Part 1 GENERAL

1.1 SUMMARY

1. This Section to conform to Division 1, General Requirements.

1.2 DESCRIPTION OF WORK

1. Provide removal of paint coatings as described in the Heritage Conservation drawings. Provide testing trials to establish preferred approach.
2. This Section describes cleaning to be carried out to limestone, clay brick and cast stone surfaces to remove all cementitous coating and atmospheric soiling and staining without causing damage to the underlying substrate. Cleaning shall include but not be limited to:

    1. Removal of cementitious coating from masonry at masonry walls.

    2. Removal of metallic stains by means of poultice-based organic solvent cleaning.

    3. Removal of bitumen or tars by poultice-based organic solvent cleaning followed by low pressure abrasive cleaning.

    4. Removal of atmospheric soiling from masonry.

    5. Final building clean-down on completion of work.

1.3 RELATED WORK

1. Masonry Procedures: Section 04 03 05 01

1.4 SUBMISSIONS

1. Submit samples, literature and details of tools, machinery and equipment as specified in Section 04 03 05 01 Masonry Procedures.

2. Execute mock-ups as specified in Section 04 03 05 01 Masonry Procedures and as described herein.

1.5 QUALIFICATIONS

1. Comply with requirements of Section 04 03 05 01: Masonry Procedures.

1.6 ENVIRONMENTAL REQUIREMENTS

1. Comply with requirements of Section 04 03 05 01: Masonry Procedures.

2. Provide copies of certificates related to transportation, use and disposal of all cleaning materials to the Consultant.

1.7 PROTECTION

1. Protect the general public and adjacent property from contact with cleaning materials by erecting properly constructed protection, positioned to confine and

prevent any overspray of water, dust or chemicals. Provide complete details of such protection for approval by the Consultant.

2. Any materials that may be damaged by the effects of any of the cleaning operations shall be protected as described herein.

3. All sash and/or exterior storm windows, including glass, frames, sealant at junction of frame and masonry, and exterior metal shall be protected by painted 6 mm exterior grade plywood sealed at the edges with split closed-cell pipe insulation and secured with non-ferrous anchors to prevent penetration of dust or liquids. Ensure installation will not allow the penetration of any materials to the interior of the building. Take necessary corrective action to address any such penetration into the building.

4. In addition, employ polyethylene sheet with adhesive tape, strippable latex caulking and closed-cell backer rod to protect all other situations as necessary.

5. At chemical cleaning immediately adjacent to any painted wood surface, take all necessary measures to protect existing paint from masonry chemical cleaning process.

6. Protect all other surrounding areas as recommended by the product manufacturer or as directed by the Consultant. Such areas include, signage, metal plaques, lighting fixtures, electrical and other any other utility's equipment or conduit, all non-masonry surfaces and particularly metal surfaces.

7. Operatives shall be aware of hazardous nature of cleaning operations and shall wear appropriate safety clothing at all times during cleaning operations.

8. Contain and collect all spent cleaning materials and water immediately below the area of cleaning to prevent run down on to areas of masonry not being cleaned and their subsequent staining. Dispose of spent cleaning materials in accordance with all relevant legislation and requirements.

1.8 SCHEDULE

1. Provide schedule of cleaning operation, prior to commencing work, for approval by Consultant.

2. Provide Consultant with minimum 48 hours notice of intent to commence cleaning operations.

Part 2 PRODUCTS

2.1 MATERIALS

1. Water: potable, clean and free from contaminants. Where water has high iron or other metal content, pre-treat with complexing agents before use to reduce risk of staining.

2. Surfactant: non-ionic detergent suitable for use on masonry.

3. Petroleum based solvents: proprietary asphalt and tar removers to approval of Consultant.
4. Organic Solvents: proprietary products to approval of Consultant.

5. Chemicals

1. EDTA (Ethylene Diamine Tetra-acetic Acid).

2. Proprietary phosphoric acid-based "ferrous stain remover".

3. Proprietary ammonia-based "copper stain remover".

4. Proprietary paint-coating remover; Acceptable product: Keim Bio-Stripper by VGR

5. Proprietary cleaners for the removal of atmospheric soiling. Acceptable range of products:

   .1 Sure Klean 766 Limestone & Masonry Prewash by ProSoCo.

   .2 Sure Klean Limestone & Masonry Afterwash by ProSoCo.

   .3 Sure Klean Heavy Duty Restoration Cleaner by ProSoCo.

6. Poultice medium: absorbent clay medium; diatomaceous earth or attapulgite.

7. Poultice reinforcement and accessories:

   .1 Fibre reinforcing: fibrillated fibre concrete reinforcement.

   .2 Plastic mesh reinforcing; alkali resisting.

   .3 Polyethylene film, 6-mil clear.

8. Biocide: Proprietary quaternary ammonium-based biocide suitable for use on masonry and to the approval of the Consultant.

2.2 TOOLS

1. Brushes: soft-fibered nylon, natural soft and stiff bristle or phosphor bronze.

2. Scrapers: wood or plastic.

3. Trowels: corrosion resistant.

2.3 WATER RINSING EQUIPMENT

1. Piping and fittings to be plastic or non-ferrous.

2. Water pumps to be fitted with accurate pressure regulators and gauges that are capable of being pre-set and locked at maximum specified levels.

3. Equipment shall be designed to provide a flow rate of between 18 and 30 litres per minute [4-6 g.p.m.] at pressures ranging from 35kPa to 400kPa [50 p.s.i. to 600 p.s.i.].

4. When rinsing on masonry or adjacent to masonry, employ pressures below 140kPa and working distances to ensure there is no loss of surface or damage to substrate.

5. Equipment shall be equipped to provide heated rinse water at minimum 80°C.

6. Spray heads to be equipped with nozzles of the fan type with spray tips of between 15° and 25°.

2.4 ABRASIVE EQUIPMENT

1. Proprietary cleaning systems based on micro-abrasives and low pressure water delivered by means of various nozzles producing a rotating vortex process. Equipment should incorporate new Rotec/Quintek nozzles.

2. Acceptable material: Jos Cleaning System.

2.5 STEAM CLEANING EQUIPMENT

1. Portable steam cleaning equipment, capable of delivering super heated water up to 150°C at low volume and low pressure through fine nozzles.

Part 3 EXECUTION

3.1 PREPARATION

1. All Methods: Provide protection as required and described herein and obtain approval of Consultant prior to undertaking / executing / doing the work.

2. Each surface being cleaned shall be evenly lit during cleaning and while drying.

3. Lighting shall be of the type and intensity required to illuminate surfaces to show stains, streaking and other defects as well as the level of cleaning results.

3.2 TESTING

1. Carry out test panels to adequately demonstrate and assess the performance of each cleaning method and system and the variables involved.

2. Locations of test panels shall be selected by the Consultant and all tests shall be carried out in the presence of the Consultant.

3. If initial methods prove unsatisfactory, combinations of methods shall be tried from acceptable alternatives.

4. Submit written results of tests, outlining methods, materials, concentrations of chemicals, dwell times etc. Obtain approval of Consultant before proceeding.

5. Accepted test panels that meet or exceed the level of clean obtained in the pre-tender mock up shall form the standard and quality of work for the entire project.

3.3 REMOVAL OF ATMOSPHERIC SOILING FROM SILICEOUS SUBSTRATES [BRICK AND SANDSTONE]

1. Perform cleaning as determined by testing. Testing will have determined dwell times of chemicals, rinsing procedures, number of applications and acceptable level of clean.

2. Clean without damaging stone.

3. Collect and dispose of cleaning materials from the work area twice daily, at the mid-day break and at the end of the working day.

4. Apply alkali pre-wash to dry substrate and allow to dwell on surface for approximately 45 minutes. Do not allow product to dry out on the surface. Re-apply and/or mist with water as necessary.

5. Rinse from bottom up using hot water system. Immediately apply Heavy Duty Restoration Cleaner diluted as determined by testing and allow to dwell on surface a maximum of 3 minutes.

6. Thoroughly rinse down from the bottom up, maintaining wet conditions below area of rinsing at all times to avoid re-absorption of cleaning chemicals into dry masonry.

7. Reapply as necessary to obtain approved level of clean.

8. Take readings using pH papers to ensure that the wall is thoroughly rinsed of all residual chemicals. Continue rinsing until neutral pH readings are obtained to the satisfaction of the Architect.

3.4 REMOVAL OF ATMOSPHERIC SOILING FROM CALCAREOUS SUBSTRATES [CAST STONE]

1. Perform cleaning as determined by testing. Testing will have determined dwell times of chemicals, rinsing procedures, number of applications and acceptable level of clean.

2. Clean without damaging stone.

3. Collect and dispose of cleaning materials from the work area twice daily, at the mid-day break and at the end of the working day.

4. Apply alkali pre-wash to dry substrate and allow to dwell on surface for approximately 45 minutes. Do not allow product to dry out on the surface. Re-apply and/or mist with water as necessary.

5. Rinse from bottom up using hot water system. Immediately apply Limestone Afterwash Cleaner diluted as determined by testing and allow to dwell on surface a maximum of 5 minutes.

6. Thoroughly rinse down from the bottom up, maintaining wet conditions below area of rinsing at all times to avoid re-absorption of cleaning chemicals into dry masonry.

7. Reapply as necessary to obtain approved level of clean.

8. Take readings using pH papers to ensure that the wall is thoroughly rinsed of all residual chemicals. Continue rinsing until neutral pH readings are obtained to the satisfaction of the Architect.

3.5 REMOVAL OF CEMENTITIOUS COATING FROM MASONRY

1. Remove heavy cementitous coating from masonry where indicated.

2. Perform mock-up to establish technique to achieve satisfactory removal of coating without damaging surface of masonry under coating.

3. Use small-scale carbide tipped chisels to remove coating.

4. Use mallet or air hammer with chisel to remove coating without damaging masonry substrate under coating.

5. On flat surfaces carborundum blocks may be used to supplement handwork.

3.6 REMOVAL OF SOLUBLE SALTS

1. Dry brush wall areas containing salts to remove surface residues. Collect salts in bags and remove from site.

2. Thoroughly irrigate wall to put salts into solution.

3. Employ nebulised spray heads arranged to achieve maximum saturation with minimum water run-off.

4. Construct eaves trough to collect run-off and run to barrels. Remove from site.

5. Prepare poultice medium from attapulgite clay and clean water to consistency of stiff cream. Reinforce with fibres as necessary.

6. Trowel-apply poultice to contaminated wall areas approximately 12 mm thick and leave finished neatly.

7. Where appropriate to provide support for the poultice over large areas apply mesh over poultice and secure into mortar joints with stainless steel fasteners.

8. Apply cover of polyethylene film or sheet and tape edges to control rate of drying.

9. Remove plastic after 24 hours.

10. Allow poultice to dry.

11. Carefully scrape residue into plastic bags, seal and remove from site.

12. Pick up any droppings and dispose of as noted above.

13. Reapply poultice up to four times as directed by the Consultant.

14. Permit samples to be taken for analysis between applications.

15. Complete poultice cleaning by carrying out a final wash-down to remove residual poultice media in the pores of the stone.

3.7 REMOVAL OF ORGANIC GROWTH

1. Apply proprietary solution of Quaternary Ammonium-based biocide in accordance with manufacturer's directions, using hand held spray unit.

2. Apply as flood coat, allowing solution to penetrate the masonry.

3. Mask off and protect all other masonry from treatment.

4. Contain solution in area being cleaned.

5. Collect any run-off and dispose of in accordance with hazardous waste legislation.

6. Re-apply as necessary.

3.8 REMOVAL OF METALLIC STAINS, BITUMENS AND TARS

1. Carry out cleaning using poultices to remove stains.

2. Prepare poultice medium mixed with clean water [or solvents or chemicals as appropriate to the nature of the soiling and as directed.].

3. Mix to consistency of stiff cream.

4. Pre-wet soiled area with liquid portion of poultice.

5. Trowel apply poultice approximately 12mm. thick over soiled area and leave finished neatly.

6. Apply cover of polyethylene film or sheet and tape edges to control rate of drying.

7. Remove plastic after 24 hours and allow poultice to fully dry out.

8. Carefully scrape residue into plastic bags, seal and remove from site.

9. Dispose of waste in accordance with hazardous waste legislation.

10. Pick up any droppings and dispose of as above.

11. Re-apply poultice and repeat procedure as necessary.

3.9 FINAL CLEAN-DOWN OF BUILDING

1. Immediately prior to application of cleaning materials pre-wet section of wall to be cleaned using hot water.

2. Apply sufficient water to surfaces to point where no further water is absorbed.

3. Apply 5% solution by weight of surfactant.

4. Agitate on wall to create lather and to remove soiling.

5. Do not allow to dry out.

6. Thoroughly rinse all traces of cleaning solution from the masonry.

7. Reapply as necessary.

End of Section 04 01 20 52