
Battle of Windmill
Lighthouse Repairs
Project No. 20030678

Specification
Title Sheet

Section 00 00 00
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July 2015

Project Title Battle of Windmill - Lighthouse Repairs

Project Number 20030678

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PART 1 - GENERAL

1.1 Description

- .1 General
 - .1 These detailed specifications cover the requirements for the furnishing of all labour, materials, tools, equipment, power plant, systems, transportation and supervision necessary to completely perform the work, as described by the Drawings and the Specifications.
- .2 Description of Work
 - .1 The repair / restoration of the Windmill Lighthouse consists of the following general scope of work and as detailed on the drawings and in these specifications.
 - .1 Provide access as required to complete the work, including protection (i.e., barricades) to the work site to prevent Public access to the work area.
 - .2 Provide protection to all features which may be affected by the work and to the satisfaction of the Departmental Representative.
 - .3 Complete masonry repairs to the exterior of the lighthouse as indicated and as directed by the Departmental Representative.
 - .4 Provide temporary bracing and shoring surrounding masonry during lintel repairs and to flooring sections during wooden joist repairs to the satisfaction of the Departmental Representative.
 - .5 Remove existing deteriorated wood joists (two joists to be replaced) and replace with new as indicated on drawings and as described in these specifications.
 - .6 Remove existing deteriorated flooring and replace with new as indicated on the drawings and as described in these specifications.
 - .7 Complete dismantling and re-construction of the interior window masonry lintels (six in total), including the vousoirs, stone rubble backing (stabilization) and deteriorated mortar joints as indicated on the drawings and as directed by the Departmental Representative.
 - .8 Complete re-painting and repairs to the exterior wood and metal work of the surmounting lantern, including the

installation of new galvanized metal decking, as indicated on the drawings and as described in these specifications.

.9 Strip existing paint, complete repairs to woodwork and repaint the entrance doors and frames as indicated on the drawings.

.10 Install new painted plywood panels and infill blocking on existing interior stair railings.

.11 Install "bulb" weather stripping on the bottom rail of existing window sash.

.12 Complete clean-up and reinstatement to the satisfaction of the Departmental Representative.

1.2 Location of the Work .1 The Windmill Lighthouse is located on the north shore of the St. Lawrence River, approximately 3 kilometers to the east of Prescott, just south of former King's Highway #2.

1.3 Relics and Antiquities .1 Relics and antiquities such as cornerstones and their contents, commemorative plaques, the remains and evidence of ancient persons and peoples, and other objects of historic value and worth will remain the property of the Department. When found, protect such articles and request directions from the Departmental Representative.

.2 Should historic objects be uncovered during the work, stop work immediately and notify the Departmental Representative. Do not resume work until such time as directed by the Departmental Representative.

1.4 Standards .1 Reference is made to OPSS, CGSB, ASTM, CSA and other national and international standards. These standards, when quoted, form an integral part of and are to be read in conjunction with the specification as if reproduced herein. The latest edition is applicable, unless a dated edition is specified.

1.5 Abbreviations .1 OPSS - Ontario Provincial Standard Specifications

- .2 CGSB - The Canadian General Standards Board.
- .3 CSA - Canadian Standards Association.
- .4 CWB - Canadian Welding Bureau.
- .5 CAN2 - A National Standard of Canada published by CGSB.
- .6 CAN3 - A National Standard of Canada published by CSA.
- .7 ASTM - American Society for Testing and Materials.
- .8 ACI - American Concrete Institute.
- .9 ANSI - American National Standards Institute.
- .10 NBC - National Building Code of Canada.
- .11 JIC - Joint Industrial Conference, Hydraulic Standards for Industrial Equipment.
- .12 NLGA - National Lumber Grades Authority.
- .13 AWWA - American Water Works Association.

1.6 Definitions

- .1 Unless the context clearly indicates otherwise, the following definitions apply.
 - .1 Plans - the drawings listed in the "List of Drawings".
 - .2 Specification - the subject matter listed in the "Index to Specification", Addenda to the Specification and all relative written communications sent by the Departmental Representative to the Contractor in connection with the work.
 - .3 Department - Parks Canada Agency, Georgian Bay and Ontario East Field Unit and Ontario Waterways Group.

1.7 Sub-Surface Information

- .1 Sub-surface information, when given, is for general information and is not guaranteed.

1.8 Pedestrians and the Public

- .1 Posts shall not be anchored by drilling into existing bedrock or other existing features, nor

shall existing loose rock or other site materials be used as counter balance material. Contractor shall obtain approval on "securing" measures for post stability prior to proceeding with work.

- .2 Provide secure coverings to all openings to prevent Public access to the work areas at all times during construction.

1.9 Protection of the Work

- .1 Protect the work from damage by adverse climatic conditions.

1.10 Measurement for Payment

- .1 No quantities associated with items of work described in this section will be measured for payment purposes.

1.11 Basis of Payment

- .1 The lump sum price for the item "Sitework" will cover the costs for mobilization/demobilization including the following.
 - .1 Supply, installation and maintenance of site barricades (i.e. snow fence).
 - .2 Provision and maintenance of temporary facilities.
 - .3 Layout of the work.
 - .4 Scheduling.
 - .5 Permits and taxes (including building permit).
 - .6 Environmental measures.
 - .7 Rectification of existing surfaces, materials and access routes including topsoil, finish grading, seeding and mulching.
 - .8 Site Clean-up and restoration.
 - .9 Any other items of work (referred to as miscellaneous work items) called for on the drawings and specifications and not specifically covered by other payment items of the Contract.

PART 2 - PRODUCTS

2.1 Acceptance of Materials

- .1 Where materials and equipment are specified to OPSS, CSA, CGSB, ASTM or similar standards, submit a written request to the Departmental Representative for approval of the relevant items. Include all relevant items. Do not use

until written approval has been received from the Departmental Representative.

- .2 Use new, unused material only, except as noted or approved by the Departmental Representative in writing.
- .3 Materials and equipment specified by a manufacturer's name, catalogue number or trade name are intended to establish a standard of quality. Materials or equipment at least equivalent thereto may be submitted to the Departmental Representative for approval along with proof of equivalence.

2.2 Samples

- .1 Be responsible for samples and sampling. The Departmental Representative will be responsible for testing.

2.3 Rectification
of Existing Surfaces
and Materials

- .1 Repair, replace and/or refinish, to the Departmental Representative's approval, existing surfaces and items damaged by the work, including the access route(s).
- .2 The repaired, replaced and/or refinished items to be at least equal to those that existed immediately before damage occurred.
- .3 Restore topsoil and seed and mulch at the Contractor's expense in areas which have been disturbed by the Contractor's operations under this Contract and which are not covered by other items of the Contract. All topsoil and seeding and mulching repairs to be carried out in accordance with OPSS 570 and 572 (Standard Roadside Mix for grass seed).
- .4 Restoration must occur as soon as possible after construction is completed.
- .5 Seeded areas will be accepted when the turf is properly established.

PART 3 - EXECUTION

3.1 Requirements of
Regulatory Agencies

- .1 Be entirely responsible for the design and adequacy of all supports, bracings, blocking,

handrails, scaffold conveyance systems, etc. used in the construction, and comply with applicable Provincial and Municipal ordinances.

- .2 Adhere to National, Provincial and Municipal requirements relating to the safety, health and protection of workers and the environment.

3.2 Scheduling

- .1 The Contract must be completed on or by the date specified in the instructions to tenderers portion of these documents.
- .2 Submit the Construction Progress Schedule within five days of award of Contract. No progress payments will be made until the Construction Progress Schedule is approved. Submit a cost breakdown for each lump sum payment item - the breakdown to be in sufficient detail as to permit the calculation of progress payment amounts. Upon receipt of notice from the Departmental Representative, in writing, that the Progress Schedule is not approved or no longer valid, submit a revised Construction Progress Schedule within five days.
- .3 Take all necessary measures to complete the work within the scheduled times approved by the Departmental Representative.
- .4 Do not make changes to the approved schedule except with the Departmental Representative's approval.

3.3 Layout of the Work

- .1 The Contractor to be responsible for all layout and control work.

3.4 Temporary Services

- .1 The Contractor will be allowed access to the power service at the Lighthouse (which is limited in capacity) as approved by the Departmental Representative and within the capacity of the existing power supply. Any power requirements in excess of that which may be provided by the Lighthouse's supply will be provided for by the Contractor.
- .2 Contractor shall supply their own water (including all potable water for work items) and

washroom facilities.

3.5 Temporary
Facilities

- .1 Provide and maintain:
 - .1 Suitable storage facilities, of types and at locations approved by the Departmental Representative;
 - .2 A site trailer/office at a location approved by the Departmental Representative, open during working hours;
 - .3 Necessary scaffolding, ladders and platforms, or other approved means of access to Canadian Construction Safety Code, NRCC 15562;
 - .4 All necessary enclosures, guards, guardrails, hoarding, barricades, warning signs, flashing warning lights (for night) and similar items.

3.6 Examination of
the Site of the Work

- .1 One site visit has been scheduled during the tender period. This visit is tentatively scheduled as indicated in the instructions to tenderer's. Confirmation of attendance is to be made through the Parks Canada Project Manager. No other visits will be scheduled by the Owner and, should the tenderer wish to visit the site at other times, it will be his responsibility to make arrangements.
- .2 Investigate and be fully informed as to the character and extent of the work to be performed and the difficulties involved, the facilities available for delivering, placing and operating the necessary plant and delivering and handling of materials.

3.7 Clean-Up

- .1 Clean and tidy the work area on a daily basis and permit no undue amounts of debris, trash, and/or garbage to accumulate.
- .2 At the completion of the work, remove all surplus materials, tools, plant, rubbish and debris and dispose of them in an approved manner off the site.

3.8 Taxes

- .1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).

- 3.9 Permits .1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Notify the Ministry of Labour of the work. Provide inspection certificates as evidence that work conforms with requirements of authority having jurisdiction.

PART 4 - DOCUMENTS

- 4.1 Documents Required .1 Maintain at job site, one copy each of following.
- .1 Contract Drawings,
 - .2 Specifications,
 - .3 Addenda,
 - .4 Change Orders,
 - .5 Other modifications,
 - .6 Field Test Reports,
 - .7 Copy of approved work schedule,
 - .8 Manufacturers' installation and application instructions, and
 - .9 Notice of Project issued by Ministry of Labour.
 - .10 Site Specific Health and Safety Plan.

PART 5 - ENVIRONMENTAL
CONSIDERATIONS

- 5.1 Fires .1 Fires and burning of rubbish or any material on site is not permitted.
- 5.2 Disposal of Waste .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner on site.
- .3 All waste described as subject to Regulation 309, Environmental Act, must be transported with a valid "Certificate of Approval for a Waste Management System" to a site approved to accept the waste.
- 5.3 Disruption of Site .1 Minimize disruption of site and restore all damaged features to satisfaction of Departmental

Representative and at least to the condition before damage occurred.

PART 6 - PROGRESS PAYMENTS

6.1 Progress Payments

- .1 A number of items in this Contract are paid for on a lump sum basis. Prior to submission of the first progress payment claim, the Contractor shall submit to the Departmental Representative a detailed breakdown of these lump sum items in order to facilitate approval and processing of progress payment claims. The detailed breakdown is subject to review by the Departmental Representative.

PART 1 - GENERAL

1.1 General

- .1 This section specifies general requirements and procedures for Contractors submissions of shop drawings, product data, samples and mock-ups to the Departmental Representative for review. Note that additional specific requirements for submissions are also specified in other individual sections of these specifications.
- .2 Do not proceed with work until relevant submissions are reviewed by the Departmental Representative.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information are not produced in SI Metric units, converted values are acceptable.
- .5 Contractor's responsibility, for errors and omissions in submission, is not relieved by the Departmental Representative's review of submissions.
- .6 Notify the Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Departmental Representative's review of submission, unless the Departmental Representative gives written acceptance of specific deviations.
- .8 Make any changes in submissions which the Departmental Representative may require consistent with Contract Documents and resubmit as directed by the Departmental Representative.
- .9 Notify the Departmental Representative, in writing, when resubmitting any revisions other than those requested by the Departmental Representative.

1.2 Submission
Requirements

- .1 Co-ordinate, each submission, with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow 7 days for the Departmental Representatives review of each submission.
- .3 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .4 Submission shall include:
 - .1 Date and revision dates.
 - .2 Project title and dates.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents. Note: submissions without a signed Contractor's stamp will not be reviewed and will be returned to the Contractor for resubmission with the required signed stamp.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .5 After the Departmental Representative's review, distribute copies.

- 1.3 Shop Drawings
- .1 Shop drawings: original drawings, or modified standard drawings provided by the Contractor, to illustrate details of portions of the Work, which are specific to the project requirements.
 - .2 Submit shop drawings as follows:
 - .1 Minimum of three (3) copies of prints which will be retained by the Departmental Representative plus a reasonable number of prints the Contractor wants returned for the Contractor's use.
 - .3 Cross-reference shop drawing information to applicable portions of the Contract Documents.
- 1.4 Product Data
- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .2 Submit two (2) copies of product data.
 - .3 Sheet size: 215 x 280 mm, maximum of 3 modules.
 - .4 Delete information not applicable to project.
 - .5 Supplement standard information to provide details applicable to project.
 - .6 Cross-reference product data information to applicable portions of Contract Documents.
- 1.5 Samples
- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
 - .2 Where colour, pattern or texture is criterion, submit full range of samples.
 - .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.
- 1.6 Mock-ups
- .1 Mock-ups: field-erected example of work complete with specified materials and workmanship.
 - .2 Erect mock-ups at locations acceptable to the Departmental Representative.

- .3 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be verified.

1.7 Shop Drawings Review

- .1 The review of shop drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that the Departmental Representative approves the detailed design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and, for co-ordination of the work of all sub-trades.

PART 2 - PRODUCTS

- 2.1 Not used .1 Not Used.

PART 3 - EXECUTION

- 3.1 Not used .1 Not used.

PART 1 - GENERAL

- 1.1 References .1 CSA S269.1 R2003 Falsework for Construction Purposes.
.2 CSA-S269.2 R2003(Access Scaffolding for Construction Purposes).
- 1.2 Related Work .1 Section 01 54 23 - Access.
- 1.3 Construction Safety Measures .1 Observe construction safety measures of National Building Code, Canadian Labour Code, Provincial Government, Workers'/Workmen's Compensation Board and municipal authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.
.2 Comply with requirements of FCC No. 301.
- 1.4 Overloading .1 Ensure no part of Work is subjected to loading that will endanger its safety or will cause permanent deformation.
- 1.5 Falsework .1 Design and construct falsework in accordance with CSA S269.1.
- 1.6 Scaffolding .1 If used, design and construct scaffolding in accordance with CSA S269.2
- 1.7 WHMIS .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.
.2 Deliver copies of WHMIS data sheets to Departmental Representative on delivery of materials.

PART 2 - PRODUCTS

2.1 Not used .1 Not Used.

PART 3 - EXECUTION

3.1 Not used .1 Not used.

PART 1 - GENERAL

1.1 References

- .1 Canadian Standards Association (CSA):
 - .1 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2010 (NBC):
 - .1 Division B, Part 8 Safety Measures at Construction and Demolition Sites
 - .3 National Fire Code 2010 (NFC):
 - .1 NFC 2010, division B, Part 2 Emergency Planning, subsection 2.8.2 Fire Safety Plan.
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, O. Reg. 213/91 as amended, Reg. 834, O. Reg. 278/05 (Asbestos - Construction).
 - .2 Workplace Safety and Insurance Act, 1997
 - .3 Municipal statutes and authorities.
 - .5 Canada Labour Code - Part II, Occupational Health and Safety Regulations.

1.2 Submittals

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan: Within 5 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
 - .4 Contractor's and Sub-contractors' Safety Communication Plan.
 - .5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations.

- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and may provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
 - .4 Departmental Representative's review of Contractor's final Site Specific Health and Safety Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction site health and safety.
 - .5 Submit records of Contractor's Safety Meetings at regular project site meetings.
 - .6 Submit 1 copy of the Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative when requested.
 - .7 Submit copies of reports or directions issued by safety inspectors of authority having jurisdiction.
 - .8 Submit copies of incident and accident reports.
 - .9 Submit Material Safety Data Sheets for all products and items used on site(MSDS)to Departmental Representative.
 - .10 Submit names of personnel and alternates responsible for site safety and health.
 - .11 Submit WSIB - Workplace Safety and Insurance Board, Experience Rating Report for Province of Ontario.
 - .12 Contractor shall submit signed Parks Canada Attestation and Proof of Compliance with Occupational Health and Safety form prior to start of work.
- 1.3 Filing of
Notice
- .1 File Notice of Project with Provincial authorities prior to commencement of Work.

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- 1.4 Safety Assessment
- .1 Perform site specific safety hazard assessment related to project. Identifying all potential hazards.
- 1.5 Meetings
- .1 Pre-construction meeting: schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of work.
- 1.6 Regulatory Requirements
- .1 Comply with Acts and regulations of the Province of Ontario.
- .2 Comply with specified standards and regulations to ensure safe operations at site.
- .3 In event of conflict between any provisions of specified standards and regulations, the most stringent provision governs.
- 1.7 Project Site Conditions
- .1 Work at the site will also involve:
- .1 A Hazard Assessment and listing of designated substances on site.
 - .2 Mitigation of all hazardous substance removals and disposal in accordance with applicable legislation and Ministry of Labour requirements.
 - .3 Work at heights.
 - .4 Work near water.
- .2 Contact with:
- .1 High levels of silica/dust in Concrete and masonry rubble.
 - .2 Lead in the paint as follows:
 - .1 Doors - 17000µg/g.
 - .2 Roof - 471 µg/g.
 - .3 Test results can be obtained upon request from the Contractor.
 - .4 Contractor shall ensure all Ministry of Labour requirements are followed with respect to silica presence and the above noted lead concentrations.
- 1.8 General Requirements
- .1 Develop an independent written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until

after final demobilization from site. Health and Safety Plan must address project specifications.

- .2 Relief from or substitution for any portion or provision of minimum Health and Safety Guidelines specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing. Departmental Representative will respond in writing, where deficiencies are noted and request resubmission with correction of deficiencies either accepting or requesting improvements.

1.9 Responsibility

- .1 Be responsible for safety of persons and property on site and for protection of environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Ontario Act.

1.10 Compliance Requirements

- .1 Comply with Occupational Health and Safety Act, R.S.O.

1.11 Unforeseen Hazards

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act.

1.12 Posting of Documents

- .1 Provide documents as follows and post on site in a conspicuous location:
 - .1 Contractor's Safety Policy.

- .2 Constructor's Name
 - .3 Health & Safety Representatives Name.
 - .4 Ministry of Labour Orders for Province of Ontario.
 - .5 Occupational Health and Safety Act for Province of Ontario.
 - .6 Material Safety Data Sheets.
 - .7 Safety Plans.
 - .8 Notice of Project.
 - .9 Joint Health and Safety Committee Members(where required).
- .2 Comply with Provincial general posting requirements.
- 1.13 Correction of Non-Compliance
- .1 Immediately address health and safety non-compliance issues identified by Departmental Representative and regulatory agency having jurisdiction in the Province or any individual who notes a safety related issue.
 - .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
 - .3 Departmental Representative may stop Work if a perceived non-compliance of health and safety regulations is perceived to not be immediately corrected.
- 1.14 Work Stoppage
- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
 - .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.
- PART 2 - PRODUCTS
- 2.1 Not Used
- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used .1 Not used.

PART 1 - GENERAL

1.1 Related
Requirements
Specified
Elsewhere

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

1.2 Appointment and
Payment

- .1 Departmental Representative will appoint and pay for services of testing laboratory except for the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
 - .6 Additional tests specified in paragraph 1.2.2.
- .2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.

1.3 Contractor's
Responsibilities

- .1 Furnish labour and facilities to:
 - .1 Provide access to work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 Not used .1 Not Used.

PART 3 - EXECUTION

3.1 Not used .1 Not used.

PART 1 - GENERAL

1.1 Items of Work

- .1 This section covers the requirements for the provision of access to permit work to be carried out for restoration of the exterior masonry of the lighthouse as well as the repairs/repainting of the surmounting light. It is intended that standard scaffolding will be used for this purpose.
- .2 The supply, maintenance and removal of all plywood covers or, other protective measures deemed necessary by the Departmental Representative, to protect existing architectural features.
- .3 Access to permit work to be carried out to the floor joists, walls and surmounting light of the lighthouse shall be by means of standard scaffolding or other approved means meeting Ministry of Labour requirements.
- .5 If used, provide shop drawings of all scaffolding methods and locations.
- .6 Implement scaffold safety status tag system as appended to this section.

1.2 Related Work

- .1 Section 01 01 00 - General Requirements.
- .2 Section 04 43 04 - Repointing and Miscellaneous Masonry.
- .3 Section 04 43 05 - Masonry Removals.
- .4 Section 04 43 06 - Cut Stone.
- .5 Section 04 43 07 - Installation of Masonry.
- .6 Section 06 10 00 - Rough Carpentry
- .7 Section 07 62 00 - Flashings and Sheet Metal
- .8 Section 09 91 10 - Painting

- 1.3 Definition .1 Scaffolding: rigid framed and/or tube and clamp scaffolding.
- 1.4 Measurement and Payment .1 No measurement for payment will be made for the items "Access and Protection - Exterior Work" and "Access and Protection - Interior Work". Payment shall be by lump sum. All costs for labour, equipment and materials necessary to erect and dismantle scaffolding (or other approved access works), barriers and protective measures to architectural and base support features and to maintain it for the duration of the work are to be included in the lump sum bid for these items.
- .2 For purposes of facilitating progress payments, the lump sum items shall be considered to be broken down as follows:
- .1 50% of the lump sum item will be paid on satisfactory completion of scaffolding (or other approved access means) set-up, (pro-rated for the percentage of coverage in a given set-up, as proposed by the Contractor).
- .2 15% of the lump sum item will be paid on satisfactory completion of scaffolding (or other approved means) dismantling and removal from the site.
- .3 The remaining 35% shall be pro-rated over the duration of the Contract based on the schedule submitted by the Contractor.

PART 2 - PRODUCTS

- 2.1 Scaffolding .1 Scaffolding materials shall be new, or used materials in good condition.
- .2 Provide five sets of shop drawings to the Departmental Representative for review and approval.

PART 3 - EXECUTION

3.1 Scaffolding,
Hoarding and
Barriers

- .1 Provide all scaffolding, ladders, access, lifting equipment, etc. as necessary to carry out the work of all trades and as per the requirements of the work. All work to be in accordance with the Occupational Health and Safety Act. Field measure to ensure proper fit of all works.
- .2 Scaffolding shall be erected on wood sills which are placed on tarps to prevent discoloration or contamination of surfaces.
- .3 Provide suitable ladders to scaffolding at each section of scaffold isolated from other sections, for full height of scaffold. Access from the ladder(s) to the scaffolding shall be clear of obstructions and cross bracing so workers and materials can easily enter.
- .4 Scaffolding shall be designed and inspected by a registered Professional Engineer experienced in this work. Provide shop drawings for review. All drawings shall be stamped and signed by a registered Professional Engineer. Prior to the Contractor using the scaffolding for the work, the design Engineer for the scaffolding shall complete an inspection of the scaffolding and submit a stamped/sealed letter to the Departmental Representative indicating that the scaffolding installation has been completed in conformance with the design and is suitable for the Contractor's use in completing the work. Make all changes required by Ministry of Labour officials. Provide for periodic inspections of scaffolding monthly as work progresses.
- .5 Install, maintain and remove all plywood covers or other measures to protect existing architectural features.
- .6 Contractor shall be responsible for removal of all anchors from the masonry. Contractor is responsible to ensure all holes are filled to the satisfaction of the Departmental Representative as scaffolding is dismantled.
- .7 Install, maintain and remove all barriers around the site to prevent access by the Public to the immediate work areas. All barriers to be in

accordance with the Occupational Health and Safety Act.

- .8 Where required to prevent Public access, all hoarding to be panelized 1.2 metres wide x 2.4 metres high. Provide locks on all doors accessing the scaffolding through this hoarding. Securely brace and fasten to resist all wind loads.

PART 1 - GENERAL

1.1 Items of Work

- .1 Unless otherwise noted, provide all necessary shoring to support stonework remaining when removals occur and support from below is lost.
- .2 Provide bracing and shoring as required to ensure all masonry remains stable at all times.
- .3 Provide bracing as required to ensure all wooden floor units remain stable during joist replacement and lintel reconstruction

1.2 Related Work

- .1 Section 01 33 00 - Shop Drawings, Product Data, Samples and Mock-ups.
- .2 Section 04 43 04 - Repointing and Miscellaneous Masonry.
- .3 Section 04 43 05 - Masonry Removals.
- .4 Section 06 10 00 - Rough Carpentry.

1.3 Definitions

- .1 Bracing: temporary support installed in structure to increase rigidity in both longitudinal and transversal axes and thus stabilize against deformations.
- .2 Shoring: temporary support installed in an excavation or structure to relieve vertical and/or horizontal loads to permit alterations or repairs to foundation or main supporting elements.

1.4 Source Quality

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA standards.

1.5 Measurement and
Payment

- .1 No measurement for payment will be made for the work of this section. All costs associated with the work of bracing and shoring shall be deemed to be included in the related masonry items.

PART 2 - PRODUCTS

2.1 Material

- .1 Structural members: solid timber or built-up timber group A, B, C or D, grade structural No. 1 to CAN/CSA-0141-05.
- .2 Structural steel members: to CSA G40.20/40.21-04 (R2009), Grade 300 or Grade 350, Type W.
- .3 Wood connections: Canadian soft wood plywood to CSA 0151, Douglas Fir plywood to CSA 0121, Poplar plywood to CSA 0153 sheathing grade (all, latest editions).
- .4 Steel connections: steel plates and angles to CSA G40.20/40.21-04(R2009), Grade 300 or 350, Type W.
- .5 Nails: to CSA B111-1974(R2003).
- .6 Bolts: lag screws, nuts and washers to CAN3-086-09.
- .7 High-tensile bolts: to ASTM A325M-09.
- .8 Welding materials: CSA W59-03(R2008).
- .9 Temporary Jack Posts: Heavy duty and having capacity as indicated on drawings or as required by design Engineer (Contractor's) for bracing and shoring systems to lintels and floor structures.

PART 3 - EXECUTION

3.1 Inspection

- .1 Before work is begun, inspect conditions upon which this work depends for damage and weakness and inform Departmental Representative in writing of conditions not discussed in contract.

3.2 Installation

- .1 Erect structural timber to CAN3-086-M84.
- .2 Fabricate and erect structural steel work to CSA-S16-09.
- .3 Weld to CSA W59-03(R2008).
- .4 Install braces and/or shoring to support masonry to remain and, floor structures associated with the re-construction of the failed stone masonry lintel and deteriorated floor joists (to be replaced).
- .5 Install braces as required to maintain structures in a safe and stable condition.
- .6 Install packing behind wall pieces to compensate for unevenness of wall surfaces.

3.3 Maintenance

- .1 Maintain effectiveness of system by making adjustments, replacing or repairing damaged and weakened elements of system until final completion of project.

PART 1 - GENERAL

1.1 Description of Work

- .1 Work of this section includes, but is not limited to:
- .1 The areas of stonework to be chipped and repointed, are as shown on the drawings or as delineated in the tender items or as directed by the Departmental Representative.
 - .2 Re-setting of dislodged masonry units. Portions of the masonry are in a deteriorated condition and therefore great care must be exercised in carrying out the work.
 - .3 Where voids are encountered in joints, or behind removed masonry units, mortar fill is to be installed as directed by the Departmental Representative.
 - .4 Remove and replace deteriorated masonry units as directed by the Departmental Representative.
 - .5 Install masonry vents at locations shown on the drawings and as directed by the Departmental Representative.
 - .6 Seal skyward facing masonry joints at base of tower and install sealant as directed by the Departmental Representative in "active" mortar joints such as the vertical cracked masonry joint on the west side of the infilled doorway over the main entrance doorway.
 - .7 Install injection grout or DHL into cracks as directed by the Departmental Representative.

1.2 Related Work

- .1 Section 01 54 23 - Access and Protection.
- .2 Section 04 43 01 - Bracing and Shoring.
- .3 Section 04 43 05 - Masonry Removals.
- .4 Section 04 43 07 - Installation of Masonry.

1.3 Qualifications

- .1 All work of this section is to be done by skilled tradesmen having substantial proven experience in this type of work. In this regard, the workers must have had a minimum of 5 years' experience in this type of work and must be able to prove this before being allowed to complete any of this work.

- .2 The work of this section shall be executed under the continuous supervision and direction of a competent mason.
- .3 One thoroughly experienced, reliable and competent workman shall be in charge of all mortar mixing for the duration of the job.

1.4 Definitions

- .1 Repointing: filling and finishing of masonry joints from which mortar has been raked out or omitted.
- .2 Tooling: finishing masonry joints to provide final contour.
- .3 Repair: using adhesives to sections of fractured masonry.
- .4 Consolidation: strengthening masonry units to prevent deterioration (spalling).
- .5 Ornamental Stones: arch voussoirs.

1.5 Standards

- .1 All masonry restoration to be to CSA A371-14, "Masonry Construction for Buildings" and as augmented by these specifications.
- .2 "Mortar and Grout for Unit Masonry" to be in accordance with CSA A179-14 and as augmented by these specifications.
- .3 "Connectors for Masonry" to be in accordance with CSA A370-14 and as augmented by these specifications and the Contract drawings.
- .4 "Quicklime for Structural Purposes" to be in accordance with ASTM C5-10.
- .5 "Hydrated Lime for Masonry Purposes" to be in accordance with ASTM C207-06(2011).
- .6 "Concrete Materials and Methods of Concrete Construction / Methods of Test for Concrete", to CSA A23.1-14/A23.2-14.

1.6 Inspection and
Testing

- .1 Routine testing of materials, of proposed mortar mix and of final work for compliance with the specification, will be carried out by the Departmental Representative or his appointed representative. Mortar samples shall be taken from time to time for testing.
- .2 If test results show that performance criteria are not met, removal and repair of rejected work shall be performed at no additional cost to the Owner. All work must be done to the original specification.

1.7 Standard
Reference Test
Panel

- .1 Before commencement of final pointing work, the Contractor shall complete up to a 1.0 square metre (m²) test panel demonstrating all aspects of the repair procedure for each type of masonry materials specified.
- .2 The panel(s) shall be located as directed by the Departmental Representative.
- .3 The completed panel is to be used as the standard reference for acceptance or rejection of all repointing work on the job.
- .4 Start work only upon receipt of written approval of the test panel by the Departmental Representative.

1.8 Samples

- .1 Submit mortar samples in quantity and size to the requirements of CSA A179M.
- .2 Clearly labelled samples and associated data sheets of all materials to be used on the job shall be submitted to the Departmental Representative for approval before work starts.
- .3 The approved samples shall become the standard for the materials used on the job. Substitutions shall not be permitted without written approval from the Departmental Representative.

1.9 Storage and
Handling of
Materials

- .1 Store cementitious materials in accordance with CSA A5. Store aggregates in accordance with CSA A23.

- .2 All materials are to be kept dry and protected from weather and contamination. Masonry units are to be stacked on pallets.
- .3 Manufacturers' labels and seals must be intact upon delivery.
- .4 Any material that has deteriorated or has been contaminated shall not be incorporated into the work and must be removed from the site.
- .5 Store lime putty in plastic-lined, sealed drums. Do not allow lime putty to freeze at any time.

1.10 Environmental Requirements

- .1 When the air temperature is less than 5°C, sand and mixing water shall be heated to produce mortar at a temperature of not less than 5°C or more than 27°C.
- .2 No mortar may be placed when the temperature is below 0°C (32°F), or below 4°C (40°F) and falling. Repointing must not be done at temperatures above 27°C (80°) unless shading and water-misted burlap is provided over new work.
- .3 All newly laid masonry mortar placed during cold weather, shall be protected and heated in a manner that will maintain an air temperature above 10°C for three days prior to the commencement of masonry work, through the duration of the work and, for a period of seven days following the completion of the work. The masonry or base materials to which the new masonry is to be placed shall be completely free of frost and above a temperature of 5°C.

1.11 Protection

- .1 All methods of enclosure and protection shall be to the approval of the Departmental Representative.
- .2 Newly laid mortar shall be protected from excessive exposure to rain, full sunlight and wind until the surface is thumb-print hardened.
- .3 Provide and maintain protection for masonry walls at all times, when work is suspended, to prevent water from entering partially repointed masonry or to prevent rapid drying of the joints resulting in the development of shrinkage cracking.

- .4 Protection shall consist of non-staining plastic sheets, tarpaulins or burlap, secured to prevent lifting in high winds.
- .5 Provide protection boards to exposed corners and vulnerable decorative work which may be damaged by construction activities. Maintain protection for the duration of operations. Remove and dispose of protective material as directed by the Departmental Representative.
- .6 Provide protection against the spread of dust, debris and water at or beyond the work area by suitable enclosures of sheeting and tarpaulins.

1.12 Existing Condition

- .1 The Contractor shall report to the Departmental Representative, in writing, all areas of severely deteriorated masonry revealed during the work, and shall await instruction regarding repair or replacement of masonry units.

1.13 Measurement for Payment

- .1 Measurement for payment for the following items shall be as indicated.
 - .1 Chip & Repoint Masonry Joints (Full) (m²)
 - .2 Chip & Repoint Masonry Joints (Finish layer only) (m²)
 - .3 Mortar fill (m³)
 - .4 Remove & Reset Loose Masonry Units.. (m³)
 - .5 Masonry Vents..... (each)
 - .6 DHL Crack Injection..... (dm³)
 - .7 Seal Cracked Masonry Joints..... (m)
- .2 The item "Chip and Repoint Masonry Joints (Full)" refers to the chipping out and repointing of joints to the limits as indicated on the drawings (depending on joint width and configuration) while the item "Chip and Repoint Masonry Joints (Finish Layer Only) is to only replace the finish layer of recently completed repointing to provide a uniform appearance.
- .3 For the removal and resetting of loose masonry units, the volume shall be based on the average dimensions of the void in which the unit is to be reset. Units dealt with under this item will only be as authorized by the Departmental Representative and shall not be considered as part of the work of sections 04 43 05, Masonry Removals, or 04 43 07, Installation of Masonry. Where large loose units are reset by packing voided joints with mortar, all mortar not paid

for under the relevant Chip and Repoint item shall be paid for under the mortar fill item and no payment will be made under the Item "Remove and Reset Loose Masonry Units".

- .4 No measurement for payment shall be made for the item "Seal Skyward Facing Masonry Joints"; this pertaining to the joints in the ledge at the base of the tower. Payment shall be by lump sum.

1.14 Basis of Payment

- .1 Payment at the unit and lump sum prices bid for the above items shall be full compensation for all labour, equipment and materials necessary to do the work of these items in accordance with the Contract drawings and these specifications.

PART 2 - PRODUCTS

2.1 Water

- .1 Water shall be potable and free from contamination.

2.2 Cement

- .1 Cement shall be an approved grey Portland cement to A179-14. The intent of using a grey Portland, as opposed to white non-staining, is to provide a better colour match to the existing mortar joints.

2.3 Lime

- .1 Lime shall be either:
i) Slaked quicklime putty made from finely ground crushed quicklime conforming to CSA A179-14 and ASTM C207-06(2011) or,
ii) Dolomitic hydrated lime (Type S) or Masons hydrated lime (Type N) conforming to CSA A179-14 and ASTM C207-06(2011).

2.4 Pigments

- .1 Pigments shall be approved dry, powdered, inorganic pigments compatible with the materials to which the pigment is added.

2.5 Aggregates

- .1 The aggregate shall be well-graded sand (concrete sand conforming to CSA A-179) matching the texture and range of sizes found in both the test sample and the joints that will not be

repaired in the surrounding area. The colour of the sand shall match that of the surrounding mortar; a blending of sands may be required to achieve a satisfactory colour match. The colour of the mortar should ideally be achieved through the mixing of colours of sand. Colour match using pigments must only be done after approval is given by the Departmental Representative.

2.6 Air Entraining Agent

- .1 Air entrainment of the final mix shall be between 15% to 17% as measured in accordance with CSA A23.2-4c. If this cannot be achieved by mixing, an air entrainment agent (an acceptable product is "AIREX-L", by Euclid Admixture Canada Inc.), shall be added. Dosage to be as recommended by the Manufacturer.
- .2 Note that air entrainment in bedding mortars, for laying new stone units, may be reduced to facilitate the work.

2.7 Masonry Vents

- .1 Masonry vents shall be a screened aluminum louvre fabrication with an acceptable product being that by "Midget Louvre Co.".
- .2 Sealant for masonry vents to be an approved 20 year silicon sealant.

2.8 DHL Crack Injection

- .1 Dispersed Hydrated Lime (DHL) as supplied by U.S. Heritage Group. Provide pigments as required to obtain acceptable colour match.

2.9 Sealant for Skyward Facing Masonry Joints and Cracked Masonry Joints

- .1 Installation of special masonry joint finish sealant shall be completed using an acrylic latex sealant. An acceptable product is "Perma Chink" as used for filling joints in log homes.
- .2 Bond Breaker: use closed cell polyethylene backer rod recommended by sealant manufacturer. Where depth of joint prohibits use of backer rod, use recommended adhesive backed tape.

PART 3 - EXECUTION

3.1 Cutting Out
Deteriorated
Jointing

- .1 Unless otherwise noted herein, all joints are to be cut out to the full height of the joint and to minimum depths as follows.
- .1 Fine joints, less than 3 mm, shall be raked out a depth of 10 mm in order to reduce the danger of chipping off stone masonry edges. Less damage will occur if cutting out with power saws.
- .2 For joints greater than 13 mm and less than 50 mm, the minimum depth to be raked out shall be 2 times the joint width.
- .3 If loose material is encountered during removal for joints fitting any of the above definitions, removal and replacement of up to a 100 mm depth shall be included in the work of chipping and repointing.
- .4 For joints greater than 50 mm in width, the maximum depth to be raked out shall be 2 times the joint width or 150 mm. For joints greater than 50 mm, the Departmental Representative shall provide direction as to whether or not new stone units are to be installed as part of the repointing operation. Where authorized, the supply and installation of new stone units shall be in accordance with Sections 04 43 07, "Installation of Masonry" and 04 43 19, "Cut Stone". Proceed as directed by the Departmental Representative.
- .5 Where loose, powdery or sandy joint material is encountered during the raking out operation, notify the Departmental Representative who will provide direction on how to proceed. As a guideline, if the joint is otherwise full and the section of masonry is of medium to low structural importance, the joint shall be repointed to contain the loose, powdery material and seal against water penetration. If, on the other hand, the joint is voided and/or of primary structural importance, the joint shall be packed with mortar fill to the level of the base of finish pointing or the unit shall be removed and reset in a complete bed of mortar. The installation of mortar fill shall be covered under the item "Mortar Fill" while removal and resetting shall be covered under the item "Remove and Reset Masonry Units".
- .2 Metal fittings such as nails, brackets, wood wedges, clips and the like must be removed from wall areas as cutting out proceeds.

3.2 Method of
Cutting Out

- .3 Foreign materials such as joint caulking and tar shall be considered to be defective and shall be removed in their entirety from the joints under this item.
- .1 All cutting out is to be done by skilled laborers under the direction of a competent mason experienced in this type of work.
- .2 For all joints, tools for removal shall be thinner than the mortar joint to ensure that stone arises are not damaged. Joints are not to be evened out. The Contractor may use a small diameter diamond saw for very fine joints subject to review of the contractor's workmanship by the Departmental Representative.
- .3 All cutting out of joints is to be done with hammer and chisel, unless otherwise specified herein or approved by the Departmental Representative.
- .4 Joints may be partially cut out with power saws and grinding wheels under the following conditions and as approved by the Departmental Representative:
- .1 All work to be done under the direct supervision of the foreman.
 - .2 Power equipment may be used only to score one cut in each joint at the center of the joint; the cut is to be no more than one half the width of the joint; and cut to the full depth of the joint required.
 - .3 Final cutting out of the joints is to be made with serrated tools or sharp bolsters, to detach the upper and lower fragments remaining. Do not clean out joints with power equipment. All finish work is to be done by hand.
- .5 Final cutting out of the joints is to be made with serrated tools or sharp bolsters, to detach the upper and lower fragments remaining. Do not clean out joints with power equipment. All finish work is to be done by hand.
- .6 When cutting out is completed in each area, all joints are to be brushed clean of debris and, in general, the joints blown clean with medium-pressure compressed air. Where loose, powdery joint material is encountered, obtain direction from Departmental Representative on method of final joint cleaning.

3.3 Air Cleaning

- .1 After chipping out joints, the joints (unless loose and powdery) shall be blown with compressed air with a pressure of at least 345 kPa (50 psi). Water should not be used to remove debris.
- .2 In some areas, loose, powdery (sandy) mortar may exist and it is intended to be flushed out with low pressure 69 KPa (10 psi) compressed air or water. Prior to cleaning, the joints will be assessed by the Departmental Representative and direction given.
- .3 Care shall be taken so that stones do not lose all support.

3.4 Repointing

- .1 Preparation of Lime Putty
 - .1 Estimate the quantity of lime putty required to complete the work.
- .2 Allow at least two weeks storage time for slaked lime putty before it is used.
 - .1 Slaked quicklime is prepared by filling a large mixing tray with approximately 300 mm of hot water. Lumps of fresh quicklime are added to the water, taking care that the water covers the lime.
 - .2 Stir and hoe the mass while the lime splits and breaks up with the generation of heat and carbon dioxide gas. Further water and quicklime are added until a sufficient quantity is produced.
 - .3 The reaction between the lime and water may be fierce and slaking operations must be carried out under strictly controlled conditions.
 - .4 A slaking operation produces a thick, creamy liquid which must be run through a 3 mm mesh screen into plastic-lined drums when cool. The putty is stored under 100 mm of water and left to cure, for at least two weeks, undisturbed.
 - .5 During this time, the consistency of the putty develops and the water over it clears.
 - .6 The drums should be dated and labelled, and the tops sealed.
- .3 Hydrated Lime
 - .1 Putty can be made from hydrated mason's lime by adding dry-bagged hydrated lime to water. The mass is stirred and hoed to form a thick

cream. Allow to stand at least 24 hours under water before use, preferably longer.

.4 Preparation of Roughage

.1 If the Contractor desires, the lime and aggregate may be pre-mixed to produce what is known as roughage or coarse-stuff. This compound may be stored indefinitely if kept sealed from air and kept from freezing

.2 The sand and lime should be accurately proportioned using measuring boxes constructed to contain the exact volume of each ingredient required to make one batch. These materials are to be thoroughly mixed in a mechanical mixer for about ten minutes, then stored in plastic-lined drums and sealed until required.

.3 When required for use, the correct portion of gauging cement should be added, and the mix worked up as specified and used immediately.

.4 As the strength and colour of even slightly different mixes varies dramatically, accurate portioning is a strict requirement of this specification.

.5 Cement Gauging of Mortars

.1 The addition of hydraulic cements to lime and aggregate mixes must be done immediately before the use of the mortar.

.2 All mortar must be used within two hours of gauging; do not re-temper mortars after this time has elapsed.

.3 All batching is to be done with wooden boxes or plastic pails of known volume to ensure standardization and conformity of measurement. Shovel measurement of materials is not permitted. Boxes should be of such a size that a batch sufficient for one mixer load is measured out.

.4 Initially, mortars should be mixed for five minutes without cement or addition of water.

.5 Cement and air-entrainment should be added at the end of the initial 5 minutes of mixing and the mortar must be mixed for an additional 10 minutes before using. A total of 15 minutes of mixing is preferred to improve workability, increase air entrainment and plasticity, and ensure thorough mixing. The amount of water required should be recorded and added at the start of mixing for future batches. Careful addition of a small amount of water should produce a mortar that is just wet enough to hang on a trowel. Excess water creates a shrinkage problem, and water content in excess of 5% will retard carbonation significantly

.6 All mixing boards and mechanical mixing machines must be cleaned between batches.

.7 Strict control must be exercised so the masons refrain from using too wet a mix. The addition of water does improve workability, but does so at the sacrifice of mechanical strength and the increase in final shrinkage. Mortars must be just damp enough to hang on a trowel. Only water lost through evaporation should be replaced at the mortar-board by the mason; a spray bottle of water is used for this purpose.

.6 Mix Formula

.1 All Mortars.

.1 Cement: Lime: Aggregate (1: 1: 6)

.2 Air Entrainment: (15% to 17%). Add air entraining agent as required to achieve this level of air entrainment

.2 Mixing: Mix mortar as dry as possible to minimize shrinkage and cracking.

.7 Re-setting Masonry Units

.1 Where loose masonry units are encountered, notify Departmental Representative and obtain direction on how to proceed. In general, units less than 0.08 m² in face area are to be carefully removed and re-set in a full bed of mortar. Large units are not to be removed unless required for lintel rebuild.

.2 Where units are removed and reset, the unit cavity is to be cleaned out of all loose material and washed with water to remove dust and pre-wet the adjacent material.

.3 Units are to be re-set in a solidly and evenly filled bed of mortar, notwithstanding current trade practice.

.4 Units are to be set true and level matching exactly the existing bond pattern and coursing throughout.

.5 All joint widths are to match existing work. Joints are to be squeezed full of mortar; slushing of joints is not permitted.

.6 Heavy masonry units that are loose and not required for removal to square the window opening are to be wedged tight into position with plastic wedges or wooden wedges previously soaked in water; the joints are to be cleaned out and the units repointed in situ. Wedges are to be removed when joint-filling mortar is set and prior to finish pointing.

.7 All masonry repairs must be completed before commencing repointing. Joints in repaired

areas are to be recessed a minimum of 15 mm (back of finish pointing layers) and allowed to set and dry for at least 72 hours to allow shrinkage to take place.

.8 Repointing

.1 Immediately before repointing operations commence, the area to be pointed is to be thoroughly blown clean with compressed air (unless joint material is loose and powdery) to remove all dust and the surface is then to be well "wetted" until suction is controlled and the surface stays wet.

.2 Areas cleaned free of mortar are to be filled with mortar. Pointing is to be built up in layers not exceeding 15 mm in depth when the removal depth is 30 mm or less; the bottom layer must be allowed to set for not less than 24 hours before the subsequent layer of mortar is applied. For joints greater than 3 mm but less than 13 mm a single lift of finished pointing can be used provided that the depth of removal is 26 mm or less. If loose material is encountered in a joint of this dimension it shall be treated in the same manner as a joint wider than thirteen mm including a separate lift of scratch pointing and a separate lift of finish pointing. Where the joint depth is greater than 30 mm, back point in one lift to the 30 mm depth and then complete in two 15 mm lifts (a 15 mm backpoint lift and a 15 mm finish lift). Pointing shall be well pressed in and the surface, except for the finish point layer, shall be "scratched"/roughened to provide mechanical bond between successive layers of pointing.

.3 After the final layer of mortar has set, the joint is to be tooled lightly to give the final required form. Do not overwork the face of the joint. Head joints must be tooled first.

.4 All masons are to use identical jointing tools.

.5 Joints are to be tooled behind the face of the masonry units.

.6 All excess mortar must be removed from the face of the masonry before it sets and the jointing neatly finished. The preferred joint finish will be slightly concave.

.9 Cleaning Up

.1 Excess mortar shall be immediately removed from adjacent surfaces.

.2 As work proceeds, clean all masonry of mortar droppings, stains and other blemishes with a fibre-bristle brush or plastic brush. Do

not use a metal brush at any time. Do not use acids or chemical cleaners.

.3 Wash down the completed sections of wall from top to bottom after the pointing has hardened for three days.

.4 Do not leave clean-up debris from mixes or mortars, etc., laying around the site. Remove excess mortar and debris from the site. Place tarps under the mixing area to facilitate clean up.

.10 Curing

.1 Cover all finish pointing with burlap. The burlap shall be hung approximately 50 mm or less in front of the wall but, shall not be in contact with the wall since this could lead to unacceptable discoloration. The burlap shall be covered with white plastic tarps to reduce evaporation of the water from the building.

.2 Cure mortar joints by applying water with a portable pressurized sprayer a minimum of three times a day for three days. Note, more frequent misting, to maintain adequate humidity levels, may be needed if housing and heating is required. Maintain humidity levels to satisfaction of the Departmental Representative.

.3 For the three day curing period, protect all newly placed masonry and repointed joints with tarps, shade covers, etc. so as to prevent drying from wind and direct exposure to the sun or, the effects of housing and heating operations, if applicable.

.4 In the case of large voids, mortar fill to be installed with stone fill (quality as per Section 04420, Cut Stone and angular in form), approximately 50 percent of volume, to form a complete mass. Stone fill to be supplied as per Section 04420, Cut Stone.

3.5 Mortar Fill

.1 Use lime mortar to match pointing mortar.

.2 The intent of the item "Mortar Fill" is to fill voids in the masonry walls or joints where not included under the work of installation of masonry or chipping & repointing joints.

.3 Proceed with filling of voids with mortar fill only as directed by the Departmental Representative.

3.6 Masonry Vents

- .1 Drilling of 25 mm countersink and 20 mm diameter holes for installation of masonry vents shall be by drilling, without percussion, from the exterior face only.
- .2 Drill 20 mm diameter hole at locations and depth as shown on the Contract drawings or as directed by the Departmental Representative. Holes are to be angled upwards to permit drainage of interior masonry to the exterior face.
- .3 Drill start of hole 25 mm in diameter to countersink and place the screened vent.
- .4 After blowing hole clean to the satisfaction of the Departmental Representative, caulk screened aluminum louvre in place ensuring no direct contact between aluminum and masonry. Caulking to be an approved clear coloured 20 year silicon sealant. Contractor to submit samples and/or product information concerning proposed sealant and only install sealant when approved by the Departmental Representative.

3.7 DHL Crack Injection

- .1 Mix only as much product as is required for immediate use and apply in strict conformance to manufacturer's recommendations.
- .2 Pigment materials to achieve a colour match to the stone. Apply finish in strict accordance with manufacturer's recommendations.

3.8 Installation
of Special Masonry
Joint Finish
Sealant

- .1 For skyward facing joints and cracked mortar joints (where directed by the Departmental Representative), sealant shall be applied as the finish layer of pointing rather than mortar.
- .2 Install sealant complete with bond breaking tape or foam backer rod in accordance with manufacturer's recommendations.
- .3 Colour of sealant to match adjacent stone units and to be approved by Departmental Representative.
- .4 Clean up excess sealant, following installation, to the satisfaction of the Departmental Representative.

PART 1 - GENERAL

1.1 Scope

- .1 Where not otherwise indicated on the Contract drawings, it is intended that the Contractor's representative and the Departmental Representative shall delineate individual stones for removal within the limits of the work.
- .2 Included in the work of this section is the dismantling of interior stone lintels (six delineated for reconstruction) and salvaging of the dismantled stone for reconstruction (where stone is deemed salvageable by the Departmental Representative).

1.2 Related Work

- .1 Section 04 43 01 - Bracing and Shoring.
- .2 Section 04 43 04 - Repointing and Miscellaneous Masonry.
- .3 Section 04 43 06 - Cut Stone.
- .4 Section 04 43 07 - Installation of Masonry.

1.3 Precautions

- .1 Provide temporary supports, bracing, shoring, etc. to the masonry, in accordance with Section 04 43 01, around areas that are to be removed. All damage as a result of failure to adequately support the surrounding masonry shall be made good at the Contractor's expense.

1.4 Control

- .1 Mark the following:
 - .1 Stones and other elements or components to show identity and position.
 - .2 Spaces from which stones are removed.

1.5 Measurement for Payment

- .1 Measurement for payment for the following item shall be as indicated.
 - .1 Stone Masonry Removals.....m3.
 - .2 Dismantle and Salvage Stone in Interior Window Lintelsm3.

For the item, Stone Masonry Removal, the volume shall be equal to the volume of stone and mortar removed as authorized by the Departmental Representative. Additional removals shall only be done by direction from the Departmental Representative. If additional removals are done without authorization, they will be at the expense of the Contractor and will not be compensated for in any way. The Departmental Representative shall together, with the Contractor, make measurements of the depth of removal to establish the average depth. The depth measurement will be taken from the face of mortar joints excluding the stone pitch dimension, if any.

.2 For the item, Dismantle and Salvage Stone in Interior Window Lintels, the volume shall be the full volume of stone and mortar removed as directed by the Departmental Representative and as measured together with the Contractor.

1.6 Basis of Payment

.1 Payment at the unit price bid for the above items shall be full compensation for all labour, equipment and materials necessary to do the work of these items in accordance with the Contract drawings and these specifications.

PART 2 - PRODUCTS

2.1 Stone

.1 The Contractor shall dismantle and remove and/or salvage stone as directed by the Departmental Representative.

PART 3 - EXECUTION

3.1 Inspection

.1 Record and report, to Departmental Representative, site conditions not described in Contract.

3.2 Support

.1 Construct shoring and cradling, and other temporary framing work needed to support structure, or parts of it, during removing operations.

3.3 Loosening
Masonry (Full
Removal)

- .1 Loosen stones using approved methods which will cause no damage either to adjacent masonry or to other architectural elements.
- .2 Do not use pneumatic chisel or hammer, or steel tools exerting concentrated pressure on edge of adjacent masonry.
- .3 When temperature is below freezing point, do not attempt to loosen wet masonry.

3.4 Cleanup

- .1 Stone removals, not designated for salvage, shall be removed from the site on a daily basis.
- .2 Salvaged stone shall be promptly cleaned and stored on wood pallets within the work and storage areas to the satisfaction of the Departmental Representative.

PART 1 - GENERAL

1.1 Description of
The Work

- .1 The work of this section covers the requirements for the supply of all new cut stone, on this project. All new stone will be designated as face stone except for arch voussoirs over windows or doors which shall be designated as ornamental stone.
- .2 Included with the work of new stone supply shall be that of all chiseled and bush hammer finishes to match the original finish on the stone to be replaced.

1.2 Related Work

- .1 Section 04 43 04 - Repointing and Miscellaneous Masonry.
- .2 Section 04 43 05 - Masonry Removals.
- .3 Section 04 43 07 - Installation of Masonry.

1.3 References

- .1 ASTM C568-10 Specification for Limestone Building Stone.

1.4 Samples

- .1 Samples of all types of stones are required. Samples will be of sufficient size to demonstrate all finishes and profiles and shall be clearly marked as to location of quarry of origin and the supplier(s). Samples which are approved may be incorporated in the work provided that they match all dimensions of stones scheduled as being replaced. The finish of any ornamental stone shall match the undeteriorated profile of each type of stone. The surface shall be finished to match the undeteriorated finish of each type of stone and in no case shall the finish be rougher than stones of this type in good condition elsewhere.
- .2 Acceptability of the source of stone will also be determined by the weathered colour of the stone samples. Samples should include weathered examples and a possible visit to the quarry may be required for acceptance. In general, the weathered colour should match the predominant

stone colour of the overall structure. The colour of the new stone should not be close in colour to the extreme ends of the range of stone colours present in the structure.

- .3 Limestone sources which have stylolitic inclusions in the stone matrix (occurs in large bed depths) will not be acceptable for stones that will be bush hammered unless the inclusion is in the middle third and can be shown, to the satisfaction of the Departmental Representative, that the stone is not objectionably weakened. Note that the Departmental Representative's decision will be considered final on the acceptance of stones with stylolitic inclusions.

1.5 Delivery and Storage

- .1 Deliver, store and handle cut stone in a manner to prevent damage, adulteration, deterioration and soiling in accordance with the manufacturers' written instructions.

1.6 Measurement for Payment

- .1 Measurement for payment for the following items shall be as indicated.
 - .1 Supply New Face Stonem3.
 - .2 Supply New Ornamental Stone.....m3.
- .2 Measurement will be taken as equal to the actual finished stone dimensions prior to placement.

1.7 Basis of Payment

- .1 Payment at the unit price bid for the above items shall be full compensation for all labour, equipment and materials necessary to do the work of these items in accordance with the Contract drawings and these specifications.
- .2 Payment will normally be made after new stone is placed in its final location. If stone is manufactured in advance to the need for placement in the structure payment in the amount of 75 percent of the invoiced amount, from the stone supplier, may be authorized by the Departmental Representative provided the stone has been delivered and stored on site and accepted by the Departmental Representative. It is understood that any stone that is damaged after this acceptance will be replaced at no additional cost to the contract.

PART 2 - PRODUCTS

2.1 Materials

- .1 Limestone: to ASTM C568, Category III, high density, colour, pitch, texture and thickness to match existing. Limestone shall be from the Black River Geologic formation (Kingston Limestone and selective areas in Ontario and Quebec).
- .2 Contractor shall submit for Departmental Representative's approval both weathered stone sample and stone sample representing the actual proposed finished stone profile to match the existing. Contractor shall not commence production of stone units prior to Departmental Representative written approval of stone source and profile.

2.2 Cutting

- .1 Cut stone to shape and dimensions and full to square with jointing to match existing. Dress exposed faces true. Cut stone to lay on its natural quarry bed and to an accuracy of 3 mm.
- .2 Make beds and joints to match adjacent masonry and at right angles to face.
- .3 Where applicable, cut stones for support systems. Provide holes, to suit special lifting devices, in pieces which cannot be manually or mechanically lifted without damage. Do not cut holes in exposed surfaces.

2.3 Finish

- .1 Tool the face to match the finish of the stone being removed, to match adjacent masonry to which the stone is being placed or, as otherwise indicated on the drawings.
- .2 Score machine cut faces to provide a rough surface for mortar adhesion (see Section 04 43 07, Installation of Masonry).

PART 3 - EXECUTION

3.1 General

- .1 Early in the project, inspect the masonry with the Departmental Representative and determine as near as possible the extent of stone replacement required. Supply replacement stones by number and size.
- .2 Supply stones to the site and protect from damage. Cut stones as required to match existing and to CSA S304.1-14. Finish stone to match existing.
- .3 In order to expedite stone delivery, the intent is to immediately supply and finish as much stone as possible.
- .4 All face finishing debris and end cut-offs which are not used shall be removed from the site.
- .5 Cut face stones to match existing coursing or, to dimensions as indicated.

3.2 Stone Finish

- .1 Face and ornamental stones shall be finished with hammer and chisels. Mark stone arrises and remove excess stones from all faces. Pitched faces, where required, shall match existing.

3.3 Setting

- .1 Clean stone exposed surfaces by washing with stiff fibre brush and water.
- .2 Drench dry stones with clean water just before setting.

3.4 Stone Supply

- .1 As part of this Contract, review the work to establish the actual quantity required to finalize the supply and minimize over-supply and losses. Be responsible for acceptance of the supplied and finished stone.

PART 1 - GENERAL

- 1.1 Description of Work
- .1 Work of this section includes the installation of all stone masonry including the reconstruction of the dismantled interior window lintels.
- 1.2 Related Work
- .1 Section 04 43 04 - Repointing and Miscellaneous Masonry.
- .2 Section 04 43 05 - Masonry Removals.
- .3 Section 04 43 06 - Cut Stone.
- 1.3 Workshop Inspection
- .1 Make mason's workshop accessible to Departmental Representative for inspection of current work-in-progress.
- 1.4 Precautions
- .1 Move and lift stone units using means to prevent dropping or sudden impacts. Submit stone units dropped or impacted to Departmental Representative for approval. Do not make holes or indentations, for lifting devices, on face or top side of stone.
- .2 Indicate bedding planes of stone units. Duplicate bedding marks on usable pieces of cut stone.
- 1.5 Protection
- .1 Cover top of completed and partially completed wall, not enclosed or sheltered, with weatherproof coverings at end of each working day. Anchor securely in position.
- .2 Protect adjacent work from marking or damage due to work.
- .3 Provide temporary bracing of masonry work during erection until permanent structure provides adequate bracing.

1.6 Measurement for
Payment

- .1 Measurement for payment for the following items shall be as indicated.
 - .1 "Install Stone Masonry - Individual unitsm3.
 - .2 "Install Stone Masonry - Interior Window Lintels.....m3.
- .2 Measurement will be taken as equal to the actual volume of the hole/recess, in which the stone and mortar are to be placed prior to placement.

1.7 Basis of
Payment

- .1 Payment at the unit price bid for the above items shall be full compensation for all labour, equipment and materials necessary to do the work of these items in accordance with the Contract Drawings and these specifications including:
 - .1 Placing of all mortar and back-up masonry to fill the total voids behind stone units.
 - .2 Placing of the stone (new and salvaged).
 - .3 Pointing of joints around the stone units.

PART 2 - PRODUCTS

2.1 Cut Stone

- .1 Supply cut stone in accordance with Section 04 43 06 - Cut Stone. Dress face of cut stone to match existing stonework after unit is roughly sized to opening.
- .2 All stone surfaces of new cut stone against which mortar is to be placed shall be intentionally roughened (if the face is "smooth" as a result of sawing) by scoring with saw or grinder. Score lines shall be spaced at no more than 25 mm on center and shall be not less than 3 mm in depth.

PART 3 - EXECUTION

3.1 Cutting /
Sizing of Stone

- .1 Use calipers, squares and levels to measure opening for new stone. Allow for mortar joints to match existing or, as directed by the Departmental Representative, around the stone

perimeter. In the case of wall replacement face units, the space between the back of the new stone units and face of existing shall be nominally 25 mm (this space to be filled with mortar as part of the work of installation).

3.2 Moving Stones

- .1 Use lifting devices, requiring drilling of the stones, on sides of stones only.
- .2 Move stones horizontally in wheelbarrows, on carts or on sleds.
- .3 Slide stones into place on wood ramps.

3.3 Stone Installation

- .1 Clean stone by washing with water and natural fibre brush before laying. Stone should not be dry at time of placing.
- .2 All stones shall be placed with the bedding planes horizontal unless, for a specific stone, the Departmental Representative directs otherwise.
- .3 Dampen surfaces of slot and apply mortar to stone perimeter.
- .4 Where there is more than one course of stone replacement, lay successive stone courses only after mortar in courses below has hardened sufficiently to support weight.
- .5 Prop and anchor stones until mortar has set.
- .6 Set large stones on water soaked softwood wedges to support stone in proper alignment until mortar has set. Remove wedges when dry, do not break off. The use of stone wedges is not permitted.
- .7 Remove mortar droppings from face of stone before mortar is set. Sponge stone free of mortar as work progresses.
- .8 Set stones plumb, true, level in full bed of mortar with vertical joints flushed full except where otherwise specified. Completely fill anchor, dowel and lifting holes.

- 3.4 Filling Joints
/ Pointing
- .1 Fill joints and point: in accordance with Section 04 43 04 "Repointing and Miscellaneous Masonry".
 - .2 Moist cure new mortar for 3 days.

PART 1 - GENERAL

- 1.1 Description of Work
- .1 The work of this section covers the requirements for all masons to attend an orientation prior to working on the project.
- 1.2 Related Work
- .1 Section 01 35 30 - Health and Safety
- .2 Section 01 54 23 - Access and Protection.
- .3 Section 04 43 01 - Bracing and Shoring.
- .4 Section 04 43 04 - Repointing and Miscellaneous Masonry.
- .5 Section 04 43 05 - Masonry Removals.
- .6 Section 04 43 07 - Installation of Masonry.
- 1.3 Measurement and Payment
- .1 No measurement for payment will be made for the work of this section. All costs for the work of this section shall be included in the tendered prices for related work items.
- .2 The Contractor shall be fully familiar with the specification and inform the Departmental Representative of any direction during the orientation that would result in an extra cost to the contract prior to commencing the work. Work that is completed according to the orientation that contradicts the specification shall not receive extra compensation beyond the tendered prices.

PART 2 - ORIENTATION

- 2.1 Orientation Meeting
- .1 The content of the orientation meeting shall be generally as follows:
- .1 Pre-Construction Orientation for Masons.
- .1 The intent of this orientation is to have all masons understand what will be expected of them with respect to joint

removal, stone removal, stone preparation, stone installation, scratch coat pointing and final coat pointing. As a result, more consistent results are anticipated from all masons with a minimization of rejected work. ALL MASONS, that will be associated with any element on this project as described above, are required to attend the orientation meeting prior to beginning the work. The orientation time should not last for more than one (1) hour.

.2 The material discussed in this orientation is taken directly from the specification and reflects the expectations of that specification.

.3 Test panels will still be required to establish the standard of workmanship. All masons should be aware of the work in preparing the panels at the various steps. If a mason is not present, for the test panel it will not excuse that mason from understanding and implementing the procedures used for the preparation of that panel.

.2 Joint Removal

.1 Masons shall take care so as not to damage the surrounding stone that is to remain.

.2 If a grinder is required to remove the joint, the mason shall only make one (1) pass on the joint and shall locate the pass in the center of the joint.

.3 The mason is not permitted to allow the grinder to score the surrounding stone that is to remain.

.4 Chisels shall be thin enough so as not to bind on the adjacent stones and potentially damage the stones.

.5 Joint material shall be completely removed back to the required depth as described on the drawings.

.6 Loose jointing material is to be removed; any additional joint material removal is to be reviewed by the Departmental Representative and direction given prior to removal.

.7 Thoroughly clean joint with a non-metallic brush and compressed air. Water is not to be used for the cleaning of the joints.

.3 Stone Removal

.1 Mortar joints shall be removed, as much as possible, on all of the surrounding joints of the stone that has been marked for removal prior to its removal.

.2 If the stone is to be salvaged, the mason shall exercise care while removing the stone unit. If the stone is not to be salvaged, the mason may use whatever means he feels is necessary to remove the stone while preserving the surrounding stones to remain.

.3 Under no circumstances shall adjacent stones be used as lever points for pry bars, pneumatic chisel bits, percussion drills, etc. to help in the removal of the stone. If the Contractor thinks that removal of an individual stone will not be possible without damaging an adjacent stone, this must be discussed with the Departmental Representative prior to removal. The Contractor will be responsible for damages unless the Departmental Representative agrees that damage is unavoidable.

.4 Damaging of adjacent stones will result in the repair or replacement of the stone at the Contractor's expense.

.5 The resulting cavity shall be braced, cleaned, and protected from the elements until a new matching stone is installed in the cavity.

.6 If adjacent stones become loose during the removal process, the mason shall quickly stabilize the area and the Departmental Representative is to be informed.

.4 Stone Preparation

.1 Stones are to be handled carefully so as not to excessively stress or damage the stones.

.2 Cut stones to the dimensions required allowing for the correct joint width, usually 10 to 15 mm or to match the surrounding joint work. Seek direction from the Departmental Representative before creating joints wider than 15 mm.

.3 Stones cut using a saw, must have the smooth cut faces roughened with grooves as described in the specification.

.4 Stones are to be cut square and straight on the exposed faces. The pitch of the exposed face shall match that of

the adjacent, existing stone.

.5 In situations where several stones are to be replaced, the mason shall ensure that the layout matches, as closely as possible, the existing stone layout and furthermore avoids small "slivers" of stone to fill irregular spaces. Eliminate stone "slivers" when possible.

.6 Creating stack bonding is to be avoided and will be rejected and must be replaced.

.7 Stones are to be laid with the bedding planes in the horizontal orientation unless otherwise approved by the Departmental Representative.

.8 Stones shall be cleaned with water and a soft, non-metallic, bristle brush to remove dust.

.9 Carefully transport the stones so as to do no damage.

.5 Stone Installation (The mortar used for the installation of stone units may have a slightly lower air percentage; this should be reviewed on site with the labourer responsible for preparing mortar)

.1 Cavity is to be free of loose mortar or debris.

.2 Lightly wet the cavity with water prior to applying the mortar bedding or backup. Just apply enough water to moisten the area; avoid standing water situations.

.3 The stone unit should also be lightly wetted.

.4 Install stone on a bed of mortar, pack mortar around the stone. Make sure that the head joints are equal in width and that the top and bottom joints are also equal in width.

.5 Stone is to be placed square and plumb and in alignment to adjacent stone. Shim stones as required maintaining the position. The shims shall be soaked softwood wedges. Under no circumstances shall stone chips be used as shims.

.6 Clean excessive mortar away from stones immediately. Clean stone with a damp sponge.

.7 Once the mortar has stiffened remove excess joint material and finish joint to accept the finish coat of mortar. Thin joints should be finished to the final state as shown on the drawings.

- .6 Scratch Coat Pointing
 - .1 Thoroughly clean joint with a non-metallic brush and compressed air.
 - .2 Slightly moisten the joints. Over wetting will result in the mortar thinning out and being "messy" to work with. By not wetting the joints prior to mortar installation, the surrounding joint and stone will wick away the water in the newly placed mortar resulting in a weakened mortar joint.
 - .3 Install mortar to a point just proud of the required depth for the final finished pointing. Press the mortar in firmly. Allow the mortar to stiffen. When the mortar has stiffened, remove the excess mortar being careful not to smooth out the joint.
 - .4 The finish of the scratch coat pointing should be rough but not "messy". The intent is to provide a good mechanical bond between the scratch and the finish coats of pointing.
 - .5 Wide joints should be treated in the manner specified, with coarser sand and stone chip aggregate in the mix.
 - .6 Additional lifts of mortar shall be placed after a minimum of 24 hours of moist curing on the previous lift.
 - .7 Protect mortar joints, during the curing period, from the effects of weather. Joints should be misted regularly with water but, not overly.

- .7 Final Coat Pointing
 - .1 Lightly clean joints with non-metallic brush and compressed air.
 - .2 Slightly moisten the joints. Over wetting will result in the mortar thinning out and being "messy" to work with. By not wetting the joints prior to mortar installation the surrounding joint and stone will wick away the water in the mortar resulting in a weakened mortar joint.
 - .3 Install mortar to a point just proud of the face of the adjacent stone. Press the mortar in firmly.
 - .4 Allow the mortar to stiffen to 'thumb print' hard. Once mortar has stiffened, remove the excess mortar with a wooden dowel in a firm consistent stroke. The mortar is to have a slightly concave appearance. The head joints should be

finished first. The dowel will 'pull' the mortar exposing the aggregate.

.5 Lightly brush the joint with a bristle brush, taking care not to remove the texture but to ensure consistency in the final appearance.

.6 Clean excessive mortar away from stones immediately. Clean stone with a damp sponge.

.7 Cover the area with burlap and moist cure for three days. If excessive drying of burlap is occurring due to wind or sun, the burlap is to be covered with white plastic. The burlap is not to be in prolonged contact with the masonry since discolouration can occur.

.8 Final Inspection (Acceptance of the completed installation will include conformance to the following. Note that this is not all inclusive).

.1 No joint cracking after drying.

.2 Uniformity of mortar colour.

.3 Consistency of joint profile and texture.

.4 Crisp lines at interface between mortar and stones.

.5 Clean stones.

PART 3 - EXECUTION

3.1 General

- .1 Prior to working on the project all masonry personnel shall attend an orientation session conducted by the Departmental Representative in which the expectations of the level of workmanship is described.
- .2 The content of the orientation shall generally be as outlined in Part 2 of this section. "Orientation Content."
- .3 The orientation will describe the expectations of the Departmental Representative. Any discrepancy between the orientation and the specification should be immediately brought to the attention of the Departmental Representative. The resulting direction will be confirmed in writing.

- .4 Other sections of the specification shall take precedence over all information described in the orientation. It is anticipated that the orientation will not contradict the specification.
- .5 The Contractor shall follow the methods described by the Departmental Representative. If the contractor suggests other methods they will not be used unless approved by the Departmental Representative.
- .6 Any work not completed in conformance to this Section shall be subject to rejection at the discretion of the Departmental Representative.

PART 1 - GENERAL

1.1 Description of Work

- .1 The work of this section includes all rough carpentry necessary for the removal of decayed wood joists (two joists to be replaced), the application of preservative treatment and, the installation of new wood joists.
- .2 Also included in this section is the work of replacing any decayed wood decking on internal floors and in the lighthouse lantern deck surround and in the entrance door and frame. When the existing metal roof deck is removed and paint has been stripped from the entrance door and frame, the contractor shall inspect the wood deck and entrance door and frame with the Departmental Representative and complete repairs, if required, as directed by the Departmental Representative.
- .3 At the base of the sash in the windows, install compressible bulb weather stripping as indicated on the drawings.
- .4 Install plywood facing panels and blocking on interior stair railings to provide "step free" surfaces.

1.2 Related Work

- .1 Section 07 62 00 - Flashings and Sheet Metal.

1.3 References

- .1 ASTM International
 - .1 ASTM A 123/A 123M-13, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A 653/A 653M-09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O141-05(R2014), Softwood Lumber.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2007.

1.4 Action and Informational.1
Submittals

Submit in accordance with Section 01 33 00 -
Submittal Procedures.

.2

Product Data

.1 Submit manufacturer's instructions, printed
product literature and data sheets for wood
products and accessories and include product
characteristics, performance criteria, physical
size, finish and limitations.

1.5 Quality
Assurance

.1

Lumber by grade stamp of an agency certified by
Canadian Lumber standards Accreditation Board.

1.6 Delivery, Storage and
Handling

.1

Deliver, store and handle materials in
accordance with manufacturer's written
instructions.

.2

Delivery and Acceptance Requirements: deliver
materials to site in original factory packaging,
labelled with manufacturer's name and address.

.3

Storage and Handling Requirements:

.1 Store materials in accordance with
manufacturer's recommendations in clean, dry,
well-ventilated area.

.2 Replace defective or damaged materials
with new.

1.7 Measurement and
Payment

.1

No measurement for payment will be made for the
items "Remove and Install New Wooden Floor
Joists" or "Install Bulb Weather Stripping in
Window Sash". Payment shall be by lump sum. All
costs for labour, equipment and materials
necessary to do the work of these items shall be
included in the lump sum bid for these items.

.2

Measurement for payment for the item "Replace
Deteriorated Woodwork" shall be by the board foot
(brd ft.) of acceptably placed replacement
woodwork. All costs for labour equipment and
materials necessary to do the work of this item
shall be included in the unit price bid for
this item.

- .3 No measurement for payment will be made for the item "New Plywood Panels and Infill Blocking on Existing Stair Railings". Payment shall be by lump sum and shall include all costs for labour, materials and equipment necessary to complete the work of this item, as described in this section and as shown on the drawings, including the supply and installation of the plywood panels and blocking as well as painting.

PART 2 - PRODUCTS

2.1 Lumber

- .1 All lumber to be dried to a 15% moisture content.
- .2 All lumber used for replacement of joist and flooring members to match existing members in dimension, species and grade.

2.2 Accessories

- .1 Nails, spikes, wood screws and staples: to CSA Bill.
- .2 Fastener Finishes:
.1 Galvanizing: to ASTM A 123/A 123M, use galvanized fasteners or acceptable alternate rust proof coating for all work of this section.
- .3 Waterproofing Membrane:
.1 Self-Adhesive Waterproofing membrane material, to be wrapped around the ends of new floor joists, is "Blue Skin" self-adhering membrane.
- .4 Bulb Weather Stripping: kerf mounted bulb weather stripping suitable for door and window installations. Submit samples for approval.
- .5 Plywood: plywood to be used as facing on the interior railings, to be 12.7 mm fir plywood, sanded both sides and conforming to CSA 0121.
- .6 Blocking on Rails and Plywood edging: select grade pine conforming to CSA/CAN3-086.

PART 3 - EXECUTION

3.1 Examination

- .1 Verify with Departmental Representative the extent of removals (joists, flooring and related masonry and decking at the lantern). This work to be carried out prior to the installation of replacement joists and flooring or the installation of new metal roofing.
- .2 Verify dimensions/configuration of all interior railings to verify sizes of all new plywood panels and blocking (on vertical balusters between existing rails) to be installed. Submit Shop Drawings showing all panel and blocking sizes per stair section.

3.2 Installation of Replacement Joists

- .1 Remove catwalk planks above that are supported by the decayed joist as shown on the Contract Drawings.
- .2 Remove decayed joists so as to minimize damage to stonework that surrounds the existing joists.
- .3 Clean out stone chips and debris from the "seat" of the existing joists. Minor stone removal may be required to eliminate the need to notch the new joist.
- .4 Install new painted joist member ensuring 10mm clearance is provided around the top and both sides at each end of the joist, between the joist and the existing stone walls.
- .5 Place mortar in side cavities to maintain lateral stability of joists as directed by the Departmental Representative.

3.3 Repair of Deteriorated Decking

- .1 Immediately after the existing metal work is stripped from the lantern deck, together with the Departmental representative, inspect the deck for deteriorated wood and complete repairs as directed by the Departmental Representative.
- .2 Carefully remove deteriorated decking (internal floor and lantern deck) so as not to damage any adjacent decking to remain. Any damage to the decking to remain shall be repaired to the satisfaction of the Departmental Representative at no additional cost to the Contract.

-
- .3 Install new decking pieces with material matching species, grade and dimensions (to match existing) unless otherwise approved by the Departmental Representative.
- 3.4 Installation of Weather Stripping
- .1 Carefully remove window sash, if required, remove material from bottom of sash to provide clearance of minimum of 5 mm between bottom of sash and frame, cut groove in base of sash to receive weather stripping, prime and paint resultant slot in bottom of sash, install bulb weather stripping and, re-install sash.
- .2 When window sash is removed, provide a temporary plywood closure on the opening so as prevent weather from entering the structure. Method of attachment, or holding the plywood covering in place, to be approved by the Departmental Representative.
- 3.5 Plywood Facing and Blocking on Existing Interior Railings
- .1 Field measure existing railings to identify different railing configurations and dimensions for sizing of plywood panels and infill blocking. Submit Shop Drawings showing field measurements and intended panel sizes based on the guidelines provided on the drawings.
- .2 Fabricate panels as per reviewed Shop Drawings, complete with border edgings.
- .3 Shop paint panels with one coat of approved primer and two finish coats.
- .4 Install panels and blocking with approved non-corrosive screws.
- .5 Fill heads of screws with approved filler and, field paint one finish coat over the complete panel and blocking assembly to the approval of the Departmental Representative.
- 3.6 Cleaning
- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment to the satisfaction of the Departmental Representative.
- 3.7 Protection
- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by rough carpentry installation.

Battle of Windmill
Lighthouse Repairs
Project No. 20030678

Rough Carpentry

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PART 1 - GENERAL

- 1.1 Description of Work
- .1 The removal of all existing roofing/cladding and replacement with new metal where called for on the drawings and/or described herein. This includes replacing the deck cladding around the lantern in galvanized sheet steel.
 - .2 The patching of gaps/holes at the cast iron panels.
 - .3 Re-forming and/or re-leading of cast iron panel junctions at the lantern.
 - .4 Undertake any repairs to wood blocking or deck surfaces which come to light upon removal of sheet metal and as directed by the Departmental Representative.
 - .5 Remove, repaint and reinstate pipe railing to detail shown on the Drawings.
- 1.2 Qualification
- .1 The sheet metal fabricator and applicator shall be of recognized standing with a proven record of satisfactory installations using traditional materials and installation techniques.
- 1.3 Warranty
- .1 Furnish a three (3) year warranty on all metalwork installed or repaired under this Contract, undertaking to repair all defects becoming evident during the period of this guarantee, in a prompt and thorough manner.
- 1.4 Workmanship
- .1 All workmanship shall be of the highest quality conforming to the best traditional practice and be to the approval of the Departmental Representative.
- 1.5 Storage
- .1 All materials will be stored in a location approved by the Departmental Representative.
- 1.6 Shop Drawings, Samples and Mock-up
- .1 Submit to the Departmental Representative, for approval, samples of all materials specified prior to fabrication or commencement of work on site.
 - .2 Provide job-site or shop mock-ups of typical sections of the work as and when required by the Departmental Representative. Discuss details with the Departmental Representative before producing mock-ups.

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- 1.7 Related Work .1 Section 06 10 00 - Rough Carpentry.
.2 Section 09 91 10 - Painting.
- 1.8 Measurement and Payment .1 No measurement for payment will be made for the items "Galvanized Sheet Steel Decking" and "Leadwork". Payment shall be by lump sum. All costs for labour, materials, and equipment, are to be included in the lump sum prices bid for these items in accordance with the Contract Drawings and these specifications. For the item "Galvanized Sheet Metal Decking", include the removal of existing metal decking, installation of new decking and, the removal, repainting and re-instatement of the pipe railing.
.2 Measurement for payment for the following items shall be as indicated:
.1 "Patching Gaps/Holes in Cast Iron Panels"... dm2.

All costs for labour, materials and equipment necessary to do the work of this item in accordance with the contract documents and as directed by the Departmental Representative shall be included in the unit price bid for this item.
- PART 2 - PRODUCTS
- 2.1 Membrane .1 Grace Ice and Water shield or approved alternate product Blueskin PE 200HT by Bakor are approved products.
- 2.2 Slip Sheet .1 Rosin sized paper as 'slip-sheet' weighing approximately 6lb./per 100 square feet between metal and membrane.
- 2.3 Sheet Metal .1 Match gauge of existing sheet steel galvanized by batch hot dipping with zinc coating and thickness as governed by ASTM A123 for roofing sheet.
.2 Metal sheet shall be free of pinholes or other de-wetted areas, uniform in quality and temper, clean, smooth, commercially flat and straight, free from injurious defects. Materials not conforming to this specification shall be rejected.

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- 2.4 Fasteners
- .1 Nails for galvanized sheet or lead shall be 25mm large, flat headed barbed slating nails; No.12 gauge of stainless steel, Type 316.
 - .2 Screws shall be round-headed wood screws; min. No.12 gauge as above.
- 2.5 Expansion Shields
- .1 Shields shall be 100% pure lead shields. Plastic or galvanized fixings are not permitted.
- 2.6 Solder and Flux
- .1 All solder for sheet steel to be 60% lead and 40% tin.
 - .2 All flux shall be rosin type only.
- 2.7 Blocking and Furring
- .1 Blocking and furring shall be in non-resinous wood e.g. pine, preservative treated with zinc naphthanate brush applied.
- Note: any blocking or furring in direct contact with zinc-tin material must be coated with an approved latex paint.
- 2.8 Cast Iron Patching
- .1 Epoxy filler with embedded stainless steel fibers. Submit manufacturers information of proposed product for approval.
- PART 3 - EXECUTION
- 3.1 Removals
- .1 Complete removals of all existing decking as called for on the drawings. Remove existing railing, re-paint and, re-install after new decking is installed.
 - .2 Dispose of removals off site.
- 3.2 Cleats
- .1 Cleats are to be fabricated from 50mm x 75mm long metal, spaced not over 300mm unless otherwise specified.
 - .2 Secure one end with two nails and fold back over nail heads. Lock free end of cleat into seam or into folded edge of metal sheet.

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- 3.3 Tinning .1 Tin all edges to be soldered for a width of 40mm both sides with solder.
- 3.4 Soldering .1 Clinch-locked joints and seams are to be closed gently with a block of wood and mallet, then fluxed and filled with molten solder. The work is to be done with sufficient heat to induce the solder to move by capillarity and create a waterproof joint.
- .2 Perform soldering slowly with well heated materials, so as to heat thoroughly the seam and sweat the solder through its full width.
- .4 All exposed joints are to be wiped clean and washed immediately after the joints are soldered to remove all traces of solder and flux. All metalwork is to be washed clean with soapy water upon completion.
- 3.5 Edge and Drip Strips .1 Provide where necessary to secure sheet metal work at locations indicated and elsewhere as may be required.
- .2 Form edge strips of galvanized metal matching existing gauge unless otherwise noted.
- .3 Secure with stainless steel screws set 300mm o/c.
- .4 Install strips in continuous butted lengths to allow metalwork to be hooked over not less than 20mm.
- 3.6 Seams .1 Flat lock seam shall be finished not less than 20mm wide.
- .2 Soldered lap-seams are to be finished not less than 30mm wide and, riveted 50mm o/c.
- .3 Non-soldered lap-seams shall be finished not less than 90mm wide, and riveted 50mm o/c.
- .4 All seams are to be made in the direction of flow.
- .5 All seams visible from the ground are to be blind-soldered.
- 3.7 Dissimilar Metals .1 Dissimilar metals are not to be in direct contact with each other or any other type of metal other than approved lead-plugs or washers, to eliminate galvanic corrosion.

- .2 All concealed fasteners and clips are to be of the same metal as the flashings.
- .3 Where contact between metals cannot be absolutely assured, paint potential contact surface of galvanized metal with bituminous paint.

3.8 Forming
Generally

- .1 All new sheet metal is to be formed on the bending-brake. Shaping, trimming and hand seaming are to be done on the bench as far as possible with the proper sheet metal-working tools.
- .2 Replacement formed work is to be hand formed over wooden moulds matching the original work.
- .3 The angle of bends and the folds of interlocking metal shall be made with full regard for expansion and contraction to avoid buckling of fullness in the metal after it is in service.
- .4 Hem all exposed edges 20mm, raw edges are not permitted.

3.9 Joining

- .1 All horizontal joints or sloped joints less than 1:5 are to be flat-locked and seam soldered.
- .2 All vertical joints and sloped joints more than 1:5 are to be made watertight by forming with double seam corner locks.
- .3 All mitred corners visible from grade are to be blind soldered.

3.10 Preparation
of Surfaces

- .1 Surfaces to which sheet metal is to be applied or reset are to be made smooth, sound, clean, dry and free from any other defects that might adversely affect the installation.
- .2 Any small holes or voids are to be fully covered with similar sheet metal before the application of underlayment.
- .3 Generally install sheet metal over rosin paper slip sheet which is placed over "Ice and Water Shield" (elastomeric membrane).

3.11 Installation
Standards

- .1 Install flashings and sheet metal work dead-level, true to line and square.
- .2 No exposed fasteners are permitted unless directly called for in these documents and/or approved by the Departmental Representative. All work is to be held in place with cleats or edge strips.

3.12 Repairs to Existing Cast Iron

- .1 At existing cast iron lantern, clean all areas exhibiting rust, free of paint, corrosion and soiling by carefully controlled paint stripping to bare metal followed by hand sanding away rust deposits. Immediately as exposed, prime bare metal with zinc rich primer.
- .2 Areas to be patched are to be cleaned of all oils and residues. Gaps are to be filled with approved 'metal epox' type fillers and/or approved auto-body fillers. At larger gaps apply stainless steel mesh across gap (embedding edges in epoxy) to 'key' filler.
- .3 Where fillers are used, mechanically etch the surface to promote bond of the filler to the parent metal. When filler has set and cured, sand smooth to provide a smooth, feathered transition between filler and parent metal.

3.13 Flat Seam Roofing

- .1 Use rectangular sheets to sizes shown on the Drawings. Notch corners and fold over edges $\frac{3}{4}$ ". Modify sheet form to circular form of cupola deck.
- .2 Ensure positive drainage to outside when deck is exposed. Cover whole deck with 'Ice and Water Shield' and extend up rear of pedestal.
- .3 Lay sheets over slip-sheet (Rosin paper or Arctic paper) with long dimension parallel to eaves and cross joints staggered. Fasten sheets with cleats. Place cleats on long side at the centre of each sheet and adjacent to the intersections of the cross seams. On cross seams, place two cleats per seam.
- .4 Lock cleats into seams; flatten smooth in the direction of flow. Sweat seams thoroughly with solder producing water-tight joint.

- .5 Include 4 loose-lock expansion joints as detailed on Drawings.

3.14 Leadwork

- .1 Examine all leaded joints at lantern roofing panels with Departmental Representative for integrity. Assume existing lead at those locations can be made malleable with heat and work back into joints for weather-proof fit if necessary.
- .2 At junction of eaves at panels undertake as above but assume the addition of more lead in order to seal those locations.

PART 1 - GENERAL

1.1 Description
of the Work

- .1 This section describes the requirements for painting the wood and metal work in the lantern surmounting the lighthouse as well as the wood work, and associated hardware, in the entrance doorway and, the new plywood panels and blocking on the interior railings.
- .2 Note: Paint colour to be specified by Departmental Representative but, in general, is to match existing.
- .3 Note: Paint contains lead; see appended certificates of analysis. Remove and dispose of existing paint in accordance with applicable legislation.

1.2 Qualifications

- .1 Provide for all work to be done by skilled and experienced tradesmen specializing in this type of work.

1.3 Job and
Environmental
Conditions

- .1 Use sufficient drop cloths and protective coverings for the full protection of work not being painted. Protect hardware and all other components of the structure which do not require painting from paint spoiling and other soiling during the painting process.
- .2 Provide metal pans or adequate tarpaulins in areas assigned to the mixing of paints.
- .3 Keep waste rags in metal drums containing water and remove at the end of every working shift.
- .4 The painting contractor shall remove from the site all excess material, leftovers and scrap as well as his own equipment at the end of the job.
- .5 The owner will be provided with extra stock of each paint colour used, labelled as to its appropriate location of use.
- .6 DO NOT paint in unclean areas.
- .7 Application and drying of paints shall not proceed at temperatures below 10°C.

- .8 Painting shall not proceed when the substrate surface is damp with morning dew.
- .9 Painting shall not proceed during periods of rain and shall not resume until the wetted surface has dried.
- .10 Moisture content of wood must not exceed 15% prior to applying paint.
- 1.4 References
- .1 Section 07 62 00 - Flashings and Sheet Metal.
- .2 Ontario Provincial Standard Specification (OPSS) 911 - Coating Structural Steel Systems, November 2004.
- .3 Section 06 10 00 - Rough Carpentry.
- 1.5 Measurement for Payment
- .1 No measurement for payment will be made for the following items:
- .1 "Paint Surmounting Lighthouse".
- .2 "Paint Entry Door and Frame"
- .2 All costs for labour, materials and equipment necessary for the completion of the work of this item shall be included in the lump sum prices bid for the item.
- .3 See Section 06 10 00, "Rough Carpentry" for measurement and payment related to the supply, installation and painting of the plywood panels and infill blocking to be installed on the interior stairway railings.

PART 2 - PRODUCTS

- 2.1 Exterior Paint (Woodwork)
- .1 Exterior Trim: Two-part Polyurethane based Marine Coatings, Epifanes or equivalent.
- 2.2 Exterior Paint (Lighthouse Metal Work and Entrance Door Hardware)
- .1 Epoxy-Zinc, Epoxy Polyurethane System: Three coat system as per Table 2 of OPSS 911.
- 2.3 Primer (Woodwork)
- .1 Primer as directed by Manufacturer's specifications for approved system - typically a two-part epoxy based primer/intermediate coat.

2.4 Primer (Lighthouse Metal Work and Entrance Door Hardware) .1 Zinc rich primer with epoxy intermediate coat.

2.5 Paint for Plywood Panels and Infill Blocking on Interior Stair Railings .1 Epifanes yacht enamel coating system or approved alternate product including primers specified within manufacturer's system.

2.6 Fillers .1 Latex based wood filler for cosmetic gouge and gap filling.
.2 Epoxy based wood filler where strength is required.
.3 Epoxy filler with stainless steel fibers for filling puncture etc. at metal components.

2.7 General .1 Water: potable.
.2 Bleach: 10% sodium hypochlorate solution (e.g. Javex).
.3 Tri-sodium phosphate.
.4 Mineral Spirits or Varsol.
.5 Scrub brushes: natural bristle or soft plastic type only.
.6 Mechanical scrapers: round all edges
.7 Chemical Strippers: Citrus based organic gel type.

PART 3 - EXECUTION

3.1 Preparation .1 With regard to the metal work, prepare and paint in accordance with the requirements of OPSS 911 and as augmented in the following. Prior to commencing painting, complete mock-up as directed by the Departmental Representative. Do not proceed with painting until mock-up is approved and authorization has been given by the Departmental Representative.

- .2 Apply all work in accordance with the manufacturer's printed directions unless modified by this Specification. Provide copy of manufacturer's specifications, samples of each primer and paint type for approval prior to application. Provide sample of full coating system of each type on each of the substrates (metal and wood) for approval prior to general application.
- .3 Apply work with suitable, clean equipment in good condition.
- .4 Apply work in dust free, suitable conditions and on surfaces free from machine, tool or sandpaper marks, insects, grease, oil rust, salts and any other condition liable to impair finished work or prevent the production of good results.
- .5 All work shall be even, uniform of sheen, colour and texture, free from marks, well brushed in and free of sags, crawls, runs, joint marks and other defects.
- .6 Use paint unaltered, except as specified by manufacturer, use same brand of paint for primer, intermediate and finish coats.
- .7 Conform with the Departmental Representative's colour schedule and exactly match approved samples.
- .8 Surfaces soiled by the spillage of paint, paint splattering etc. shall be cleaned by this Trade. If such cleaning operations damage the surface, replacement or making good shall be at the expense of this Trade.
- .9 All surface preparation must be done using hand tools such as scrapers and brushes. Hand tools must have rounded edges to prevent unnecessary damage such as gouging and scratching to the substrate.
- .10 Surfaces must be hand-sanded as required.
- .11 Use only citrus based paint strippers for paint stripping.
- .12 Wash woodwork down with tri-sodium phosphate solution in hot water.
- .13 All new wood shall be primed immediately as it

is installed and before exposure.

- .14 Any open joints shall be sealed with caulking compound.
- .15 Weathered wood shall be carefully treated by gently sanding the area by hand until it is relatively smooth and using filler to provide smooth surfaces.
- .16 Carefully sand smooth between coats including prime coat; apply one coat leafing aluminium type sealer or red shellac before applying first coat paint to knots or sap blemishes.
- .17 Nail heads with the capacity to rust shall be sunk below the surface of the wood and the nail hole puttied with oil base putty and putty painted with one coat gum shellac cut in pure alcohol.
- .18 After first coat, fill nail holes, splits and scratches, using putty coloured to match finish.

3.2 Application

- .1 Painting coats are intended to cover surfaces perfectly; if in the Painter's opinion the formulae specified are inadequate to provide a first-class finished surface, report to the Engineer before commencing work; surfaces imperfectly covered shall receive additional coats at no additional cost.
- .2 All paint is intended to be applied by hand brushing. Approval may be granted for alternate methods (rolling) upon further discussion with the Contractor. Do not use roller or spray methods on the job.