work.
- viii) All stones drawn must show steel fixings and positions of cramps as specified.

COPIES FOR APPROVAL: Submit three (3) copies of each drawing to the Principal's Representative and do not proceed with any work or remove stone until a full record of all existing details is complete and a signed copy by the Principal's Representative of each drawing has been returned.

The Contractor shall check all replacement stone units and indents and be responsible for the accuracy of the stone for the building and shall make good any inaccuracy at his/her own cost, to the satisfaction of the Principal's Representative.

3.7 PROCESSING NEW STONE

REQUIREMENT: Process and work all stone to the various forms and dimensions indicated in the drawings and confirmed on site, carried up plumb to existing lines and to match the existing original finishes of the stone to be replaced or indented.

The lines of all mouldings, curves, returns and angles are to be worked out of the solid, to exactly match the original profile of that portion of stone cut out or removed.

New replacement stone and indent replacement stone shall be dressed to fit tightly into the opening made. It shall be cut, moulded and finished exactly as existing and detailed on the shop drawings.

3.8 TOLERANCES

REQUIREMENT: Process all new stonework within the tolerances of the existing stone courses etc.

3.9 MOULDING PROFILES

REQUIREMENT: Templates for moulding profiles must be taken from an existing joint.

In handworking mouldings, reverse moulds must be used to maintain the accuracy of the moulding profiles. All members of moulded profiles shall be maintained with clean sharp arises and internal angles. Flattened planes and planning machine marks must be removed by wet carborundum rub to present a true continuous profile of the moulding.

Do not feather ends of profiles to meet the existing eroded or weathered profiles of adjacent stonework mouldings.

3.10 PROFILE CUTTING

CUTTING BACK: Perform the necessary cutting of stone profiles as shown on the Drawings to indicate weatherings, jointing, forming grooves and drilling for handling, fixing, and the like. Work the bed, face and back joints of the stone square and true.

3.11 INDENT STONEMWORK

REQUIREMENT: New indent replacement stone shall be of 100mm minimum depth so as to become a genuine part of the wall. The original joint pattern shall be continued and replacements shall be confined either to piecing or replacing individual stones.

Indent replacement stones with internal return angles shall have all internal angles chamfered at 45° in order to avoid potential weakness in the stone at these corners.

3.12 HOLES/INSERTS

CUTTING FOR HOLES / INSERTS : Mark the exact positions for any drilling and cutting of holes for bolts, inserts and pipes on shop drawings before stone is delivered on site.

Broken arrises or chipped stone will mean rejection of that stone.

3.13 BED AND KEY PREPARATION

PREPARATION (Mandatory): The bottom bed of each stone is to be punch scabbled to provide an adequate mortar key with 2 rows of punch marks 24mm min. from exposed outside faces and not more than 50mm apart.

All hidden perpendicular joints are to be worked with 2 concealed centrally located corresponding "y" joggles, filled with mortar prior to fixing.

3.14 SWEETENING

REQUIREMENT: Sweetening in of replacement stone may be permitted only in areas where existing stones are not plumb and true on the façade. Stone units, indents and inserts requiring excessive sweetening in may be rejected.

3.15 PATCHING

PATCHING: Small patching of new stone using hairline or tight jointed stone insert patches may only be permitted if approved by the Principal's Representative / Heritage Architect. Similar coloured matching stone must be used to match the new replacement parent stone unit.

3.16 WASHING

REQUIREMENT: Wash down the newly excavated or worked stone surfaces to remove stone dust etc.

3.17 STONE FINISHES

REQUIREMENT: All finishes shall match the existing original finishes.

3.17.1 DRESSED AND RUBBED FINISH (D & R)

REQUIREMENT: For dressed and rubbed finishes, rub completely back up to 3mm generally by hand using a carborundum block and water.

All rubbed finish stonework shall be finished free from all saw and other tool marks.

3.18 STORAGE OF PROCESSED STONE

REQUIREMENT: Store processed stone so that it is protected from the weather, clear of the ground on its natural bed, on supports which do not locally overstress or damage it, and which allow room for slings to be put around processed units for future use and transportation.

Store in conditions where the stone will not be subjected to staining, contamination, marking or damage.

3.19 INSPECTION OF PROCESSED STONE IN THE YARD

INSPECTION: All processed replacement stone shall be inspected in the yard immediately prior to transportation to the site.

3.20 DELIVERY OF PROCESSED STONE

REQUIREMENT: Deliver processed stone to the site when requested by the Principal's Representative, in accordance with the approved work program.

DAMAGE DUE TO TRANSPORTATION AND HANDLING: Do not damage any processed stone. Damaged stone may not be accepted, and any stone damaged due to transportation and handling must be made good at the Contractors expense, to the satisfaction of the Principal's Representative.

HANDLING AND TRANSPORTATION: Arrange each stone for handling and transportation to take its own weight without support from adjoining stones, and without damage to the stones.

Mark for identification and store as directed on site by the Principal's Representative for refixing.

Keep all straps and slings etc, free of all arrises, mouldings, etc.

DELIVERY TRIPS: Delivery of processed stone throughout the contract will be limited to three trips from the processing yard to the site.

Deliveries shall be made within five working days from the time of notification.

Delivery times to be between 7.00am and 1.00pm, Monday to Friday or as agreed to by the Principal's Representative.

4 STONE MASONRY

4.1 GENERALLY

SCOPE: This subsection of the specification includes, but is not necessarily limited to the following on site stone masonry fixing work;

Cutting out and removal of decayed stone and stone units for stone indents, inserts and units to be replaced.

Removal of existing stone units for retention and reuse.

Taking delivery of new replacement stone units, indents and inserts.

Fixing of new stone replacement units, inserts and indents, complete with all associated materials and including, bedding, jointing, associated pointing and repointing, and accessories such as fixings, flashings, damp proofing course (DPC) insertion, structural elements etc., and all associated stone masonry.

All Stonemasonry work listed in the EXTENT OF WORK SCHEDULES.

ASSOCIATED STONEMASONRY SUBSECTIONS: Refer to the following subsections to be included in the work specified in this contract;

Subsection 1 GENERAL

Subsection 3 POINTING AND REPOINTING

4.2 QUALITY

INSPECTION

REQUIREMENT: The proposed work shall be jointly inspected in detail by the Contractors' Nominated Representative and the Superintendent or Clerk of Works, to confirm the work on each stone, and in each location.

REQUIREMENT: The Contractor shall coordinate with the Superintendent or Clerk of Works, so that stonework may be inspected in the following stages. Give sufficient notice so that the following may be inspected;

All stones to be cut out or removed prior to cutting out and/or dismantling, to confirm the works. (Hold point)

- ii) Stones on site prior to fixing. (Hold point)
- iii) Substrate prepared to receive the stone. (Witness point)
- iv) At regular intervals during the installation period. (Witness point)
- v) Items to be built-in located in their correct positions including damp-proof courses, flashings, bolts, cramps, brackets, structural metalwork, rainwater goods and the like. (Witness point)
- vi) Stones fixed prior to pointing. (Witness point)
- vii) Pointing mix samples. (Hold point)
- viii) When joints are clean and ready for pointing. (Witness point)
- ix) Stonework completed. (Hold point)

Note

1. The Contractor shall allow the Principal's Representative access for the duration of the contract to inspect the masonry works.
2. Final sized stone blocks shall be inspected in a free standing condition so that all surfaces (with exception of the bed) are visible.
3. The Contractor is to notify two weeks in advance when delivery to the site is required.

4.3 BANKER MASON

REQUIREMENT: Provide an experienced and approved banker mason on site qualified to supervise fixing, site adjustment to joints and surface finishing.

IDENTIFICATION: Before commencing stonework submit the names and details of the qualifications of the banker masons proposed to be used on the Work.

4.4 SHOP DRAWINGS

Requirements:

A) Where stonework is specified to have shop drawings. Submit them prior to the commencement of the works all in compliance with the requirements of the specification and the relevant Stonework clauses as hereinafter specified.

B) The Contractor shall provide shop drawings based on the Principal's contract documents and on the Contractor's own site surveys and measurements.

The drawings shall show the following where applicable:

- i) Stonework setting out.
- ii) Stones to be removed and order of removal, with position and identifying number of each stone to be reused. Stones to be numbered in courses from the top.
- iii) Drawings to be 1:10 scale. Details to include the type of finish or finishes that applies to each type of new or reworked stone according to its form and location.
- iv) Methods of installation and fixing of each type of stone.
- v) Details of lifting methods of each type of stone.
- vi) Temporary propping and support details.
- vii) Fittings and accessories, if any, associated with the stone replacement work.
- viii) All stones drawn must show steel fixings and positions of cramps as specified.

COPIES FOR APPROVAL: Submit three (3) copies of each drawing to the Principal's Representative and do not proceed with any work or remove stone until a full record of all existing details is complete and a signed copy by the Principal's Representative of each drawing has been returned.

The Contractor shall check all replacement stone units and indents and be responsible for the accuracy of the stone set out on the building and shall make good any inaccuracy at his/her own cost.

4.5 MORTAR

REQUIREMENT: Provide mortar for bedding, pointing and repointing stone as specified below;

MORTAR MATERIALS

REQUIREMENT: To be as specified in Stonemasonry Subsection 5 Pointing and Repointing - Mortar Materials.

MORTAR MIXES

REQUIREMENT: To be as specified in Stonemasonry Subsection 5 Pointing and Repointing - Pointing and Repointing Mortar and Bedding Mortar.

BEDDING MORTAR

REQUIREMENT: To be as specified in Stonemasonry Subsection 5 Pointing and Repointing Mortar and Bedding Mortar.

POINTING AND REPOINTING MORTAR

REQUIREMENT: To be as specified in Stonemasonry Subsection 5 Pointing and Repointing. Colour and texture to match approved samples as required.

4.6 PROTECTION AND STORAGE OF STONE

PROTECTION: Protect existing building surfaces from damage resulting from the provision of mason's constructional plant, including scaffolding, hoisting facilities and the like. Isolate points of contact or potential contact.

Stonemasonry shall be liable to rejection if damaged or disfigured during the course of the work under the Contract. The Contractor shall make good at his own expense.

STORAGE: Store stone so that it is protected from the weather, clear of the ground on its natural bed, on supports which do not locally overstress it, and in conditions suitable without staining, marking or damage, and which allow room for slings to be put around units or blocks for future use or movement.

Store in conditions where the stone will not be subjected to staining, contamination, marking or damage.

4.7 UNSAFE AND BADLY DECAYED STONES

REQUIREMENT: Carefully shore insecure sections of stonemasonry and remove loose or dangerous stones and fragments.

Immediate attention shall be given to structural defects.

4.8 STONEMASONRY – DISMANTLING AND CUTTING BACK

REQUIREMENT: Where scheduled cut out the existing stone and replace it with matching new natural stone units or indents to be provided by others.

Cutting Back: Cut back the face of decayed stone where scheduled and/or as shown in the tender drawings to a firm sound surface, but generally not less than 100mm deep, in preparation for inserting the replacement stone. Provide chamfers, tongues, undercut edges and the like as shown or as required.

Existing joint lines shall be maintained unless otherwise scheduled. Cutting shall be carried out under the supervision of an experienced Banker Mason, and all newly excavated surfaces shall be immediately covered and protected from exposure to the weather. Carefully bag debris and remove as soon as possible to keep scaffold clear of debris and prevent overloading.

IN-SITU WORK: Carry out in-situ work to existing stonework by methods which do not disturb the bed or damage the arrises or exposed faces of the original stone.

DISMANTLING WORK: Keep the lines of all arrises, worked faces and returns undisturbed during the dismantling of stone units, handling, breaking up mortar beds, transportation and storage work.

STACKING: All stones to be stacked to provide a natural sequence for refixing.

PROPPING AND PACKING: Use non-staining softwood wedges, supports and spacers or approved equal for propping and packing stone. Metal pinches shall not bear directly on worked faces or no closer than 75mm to worked arrises.

4.9 REPLACEMENT STONE UNIT DELIVERY

REQUIREMENT: Arrange for the taking of delivery of all new replacement stone units, indents and insert stones.

All replacement stones will be provided by others who will deliver the new stones to the site at ground level.

Give two weeks notice of requirements for delivery. Submit delivery day times and the list of stones to be delivered.

Arrange to check immediately the condition of all replacement stones in conjunction with the Superintendent.

Once delivered, the new replacement stones shall become the responsibility of the Stonemasonry fixing contractor who shall make good any damage at his/her own cost.

4.10 REPLACEMENT STONE HANDLING, TRANSPORTATION AND REFIXING

HANDLING AND TRANSPORTATION: Arrange each stone for handling and transportation to take its own weight without support from adjoining stones, and without damage to the stones. Keep all straps etc. free of arrises etc.

REFIXING: Remove stone wall units indicated in the drawings without damaging exposed faces and arrises, mark for identification and store for refixing.

The preferred method of fixing stones is with nylon straps and softening used for hoisting the stones into their initial position. This enables placement of the stone on timber packers on the wall to permit easy removal of the slings. Use approved lewis pins for the final fixing onto the mortar bed.

4.11 STONEMASONRY – BEDDING AND FIXING

REQUIREMENT: Bed and fix all replacement stone units, indents and inserts.

BEDDING: Set stone on its natural or quarry bed.

The beds, face and back joints of every stone throughout shall be worked square and true from end to end to existing lines and be free from hollow or rough surfaces. Where possible, stone shall be bedded and jointed in one operation.

Before bedding any stone, the replacement stone and the excavated area of existing stone shall be cleaned free of all dust and impurities, and shall be thoroughly wetted or dampened down before the mortar is laid. After any stone is bedded and adjusted to its correct position it shall be solidly grouted at its back and at the joints.

FIXING: No stone shall be fixed against work surfaces which, because of an irregularity or defect may prevent the proper execution or permanency of the mason's work.

Each stone shall be fixed to take its own weight without support from adjoining stones, unless otherwise specified.

Prior to the stonework grouting, all stone shall be set and packed out as necessary.

Joggles, cramps, pins and dowels shall be used in the fixing of the replacement stone in accordance with the best masonry practice and shall be metal or alloy (iron and steel shall not be used).

In the setting of the stone, care shall be taken to ensure that no mortar, either from spillage or from over filling, shall come in contact with the external face of the stone.

Non staining softwood wedges soaked in water or laths shall be used for fixing stone. Metal pinches shall not bear directly on stone.

DAMAGED STONE: Remove from the site stone damaged during the course of the work. Where prior written permission to attempt repairs has been given, satisfactorily repaired stone may be accepted.

RE-BEDDING EXISTING STONE UNITS: Allow to carefully lift up and/or re-bed existing stone units where scheduled in the WORK SCHEDULES and repoint all affected points.

CLEANING: Clean the stonework progressively as the work proceeds without using acid and without damage to the work, as necessary to remove mortar smears, stains discolouration, and the like, and leave the stonework clean on completion. Mortar stains to be washed off the stone at the end of each days work.

Remove all debris off the scaffolding, and prepare the area as required ready for further stonework.

SWEETENING: Carry out sweetening on replacement stonework as necessary to provide accurate mouldings and surfaces to match existing, and on existing work where shown on the Drawings to remove surface imperfections, or to remove protrusions at joint lines.

SITE ADJUSTMENT: To be the contractors responsibility.

4.12 FIXING CRAMPS AND DOWELS

REQUIREMENT: Harmful iron cramps and fixings are wherever possible to be removed and replaced by approved bronze, copper or other non ferrous metal or by stainless steel of approved alloy. Cut away for key and insert new cramps to afford all necessary additional support for the stone.

All cramps shall be run with a 1:3 cement, sand mortar.

Provide and fit all necessary fixings, cramps, dowels . as is required to fix the stone in accordance with the best masonry practice or as directed by the Principal's Representative or Heritage Architect

.01 The metal dowels and fixings shall be of stainless steel of approved alloy in accordance with the requirements of the appropriate codes.

.02 The tying back and together (restraint) fixings shall be either of copper, phosphor bronze, or stainless steel as required in accordance with the appropriate codes.

.03 The load bearing fixings shall be of phosphor bronze, or stainless steel, all to the appropriate AS Codes.

Cramps, dowels, bolts, ties and all other fixings shall be designed and fixed to effectively support each stone.

The Contractor shall be responsible for the positioning and strength of each cramp.

4.13 REPLACEMENT STONE JOINTING

REQUIREMENTS: Provide all new joints of a width and appearance exactly matching the original existing joints. Maintain all existing joint lines.

Set all stones on a full bed of mortar and tap home.

All joints and joggles shall be completely filled with mortar, and all mortices and cramps must be completely grouted to ensure that no cavities are left.

Rake out new and existing joints as required to take pointing and repointing material.

Form all joggles with air escape holes as required, mortises, sinkings or ties, checks, perforations and grooves for flashings.

All stone is to be thoroughly wetted before pointing.

Point all joints affected by the stonemasonry work. Pointing and repointing shall be as specified in Subsection 5 Pointing and Repointing.

4.14 STONE FINISHES

All stonework shall be finished to match the existing stonework and as listed in the work schedules.

i) DRESSED AND RUBBED FINISH (D & R)

REQUIREMENT: Where scheduled rub completely back 3mm minimum generally . Use a wet head angle grinder using coarse grit initially, thence medium grit. Then complete the rubbed finish by hand using a carborundum block and water.

All rubbed finish stonework shall be finished free from all saw and other tool marks.

ii) CLEAN CHISEL AND RUBBED FINISH

REQUIREMENT: Where scheduled or where stones contain internal corners . or where access is unobtainable with a grinder, stones shall be hand chiselled back 3mm minimum with a fire sharpened chisel and then hand rubbed with a carborundum block and water to remove chisel marks where stones are originally dressed and rubbed finish.

All rubbed finish stonework shall be finished free from all saw and other tool marks. Allow for all clean chisel and rubbed finish work to be free of chisel marks unless otherwise directed on site by the Superintendent.

iii) **SPARROW PECKED FINISH**

REQUIREMENT: Where specified, scheduled or where a matching finish is required to achieve the same finish as existing on the stone to be repaired or replaced.

Allow for the sparrow pecked finish stone to be finished as follows:

- o Lightly chisel a drafted margin around the exposed face of the stone (approx. 20mm - 40mm wide, to match adjacent or repaired stone margins).
- o Then use a punch to the entire face of the stone (excluding the drafted margin) to achieve the matching sparrow pecked finish.
- o Finally lightly boast the remaining entire exposed stone face or faces to match the existing sparrow pecked stone finish.
- o Allow to prepare up to three samples, each 900mm x 300mm for approval by the Superintendent prior to commencement of the work.

iv) **ROCK FACE FINISH**

REQUIREMENT: Where specified, scheduled or where a matching finish is required to achieve the same finish as existing on the stone to be repaired or replaced.

4.15 HAIRLINE JOINTED INSERT

REQUIREMENT: Provide hairline jointed inserts where scheduled.

Inserts to be placed where directed and documented and sweetened into the parent stone. Execution of tight joints is to be carried out by a Banker Mason.

Use an approved epoxy resin as a jointing adhesive with the necessary quantity of hardener and binder mixed to the manufacturers recommendations. Submit technical details of proposed epoxy material to be used.

The two stone faces shall be bonded for their full depth and the finished exposed hairline joint shall simulate the stone being flush and of the same colour and particle density. Take extreme care to avoid adhesive contacting the exposed face of the stone, causing staining etc.

4.16 SWEETENING

REQUIREMENT: Carry out sweetening as required to provide accurate moulding and face lines in order to finish new stonework to match existing. It shall be performed in a manner similar to "Rubbed Finish".

On joint lines where protruding rubbed stone surfaces exist, sweetening shall be carried out to remove protrusions.

4.17 PROTECTION

REQUIREMENT: Protect all stonework from ongoing work, staining, damage of any kind, and inclement weather.

Protect adjoining surfaces and surfaces immediately below work being carried out to prevent damage during cleaning and pointing work.

Completely protect the stone edges and arrises of all cornices, in areas where there is access to the scaffolding above the stone.

4.18 SCHEDULE OF WORK - STONEMASONRY

Complete all work as scheduled for this section of the Specification in scope of works and as indicated on the drawings.

4.19 ASSOCIATED DRAWINGS

Refer to and complete all work as indicated on the Tender drawings.

5 POINTING & REPOINTING

5.1 GENERALLY

SCOPE: This subsection of the specification includes, but is not necessarily limited to the following pointing and repointing work;

- Removal of hard cement mortar and joint preparation for pointing and repointing.
- Pointing and repointing of all defective joints in the work area.
- Pointing and repointing of all joints affected by the stone repair and replacement work.
- Preparation of mortar for bedding, pointing and repointing stonework.

All pointing and repointing work listed in the scope of works and tender drawings.

ASSOCIATED STONEMASONRY SUBSECTIONS: Refer to the following subsections to be included in the work specified in this contract;

Subsection 1 GENERAL

Subsection 2 STONEMASONRY

ASSOCIATED DRAWINGS: Refer to the drawings located in this specification.

REQUIREMENT: Unless otherwise specified all pointing and repointing shall be in an approved mortar as specified to match the original existing mortar.

Use an approved elastomeric sealant only in locations specified below. Refer to clause 5.8 - Elastomeric Sealant Pointing and Repointing.

Provide samples of up to 10 lineal metres and obtain approval before commencing the work.

SEQUENCE: Do not commence pointing or repointing until cleaning and repair work in the vicinity has been completed.

Clean down generally before commencement of pointing and repointing.

Point and repoint all joints in new work, all joints affected by the work and all open and defective loose joints.

Protect all stonework and clean up on completion of the work.

5.2 QUALITY

REQUIREMENT: The proposed work shall be jointly inspected in detail by the Contractors Nominated Representative and the Superintendent or Clerk of Works, to confirm the work in each location.

REQUIREMENT: The Contractor shall co-ordinate with the Superintendent so that pointing and repointing may be inspected in the following stages;

- i) Existing pointing removal and joint preparation for pointing and repointing. Submit tools and proposed removal method for approval. (Hold point)
- ii) Sand proposed for use. (Witness point)
- iii) Mortar pointing and repointing samples. (Hold point)

- iv) Elastomeric sealant material and colour, complete with manufacturers data sheets and application recommendations prior to the preparation of samples.(Witness point)
- v) Elastomeric sealant pointing and repointing samples. (Hold point)
- vi) Pointing and repointing work completed. (Hold point)

5.3 APPROVED SUBCONTRACTOR AND APPLICATORS

REQUIREMENT: All pointing and repointing shall be carried out only by contractors and personnel experienced in the type of work specified.

Submit with the tender a list of personnel proposed to be used for the work, complete with details of experience, previous work on buildings etc. List referees etc. who can establish that the tenderers and nominees have executed the same work to that specified. This information will be taken into account when assessing the tender.

5.4 POINTING AND REPOINTING MATERIALS

Pointing and repointing materials to be as specified and scheduled shall be either:

- a) Mortar or
- b) Elastomeric Sealant

5.5 MORTAR MATERIALS

REQUIREMENT: Provide mortar for bedding, pointing and repointing stone as specified below.

GENERALLY: Provide mortar for pointing and repointing which shall as nearly as possible match in colour, texture, strength and porosity, that of the original mortar or the approved sample. Being always softer and more porous than the stones, in order to "chaperone" and protect them.

Mix with an oxide colouring to match existing colour where required. Submit all relevant suppliers guarantees, data sheets etc for approval to the Principal's representative prior to commencement of the work.

MORTAR MATERIALS: To AS A123. Mortar for masonry construction.

Off-White Cement: To AS 3972, Type GP, with iron salt content not exceeding 1%.

Sand: Fine evenly graded, washed with a low clay content and free from effervescing salts.

Submit samples of sand proposed for use, complete with sand grading analysis prior to commencement of the work.

Grading of sand shall conform to the following sieve analysis:

<u>Sieve size</u>	<u>Percentage</u>
<u>Passing by Weight</u>	
2.36mm	100
1.18mm	100
600 microns	95
300 microns	5
150 microns	0

Sand used for pointing and repointing shall be subject to approval after the preparation of sample panels as later specified.

Lime: To AS 1672. Provide a test certificate showing that the lime has passed the relevant tests.

The lime shall be prepared for adding to the mortar mix in the form of a putty, and shall be hydrated lime from an approved source.

Prepare lime for incorporation into the mix to AS A123, Clause 1.4.

Store lime on site in accordance with code requirements.

All lime used on the job shall be slaked as specified below, and tested for consistency. Lime to be hydrated as specified.

HYDRATED LIME PREPARATION: Thoroughly mix with water by adding the lime to water contained in an approved clean container, and stirring it to a thick creamy consistency. The contents are then to be allowed to stand undisturbed in the container for not less than 16 hours.

The container shall be properly sealed with an airtight lid in an approved manner.

At the end of 16 hours the lime mixture should have achieved, through evaporation, a consistency of very thick cream. If excess water is present, it shall be siphoned or poured off in accordance with code requirements.

CONSISTENCY OF LIME: Particular attention shall be given to the proportion of lime in the mix of one part of lime and water in the slaked lime mix. The proportion is critical at the time of mixing the lime into the bedding and pointing mortar mixes. This proportion will be known as the consistency of the lime.

STORAGE: The Contractor shall have approved containers of slaked lime on site. The containers shall be airtight and of approved type and size.

ADDITIVES: Do not use additives unless prior approval has been obtained.

Use of pre-made "Rock Lime Putty" by Lime Industries of Western Australia or equal, is accepted.

5.6 POINTING AND REPOINTING MORTAR

MORTAR MIX: To AS 3700. Mix by weight. Particular attention shall be paid to the exact measurement of mortar contents and the mixing procedure.

Used approved batching boxes for mixing of mortar by volume. Machine mix.

BEDDING AND JOINTING MORTAR: To be:
one part off-white cement, one part lime, six parts sand

POINTING AND REPOINTING MORTAR: To be:
one part off-white cement, one part lime and six parts sand

REQUIREMENT: Colour and texture to match approved sample. Use a small amount of approved oxide to match colour.

SAMPLES: Allow for samples of pointing and repointing mix to be prepared. Tenderers shall allow to use either white cement or off-white cement for the contract, depending on the approved sample mix.

5.7 MORTAR POINTING AND REPOINTING

THE WORK AREA: Clean down the work area prior to commencement.

DEFINITION: Defective joints are those joints having:

- Loose or missing mortar;
- Excessively soft, powdery or crumbling mortar;
- Hard cement mortar.

The building fabric, scaffolding, and work area shall be maintained free of all residual or excess pointing or repointing material.

POINTING REMOVAL: Carefully remove the existing pointing from open and loose joints and where indicated in the Work Schedules, to a depth of 20mm, using an approved method and hand tools, without damaging the adjacent stonework and arrises. No power tools shall be used.

Do not widen the joints.

Submit tools and proposed removal method for approval.

Prepare sample area of joint removal, prior to commencement of the work.

CLEANING OUT JOINTS: Use either vacuum suction or compressed air jetting etc, to remove dust and loose debris. Lightly hose out the joint, clean out free of foreign material and loose stone, and leave damp for pointing or repointing. Dry joints shall not be repointed.

Prepare all joints to take a minimum of 20mm mortar **as well as** the backing rod.

TAPING JOINTS: Tape all joints with 50mm wide masking tape, after washing down and immediately prior to repointing or pointing.

The tape shall be set along the joint arris as close as possible to enable the repointed joint to appear as thin as possible to match the original joint line.

Strip off the masking tape when the joint is partially set, so removal does not disturb the new pointing.

BACKING RODS: Provide and insert a closed cell backing rod, or approved similar material, to all vertical joints generally, and where necessary to enable firm insertion of the mix.

Backing rods shall be located to provide a full repointing mortar depth of 20mm inside the joint, and shall be capable of assisting the pointing mix to be firmly inserted against it to the full depth of the open joint.

Place backing rod in joint under compression.

Allow in the contract price for all vertical joints to be inserted with backing rods.

APPLICATION OF MORTAR: The pointing or repointing mortar shall be applied in a putty-like consistency and be plastic enough to be sufficiently stable.

It shall be capable of being moulded into a ball-like consistency so that it can be firmly pushed completely back in several applications into the joint to completely fill the empty joint. Cut the mortar back before it sets, and finish with a brush.

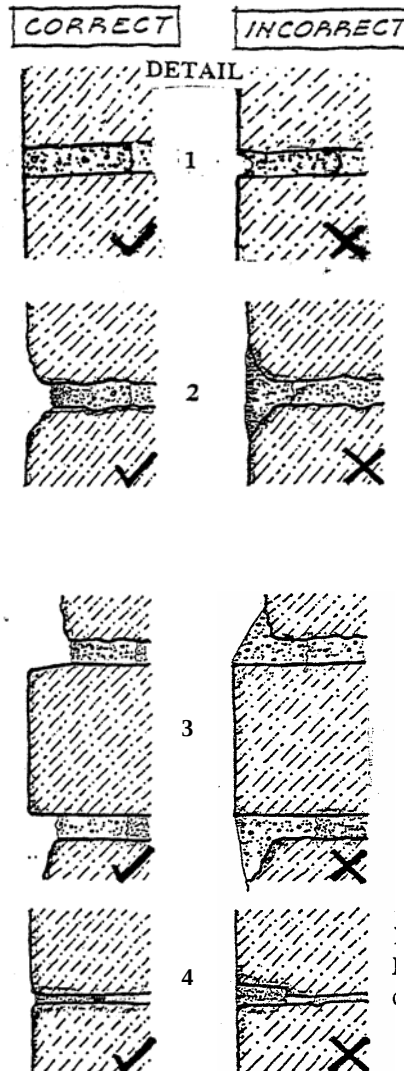
The mix shall be applied in an approved manner, using approved tools, from approvals given during preparation of the sample panels.

Finish joint to match approved sample finish.

PROTECTION: Protect all adjoining stone surfaces during application. Clean off all mortar and mortar droppings on a daily basis.

ON COMPLETION: Clean away all debris off site etc.

Remedial Treatment of Joints



(Not to scale)

NOTES

DETAIL 1. STANDARD JOINT POINTING & REPOINTING

Point and repoint all open, loose and defective joints as specified, and where indicated. Maintain the original joint width using standard details as specified for pointing and repointing. Flush fill joints to the original face line.

DETAIL 2. ERODED ARRIS JOINT PATCHING

Maintain original joint width by not filling these joints out to the original face line. Use mortar and workmanship procedures as before stated Detail 1. Fill joints out only to where the eroded arrises begin to widen in the joint. Avoid thickening the joint appearance. Avoid mortar being feathered on the outside of the stone where water traps may be created.

DETAIL 3. PROJECTING STONE OR BRICK JOINT REPOINTING

Point and repoint all open and defective joints as before stated Detail 2. Allow to slightly chamfer or round the top bed of the projecting stone or brick to throw off water. Do not change the thickness or appearance of the joint by using weather struck mortar fillets, which may also trap water.

DETAIL 4. THIN JOINT REPOINTING

Point and repoint all open and defective joints as before stated Detail 1. Maintain original joint width.

Details and information from : "Conservation of Building & Decorative Stone", Vol. 2. John Ashurst & Francis G. Dimes, pp. 87

5.8 ELASTOMERIC SEALANT POINTING AND REPOINTING

GENERALLY

REQUIREMENT: The intention of using an elastomeric sealant is to prevent water penetration into joints and in joints with excessive movement in locations as specified and as indicated on the tender drawings.

EXTENT OF WORK

REQUIREMENT: Pointing or repointing shall be applied to the stonework areas as specified above in clause "Generally" and/or as scheduled in scope of work and as indicated on the tender drawings.

MATERIAL

REQUIREMENT: The elastomeric sealant material shall be an approved material of fifteen (15) years proven durability of application on sandstone etc. similar to "Z Bond V-4" neutral cure low modulus R.T.V. non acetic silicone sealant, V-4 colour beige, as distributed by Rhône-Poulenc Pty Ltd (Phone No. 9624 1212). Submit with the tender the proposed elastomeric sealant to be used.

SAMPLE AREA

REQUIREMENT: Prepare a sample area of approximately six (6) lineal metres in the presence of the Superintendent. Contractor to nominate an experienced applicator to perform this work.

Submit the Manufacturer's recommendations for use and application prior to commencement of the sample.

CUTTING OUT

REQUIREMENT: All joints nominated for the use of elastomeric sealant shall be cut out to provide a width/depth ratio of 1:1 for the insertion of the sealant after placement of a foam backing rod. Joints narrower than 6mm may be carefully widened to admit the pointing or repointing.

CLEANING OUT JOINTS: All joints shall be cleaned and dry and free from foreign matter, immediately prior to application.

THE WORK AREA

REQUIREMENT: Clean down prior to commencement. The building fabric, scaffolding, and work area shall be maintained free of all residual or excess pointing or repointing material, and all empty sealant cartridges. The building fabric and scaffolding (including planks) shall not be used for wiping applicators guns, hands etc. free of pointing or repointing material.

TAPING

REQUIREMENT: Protect the stonework surface one each side of the joint by 50mm wide masking tape. On completion of pointing or repointing remove the tape and remove any stains or marks from the stonework surface.

BACKING ROD

REQUIREMENT: An approved foam backing rod shall be used in accordance with the manufacturer's recommendations.

Provide and insert a closed cell backing rod or strip such as a non-stick expanded polyethylene or polyurethane foam which doesn't adhere to the sealant and does not inhibit movement.

Place backing rod in joint under compression.

PRIMER: An approved primer shall be used and applied in an approved manner.

APPLICATION GENERALLY

REQUIREMENT: The jointing material shall be applied in accordance with the manufacturer's instructions, using standing bulk or air gun equipment.

AVOIDING DAMAGE TO THE STONE

REQUIREMENT: The sealant material and primer shall be kept off the exposed face of the stone.

ON COMPLETION: Clean away all debris and spent cartridges. Clean down any exposed residual elastomeric sealant material etc.

5.9 ASSOCIATED DRAWINGS

Refer to associated drawings:-

6 SYNTHETIC STONE REPAIR

6.1 GENERALLY

SCOPE: This subsection of the specification applies to and includes the provision of all materials, tools, labour and equipment required for the repair of weathered decayed and physically damaged sandstone using an approved synthetic stone resin and mortar.

The work includes, but is not necessarily limited to;

- Selection of proven resin and synthetic stone material with approved matrix colouring agents and reinforcement.
- Cutting back of defective substrate to sound stone.
- Removal of inserts.
- Reinstatement of stone faces and profiles to an unweathered and/or undamaged moulding by filling with the approved material.
- Filling of cracks in stone.
- Pointing and repointing of joints affected by the work.
- Provision of pin reinforcement in stonework where required.
- Provision of samples for approval, warranties, tests etc and quality control items.

Complete all synthetic stone repair listed as specified and indicated on the drawings.

EXTENT OF WORK: Complete all work as specified in the scope of work and indicated on the drawings.

ASSOCIATED STONEMASONRY SUBSECTIONS: Refer to the following subsections to be included in the work specified in this contract:-

Subsection	1	GENERAL
Subsection	4	STONEMASONRY
Subsection	5	POINTING AND REPOINTING

6.2 APPROVED SUB CONTRACTOR AND APPLICATORS

REQUIREMENT: All synthetic stone repair shall be carried out only by approved contractors and/or personnel with ten years minimum sandstone experience in the type of work specified.

Submit with the tender a list of personnel proposed to be used for the work, complete with details of experience, previous work on buildings etc. List referees etc. who can establish that the tenderers and nominees have executed the same work to that specified. This information will be taken into account when assessing the tender.

The Principal's Representative has a list of approved synthetic stone repair applicators capable of performing this type of work. The names of these applicators will be given to the tenderer, on request, by the Contact Officer.

Tenderer to submit name of proposed applicator with the tender.

6.3 QUALITY

INSPECTION

INSPECTION: The proposed work shall be jointly inspected in detail by the Contractors' Nominated Representative and the Superintendent or Clerk of Works, to confirm the work on each stone, and in each location.

REQUIREMENT: The Contractor shall coordinate with the Superintendent so that stonework may be inspected in the following stages. Give sufficient notice so that the following may be inspected;

- i) The location and extent of the synthetic stone repair work to be done. (Hold point);
- ii) The prepared sample range. (Hold point);
- iii) The stone cut out and the sub-base prepared to receive the synthetic stone mortar. (Witness point);
- iv) Provide shop drawings for all stones where reinforcement is required. (Hold point);
- v) Reinforcement for the synthetic stone in position. (Hold point);
- vi) Filling in holes and the stone profiles completed. (Witness point);
- vii) Pointing and repointing mix samples. (Hold point);
- viii) Joints prepared ready for pointing and repointing. (Witness point);
- ix) Completed work. (Hold point).

DATA SUBMISSIONS

REQUIREMENT: Submit with the lump sum Tender, before the work commences, and at subsequent stages where so specified, the following data:

Supplier's data: Technical data sheets etc, from the supplier stating;

- i) The supplier's experience in the required type of work.
- ii) Particulars of established quality control procedures (if any), and the category of the procedures to the relevant standard.
- iii) The physical properties for any material required to produce the synthetic stone.
- iv) Test data for the material.
- v) A warranty certifying that the material supplied complies with the specification and is suitable for the intended use.
- vi) Recommendations for installation.

SAMPLES

REQUIREMENT: Provide samples as specified prior to the commencement of the work, and obtain approval from the Superintendent. Label all samples.

COLOUR CONTROL SAMPLES: Tenderer to submit with the tender two (2) sets of at least three (3) different 150 x 150 mm synthetic stone colour control samples varying in colour to match the colour range of the weathered sandstone in the project. Use these colours, if approved, in the locations directed by the Superintendent. One set of

approved colour samples will be retained by the Superintendent, the other shall be retained by the Contractor.

Repairs that vary excessively in colour from the surrounding stone or from the original samples shall be replaced at the Contractors expense.

Nominate for each colour control sample, the source of all aggregates, the particle size gradation of aggregates, the binder/aggregate ratio, the binder (resin & hardener) and any other additives.

SAND OR BLENDED MIX SAMPLE: Tenderer to submit a representative sample of the proposed sand or blended mixture for approval and if required by the Superintendent it shall be tested by a NATA registered laboratory or by the CSIRO Building Construction and Engineering Division, Testing Laboratory, North Ryde, Sydney according to the requirements of Sections 11, 12, 24, 33 and 35 of AS 1141-1974 at the Contractor's expense. Submit sample in approved clear plastic containers.

SAND GRADING: If required by the Superintendent submit a sieve analysis of the sand or sands proposed to be used carried out by a NATA registered laboratory.

REINFORCEMENT: Submit samples of proposed stainless steel reinforcement.

TESTING: All tests shall comply with the testing requirement nominated in the preliminaries section of the specification.

Prior to the commencement of the works and not later than two weeks after the issue of a letter of acceptance the Contractor shall provide if required by the Superintendent, six 50mm cubes made of the synthetic stone materials.

6.4 SHOP DRAWINGS

REQUIREMENT: Supply shop drawings where specified and showing the following where applicable: setting out position and identifying number of each stone, details of 1:10 scale of each major synthetic stone repair unit showing reinforcement and type of finish for each stone

Allow for four (4) working days for review of each set of shop drawings. For each drawing supply two copies in the form of prints on paper.

6.5 SYNTHETIC STONE MATERIALS

REQUIREMENT: Synthetic stone materials shall be an approved epoxy mortar of at least 10 years proven durability of use in similar situations and locations to those proposed in this contract. Submit manufacturers recommendations and information sheets with the Tender.

All materials used in the preparation of an epoxy mortar shall be approved by the Superintendent.

RESIN AND HARDENER - MORTAR RESIN REQUIREMENTS: For synthetic stone mortar the epoxy resin and hardener shall be supplied by a recognised manufacturer and used in accordance with the manufacturer's instructions.

The epoxy mortar shall be moisture insensitive.

Both components of the resin shall be 100% reactive without any solvent content.

Where resins change colour within the defects liability period, they will be rejected and made good or replaced at the Contractor's expense.

LOW VISCOSITY EPOXY RESIN: For crack repairs i.e fine cracks, fill with low viscosity epoxy resin especially formulated for this type of application using a hypodermic type syringe and where appropriate a vacuum suction to ensure full penetration of the epoxy resin.

Both components shall be 100% reactive without any solvent content.

HEALTH HAZARD: There are certain health hazards associated with the use and application of epoxy resins, particularly from skin contact and lack of sufficient ventilation. The contractor shall ensure that the operators are adequately protected and comply with the requirements of the Occupational Health & Safety Act.

SAND REQUIREMENT: The sand used in the preparation of the epoxy mortar shall be clean, well-washed material, free from clay and any other deleterious impurities.

A blended mixture of different sands shall be used to produce a suitable mortar.

SAND SAMPLE: Submit a representative sample of the proposed sand or blended mixture for approval A.B.S Clause 6.3 Quality.

SAND GRADING: Submit a sieve analysis A.B.S Clause 6.3 Quality.

COLOURING AGENTS REQUIREMENT: The colour of the repair mortar shall blend closely with the surrounding sandstone.

Prepare trial samples as specified in Clause 6.3 Colour Control Samples to the Superintendent's approval that this requirement can be met.

Where possible, the colour matching shall be achieved by the careful selection of naturally coloured sands. If it is necessary to use artificial colouring agents, only inorganic pigments approved by the Superintendent shall be used, and also in locations approved by the Superintendent.

Organic pigments are not permitted.

No ultra-violet absorbing liquid coatings shall be used.

REINFORCEMENT REQUIREMENT: Reinforcement to be Stainless Steel 316 Grade or equal.

Depending on the size and shape of the repair, reinforcement can be provided as a mesh or as individual wires with a minimum diameter of 3mm. A sample of the proposed reinforcement shall be submitted for approval.

BOND COAT REQUIREMENT: Use approved bond coat between the underlying sandstone substrate and the repair mortar as recommended by the manufacturer of the resin used in the mortar.

6.6 SUBSTRATE PREPARATION

GENERALLY: Complete other preparation work as before specified (ABS) and prepare stone substrate to provide a firm base to support the synthetic stone repair and reinforcement as required. Perform work as scheduled in Extent of Work Schedules.

SUBSTRATE CLEANING

CLEANING REQUIREMENT: Generally where directed by the Superintendent clean surfaces of all stones to be repaired, of all relatively loose surface deposits, unwanted stains, bird debris, fungal and lichen growths etc. Cleaning shall only be performed to leave the stonework exposed faces with an even weathered and naturally oxidised appearance without streaks or stains.

Determine, with the Superintendent, the nature and extent of the dirt and deposits to be removed.

Complete a general washing clean initially with a brush and water then check with the superintendent where further detailed or 'spot' cleaning is required. Do not overclean. Do not damage the stone or building during cleaning. Do not attempt to produce a 'new stone' appearance. Do not use acids. Do not use cleaning agents unless approval in writing has been given by the Superintendent, and then on stones specified in the approval.

The aim in cleaning is to provide the approved colour required of the synthetic stone repair.

SAMPLE CLEANING PANEL. Where and when directed by the Superintendent provide a sample area using water and scrubbing brushes initially. If this is unsuccessful, use approved bronze brushes and water. Allow to soak the stone prior to brushing.

Where the previous two methods are unsuccessful allow to use an approved very mild cleaning agent such as a mild detergent, soak and brush. This work on the sample panel shall be carried out in the presence of the Superintendent.

Allow each sample area to be 300mm long x 300mm high, in locations selected by the Superintendent.

PROTECTION: Take all necessary precautions to prevent damage to the building, stonework or nuisance to the occupants.

LIGHT CHISEL SUBSTRATE

REMOVAL OF SALT DEPOSITS: Where required on stones to be repaired, lower aggressive salt content in stones by light chiselling and brushing all 'hardened crust' or decayed stone surface layers on the nominated stones. Chiselled work shall vary from scraping soft surfaces with a chisel to applying a light mallet chisel work. Work to be performed by an approved mason. On completion of light chisel work where required commence cycles of washing, drying and brushing in accordance with the desalination specification requirements.

Perform the work as specified for 'Sponge Washing' where required.

Treat all aggressive salt contamination prior to carrying out the repairs.

REMOVAL OF SALT DEPOSITS

Requirement:

Desalinate wash to remove salt deposits and to lower aggressive salt content in stones by lightly hand chiseling and brushing all 'hardened crust' or decayed stone surface layers or soft surfaces as specified on the nominated stones, washing repeatedly with a sponge and allowing the stone to dry.

Chiseled work shall be carried out by an approved mason.

Commence cycles of washing, drying and brushing in accordance with the sponge desalination wash requirements as directed by Superintendent.

Perform the work as specified for 'Desalination Wash' where required to all synthetic stone patches in the work schedules

Treat all aggressive salt contamination prior to carrying out the repairs.

Desalination Washing – Sponge Process:

Sponge washing desalination work shall comprise a cycle of brushing, washing and drying processes, at regular intervals as specified or as directed by the Heritage Architect.

Commence sponge washing process by removing the "hardened crust" or decayed stone surface layers as before stated and brushing off loose surface dust and salt particles. Prior to washing, fill all open joints, protect all openings from water and provide a suitable water disposal system.

Proceed with sponge washing desalination work by using the approved sponge on one stone at a time. Wherever possible, no salt laden water is to flow onto adjacent stones. Apply well wetted sponge to the salt affected stone and thoroughly wet a horizontal strip along the top area of the stone. Repeat the process in layers down the stone. Repeat by starting again at the top and continue the sponging until the stone is saturated.

After each application, thoroughly rinse the sponge in clean water and squeeze the contaminated sponge into another empty bucket, etc.

At the end of the wetting phase, wipe surface water off the stonework using a clean damp sponge.

Repeat the work over the entire face of the contaminated stone area for at least 2 cycles, keeping the stonework moist continuously.

Washing and Drying Times: Allow stone to dry out to allow salt to form on the surface of the stone. Allow to monitor the drying process and adjust the extent of time in the cycle to allow the stone to dry out.

Brushing Process: After the suitable drying out time has elapsed, use an approved hair brush to brush off all the newly formed salt crystals on the surface of the stone, prior to further wetting desalination treatment.

Sponge Washing Cycle: Repeat the washing, drying and brushing processes initially on a 24 - 48 hour (minimum of 24 and a maximum of 48 hour) cycle.

Wet Weather: Where wet weather occurs during the work, allow for a longer drying out time.

Repeat Washing/Brushing/Drying Cycles: Allow for at least five (2) cycles in total, unless otherwise directed.

REMOVAL OF INSERTS

REQUIREMENT: Allow to carefully remove inserts where scheduled prior to repair work. Check extent of insert removal with the Superintendent prior to starting the work. Complete all work as specified and work identified on Tender drawings.

Inspect all holes and other defects. All exposed timber, iron and metal plugs and inserts foreign to the stone shall be carefully extracted with a minimum of damage to the stone. All work shall be executed in an approved manner.

Once all inserts have been removed, all holes shall be thoroughly cleaned out to provide a good key for the patching material.

CUTTING BACK SYNTHETIC STONE REPAIR WORK

REQUIREMENT: Remove all decayed and unsound stone from the repair area to provide a sound base for the repair mortar to adhere to. Use only approved fire sharpened or tungsten tipped chisels. Feather edges are not permitted. The edges of the repair area shall be undercut to provide an effective physical key. The minimum depth shall be as specified in Clause 6 - Synthetic Stone Repair and Clause 6.9 – Repair Methods.

CHEMICAL CONSOLIDANTS OR SOLVENTS

REQUIREMENT: No chemical consolidants or solvents shall be used. Solvent based chemicals shall not be applied over epoxy mortar repairs.

MATCHING EXISTING STONE FINISHES

REQUIREMENT: Synthetic stone repair shall match surface colour, texture and finish of adjacent natural stone. Synthetic stone repair is to match the surface finish of the stone it is applied to. This could be (but not limited to) any of the following finishes;

- Clean Chisel & rubbed finish
- Chiselled finish
- Rockface finish
- Sparrow Pecked finish

6.7 SYNTHETIC STONE MORTAR MIX

REQUIREMENT: All work shall be strictly in accordance with the technical advice of the product manufacturer. All mixing shall be carried out exactly, using the correct proportions in mechanical mixers.

Mix material with suitably approved clean naturally coloured silica sands to ensure that the patch material used resembles the natural sandstone being replaced as closely as possible in colour and structure.

BATCHING AND MIXING: All batching of the mortar ingredients shall be done by weight.

All batches must be prepared using an electric mixer. Very small batches may be mixed by hand. Allow for less than 0.25 of a litre.

Resin and hardener shall be premixed strictly in accordance with the technical advice of the product manufacturers.

The resin and hardener shall be mixed together to obtain a uniform appearance. A machine mixer shall be operated until a thorough blending of the ingredients is achieved.

THE MIX: The mix shall consist of not less than 1:10 and not more than 1:12 parts of resin and hardener to sand by weight.

AGGREGATE MIXES: The aggregate mixes shall be carried out using the proportions approved for the three (3) nominated colour mixes.

Aggregate mix batches shall be preweighed and packaged to suit both the scale of patching undertaken and pot life both on site conditions and each binder/aggregate ratio.

ADDITIVES: Additives shall not be used to extend pot life.

COMPRESSIVE STRENGTH: To be not less than 30MPa and the bulk density not less than 1750kg/m³ for an epoxy based mortar mix of 1:10 and to be not less than 25MPa and the bulk density not less than 1720kg/m³ for an epoxy based mortar mix of 1:12.

6.8 SYNTHETIC STONE REPAIR WORK

SYNTHETIC STONE REPAIR

REQUIREMENT: Repair individual stones separately. Patching shall preserve existing joints and maintain the integrity of individual stones. Pointing between repairs must be carried out separately. Areas should never be repaired as render and joint-scored.

APPLICATION

REQUIREMENT: Prior to any epoxy patching, carry out all preliminary work as specified herein. Provide a minimum of 300 lux lighting level to the working surface during the work. This is particularly important where the working surface is in shade due to scaffolding, hoarding and/or shade cloth etc.

The work shall be kept dry, before, during and after patching. Provide complete protection from sun, wind and rain, and allow for temperature and wind variations at all times.

Treat excessive salt contamination prior to carrying out the repairs.

The contact surfaces shall be roughened and then cleaned before being repaired. They shall be free of dust and shall be dry.

Generally the minimum depth of any unreinforced repair shall be 6mm and 25mm for reinforced repairs. However for this contract, the Contractor shall allow to provide approved metal reinforcement for each separate repair item for all Epoxy Repair (EP) Work and also for Inject (In) repair crack with epoxy resin. Unreinforced patches may be used where approved by the Superintendent and after detailed advice from the Structural Engineer.

Provide all necessary reinforcement, pins, wire, etc. using approved 316 Grade stainless steel to patches as specified.

Patching shall be carried out with resin/sand mixes as previously specified.

The Contractor shall ensure that no epoxy resin or other material discolours or stains the surface of adjoining stones. The Contractor shall make good all such damage.

REINFORCEMENT

REINFORCEMENT REQUIREMENT: All overhanging stone requires reinforcement. Where repairs exceed 75mm diameter or exceed 50mm in depth use reinforcement, which can be provided as a mesh or as individual wires. The reinforcement shall be fixed to sound stone by stainless steel pins or tie wires, whichever is appropriate.

Submit all reinforcement details for approval by the Superintendent prior to commencement of the work.

All anchoring pins or tie wires shall be embedded in drilled holes, a minimum of 25mm deep for in-situ patches and with an approved epoxy resin of a stiff, paste consistency.

The minimum cover for reinforcement shall be 10mm, unless otherwise advised by the Structural Engineer.

All in situ reinforcement mesh shall be placed in the course of 30mm deep patches and for every extra 10mm depth of patch an extra layer of mesh shall be placed at 10mm centres thereafter. The application or bars must be monitored by the Contractor to ensure sufficient cover as specified above.

WORK FINISH

REQUIREMENT: No in situ work shall be finished off with rollers or plasterer's templates. All work must be confined to the cut out area only and compacted with hand held tools. At no time shall the finished work be smoothed over with trowels or rollers. Completed work shall have an exact textured match with that of the surrounding naturally weathered stone. Any excessively smooth poorly matched finish will be rejected and made good at the Contractor's expense.

6.9 REPAIR METHODS

REQUIREMENT: The following methods of repair are to be used, depending on the size and location of the proposed patch. The synthetic stone repair work may be divided into the following work methods:

Refer to Clause EXTENT OF WORK SCHEDULES for extent and location of the work.

Provide a rate/patch in the SCHEDULE OF LUMP SUM PRICES AND RATES to be submitted with the Tender.

M1 - SMALL PATCHES WITHOUT REINFORCEMENT (SEP)

These patches shall only be carried out (unreinforced patches) following approval by the Superintendent.

Patching of small cavities in the stone, filling of small holes etc. less than 80mm diameter, previously formed to hold metal fixing or inserts to be removed, and repairs to edge spalls.

These repairs may require reinforcement. After cleaning, fill with synthetic stone mortar as specified. Finish off flush with the adjacent stone surface.

M2 - REINFORCED PATCHES (EP) AND (PIN)

All repairs shall require the use of stainless steel reinforcement and pin etc, to increase adhesion and prevent cracking or spalling and for public safety.

These repairs shall be completed insitu. Prepare shop drawings for all patches where reinforcement is required.

Formwork is to be constructed into which the synthetic stone mortar shall be compacted.

M5 - INJECTION FILLED CRACKS (IN)

Fine cracks in stone which is otherwise sound shall be filled with low viscosity epoxy resin. As specified below and in accordance with clause 6.11 Injection Patching – In.

Drill injection ports at maximum 150mm centres - in both directions, and ensure that the cracks appearing on the surface are drilled for receiving the synthetic stone resin. Drill the holes down to sound stone depth in the stone plus 25mm.

Pressure inject with an approved grout of low viscosity resin which is compatible with the stone, flowable, durable and compatible with the approved stainless steel inserts.

During injection, maintain sufficient pressure to enable all cracks and voids to be completely filled. However all care must be taken to avoid any bursting or breaking of the stone.

6.10 APPLICATION OF SYNTHETIC STONE REPAIR MORTAR - EP

Mortar shall not be placed in any reinforced patches until the Superintendent has inspected and approved the reinforcement.

APPLICATION: Place the mortar with a trowel and firmly compact the mortar particularly around reinforcement into corners and around the edges of the repair to prevent voids. It must be applied within the duration of the pot life of the mortar resin/hardener mix. Where required, entire patch planes are to be patched in layers of one application.

The mortar shall be applied in layers in accordance with the Manufacturers data sheets or specifications and may be applied in some cases not more than 50mm thick, where deep repairs are required.

Repairs showing visible changes in layers in compaction or appearance are unacceptable and shall be replaced at the Contractors expense.

The outer surface shall be smoothed with a trowel dipped in solvent such as methylated spirits, in order to achieve a textural match with that of the adjacent stone.

Repairs may not be sanded back after setting to remove feathered edges or finish defects and shall be replaced at the Contractors expense.

Synthetic stone mortar repairs shall be carried out within a temperature range of 10°C to 30°C. They shall not be applied when the relative humidity is in excess of 80%.

CHEMICAL REACTION: The chemical reaction between the resin and hardener is exothermic. Large repairs are likely to generate considerable heat which can have harmful effects on the durability of the mortar. Refer to the manufacturer's data sheets or specification.

MASKING TAPE: Use approved masking tape to avoid detrimental staining of adjacent stone.

COMPATIBILITY OF MORTAR AND STONE: The success of the repairs will be influenced by the degree of compatibility of the mortar and the adjacent stone. It is undesirable to have an excessively strong mortar bonded to a weak stone. Their permeabilities, thermal expansion and moduli of elasticity should also be similar.

BOND COAT: An epoxy bond coat recommended by the manufacturer of each resin used in the mortar shall be applied over the stone just prior to the placement of the mortar. The bond coat must be still tacky when the mortar is placed. The bond coat shall not be applied over the whole contact surface, but shall have some regularly spaced areas of stone, approx 40% shall be left uncoated so that the underlying stone can breathe. Where the bond coat has dried prior to the application of epoxy mortar mix, it shall be removed and re-applied. At no time shall one bond coat layer be applied over another.

6.11 INJECTION PATCHING - In

FILLING OF FINE CRACKS: Remove all loose debris in cracks prior to repairs. Compressed air jetting shall be used to remove dust from cracks etc.

Seal the external surface of the cracks temporarily during the injection treatment with a removable plugging material so that the low viscosity resin does not run back over the stone.

Use a hypodermic-type syringe to inject the resin in the crack.

Use Vacuum suction where appropriate to remove air in order to achieve greater penetration in deep cracks.

Take special care to avoid surface staining of the stone adjacent to cracks being repaired.

PROTECTION: At all times protect all stonework from ongoing work, staining, damage of any kind, and inclement weather.

6.12 ON COMPLETION

CLEANING DOWN ON COMPLETION: On completion of all work all stone shall be cleaned down and protected. All mortar stains shall be removed from the stone as soon as possible after they occur, and no later than 12 hours after the time of application. In warm weather, the epoxy could harden soon after mixing.

Clean down all stonework and building areas, free of all debris, stone, dust, stains etc.

6.13 POINTING AND REPOINTING

REQUIREMENT: Point and/or repoint all open and defective joints, and all jointing affected by the synthetic stone repair work.

Provide all pointing and/or repointing as specified in Subsection 5 - Pointing And Repointing.

6.14 ASSOCIATED DRAWINGS

Refer to the associated drawings:-

END OF SECTION: STONEMWORK

6. METAL FIXTURES

1 GENERAL

1.1 CROSS REFERENCES

Extent of Work

The works include but are not necessarily limited to the following:

- Reinstate all missing air vents with new cast iron units to match original.
- Reinstate and re-bed all existing air vents in existing locations.
- All items in the scope of works 3.1.12 and as indicated on the drawings.

Related sections

Refer to the following sections:

Section 3:	General Requirements
Section 5:	Stonework

2 QUALITY

2.1 INSPECTION

Give sufficient notice so that inspection can be made at the stages indicated in the inspection and test plans schedule located in section 3.2.1 for witness and hold points.

3 MATERIALS

3.1 MATERIALS AND COMPONENTS

Metals

Performance: Provide metals suited to their required function, finish and method of fabrication, in sections of strength and stiffness adequate for their purpose.

Reproduction replacement cast metal elements are to be of cast iron and are to match adjacent cast iron original elements. If standard moulds are unavailable existing elements should be used to make new moulds for these elements. Allow for shrinkage during casting process.

4 EXECUTION

4.1 CONSTRUCTION GENERALLY

Metals

Performance: Provide metals so that they transmit the loads imposed and ensure the rigidity of the assembly without causing deflection or distortion of finished surfaces.

Incompatible metals: Separate using concealed layers of suitable materials in appropriate thicknesses.

Fasteners

Performance: Provide fasteners so that they do not cause galvanic corrosion.

Materials: Provide fasteners in materials of mechanical strength and corrosion resistance at least equal to that of the lowest resistant metal joined.

Fabrication

Workshop: Fabricate and pre-assemble items in the workshop wherever practicable.

Edges and surfaces: Keep clean, neat and free from burrs and indentations. Remove sharp edges without excessive radiusing.

Thermal movement: Accommodate thermal movement in joints and fastenings.

Joints

General: Fit joints to an accuracy appropriate to the class of work. Finish visible joints made by welding, brazing or soldering using grinding, buffing or other methods appropriate to the class of work, before further treatment.

Self-finished metals: Free of surface colour variations, after jointing.

Joints: Fit accurately to a fine hairline.

4.2 WELDING AND BRAZING**General**

Quality: Provide finished welds free of surface and internal cracks, slag inclusion, and porosity.

4.3 ASSOCIATED DRAWINGS

Refer to the associated drawings:-

END OF SECTION: METAL FIXTURES

7. DRAINAGE

1 GENERAL ---

1.1 CROSS REFERENCES

Extent of Work

The works include but are not necessarily limited to the following:

The Contractor is to -

- Provide all drainage items as indicated in the Scope of Works section 3.1.12 and as indicated on the drawings..

General

Refer to the *General Requirements* section.

Related Sections

Refer to the following sections:	Section 3:	General Requirements
	Section 4:	Demolition
	Section 9:	Paving

1.2 STANDARD

Stormwater Drainage

General: To AS/NZS 3500.3.2

2 QUALITY ---

2.1 INSPECTION

Give sufficient notice so that inspection can be made at the stages indicated in the inspection and test plans schedule located in section 3.2.1 for witness and hold points.

END OF SECTION: DRAINAGE

8. LANDSCAPING

1 GENERAL ---

1.1 CROSS REFERENCES

Extent of Work

The works include but are not necessarily limited to the following:

The Contractor is to -

- All works to Landscaping as indicated in the Scope of works section 3.1.12 and as indicated on the drawings.

General

Refer the *General Requirements* section.

Related Sections

Refer to the following sections:

Section 3:	General Requirements
Section 4:	Demolition

1.2 STANDARDS

Soils

General: To AS 4419.

2 QUALITY ---

2.1 INSPECTION

Give sufficient notice so that inspection can be made at the stages indicated in the inspection and test plans schedule located in section 3.2.1 for witness and hold points.

END OF SECTION: LANDSCAPING

9. PAVING

1 GENERAL

1.1 CROSS REFERENCES

Extent of Work

The works include but are not necessarily limited to the following:

The Contractor is to –

- Repair paving as indicated in the Scope of Works 3.1.12 and as indicated on the drawings and within this section.
- Refer to engineers drawings for concrete paving repairs Dubbo Railway Station

1.2 GENERAL

Refer the *General Requirements* section.

1.3 RELATED SECTIONS

Refer to the following sections:

Section 3:	General Requirements
Section 4:	Demolition
Section 5:	Stonework
Section 7:	Drainage

2 QUALITY

2.1 INSPECTION

Give sufficient notice so that inspection can be made at the stages indicated in the inspection and test plans schedule located in section 3.2.1 for witness and hold points.

2.2 SAMPLES

Finishes

General: Submit samples of the pavement finishes if new material is to be introduced, showing the full range of texture and colour of the material.

3 MATERIALS AND COMPONENTS

3.1 MATERIALS

General

Fill for sub-base: Sand.

Sub-base: Well-graded sharp sand well compacted over area of paving.

Re-use of existing pavers is acceptable, all new brick pavers to match existing. Provide new paver edge restraint as indicated on the drawings bedded in cement mortar.

4 EXECUTION

4.1 GENERAL

Sub-grade brick paving

General: Remove existing paving and topsoil containing grass roots. Fill and compact as necessary. Ensure strength and stiffness is similar throughout, including soft spots and service trenches. If necessary, loosen the sub-grade to a depth of 200mm and adjust the moisture content before compaction.

Level tolerance: +0, -25mm.

Sub-base

Well-graded sharp sand well compacted over area of paving.

Thickness tolerance: + 5 mm, - 5mm.

Drainage

Finished surface cross falls: 1:50 minimum.

Ponding: Grade pavements to even falls so as to drain away from buildings without ponding.

Surface run-off: Provide channels and drains to discharge points.

Poorly drained sites: Select from the following:

Provide subsurface drains (refer to Section 7 "Drainage").

At walls: Set finished level of pavements below damp-proof course, weep holes and vent openings.

5 COMPLETION

5.1 MAINTENANCE

Cleaning

Leave pavements clean on completion.

END OF SECTION - PAVING
