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END OF SECTION

1 DEFINITIONS

The following definition applies only to this section 00 31 00 – Available Project Information.

- .1 “**Information Documents**” means available documentation related to the Project generally which is not intended to form part of the Scope Documents and is identified in this section as such, irrespective of the type or form of that documentation.

2 STATUS OF INFORMATION DOCUMENTS

- .1 Information Documents are not intended to form part of the Scope Documents but may subsequently be incorporated into the Scope Documents by means of copying, transcribing or referencing.

3 USE OF INFORMATION DOCUMENTS

- .1 Information Documents are made available to bidders to provide access to all information available to Parks Canada.
- .2 Provision of Information Documents is not to be considered a representation or warranty that information contained in them is accurate, complete or appropriate.
- .3 Bidders should interpret and draw their own conclusions about Information Documents and are encouraged to obtain specialist advice with respect to them, where appropriate. AHS assumes no responsibility for any of those interpretations and conclusions.
- .4 The contents of Information Documents may be time sensitive and revision dates should be considered when interpreting Information Documents.

4 INFORMATION DOCUMENTS

- .1 The following Information Documents are made available to bidders:
 - .1 **Barrow Safety Services.**
Edmonton, AB
780-865-7763
Asbestos Survey Dated November 18, 2016
Note: the asbestos for the flooring in the washrooms has already been removed.

5 ACCESS TO INFORMATION DOCUMENTS

- .1 Any enquiries regarding Information Documents should be directed to the Bid Administrator.

END OF AVAILABLE PROJECT INFORMATION

1. WORK OF THIS CONTRACT

- .1 Work of this Contract generally comprises the following:

Renovate and complete the washroom upgrades for the Palisades Machine room. The work involves new showers, replacing existing piping for the waterclosets and sinks. Providing a 45 minute rated wall between the two suites, which includes the living room separation. Mechanical upgrades to add on demand hot water for the showers and sinks is included. In addition, wiring, panel and power upgrades are also required, refer to Mechanical and Electrical drawings.

- .2 Municipal Address: Palisade Centre, Machine Shed, Jasper, AB.

- .3 Physical Limits: Work of the Contract is not necessarily restricted to work within property lines of site, but includes all Work required by Contract Documents, both within and outside property lines, as shown on the Contract Documents.

2. CONTRACT TIME

- .1 Date of commencement of the Contract shall be the date of issuance of the Letter of Acceptance.
- .2 Upon receipt of Letter of Acceptance, promptly, and without undue delay, commence work at the Place of the Work.

3. CONTRACTUAL ARRANGEMENT

- .1 Work shall be performed under a single contract under a Stipulated Price Arrangement.

4. CONTRACTOR'S USE OF PREMISES

- .1 Contractor shall have partial use of premises for performance of the Work.

- .2 Contractor shall limit his use of premises to the following areas:

.1 Renovation areas identified in the Contract Documents.

- .3 Contractor shall limit his use of premises to allow for:

.1 User occupancy.

.2 Public use and access.

5. USER OCCUPANCY

- .1 User will occupy premises during entire construction period. Cooperate with the Departmental Representative and user's representative to minimize conflict and to facilitate usage.

- .2 User will temporarily vacate portions of the premises to permit access to those areas for performance of the Work.
- .3 Phasing may be required.
- .4 Phasing and additional hoarding arrangements may be required to be worked out with the users.

6. RESPONSIBILITY FOR EXISTING PROPERTY

- .1 Contractor shall assume responsibility for premises assigned to him for performance of the Work.
- .2 Contractor shall assume responsibility for and make good damage to existing property attributable to performance of Work of this Contract.

END OF SECTION

1. General

1.1 ACCESS AND EGRESS

- .1 Design, construct, and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps, ladders, and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial, and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Where security is reduced by work, provide temporary means to maintain security.
- .3 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .4 Closures: Protect work temporarily until permanent enclosures are completed.

1.3 WORKING TIMES

- .1 Operation of construction equipment is permitted only between 9:00 am and 7:00 pm on weekends, and between 8:00 am and 8:00 pm on weekdays to minimize disturbance to residents and businesses.
 - .1 Application may be made to Departmental Representative for extended work hours under special circumstances.
- .2 Construction is not permitted on long weekends.

1.4 NATIONAL PARK REGULATIONS

- .1 Ensure that all work is performed in accordance with ordinances, laws, rules and regulations set out in the Canada National Parks Act.
- .2 Ensure personnel comply with National Park Regulations.
- .3 Obtain business licenses from Parks Canada Administration Office prior to commencement of work.
- .4 Comply with laws and government regulations applicable to work under this contract.
- .5 Obtain vehicle passes from Parks Canada Administration Office for business and private vehicles.
- .6 Equip all service vehicles and supervisory vehicles with Emergency Spill Kit DOT-E-10102 or equivalent.

1.5 SPECIAL REQUIREMENTS

- .1 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic, and security regulations.
- .2 Keep within limits of work and avenues of ingress and egress.
- .3 Ingress and egress of Contractor vehicles at site is limited to existing road and driveway areas.

1.6 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions.

END OF SECTION

1. GENERAL COORDINATION

- .1 Coordinate all construction activities as required to ensure efficient and orderly installation of each part of the Work.
- .2 Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule and coordinate construction activities in the sequence required to obtain the best results.
- .3 Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
- .4 Make adequate provisions to accommodate items scheduled for later installation under separate contract or by the Departmental Representative's own forces.

2. ADMINISTRATIVE PROCEDURES

- .1 Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities shall include, but not be limited to, the following:
 - .1 Preparation of schedules.
 - .2 Installation and removal of temporary facilities.
 - .3 Delivery and processing of submittals.
 - .4 Progress meetings.
 - .5 Building furniture relocation to facilitate project Work.
 - .6 Contract acceptance procedures.

3. GENERAL INSTALLATION PROVISIONS

- .1 Require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- .2 Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- .3 Inspect Materials immediately upon delivery and again prior to installation. Reject damaged and defective items.
- .4 Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- .5 Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Departmental Representative for final decision.

- .6 Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- .7 Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- .8 Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Departmental Representative for final decision.
- .9 Supervise construction activities to ensure that no part of the Work, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

4. CUTTING AND REMEDIAL WORK

- .1 Do the cutting and remedial work required to make the several parts of the Work come together properly.
- .2 Coordinate the Work to ensure that this requirement is kept to a minimum.
- .3 Cutting and remedial work shall be performed by specialists familiar with Materials affected and shall be performed in a manner to neither damage nor endanger the Work.

END OF SECTION

1. RELATED SECTIONS

- .1 Section 01 32 16 – Construction Schedules.

2. PRE-CONSTRUCTION MEETING

- .1 Schedule a pre-construction meeting within 5 Days after date of commencement of the Contract and prior to commencement of activities at the Place of the Work.
- .2 Purpose: to review personnel assignments, responsibilities, and administrative and procedural requirements.
- .3 Location: To be determined.
- .4 Meeting Chaired By: the Departmental Representative.
- .5 Attendees:
 - .1 Contractor's representatives: Contractor's senior management, Contractor's project manager, Contractor's site superintendent, representatives of major Subcontractors,
 - .2 Departmental Representative: as determined by the Departmental Representative.
- .6 Agenda:
 - .1 Introduction of the Departmental Representative's and Contractor's representatives.
 - .2 Review of significant contractual responsibilities and administrative and procedural requirements.
 - .3 Other business.
- .7 Minutes: The Departmental Representative will record minutes and distribute copies to all attendees within seven days after meeting.

3. CONSTRUCTION PROGRESS MEETINGS

- .1 Schedule regular construction progress meetings during the course of the Work.
- .2 Purpose: to monitor construction progress and to identify problems and action required for their solution, to expedite the Work.
- .3 Frequency: once a week, or as otherwise directed by the Departmental Representative.
- .4 Location: Teleconference or on site (Palisades Machine Shed), as directed by the Departmental Representative.

- .5 Attendees:
 - .1 Contractor's representatives: Contractor's project manager, Contractor's site superintendent and when so requested by the Departmental Representative, Subcontractors, suppliers and other parties involved in the Work. Contractor's representatives shall be qualified and authorized to act on behalf of the party each represents.
 - .2 Departmental Representative: as determined by the Departmental Representative.
- .6 Meeting Chaired By: Departmental Representative.
- .7 Agenda:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of items of significance that could affect progress.
 - .3 Other topics for discussion as appropriate to current status of the Work.
- .8 Minutes: The Departmental Representative will record minutes and distribute copies to all attendees within seven days after meeting.

4. WARRANTY MEETINGS

- .1 Warranty meetings shall be held between Final Acceptance of the Work and Total Completion of the Work.
- .2 Purpose: to bring to Contractor's attention Contract Deficiencies identified during warranty period, determine action required for their correction, and monitor progress of Contract Deficiency correction.
- .3 Frequency: called by the Departmental Representative on an as-needed basis.
- .4 Location: as agreed to between the Departmental Representative and Contractor.
- .5 Attendees: same as construction progress meetings.
- .6 Meeting Chaired By: Departmental Representative.
- .7 Agenda:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of progress of Contract Deficiency correction.
 - .3 Identification of problems impeding Contract Deficiency correction.
 - .4 Review of outstanding Contract Deficiencies.
 - .5 Other business.

.8 Minutes: same as construction progress meetings.

END OF SECTION

1. RELATED SECTIONS

- .1 Section 01 10 00 – Summary of Work.
- .2 Section 01 33 23 – Shop Drawings, Product Data and Samples.

2. CONSTRUCTION PROGRESS SCHEDULE

- .1 Form of Schedule:
 - .1 Horizontal bar chart of sufficient size to clearly indicate all required information.
 - .2 Divide time into months, weeks and days. Identify first workday of each week.
 - .3 Allow space for revisions.
- .2 Content of Schedule:
 - .1 List and provide a separate bar for each activity.
 - .2 Indicate start and completion dates for each activity.
 - .3 Indicate projected percentage of completion for each activity at each progress meeting.
- .3 Progress Revisions:
 - .1 Keep schedule on site and up-to-date for duration of Contract.
 - .2 Indicate actual progress of work.
 - .3 Indicate major changes in scope.
 - .4 Revise projections of progress and completion as required.
- .4 Submissions:
 - .1 Within 10 Days after date of commencement of Contract, submit a copy of an initial construction schedule for the Departmental Representative's review and acceptance at the pre-construction meeting.
 - .2 Revise and resubmit schedule as required by the Departmental Representative.
 - .3 Submit copy of updated schedule when requested by the Departmental Representative.

END OF SECTION

1. RELATED SECTIONS

- .1 Section 01 32 16 – Construction Schedules.
- .2 Section 01 33 23 – Shop Drawings, Product Data and Samples.
- .3 Section 01 77 00 – Closeout Procedure.

2. WORKERS' COMPENSATION BOARD CERTIFICATE

- .1 Before commencement of activities at the Place of the Work, obtain and submit to the Departmental Representative, a certificate of an account with the Workers' Compensation Board.

3. CASH FLOW FORECAST

- .1 Before submission of first application for payment, submit to the Departmental Representative for approval, a forecast of approximate monthly progress payments for the duration of the Contract.
- .2 Submit revised cash flow forecasts as required as the work progresses or when requested by the Departmental Representative.

4. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES - GENERAL

- .1 Submit to the Departmental Representative, for review, shop drawings, product data and samples called for by the Contract Documents and for such other items as the Departmental Representative may reasonably request. Do not proceed with work until related submission has been reviewed.

5. SHOP DRAWINGS

- .1 Shop Drawings means technical data specially prepared for work of this Contract including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form.
- .2 Submit shop drawings presented in a clear and thorough manner to appropriately illustrate the work.

6. PRODUCT DATA

- .1 Product Data means standard printed information describing materials, products, equipment and systems; not specially prepared for work of this Contract, other than the designation of selections.

- .2 Product data consisting of manufacturers' standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and descriptive data will be accepted in lieu of shop drawings provided that:
 - .1 information not applicable to the work of this Contract is deleted, and
 - .2 standard information is supplemented with information specifically applicable to the work of this Contract.

7. SAMPLES

- .1 Samples means cuts or containers of materials or partial sections of manufactured or fabricated components which are physically identical to products proposed for use.

8. SUBMISSION OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- .1 Review, date and sign, shop drawings, product data and samples, prior to submission.
- .2 Determine and verify:
 - .1 Field measurements.
 - .2 Field construction criteria.
 - .3 Catalogue numbers and similar data.
 - .4 Conformance with Contract Documents.
- .3 Notify the Departmental Representative, in writing, on the submission and at the time of submission, of deviations from requirements of Contract Documents.
- .4 Make corrections or changes to rejected submittals and resubmit, as specified for initial submittal.
- .5 The Departmental Representative's review of submittals does not relieve Contractor from responsibility for errors and omissions, nor deviations from requirements of the Contract Documents.

END OF SECTION

1. INTENT

- .1 Submit to the Departmental Representative, for review, shop drawings, product data and samples called for by the Contract Documents and for such other items as the Departmental Representative may reasonably request.
- .2 Until submittal is reviewed, do not proceed with work involving the relevant product.

2. RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 32 16 – Construction Schedule.

3. SHOP DRAWINGS

- .1 Shop drawings means technical data specially prepared for work of this Contract; including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form.
- .2 Present shop drawings in a clear and thorough manner to appropriately illustrate the work.
- .3 Identify field dimensions on drawings.
- .4 Identify shop drawings by appropriate references to sheet, detail, schedule or room numbers.
- .5 Maximum drawing size: 860 x 1120 mm.
- .6 Leave a clear space of 100 mm x 75 mm on each sheet of shop drawings for placement of the Departmental Representative's review stamp.
- .7 Submit digital copy of Shop Drawings and Product Data, unless requested by the Consultant.

4. PRODUCT DATA

- .1 Product data means standard printed information describing materials, products, equipment and systems; not specially prepared for work of this Contract, other than the designation of selections.
- .2 Clearly mark product data to identify products.

- .3 Manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and descriptive data will be accepted in lieu of shop drawings provided that:
 - .1 information not applicable to work of this Contract is deleted, and
 - .2 standard information is supplemented with information specifically applicable to the work of this Contract.
- .4 Submit shop drawings electronically for each requirement requested in specification Sections and as Consultant may reasonably request. If drawings are submitted to the General Contractor as hard copy the General Contractor will scan them and submit them electronically to the Consultant.

5. SAMPLES

- .1 Samples means cuts or containers of materials or partial sections of manufactured or fabricated components which are physically identical to products proposed for use and which establish minimum standards by which the work will be judged.
- .2 Label samples as to origin and intended use in the Work.

6. SUBMITTAL PREPARATION

- .1 Review, date and sign, shop drawings, product data and samples, prior to submission.
- .2 Determine and verify:
 - .1 Field measurements.
 - .2 Field construction criteria.
 - .3 Catalogue numbers and similar data.
 - .4 Conformance with Contract Documents.
- .3 Coordinate each submittal with requirements of work and Contract documents. Individual drawings will not be reviewed until all related shop drawing and product data are available.
- .4 Notify the Departmental Representative, in writing, on the submittal and at the time of submission, of deviations from requirements of Contract Documents.

7. SUBMISSION REQUIREMENTS

- .1 Make submittals five (5) business days in advance of the date that reviewed submittals will be required, for the Departmental Representative review and, in such sequence, as to cause no delay in the Work.

- .2 Accompany submittals with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Number of each shop drawing, product data and sample submitted.
 - .5 Other pertinent data.

- .3 Submittals shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name of:
 - .1 Contractor.
 - .2 Subcontractor.
 - .3 Supplier.
 - .4 Manufacturer.
 - .5 Name of detailer when details not prepared by Contractor, sub-contractor, or supplier.
 - .4 Contractor's stamp, initialed or signed, certifying review of submittal, verification of field measurements, and compliance with Contract Documents.

- .4 Make corrections or changes to rejected submittals and resubmit, as specified for initial submission.

8. RESPONSIBILITY FOR ERRORS, OMISSIONS AND DEVIATIONS

- .1 The Departmental Representative's review of submittals does not relieve Contractor from responsibility for errors and omissions, nor deviations from requirements of the Contract Documents.

END OF SECTION

1. INTENT

- .1 These procedures apply to requirements for patching and making good around new and existing work.

2. SUBMITTALS

- .1 Comply with requirements of Section 01 33 00 – Submittal Procedures.
- .2 Submit drawings of structural alterations and temporary support systems for the Departmental Representative's review before proceeding with structural alterations.
- .3 Provide drawings fully detailing alterations to structure, signed and sealed by a professional structural engineer registered to practice in the Province of Alberta.
- .4 Submit, for the Departmental Representative's approval, details of methods other than specified coring, drilling, or cutting.

3. STRUCTURAL ALTERATIONS

- .1 Do not cut, cut into or alter any building structure, or bearing walls and partitions until proposed methods and procedures for doing so, including temporary support system, are reviewed by the Departmental Representative.
- .2 Conform strictly to approved details. Cut or remove only to extent shown on engineer's drawing reviewed by the Departmental Representative.

4. SPECIAL PROTECTION REQUIREMENTS

- .1 Protect unaffected finishes, equipment and adjacent work from damage caused by cutting, moving, removal and patching operations. Protect surfaces which will remain as part of finished work.
- .2 Notify the Departmental Representative immediately of damage to fireproofing coatings.
- .3 Protect fireproofing coating to structural members. If damaged due to work of this Contract, restore damaged areas to original condition using materials to match existing colour, texture and required fire protection rating.
- .4 Protect personnel, building occupants and public from airborne dust and contaminants when cleaning spray fireproofing or contaminant-generating materials from structure.
- .5 Protect area below welding work from sparks and molten metal, using wet double canvas blankets.

5. CUTTING, REMOVAL AND FITTING

- .1 Make cuts with clean, true, smooth edges. Provide patches inconspicuous in final assembly.
- .2 Use electric percussion tools to cut clay tile, plaster and concrete blocks.
- .3 Carefully remove material being cut. Do not cut services discovered.
- .4 Where required, carefully remove modular, manufactured type finishes, including lay-in ceiling tile in component ceiling systems.
- .5 Fit alteration work airtight to pipes, sleeves, ducts, conduits and other required penetrations through building elements.

6. MATERIALS

- .1 Obtain new products to patch, match or extend existing products and meet or exceed quality of existing products.
- .2 Quality of existing products, available for assessment during pre-bid site visit, shall serve as basis for requirements for appearance and performance of materials used in the Work.
- .3 Where existing material cannot be matched with new, salvaged material may be used subject to approval by the Departmental Representative.
- .4 Where matching materials are not available, the Departmental Representative will consider similar product which meets same performance requirements as existing.
- .5 Obtain acceptance of the Departmental Representative before installing any materials not matching existing.

7. PATCHING, EXTENDING AND MAKING GOOD TO EXISTING WORK

- .1 Patch, extend and make good existing work using skilled workers able to match existing quality. Quality of work shall meet technical requirements for similar components throughout Specifications.
- .2 Where a portion of existing finished surface is damaged, lifted, stained, or otherwise imperfect, patch or replace with matching materials. Match existing finishes unless specified otherwise.
- .3 If patched or imperfect surface was painted or coated, repaint or recoat entire surface area.
- .4 Replace damaged lay-in type ceiling tile and other components with new.

- .5 Patch surfaces and materials exposed by partition removal, with finishes to match adjacent.
- .6 Restore existing work damaged during construction to a condition matching existing finishes.

8. TRANSITIONS

- .1 Make transitions as smooth as possible where new work abuts or finishes flush with existing work.
- .2 Match existing adjacent work in texture and appearance, providing transition invisible to the eye from a distance of 2 meters.
- .3 When smooth transition is not practicable, e.g., from a smooth finish to masonry, tile or plaster, terminate existing surface along a straight line at a natural point of division and provide trim to the Departmental Representative's approval.
- .4 Where two or more spaces become one space and planes are nominally continuous, re-work floors and walls and ceilings to provide planes meeting without breaks, steps or bulkheads.
- .5 Where change of plane exceeds 75 mm, obtain instructions from the Departmental Representative for method of executing transition.

9. EXISTING SERVICES

- .1 Establish location and extent of services in area of work and notify the Departmental Representative of findings before starting Work.
- .2 Inform the Departmental Representative immediately of unknown services that are encountered. Confirm findings in writing.

10. ALTERATIONS TO MECHANICAL AND ELECTRICAL SERVICES

- .1 Refer to mechanical and electrical drawings and Divisions 20 and 26 of the Specifications for extent of mechanical and electrical alterations.
- .2 Perform alterations with minimum disturbance to existing work.
- .3 Access service runs in ceiling spaces through light fixture openings and ceiling access panels where possible. Subject to the Departmental Representative's approval, provide bulkheads to conceal services where ceiling spaces are not accessible.

.4 Except in mechanical and electrical rooms, conceal the following:

- .1 ducts
- .2 pipes
- .3 raceways
- .4 conduit runs
- .5 junction boxes

using chases and cut-outs in walls and floors, underfloor ducts and ceiling spaces.

.5 Patch and make good existing work, where damaged due to alterations to and installation of services.

11. CORING, DRILLING AND SAW-CUTTING CONCRETE

.1 Complete an x-ray inspection of affected concrete area before coring. Employ the services of an experienced x-ray inspector. Confirm with the Departmental Representative before coring or drilling, location of reinforcing steel and raceways that may be present.

.2 Perform coring and drilling after normal working hours, unless specified otherwise. Confirm coring and drilling times with the Departmental Representative.

.3 Wet or dry core drilling and saw-cutting are acceptable. Reduce amount of cooling water used to minimum required and collect water used in suitable containers, or use a suitable vacuum system that will collect water.

.4 Do not core through structural beams or cut conduits or reinforcing steel without written permission from the Departmental Representative.

END OF SECTION

1. WORK SITE SAFETY - THIS CONTRACTOR IS "PRIME CONTRACTOR"

- .1 The Contractor shall, for the purposes of the *Occupational Health and Safety Act* (Alberta), and for the duration of the Work of this Contract:
 - .1 be the "prime contractor" for the "work site", and
 - .2 do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the Act and its regulations, as required to ensure the health and safety of all persons at the "work site".
- .2 The Contractor shall direct all Subcontractors, Sub-subcontractors, Other Contractors, employers, workers and any other persons at the "work site" on safety related matters, to the extent required to fulfill its "prime contractor" responsibilities pursuant to the Act, regardless of:
 - .1 whether or not any contractual relationship exists between the Contractor and any of these entities, and
 - .2 whether or not such entities have been specifically identified in this Contract.
- .3 The Departmental Representative does not anticipate that there will be any contractors, other than those performing the Work of this Contract, engaged in work at the "work site" during the performance of the Work of this Contract.

2. SUBMITTALS

- .1 Safety Plan.

3. SAFETY REQUIREMENTS

- .1 Included but not limited to providing fall protection at all roof edges that do not already have fall protection.

END OF SECTION

1. General

1.1 REFERENCE STANDARDS

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Alberta
 - .1 Occupational Health and Safety Act, SA 2017, Chapter O-2.1 - updated 2018.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan within seven 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 for site tasks and operation found in work plan.
- .3 Submit one copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS Safety Data Sheets (SDS) for products used in the project.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten working days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within five days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

- .1 Where required, file Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Perform Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and 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, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Alberta Occupational Health and Safety Act, and its Regulations.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORESEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety co-ordinator and follow procedures in accordance with Acts and Regulations of Alberta and advise

Departmental Representative verbally and in writing.

1.11 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have working knowledge of occupational safety and health regulations.
 - .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .3 Be responsible for implementing, enforcing daily and monitoring site- specific Contractor's Health and Safety Plan.
 - .4 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.12 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Alberta, and in consultation with Departmental Representative.

1.13 WHMIS

- .1 Ensure that products used in project comply with Workplace Hazardous Materials Information System (WHMIS) Regulations and Chemical Substances of the OH&S Act and Regulations regarding use, handling, labelling, storage, and disposal of hazardous materials.
- .2 Deliver copies of relevant Safety Data Sheets (SDS) to job site and Departmental Representative. SDS to be acceptable to Labour Canada and Health and Welfare Canada for controlled products that will be used in performance of this work. Locate SDS in accessible locations for workers and visitors throughout the site, bound and organized in binders.
- .3 Train workers required to use or to work in close proximity to controlled products in accordance with OH&S Act and Regulations.
- .4 Label controlled products at jobsite in accordance with OH&S and Regulations and WHMIS.
- .5 Provide appropriate emergency facilities as specified in the SDS where workers might be exposed to contact with chemicals, including eye-wash facilities, emergency shower.
 - .1 Workers are to be trained in use of such emergency equipment.
- .6 Provide appropriate personal protective equipment as specified in the SDS where workers are required to use controlled products.
 - .1 Properly fit workers for personal protective equipment
 - .2 Train workers in care, use, and maintenance of personal protective equipment.
- .7 No controlled products are to be brought on-site without prior approved SDS.
- .8 SDS are to remain on site at all times.

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .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 non-compliance of health and safety regulations is not corrected.

1.15 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.16 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.

END OF SECTION

1 General

1.1 REFERENCES

- .1 Definitions:
 - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
 - .3 Surveillance Officer: Parks Canada-assigned personnel responsible to monitor compliance with environmental mitigation measures.

1.2 COMPLIANCE REQUIREMENTS

- .1 Perform work in accordance with the ordinances and laws set out in the Canada National Parks Act and Regulations.
- .2 Read, understand, and comply with Parks Canada Development Permit and all stipulations provided.
- .3 Execute Work in compliance with the Canadian Environmental Assessment Act, 2012.
- .4 Comply with mitigation measures as defined in Pre-approved Routine Impact Assessment – Frontcountry Areas document found in Appendix E..
- .5 Failure to comply with or observe environmental protection measures, as identified in these specifications and those outlined in the Impact Assessment, may result in work being suspended pending rectification of measures.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Environmental Protection Plan to Departmental Representative for review.

1.4 CONTRACTOR'S EMPLOYEE BRIEFING

- .1 Contractor shall contact the Parks Canada Impact Assessment Office two weeks (or as soon as possible) prior to commencement of Work. The Environmental Surveillance Officer (ESO) may schedule an on site start-up meeting, complete equipment inspections and inspect the jobsite. The ESO may require additional mitigations in response to any unforeseen environmental impacts.
- .2 Surveillance Officer will take place prior to commencement of construction.
- .3 Contract documents have been developed in accordance with Canadian Environmental Assessment Act, 2012 Impact Assessment requirements.

Construction methods that are directly affected by CEAA, 2012 Impact Assessment will be reviewed at initial site meeting. Comply with and ensure construction practices meet mitigation measures outlined in the Impact Assessment. Failure to comply may lead to cessation of work.

1.5 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 After receipt of such notice, inform Departmental Representative of proposed corrective action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative may issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.6 ENVIRONMENTAL PROTECTION PLAN

- .1 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Departmental Representative.
- .2 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .4 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring, and reporting requirements to assure that control measures comply with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas,

- structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
 - .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
 - .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
 - .13 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
 - .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

1.7 EROSION AND SEDIMENTATION CONTROL

- .1 Develop and submit Erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Include monitoring and reporting requirements to assure that control measures comply with erosion and sediment control plan, Parks Canada requirements, and Federal, Provincial, and Municipal laws and regulations.
 - .1 ESC Plan is to be developed by a qualified professional.
 - .2 Refer to Best Management Practices document for ESC Plan minimum requirements.
- .2 Obtain permit for dewatering of construction site.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.

- .4 Ensure water pumped into sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Parks Canada requirements, and in conformance with the Environmental Contaminants Act and applicable provincial regulations, while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .6 Exercise control of erosion caused by wind, using measures in compliance with Best Management Practices document.

1.8 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 metres minimum.
- .3 Where necessary to work adjacent to existing trees and shrubs, exercise all possible care to avoid injury to vegetation. Where roots or limbs over 25 mm in diameter and bark are damaged during operations, trim damaged portion and immediately inform Departmental Representative for inspection and approval.
- .4 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .5 Obtain permits as required from Environmental Impact Assessment Office if a tree is to be removed.
- .6 Minimize stripping of topsoil and vegetation. Any topsoil present shall be salvaged and stored separately from subsoil. Ideally intact sod mats will be removed and replaced once work is complete.
- .7 Obtain list from Impact Assessment Office for native grasses, shrubs, flowers and trees acceptable for re-vegetation.

1.9 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

Provide dust control for temporary roads.

1.10 WILDLIFE

- .1 Avoid or terminate activities on site that attract or harass wildlife.
- .2 Immediately notify Departmental Representative who will notify Park Wardens of bear activity or encounters on or around site. Report other wildlife encounters within 24 hours.
- .3 If bat activity is observed within the interior of attic of the building, stop work and leave windows and doors ajar to allow the bat to exit.
- .4 Notify the Department Representative of any and all sightings of bats either interior to exterior to the building.

1.11 FIRES

- .1 Fires and burning of rubbish on site are not permitted.

1.12 HISTORICAL/ARCHAEOLOGICAL CONTROL

- .1 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
- .2 Include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.
- .3 Give immediate notice to the Departmental Representative if evidence of archaeological finds is encountered during construction and await Departmental Representative's written instructions before proceeding with work in this area.
- .4 Relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on site remain the Department's property. Protect such articles and request directives from Departmental Representative.
- .5 Provide 48 hours' notice to Departmental Representative prior to commencing work that may interfere with or affect an identified historical or archaeological site. Commence work only upon written instructions from Departmental Representative.
- .6 If during the course of the Work, the Contractor encounters any object, item, or thing which is described in Article 1.12.4 or which resembles any object, item or thing described in paragraph Article 1.12.4 the Contractor shall:

- .1 take all reasonable steps, including stopping work in the affected area, to protect and preserve the object, item or thing.
- .2 immediately notify Departmental Representative of the circumstances in writing; and
- .3 take all reasonable steps to minimize additional costs that may accrue as a result of a work stoppage.

Part 2 Products

2.1 Not used

Part 3 Execution

3.1 CONTRACTOR'S OPERATIONS

- .1 Confine operations to work limits as indicated on drawings. No activities of any kind may be carried out beyond work limits without Departmental Representative's written permission.
- .2 Do not store or stockpile construction materials in trees bordering or being preserved on site. Do not unreasonably encumber site with products.
- .3 Perform equipment maintenance in designated areas or as approved by Departmental Representative and Environmental Impact Assessment Office. Use of turnouts, campgrounds, picnic areas, or work camps for equipment oil changes and other servicing is not permitted.
- .4 Collect and dispose used oil, filter and grease cartridges, lubrication containers, and other products of equipment maintenance at nearest industrial waste facility.
- .5 Provide sufficient sanitary facilities and maintain in a clean condition.
- .6 Obtain permit from Environmental Impact Assessment Office for storage of fuel or other inflammable liquids. Observe all restrictions and conditions imposed by permit regarding special protection and berming to control spills and tank damage; fire protection considerations; provisions for disposal of fouled material and used petroleum products
- .7 Conduct operations to preserve natural features and vegetation in area. Cut and fill slopes to blend with adjoining topography. Do not permit material from fill slopes to slough or roll into surrounding tree cover or to bury plant material designated to be retained.
- .8 When, in opinion of Departmental Representative, negligence on part of Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond staked or designated work areas, Contractor shall be responsible, at

their expense, for complete restoration of trees including replacement of trees, shrubs, topsoil, grass, and other vegetation to Departmental Representative's satisfaction.

- .9 As no non-native vegetation is allowed in Park, thoroughly wash construction equipment for inspection and approval by the Surveillance Officer before entering Jasper National Park.

3.2 DISPOSAL OF WASTE

- .1 Waste Management: Remove waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Store and handle garbage in conformance with National Parks of Canada Garbage Regulations.
- .3 Store domestic garbage over the short term in wildlife-proof dumpsters. Put domestic recycling in appropriate facilities. Remove contaminated materials out of the Park.
- .4 Do not bury rubbish and waste materials on site.
- .5 Maintain site in tidy condition, free of waste material, debris and litter.
- .6 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .7 Provide copies of waybills for disposal of hazardous or contaminated wastes to Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 23 – Final Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 23 – Final Cleaning.

END OF SECTION

1. DEFINITIONS

- .1 Regulatory requirements mean laws, by-laws, ordinances, rules, regulations, codes, orders of authorities having jurisdiction, and other legally enforceable requirements applicable to the Work and which are or become in force during the performance of the Work.

2. GENERAL

- .1 Comply with regulatory requirements.
- .2 Except as otherwise specified, apply for, obtain, and pay all fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and the Contract Documents, based on:
 - .1 regulatory requirements and fees in force on date of tender submission, and
 - .2 any change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given prior to date of tender submission.
- .3 Contractor shall give all notices required by regulatory requirements.

3. CONTRACT DOCUMENTS

- .1 Contractor shall not be responsible for verifying that Contract Documents comply with regulatory requirements. If Contract Documents are at variance therewith, or changes which require modification to Contract Documents are made to regulatory requirements, by authorities having jurisdiction, subsequent to date of tender closing, Contractor shall notify The Departmental Representative in writing, requesting direction, immediately such variance or change becomes known to him. The Departmental Representative may make changes required to Contract Documents, and any resulting change in Contract Price or Contract Time will be made in accordance with the General Conditions of Contract.
- .2 If Contractor fails to notify the Departmental Representative in writing and obtain the Departmental Representative's direction as required in paragraph 3.1 and performs work knowing it to be contrary to regulatory requirements, Contractor shall be responsible for and shall correct violations thereof and shall bear costs, expenses and damages attributable to his failure to comply with provisions of such regulatory requirements.

4. **NATIONAL BUILDING CODE 2015 - ALBERTA EDITION – 2019 AND THE NATIONAL PARKS ACT**
 - .1 Conform to and perform work in accordance with the National Building Code – 2015, 2019 Alberta Building Code, and the National Parks Act, except as otherwise indicated in Contract Documents. Contractor is responsible to build to all codes and regulations. If drawings do not indicate something to code then it is their responsibility to bring it forward to the Departmental Representative.
5. **PERMITS**
 - .1 Development Permit: The Departmental Representative will apply for, obtain, and pay for development permit if required.
 - .2 Building Permit:
 - .1 Contractor shall obtain and pay for pre-approved Building Permit on behalf of the Departmental Representative, inspections, and other permits required for Work.
 - .2 Apply for Building Permit from one of the following Parks Canada Agency
 - .1 Approved National Park Inspection Agencies:
 - .1 Superior Safety Codes, Edmonton Office, 1-866-999-4777, 780-489-4777.
 - .2 The Inspections Group Inc., Edmonton Office, 1-866-554-5048, 780-454-5048.
 - .2 Contractor to carry the cost of the Building Permit in their Bid.
 - .3 Subcontractors' other work permits may be obtained from a Provincially approved permitting agency.
 - .4 Contractor shall display the building permit and such other permits in a conspicuous location at the Place of the Work.
 - .3 Occupancy Permits:
 - .1 Where required by authority having jurisdiction, Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits.
 - .2 Where Contract Document deficiencies are required to be corrected in order to obtain occupancy permits, including partial occupancy permits, the Departmental Representative will issue appropriate instructions to correct the Work.

- .3 Turn occupancy permits over to the Departmental Representative.

- .4 Business Licenses:
 - .1 Each Contractor and sub-contractor working on the project is required to apply and pay for a Jasper business license.

END OF SECTION

1 General

1.1 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work wherever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals whether by Departmental Representative instructions, or by law of Place of Work.
- .3 If Contractor covers, or permits to be covered, Work that has been designated for special tests, inspections, or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work at Contractor's own expense.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination, such work is found not in accordance with Contract Documents, Contractor to correct Work and pay cost of examination and correction. If Work is found in accordance with Contract Documents, cost of examination and replacement will be borne by Departmental Representative.

1.2 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 All testing required to meet specifications is Quality Control (QC) testing, to be conducted by a certified material testing laboratory, engaged and paid by Contractor.
- 3 Departmental Representative may engage and pay for an independent material testing laboratory for random Quality Assurance (QA) testing.
- .4 Contractor to provide equipment required for executing inspection and testing by appointed agencies.
- .5 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .6 If defects are revealed during inspection and testing, appointed agency will request additional inspection and testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re- inspection.

1.3 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents at Contractor's cost.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly at Contractor's cost.
- .3 If, in opinion of Departmental Representative, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will determine and deduct from Contract Price difference in value between Work performed and that called for by Contract Documents.

1.6 REPORTS

- .1 Submit three hard copies and one electronic copy of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested.

1.7 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or

beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.8 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time, and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing schedule-fixing dates for preparation.
- .6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.9 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical, electrical, and building equipment systems.

1.10 TESTING BY CONTRACTOR

- .1 Contractor shall furnish to the Departmental Representative, upon request, test results from testing performed by Contractor.

1.11 TESTING BY DEPARTMENTAL REPRESENTATIVE

- .1 The Departmental Representative reserves the right to employ services of independent testing agencies to establish if work complies with Contract Documents. The Departmental Representative will appoint and pay for services of such testing agency.
- .2 Where tests or inspections, by the Departmental Representative appointed testing agency, indicate work is not in accordance with the Contract Documents, additional tests or inspections, as the Departmental Representative may require, to verify acceptability of corrected work, shall be paid for by Contractor.

1.12 REFERENCE STANDARDS

- .1 Within the text of these specifications, reference may be made to the following standards:

- .1 ANSI - American National Standards Institute
 - .2 ASTM - American Society for Testing and Materials
 - .3 CGSB - Canadian General Standards Board
 - .4 CSA - Canadian Standards Association
 - .5 CAN - National Standard of Canada (published by CGSB)
 - .6 FM - Factory Mutual Engineering Corporation
 - .7 ULC - Underwriters Laboratories of Canada
- .2 The referenced standard and any amendments in force on the day of receipt of bids shall be applicable to the work during the duration of the Contract.

END OF SECTION

1. INTENT

- .1 Provide temporary facilities and controls specified in this Section and as otherwise required for performance of work of the Contract.

2. REFERENCE DOCUMENTS

- .1 Canadian Standards Association (CSA):
 - .1 CSA-A23.1/A23.2-14 Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete
 - .2 CSA-0121-17 Douglas Fir Plywood
 - .3 CAN/CSA-S269.2-16 Access Scaffolding for Construction Purposes

3. SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

4. DESIGN OF TEMPORARY FACILITIES

- .1 Contractor shall be responsible for design and safety of temporary facilities. Temporary facilities of such nature that engineering proficiency is required for their design to ensure safety during construction shall be designed by a Professional Engineer in the employ of the Contractor. Before the temporary structure is used, the person responsible for the design or his representative, shall inspect the structure and issue a certificate stating that it has been constructed according to his design.

5. FIELD OFFICES AND SHEDS

- .1 Contractor's Office: Not Required.
- .2 Materials Storage: Materials can be stored within the Machine Shed.

6. UTILITIES

- .1 Sanitary Facilities: Provide and maintain during the work, temporary toilets for the use of all workmen employed on the work. Toilets in the finished portion of the building shall not be used by workmen. Comply with the Provincial Board of Health Regulations under the Public Health Act. Provide separate facilities for both sexes as required.
- .2 Water Supply: Contractor will be permitted use of existing water supply, for construction purposes, at no cost to the Contractor. Contractor shall be responsible for all service lines and removal of same upon completion of the Work.

- .3 Access to permanent light and power: Contractor is responsible for light and power for construction purposes at no cost to the Contractor. Contractor will be responsible for all connections, disconnections, switches, service lines, etc., and removal of same upon completion of the Work.
- .4 Access to permanent heating: Contractor is responsible for existing heating for construction purposes at no cost to the Contractor. Contractor will be responsible for all connections, disconnections, switches, service lines, etc., and removal of same upon completion of the Work.
- .5 Contractor shall bear costs of all temporary services required for the project in excess of those, available from existing services, supplied by the Departmental Representative.

7. PROTECTION OF THE PUBLIC AND FIRE SAFETY

- .1 Comply with requirements of the National Building Code – 2015, Alberta Edition - 2019, Part 8, except as specified otherwise.
- .2 Provide and maintain temporary fire protection equipment during performance of Work required by the Departmental Representative in accordance with governing codes, regulations, and bylaws.
- .3 Burning rubbish and construction waste materials is not permitted on site.

8. SECURITY

- .1 Secure building against illegal entry at end of each workday.

9. PREVENTING MOULD DURING CONSTRUCTION

- .1 Monitor interior relative humidity conditions in relation to surface temperatures to prevent generation of moisture that may contribute to mould growth on the surface of organic construction materials.
- .2 If using temporary heaters, use a type that exhausts combustion products directly to the exterior of building enclosures. Do not use temporary heaters that exhaust combustion products into building enclosures.
- .3 Install insulation concurrently with air and vapour barrier.
- .4 Protect all organic construction materials from the elements, before, during, and after their installation.

- .5 Refer to CCA 82 - 2004 "Mould Guidelines for the Canadian Construction Industry", published by the Canadian Construction Association, for additional information about mould, its implications and recommendations on its prevention.
- .6 Promptly report to the Minister any mould growth observed at the work site. If the Departmental Representative determines that such mold growth was caused by the Contractor's operations, the Contractor shall promptly remove it in accordance with procedures prescribed by the Departmental Representative, at no cost to the Departmental Representative.

10. CLEANING DURING CONSTRUCTION

- .1 At regular intervals during progress of work, clean-up building premises and site and dispose of waste material, rubbish, and debris.
- .2 Do not allow waste material, rubbish, and debris to accumulate and become an unsightly or hazardous condition. Maintain site in a clean and orderly condition.
- .3 Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- .4 Do not allow waste material, rubbish, and windblown debris to reach and contaminate adjacent properties.
- .5 Sprinkle dusty debris with water as required.
- .6 Lower waste material in a controlled manner; do not drop or throw materials from heights.
- .7 Clean interior building areas prior to commencement of site painting and finishing operations and continue cleaning on an as-needed basis and to eliminate dust, until building is ready for occupancy.
- .8 Ensure that each Subcontractor engaged on the Work bears his full responsibility for cleaning up during and upon completion of his work in accordance with provisions of this article.

11. WASTE DISPOSAL REQUIREMENTS

- .1 Comply with Provincial, Municipal and Federal laws, rules and regulations pertaining to disposal operations.
- .2 Provide on-site metal containers with lids, for collection and temporary storage of waste material, rubbish, and debris.
- .3 Dispose of waste material, rubbish, and debris at disposal areas outside of the National Parks.

- .4 Do not burn or bury waste material, rubbish and debris on site.
- .5 Do not dispose of wastes into brooks, streams, rivers, waterways, lakes or ponds.
- .6 Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

12. CLEANING OF STREETS AND SIDEWALKS

- .1 Comply with Section 01 35 43 – Environmental Procedures.
- .2 Take precautions to prevent depositing of mud or debris on roadways, sidewalks, and paved areas. Promptly clean up any mud or debris so deposited.
- .3 Neglect of these requirements will cause the Departmental Representative to have necessary clean-up work carried out and to charge all costs to Contractor.

19. RESTORATION

- .1 Clean and repair damage caused by installation or use of temporary facilities. Restore existing facilities used during construction to original condition.

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

- .1 Provide temporary barriers and enclosures in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.2 HOARDING

- .1 Erect temporary site enclosures using panelized chain link or weld-mesh fence to a minimum height of 2100mm around the perimeter of the entire site.
- .2 Provide one (1) lockable truck entrance gate and at least one (1) pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .3 Maintain public side of enclosure in clean condition.
- .4 Maintain fence in good repair.

1.3 GUARDRAILS AND BARRICADES

- .1 Provide secure, rigid, guardrails and barricades around deep excavations, open shafts, open stairwells, open edges of floors, roofs, and steep slopes.
- .2 Provide as required by governing authorities.

1.4 WEATHER ENCLOSURES

- .1 Provide weathertight closures to unfinished door and window openings, tops of shafts, and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure and snow loading.

1.5 ACCESS TO SITE

- .1 Provide and maintain access roads, ramps, and construction runways as may be required for access to Work.

1.6 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns; as required to perform Work and protect public.

1.7 FIRE ROUTES

- .1 Maintain access to property, including overhead clearances for use by emergency response vehicles.

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.

- .2 Be responsible for damage incurred.

1.9 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Be responsible for damage incurred due to lack of or improper protection.

1.10 WASTE MANAGEMENT AND DISPOSAL

- .1 Dispose of waste material in accordance with all regulations and local bylaws, and in accordance with Section 01 74 21 – Construction Waste Management.
- .2 Conform to sustainability requirements as stipulated in Section 01 35 43 – Environmental Procedures.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

1. RELATED REQUIREMENTS

- .1 Substitutions during bidding period: Instructions to Bidders.

2. DEFINITIONS

- .1 Proprietary specification means a specification which includes one or more proprietary names of products or manufacturers, or both, and may also include descriptive, reference standard, or performance requirements, or any combination thereof.
- .2 Non-proprietary specification means a specification which includes descriptive, reference standard or performance requirements, or any combination thereof, but does not include proprietary names of products or manufacturers.
- .3 Substitution means a product or manufacturer not specified by proprietary name which may be acceptable in place of a product or manufacturer which is specified by proprietary name.

3. PRODUCT OPTIONS

- .1 For products specified by non-proprietary specification:
 - .1 select any product by any manufacturer, which meets requirements of Contract Documents.
- .2 For products specified by proprietary specification:
 - .1 select any product or manufacturer named, or
 - .2 substitute an unnamed product or manufacturer in accordance with Article 4. of this Section.
- .3 For products specified by proprietary specification and accompanied by words indicating that substitutions will not be accepted; select product or manufacturer named; substitutions are not permitted.

4. SUBSTITUTIONS

- .1 Products and manufacturers specified in these documents for use in performance of Work of Contract shall not be changed without Departmental Representative's written consent. Where substitute manufacturers are permitted, unnamed manufacturers will not be given consideration during the solicitation period and only accepted post solicitation by the Department Representative, subject to the following:
 - .1 Submit requests to change specified products and manufacturers to the Departmental Representative in writing, including product data indicated in Article 6.

- .2 Request for approvals shall contain sufficient data to establish the merits of the proposed materials and equipment.
- .2 Substitute Products: Where substitute products are permitted, unnamed products will be accepted by the Consultant, subject to the following:
 - .1 Substitute products shall be the same type as, be capable of performing the same functions as, and meet or exceed the standards of quality and performance of the named product(s). Substitutions shall not require revisions to Contract Documents nor to work of other Contractors.
- .3 Substitute Manufacturers: Where substitute manufacturers are permitted, unnamed manufacturers will be accepted by the Departmental Representative, subject to the following:
 - .1 Substitute manufacturers shall have capabilities comparable to those of the named manufacturer(s). Substitutions shall not require revisions to Contract Documents nor to work of other Contractors.
- .4 In making a substitution Contractors represents that:
 - .1 he has investigated substitute product or manufacturer, or both, and has determined that it meets the criteria specified in Article 4.1 or 4.2, or both, and
 - .2 he will make any changes to the Work necessitated by the substitution as required for the Work to be complete in all respects, and
 - .3 he waives claims for additional costs and time caused by substitution which may subsequently become apparent.
- .5 Substitutions shall not be ordered nor installed without the Departmental Representative's acceptance.
- .6 If the substitution does not meet the specifications of the contract documents, the contractor shall provide, at no extra cost to the contract, a product that does meet the requirements of the specifications.

5. PROPRIETARY SPECIFICATIONS

- .1 Notwithstanding specified proprietary names of either or both products or manufacturers, products provided shall meet other applicable requirements of Contract Documents. Modify products if necessary to ensure compliance with all requirements of Contract Documents.

6. CHANGES TO ACCEPTED PRODUCTS AND MANUFACTURERS

- .1 Products and manufacturers accepted by the Departmental Representative for use in performance of Work of Contract shall not be changed without the Consultant's written consent.
- .2 Submit requests to change accepted products and manufacturers to the Departmental Representative in writing, including product data indicated in Article 7.

7. PRODUCT DATA

- .1 When requested by Consultant, submit complete data substantiating compliance of a product with requirements of Contract Documents. Include the following:
 - .1 Product identification, including manufacturer's name and address.
 - .2 Manufacturer's literature providing product description, applicable reference standards, and performance and test data.
 - .3 Samples, as applicable.
 - .4 Name and address of projects on which product has been used and date of each installation.
 - .5 For substitutions and requests for changes to accepted products, include in addition to the above, the following:
 - .1 Itemized comparison of substitution with named product(s). List significant variations.
 - .2 Designation of availability of maintenance services and sources of replacement materials.

END OF SECTION

1 General

1.1 RELATED SECTIONS

- .1 All Sections relate to this Section.

1.2 DEFINITION

- .1 Material Stream – A flow of materials coming from a job site into markets for building materials. A stream can be either a specific material category that is diverted in a specific way, or a mixture of several material categories that diverted in a specific way.

2 Products

- .1 Not used.

3 Execution

3.1 CONSTRUCTION WASTE MANAGEMENT REQUIREMENTS

- .1 The Construction Manger is required to recycle or properly dispose of waste construction materials, packaging, metals, woods, masonry, gypsum board, and soils, either contaminated or surplus.
- .2 Gather, sort and recycle all demolition materials, including but not limited to asphalt, concrete, reinforcing steel, building structural steel, brick, concrete block, conduit, ductwork, flooring and finishing products, and any other materials that can be recycled.

3.2 SUBMITTALS

- .1 Develop a Construction Waste Management Plan for review and approval by the Departmental Representative and the Prime Consultant.

END OF SECTION

1. RELATED SECTIONS

- .1 Section 01 33 00 – Submittals Procedures.
- .2 Section 01 35 43 – Environmental Procedures.
- .3 Section 01 50 00 – Temporary Facilities and Controls.

2. SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

3. DELIVERY, STORAGE AND HANDLING

- .1 Protect packaging during delivery, storage and handling to prevent development of mould and mildew on packaging and on products.
- .2 Request that suppliers provide cleaning materials to minimize packaging and equipment.
- .3 Deliver materials in recyclable, or in reusable packaging, such as cardboard, wood paper, or reusable blankets which will be reclaimed by supplier or manufacturer for recycling.

4. CLEANING MATERIALS

- .1 Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

5. FINAL CLEANING

- .1 Perform final cleaning operations specified herein prior to request for inspection for Interim Acceptance of the Work.
- .2 Use experienced workers or professional cleaners for final cleaning.
- .3 Remove grease, paint spots, dirt, dust, stains, labels, fingerprints and other foreign matter from interior and exterior surfaces; vacuum and dust behind grilles, louvres and screens; wash floor surfaces not otherwise finished; clean metal doors and frames; clean metal work; clean equipment; clean hardware; clean and polish glass on both sides; clean and polish mirrors.
- .4 Repair, patch and touch-up marred surfaces to match adjacent finishes.
- .5 Replace cracked and broken glass.
- .6 Ensure that cleaning agents and methods do not remove finishes and permanent protective coatings on surfaces being cleaned. Follow manufacturer's printed maintenance requirements for cleaning.

- .7 Broom clean or remove snow and ice from all exterior paved areas designed for pedestrian or vehicular traffic, including parking areas.
- .8 Leave all surfaces in perfectly clean and unsoiled condition to the Departmental Representative's satisfaction.
- .9 Perform final cleaning prior to request for inspection for Interim Acceptance of the Work.
- .10 Use experienced workers or professional cleaners for final cleaning.
- .11 Remove grease, paint spots, dirt, dust, stains, labels, fingerprints and other foreign matter from interior and exterior surfaces.
- .12 Repair, patch and touch-up marred surfaces to match adjacent finishes.
- .13 Replace cracked and broken glass.
- .14 Ensure that cleaning agents and methods do not remove finishes and permanent protective coatings on surfaces being cleaned.
- .15 Remove waste, surplus materials and temporary facilities from the site.
- .16 Leave all surfaces in perfectly clean and unsoiled condition.

6. WASTE DISPOSAL REQUIREMENTS

- .1 Remove all waste generated during cleaning operations from site.

END OF SECTION

1. CONTRACT ACCEPTANCE PROCEDURES

- .1 Prior to requesting the Departmental Representative's inspection for Interim Acceptance, Contractor shall do the following:
 - .1 Ensure that the Work is ready for use for the purpose intended.
 - .2 Review Contract Documents and inspect Work to confirm that prerequisites to Interim Acceptance of Work have been fulfilled and that Work is ready for inspection for Interim Acceptance.
- .2 Submit written request to the Departmental Representative for inspection for Interim Acceptance of the Work, certifying that prerequisites have been fulfilled and specifying known exceptions in the form of a list of items to be completed, corrected or submitted.
- .3 Results of the Departmental Representative's inspection for Interim Acceptance will form initial Contract Deficiency list.
- .4 Following inspection, the Departmental Representative will:
 - .1 issue a Letter of Interim Acceptance stating effective date of Interim Acceptance of the Work, with a copy of the Contract Deficiency list attached thereto, or
 - .2 advise Contractor that prerequisites to Interim Acceptance are not fulfilled and repeat inspection for Interim Acceptance as necessary.
- .5 Upon issuance of Letter of Interim Acceptance, the Departmental Representative will assume responsibility for care, custody and control of the Work, including responsibility for:
 - .1 Facility operation, including all systems and equipment.
 - .2 Maintenance.
 - .3 Security.
 - .4 Property insurance.
 - .5 Utility costs.
- .6 Prior to requesting the Departmental Representative's inspection for Final Acceptance, Contractor shall do the following:
 - .1 Ensure that the entire Work, except those items arising from the warranty provisions of the Contract Documents, has been performed to the requirements of the Contract Documents.
 - .2 Review Contract Documents and inspect Work to confirm that prerequisites for Final Acceptance of Work have been met and that Work is ready for inspection for Final Acceptance.

- .7 Submit written request to the Departmental Representative for inspection for Final Acceptance of Work, including copy of the Departmental Representative's most recent Contract Deficiency list, and certifying that each Contract Deficiency has been corrected or otherwise resolved in a manner agreed to between the Departmental Representative and Contractor. List known exceptions, if any, in request.
- .8 Following inspection, the Departmental Representative will:
 - .1 issue a Letter of Final Acceptance, stating effective date of Final Acceptance of Work, or
 - .2 advise Contractor of Contract Deficiencies which must be corrected prior to issuance of Letter of Final Acceptance.

2. FINAL CLEANING

- .1 Perform final cleaning prior to request for inspection for Interim Acceptance of the Work.
- .2 Use experienced workers or professional cleaners for final cleaning.
- .3 Remove grease, paint spots, dirt, dust, stains, labels, fingerprints and other foreign matter from interior and exterior surfaces.
- .4 Repair, patch and touch-up marred surfaces to match adjacent finishes.
- .5 Replace cracked and broken glass.
- .6 Ensure that cleaning agents and methods do not remove finishes and permanent protective coatings on surfaces being cleaned.
- .7 Remove waste, surplus materials and temporary facilities from the site.
- .8 Leave all surfaces in perfectly clean and unsoiled condition.

3. PROJECT RECORD DOCUMENTS

- .1 The Departmental Representative will provide a set of original prints for record drawing purposes.
- .2 Maintain project record drawings separate from construction drawings and record deviations from Contract Documents caused by site conditions and changes ordered by the Departmental Representative. Mark changes in red coloured ink.
- .3 Record the following:
 - .1 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - .2 Field changes of dimensions and detail.

.3 Changes made by change and field order.

.4 Submit project record drawings to the Departmental Representative before or with request for inspection for Interim Acceptance.

4. OPERATION AND MAINTENANCE DATA

.1 Provide the Departmental Representative with one digital copy of operation and maintenance data, as called for in the Contract Documents, made up as follows:

.1 Enclose title sheet, labeled "Operating and Maintenance Data Manual", project name, date and list of contents.

.2 Organize contents into applicable sections of work to parallel project specifications section break-down. Identify each section with tabs of laminated mylar plastic.

.2 Include the following information plus data specified.

.1 Maintenance instructions for finished surfaces and materials.

.2 Copy of hardware schedules.

.3 Names, addresses and phone numbers of subcontractors and suppliers.

.4 Guarantees, warranties and bonds indicating:

.1 Name and address of project.

.2 Warranty/Guarantee/Bond commencement date and duration.

.3 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.

.4 Signature and seal of Contractor.

.5 Additional material/equipment used in project listed under various sections showing name of manufacturer and source of supply.

.3 Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

.4 Include one complete set of reviewed shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.

.5 Submit operation and maintenance manuals before or with request for inspection for Interim Acceptance.

5. SPARE PARTS AND MAINTENANCE MATERIALS

- .1 Deliver specified spare parts and maintenance materials before request for inspection for Interim Acceptance.
- .2 Use unbroken cartons, or if not supplied in cartons, they shall be securely packaged. Clearly mark as to content.
- .3 If applicable, identify colour, room number or area where materials are used.

END OF SECTION

1 INTENT

- .1 The Contractor shall obtain all specified operation and maintenance data, and using this data, shall prepare and submit 2 USB's with electronic copy in PDF format.

2 DESCRIPTION OF TYPES OF OPERATION AND MAINTENANCE DATA

- .1 Data on Contractor-supplied equipment and systems, including:
 - .1 system design criteria;
 - .2 system and controls descriptions;
 - .3 system and controls schematics; and
 - .4 operating instructions.
- .2 Installation instructions: manufacturer's printed instructions describing manufacturer's recommended installation procedures.
- .3 Operating instructions: manufacturer's printed instructions describing proper operation.
- .4 Equipment identification: name plate information for each piece of equipment.
- .5 Maintenance instructions: manufacturer's printed instructions describing manufacturer's recommended maintenance.
- .6 Spare parts lists: parts lists and manufacturer's recommended spare parts.
- .7 Suppliers and Subcontractors list: list of Subcontractors and suppliers who supplied and installed equipment, systems, Materials or finishes, organized by division and system, and including company name, address and telephone number.
- .8 Tag directories: directory identifying tag number and equipment description and location.
- .9 Drawings list: list of Drawings.
- .10 Shop Drawings: final reviewed/stamped shop drawings.
- .11 Product data: manufacturer's product data for equipment, systems, Materials and finishes.
- .12 Certifications, including:
 - .1 Copies of inspection reports prepared by authorities having jurisdiction;
 - .2 Certified copies of test reports prepared by independent testing agencies; and
 - .3 Any other certificates required by the Contract.

- .13 Warranties and bonds: Departmental Representative's copy of manufacturer's warranties, maintenance bonds and service contracts.
- .14 Reports: including, as required by the Contract:
 - .1 Reports documenting system performance testing methods and results; and
 - .2 Documentation of other Materials, equipment or system related information.

3 GENERAL ORGANIZATION OF CONTRACTOR PREPARED OPERATION AND MAINTENANCE MANUALS

- .1 The Contractor will include the following in each volume:
 - .1 Title page.
 - .2 Table of contents. Identify volume number where listed information is located.

4 MANUAL CONTENTS ORGANIZATION

- .1 For each major equipment, system, Materials or finishes area, organize operation and maintenance data as follows:
 - .1 Operation division: include the following, as applicable:
 - System design criteria.
 - System and controls descriptions.
 - System and controls schematics.
 - Operating instructions.
 - Equipment data.
 - .2 Maintenance division: include the following, as applicable:
 - Maintenance tasks and schedules.
 - Spare parts.
 - Suppliers and Subcontractors.
 - Tags and directories.
 - .3 Contract division: include the following, as applicable:

- Drawings List.
- Shop Drawings and product data.
- Certifications.
- Warranties and bonds.
- Maintenance brochures.
- Reports.

5 SUBMISSION OF OPERATION AND MAINTENANCE MANUALS

- .1 Prior to Substantial Performance of the Work submit two USB electronic copy in PDF format, to the Departmental Representative for review. Substantial Performance of the Work will not be ratified until all complete sets of manuals are approved by the Prime Consultant and are ready for submission to the Departmental Representative.

END OF SECTION

1 INTENT

- .1 The Contractor shall continuously maintain and update a marked-up, accurate, hard-copy record of:
 - .1 all changes from the initial Drawings made during construction; and
 - .2 the location of concealed systems.

2 DESIGNATION OF PROJECT RECORD DOCUMENTS

- .1 At commencement of the Work, the Contractor will request from the Departmental Representative the following documents, to be designated and retained as the Project record documents:
 - .1 One copy of the Request for Bids;
 - .2 Two complete sets of Drawings; and
 - .3 One set of all Addenda issued.

3 MAINTENANCE OF PROJECT RECORD DOCUMENTS

- .1 Store the Project record documents in the site office apart from sets of documents used for construction.
- .2 Label each document "PROJECT RECORD" in neat, large printed letters.
- .3 Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.
- .4 Keep record documents continuously available for review by the Departmental Representative upon request.

4 RECORDING INFORMATION ON PROJECT RECORD DRAWINGS

- .1 Record changes to, and variations from, the Drawings concurrently with construction process. Do not conceal any construction Work until the required information, including all information contained in Change Orders and all other physical changes to the Work, is recorded.
- .2 Legibly mark one set of the hard-copy Project record drawings to record actual construction, including:
 - .1 measured depths of foundation elements in relation to finished first floor datum;
 - .2 measured horizontal and vertical locations of underground utilities and appurtenances. Reference locations to permanent surface improvements;
 - .3 measured locations of internal utilities and appurtenances concealed in construction. Reference to visible and accessible features of construction;

- .4 field changes of dimension and detail;
 - .5 changes to equipment layout and services, including changes to accommodate substituted equipment; and
 - .6 all items contained in Site Instructions issued during the Work (not just references to Change Orders, etc.).
- .3 Record information as follows:
- .1 Use coloured erasable pencils to record information; and
 - .2 Use a unique colour to record the information pertaining to each major system.

5 RECORD DOCUMENTS REVIEW AT CONSTRUCTION PROGRESS MEETINGS

- .1 The Contractor shall bring the current set of the record drawings to each regular construction progress meeting for review with the Departmental Representative's representatives at the meeting.

6 SUBMISSION OF PROJECT RECORD DOCUMENTS

- .1 Prior to placing concrete slab, submit one hard-copy set of Project record drawings showing locations of:
 - .1 site services; and
 - .2 underslab services, equipment and materials.
- .2 Submit completed Project record documents to the Departmental Representatives for review and approval before, or with the, application for Substantial Performance of the Work. Substantial Performance of the Work will not be ratified until documents gain Departmental Representative's approval.
- .3 Each submission will include a covering letter, stating:
 - .1 date of submission;
 - .2 Project title, plan no. and centre code;
 - .3 Contractor's name, address and telephone number;
 - .4 number and title of each record document; and
 - .5 signature of authorized representative of the Contractor.

END OF SECTION

1 General

1.1 REFERENCE DOCUMENTS

- .1 American National Standards Institute (ANSI):
 - .1 ANSI A10.8-2011 Safety Requirements for Scaffolding
- .2 Canadian Standards Association (CSA):
 - .1 CSA S350-M1980 Code of Practice for Safety in Demolition of Structures (R2003)
- .3 Hazardous Materials Information Review Act, 1985.
- .4 Motor Vehicle Safety Act (MVSA), 1995.
- .5 National Fire Protection Association (NFPA):
 - .1 NFPA 241-13 Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.2 EXISTING CONDITIONS

- .1 Visit and examine the site and note all characteristics and irregularities affecting the work of this Section.

1.3 PROTECTION

- .1 Take precautions to guard against damage to adjacent work. Be liable for any damage or injury caused.
- .2 Cease operations and notify the Departmental Representative if safety or any adjacent work appears to be endangered. Do not resume operations until reviewed with the Departmental Representative.
- .3 Ensure safe passage of building occupants around and through area of demolition.
- .4 Cease operations and notify the Departmental Representative immediately for special protective and disposal instructions when asbestos materials or other hazardous materials are suspected or uncovered during the work of this project.
- .5 Protect temporarily suspended work that is without continuous supervision to prevent access by unauthorized persons.

1.4 TEMPORARY PARTITIONS

- .1 Erect and maintain dustproof partitions, seal off ducts as required to prevent spread of dust and fumes to other parts of the building. On completion, remove partitions and make good surfaces to match adjacent surfaces.

1.5 SALVAGEABLE AND RECYCLABLE MATERIALS

- .1 Except where otherwise specified, all materials indicated or specified to be permanently removed from the Place of the Work shall become Contractor's property. Maximize to the fullest extent possible, salvage and recycling of such materials, consistent with proper economy and expeditious performance of the Work.
- .2 To reduce the quantity of material otherwise destined for disposal at a landfill, the Contractor is encouraged to consider utilizing the services of businesses and non-profit organizations that specialize in salvage and recycling of used building materials, but does so at his own option and risk.
- .3 A current listing of recyclers specializing in specific categories of materials may be obtained during normal office hours from:

Alberta Environment
Recycling Branch
Recycle Info Line
Phone: (780) 427-6982 or 1-800-463-6326
Website: www.recyclinghotline.ca

2 Products

2.1 MATERIALS AND EQUIPMENT

- .1 Provide materials and equipment as required to perform the work of this Section.

3 Execution

3.1 MATERIALS TO BE RETAINED BY DEPARTMENTAL REPRESENTATIVE

- .1 Consult with the Departmental Representative for identification of objects to be removed from areas to be renovated.
- .2 Carefully remove the following materials and equipment as identified to be retained by the Departmental Representative. Obtain instructions from the Departmental Representative regarding location of storage.

3.2 MATERIALS TO BE REUSED

- .1 Carefully remove, store and protect for possible re-installation the following material and/or equipment:
 - .1 Light fixtures and ballasts.
 - .2 Electrical panels.
 - .3 Electrical switch gear and controls.
 - .4 Radiant convectors.

- .5 Ceiling and wall registers and diffusers.
- .6 Windows and glass.
- .7 Doors and hardware.
- .8 Miscellaneous or ornamental metals.
- .9 Mirrors.
- .10 Toilets.
- .11 Sinks.

3.3 DEMOLITION

- .1 Unless otherwise specified, carry out demolition in accordance with CSA S350.
- .2 Completely demolish the items scheduled and immediately remove materials from the premises.
- .3 Carry out demolition work in a manner to least inconvenience adjacent occupied building area.
- .4 Carry out demolition in an orderly and careful manner.
- .5 Lower waste materials in a controlled manner; do not drop or throw materials from heights.

3.4 EXISTING SERVICES

- .1 Disconnect all electrical and telephone service lines in the areas to be demolished. Post warning signs on all electrical lines and equipment which must remain energized to serve other areas during period of demolition. Disconnect electrical and telephone service lines in demolition areas to the requirements of local authority having jurisdiction.
- .2 Disconnect and cap all mechanical services in accordance with requirements of local authority having jurisdiction. Natural gas supply lines shall be removed by the gas company or by a qualified tradesman in accordance with gas company instructions.
- .3 Essential Services: Maintain fire alarm, sprinkler system, emergency lighting and all essential services to all areas.
- .4 In each case notify the affected utility company in advance and obtain approval where required, before commencing with the work on main services.
- .5 Contractor is responsible for all private, secondary utility locates required to perform the work.

3.5 RESTORATION

- .1 Make good any demolition to the existing work beyond that necessary for carrying out new work, at no expense to the Departmental Representative.

3.6 CLEAN UP

- .1 Remove all debris and rubbish away from site at regular intervals.
- .2 Remove all tools and equipment from site.

END OF SECTION

1. General

1.1 INTENT

- .1 This Section specifies general requirements common to all asbestos control work. Read this section in conjunction with related Sections that specify requirements for specific procedures and methods for asbestos control. Work of this Section to be provided by the Contractor as part of the Work.

1.2 RELATED SECTIONS

- .1 Section 02 82 33 - Asbestos Removal.
- .2 APPENDIX A - Standards and Guidelines for the Conservation of Historic Places in Canada
- .3 APPENDIX B - Province of Alberta – Historical Resources Act, June 2, 2021
- .4 APPENDIX C - Barrow Safety Services / Enviro-Works Inc. – Certificate of Analysis.

1.3 REFERENCE DOCUMENTS

- .1 Alberta Asbestos Abatement Manual, Current Edition, available online from Alberta Labour and Immigration.
- .2 Alberta User Guide for Waste Managers, available online from Alberta Environment and Parks.
- .3 Guidelines for the Disposal of Asbestos Waste, available online from Alberta Environment and Parks.
- .4 CAN/CGSB-1.205-03, Sealer for Application to Asbestos-Fibre-Releasing Materials.
- .5 Transport Canada Standard TP14850E, “Small Containers for Transport of Dangerous Goods, Classes 3, 4, 5, 6.1, 8 and, 9, a Transport Canada Standard”.

1.4 DEFINITIONS

- .1 Asbestos-Containing Material: means a product or building material containing asbestos in any quantity or percentage.
- .2 Asbestos Control Work: means asbestos containment procedures, removal or encapsulation, and disposal of asbestos or materials containing asbestos, as specified.
- .3 Asbestos Control Area: means space in which asbestos control work is being performed and to which general access is prohibited.
- .4 Asbestos Waste: means discarded materials from which there is a reasonable chance that asbestos might be released and become airborne, and includes disposable protective clothing used during asbestos abatement.
- .5 Contaminant: means asbestos material.
- .6 Contaminated: describes products, by-products, or material containing, or affected by, asbestos or removal thereof.
- .7 Full Containment Procedures: means construction of temporary facilities and following of procedures to contain asbestos fibres, as specified in Section 02 82 05.
- .8 HEPA Filter: high efficiency particulate air filter, removing not less than 99.97% of particles measuring 0.3 microns and larger, for powered respirators, vacuums, vacuum trucks and negative air units.
- .9 P100 Filter: high efficiency, oil proof, particulate air filter, removing not less than 99.97% of particles measuring 0.3 microns and larger, for non-powered air purifying respirators.

1.5 WORKER QUALIFICATIONS

- .1 All workers involved in high-risk asbestos abatement projects must have completed an asbestos abatement course of at least two days duration with an examination that requires an 80 per cent as a passing grade and is approved by Alberta Labour and Immigration. The worker must be in possession of a valid asbestos worker card at all times.
- .2 Workers involved in low and moderate-risk abatement projects (work sites that are not “restricted areas”) are not required to complete a two-day asbestos abatement course and need not possess an Asbestos Worker Card. However, in accordance with Section 15 of the OHS Regulation, appropriate training must be provided to meet the level of worker involvement in the project. The training should, at a minimum, contain the following elements:
 - .1 health hazards associated with exposure to asbestos.
 - .2 responsibility of workers, employers, contractors and suppliers under the Occupational Health and Safety Act.
 - .3 asbestos requirements in Part 4 of the OHS Code.
 - .4 work site specific safe work procedures related to the work.

- .5 instructions on how to properly wear, use and maintain personal protective equipment required for the work.
 - .6 procedures to be followed in an emergency.
 - .7 information and procedures related to other hazards that may be encountered during the work.
- .3 Employers must ensure the worker has their valid certificate of completion of the course in their possession, and proof of training should be available at the work site for inspection by an OHS officer.
- .4 At least one employee who will be performing the work shall have completed a standard first aid course and meet the minimum requirements for first aiders as required by Alberta Occupational Health and Safety Act.
- .5 Persons involved in heavy equipment operations, loading, transportation, unloading, and disposal of asbestos waste to an approved sanitary landfill site shall have been trained in accordance with the Dangerous Goods Transportation and Handling Act.

1.6 SUBMITTALS

- .1 Comply with requirements of this Section and Division 01. Provide proof of qualifications and approval prior to start of asbestos control work.
- .2 Submit copy of test results documenting Dioctyl Phthalate (DOP) testing or its equivalent, of HEPA filtered vacuums and negative air units.
- .3 Submit certification that HEPA filtered vacuums required for this contract meet specified HEPA filter designation for component filter assemblies.
- .4 Submit disposal procedure for contaminant and contaminated waste.
- .5 Submit a copy of "Code of Practice" for the work, required by the Occupational Health and Safety Act.
- .6 Submit a copy of worker protection information which will be provided to employees.
- .7 Submit plan for air monitoring to ensure use of proper respirators within work area.
- .8 Submit proof that Occupational Health and Safety has been notified, a minimum of 72 hours before asbestos control work is to be performed. The OHS Contact Center telephone number is 1-866-415-8690.
- .9 Submit proof that all persons involved in the handling, packing, loading, transportation, unloading, and disposal of asbestos waste are trained in accordance with the Dangerous Goods Transportation and Handling Act.

1.7 REGULATORY REQUIREMENTS

- .1 Comply with the following legislation and regulations:
 - .1 Environmental Protection Act (Canada).
 - .2 Environmental Protection and Enhancement Act (Alberta).
 - .3 Occupational Health and Safety Act, Regulation and Code (Alberta).
 - .4 Transportation of Dangerous Goods Act, 1992 (Canada).
 - .5 Dangerous Goods Transportation and Handling Act (Alberta) and Regulations.
 - .6 Other legislation and regulations which apply to the performance of asbestos control work.

1.8 MONITORING AND INSPECTION BY THIRD PARTY ENVIRONMENTAL CONSULTANT

- .1 Third Party Environmental Consultant will perform the following:
 - .1 review contractor's submittals including "Code of Practice".
 - .2 measure asbestos fibre levels inside and outside asbestos control area prior to commencement of asbestos control work. Post air results at site.
 - .3 inspect negative air units and HEPA vacuums prior to commencement of asbestos control work.
 - .4 monitor air outside asbestos control area and where removal method is used. Monitor air prior to, during, and after asbestos control work.
 - .5 monitor asbestos fibre levels inside asbestos control area prior to removal of barriers.
- .2 Third Party Environmental Consultant engaged to perform air monitoring is authorized to identify deficiencies in the asbestos control work and provide site instructions to ensure compliance with Contract requirements.
- .3 In the event that airborne asbestos fibres exceed acceptable levels, Third Party Consultant may stop work until corrective actions have been taken and airborne fibres return to acceptable level.
- .4 Third Party Environmental Consultant may stop work where he has reasonable cause to believe that:
 - .1 fibre levels inside asbestos control area are unacceptable, or
 - .2 work conditions and practice may lead to:
 - .1 contamination of building with asbestos,
 - .2 asbestos exposure to building occupants, or
 - .3 release of asbestos fibres into the environment.

1.10 EQUIPMENT TESTING BY CONTRACTOR

- .1 Appoint and pay for services of a testing agency to perform Dioctyl Phthalate (DOP) testing or its equivalent on completed installation of negative air units and HEPA vacuums, in accordance with the test procedures outlined in the Alberta Asbestos Abatement Manual (current edition).
- .2 Test prior to commencement of asbestos removal.
- .3 Use only negative air units and HEPA vacuums tested and inspected as specified.

1.11 AIRBORNE FIBRE LEVELS

- .1 In areas outside asbestos control area and where full containment procedures are not required, airborne fibre levels shall not exceed 0.01 fibers per cubic centimeter of air.
- .2 In areas inside asbestos control area where full containment procedures are followed including during set up and tear down, airborne fibre levels shall not exceed acceptable limits for type of respirators being used.

1.12 PROTECTION OF PERSONNEL

- .1 Provide workers with respirators and hooded disposable coveralls conforming to Occupational Health and Safety Regulations for the airborne asbestos fibre levels that are present during asbestos control work.
- .2 Do not permit smoking, eating or drinking in work area.
- .3 Provide the following to employees involved in asbestos control work:
 - .1 written information describing potential health hazards related to exposure to asbestos fibre.
 - .2 written instructions describing safe work procedures.
- .4 Where full containment procedures are not required, do the following:
 - .1 comply with provincial regulatory requirements.
 - .2 provide workers with not less than a non-powered pre-fitted half-mask respirator equipped with P100 filters and hooded disposable coveralls. Coveralls shall fit snugly around neck, wrists and ankles.
 - .3 allow no one in the removal area during asbestos control work unless wearing disposable coveralls and respirator equipped with P100 filters or as required to protect against reported fibre levels.
- .5 Provide the following safety equipment for Departmental Representative, as required to permit ready and safe access to the work:
 - .1 disposable coveralls made of material that resists penetration by asbestos fibres.
 - .2 rubber boots or easily decontaminated footwear.
 - .3 caps.

- .4 eye protection.
- .5 gloves.
- .6 hard hats.
- .7 non-powered half mask respirator equipped with P100 filters (minimum) or as required to protect against reported fibre levels.

2. Products

2.1 MATERIAL AND EQUIPMENT

- .1 Amended Water: water containing a surfactant to reduce water surface tension. Surfactant added at a concentration to provide penetration and wetting of asbestos fibres. Use the following 50% polyoxyethylene ester and 50% polyoxyethylene ether.
- .2 Sealer for lock down: to CAN/CGSB-1.205-03, Sealer for Application to Asbestos-Fibre-Releasing Materials, Class A - water-based, for spray application that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .3 Vacuums: HEPA filtered wet/dry type, with accessories adequate to perform removal and cleanup work.

2.2 ASBESTOS DISPOSAL CONTAINERS

- .1 Plastic Bags: to TP14850, minimum 150 micrometer thick sheet polyethylene. Bag seams shall be sufficiently strong to resist pressure and shocks that occur under normal conditions of transport. Designed and manufactured to contain a maximum net mass of 50 kg.
- .2 Drums: to TP14850, sturdy non-reusable, steel (1A2), aluminum (1B2), or plastic (1H2), with tight fitting lids.
- .3 Sheet Polyethylene: two separate layers, minimum 150 micrometer thick, each layer sealed with water-resistant plastic duct tape.
- .4 Label containers with labels stating "CONTAINS ASBESTOS, CANCER HAZARD, AVOID BREATHING DUST".
- .5 Duct Tape: Good quality, water resistant plastic type.

2.3 WARNING SIGNS

- .1 Provide warning signs which state as follows and provide the name of a contact person on-site:
 - .1 caution asbestos dust hazard.
 - .2 avoid breathing dust, wear protective equipment
 - .3 breathing asbestos dust may cause cancer
 - .4 entry is prohibited except to authorized persons.
 - .5 drinking, eating and smoking are prohibited in this area.

- .2 Obtain Departmental Representative approval of warning sign wording, legibility and location.

3. Execution

3.1 PREPARATION

- .1 Asbestos control work may commence only after the following have been completed:
 - .1 existing property, including non-removable equipment and furnishings, surfaces and finishes, have been protected from damage and contamination due to asbestos control work.
 - .2 HVAC system has been isolated and sealed to prevent asbestos fibres from entering the system.
 - .3 electrical system has been isolated.
 - .4 barriers are in place.
 - .5 decontamination facilities are in place and operational.
 - .6 negative pressure ventilation system has been installed and certified acceptable by testing agency.
 - .7 warning signs have been placed around perimeter of asbestos control area and at each potential entrance to the area.
 - .8 Third Party Environmental Consultant has inspected and approved preparations.
 - .9 Notice of project has been filed with Occupational Health and Safety and an acceptance has been granted and received.

3.2 ASBESTOS REMOVAL

- .1 Refer to Section 02 82 33 for asbestos removal requirements.

3.3 PREPARATION FOR ASBESTOS DISPOSAL

- .1 Prepare contaminant and contaminated materials for disposal as follows:
 - .1 place in double bagged plastic asbestos disposal bags or inside disposable drums with tight fitting lids.
 - .2 wrap bulk materials that do not lend themselves to disposal in plastic bags or drums, in sheet polyethylene. (2 separately sealed layers).

- .3 the resulting package must be constructed, filled and closed so that, under normal conditions of handling and transport, there will be no discharge, emission or escape of the dangerous goods from the package or small container that could constitute a danger to public safety.
- .2 Transfer asbestos waste containers and normal construction waste from asbestos control area for disposal, in accordance with procedures described in the following documents.
 - .1 Alberta Asbestos Abatement Manual, Current Edition, available online from Alberta Labour and Immigration.
 - .2 Guidelines for the Disposal of Asbestos Waste, available online from Alberta Environment and Parks.
 - .3 Section 02 82 33 – Asbestos Removal.
 - .4 Where more than one document addresses an issue, the most stringent requirements shall apply.
- .3 Treat contaminated water as asbestos waste.

3.4 DISPOSAL OF NORMAL CONSTRUCTION WASTE

- .1 This article applies to materials not readily prepared for asbestos disposal as specified, and being capable of thorough cleaning, for example, bulky mechanical equipment.
- .2 Clean materials until free of visible asbestos, wash, and dip in or spray with asbestos sealer.
- .3 Dispose of as normal construction waste.

3.5 TRANSPORTATION AND PERMANENT DISPOSAL OF ASBESTOS WASTE

- .1 Transport asbestos waste in accordance with Alberta and Federal legislation and regulations.
- .2 Ensure that all materials are properly packaged and labeled prior to transportation. Each container must be marked in accordance with the Dangerous Goods Transportation and Handling Act showing the shipping name [(Blue or Brown Asbestos)] [(White Asbestos)] and product identification number [(UN2212)] [(UN2590)].
- .3 Transport hazardous waste materials in properly placarded vehicles.
- .4 Transport asbestos waste in a manner which will prevent asbestos fibres from becoming airborne.
- .5 Each load shall be accompanied by a properly completed non-hazardous waste manifest satisfactory to the authority having jurisdiction.
- .6 Dispose of asbestos waste in a supervised, approved sanitary landfill site.
- .7 Provide the Departmental Representative with a copy of each waste manifest once asbestos waste has been disposed of at a supervised, approved landfill site.

3.6 WORKER DECONTAMINATION

- .1 Workers shall follow decontamination procedures as outlined in the "Code of Practice" and as specified.
- .2 Prior to leaving area where asbestos has been removed by method not requiring full containment, vacuum using HEPA filtered vacuum or wet wipe in coveralls. Dispose of coveralls and wiping rags into polyethylene bags as asbestos waste.
- .3 Immediately upon leaving area where asbestos has been removed by method not requiring full containment, perform the following:
 - .1 Proceed to nearest shower outside work area and, with respirator in place, shower head and face prior to removal of respirator. If a shower is not available, wash head thoroughly, including exterior of respirator, prior to removing respirator.
 - .2 Dispose of respirator filters as asbestos waste.

3.7 DAILY CLEANING

- .1 Progressively containerize contaminant and contaminated material as removal work progresses. Do not permit asbestos waste to accumulate.
- .2 Keep contaminant and contaminated material damp to minimize generation of airborne asbestos fibres.
- .3 Remove asbestos waste from asbestos control area at least once per day.
- .4 Regularly check, clean and replace filters as necessary.

3.8 FINAL CLEANING

- .1 Upon completion of asbestos control work, perform the following:
 - .1 Remove asbestos waste from work site.
 - .2 Vacuum and wash contaminated tools and equipment and bag in clear 2 mil bags.
 - .3 Dispose of non-reusable materials and contaminated materials as asbestos waste.
 - .4 Clean site to original condition.
 - .5 Make good any damage resulting from the asbestos control work, to the satisfaction of the Third Party Environmental Consultant.

END OF SECTION

1. General

1.1 INTENT

- .1 Read this Section in conjunction with Section 02 82 01 - Asbestos Control General Requirements.

1.2 SECTION INCLUDES

- .1 This Section includes requirements for:
 - .1 isolation of asbestos control area from other building space, [and the exterior environment].
 - .2 measures to maintain asbestos fibre levels inside and outside of asbestos control areas to acceptable levels.
 - .3 measures to control transfer of materials and personnel in and out of asbestos control area, to minimize escape of asbestos fibres from the control area.

1.3 RELATED SECTIONS

- .1 Asbestos Removal: Section 02 82 33.

1.4 REFERENCE STANDARDS

- .1 CAN/CGSB-51.34-M86 - Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .2 CSA O121-08 – Douglas Fir Plywood.
- .3 CSA-O141-05 (R2009) – Softwood Lumber.
- .4 CSA O151-09 – Canadian Softwood Plywood.
- .5 CSA O153-M1980 (R2008) – Poplar Plywood.
- .6 CSA O437 Series 93(R2011) – Standards on OSB and Waferboard
- .7 National Lumber Grades Authority (NGLA), latest edition – Standard Grading Rules for Canadian Lumber.

1.5 DEFINITIONS

- .1 Barrier: means construction designed to isolate and seal asbestos control area from remainder of building [and from the exterior environment] before, during, and after asbestos control work.

1.6 FIRE REGULATIONS

- .1 Comply with requirements of authority having jurisdiction over fire safety, including the following:
 - .1 locations of emergency and fire exits from the work area.
 - .2 on-site firefighting equipment.

2. Products

2.1 BARRIER MATERIALS

- .1 Sheet Material for Walls and Ceilings: polyethylene, to CAN/CGSB-51.34-M86, minimum 150 micrometre thick.
- .2 Sheet Material for Floors: sheet polyethylene, glass fibre reinforced, minimum 250 micrometre thick.
- .3 Dimension Board Lumber: to CAN/CSA-0141-05 (R2009) and graded in accordance with current National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.
 - .1 Moisture Content: maximum 19% at time of installation.
 - .2 Surface Finish: S4S for members receiving finishes, S2S or S4S for members not receiving finishes.
- .4 Wood Panel Products:
 - .1 Canadian Softwood Plywood: to CSA 0151-09.
 - .2 Douglas Fir Plywood: to CSA 0121-08.
 - .3 Poplar Plywood: to CSA 0153-M1980 (R2008).
 - .4 Waferboard and Oriented Strand Board: to CSA 0437 Series 93(R2011).
- .5 Duct Tape: Good quality, water-resistant plastic type.

2.2 EQUIPMENT

- .1 Negative Air Units: two-stage HEPA filter system and accessories required to exhaust air to outside of building through a secured location.

2.3 DECONTAMINATION FACILITIES

- .1 Decontamination facilities shall include:
 - .1 clean change room.
 - .2 asbestos waste transfer rooms.
 - .3 protective equipment storage.
 - .4 wash up station.

- .2 Provide minimum number of entrances into decontamination facility from outside asbestos control work area.
- .3 Obtain Third Party Consultant approval of location and construction of decontamination facility prior to commencement of work.
- .4 Provide adequate facilities for storage of protective equipment in decontamination facility.
- .5 Hot and cold water supply lines shall have water shut-off valve located outside of asbestos control area.

2.4 NEGATIVE PRESSURE VENTILATION SYSTEM

- .1 Provide negative pressure ventilation system that is separate from building mechanical system. Confirm leak testing of equipment fitted with HEPA filters after filter installation has been completed with Dioctyl Phthalate (DOP) or equivalent on site.
- .2 System shall include:
 - .1 make-up air drawn through decontamination facility.
 - .2 exhaust air vented to building exterior through negative air units.
- .3 System shall:
 - .1 be capable of changing total volume of air in the containment area four times per hour, and
 - .2 maintain a negative pressure of 5 Pa across the barrier between the clean area and the asbestos control area.
- .4 Start operation of negative air system before beginning asbestos control work. The HEPA-filtered exhaust unit must remain in continuous operation to maintain negative pressure in the enclosure while the removal is in progress and during clearance procedures after the removal.
- .5 Negative pressure must be maintained until site decontamination work is complete and air monitoring tests collected by the Third Party Consultant confirm fibre levels are low enough to permit dismantling of the enclosure. Negative air systems shall not be turned off at any point during the abatement activities.
- .6 Exhaust air from the containment must pass through a HEPA filter and be discharged outdoors through a window. The discharge point for any exhaust air unit should be to the outside air, away from other work areas, air conditioning inlets or breathing air compressors.
- .7 Monitor condition of filters on a regular basis and replace filters as required to maintain air changes and negative pressure.
- .8 Provide separate makeup air ducting and combustion air ducting to prevent backdrafting or damage to boilers, hot water heaters or any other gas fired equipment that is required to remain operational during asbestos removal work.

3. Execution

3.1 HVAC SYSTEM ISOLATION

- .1 Shut down HVAC system to asbestos control area.
- .2 Seal openings to HVAC system to prevent asbestos fibres from entering system.
- .3 Coordinate mechanical system isolation with Departmental Representative.

3.2 ELECTRICAL SYSTEM ISOLATION

- .1 Isolate electrical systems which will remain energized in the asbestos control area, with ground fault interrupters.
- .2 Use only ground fault protected electrical services for electrical equipment used in the asbestos control area.
- .3 Coordinate electrical system isolation with Departmental Representative.

3.3 INSTALLATION OF BARRIERS

- .1 Isolate asbestos work area from remainder of building.
- .2 Seal off openings in the perimeter including, but, not limited to, the following:
 - .1 heating and ventilation grills and outlets.
 - .2 doorways.
 - .3 elevator shafts.
 - .4 corridors.
 - .5 openings for lighting and electrical systems.
 - .6 sleeves in ceiling space and floors, above and below work area, including plumbing and conduit chases.
- .3 Use barrier materials to construct entrances, exits and transfer openings to decontamination area, in an arrangement to form an airlock between doors. Door arrangement shall meet the following criteria:
 - .1 one door shall always be closed as workers pass through entry system.
 - .2 under negative pressure, supply air can be drawn in through the entry system.
 - .3 in the event of loss of negative pressure, door systems shall seal to prevent airborne fibres from escaping asbestos control area.
- .4 Seal HVAC supply and return air louvres, and grilles to prevent contamination of the system. Cover louvres and grilles with rigid material such as plywood or sheet metal, and seal with two layers of polyethylene. Obtain Third Party Consultant approval prior to using an alternative sealing method.
- .5 Protect walls and ceilings within work area with polyethylene sheeting mechanically fastened at the top and bottom of the wall. Seal joints with tape.

- .6 Construct free standing barriers as required, running from floor to underside of structure above, using wood or steel stud spaces at maximum 600 mm on centre with polyethylene sheeting. Seal joints and perimeter with tape.
- .7 After penetrations through floors have been sealed, protect floors with two layers of fibre-reinforced polyethylene with 300 mm turn up at wall interface. Seal joints and perimeter with tape.
- .8 Protect wall-mounted equipment from asbestos contamination by sealing with polyethylene. Where equipment is left exposed, thoroughly clean after completion of asbestos control work.

3.4 REMOVAL OF BARRIERS

- .1 Upon completion of asbestos control work, perform the following:
 - .1 HEPA vacuum and wash down the polyethylene sheets then spray the surfaces with an appropriate slow drying glue to seal down any invisible dust and fibers.
 - .2 remove polyethylene wall sheets when airborne asbestos fibre concentration has reached an acceptable level. Departmental Representative will advise when fibre concentrations are low enough to remove sheeting.
 - .3 carefully fold sheets with asbestos exposed side folded in. Dispose of as asbestos waste.
- .2 Remove other barrier materials from site.

END OF SECTION

1. General

1.1 INTENT

- .1 Read this Section in conjunction with Section 02 82 01 - Asbestos Control General Requirements.

1.2 RELATED SECTIONS

- .1 Asbestos Containment Procedures: Section 02 82 05.

2. Products

2.1 MATERIALS AND EQUIPMENT

- .1 Required equipment and materials shall include the following
 - .1 Portable HEPA-filtered exhaust units with extra HEPA filters and fuses;
 - .2 Flexible or rigid duct;
 - .3 Vacuum cleaners fitted with HEPA filters;
 - .4 Electrical extension cords;
 - .5 Portable ground fault circuit interrupter (GFCI);
 - .6 Garden hose and hand pump garden sprayer to wet asbestos;
 - .7 Wetting agent (50% polyoxyethylene ether and 50% polyoxyethylene, or equivalent);
 - .8 Scrapers, nylon brushes, dust pans, shovels, etc.;
 - .9 Scaffolds with railings;
 - .10 Duct tape or an alternative tape with similar or better adhesive qualities;
 - .11 Polyethylene sheeting having a minimum six mil thickness;
 - .12 Six mil thick labelled asbestos disposal bags;
 - .13 Barriers and warning signs;
 - .14 Mops and/or rags, water and other supplies for clean-up;
 - .15 Encapsulant for sealing edges;
 - .16 Manometer, pumps and smoke generator;
 - .17 Fire extinguisher;
 - .18 Appropriate first aid kit; and

- .19 Glovebags, zippered: prefabricated PVC bag, gloves and elasticized valve port, minimum 250 micrometre thickness, and with reversible double-pull, double-throw top zipper with protective flap of 250 micrometer thick PVC.

3. Execution

3.1 REMOVAL, GENERALLY

- .1 Remove saturated asbestos materials in a systematic manner. Do not use aggregate blasting or other abrasive removal methods.
- .2 Keep contaminated debris, created by removal operation, damp using amended water to prevent asbestos fibres from becoming airborne. If contaminated debris dries out, re-soak before continuing with removal operation.
- .3 Collect contaminants upon removal and put into asbestos disposal containers. Do not permit asbestos waste to accumulate.
- .4 Ensure contaminants are completely removed from substrates and that asbestos debris and dust are removed from pipes, ducts, fixtures and other items.
- .5 Prior to sealing, purge work area air with fine spray of amended water solution.
- .6 Spray exposed surfaces with asbestos sealer for lock down after removal is complete and all visible asbestos is removed, in order to seal any remaining invisible asbestos fibres to the surface. Ensure that surfaces are dry prior to spraying.

3.2 REMOVAL OF PIPE AND EQUIPMENT INSULATION

- .1 Remove pipe and equipment insulation using full containment procedures in accordance with Section 02 82 05.
- .2 All people within the work area shall be wearing disposable coveralls made of material that resists penetration by asbestos fibres and a Powered Air Purifying Respirator (PAPR) or better equipped with P100 filters.
- .3 Pre-clean any asbestos debris with HEPA vacuum and wet wiping if previous damage found.
- .4 Remove insulation in small sections.
- .5 Vacuum visible debris from insulation jacket and saturate insulation with amended water.
- .6 Cut and remove insulation jacket, applying a mist of amended water to contaminated surfaces as jacket is removed to keep airborne asbestos fibres at the lowest practicable level. Keep surfaces wet during this operation.
- .7 Immediately place contaminated jacket into disposal bag and re-soak asbestos insulation.
- .8 Where applicable, remove wire mesh holding insulation together. Dispose of wire mesh as asbestos waste.
- .9 Wet isolation barriers, fold toward inside, sides facing work area. Prepare for disposal and dispose of as contaminated waste.

- .10 Air monitoring in removal area and a visual inspection by the Third Party Consultant] must be completed prior to acceptance of the work. Air monitoring results should be below 0.01 f/cc during all phases of the work.

3.5 GLOVEBAG REMOVAL OF PIPE INSULATION (Moderate-Risk Asbestos Removal Procedure)

- .1 Remove pipe insulation using glovebag method in accordance with glovebag manufacturer's recommendations and "Safe Work Procedures". Take care to avoid cutting glovebags.
- .2 All people within the work area shall be wearing disposable coveralls made of material that resists penetration by asbestos fibres and half face negative air respirator equipped with P100 filters.
- .3 Use zippered Glovebag as follows:
- .1 to remove asbestos material from live feed and condensate steam lines, and other piping transmitting fluids at similar temperatures.
 - .2 to sequentially remove contaminated material from more than one glovebag length along piping.
 - .3 Otherwise use either zippered or non-zippered glovebags, at Contractor's option.
 - .4 Install drop sheet beneath work area prior to commencing work.
 - .5 When ready to dispose of glovebag, pull disposal bag over glove bag attached to pipe. Undo zipper to open top of glove bag and fold it down into disposal bag.
- .4 When stripping is complete, spray surfaces from which asbestos pipe insulation has been removed (prior to removal of bag from pipe) with asbestos sealer lock down to seal any asbestos fibres left on surface. Ensure surfaces are dry prior to spraying. Clean up with HEPA vacuum and wet wiping.
- .5 Air monitoring in glove bag removal area and a visual inspection by the Third Party Consultant must be completed prior to acceptance of the work. Air monitoring results should be below 0.01 f/cc during all phases of the work.

3.7 CUT AND WRAP REMOVAL OF INSULATED PIPE FITTINGS (Low-Risk Asbestos Removal Procedure)

- .1 Install drop sheet beneath work area prior to commencing work.
- .2 All people within the work area shall be wearing disposable coveralls made of material that resists penetration by asbestos fibres and half face negative air respirator equipped with P100 filters.
- .3 Remove sections of non-asbestos insulation 150-300 mm beyond both ends of asbestos-containing insulation.
- .4 Wrap entire contaminated insulated fitting with minimum two layers of 150 micrometre thick sheet polyethylene. Tape seal joints and around pipe exposed by removal of non-asbestos insulation.
- .5 Cut through pipe to permit removal of polyethylene wrapped, insulated fitting.
- .6 Clean up contaminated debris using a HEPA filtered vacuum or by wet cleaning.
- .7 Air monitoring in removal area and a visual inspection by the Third Party Consultant should be completed prior to acceptance of the work. A baseline measurement should be taken in addition to monitoring during the work, as required. Air monitoring results should be below 0.01 f/cc during all phases of the work.

3.8 OUTDOOR REMOVAL

- .1 Ensure weather conditions are safe for workers performing the removal. For more information, refer to the following Government of Alberta publication: Best Practice – Working Safely in Heat and Cold (GS006).
- .2 Mobile decontamination facilities, special work platforms and other specialized equipment may be required for outdoor removal.
- .3 Air monitoring to be taken by the Third Party Consultant for each shift including downwind from removal area and around workers in removal area. Personal sampling of workers performing the outside removal is also taken at least once a day.

END OF SECTION

1 General

1.1 RELATED REQUIREMENTS

- .1 Section 09 91 00 – Painting.
- .2 Section 09 29 00 – Gypsum Board.

1.2 REFERENCE STANDARDS

- .1 National Building Code - Alberta Edition 2019.
- .2 American Society for Testing and Materials (ASTM International):
 - .1 ASTM D2559-12a(2018), Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions.
 - .2 ASTM D5456-19e1, Standard Specification for Evaluation of Structural Composite Lumber Products.
 - .3 ASTM F1667-18a, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .3 Canadian Standards Association (CSA):
 - .1 CAN/CSA G164-18, Hot Dip Galvanized of Irregularly Shaped Articles.
 - .2 CSA O8-15(R2020), Wood Preservation.
 - .3 CSA O86-19, Engineering Design in Wood (Limit States Design).
 - .4 CSA O121-17, Douglas Fir Plywood , Includes Update No. 1 (2013).
 - .5 CAN/CSA O141-05 (R2019), Softwood Lumber.
 - .6 CSA O151-19, Canadian Softwood Plywood.
 - .7 CSA O153-19, Poplar Plywood.
- .4 Underwriters Laboratories Canada (ULC):
 - .1 CAN/ULC-S102:2018, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

- .5 National Lumber Grading Authority (NLGA): Standard Grading Rules for Canadian Lumber (2014 edition).

1.3 SUBMITTALS

- .1 Submit manufacturer's printed product literature, specifications and data sheet.
- .2 Submit MSDS sheets or official manufacturer literature stating no urea-formaldehyde was used in the manufacturing of composite wood.
- .3 Indicate manufacturer's acceptable types of paint, stain and clear finishes that may be used over treated materials to be finished after treatment.

1.4 QUALITY ASSURANCE

- .1 Material shall comply with applicable requirements of Alberta Building Code 2019 (ABC).
- .2 Lumber shall be graded and stamped by an agency certified by Canadian Lumber Standards Administrative Board.
- .3 Plywood shall be graded and stamped in accordance with applicable CSA standards.
- .4 Panel products shall be marked with a recognized, visible grade stamp.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Protect materials from weather upon delivery to job site.
- .2 Storage and Handling Requirements:
 - .1 Store materials on raised supports. Cover materials with waterproof covering. Provide adequate air circulation and ventilation.
 - .2 Do not store seasoned materials in wet or damp areas.
 - .3 Protect edges and corners of sheet materials from damage during handling and storage.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling where possible.

2 Products

2.1 LUMBER

- .1 Lumber: to CAN/CSA O141, softwood, S-P-F, S4S, surface-dry, graded and stamped in accordance with National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.
 - .1 Moisture Content: at time of installation, maximum 19%.
 - .2 Finger jointed lumber is not acceptable.
- .2 Framing and Board Lumber: in accordance with Alberta Building Code 2019 and as specified in schedules.
- .3 Furring, Blocking, Nailing Strips, Grounds, Rough Bucks, Cants, Curbs Fascia Backing and Sleepers: S4S, “Standard” or better grade for board, post and timber sizes, “Standard” light framing or better for dimension sizes.

2.2 PANEL COMPONENTS

- .1 **There is currently on site:**
 - 3 - 4’x 8’ sheets of 19mm Subfloor,**
 - 5 - 4’x 8’ sheets of 13mm Tile Backer Board,**
 - 3 - 4’x 8’ sheets of 10mm Underlay,**
- .2 Provide panel products manufactured with phenol-formaldehyde or formaldehyde-free adhesives.
- .3 Canadian Softwood Plywood: to CSA O151.
- .4 Douglas Fir Plywood: to CSA O121.
- .5 Poplar Plywood: to CSA O153.
- .6 Oriented Strand Board (OSB): to current standards, Grade O-2, thickness as indicated on drawings. Grade stamp shall indicate span rating.
- .7 Underlayment: Douglas Fir plywood, exterior, sanded grade, G1S, wood inlay patches only, plugged crossbands, thickness as indicated on drawings.

2.3 FASTENING DEVICES AND HARDWARE

- .1 Nails, spikes and staples: in accordance with Alberta Building Code 2019 and as follows:
 - .1 Use common spiral nails and spikes except where indicated otherwise.

.2 Use hot dip galvanized finished steel for exposed exterior work, highly humid interior areas, pressure - preservative and fire-retardant treated lumber.

.2 Bolt, nut, washer, screw and pin type fasteners: hot dip galvanized finish to CSA G164.

2.4 WOOD FURRING AND BLOCKING

.1 Provide wood furring and blocking to meet code requirements, as required for good workmanship and as required by the manufacturer of the product. As well as at all locations where electrical, mechanical equipment or fabrications are being mounted.

2.5 ANCILLARY MATERIALS

.1 Plywood adhesive: waterproof type, cartridge loaded for sub-floor to framing, liquid brush on for underlay.

.2 Subflooring adhesive: to latest standard, cartridge loaded.

.3 Surface applied wood preservative: to CAN/CSA O80, copper naphthenate or pentachlorophenol base water repellent, coloured green.

2.6 PRESSURE PRESERVATIVE TREATED WOOD

.1 Pressure Preservative Treated Wood: in accordance with CAN/CSA 080.

.2 Water-borne preservative treated wood shall have maximum moisture content of 19% after treatment.

3 Execution

3.1 ERECTION OF FRAMING MEMBERS

.1 Install members true to line, levels and elevations. Space uniformly.

.2 Construct continuous members from pieces of longest practicable length.

.3 Install spanning members with "crown-edge" up.

.4 Install blocking to facilitate installation of finishing materials, fixtures, specialty items and trim.

.5 Ensure that all members are framed, anchored, tied and braced together to provide the strength and rigidity necessary for their end purposes.

- .6 Comply with minimum requirements for spacing, size and type of fasteners listed in Alberta Building Code 2019, for each particular end use, unless more restrictive requirements are detailed and/or specified, or are necessary to assure adequate securement.
- .7 Ensure that at least 50% of length of fasteners penetrate wood materials to which fasteners are secured.
- .8 Erect all framing materials forming subsurfaces for wood finishes, drywall, etc. to be straight in any plain with a tolerance of 6 mm in 3 m non cumulative.
- .9 Install engineered wood products to comply with manufacturers written instructions, drawings and details.

3.2 APPLICATION OF SURFACE APPLIED WOOD PRESERVATIVE

- .1 Treat surfaces of components with wood preservative before installation. Wherever possible apply preservative after components have been cut and sized to fit.
- .2 Apply preservative by dipping, or by brush or spray to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of surface applied wood preservative before installation.

3.3 WOOD FURRING AND BLOCKING

- .1 Install wood plates where indicated. Erect plumb and true. Rigidly support and securely anchor to substrate.
- .2 Provide and install wood strapping or furring as indicated. Strapping to be shimmed out plumb, square and true to line.
- .3 Install blocking where required for items to be fixed to walls.

3.4 APPEARANCE GRADE MATERIALS

- .1 Install lumber and panel materials designated "Appearance" (A) Grade so that grade-marks and other defacing marks are not visible on surfaces specified to be left unfinished or to be finished with translucent or transparent type coating. Surface cutting or sanding to remove such marks is acceptable only in locations where defacement will not be evident after finishing.

3.5 WOOD FURRING AND BLOCKING

- .1 Install wood plates where indicated. Erect plumb and true. Rigidly support and securely anchor to masonry, concrete, and metal stud framing..
- .2 Provide and install wood strapping or furring indicated on drawings.
- .3 Strapping: Shimmed out plumb, square and true to line. Use 19 mm x 64 mm at 406 mm o.c. , unless indicated otherwise.
- .4 Install at least one row of solid blocking to wood stud walls not more than 2440 mm high, two rows if over 2440 mm high.
- .5 Install blocking behind all sheathing and wallboard joints, and where required for items to be fixed to walls.

3.6 PANEL TYPE SUBFLOORING

- .1 Install subflooring with panel end joints located on solid bearing, staggered at least 800 mm.
- .2 Apply subflooring adhesive on wood framing to support panel-type subflooring. Place continuous single-bead on each framing member and double-bead on framing members supporting panel joints. Comply with adhesive manufacturer's installation instructions.
- .3 Fasten subfloor panels using common spiral or annular-grooved nails spaced 150 mm O.C. along edges and 300 mm o.c. along intermediate supports. Use of staples is not acceptable.

3.7 PANEL TYPE UNDERLAYMENT

- .1 Install only when environmental conditions in installation area conform to requirements for flooring installation. Install to manufacturer's printed recommendations.
- .2 Acclimatize wood underlayment in installation area for at least 24 hours before installation. Store on edge, spaced to permit air movement between faces. Test moisture content of underlayment and subfloor to ensure they are within acceptable range recommended by underlayment manufacturer.
- .3 Install underlayment panels over subflooring with grade stamp down.
- .4 Install with face grain at right angles to subfloor panels. Stagger underlayment panel joints. Offset underlayment and subfloor joints minimum 150 mm.

- .5 Lightly abut panels to eliminate joint gaps. Sand panel joints level until joints cannot be felt by hand.
- .6 Leave 3 to 6 mm gap between underlayment and abutting vertical surfaces such as columns and perimeter walls.
- .7 Fully fasten one panel at a time.
- .8 Nail or staple panels every 50 mm along edges, minimum 6 mm and maximum 10 mm from edges, and every 100 mm over remainder of panels. Do not use screws. Do not fasten underlayment to joists.
- .9 When stapling, ensure panels at staple gun are in firm contact with subfloor and that staples are installed parallel to panel face grain.

3.8 SCHEDULE OF PANEL PRODUCTS

Location/Panel Type	Thickness	Grade
Floor Underlayment (if required)	12mm	G1S
Douglas Fir Plywood	19 mm	As specified under 2. Products

3.9 SCHEDULE OF PRESSURE PRESERVATIVE TREATED WOOD

- .1 Use pressure treated wood for the following components:
 - .1 Wood in direct contact with soil materials.
- .2 Before installation, provide liberal brush application of surface applied wood preservative to surfaces of pressure preservative treated wood exposed by cutting, trimming or boring.

END OF SECTION

1. General

1.1 RELATED WORK SPECIFIED IN OTHER SECTIONS

- .1 Waste Management and Disposal Section 01 74 19.
- .2 Gypsum Board Section 09 29 00.

1.2 REFERENCE DOCUMENTS

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C553-08 Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .2 ASTM C665-06 Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .3 ASTM C1320-05 (2009) Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Underwriters Laboratories of Canada (ULC):
 - .1 CAN/ULC-S702-09 Thermal Insulation Mineral Fibre for Buildings.
 - .2 CAN/ULC S703-01 Standard for Cellulose Fibre Insulation (CFI) for Buildings, Includes Amendment 1.

1.3 SUBMITTALS

- .1 Comply with requirements of Division 01.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Deliver insulation and accessories in original unopened packaging or cartons bearing manufacturer's seals and labels.
- .2 Storage and Handling Requirements:
 - .1 Store materials under cover on raised platforms, away from moisture. Keep dry at all times.

2. Products

2.1 BATT INSULATION

- .1 Fibrous Glass Batts: preformed insulation without a membrane, sized for friction fit between framing, thermal resistance (RSI) as indicated in insulation schedule.
- .2 Fibrous Mineral Wool Batts: preformed mineral slag insulation without membrane, sized for friction fit between framing, thermal resistance (RSI) as indicated in insulation schedule. **NOTE: One opened bag is on site for use.**

3. Execution

3.1 PREPARATION

- .1 Ensure all in-wall construction is complete before beginning installation.
- .2 Install insulation after building substrate materials are dry.
- .3 Ensure substrate materials are properly installed and complete before beginning installation.

3.2 INSTALLATION - GENERAL

- .1 Install insulation materials in accordance with manufacturer's recommendations.
- .2 Install insulation to maintain continuity of thermal protection of building elements and spaces.
- .3 Fit insulation tightly around openings and protrusions in plane of insulation.

3.3 INSTALLATION OF BATT INSULATION

- .1 Install batts between framing members, structural components and other items snug and tight.
- .2 Cut and trim batts neatly to fit spaces. Use batts free from ripped or damaged back and edges.
- .3 Do not compress insulation to fit into spaces.

END OF SECTION

1 General

1.1 INTENT

- .1 Provide firestopping to meet or exceed requirements of the Alberta Building Code 2019 as specified in this Section.

1.2 REFERENCE STANDARDS

- .1 Alberta Building Code 2019.
- .2 Underwriters Laboratories of Canada (ULC):
 - .1 CAN/ULC S115-18, Standard Method of Fire Tests of Firestop Systems.
 - .2 ULC-FS-15, Firestop Systems and Components 2015 Edition.
- .3 Warnock Hersey (WH) Certification Listings, current edition.

1.3 PERFORMANCE REQUIREMENTS

- .1 Firestopping shall provide a rating equal to that of the separation, when tested to ULC S115, for a rating period applicable to the fire separation.
- .2 Firestopping of electrical and communications cables shall be easily re-enterable and re-sealable with negligible risk of damage to cables, and shall not require de-rating of electrical cables.
- .3 Firestopping used to fill voids in floors having openings 100 mm diameter or larger, and which are accessible to the public, shall support floor design loading.

1.4 SUBMITTALS

- .1 Comply with requirements of Division 01.
- .2 Submit manufacturer's printed product literature, specifications and data sheet. Include manufacturer's printed instructions for installation.
- .3 Data shall indicate conformance with requirements of this Section, including ULC or Warnock Hersey system number.

1.5 COORDINATION AND SEQUENCING

- .1 Coordinate construction of fire separations and penetrations through fire separations with work of this Section.

- .2 Ensure penetrations have been completed prior to installing firestopping.
- .3 Install firestopping prior to insulation of piping, unless insulation is part of a tested firestop system meeting requirements.

1.6 QUALITY ASSURANCE

- .1 Provide site mock-up of each proposed type of firestop system at locations designated by and for approval by the Departmental Representative.
- .2 Approved mock-up shall establish minimum standard, and may be incorporated into work of this Section.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in original, unopened packaging bearing manufacturer's seals and labels intact.
- .2 Store materials off ground, under cover and away from moisture.

2 Products

2.1 SYSTEMS AND MATERIALS

- .1 Firestopping systems: as listed under ULC-FS-15 Firestop Systems and Components 2015 Edition, or as listed in WH Listings under "Through-Penetration Firestopping Systems".
- .2 Firestopping materials, whether used in a tested system or not, shall be:
 - .1 listed under ULC-FS-15 or under WH Listings,
 - .2 labelled with applicable ULC or WH label, and
 - .3 compatible with applicable substrates and openings.
- .3 Provided that all other specified requirements can be met use any of the following products, either singly or in combination:
 - .1 Elastomeric sealant.
 - .2 Elastomeric coating.

- .3 Mineral fibre.
 - .4 Mortar.
 - .5 Intumescent putty.
 - .6 Poured-in-place silicone foam.
 - .7 Preformed silicone foam.
 - .8 Multi-cable transit system.
 - .9 Any other product which meets all other specified requirements.
- .4 Primer: as recommended by firestopping manufacturer for applicable substrate.

3 Execution

3.1 VERIFICATION OF CONDITIONS

- .1 Examine condition of voids to be filled to ensure suitability for firestop systems.
- .2 Verify installation of service penetrations and adjacent construction has been completed.

3.2 PREPARATION

- .1 Prepare substrates and surfaces to a clean, dry, and frost free condition, ready to receive firestopping.
- .2 Prime substrates and surfaces to manufacturer's recommendations.

3.3 INSTALLATION

- .1 Provide tested firestopping systems meeting specified performance requirements wherever the continuity of a fire separation is interrupted by mechanical, electrical or other service penetrations, or by any other openings, gaps or discontinuities.
- .2 Install tested firestopping systems in accordance with manufacturer's recommendations and in strict conformance with tested systems.
- .3 In locations for which there are no applicable tested firestopping systems, provide firestopping materials where indicated and as detailed on drawings. Install materials in accordance with manufacturer's recommendations.

- .4 Where applicable, neatly tool or trowel firestopping surfaces remaining exposed and make flush with surrounding exposed surfaces.

END OF SECTION

1 General

1.1 SUBMITTALS

- .1 Comply with requirements of Division 01.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet. Submittals shall describe the following:
 - .1 Cleaning compound.
 - .2 Sealant.
 - .3 Primers.
 - .3 Samples:
 - .1 Submit samples of each type of material and colour to be used.
 - .2 Cure samples under identical conditions to job site, before submission.

1.2 QUALITY ASSURANCE

- .1 Sealant manufacturers representative shall review site conditions, joint design and installers qualifications. Report unsatisfactory conditions to the Departmental Representative.
- .2 Representative shall check container labels, randomly inspect preparation of substrate materials and randomly test installed work.
- .3 Make 150 mm long cut tests to random locations of installed work. Certify thickness, hardness and surface finish conforms to intended design. Report to the Departmental Representative.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Receive and store materials as recommended by materials manufacturer.
- .2 Maintain containers and labels in undamaged condition.

1.4 EXISTING CONDITIONS

- .1 The Contractor to examine substrate materials, joint voids and note temperature/humidity conditions. Report unacceptable conditions to the Departmental Representative.
- .2 Commencement of work implies acceptance of conditions.

2 Products

2.1 MATERIALS

- .1 Joint Cleaner: Non corrosive solvent recommended by sealant manufacturer for applicable substrate material.
- .2 Primer: Non-staining type recommended by sealant manufacturer.
- .3 Joint Back-Up: Round closed cell foam, extruded neoprene, Shore A hardness of 20, tensile strength 140 to 200 kPa, oversized 30-50%, compatible with sealant and primer, non-adhering to sealant.
- .4 Bond breaker: Pressure sensitive polyethylene tape, not bondable to sealant.
- .5 Sealant: Polysulphide base, one (1) component, to current standards, Shore A hardness 15-25.
- .6 Sealant: Polysulphide base, two (2) component, to current standards, Type 1(horizontal) and 2 (vertical), Shore A hardness 15-25.
- .7 Sealant: Silicone base, one (1) component to current standards, Shore A hardness 15-25.
- .8 Sealant: Silicone base, two (2) component, to current standards, Shore A hardness 15-25.
- .9 Sealant: Polyurethane base, one (1) component, to current standards, type 1 and 2, Shore A hardness 20-35.
- .10 Sealant: Polyurethane base, multi-component, to current standards, type 1 and 2, Shore A hardness 20-35.
- .11 Colours: Sealant and caulking colours shall match adjacent materials and be selected by Consultant from manufacturer's standard colour range.

2.2 SEALANTS

Type	Description and Standard	Attributes
S = Sealant		
Type S-1	Polysulphide base, two (2) component, non-sag, to to current standards, Type 2	Shore A hardness 15-25, joint movement range +/- 25%
Type S-2	Polysulphide base, two (2) component, self-levelling, to current standards, Type 2	Shore A hardness 15-25, joint movement range +/- 25%
Type S2A	Polysulphide base, two (2) component, self-levelling, to current standards, Type 1 and 2	PRC Rubber Caulk 250, no substitution.
Type S-3	Polysulphide base, one (1) component, non-sag, to current standards, Type 1 and 2	Shore A hardness 15-25, joint movement range +/- 25%
Type S-4	Silicone base, one (1) component, to current standards, chemical curing	Shore A hardness 15-25, joint movement range +/- 25%
Type S-5:	Silicone base, one (1) component to CAN/CGSB-19.18-M87 solvent curing	Shore A hardness 15-25, joint movement range +/- 25%
Type S-6	Silicone base, one (1) component, non-sag to current standards, mildew resistant	Shore A hardness 20-25
Type S-7	Silicone base, two (2) component, non-sag, to current standards, Type 2 chemical curing	Shore A hardness 15-25, joint movement range +/- 25%
Type S-8	Polyurethane base, one (1) component, non-sag, to current standards, Type 1 and 2	Shore A hardness 15-25, joint movement range +/- 25%
Type S-9	:Polyurethane base, multi-component, non-sag, to current standards, type 2	Shore A hardness 20-35, , joint movement range +/- 25%

Type	Description and Standard	Attributes
C = Caulking		
Type C-1	Acrylic Base, one (1) component to to current standards, emulsion base.	Joint movement range +/- 7.5%
Type C-2	Butyl-Polyisobutylene Polymer Base, solvent curing, one (1) comoponent butyl rubber caulking to to current standards.	Joint movement range +/- 0.5%
Type C-3	Sealing and Bedding Compound Acoustical, one (1) component, to current standards, non-drying, non- hardening, synthetic rubber	

3 Execution

3.1 PREPARATION

- .1 Remove dust, paint, loose mortar and all foreign matter; dry joint surfaces.
- .2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
- .3 Remove oil, grease and other coatings from non-ferrous metals with appropriate solvent.
- .4 Prepare concrete, masonry, glazed and vitreous surfaces as recommended by sealant manufacturer.
- .5 Examine joint dimensions and size materials to achieve joint depth which is half the width of the joint with minimum width and depth of 5 mm, maximum width 25 mm.
- .6 Install joint back-up to achieve correct joint depth.
- .7 To prevent staining, mask adjacent surfaces with tape prior to priming.
- .8 Apply bond breaker tape in accordance with manufacturer's directions.
- .9 Prime sides of joints to manufacturer's directions immediately prior to caulking.

3.2 APPLICATION

- .1 Select sealant to suit applications as recommended by manufacturer. Apply sealant in accordance with manufacturer's directions, using a gun with proper size nozzle, to leave a weathertight, air tight installation. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- .2 Form surface of sealant smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.
- .3 In masonry cavity construction, vent caulked joints from cavity to 3 mm beyond external face of wall by inserting 3 mm diameter plastic tubing at bottom of each joint and maximum of 1500 mm on centre vertically.
- .4 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings, using recommended cleaners as work progresses. Remove masking tape after tooling of joints.

3.3 SEALANT APPLICATION SCHEDULE

Movement	Application	Sealant Types
Significant +25 or -25%	Vertical or inclined joints such as panel, coping, expansion, precast planks, prestressed concrete joints and sloped pavement.	S-1, 3
Significant +25 or -25%	Horizontal joints not exposed to fuel or gas.	S-2A
Minimal +25 or -25%	Vertical or inclined joints such as perimeter of doors, windows, wall penetrations.	S-1, 3, 9,
Minimal +25 or -25%	Glazing sealant for non-structural glazing.	S-4, 5
Low +5 or -5%	Interior joints such as steel door frames in drywall or masonry, drywall control joints	C-1
	Exposed acoustical	S-5
	Non-exposed acoustical	S-5, C-3

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Fire-rated and non-fire-rated access panels in Wood subfloors and gypsum board ceilings.

1.2 RELATED REQUIREMENTS

- .1 Section 09 29 00 – Gypsum Board.
- .2 Section 09 91 00 – Painting.
- .3 Mechanical Sections.
- .4 Electrical Sections.

1.3 REFERENCE STANDARDS

- .1 American Society for Testing and Materials (ASTM International):
 - .1 ASTM A568/A568M-19a, Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
 - .3 ASTM A653/A653M-20, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A879/A879M-12(2017), Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.
 - .4 ASTM A1008/A1008M-20, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 - .5 ASTM B221-20, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .6 ASTM C1396/C1396M-17, Standard Specification for Gypsum Board.
- .2 National Fire Protection Association (NFPA):

- .1 NFPA 80: Standard for Fire Doors and Other Opening Protectives, 2019 edition.
- .3 Underwriters' Laboratories of Canada (ULC):
 - .1 UL 10B-15(R2020), Standard for Fire Tests of Door Assemblies.

1.4 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings indicating panel construction, anchor method, hardware, and finishes.
- .3 Provide product data for each type of door and frame indicated, including construction details relative to materials, individual components and profiles, finishes, and fire ratings (if required) for access doors and frames.

2 Products

2.1 ACCESS PANELS

- .1 Acceptable manufacturers or approved equivalents:
 - .1 Acudor Acorn Limited.
 - .2 Inryco/Milcor.
 - .3 Shanahan's.
 - .4 Steelcraft.
 - .5 Or approved equivalent.
- .2 Construction:
 - .1 Rated assemblies insulated.
 - .2 Minimum 1.6mm thick sheet steel frame and door leaf.
 - .3 Frame with integral mounting flange.
 - .4 Prime painted, zinc chromate, rust inhibitive type.
- .3 Hardware:

- .1 Concealed rod hinge.
- .2 Tamperproof latch and stop.
- .3 Labeled assemblies self-closing and self latching.
- .4 Size:
 - .1 Unless otherwise detailed, minimum size to be 400mm x 400mm clear opening.
 - .2 For access to above ceiling mechanical equipment coordinate size of hatch with maximum size of equipment to be removed for maintenance purposes.
- .5 Finish:
 - .1 All hatches to be delivered primed. Unless noted otherwise, hatches to be painted onsite to match adjacent colour of wall or ceiling they occur in.

3 Execution

3.1 INSTALLATION

- .1 Prior to installation of ceiling access panels coordinate location with Departmental Representative.
- .2 Coordinate with Electrical and Mechanical trades for optimum location of equipment service access locations.
- .3 Install in place in accordance with manufacturer's directions, level, and flush with top of wall and ceiling surfaces.
- .4 Install rated access panels in rated wall and ceiling assemblies. Install non-rated access panels in non-rated wall and ceiling assemblies.
- .5 After installation, fit, align, and adjust access panels to provide proper operation.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 This Section includes requirements for supply and installation of the following:
 - .1 Gypsum board on walls.
 - .2 Metal furring for gypsum board related to suspension of gypsum board assemblies.
 - .3 Related accessories.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 07 21 16 – Non-Rigid Fibrous Insulation.
- .3 Section 07 84 00 – Firestopping and Smoke Seals.
- .4 Section 07 92 00 – Joint Sealants.
- .5 Section 09 91 00 – Painting.

1.3 REFERENCE STANDARDS

- .1 American Society for Testing and Materials (ASTM International):
 - .1 ASTM A653/A653M-20, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM C473-19, Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - .3 ASTM C475/C475M-17, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .4 ASTM C645-18, Standard Specification for Nonstructural Steel Framing Members.
 - .5 ASTM C665-17, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .6 ASTM C754-20, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

- .7 ASTM C840-20, Standard Specification for Application and Finishing of Gypsum Board.
- .8 ASTM C1002-20, Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .9 ASTM C1047-14a(2019), Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .10 ASTM C1177/C1177M-17, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .11 ASTM C1278/C1278M-17, Standard Specification for Fiber-Reinforced Gypsum Panel.
- .12 ASTM C1396/C1396M-17, Standard Specification for Gypsum Board.
- .13 ASTM F1667-18a, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 Conform to Association of Wall and Ceiling Contractors of Alberta (AWCC) Specification Standards Manual except as otherwise specified herein.
- .3 In case of conflict between the above documents, the more stringent requirements shall govern.
- .4 Materials and installation of fire-rated assemblies shall conform to assemblies that have achieved the specified rating when tested to Underwriters' Laboratories of Canada, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

1.4 SUBMITTALS

- .1 Submit manufacturer's printed product literature, specifications and data sheets.

2 Products

2.1 GYPSUM BOARD

- .1 Gypsum board products shall meet or exceed requirements of ASTM C1396-17, unless specified otherwise.
 - .1 Gypsum board products shall be 1220mm wide x maximum practical length for application, unless specified otherwise.

- .2 Fire-rated board and other board specified with fire-rated core shall be labeled in accordance with a certification program accredited by the Standards Council of Canada.
- .2 Standard Gypsum Board: 13mm and 16mm thick (as detailed on the Drawings); ends square cut, edges tapered and beveled edges.
- .3 Fire-Rated Gypsum Board: 16mm thick, Type X, ends square cut, edges tapered and beveled edges.
- .4 Water Resistant Gypsum Board: 13mm and 16mm fire-rated (as detailed on the Drawings), ends square cut, edges tapered and beveled edges.
- .5 Acceptable Manufacturers: CertainTeed, CGC, USG, G-P Gypsum Corporation or approved equivalent.

2.2 FIBRE REINFORCED PANELS

- .1 Fibre reinforced gypsum panel products shall meet or exceed requirements of ASTM C1278/C1278M-17.
- .2 Fibre reinforced gypsum panel products shall be 1220mm wide x maximum practical length for application, unless specified otherwise.
- .3 Panels specified with fire-rated core shall be labeled in accordance with a certification program accredited by the Standards Council of Canada.
- .4 Interior Fibre-Reinforced Gypsum Panels: Ends square cut, tapered edges.
- .5 Water-Resistant Fibre-Reinforced Gypsum Backing Panels: Ends square cut, tapered edges.
- .6 Water-Resistant Exterior Fibre-Reinforced Gypsum Sheathing Panels: Ends square cut, square edges.

2.3 ACCESSORIES

- .1 Accessories shall meet or exceed requirements of ASTM C1047-14a(2019), unless otherwise required for conformance to fire-rated assemblies.
- .2 Screws: To ASTM C1002-20, and modified as required for fastening to 1.22mm and thicker steel studs.
- .3 Nails: To ASTM F1667-18a, annular ring type, galvanized.

- .4 Interior and Exterior Corner Beads: Galvanized sheet steel to ASTM A653/A653M-20, Z180 zinc coating, beaded angle, knurled and perforated, metal and paper flange combination, beaded angle, for installation with joint compound.
- .5 Casing / Edge Beads: To ASTM C1047-14a(2019), galvanized sheet steel to ASTM A653/A653M-20, Z180 zinc coating, beaded edge, knurled and perforated flange 32mm wide, for joint compound filling.
- .6 Joint Treatment Material, Joint Tape, and Topping Compound: To ASTM C475/C475M-17.
- .7 Joint Tape for Cementitious Wallboard: Coated glass fibre tape, 50mm wide.

2.6 ACOUSTIC TREATMENT MATERIALS

- .1 Acoustic Sealant: Non-hardening, non-skinning, permanently flexible.
- .2 Acoustic Insulation: To ASTM C665-17, Type I, non-combustible, mineral fibre, unfaced batts, friction fit, thickness to fill stud cavities, or as indicated on Drawings.

2.7 WATERPROOF MEMBRANE

- .1 Polyethylene Film To current standards, 0.15mil thick.
Provide under subfloor on ground below washroom area that is being insulated. c/w tape on overlapped joints. Extend poly 1000mm beyond washroom area extent of insulation where possible.

3 Execution

3.1 INSTALLATION, GENERALLY

- .1 Meet or exceed the requirements of ASTM C84020, for gypsum board, and ASTM C1280-18 for gypsum sheathing.
- .2 Materials and installation of fire-rated assemblies shall conform to assemblies that have achieved the specified rating when tested to Underwriters' Laboratories of Canada.

3.2 FURRING

- .1 Furr to form bulkheads between ceilings at different levels. Furr for beams, columns, pipes, and around exposed services, except as otherwise indicated.
- .2 Frame perimeter of openings to support access panels, light fixtures, diffusers, grilles, and similar components.

- .3 Install 150mm continuous strip of 13mm gypsum board or panel along base of partitions where resilient furring is installed.

3.3 ACOUSTIC TREATMENT

- .1 Install acoustic insulation between studs in acoustically rated partitions.
- .2 Ensure acoustic insulation fills spaces between studs, full height of walls, and is continuous over door frames and around openings and corners.
- .3 Ensure insulation is packed around cut openings in board and panels, behind outlet boxes, around plumbing, heating or structural items passing through the system and at abutting walls.
- .4 Unless indicated otherwise on Drawings, apply 15mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to acoustically seal gypsum board and panel junction with abutting fixed building components. Seal full perimeter of cutouts around electrical boxes, ducts, piping, etc.
- .5 Apply sealant in accordance with manufacturer's directions.
- .6 Apply two (2) 10mm diameter beads of acoustic sealant between stud framing and fixed building components, around periphery of acoustically rated partitions.

3.4 APPLICATION OF BOARDS AND PANELS

- .1 Do not apply gypsum board and panels until framing, blocking, mechanical and electrical work have been inspected and approved by the Departmental Representative.
- .2 Erect gypsum board and panels vertically for walls unless horizontal application results in fewer end joints. Locate end joints over framing members.
- .3 Cut holes for penetrating items to minimize gaps between items and board and panels.
- .4 Keep end joints away from prominent locations and central portions of ceilings.
- .5 Locate vertical joints at least 300mm from jamb lines of doors, windows, and other openings.
- .6 Erect ceiling gypsum board and panels with long dimensions perpendicular to framing members.

3.5 INSTALLATION OF ACCESSORIES

- .1 Erect beads and joints straight and rigid. Use full length pieces only. Mitre and fit corners accurately.
- .2 Install corner beads at external angles. Secure to substrate.
- .3 Install fillable casing beads where gypsum board materials terminate against surface having no trim concealing the junction.

3.6 TAPING AND FINISHING

- .1 Meet or exceed requirements of ASTM C840-20.
- .2 Provide the finish level specified in ASTM C840-20 for the following surfaces:
 - .1 Level 1: Plenum areas above ceilings and other concealed areas.
 - .2 Level 2: Surfaces that are to receive ceramic tile.
 - .3 Level 4: Surfaces to receive wallcoverings, paints, or light textures.
- .3 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and topping compound.
- .4 Apply joint system according to manufacturer's directions. Feather out onto board and panel faces.
- .5 Finish corner beads, control joints and trim as required with two (2) coats of joint compound and one (1) coat of topping compound feathered out 300mm onto board and panel faces.
- .6 Fill each screw and nail head depression individually with joint and topping compounds to bring flush with adjacent surfaces of gypsum board and panels so as to be invisible after painting is completed.
- .7 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surfaces of boards and panels.
- .8 Use minimum #120 grit sandpaper for first and second sandings. Use minimum #150 grit sandpaper for final sanding.
- .9 Completed installation shall be smooth, level or plumb, free from waves and other defects, ready for painting.

3.7 CUTTING AND PATCHING

- .1 Do all cutting, patching and making good as required to provide a satisfactory finish.
- .2 When prime coat has become sufficiently dry, examine surfaces for any final patching that may be required. Use colour tinted patching compound for later visual examination and approval by Consultant before final prime and paint coats.

END OF SECTION

1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 23 – Submittal Procedures.
- .2 Section 09 29 00 – Gypsum Board.

1.2 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI):
 - .1 ANSI A108/A118/A136.1:2020, American National Specifications for the Installation of Ceramic Tile - Version 2013.1.
 - .2 ANSI A137.1:2019, American National Standards Specifications for Ceramic Tile.
- .2 American Society for Testing and Materials (ASTM International):
 - .1 ASTM C207-18: Standard Specification for Hydrated Lime for Masonry Purposes.
 - .2 ASTM C267-20, Standard Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes.
 - .3 ASTM C499 – 20, Standard Test Method for Facial Dimensions and Thickness of Flat, Rectangular Ceramic Wall and Floor Tile.
 - .4 ASTM C627-18, Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.
 - .5 ASTM C648-20, Standard Test Method for Breaking Strength of Ceramic Tile.
 - .6 ASTM C778-17, Standard Specification for Standard Sand.
 - .7 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants.
 - .8 ASTM E84-20, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .3 Canadian Standards Association (CSA Group):
 - .1 CSA A5-A8-A362:1998, Portland Cement; Masonry Cement; Blended Hydraulic Cement.

- .2 CAN/CSA-A3000-18, Cementitious Materials Compendium.
- .4 Terrazzo, Tile and Marble Association of Canada (TTMAC):
 - .1 Specification Guide 09 30 00 Tile Installation Manual 2012-2014.
 - .2 Hard Surface Maintenance Guide, latest version.
- .5 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC-S102:2018, Standard Method of Test for Surface Burning Characteristics of building Materials and Assemblies.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, Specifications, and data sheets in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings of ceramic tile work in accordance with Section 01 33 00 – Submittal Procedures.
- .3 Samples:
 - .1 Submit duplicate 300 x 300mm sample panels of each colour, texture, size, and pattern of tile required for this Project.
 - .2 Submit two (2) sections of each accessory specified, minimum 300mm in length.
 - .3 Obtain approval of each tile and grout sample prior to supplying material to Project.

1.4 ENVIRONMENTAL CONDITIONS

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 13°C for twenty-four (24) hours before, during, and after installation.
- .2 Apply tile only to surfaces sufficiently dry, clean, firm, level, plumb, and free from oil or wax or any other material which may act as a bond breaker.

- .3 Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.

1.5 QUALITY ASSURANCE

- .1 Work of this Section shall be undertaken by a company that is a member in good standing of the Tile, Terrazzo and Marble Association of Canada.
- .2 Materials and workmanship shall be in accordance with the Specifications and recommendations of TTMAC and the requirements of the ANSI A108.1 Series of Standards. Refer to TTMAC Detail 317SP and Notes to the Professional for placement and detailing of movement joints, and for substrate preparation details.
- .3 Execute Work of this Section using qualified personnel skilled in ceramic tile installation, exhibiting proficient experience; and that have completed tile installations similar in material, design, and extent to that indicated for this Project.
- .4 Conduct a pre-activity meeting at Project site in accordance with Division 01. The purpose of this meeting will be to discuss installation techniques, confirm compatibility of materials, identify any concerns arising from site conditions and identify any concerns of the installer. Attendees shall include the Contractor and Departmental Representative.
- .5 Tile Application System (if used): Self-leveling underlayment, slurry coat, mortar bed, waterproof and **crack isolation membrane**, bond coat, grout and sealer, provided from a single manufacturer, to ensure compatibility.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver packaged materials in original unopened containers.
- .2 Keep delivered material dry and free from stains. Store cementitious material off damp surfaces.

1.7 WARRANTY

- .1 Tile Application System Warranty shall be provided. Tile Application System manufacturer, through the Installation Contractor, shall warranty the products, materials, and installation labour for a period of five (5) years commencing from the date of Substantial Performance of the Work.

2 Products

2.1 MATERIALS

- .1 Ceramic Wall Tile (**Supplied by Owner- installed by Contractor**) as noted on the Drawings).
 - .1 Size: refer to drawings.
 - .2 Grout / Colour: (**Supplied by Owner- installed by Contractor**).
- .2 Thin-Set Mortar: To ANSI A118.4 when combined with acrylic mortar admix, shear bond strength: 440 psi (7-day), compressive strength: 3000 psi (7-day).
- .3 Water Resistant Backing Panel for Wall Tiled Areas (where not installed to concrete block): Dens Shield Tile Guard by Georgia Pacific Company, or CGC Tile Backer board, or approved equivalent. (**Some materials are Supplied by Owner- installed By Contractor**). **Contractor to provide additional material to complete the project.**
- .4 Wall Tile Adhesive: Organic Tile: To meet or exceed ANSI A136.1:2020, Type 1, low VOC, solvent-free, non-flammable and non-toxic.

2.2 ACCESSORIES

- .1 Tile Edge Trims: Extruded aluminum type with mill finish, purpose to suit application, match to thickness of each tile / transition application.
 - .1 Acceptable Manufacturer: Schluter, or approved equivalent.
 - .1 Description: Anodized aluminum profile with textured, sloped exposed surface, tapered leading edge, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
 - .2 Locations and Profile:
 - a) Provide Schluter ‘SCHIENE’ edge trims for all exposed edges of floor tile at depressed scale locations (2).
 - b) Provide Schluter ‘JOLLY’ edge trims for tops and exposed side edges of all floor and wall base field tile.
 - c) Provide Schluter “Metal Edge Ramp” to all exposed edges of sheet flooring to concrete as required.
 - .3 Colour: AE Satin Anodized Aluminum.

.4 Height: as required to work with tile, not to exceed 12mm final height.

.2 Tile Control Joints (if required): Contractor to locate tile controls joints in tile on concrete cold-joint locations and pour break joint locations, extent to be determined on site. Install tile control joints based on TTMAC details and recommendations.

2.3 MEMBRANES

.1 Preformed Waterproofing Membrane System: To ANSI A118.10, soft polyethylene membrane with fleece webbing laminated on both sides complete with special cut rolls and special shapes for corners and pipe sleeves, and manufacturer's standard floor drain assembly. **(2 rolls of membrane are Supplied by Owner- installed By Contractor). Contractor to provide additional material to complete the project.**

.2 Location: Behind and/or under all tile in shower floors, walls, curbs and gutters.

3 Execution

3.1 WORKMANSHIP

.1 Do tile work in accordance with Installation Manual, produced by TTMAC, except where specified otherwise.

.2 Apply tile or backing coats to non-frozen frost free surfaces.

.3 Fit tile units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance. **Mitre interior corners in the shower.** Make cut edges smooth, even and free from chipping. Edges resulting from splitting are not acceptable.

.4 Make joints between tiles uniform and approximately 1.5mm, plumb, straight, true, even, and with adjacent tile flush. Ensure sheet layout not visible after installation.

.5 Align patterns. Lay out tiles so that perimeter tiles are minimum 1/2 size.

.6 Sound tiles after setting and replace hollow sounding units to obtain full bond.

.7 Clean installed tile surfaces after installation cured.

.8 Maintain building expansion joints. Keep free of mortar or grout.

.9 Make internal angles square, external angles square. Use finished edge tiles for square external angles.

- .10 Make internal angles square, external angles bullnosed. Use bullnose edged tiles to achieve bullnose effect. **Sub-Contractor to Supply and Install compatible bullnose edged tiles. Bullnose edge tiles also to be installed around Niche for soap holder.**
- .11 Use bullnose edged or trim tiles at termination of tile panels except where panel butts a projecting surface or differing plane.

3.2 INSTALLATION

- .1 Install tile on substrates to TTMAC details.

END OF SECTION

1 General

1.1 SUMMARY

- .1 This Section includes all labour, materials, tools and other equipment, services and supervision required to complete all exterior and interior painting and surfaces to full extent of the drawings and specifications to the requirements of the **Architectural Specifications Manual**, current edition, including the latest edition of the **Approved Products List**, published by **The Master Painters Institute (MPI)**.
- .2 The painting and finishing specifications for previously painted or finished substrates are based on, and make reference to the **Maintenance Repainting Manual**, current edition, including the latest edition of the **Approved Products Lists**, published by **The Master Painters Institute (MPI)**.
- .3 Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections, and as follows:
 - .1 Surface preparation of substrates including cleaning, small crack repair, patching, caulking and making good surfaces and areas.
 - .2 Surface preparation and prime painting surfaces for wall coverings before installation in accordance with wall covering manufacturer's written instruction.
 - .3 Prime painting and back-priming of surfaces except where pre-primed with an MPI-approved primer under other Sections of the Work.
- .4 Paint exposed and semi-exposed items and surfaces, except where Specifications indicate that the surface or material is not painted or is to remain natural, as follows:
 - .1 Paint item or surface same as similar adjacent materials or surfaces where item or surface is not specifically mentioned.
 - .2 Paint to match existing.
 - .3 Painting including field painting of exposed bare and covered conduit, pipes and ducts including colour coding, hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory applied final finish.
 - .4 Painting of semi-concealed areas such as inside of light valances, behind grills, and projecting edges below sight lines.

- .5 Provision of safe and adequate ventilation as required over and above temporary ventilation supplied by Contractor, where toxic, volatile, or flammable materials are being used.
 - .6 Touch-ups and field painting necessary to complete work shown, scheduled, or specified.
 - .7 Site touch-up of pre-finished wood doors.
 - .8 Painting of exposed to view mechanical heating, ventilation and plumbing services, and equipment such as ducts, sprinkler piping, and electrical work to extent specified unless pre-finished.
- .5 The reference document is available from:

The Master Painters Institute

2800 Ingleton Avenue, Burnaby, BC Canada V5C 6G7

Tel: toll free 1-888-674-8937 Fax: toll free 1-888-211-8708

Email: info@paintinfo.com Website: www.paintinfo.com

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 08 31 00 – Access Doors and Panels.
- .3 Section 09 29 00 – Gypsum Board.

1.3 REFERENCES STANDARDS

- .1 American Society for Testing and Materials (ASTM International):
 - .1 ASTM D16-19, Standard Terminology for Paint, Related Coatings, Materials, and Applications.
 - .2 ASTM E84-20, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .3 ASTM F1869-16a, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- .2 Canadian Standards Association (CSA):

- .1 CSA A23.1:19A23.2:19, Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
- .3 Canadian General Standards Board (CGSB):
 - .1 CGSB 1 Series of Standards contained in the MPI Manual Description of Products, for products forming part of the specified systems.
- .4 Green Seal Standards:
 - .1 GC-3: Green Seal Environmental Criteria for Anti-Corrosive Paints, Second Edition, January 7, 1997.
 - .2 GS-11: Green Seal Standard for Paints and Coatings, Third Edition, October 16, 2015.
- .5 Environmental Choice Program (ECP):
 - .1 Paints and Surface Coatings, Low VOC Product Listings.
- .6 The Master Painters Institute (MPI):
 - .1 Architectural Painting Specification Manual.
- .7 The Society for Protective Coatings (SSPC):
 - .1 Coating Material Guide.
 - .2 Surface Preparation Guidelines.

1.4 SUBMITTALS

- .1 Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit list of all painting materials used for the Work, to Departmental Representative for review prior to ordering materials for each paint system indicated, including cleaning agents, block fillers, and primers:
 - .1 Material List: An inclusive list of required coating materials indicating each material and cross reference specific coating, finish system, and application; identify each material by manufacturer's catalogue number and general classification.

- .2 Manufacturer's Information: Manufacturer's product technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- .3 Manufacturer's printed product literature, Specifications, and data sheets.
- .3 Sample for Verification:
 - .1 Provide samples of each colour and material, with texture to simulate actual conditions, on representative samples of the actual substrates.
 - .2 Provide stepped samples, defining each separate coat, including block fillers and primers.
 - .3 Resubmit until required sheen, colour, and texture are achieved.
 - .4 Provide a list of materials and applications for each coat of each sample.
 - .5 Label each sample for location and application.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Stock Materials:
 - .1 Leave on premises not less than 4L of new material of each colour and finish sheen used.
 - .2 Provide maintenance materials in new containers, full, tightly sealed, and clearly labelled. Remnants of used materials are not acceptable.

1.6 QUALITY ASSURANCE

- .1 Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated in this Project, whose work has resulted in applications with a record of successful service performance, and as follows:
 - .1 Exhibiting proficient experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the Work.
 - .2 When requested provide a list of the last three (3) comparable jobs including name and location, specifying start and completion dates, and cost of the painting work.

- .3 Only qualified journeymen who have a Tradesman Qualification Certificate of Proficiency shall be engaged in painting and decorating work.
- .4 Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .2 Source Limitations:
 - .1 Use only paint manufacturers and products as listed under the Approved Products Section of the MPI Architectural Painting Specification Manual.
- .3 Installation:
 - .1 The following requirements establish the standard of acceptance for the Work, when viewed using the final lighting source.
 - .1 Vertical surfaces: No defects visible from a distance of 1m at 90 degrees to surface.
 - .2 Horizontal surfaces: No defects visible from a distance of 1m at 45 degrees to surface.
 - .3 Ceilings: No defects visible from floor at 45 degrees to surface.
 - .4 Final coat shall exhibit uniformity of sheen across full surface area.
 - .2 Defects include brush marks, streaks, runs, laps, drips, heavy stippling, pile up of paints, roller tracking, inadequate hiding of substrate, skipped or missed areas, and foreign materials in paint.
- .4 Mock-ups:
 - .1 Construct mock-ups for each form of construction and finish required to verify selections made under sample Submittals to demonstrate aesthetic effects and qualities of materials, and execution before installing suspended acoustic ceilings.
 - .2 When requested by the Departmental Representative, prepare and paint designated surface area, room, or item in each colour scheme using specified paint coating selected colours, gloss, textures, and workmanship to MPI Manual standards for review and acceptance.
 - .3 Locate mock-ups in room or area as directed by the Departmental Representative.

- .4 Notify the Departmental Representative seven (7) days in advance of preparing mock-up.
- .5 Maintain mock-ups during construction in an unobstructed condition as a standard for judging the completed work.
- .6 Approved mock-ups in an undisturbed condition at Final Completion of the Project may become part of the completed work.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following:
 - .1 Product name or title of material.
 - .2 Product description.
 - .3 Manufactures stock number and date of manufacture.
 - .4 Contents by volume.
 - .5 Thinning instructions.
 - .6 Application instructions.
 - .7 Colour name and number.
 - .8 EcoLogo identified, as applicable.
- .2 Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 10°C.
 - .1 Protect materials from freezing.
 - .2 Store material off concrete slabs on raised pallets.
 - .3 Keep storage area neat and orderly.
 - .4 Remove oily rags and waste daily.
 - .5 Maintain toxic, volatile, and explosive or flammable materials in a safe environment.

.6 Provide one (1) 9kg ABC fire extinguisher with all temporary heating equipment, and in close proximity to where paint and coating materials are being stored.

.3 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling, where possible.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Handle and dispose of hazardous materials in accordance with regional and municipal regulations.

.4 Ensure emptied containers are sealed and stored safely.

.5 Unused paint and coating materials must be disposed of at official hazardous material collections site as approved by the Owner.

.6 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.7 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.8 To reduce amounts of contaminants entering waterways, sanitary/storm drain systems, or into ground, follow these procedures:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal. Ensure no construction liquids are disposed of into septic system. Refer to Environmental Procedures.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

- .9 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

1.8 PROJECT CONDITIONS

- .1 Maintain temperatures of surfaces and surrounding air between the following temperatures for a minimum of twenty-four (24) hours before, during, and after application or until paints and coatings are fully cured, whichever is greater:
 - .1 Waterborne Paints and Coatings: 10°C to 32°C.
 - .2 Solvent-Thinned Paints and Coatings: 7°C to 35°C.
 - .3 Maintain temperatures during application and until materials are fully cured.
- .2 Maintain surfaces free from:
 - .1 Snow, rain, fog or mist, dampness, or wetness that could impair bond.
 - .2 Relative humidity in excess of 85%.
 - .3 Temperatures less than 3°C above the dew point.
 - .4 Painting may continue during inclement weather if surfaces and areas are enclosed and heated within temperature limits specified above.
- .3 Maintain surfaces at less than maximum moisture content indicated below; test wood and plaster surfaces using a properly calibrated electronic moisture meter.
 - .1 12% for concrete and masonry, test concrete surfaces in accordance with ASTM F1869-16a and as follows:
 - .1 Do not paint concrete or masonry surfaces for a minimum of sixty (60) days after installation.
 - .2 Concrete and masonry surfaces must be visually dry on both sides and tested for maximum moisture content.
 - .3 This is not to be construed as including a wetting down process that may be required for latex or filler coatings.
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
- .4 Test concrete, masonry, and plaster surfaces for alkalinity as required.

- .5 Maintain a minimum lighting level of 323 Lux (30-foot candles) on surfaces where paint or coatings are being applied.
- .6 Maintain adequate continuous ventilation and sufficient heating facilities to maintain specified air and substrate temperatures.
- .7 Maintain a dust free environment in area of site painting.

1.9 WARRANTY

- .1 Provide a two (2) year warranty commencing from the date of Substantial Performance of the Work.
- .2 Warrant that painting work has been performed in accordance with MPI Manual requirements.

1.10 MAINTENANCE AND DATA SHEETS

- .1 Submit copies of manufacturer's written maintenance information for inclusion in the Operation and Maintenance Manual.
- .2 Provide specific warning of any maintenance practice or materials that may damage or disfigure the finished Work.
- .3 Maintenance materials shall match products installed; packaged with protective covering for storage and identified with labels describing contents and building location.

1.11 COORDINATION

- .1 Coordinate the supply of temporary heat and light, scaffolding and platforms, and housekeeping services with Contractor.
- .2 Schedule painting work before installation of miscellaneous hardware, surface fittings, fastenings, fixtures, and trim by other trade contractors including the hanging of doors and installation of door hardware.
- .3 Coordinate compatible shop primer for architecturally exposed steel with structural steel, open web steel joists, metal deck, and steel fabrications. Metal fabricators will be responsible for surface preparation and application of compatible primer systems.
- .4 Metal fabricators will be responsible for applying primer to shop applied materials at field welds, immediately after completion of field welds.

- .5 This Section will be responsible for performing minor site touch-up and repair to metal priming system and apply finish coats of paint.
- .6 Coordinate corrections of defects and deficiencies in substrates which may adversely affect painting work, except for minimal work specified in this Section and preparation of surfaces to receive paint and finishes under this Section of work, with trades responsible for installation of deficient substrates.
- .7 Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates.
- .8 Coordinate surface preparation and shop priming of structural steel, steel deck, miscellaneous and ornamental metal fabrications, metal doors, frames, and windows, including fittings; as specified under those respective Sections for type of primer, including part of the painting system specified in this Section.
- .9 Coordinate requirements for painting and identification of mechanical piping and ducting, and electrical conduits with trades responsible for that part of the Work. Mechanical Contractor shall provide quantity or length of materials requiring applied finishes and identify which colour is required on each surface. Painting Contractor shall prepare surfaces and apply coating systems specified in colours required for each surface.

2 Products

2.1 MATERIALS

- .1 Provide materials (cleaning agents, primers, coatings, varnishes, lacquers, fillers, solvents, thinners) in accordance with the MPI Manual Architectural Painting Specification Manual, Chapter 5 Approved Product Listing.
- .2 Paint materials for each coating formula to be products of a single manufacturer.
- .3 Use only MPI approved products from the MPI Approved Product List corresponding to the specified finishing systems.
- .4 All paint materials shall have good flowing and brushing properties and shall dry or cure free of blemishes, sags, air entrapment, etc.
- .5 Where required, paints and coatings shall meet flame spread and smoke developed ratings designated by local Code requirements and/or Authorities Having Jurisdiction.

2.2 MIXING

- .1 Except as otherwise specified, paint shall be ready-mixed. Re-mix prior to application to ensure colour and gloss uniformity. Materials in paste or powder form, or to be field-catalyzed, shall be field mixed in accordance with manufacturer's directions. Perform colour tinting operations prior to site delivery.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 If required, thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

2.3 COLOURS

- .1 Paint colours and other finishes will be selected by the Departmental Representative.
- .2 Colour Scheme: For bidding purposes, colour schemes will be generally as follows unless noted otherwise:
 - .1 Maximum two (2) colours for walls within room or area.
 - .2 Maximum one (1) colours for ceilings.
 - .3 Maximum two (2) colours for doors, frames, trims, etc.

2.4 GLOSS / SHEEN RATINGS

- .1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following MPI values:

Gloss Level	Description	Units at 60 degrees	Units at 85 degrees
G1	Matte or Flat Finish	0 to 5	10 max.
G2	Velvet Finish	0 to 10	10 to 35
G3	Eggshell Finish	10 to 25	10 to 35
G4	Satin Finish	20 to 35	35 min.

G5	Semi-Gloss Finish	35 to 70	
G6	Gloss Finish	70 to 85	
G7	High-Gloss Finish	> 85	

- .2 Except as otherwise specified, provide the following gloss levels for specified locations and substrates:
 - .1 Interior Paint Finishes:
 - .1 Flat Finish - G1
 - .2 Velvet Finish - G2
 - .3 Eggshell Finish - G3
 - .4 Satin Finish - G4
 - .5 Semi-Gloss Finish - G5
 - .6 Gloss Finish - G6
 - .7 High-Gloss Finish - G7
 - .2 Interior Transparent Finishes:
 - .1 Satin Finish - G4
 - .2 Gloss Finish - G6
 - .3 Exterior Paint Finishes:
 - .1 Flat Finish - G1
 - .2 Semi-Gloss Finish - G5
 - .3 Gloss Finish - G6
 - .4 Exterior Transparent Finishes:
 - .1 Satin Finish - G4
 - .2 Gloss Finish - G6
- .3 Where gloss level is not specified, confirm required gloss level with Departmental Representative prior to proceeding with finish coats.

.3 Execution

3.1 VERIFICATION OF CONDITIONS

- .1 Ensure all dust generating activities have been terminated and dust removed.
- .2 Prior to commencement of painting and finishing work, thoroughly examine substrates scheduled to receive coatings.
- .3 Do not apply coatings to substrates whose condition will adversely affect execution, permanence, or quality of work and which cannot be put into an acceptable condition through preparatory work specified herein.
- .4 Ensure that site applied paints and finishes are compatible with primers or other finishes applied in the shop or factory.
- .5 Verify compatibility of any previously applied coatings with specified coatings.
- .6 Notify Departmental Representative of any incompatibilities.

3.2 PREPARATION OF SURFACES

- .1 Prepare new surface in accordance with the Master Painters Institute (MPI) Architectural Painting Specification Manual, current edition.
- .2 Protect adjacent surfaces from spray, splashings, and droppings.
- .3 Remove electrical plates, surface hardware, fixtures, fittings, and fastenings etc., prior to painting operations, unless approved by the Departmental Representative in writing.
- .4 Keep sprinkler heads and smoke detectors free of paint. Replace those that do receive paint.
- .5 Properly prepare each surface to obtain correct and sufficient adhesion of next coat of material.
- .6 Mildew Removal: Scrub with solution of TSP and bleach, rinse with clear water, and allow surface to dry completely.
- .7 Remove dirt, oil, grease, and sand as necessary to provide adhesion key, and when asphalt, creosote or bituminous surfaces required paint finish.
- .8 Remove contamination from wall surfaces and prime to show defects, if any. Carry on with paint coating after defects have been remedied.

- .9 Wood: Sandpaper to a smooth and even surface. Remove dust. Ensure that moisture content is less than 15%.
- .10 Gypsum Wallboard and Plaster: Fill minor irregularities with spackling compound and sand to a smooth, level surface. Avoid raising nap of paper.
- .11 Concrete: Remove loose mortar, scale powder, and foreign matter. Remove oil and grease with a solution of TSP, rinse well and allow to thoroughly dry. Fill holes which are too large to be filled by block filler as required to produce a uniform texture.
- .12 Concrete Floors: Remove contamination, acid etch and rinse with clear water and assure acid-alkali balance is achieved, let dry thoroughly.
- .13 Masonry: Remove loose mortar, scale powder and foreign matter. Remove oil and grease with a solution of TSP, rinse well and allow to thoroughly dry. Fill holes which are too large to be filled by block filler as required to produce a uniform texture. This applies only to Change Rooms and the Natatorium; other block wall locations to be stoned or rubbed only with thinned paint application. Refer to Room Finish Schedule for locations.
- .14 Unprimed Steel: Clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Commence with painting immediately after defects have been remedied.
- .15 Primed Metal: Remove dirt and grease by cleaning with solvent. Feather shoulders of uneven primer to prevent edges from telegraphing through finish coats. Touch up of damaged shop coating and touch up patches inconspicuous. Prime all bare steel surfaces.
- .16 Galvanized Metal: Clean with detergent and solvent to etch surface, as spray, product per MPI Manual.
- .17 Apply paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.
- .18 Remove all oil and grease then clean substrates that could impair bond of the various coatings before applying paint or other surface treatments.

3.3 APPLICATION

- .1 Refer to SSPC and to the MPI Architectural Painting Specification Manual, as a general reference for application techniques, requirements, and precautions **MPI Manual Premium Grade Finish Requirements (three (3) coat system)**.

- .2 Finishes specified are intended to cover surfaces satisfactorily when applied in accordance with the manufacturer's recommendations. Re-paint surfaces to achieve hiding of substrate and uniform finish.
- .3 Mix materials thoroughly before application and apply evenly, free from sags, and other defects. Perform cutting-in neatly.
- .4 Lightly sandpaper each coat before the next coat is applied. After the prime coat is applied, fill holes and sand smooth when dry.
- .5 The filler must match the colour of the wood when a clear finish is used. Work filler well into the grain before it has set. Wipe excess from the surface.
- .6 Tint each coat slightly darker than the preceding coat, unless otherwise approved by the Departmental Representative.
- .7 Ensure that finish work is uniform in sheen, colour and texture and free from roller or brush hair, with no indication of base coat visibility. Telegraphing through of the base colours is not acceptable and will be considered a deficiency.
- .8 Clean droppings and overspray as work progresses.
- .9 Use brush application on doors and metal surfaces, unless otherwise directed. On other surfaces, airless spray or roller work is acceptable, but if this does not prove to give satisfactory results, repaint rejected surfaces with brush at no additional cost to the Departmental Representative.
- .10 Apply each coat at the proper consistency in accordance with the manufacturer's directions.
- .11 Each coat of finish should be dry and hard before a following coat is applied unless the manufacturer's directions state otherwise. Allow each coat of finish to dry twenty-four (24) hours before a following coat is applied, unless directed otherwise by the Consultant.
- .12 Finish a whole panel, door, or frame etc., rather than spot painting of facing of where a portion of the finish has been damaged or is unsatisfactory.
- .13 Paint top and bottom edges of metal doors to match faces. Finish edges of clear finished doors.
- .14 For concrete and concrete block and where block filler would be used, ensure that sufficient primer/sealer is used to totally fill and seal the surfaces and produce a uniform surface coloration of sealer so that the block colour does not telegraph through. Re-coat as required to achieve. Apply block filler at a rate sufficient to

fill all voids. Work block filler into surface leaving no pinholes or unsealed voids in the surface.

3.4 INTERIOR FINISHES

.1 Concrete Vertical Surfaces

INT 3.1C High Performance Architectural Latex G3/G5 (over waterborne alkali resistant primer)

1st coat	WB Alkali Resistant Primer	MPI# 3
2nd coat	High Performance Architectural Latex	MPI# 139, 141
3rd coat	High Performance Architectural Latex	MPI# 139, 141

.2 Plaster and Gypsum Board Surfaces (gypsum wallboard, drywall, sheet rock type material, etc., and textured finishes):

INT 9.2A Latex (over latex sealer) G1 (ceilings and bulkheads)

1st coat	Latex Sealer	MPI# 50
2nd coat	Latex	MPI# 53
3rd coat	Latex	MPI# 53

INT 9.2B High Performance Architectural Latex G3/G5 (over latex sealer)

1st coat	Latex Sealer	MPI# 50
2nd coat	High Performance Architectural Latex	MPI# 139, 141
3rd coat	High Performance Architectural Latex	MPI# 139, 141

3.4 FIELD QUALITY CONTROL / STANDARD OF ACCEPTANCE

.1 All surfaces, preparation and paint applications shall be reviewed.

.2 Painted exterior surfaces shall be considered to lack uniformity and soundness if any of the following defects are apparent to the reviewer:

.1 brush / roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped, or missed areas, and foreign materials in paint coatings.

.2 evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners, and re-entrant angles.

.3 damage due to touching before paint is sufficiently dry or any other contributory cause.

- .4 damage due to application on moist surfaces or caused by inadequate protection from the weather.
- .5 damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).
- .3 Painted surfaces shall be considered unacceptable if any of the following are evident under natural lighting source for exterior surfaces:
 - .1 visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 1000mm (39”).
 - .2 visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 1000mm (39”).
 - .3 visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.
 - .4 when the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
- .4 Painted surfaces rejected by the Departmental Representative shall be made good at the expense of the Contractor. Small affected areas may be touched up; large affected areas or areas without sufficient dry film thickness of paint shall be repainted. Runs and sags of damaged paint shall be removed by scraper or by sanding prior to application of paint.

END OF SECTION

1. General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 06 10 00 – Rough Carpentry.
- .3 Section 09 29 00 – Gypsum Board.
- .4 Section 09 30 00 – Ceramic Tile.

1.2 REFERENCES STANDARDS

- .1 American Society for Testing and Materials (ASTM International):
 - .1 ASTM A653/A653M-20, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A666-15, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - .3 ASTM A924/A924M-20, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .4 ASTM B456-17, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

1.4 SUBMITTALS

- .1 Product Data
 - .1 Submit manufacturer’s printed product literature, specifications, and data sheets in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 Include construction details, material descriptions and thickness, dimensions, profiles, fastening and mounting methods. Specified options and finishes for each type of accessory specified.
 - .3 Provide lists of sources for disposable supplies, replacement parts and service recommendations.
- .2 Shop Drawings:
 - .1 Submit shop drawings or catalogue illustrations in accordance with Division 01.

- .2 Setting Drawings: For cutouts required in other work; include templates, sub-trade preparation instructions and directions for preparing cutouts and installing anchoring devices.

1.8 COORDINATION

- .1 Coordinate accessory locations with other affected Work to prevent interference with proper installation within substrate, blocking requirements, adjustment, operation, cleaning and servicing of accessories.
- .2 Quantities of units to be determined by Contractor and supplier from architectural drawings, unless specifically noted otherwise.
- .3 Note that the complete intended Washroom Accessories list for this Project is provide in this Specification section for clarity and information. Contractor to provide all required electrical connections and backing and blocking in walls for all installed fixtures and accessories.

2. Products

2.1 FIXTURES SUPPLIED AND INSTALLED BY CONTRACTOR

- .1 Acceptable Manufacturers (selections below may vary from manufacturer):

Bobrick, Frost, American Specialties Inc.

Or approved equivalent.
- .2 **MIR** – Framed Mirror.

Mirrors - 24" W x 36" H (61 x 91cm). One-piece, roll-formed 3/4" x 3/4" (19 x 19mm) angle-frame. Type 304 stainless steel angle with satin finish. Corners heliarc welded, ground and polished smooth. Beveled frame edge at mirror for improved appearance. No. 1 quality, 1/4" (6mm) glass mirror; warranted against silver spoilage for 15 years. Galvanized steel back. Secured to concealed wall hanger with theft-resistant mounting. (2 Required).

2.2 FIXTURES SUPPLIED BY OWNER AND INSTALLED BY CONTRACTOR

- .1 Toilet(s), actual product to be determined by Parks Canada.
- .2 Sink(s), actual product to be determined by Parks Canada.
- .3 Shelf(s), actual product to be determined by Parks Canada.

3. Execution

3.1 INSTALLATION

- .1 Install and secure all fixtures rigidly in place as per manufacturer's instructions.
- .2 Locate accessories where indicated on the Drawings.

3.2 ADJUSTING AND CLEANING

- .1 Remove temporary labels and protective coatings.
- .2 Clean and polish exposed surfaces in accordance with manufacturer's instructions.

END OF SECTION

1. General

1.1 RELATED REQUIREMENTS

- .1 Read this Section in conjunction with:
 - .1 Earthwork General Requirements: Section 31 20 10
 - .2 Other Sections which specify the location, use or placement of fill materials.
- .2 This Section is intended to be used as a reference Section; it is not a "section of work". All materials specified in Part 2, Products, may not necessarily be required.
- .3 Refer to other Sections for location, use, and placement of fill materials specified herein.

1.2 REFERENCE DOCUMENTS

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM C136 / C136M Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates - 14
- .2 Canadian Standards Association (CSA):
 - .1 CAN/CGSB-8.2-M88 Sieves, Testing, Woven Wire, Metric

1.3 SOURCE OF SUPPLY - IMPORTED FILL MATERIALS

- .1 For bidding purposes, only fill materials which fully meet specified requirements, including gradations, may be used, regardless of proximity to the Place of the Work of sources of supply for such materials.

1.4 SOURCE OF SUPPLY - NATIVE EXCAVATED MATERIAL

- .1 For bidding purposes, assume that where Native Excavated Material is specified to be used, only native material required to be excavated under this Contract, may be used.
- .2 For bidding purposes, assume that where Native Excavated Material is specified to be used, sufficient quantities of such material, meeting specified requirements and acceptable to the Departmental Representative, will be available for use.
- .3 Notify the Departmental Representative if sufficient quantities of Native Excavated Material, meeting specified requirements and acceptable to the Departmental Representative, are not available for use where such material is specified to be used. Provide imported fill materials in lieu of Native Excavated Material, if and as directed by the Departmental Representative.
- .4 Provision of imported fill materials where Native Excavated Material is specified to be used, will, if directed by the Departmental Representative, be considered a change in the Work and will be valued in accordance with the General Conditions of Contract.

2. Products

2.1 AGGREGATE QUALITY, GENERALLY

- .1 Aggregate fill materials shall be comprised of clean, sound, hard particles, and be free from silt, clay, soft shale, flaky particles, organic matter and foreign substances.

2.2 GRAVEL FILL MATERIAL

- .1 Gravel: mixture of natural gravel, crushed gravel or crushed stone, and natural or crushed sand, meeting the gradation limits specified below for each type.

Fill Type	Sieve Size	% Passing By Weight
150 mm Gravel	150	100
	50	50 - 85
	5	30 - 50
	0.8	20 - 30
	0.063	2 - 9
	80 mm Gravel	80
80 mm Gravel	50	78 - 95
	20	42 - 82
	10	31 - 70
	5	22 - 60
	2	15 - 47
	0.4	9 - 28
	0.16	5 - 16
	0.063	2 - 9
	Pit Run Gravel	200
10		40 - 100
0.063		0 - 5

2.3 CRUSHED GRAVEL FILL MATERIAL

- .1 Crushed Gravel: mixture of crushed gravel or stone and natural or crushed sand, meeting the gradation limits specified below for each type and meeting following requirements:
 - .1 Liquid limit of material passing 0.4 mm sieve shall not exceed 25%.
 - .2 Plasticity index of material passing 0.4 mm sieve shall not exceed 6%.

- .3 Minimum of 50%, by weight, of material retained on 5 mm sieve shall have at least one face resulting from fracture.

Fill Type	Sieve Size	% Passing By Weight
25 mm Crushed Gravel	25	100
	10	57 - 79
	5	38 - 63
	0.8	14 - 37
	0.4	9 - 28
	0.16	6 - 19
	0.063	2 - 7
	20 mm Crushed Gravel	20
10		64 - 86
5		42 - 69
2		24 - 45
0.8		17 - 37
0.4		10 - 29
0.16		5 - 20
0.063		2 - 8

2.4 WASHED GRAVEL FILL MATERIAL

- .1 Washed Gravel: natural gravel, washed, meeting gradation limits specified below for each type.

Fill Type	Sieve Size	% Passing By Weight
Washed Pea Gravel	20	90 - 100%
	6	0 - 55%
	3	0 - 10%

2.5 WASHED CRUSHED GRAVEL FILL MATERIAL

- .1 Washed Crushed Gravel: angular shaped particles of crushed gravel or stone, washed, meeting the gradation limits specified below for each type. Minimum of 50% by weight, of material retained on 5 mm sieve shall have at least one face resulting from fracture.

Fill Type	Sieve Size	% Passing By Weight
50 mm Washed Crushed Gravel	50	100
	20	50 - 80
	10	10 - 40
	5	0 - 20
	2	0 - 5
25 mm Washed Crushed Gravel	25	100
	10	10 - 70
	5	0 - 20
	2	0 - 5
13 mm Washed Crushed Gravel	13	100
	3	0

2.6 SAND FILL MATERIAL

- .1 Sand: natural or crushed sand, meeting the gradation limits specified below for each type.

Fill Type	Sieve Size	% Passing By Weight
Coarse Sand	5	100
	2	80 - 90
	0.4	40 - 55
	0.063	2 - 10

2.7 EARTH FILL MATERIAL

- .1 Native Excavated Material: Clean, native excavated soil, free from organic matter, frozen materials, stones larger than 75 mm, building debris and other foreign substances.
- .2 Imported Clay: inorganic fine grained soil, free from organic matter, stones larger than 50 mm, building debris, and other foreign substances.

3. Execution

3.1 PLACEMENT

- .1 Refer to other Sections for location, use, and placement of fill materials specified herein.

END OF SECTION

1. General

1.1 INTENT

- .1 This Section specifies general requirements common to all earthwork. Read this Section in conjunction with related Sections which specify requirements for specific types of earthwork.

1.2 RELATED REQUIREMENTS

- .1 Changes in Sub-Surface Conditions: General Conditions of Contract.
- .2 Subsurface Soils Information: Division 00.
- .3 Fill Materials: Section 31 05 13.

1.3 DEFINITIONS

- .1 Earthwork: Earthwork means excavating of all types, backfilling, filling, compacting, grading and related work.

1.4 CLASSIFICATION OF EXCAVATION

- .1 The following classifications of excavation will be made when solid rock, rock in ledges, rock-hard cementitious aggregate deposits, large boulders or other similar obstructions are encountered:
 - .1 Earth Excavation.
 - .2 Rock Excavation in Trenches and Pits.
 - .3 Rock Excavation in Open Excavations.
- .2 "Earth Excavation" includes:
 - .1 Excavation, removal, and re-use or disposal of earth and other materials encountered, of any classification, except rock as defined below.
 - .2 Removal and disposal of obstructions, the extent of which is visible on ground surface will be considered incidental to the Work.
 - .3 Material excavated from stockpiles and redistributed or placed will also be considered as "Earth Excavation".
 - .4 Removal and disposal of underground structures and utilities, the extent of which is indicated, reflected or referred to in the Contract Documents shall be incidental to the the Work.

- .3 "Rock Excavation in Trenches and Pits" includes:
 - .1 Removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with a Caterpillar Model No. 215C LC equipped with a short stick and a 1070 mm wide rock bucket, or equivalent modern, track-mounted power excavator, rated at not less than 86 kW flywheel power and 142 kN drawbar pull, without prior drilling or blasting.
 - .2 Trenches in excess of 3 m in width and pits in excess of 9 m in either length or width will be classified as open excavation.
- .4 "Rock Excavation in Open Excavations" includes:
 - .1 Removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with a Caterpillar Model No. 973 or equivalent modern, track-mounted, heavy-duty, excavating equipment rated at not less than 157 kW flywheel power and 183 kN breakout force (with rock bucket) without prior drilling, blasting or ripping.
 - .5 Intermittent drilling, blasting or ripping performed to increase production and not necessary to perform the Work, will be considered incidental to the Work.

1.5 BASIS OF EXCAVATION

- .1 For bidding purposes, assume that all excavation work will be "Earth Excavation".
- .2 Rock encountered within areas requiring excavation and classified as "Rock Excavation in Trenches or Pits" or "Rock Excavation in Open Excavations", will be considered a change in the Work and valued in accordance with the General Conditions of Contract.
- .2 Classifications of excavation encountered which are contrary to the foregoing, will be considered a change in the Work and valued in accordance with the General Conditions of Contract.

2. Products

2.1 FILL MATERIALS

- .1 Refer to Section 31 05 13 for fill material product specifications.

3. Execution

3.1 PREPARATION

- .1 Notify the Departmental Representative minimum 2 days prior to beginning excavating operations.

- .2 Prior to commencing excavation:
 - .1 Contact all affected utility companies regarding exact location and current status of all utilities, voltage of underground and overhead power lines and pressure of natural gas lines.
 - .2 Notify the Departmental Representative if any utility lines have been omitted from or incorrectly indicated on Drawings.
 - .3 Identify known underground utilities. Stake and flag locations. Identify and flag surface and aerial utilities.
- .3 Expose building connections, service connections and utilities to be crossed to confirm horizontal and vertical alignment of existing utilities.
- .4 Expose existing utility lines by hand excavation to confirm location before machine digging within 600 mm of lines.
- .5 Maintain and protect existing above and below grade utilities which pass through work area. Protect active utility lines exposed by excavation, from damage. Hand excavate to final elevations and dimensions.
- .6 Where existing pipes, ducts or other underground services intersect a trench, support trench in a manner approved by Utility.
- .7 Where existing overhead line poles are adjacent to excavations, temporarily support poles in a manner approved by Utility.

3.2 DEWATERING

- .1 Maintain excavations free of water. Provide pumps, piping, temporary drains, trenches, sumps, and related equipment to remove water.
- .2 Do not use sanitary sewers or private property for discharge of water.

3.3 EXCAVATING

- .1 Strip topsoil from areas to be excavated or filled.
- .2 Do not excavate under wet conditions or when such conditions are anticipated.
- .3 When excavating is necessary through roots of plant materials, which are to remain, perform work by hand and cut roots with a sharp axe.
- .4 If ground squirrel burrows are found within the footprint of the excavation, cease excavation in the area and contact Departmental Representative for further direction.

3.4 MATERIAL STORAGE

- .1 Excavated topsoil, acceptable and required for use under this Contract: Stockpile on site until required.
- .2 Native excavated material, other than topsoil, acceptable and required for use as fill material under this Contract: Stockpile on site until required.
- .3 Stockpile locations shall be subject to the Province's approval.

3.5 DISPOSAL OF EXCESS AND WASTE MATERIAL

- .1 Excavated topsoil, acceptable but in excess of that required for use under this Contract: Stockpile at designated topsoil storage area on site and spread as directed by the Departmental representative.
- .2 Native excavated material, other than topsoil, acceptable but in excess of that required for use as fill material under this Contract: Stockpile at designated storage area on site.
- .3 Unacceptable excavated topsoil, unacceptable native excavated material, waste material, trash and debris: Remove from site and ensure proper disposal.

3.6 BACKFILLING

- .1 Ensure areas to be backfilled are free of debris, snow, ice, water and that surfaces are not frozen. Do not backfill over porous, wet, or spongy subgrade surfaces.
- .2 Backfill systematically, as early as possible, to allow maximum time for natural settlement.

3.7 COMPACTION

- .1 Compact fill materials using only mechanical methods. Do not use hydraulic methods.
- .2 Compaction to be performed with equipment designed for the purpose of compacting earthworks.
- .3 Maintain optimum moisture content of materials being compacted, as required to attain specified compaction density.

END OF SECTION

1. General

1.1 RELATED REQUIREMENTS

- .1 Read this Section in conjunction with:
 - .1 Earthwork Testing: Section 31 00 10.
 - .2 Fill Materials: Section 31 05 13.
 - .3 Earthwork General Requirements: Section 31 20 10.

1.2 RELATED SECTIONS

- .1 Mechanical and Electrical Service Connections: Division 01.
- .2 Pipe bedding for mechanical services: Division 22.
- .3 Pipe bedding for electrical services: Division 26.

1.3 SECTION INCLUDES

- .1 This Section includes requirements for excavating, backfilling, and compacting trenches required for installation of underground services, occurring within and outside perimeter of buildings or structures. Underground services may include pipes, ducts, ductbanks, conduits, cable and wire.

1.4 COORDINATION

- .1 Coordinate work specified in this Section with pipe bedding and other related work specified in other Sections.

2. Products

2.1 FILL MATERIALS

- .1 Refer to Section 31 05 13 for fill material product specifications.

3. Execution

3.1 EXCAVATION

- .1 Excavate trenches to alignment and depth indicated or required and to uniform width, sufficiently wide to provide adequate working room. For pipe trenches, comply with Pipe Trench Width Schedule.
- .2 Grade and shape pipe trench to give uniform and even bearing for each length of pipe. Dig bell holes at each joint as required.

3.2 PLACEMENT AND COMPACTION OF FILL MATERIAL

- .1 Backfill trenches using fill materials as specified in Backfilling Schedule.
- .2 Place fill materials in layers not exceeding loose thickness specified in Backfilling Schedule.
- .3 Uniformly compact each layer of fill to minimum percentages of Standard Proctor Density specified in Backfilling Schedule.
- .4 Use care in backfilling to avoid damage or displacement of services.

3.3 UTILITY CROSSINGS

- .1 Install crossings as indicated on Drawings.
- .2 Comply with requirements of utility company.

3.4 PIPE TRENCH WIDTH

- .1 Except as otherwise specified, minimum and maximum trench widths, up to a point 300 mm above top of pipe shall be as specified in Pipe Trench Width Schedule.
- .2 Maximum trench widths indicated in Pipe Trench Width Schedule exclude an allowance for shoring.
- .3 Minimum trench width for "Rock Excavation in Trenches" shall be 1 m.
- .4 Trench width at any point shall not be less than trench width at any depth below such point.

3.5 PIPE TRENCH WIDTH SCHEDULE

No. of Pipes	Minimum Trench Width	Maximum Trench Width
Single pipe, 850 mm diameter or less	300 mm greater than external pipe diameter	450 mm greater than external pipe diameter or 750 mm total trench width, whichever is greater
Single pipe, greater than 850 mm diameter	300 mm greater than external pipe diameter	600 mm greater than external pipe diameter
Multiple pipes, side by side	300 mm greater than horizontal dimension across outer edges of pipes	600 mm greater than horizontal dimension across outer edges of pipes

END OF SECTION

1. General

1.1 RELATED REQUIREMENTS

- | | | |
|----|--|-------------------|
| .1 | Disposal of excess and unacceptable topsoil: | Section 31 20 10. |
| .2 | Site Excavating, Filling and Grading: | Section 31 23 10. |
| .3 | Seeding: | Section 32 92 19. |

1.2 SUBMITTALS

- .1 Conform to requirements of Section 01 33 00 – Submittal Procedures. Submit the following, for Departmental Representative’s review and approval as applicable:
- .1 Imported Topsoil: provide samples from each source intended for use. Samples shall weigh about 500 g and be packaged in clean containers. Provide the following information with topsoil sample: location of topsoil source, previous land use, and date of sampling. Sample shall be typical of the topsoil lot to be supplied and provide an accurate indication of colour, texture and organic content.
 - .2 Original copy of each soil analysis report for approval before delivering any topsoil to site.
 - .3 Copies of all permits and licenses as applicable to work of this contract.
 - .4 Site supervisor’s credentials submitted prior to commencement of work.

1.4 SOIL ANALYSIS

- .1 Imported Soil: Contractor will arrange and pay for services of accredited testing laboratory to perform horticultural soil analysis on each source of topsoil supplied by Contractor.
- .2 Contractor shall be responsible for ensuring all samples of imported soil are submitted for testing well in advance of commencement of work. Imported topsoil shall not be placed on site until approved by Departmental Representative.
- .3 Native Stockpiled Topsoil: Contractor will arrange and pay for services of accredited testing laboratory to perform horticultural soil analysis on stockpiled native topsoil, where applicable.
- .4 Soil analysis for horticultural use shall include results for: existing major soil nutrients; soil pH value; total soluble salts (electrical conductivity); percentage of organic matter; soil texture and percentage of sand, silt and clay; nutrient recommendations; and recommendations for soil amendments.
- .5 Departmental Representative reserves the right to inspect and evaluate all sources of soil selected by Contractor.
- .6 Submit original copy of soil analysis report to Departmental Representative as required.

1.5 SOURCE OF TOPSOIL SUPPLY

- .1 Only use imported topsoil meeting specified requirements suitable for use in Jasper National Park.

1.6 QUALITY ASSURANCE

- .1 Contractor experienced and knowledgeable in landscape work of contract.
- .2 Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and work of contract.
- .3 Staffing: provide experienced, competent and trained landscape personnel who will perform all tasks and services in a knowledgeable and professional manner. Workers shall act safely and professionally at all times while working on site.
- .4 Contractor shall be responsible for ensuring that contract specifications are being adhered to.
- .5 Contractor shall obtain approvals as required by contract for suppliers, sub-contractors, and all materials.
- .6 Pre-Construction Conference: prior to commencement of work, Contractor shall meet with Minister to review overall work of contract.

1.7 EXAMINATION

- .1 Contractor shall advise in writing, of any conditions or defects encountered on site before or during construction upon which the work of this section depends and which may adversely affect its performance.
- .2 Do not commence work until these conditions or defects have been evaluated by the Departmental Representative and corrective measures taken.
- .3 Commencement of work shall imply acceptance of existing surfaces and conditions. No claims for damages or extras resulting discovering such conditions or defects will be accepted later, except where such conditions could not have been known prior to commencing work.

2. Products

2.1 MATERIALS

- .1 Topsoil: fertile natural loam, capable of sustaining healthy growth. Topsoil to be loose and friable, free of subsoil, clay lumps, stones in excess of 20 mm, live plants, roots or any other deleterious material greater than 20 mm diameter, free of litter, foreign matter and toxic materials harmful to plant growth. Topsoil containing construction debris, sod clumps, quackgrass or other noxious weeds is not acceptable. Topsoil to meet the following requirements:
- .1 Minimum 6% organic matter.
 - .2 Acidity/alkalinity shall range from 5.9 pH to 7.0 pH.
 - .3 Electrical Conductivity (E.C.) - level of soluble salts shall not exceed 1.5 dS/m.
 - .4 Texture: “Loam Topsoil” in accordance with *Canadian System of Soil Classification*. Topsoil to fall within an allowance of $\pm 2\%$ of the values stated in the table below:

Soil	Sand (%)	Silt (%)	Clay (%)	Class
Topsoil	35	35	30	Loam

- .2 Peat Moss: decomposed plants, fairly elastic and homogeneous, free of decomposed colloidal residue, wood, sulphur and iron. Minimum of 80% organic matter by mass, pH value between 4.5 and 6.0. Furnished in an air-dry state, packed in standard bags or bales showing name of manufacturer.
- .3 Sand: washed course sand, medium to course textured, free of impurities, chemical or organic matter.
- .4 Lime: dry ground agricultural limestone containing minimum 85% of total carbonates meeting gradation requirements: percentage passing by weight – 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .5 Sulphur: finely crushed agricultural elemental sulphur, free of impurities.

3. Execution

3.1 VERIFICATION OF CONDITIONS

- .1 Inspect and verify that rough subgrade preparation and elevations conform to specified requirements before proceeding with work of this section.
- .2 If discrepancies occur, notify Minister. Do not commence work until base conditions are corrected as instructed by Minister.

3.2 PROTECTION OF EXISTING WORK

- .1 Exercise caution against injury to, or defacement of, existing conditions. Repair or replace all items and site features damaged from installation operations to original or better condition at Contractor’s own expense.
- .2 Locate utility lines before commencement of work and protect from damage.

3.3 PREPARATION OF NATIVE STOCKPILED TOPSOIL

- .1 Control and eliminate all perennial grass and weeds including their root systems until native stockpiled topsoil is required for use. Stockpile topsoil shall be reasonably free of all perennial grass and weed growth before being placed and spread on site.
- .2 Perform weed control, as necessary, in accordance with relevant government chemical pesticide application legislation. Obtain Minister's approval for all pesticide applications.
- .3 Submit detailed pesticide applicator's log for verification after each application of approved pesticide.
- .4 Screen stockpiled topsoil as directed by Minister prior to re-spreading on site. Provide a screener capable of removing stones, soil lumps, foreign debris, undesirable plants and roots from soil to meet requirements of specifications.

3.4 PREPARATION OF SUBGRADE

- .1 Remove foreign material, debris, roots, branches, stones in excess of 25 mm diameter, and other deleterious materials. Remove subsoil contaminated with toxic materials or petroleum products. Remove foreign debris that protrudes above subsoil surface.
- .2 Dispose of removed materials off site. Do not bury any foreign material beneath areas to be landscaped.
- .3 Grade and finish subgrade to required levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas. Eliminate uneven areas and low spots, ensuring positive drainage. Finish subgrades to:
 - .1 150 mm below final grade for seeded areas.
- .4 Cultivate subgrade area to minimum depth of 75 mm where topsoil will be placed. Scarify or till subsoil using discs, harrows or other suitable equipment that will loosen subsoil before placing any topsoil. Repeat cultivation in areas where equipment used for hauling and spreading topsoil has compacted subgrade soil.

3.5 PLACEMENT AND SPREADING OF TOPSOIL

- .1 Do not place and spread topsoil until Departmental Representative has approved subgrade preparation.
- .2 Place topsoil in dry weather on loose, friable, and graded subgrade surface. Do not spread topsoil when ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the Work, as determined by Departmental Representative.
- .3 Evenly spread topsoil to a uniform depth, which, after settlement and compaction, shall provide a minimum depth of:
 - .1 150mm depth for seeded areas.
- .4 Manually spread topsoil around trees, plants and surface obstacles to prevent damage.

3.6 PREPARATION OF FINAL GRADE

- .1 Remove all surface debris, stones in excess of 20 mm diameter, soil clods, vegetation, roots, grass and weeds, litter and other foreign debris. Dispose of collected materials off site.
- .2 Fine grade and loosen topsoil. Eliminate rough spots and low areas to ensure positive drainage away from building faces and walkways. Prepare a loose friable bed by means of cultivation and subsequent raking. Maintain levels, profiles and contours of subgrade.
- .3 Float and leave surfaces smooth, uniform, and sufficiently firm against deep foot printing with a fine loose texture. Finish surface shall be clean, even and free from irregular surface changes.
- .4 On larger surfaces, use hydraulic power box rake or similar mechanical equipment that will effectively and efficiently remove soil lumps, rocks and debris; fill and level low areas; and correct other grading deficiencies.
- .5 Keep topsoil 25 mm below finish grade for sodded areas adjacent to walkways, curbs, edging materials, other hard surfaces and crown of adjacent existing turf. Elsewhere, bring topsoil up to finished grade.
- .6 Do not cover catch basins, valve covers or manholes. Cut smooth falls to catch basin rim, finish flush. Provide smooth transitions at top and bottom of slopes.
- .7 Grading work shall not be performed when moisture content of soil is such that excessive compaction will occur, or when soil is so dry that clods will not break readily or dust will form in the air. Apply water as required to prevent the formation of an airborne dust nuisance and to provide ideal soil moisture content for tilling.
- .8 Ditches: finish ditches and swales to ensure proper flow and drainage. Conduct final rolling operations to produce a hard, uniform and smooth cross-section.

3.7 SOIL AMENDMENTS

- .1 Apply and evenly spread soil amendments at specified rate as recommended in soil analysis report.
- .2 Mix soil amendment well into full depth of topsoil. Retest amended topsoil to confirm compliance with soil analysis report.

3.8 PROTECTION OF GRADED AREAS

- .1 Protect newly graded areas from traffic and erosion. Keep site clean.
- .2 Repair and reestablish grades in settled, eroded and rutted areas.

3.9 ACCEPTANCE

- .1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth and finish grading.

3.10 CLEAN-UP

- .1 Clean up, immediately, any soil or debris spilled onto roads, walkways and other finished surfaces. Keep site clean and tidy at all times.
- .2 Restore stockpile topsoil areas to a clean and fine graded condition in preparation for turf grass and other landscaping. Obtain Departmental Representative's approval.
- .3 Excess topsoil not required for landscape use on site shall be spread on site by Contractor as directed by Departmental Representative.

END OF SECTION

1. General

1.1 RELATED REQUIREMENTS

- .1 Topsoil Placement and Grading: Section 32 91 19.

1.2 SUBMITTALS

- .1 Prior to the purchase of any seed, submit certificates of seed analysis to Environmental Surveillance Officer for Approval. It is advised not to purchase any seed until written approval for individual lot is obtained.
- .2 Certification that the seed analysis comes from a certified lab and is stamped by a certified or senior member.

1.3 MEASUREMENT AND PAYMENT

- .1 Stipulated Price (Lump Sum) Contracts:
- .1 For payment purposes, all landscape work in contract shall be paid in accordance with the following guidelines:
- .1 One Hundred (100%), of the landscape contract value will be deemed to be allocated for supply and placement of landscape materials and related work specified in contract documents.
- .3 Monthly progress payments will be made for work satisfactorily completed in accordance with contract specifications. Payment will be subject to Consultants's review and acceptance of Contractor's workmanship and performance.
- .4 Work that the Consultant determines to be improper, inadequate, incomplete and not in accordance with contract specifications will not be accepted.

1.4 QUALITY ASSURANCE

- .1 Contractor: experienced and knowledgeable in landscape work of contract.
- .2 Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and work of contract.
- .3 Staffing: experienced, competent and trained landscape personnel who will perform all tasks and services in a knowledgeable and professional manner. Workers shall act safely and professionally at all times while working on site.
- .4 Contractor shall be responsible for ensuring that contract specifications are being adhered to.

- .5 Contractor shall obtain approvals as required by contract for suppliers, sub-contractors, and materials.

1.5 EXAMINATION

- .1 Contractor shall advise Departmental Representative, in writing, of any conditions or defects encountered on site before or during construction upon which the work of this section depends and which may adversely affect its performance.
- .2 Do not commence work until adverse conditions or defects have been evaluated by the Departmental Representative and corrective measures taken.
- .3 Commencement of work shall imply acceptance of existing surfaces and conditions and no claims for damages or extras resulting from such conditions or defects will be accepted later, except where such conditions could not have been known prior to commencing work.

1.6 DELIVERY AND STORAGE

- .1 Fertilizer: shall be delivered in sealed packages, clearly marked with contents, weight, analysis and name of manufacturer.
- .2 Grass seed: deliver in original package and store in dry location protected from the elements and rodents. Each seed package to contain suppliers label indicating:
 - .1 Analysis of seed mixture.
 - .2 Percentage of pure seed by weight.
 - .3 Year of production.
 - .4 Net mass.
 - .5 Date tagged and location of seed supplier.
- .3 Mulching material: deliver and store in original packages and protect from the elements.

1.7 SEED TESTING

- .1 Departmental Representative may appoint and pay for services of testing laboratory to verify seed conformance to specified requirements.

1.8 WARRANTY

- .1 Contractor shall provide warranty for all seed, related works and other materials for a minimum period of one year. Warranty period shall commence from date of Interim Acceptance of the landscape portion of Work in Contract.

- .2 During the warranty period, monitor seeded areas and repair all areas that fail to develop into a healthy, vigorous growing stand of grass. Seeded turf showing deterioration resulting from workmanship, erosion, overuse or from any other means or cause shall be repaired during warranty. Areas that are dead, unhealthy or in unsatisfactory growing condition, or that do not meet the requirements of the specifications during the warranty period shall be corrected. Warranty replacement shall be performed in accordance with contract specifications and require Departmental Representative's approval.
- .3 Departmental Representative shall be sole judge as to condition of seed regarding warranty replacements.

2. Products

2.1 MATERIALS

- .1 Fertilizer: synthetic fertilizer, granular in composition, minimum 50% of elements derived from organic sources.
- .2 Seeds older than 2 years will not be approved.
- .3 The seed under analysis must come from the eco-region, ideally the Rocky Mountains. JNP will accept seeds from Alberta, but not the Saskatchewan prairies.
- .4 In regards to purity, if there are a number of other species mixed in with the seed under analysis, it may not be approved. If there are noxious/prohibited weeds present in the mix, probability of approval is decreased.
- .5 The germination should be at least 75%.
- .6 Water: clean, fresh, and free of substances or matter that would inhibit vigorous and healthy growth of grass.
 - .1 Contractor shall supply clean water, equipment, methods of transportation, water tanker, hoses, attachments, and other accessories as necessary for all seeding requirements, maintenance and other related work.
 - .2 All costs for supply of water incurred during the contract period shall be borne by Contractor.
 - .3 Tackifier: non-toxic, water dilutable, liquid dispersion, mulch binder free of growth or germination inhibiting factors.

- .7 Fibre mulch: wood or wood cellulose fibre meeting following requirements:
- .1 Free of growth or germination inhibiting ingredients.
 - .2 Specially manufactured for use in hydraulic seeding and mulching equipment.
 - .3 Minimum organic matter content of 95%.
 - .4 Minimum moisture content of 12%.
 - .5 Water absorption potential of 800-900% for wood cellulose fibre mulch and 1200-1350% for wood fibre mulch.

2.2 GRASS SEED MIXTURE

- .1 Seed mix must contain at least three of the species listed on the JNP approved seed list below.
- .1 Seed mix to be equally split 33/33/33 by seed count and not by weight.
 - .2 Ensure the soil and elevation requirements of the seed match the site.
 - .3 Substitutions may not be approved.

Common	Scientific	Elevation	Soil	Moisture	Palatability
Slender Wheatgrass-awned is better	Elymus Trachycaulus	Montane to Subalpine	Generalist	Generalist	High
Junegrass	Koeleria Macrantha	Montane to Subalpine	Well Drained	Dry	High
Northern Wheatgrass	Agropyron Dasystachyum	Montane to Subalpine	Generalist	Dry	High
Western Wheatgrass	Agropyron Smithii	Montane to Subalpine	Generalist	Dry	High
Tufted Hairgrass	Deschampsia Caespitosa	Montane to Subalpine	Calcareous	Moist	High
Alpine Bluegrass	Poa alpina	Subalpine to Alpine	Generalist	Generalist	High
Hairy Wildrye	Elymus Innovatus	Montane to Subalpine	Well Drained	Dry to Moist	Low
Richardson's Needlegrass	Stipa Richardsonii	Montane	Generalist	Dry	High
Arctic Bluegrass	Poa Arctica	Subalpine to Alpine	Generalist	Moist	High
Northern Bentgrass	Agrostis Mertensii	Montane to Alpine	Generalist	Generalist	Moderate
Spike Trisetum	Trisetum Spicatum	Montane to Alpine	Generalist	Generalist	Moderate
Timber Oatgrass	Danthonia Intermedia	Montane to Alpine	Generalist	Generalist	High

3. Execution

3.1 FERTILIZING

- .1 Apply fertilizer prior to seeding after final grade is approved by Minister.
- .2 Apply [12-51-0] [16-32-6] fertilizer evenly at 3 kg/100 m² with calibrated mechanical distributor.
- .3 Lightly rake and incorporate fertilizer into upper 50 mm of topsoil.

3.2 PROTECTION OF SEEDED AREAS - GENERAL

- .1 Contractor shall provide adequate protection to protect seeded areas from all damage, disturbance, or other construction activity after seeding operations are complete. Remove protection after seed areas are properly established or as directed by Departmental Representative.
- .2 Damaged seed areas resulting from inadequate protection shall be promptly repaired with topsoil, fertilizer and seed at Contractor's expense. All damages shall be repaired prior to final acceptance.
- .2 Keep site well drained and landscape excavations dry.

3.3 SEED PROTECTION ON SLOPES AND DITCHES

- .1 Cover all prepared and seeded slopes 3:1 or steeper with erosion control blanket.
- .2 Unroll blanket either horizontally or vertically to the slope without stretching or pulling.
- .3 Lay blanket smoothly on soil surface. Overlap adjacent sections of blanket minimum 100 mm and staple.
- .4 Secure blanket to ground with staples in accordance with erosion control blanket manufacturer's instructions.
- .5 Minimize damage to seedbed during installation of blanket. Regrade by hand raking as required, to correct any damage.
- .6 In ditches and swales, unroll blanket in direction of flow. Overlap adjacent sections of blanket minimum 100 mm with upstream section on top and stapled. Follow manufacturer's installation recommendations.

3.4 MAINTENANCE / ESTABLISHMENT

- .1 Work of maintenance period shall be performed each week and as frequently during the week to enable the proper establishment of all new seed and other landscaping installed to ensure that required services and tasks are satisfactorily completed and sustainable.

- .2 Watering: apply water with sufficient frequency to maintain adequate soil moisture, promote seed germination and development and for continued healthy growth of grass during maintenance/establishment period. During hot dry weather increase frequency of watering to maintain seed and turf health. Promptly repair and reseed any damage that occurs through washout of soil.
- .3 Provide clean water, equipment, water tanker, methods of transportation, hoses, sprinklers, and labour necessary to adequately and efficiently apply water to all seeded areas as necessary. Record quantity of water applied on site in maintenance log.
- .4 Provide weed control in newly seeded areas. Mow, cultivate, or physically remove weeds. Use approved chemical methods once seed areas are fully established. Maintain all weed growth to maximum height of 100 mm. Ensure all weed seed heads are removed before maturity. Remove all weed clippings from site.
- .5 Control and eliminate turf damaging pests that appear in newly seeded areas.
- .6 Repair seeded areas which show root growth failure, deterioration, bare or thin spots, or which have been damaged by any means or cause, including replacement operations. Overseed areas that show inadequate or improper sowing of seed from billion or other methods.
- .8 Correct any erosion and settlement that results from faulty workmanship and/or material. Restore areas by placing topsoil as necessary and spreading new seed. Repair ruts resulting from maintenance equipment and personnel. Maintain a uniformly smooth seed bed surface.

3.5 FINAL ACCEPTANCE AND TERMINATION OF MAINTENANCE

- .1 Departmental Representative may accept work at end of maintenance period provided:
 - .1 Seeding work meets requirements of specifications.
 - .2 Seeded areas are properly, uniformly and well established.
 - .3 Seeded grass areas are free of dead, unhealthy or deteriorated areas; bare, burnt or thin spots; and rutted or eroded areas.
 - .4 Seeded areas are free of all noxious weeds and reasonably free of all other weed growth.
 - .5 Minimal surface soil is visible when grass cut to height of 70 mm or as otherwise required for native grass.
 - .6 Seeded grass areas have been fertilized as specified.
 - .7 Seeded grass areas are clean and free of all debris, litter and other foreign matter.
- .2 Contractor shall use specified materials to reestablish seed installations that do not comply with requirements for acceptance and continue with specified maintenance/establishment until deemed acceptable by Departmental Representative.

3.6 CLEAN-UP AND REPAIRS

- .1 During work of contract, keep all hard and soft surfaces clean and tidy. Sweep and wash all walkways and other pavement surfaces to maintain clean appearances. Clear soil and rubble from catch basins, manholes, valves and other hard surface features.
- .2 Collect all litter and other debris from site during work of contract.
- .3 Remove and dispose of excess materials, litter, plant debris at approved disposal site. Contractor shall be responsible for all disposal costs.
- .4 Repair all damages resulting from Work of this Contract.

END OF SECTION



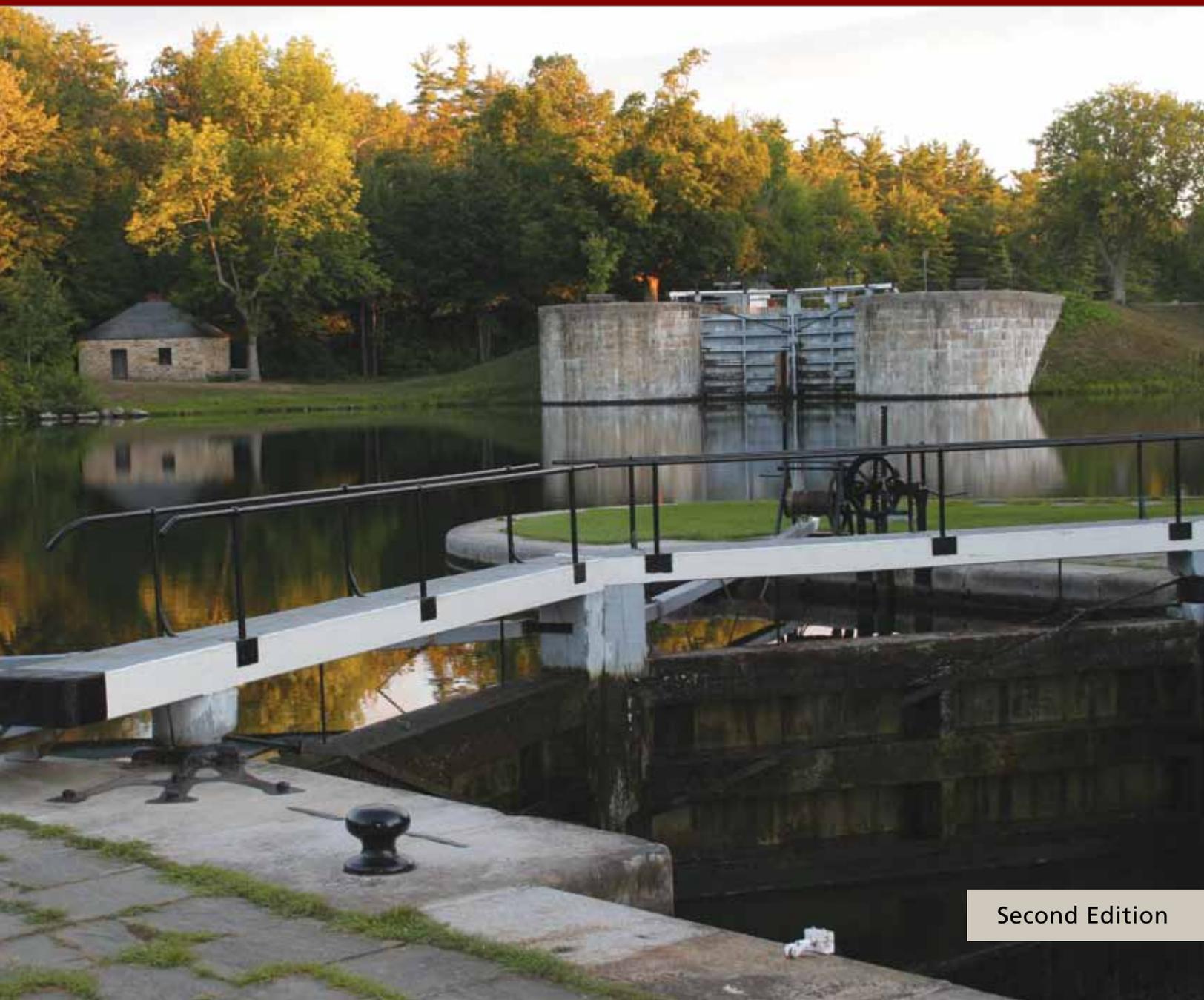
Canada's
Historic Places

Lieux patrimoniaux
du Canada

STANDARDS AND GUIDELINES

FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA

A Federal, Provincial and Territorial Collaboration



Second Edition

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Front Cover photograph:

The Jones Falls lockstation is part of the Rideau Canal waterway in Ontario, a national historic site of Canada and a world heritage site. The site contains known archaeological resources, buildings and engineering works situated in a cultural landscape.

Back Cover photographs:

Clockwise, from top left: Lunenburg, NS; Beechey Island, NU; Britannia Mines, BC; Quebec City, QC

Compliance with the *Standards and Guidelines for the Conservation of Historic Places in Canada* does not, in and of itself, confer immunity from legal obligations.

The *Standards and Guidelines for the Conservation of Historic Places in Canada* is a pan-Canadian collaboration. The participating governments are:

Government
of Alberta ■



Canada

Manitoba 

New Brunswick
Nouveau Brunswick

Newfoundland
Labrador



NOVA SCOTIA



Prince
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Island
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FOREWORD

Canada's historic places are a living legacy for all Canadians. Ensuring a future for these treasures will allow the next generations to use these exceptional places in ways both old and new. This revised edition of the *Standards and Guidelines for the Conservation of Historic Places in Canada* constitutes an essential tool to guide decisions that will give historic places new life while protecting their heritage value.

The 2003 version of the *Standards and Guidelines for the Conservation of Historic Places in Canada* has been a tremendous success. It has been adopted by government bodies and major municipalities across Canada, thereby helping to create a culture of conservation to preserve Canada's unique and irreplaceable heritage for successive generations. Since then, regular use in the field by federal, provincial, territorial and municipal governments, heritage conservation professionals, heritage developers and many individual Canadians has provided the practical experience and insights to formulate additional guidance on categories of historic places such as cultural landscapes, archaeological sites, modern buildings and engineering works.

The development of this 2010 edition of the *Standards and Guidelines* has built on the strong foundation of the initial version using a similar collaborative, pan-Canadian approach. New categories and topics have been added and best practices updated. This federal, provincial, territorial collaboration ensures that the unique experiences of Canada's primary departments and organizations responsible for heritage were reflected in this important tool.

On behalf of Parks Canada, I am proud to adopt the 2010 edition of the *Standards and Guidelines for the Conservation of Historic Places in Canada*. This document will guide Parks Canada and its partners in heritage stewardship across the country and in the establishment of world class conservation practices that help conserve our national treasures and ensure that Canadians can learn about—and have extraordinary experiences of discovery at—these historic places.

Alan Latourelle
Chief Executive Officer
Parks Canada

PREFACE AND ACKNOWLEDGEMENTS

The primary purpose of the *Standards and Guidelines for the Conservation of Historic Places in Canada* is to provide sound, practical guidance to achieve good conservation practice. This document establishes a consistent, pan-Canadian set of conservation principles and guidelines that will be useful to anyone with an interest in conserving Canada's historic places. It also provides guidance to those interested in applying for financial incentives for the conservation of historic places.

The intent of the document is not to replace the role of conservation practitioners or provide detailed technical specifications appropriate to every situation. Instead, it offers results-oriented guidance for sound decision-making when planning for, intervening on, and using an historic place.

The *Standards and Guidelines* have already been adopted by a number of federal, provincial, territorial and municipal authorities as a benchmark for assessing proposed conservation interventions on the *character-defining elements* of an historic place. When adopted by a government or funding organization, the *Standards and Guidelines* may form the basis for review and assessment of a conservation project before the project starts, and again upon completion.

Since their publication in 2003, the *Standards and Guidelines* have become an essential tool for heritage conservation across Canada. Together with the Canadian Register for Historic Places, the practice of heritage conservation has been transformed, opening the door to new tools and programs that support the continued use and enjoyment by Canadians of the historic places around them.

CHANGES SINCE THE LAST EDITION

This second edition of the *Standards and Guidelines* expands and clarifies the information contained in the original 2003 edition. The revisions in this edition:

- Address comments received from users of the first edition of the *Standards and Guidelines*;
- Clarify the relationship between the *Standards and Guidelines* and a Statement of Significance;
- Better explain the conservation decision-making process;
- Provide interpretation of the fourteen Standards to clarify these important principles;
- Add guidance for typical sustainability-related interventions;
- Address new topics such as cultural landscapes, including heritage districts;
- Address recent heritage, including the specific issues of conserving modern materials and assemblies;
- Improve the guidance provided for engineering works; and
- Provide a more comprehensive set of Guidelines for Archaeological Sites generally, and in a specific setting.

ACKNOWLEDGEMENTS

In 2003, the publication of the *Standards and Guidelines for the Conservation of Historic Places in Canada* provided, for the first time, all levels of government, conservation specialists, contractors and individuals with a pan-Canadian set of principles and guidelines for the conservation of buildings, archaeological sites, landscapes and engineering works.

This second edition of the *Standards and Guidelines* builds on this initial version. It was made possible by concerted analysis and review in order to update and enhance a document that has become an essential reference in the Canadian conservation world.

The second edition of the *Standards and Guidelines* was produced thanks to the efforts of many individuals. In particular, I would like to acknowledge the guidance and direction of Claude Charbonneau, chair of the Standards and Guidelines Standing Committee, and the participation of its members representing the federal government and all provincial and territorial jurisdictions across Canada. The Standing Committee members were: for the Federal Government, Christiane Lefebvre, Shannon Ricketts and Geneviève Charrois; for Newfoundland and Labrador, George Chalker; for Nova Scotia, Jeffrey Reed; for Prince Edward Island, Darin MacKinnon; for New Brunswick, Jim Bezanson and Carlo Laforge; for Québec, Gérald Savoie and Chantal Grisé; for Ontario, Deborah Hossack; for Manitoba, Susan Boissonneault and Marnie Gartrell; for Saskatchewan, Bernard Flaman, Ann De Mey, Bruce Dawson and Liberty Walton; for Alberta, Tom Ward; for British Columbia, Bob Parliament; for

Yukon, Doug Olynyk and Brent Riley; for Northwest Territories, Tom Andrews; and for Nunavut, Ashley Fleischer and Shamus MacDonald.

I would also like to thank the consulting team without whom this document would have never come to fruition. The core team that helped coordinate, write, edit and select photos for the second edition was headed by Susan Ross, conservation architect, at the Heritage Conservation Directorate (HCD) of Public Works and Government Services Canada and included architect Susan Coles, engineer Bob Kirkhope, landscape architect Marie-Claude Quessy of HCD, and archaeologist Virginia Sheehan of Parks Canada. Engineer John G. Cooke, P.Eng, RSW, and architect Michael McClelland, OAA, FRAIC, took part in the review of the second edition from the private sector perspective. Additionally, a working group on cultural landscapes was formed under the leadership of Joann Latremouille. This group was comprised of Susan Buggie, Lyle Dick, James Douglas, Chantal Prud'homme, Wendy Shearer and John Zvonar. In addition to leading this working group, Joann Latremouille provided an inspired draft version of the revised Guidelines for Cultural Landscapes before her untimely passing in August, 2008. Lastly, I would like to acknowledge Christophe Rivet of Parks Canada who initiated the development, testing and review of the new Guidelines for Archaeological Sites.

I hope that you will find this new edition of the *Standards and Guidelines* useful in your daily activities as stewards and promoters of good conservation practice in Canada.

Larry Ostola
Director General
National Historic Sites Directorate
Parks Canada

INTRODUCTION

Whether you live in a town or city, you are likely not far from one of Canada's *historic places*. These legacies became historic places when an authority formally recognized their heritage value and character-defining elements, or when they were nominated to the *Canadian Register of Historic Places*.

The Standards and Guidelines for the Conservation of Historic Places in Canada is a tool to help users decide how best to conserve historic places. But to do so first requires an understanding of the historic place in question and why that place is significant. In other words, what is it about the historic place that is important to conserve? For the answer, we look to its values.

Conservation practitioners operate in what is referred to as a 'values-based context' using a system that identifies and manages historic places according to values attributed through an evaluation process. These values generally include the aesthetic, historic, scientific, cultural, social and/or spiritual importance of a place, and:

- May be singular or multiple;
- Are subjective, wide-ranging, and can overlap;
- Can be differently assigned by different groups, and may even change over time.

How can you establish the heritage value of an historic place? Values are usually identified by a community associated with a site, making the identification and management of historic places more publicly accessible. Canadian jurisdictions at the federal, provincial, territorial, municipal

and Aboriginal levels may review and formally recognize historic places within their respective authority. These agencies keep records of formally recognized sites and recently collaborated to create the *Canadian Register of Historic Places* (CRHP), a web-based record of historic places in Canada (www.historicplaces.ca).

The CRHP provides the base information against which the *Standards and Guidelines* can be applied. The publication of a value statement (referred to as a Statement of Significance, or SoS, in the CRHP) identifies the *heritage value* of an historic place and lists the *character-defining elements* that must be retained to preserve this value. The SoS allows professionals, planners, and the public at large to understand a community's recognition and valuation of the historic place.

Anyone carrying out an intervention at an historic place must be mindful of its overall heritage value, using the documented character-defining elements as a starting point and guide. This understanding, along with the *Standards and Guidelines*, provides both a conceptual and practical framework for how interventions should be carried out. While the public is increasingly engaged in the evaluation and management of historic places, there remains a need for skilled conservation specialists, especially when it comes to physical interventions to historic places.

The Statement of Significance and the *Standards and Guidelines* relate respectively to the phases of understanding and planning of the conservation decision-making process. When used together, the two become powerful tools in a values-based system that help ensure the conservation and ongoing use of historic places in the life of communities.

OVERVIEW OF THE STANDARDS AND GUIDELINES

The Standards and Guidelines for the Conservation of Historic Places in Canada contains four chapters:

Chapter 1: The Conservation

Decision-making Process includes a description of the conservation decision-making process, a step-by-step guide to understanding, planning and intervening on an historic place as part of an ongoing cycle of use, maintenance, repair, and adaptation.

Chapter 2: The Conservation

Treatments introduces and explains the three conservation treatments: preservation, rehabilitation and restoration, as well as the notion of primary treatment.

Chapter 3: The Standards for the Conservation of Historic Places in Canada introduces and explains the fourteen standards, with interpretations and illustrated examples.

Chapter 4: The Guidelines for the Conservation of Historic Places in Canada forms the bulk of the document.

The Guidelines are intended to assist in applying the Standards and determining whether their intent has been met in the context of specific interventions to historic places. There are five principal sections. The first four correspond to main categories of historic places (cultural landscapes, archaeological sites, buildings and engineering works) and the fifth, to materials.

The final section, **References**, includes a glossary of terms used in the *Standards and Guidelines*, a selected bibliography and the photo credits. Although the language of the Guidelines is intended for non-experts, certain terms may be unfamiliar. For this purpose, the glossary defines the words that appear in *italics*.

1

THE CONSERVATION DECISION-MAKING PROCESS

1

THE CONSERVATION DECISION-MAKING PROCESS

Conservation activities can be seen as a sequence of actions—from **understanding** the historic place, to **planning** for its conservation and **intervening** through projects or maintenance. Because conservation is an ongoing and cyclical process, people involved in conservation must often retrace their steps to re-examine their approaches, namely, to assess the impacts of planned interventions on character-defining elements, or to obtain additional information.

Understanding an historic place is an essential first step to good conservation practice. This is normally achieved through research and investigation. It is important to know where the heritage value of the historic place lies, along with its condition, evolution over time, and past and current importance to its community. The traditional practices associated with the historic place and the interrelationship between the historic place, its environment and its communities should also be considered. The understanding phase can be lengthy and, in some cases, may run in parallel with later phases as the understanding of the place evolves and continues to inform the process. The information collected in this phase will be used throughout the conservation decision-making process and should remain accessible.

Planning is the mechanism that links a comprehensive understanding of an historic place with interventions that respect its heritage value. Planning should consider all factors affecting the future of an historic place, including the needs of the owners and users, community

interests, the potential for environmental impacts, available resources and external constraints. The most effective planning and design approach is an integrated one that combines heritage conservation with other planning and project goals, and engages all partners and stakeholders early in the process and throughout.

For historic places, the conservation planning process also needs to be flexible to allow for discoveries and for an increased understanding along the way, such as information gained from archaeological investigations or impact assessments. It is important to maintain a firm sense of the larger picture over the long term, and not to emphasize particular character-defining elements at the expense of others.

Intervening on an historic place, that is, any action or process that results in a physical change to its character-defining elements, must respect and protect its heritage value. Interventions can include:

- Preservation actions that are part of the ongoing maintenance of an historic place;
- Rehabilitation activities related to a new use or code upgrades;
- Restoration activities associated with the depiction of an historic place at a specific period in its history.

Intervening on archaeological sites may focus on:

- Preserving the physical integrity of fragile elements;
- Recording them;
- Providing access for public visitation;
- Integrating them into a new structure.

These three phases can further be defined through a series of steps. Although presented sequentially, these steps should be revisited regularly as part of the ongoing conservation decision-making process.

UNDERSTANDING

Refer to Heritage Value and Character-defining Elements

An historic place's heritage value and character-defining elements are identified through formal recognition by an authority or by nomination to the *Canadian Register of Historic Places*. If this has not yet been done, the first essential step in any conservation project is to identify and describe the character-defining elements that are important in defining the overall heritage value of the historic place. The essence of these elements is captured in a *Statement of Significance* (SoS) or equivalent document. For assistance in writing a SoS, consult the document *Writing Statements of Significance* at www.historicplaces.ca.

Investigate and Document Condition and Changes

On-site investigation as well as archival and oral history research should be carried out as a basis for a detailed assessment of current conditions and previous maintenance and repair work. Known changes should be documented in a chronology or report. If no existing plans are found, then a photographic survey should be carried out and drawings or sketches prepared to record current conditions.

The Standards and Guidelines apply particularly to these three steps of the conservation decision-making process: Determine the Primary Treatment, Review the Standards and Follow the Guidelines.

DETERMINE THE PRIMARY TREATMENT	PRESERVATION	REHABILITATION	RESTORATION
	GENERAL STANDARDS 1 – 9		
REVIEW THE STANDARDS		Additional Standards for Rehabilitation (10–11–12)	Additional Standards for Restoration (13-14)
	GENERAL GUIDELINES		
FOLLOW THE GUIDELINES		Additional Guidelines for Rehabilitation	Additional Guidelines for Restoration

PLANNING

Maintain or Select an Appropriate and Sustainable Use

If the use of an historic place is part of its heritage value, every effort should be made to retain that use. Otherwise, a use compatible with its heritage value should be found. It is important to find the right fit between the use and the historic place to ensure this use will last and provide a stable context for ongoing conservation. A viable use better guarantees the long-term existence of an historic place and limits deterioration caused by human activity and the environment.

Identify Project Requirements

Defining the needs of existing or future users and determining the scope and cost of conservation work are essential in establishing realistic objectives. It may be necessary to define priorities and organize the work in logical phases. Contemporary considerations such as health and safety, security, accessibility and sustainability, and changes in use can substantially impact on the heritage value and character-defining elements of an historic place. It is important to assess these considerations together with all the other functional goals of the project, including upgrades to improve performance.

Determine the Primary Treatment

Based on the requirements identified above, the next step is to determine the conservation approach. To do so, it helps to determine a primary treatment. While any conservation project may involve aspects of more than one of the three conservation treatments, it helps to decide during the planning stage whether the project primarily falls under *Preservation*, *Rehabilitation* or *Restoration*. A clear idea of the project's primary focus or objective and the heritage value of the historic place will contribute to the success of the conservation project. The conservation treatments and selection of a primary treatment are explained in more detail in Chapter 2.

Review the Standards

The Standards, which are the principles at the heart of this document, are central to the process of preserving, rehabilitating or restoring an historic place in a consistent manner. Because they provide the broader philosophical basis for conservation, it is important to review the Standards before the Guidelines. Note that the Standards are interrelated and should all be considered.

Nine General Standards (1 to 9) apply to all conservation projects. These nine standards also correspond to the standards for a *Preservation* project. This reflects that *Preservation* is core to all conservation projects because it extends the physical life of an historic place through proper care and maintenance. Three Additional Standards (10, 11 and 12) relate to *Rehabilitation*. All three must be considered in a *Rehabilitation* project, in addition to the nine General Standards. Two Additional Standards (13 and 14) relate to *Restoration*, both of which must be considered in a *Restoration* project, in addition to the nine General Standards. The Standards are explained in more detail in Chapter 3.

Follow the Guidelines

To ensure that conservation is based on a thorough understanding of an historic place and its character-defining elements, the Guidelines always recommend documenting and assessing the form, materials and condition of an historic place and its character-defining elements before any intervention decision and subsequent work.

KEY DEFINITIONS

Historic Place: a structure, building, group of buildings, district, landscape, archaeological site or other place in Canada that has been formally recognized for its heritage value.

Heritage Value: the aesthetic, historic, scientific, cultural, social or spiritual importance or significance for past, present and future generations. The heritage value of an historic place is embodied in its character-defining materials, forms, location, spatial configurations, uses and cultural associations or meanings.

Character-defining Element: the materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of an historic place, which must be retained to preserve its heritage value.

Similar to the Standards, General Guidelines apply to all conservation projects. The General Guidelines also correspond to the Guidelines for a *Preservation* project. Additional Guidelines relate to *Rehabilitation* and *Restoration*, and where applicable, should be followed in addition to the General Guidelines.

There are specific Guidelines for four categories of historic places: Cultural Landscapes, Archaeological Sites, Buildings, and Engineering Works. These sections are divided into separate subsections that provide guidance on character-defining elements, such as landforms or windows. A fifth category of guidelines addresses the Materials that may be part of all these historic places.

The Guidelines should not be used in isolation. There may be heritage value in the relationships between cultural landscapes, archaeological sites, buildings, or engineering works. These values should not be compromised when undertaking a project on individual character-defining elements of an historic place. The Guidelines are explained in more detail in the introduction to Chapter 4.

INTERVENING

Undertake the Project Work

The project work is a critical phase in the conservation process. It is equally important to have well-supervised people with the right skills undertake the work as it is to determine the right work to undertake. Every effort should be made to familiarize those working on the project with the planned conservation approach and to ensure they understand the scope of the project. Hiring processes for consultants and contractors should identify the need for heritage expertise and experience.

Carry out Regular Maintenance

While significant interventions may be necessary in a conservation project, the best long-term investment in an historic place is adequate and appropriate maintenance. It helps to develop and implement a maintenance plan that includes a schedule for regular inspection to proactively determine the type and frequency of necessary maintenance work. This assures a high degree of user satisfaction with the historic place, slows the rate of deterioration, and maximizes the long-term protection of heritage value.

APPLYING THE CONSERVATION DECISION-MAKING PROCESS TO THE GRIER BLOCK, A SMALL EARLY TWENTIETH CENTURY COMMERCIAL BUILDING

The Grier Block is a large, two-story commercial building prominently located within the historic commercial district of Fort Macleod, Alberta. Built in 1902, the building is notable for its imposing pressed metal front façade, a pre-fabricated system manufactured by the Mesker Brothers of St. Louis, Missouri, that was once widespread across North America but rare in western Canada. Historically home to a wide range of retail businesses, professional offices, and community organizations such as the Masons, the Grier Block is also significant for its role in the development of Fort Macleod prior to the First World War, then one of southern Alberta's fastest-growing communities. The Grier Block continues to be fully occupied by a variety of businesses on the main floor and tenants in the rehabilitated second floor residential suites.

UNDERSTANDING

Identify heritage value and character-defining elements

The heritage value of the Grier Block is identified in the Statement of Significance on the *Canadian Register of Historic Places*. Its heritage value lies in its “association with the development of the business district of [Fort] Macleod” and as an important example of “new construction materials for commercial and public buildings at the turn of the twentieth century.” The building’s character-defining elements include the pressed metal façade, with its prominent cornice and classical details such as egg-and-dart mouldings, engaged columns, and urns; and the brick masonry walls and sandstone window sills on the north and west elevations.



1906 photograph of Grier Block (at right) from southeast.

Investigate and document conditions and changes

Investigation of a small-town commercial building such as the Grier Block would include research into its construction, historical uses, and evidence of major alterations. This information might be found in historic photographs, architectural plans, and other information from such sources as municipal tax rolls and other records, local archives and museums, former owners and tenants, and members of the community. A detailed physical inspection of the building would look for evidence of these documented (and undocumented) changes and establish the building’s overall condition. Professional expertise helps in assessing the state of a building’s character-defining elements and overall condition and is essential where a building has experienced structural problems or is to undergo a major change of use that might trigger new building code requirements. The inspection results should be documented in a written report accompanied by drawings and photographs to guide future planning and interventions.

In the case of the Grier Block, no original blueprints of the building existed, but the historic design was recorded in old photographs and could be compared to pressed metal elements of Mesker facades elsewhere. The major alterations lay in the storefronts themselves, where the original recessed entrances typical of the period had been replaced by elements dating from the 1960s—a common occurrence with commercial buildings in communities both small and large. Inspection of the building by a conservation architect determined that, despite an early fire, the brick exterior walls and wood frame interior were essentially sound.



Circa 1910 photograph of Grier Block storefront, south bay. Photographs like this were an indispensable resource in developing the storefront restoration plans.

PLANNING

Select an appropriate and sustainable use

The owners had determined that continued use of the main floor by commercial tenants combined with residential occupancy on the second floor was most appropriate in the context of Fort Macleod's historic main street. Local demand for commercial space is steady, and second floor residential suites provide additional income, enhance security, and contribute to activity within the historic district. With these uses already well established in the Grier Block, the physical requirements of the historic building would remain fundamentally unchanged even though substantial upgrades would be needed to meet current building codes, provide better energy efficiency, and meet tenant requirements.

Identify project requirements

The rehabilitation goals for the Grier Block were to ensure the integrity of the building envelope, improve energy efficiency, and enhance the building's appeal to commercial and residential tenants in conjunction with the conservation of heritage value.

Although structurally sound overall, the rehabilitation was comprehensive in scope and included replacement of the roof membrane; replacement of the badly deteriorated windows with wood frame units matching the configuration of the original windows; masonry repairs; removal, cleaning, repainting and reassembly of the pressed metal façade; and restoration of the missing storefronts based on historic photographs.

The extensive interior work consisted of the addition of insulation and vapour barrier to the perimeter walls; complete upgrades to the building's electrical and mechanical systems; refinishing and replacement, where required, of the original wood floors; removal and reinstallation of original pressed metal ceilings for fire-rating purposes; and minor alterations to the floor plan to accommodate new functional requirements.



Before rehabilitation: east façade, looking southwest.



East façade after restoration of storefronts and preservation of pressed metal façade. Maintenance (repainting) in progress.

Determine the Primary Treatment

The primary conservation treatment of the Grier Block was determined to be rehabilitation, since the wide-ranging interventions all aimed at enabling the continued commercial and residential use of the building while protecting its heritage value. Within a rehabilitation approach, the conservation program included the retention and repair of existing historic fabric such as the pressed metal façade (preservation); the alteration of existing elements and addition of new ones, such as the construction of fire-rated walls (rehabilitation); and the accurate representation of missing elements through reinstatement of the storefronts to the original design (restoration).

Review the Standards

The general standards 1 to 9 and additional standards for Rehabilitation 10 to 12 apply to rehabilitation projects such as the Grier Block. The restoration component of the work, rebuilding of the missing storefronts, was guided by Standards 13 and 14 for Restoration. Each aspect of the conservation program was referred to the applicable standards to identify interventions that optimized the conservation of heritage value while satisfying the project requirements within the resources available.

Follow the Guidelines

The appropriate Guidelines for Buildings (4.3) and Materials (4.5) were consulted for each intervention on the Grier Block. For example, the guidelines for Exterior Walls and Structural Systems (Buildings) and the guidelines for All Materials and Masonry (Materials) directed the conservation of the exterior brick masonry and the addition of insulation. The Additional Guidelines for Rehabilitation found throughout the Buildings section provide guidance on interventions related to sustainability, health, safety and accessibility requirements.



Detail of pressed metal facade after rehabilitation, showing the hallmarks of the original Mesker design. The work consisted of the following: removal of the metal panels, carefully identifying their original locations; removal of multiple layers of paint using a chemical bath; recoating with an epoxy-based paint system; and reinstallation in the original locations on furring strips according to a rain screen principle.

INTERVENING

Undertake project work

Conservation of the Grier Block progressed over nearly a decade, beginning with the rehabilitation of the retail bays and residential suites as revenue generators. Restoration of the pressed metal storefront was instrumental in the initial rehabilitation of the main floor commercial areas, which was followed by rehabilitation of the retail bays one-by-one, as resources and tenant opportunities presented themselves. The comprehensive rehabilitation plan prepared by a conservation architect and the construction expertise of the building owners contributed greatly to the successful and cost-effective implementation of the conservation program.

Carry out regular maintenance

Conservation is an ongoing process. In southern Alberta, where wind-driven sand scours paint and exposed wood and intense freeze-thaw cycles crumble masonry, regular maintenance is an important part of preserving the Grier Block's character defining elements and extending the service life of building systems and fabric. A maintenance plan helps with this, and it is good conservation practice to document both periodic rehabilitation and ongoing maintenance, and to store these documents in a well-identified, appropriate location.



Left: North façade window prior to rehabilitation showing eroded mortar joints, cracking due to frost action within the wet wall, and delamination of the sandstone sill.

Right: North façade window, after replacement with new wood units and repointing mortar joints and replacing damaged bricks with salvaged historic brick matching the original. The replacement sandstone sill reproduces the rock-faced appearance of the original unit but introduces a slope to improve drainage. (A drip edge is to be added.) Since the original quarry no longer exists, the stone itself is from a different source but is of the same type ("Paskapoo" sandstone) typical of buildings in Fort Macleod and southern Alberta generally. This specimen, selected to avoid the flaws that often contribute to delamination in this type of stone, will weather to a colour closer to that of the original element.

The decision was made to not remove the paint on the brick at this time, since it was weathering away of its own accord and appeared to be causing no moisture-related distress within the wall.



Left: Interior of west (rear) wall of north retail bay, showing as-found condition of load-bearing masonry after removal of the lath and plaster interior finishes for inspection purposes. Uncontrolled runoff from the roof had saturated the wall, washed out the mortar, and caused localized collapse around the window opening.

Right: Rear wall after masonry repairs. The 2x6 stud wall for insulation creates a small cavity to allow for the evacuation of any potential moisture.

HOW PRIVATE PROPERTY OWNERS CAN PRESERVE A HERITAGE DISTRICT: THE CASE OF GRAND-PRÉ RURAL HISTORIC DISTRICT, NOVA SCOTIA

Grand-Pré Rural Historic District, located on the shores of the Minas Basin of the Bay of Fundy in Nova Scotia, is one of the oldest settlements and evidence of land use patterns of two cultural groups of significance: the Acadians and the New England Planters. Commemorated as the centre of Acadian settlement from 1682 to 1755, the site is strongly identified with the 1755–1762 deportation of the Acadians. In 1995, the site was declared Canada's first rural historic district.

The district includes the Villages of Grand-Pré, Hortonville and North Grand-Pré, as well as the surrounding farmlands, vast stretches of tidal marshes—much of which was dyked to create arable land—and orchards extending to the uplands. Grand-Pré Rural Historic District is a good example of an *organically evolved cultural landscape* that illustrates the dynamics of human interaction with the landscape namely the successive occupations of different cultural groups. This unique rural landscape reflects the overlay of one cultural tradition onto another and contains archaeological evidence of Mi'kmaq, Acadian and New England Planter peoples.



Contemporary agricultural activities by property owners at Grand-Pré continue traditional practices.



Grand-Pré Rural Historic District is an evolved cultural landscape.

UNDERSTANDING

Refer to Heritage Value and Character-defining Elements

As there may not be any Statement of Significance (SoS) for individual properties in a historic district, owners should refer to the heritage value of the historic district identified in the SoS on the *Canadian Register of Historic Places*. In the case of the Grand-Pré Rural Historic District, this document indicates that its heritage value of resides “in the blending of natural and built features, and in the retention and development of land use patterns originating with the Acadians (particularly in the spatial distribution of arable land, orchards, dykelands, and residential hamlets).” Its character defining elements include those related to “the preponderance of agricultural land use; the organization of the landscape into three primary zones (i.e. dyked marshlands, uplands, and open fields); the circulation patterns evident in pathways, roadways and the railway line which follow topographical features that create the informal boundaries of the three zones; the gently rolling topography of the dyked marshlands; and the system of drainage and dykes bordering the tidal flats.”

Investigate and Document Condition and Changes

At this stage, the owner should contact and seek guidance from the relevant authority, in this case the Nova Scotia Special Places Program. Dialogue will confirm whether or not any information is available for the property in question. Subsequent discussions between parties will help the owner recognize and understand the characteristics specific to the site and to identify character-defining elements. Research should focus on the site's history, including the introduction of elements to the site and any evidence of significant alterations. This information can be obtained from town records, local archives and museums, through period photographs, site surveys, and insurance maps. Oral history obtained through former owners, tenants and other knowledgeable community members is also useful. The relationship between different components of past landscapes can be studied through the use of archaeology.



The system of drainage and dykes bordering the tidal flats is a character-defining element of Grand-Pré Rural Historic District.

Based on this research, if parts of the site are found to have archaeological potential, or to contain character-defining elements, careful site investigation should be undertaken by experts to determine its physical condition. Together, expert and local knowledge will help to properly evaluate and articulate recommendations for conservation needs. A written report amply illustrated with drawings and photographs should be prepared to guide future planning and interventions.

Because the district is an evolved cultural landscape, it is important that any character-defining element related to the successive occupations of the district be protected; for example, dyke facings from the 20th century.



The Acadians built aboiteaux as part of the system of drainage and dykes.

PLANNING

Maintain or Select an Appropriate and Sustainable Use

It is important that private owners confirm that the proposed use is appropriate and sustainable over the long term to minimize the impact on the heritage values expressed through the character-defining elements. For example, the continued use of traditional agricultural activities by property owners in Grand-Pré have made it the place it is today: a place that still boasts many of the character-defining elements of the original settlement. For this reason, many of these activities can still be performed while their impacts on the character-defining elements of the historic place are mitigated.

Identify Project Requirements

At this phase of the project, the owner and relevant authority should have a good understanding of the scope of work and know the potential impacts on the character-defining elements of the site. When a project is planned in a zone identified as having archeological potential, most provinces or territories request or require that an archaeological investigation be undertaken prior to beginning the work.

Determine the Primary Treatment

It is expected that most interventions by private landowners will relate primarily to agricultural land use. Such interventions fall under *Preservation* as these projects continue a traditional practice that has existed for 300 years and contribute to protecting character-defining elements. In other cases, the primary conservation treatment would be considered *Rehabilitation*, such as the construction of a new barn.

Review the Standards

For a *Preservation* project, the General Standards 1 to 9 must be considered and applied where appropriate; for a *Rehabilitation* project, Standards 1 to 12 must be considered. Each standard should be reviewed in relation to the proposed work and the potential impact on the heritage value and character defining elements. The chosen approaches must balance the needs of the proposed land use development and the protection of the heritage value of the site.

Follow the Guidelines

For each intervention in the district, the appropriate Guidelines for Cultural Landscapes and Guidelines for Archaeological Sites should be consulted. For example, if a character-defining element of the historic district, such as a pathway, is affected by the intervention, then the guidelines for Circulation should be consulted. If archaeological remains are anticipated or encountered, the general guidelines for Archaeological Sites should be consulted as well as the guidelines for Sites in a Cultural Landscape.

INTERVENING

Undertake the Project Work

It is important that people who undertake the project work have the necessary knowledge and skills. A phased implementation of the work is critical, keeping in mind that *Preservation* (Stabilization) of the character-defining elements of the site should be the first priority.

Carry out Regular Maintenance

Maintenance is an important part of the *Preservation* process. Regular maintenance will preserve character defining elements and extend the service life of functional components.



The spatial organization of orchards contributes to the heritage value of the historic district.



Site investigation has found archaeological evidence of Mi'kmaq, Acadian and New England Planter peoples.

2

THE CONSERVATION TREATMENTS: PRESERVATION, REHABILITATION AND RESTORATION

2

THE CONSERVATION TREATMENTS: PRESERVATION, REHABILITATION AND RESTORATION

The overarching term for protecting historic places in Canada is *Conservation*, which is described as: all actions or processes aimed at safeguarding the *character-defining elements* of an *historic place* to retain its *heritage value* and extend its physical life. This may involve *Preservation, Rehabilitation, Restoration*, or a combination of these actions or processes. Reconstruction, or reconstitution of a disappeared historic place, is not considered conservation and is therefore not addressed in this document.

SELECTING A PRIMARY TREATMENT

While any conservation project may involve aspects of more than one of these three conservation treatments, it is important to decide during the planning stage whether the project falls under *Preservation, Rehabilitation* or *Restoration*. A clear idea of the project's primary focus or objective, as provided in a conservation plan, and the heritage values of the historic place will contribute to the success of a consistent and coherent conservation project.

Once the primary treatment type is established, it is important to refer consistently to the standards related to that treatment type for the overall project. If a different treatment is required for certain character-defining elements, then the related standards will guide interventions on those elements. For example, in a project where rehabilitation is the primary treatment, it may be appropriate to preserve certain character-defining elements, such as repairable original windows or archaeological soil layers,



The Swift Current Creek Petroglyph Boulder in Saskatchewan is an outstanding example of precontact rock art dating from at least 1,200 years ago. The pictographs are executed in rarely seen black pigment. One of the best preserved petroglyph sites in Saskatchewan, it is notable for its bison carvings and the occurrence of both petroglyphs and pictographs on the same rock. In order to maintain the fine condition of the petroglyphs, the boulder's physical properties were analyzed to assess possible *preservation* methods. Maintaining the confidentiality of the location of the site also helps protect against unauthorized activities.

or to restore certain missing or altered elements, such as a hedgerow or water wheel. In those cases, the *Preservation* or *Restoration* standards apply. The interventions specific to those character-defining elements can be considered as secondary treatments.

PRESERVATION

Preservation involves protecting, maintaining and stabilizing the existing form, material and integrity of an historic place or individual component, while protecting its heritage value. *Preservation* can include both short-term and interim measures to protect or stabilize the place, as well as long-term actions to stave off

deterioration or prevent damage. This will keep the place serviceable through routine maintenance and small repairs, rather than inoperable during intrusive interventions, extensive replacement and new construction. In archaeological sites, *Preservation* can consist of creating or maintaining a stable environment for the character-defining elements to extend their physical life.

Consider *Preservation* as the **primary treatment** when:

- (a) Materials, features and spaces of the historic place are essentially intact and convey the historic significance, without extensive repair or replacement;

- (b) Depiction during a particular period in its history is not appropriate; and,
- (c) Continuation or new use does not require extensive alterations or additions.

Preservation tends to be the most cautious of the conservation treatments and retains the most materials. It is therefore more appropriate when heritage values related to physical materials dominate. A plan for Preservation should be developed before work is undertaken.

The nine General Standards (see Chapter 3) and the General Guidelines (see Chapter 4) relate directly to *Preservation*. Since protecting, maintaining and stabilizing are at the core of all conservation projects, the General Standards and General Guidelines must be considered, and applied where appropriate, to any conservation project.

REHABILITATION

Rehabilitation involves the sensitive adaptation of an historic place or individual component for a continuing or compatible contemporary use, while protecting its heritage value. *Rehabilitation* can include

replacing missing historic features. The replacement may be an accurate replica of the missing feature or it may be a new design compatible with the style, era and character of the historic place. In the context of archaeological sites, *Rehabilitation* allows their compatible use through actions aimed at communicating and conveying their heritage value.

Consider *Rehabilitation* as the **primary treatment** when:

- (a) Repair or replacement of deteriorated features is necessary;
- (b) Alterations or additions to the historic place are planned for a new or continued use; and,
- (c) Depiction during a particular period in its history is not appropriate.

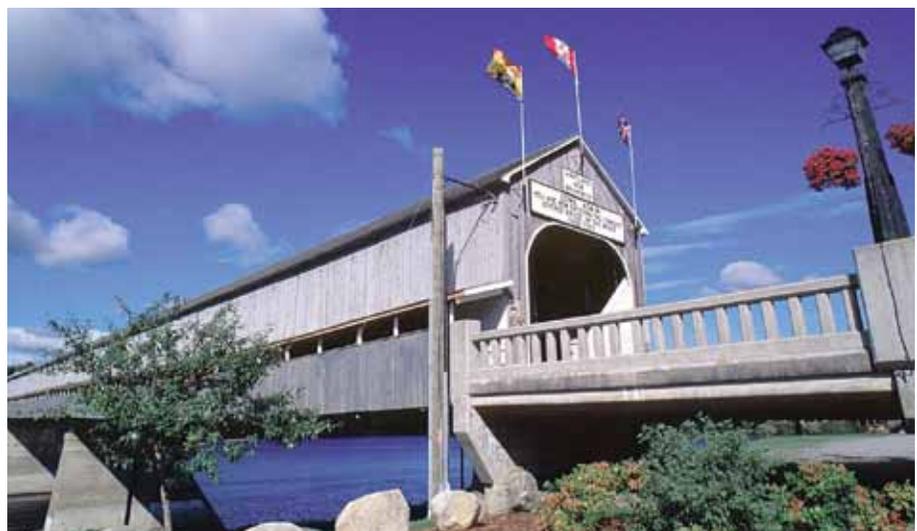
Rehabilitation can revitalize historical relationships and settings and is therefore more appropriate when heritage values related to the context of the historic place dominate. A plan for Rehabilitation should be developed before work begins.

Three Additional Standards (10–11–12) relate to *Rehabilitation* and all three must be considered, and applied where appropriate, to a *Rehabilitation* project,

in addition to the nine General Standards (see chapter 3). Both the General Guidelines and the Additional Guidelines for Rehabilitation must also be considered, and applied where appropriate, to any *Rehabilitation* project (see chapter 4).

RESTORATION

Restoration involves accurately revealing, recovering or representing the state of an historic place or individual component as it appeared at a particular period in its history, while protecting its heritage value. *Restoration* may include removing non character-defining features from other periods in its history and recreating missing features from the restoration period. *Restoration* must be based on clear evidence and detailed knowledge of the earlier forms and materials being recovered. *Restoration* does not apply to archaeological sites because archaeology does not favour one period over another. The value lies partly in the information the sites contain. In a cultural landscape, the difference must be clearly understood between ecological restoration and restoration as a heritage conservation treatment. For ecological restoration,



The Hartland Covered Bridge, crossing the St. John River at Hartland, NB, is the world's longest covered bridge. It is significant for its structural qualities, contributions to transportation and as a symbol of the heritage of covered bridges in New Brunswick. The present bridge is a standard covered bridge structure composed of a Howe truss superstructure enclosed with vertical unpainted weatherboard siding. When the New Brunswick Department of Transportation recently *rehabilitated* the bridge by installing a fire suppression system, care was taken to ensure that this new system was barely visible in the upper structural system.

consult the *Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas* (Parks Canada and the Canadian Parks Council, 2008).

Consider *Restoration* as the **primary treatment** when:

- (a) An historic place's significance during a particular period in its history significantly outweighs the potential loss of existing, non character-defining materials, features and spaces from other periods;
- (b) Substantial physical and documentary or oral evidence exists to accurately carry out the work; and,
- (c) Contemporary additions or alterations and are not planned.

Restoration is most appropriate when strong associative or symbolic values have been obscured and can be revealed through removals, repairs and replacements based on historical evidence. Before the work begins, the restoration period must be selected and justified and a plan for *Restoration* developed. The use of traditional methods and techniques should be encouraged, where possible, in a restoration project.

Restoration is rarely used today as the primary treatment for an entire historic place, but rather as a secondary treatment for specific character-defining elements. If changes to an historic place have acquired value over time, then *Preservation* or a combination of *Preservation* and *Rehabilitation* would be more appropriate.

In addition to the nine General Standards, two Additional Standards (13–14) relate to *Restoration*. These eleven standards must be considered, and applied where appropriate, to a *Restoration* project (see chapter 3). The General Guidelines and Additional Guidelines for Restoration must be considered, and applied where appropriate, to any *Restoration* project (see chapter 4).

KEY DEFINITIONS

Conservation: all actions or processes that are aimed at safeguarding the character-defining elements of an historic place so as to retain its heritage value and extend its physical life. This may involve *Preservation*, *Rehabilitation*, *Restoration*, or a combination of these actions or processes.

Preservation: the action or process of protecting, maintaining, and/or stabilizing the existing materials, form, and integrity of an *historic place*, or of an individual component, while protecting its *heritage value*.

Rehabilitation: the action or process of making possible a continuing or compatible contemporary use of an *historic place*, or an individual component, while protecting its *heritage value*.

Restoration: the action or process of accurately revealing, recovering or representing the state of an *historic place*, or of an individual component, as it appeared at a particular period in its history, while protecting its *heritage value*.



Chiefswood, birthplace of famed poetess, E. Pauline Johnson, is in Ohsweken, ON, in the Six Nations of the Grand River Territory. It was built between 1853–1856 by her father, Mohawk Chief George H. M. Johnson, a leading figure of the Six Nations. Located on a knoll overlooking the Grand River, the Italianate-style house, set back from the county highway, represents the Johnson family's interpretation of a rural Picturesque estate.

The meadow and summer kitchen, two of the site's character-defining elements, were removed in the 1960s and replaced with a manicured lawn. On the basis of both documentary and physical evidence, the summer kitchen was rebuilt and the meadow **restored** using native plant species.

3

THE STANDARDS FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA

3

THE STANDARDS FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA

The Standards for the Conservation of Historic Places in Canada promote responsible *conservation* practices to help protect Canada's historic places. They provide a philosophical approach to conservation work. While neither technical nor case-specific, they offer a framework for making essential decisions about which *character-defining elements* of an *historic place* should be preserved and which ones can be altered while protecting *heritage value*.

These Standards are, in fact, principles that express the collective wisdom that has accumulated in heritage conservation practice. They are rooted in practical and theoretical arguments that evolved as the field of conservation developed over the years. Working from these basic principles gives consistency and an ethical foundation to the decisions that must be made when conserving an historic place. The Standards are to be broadly applied throughout the conservation process and read as a whole, because they are interconnected and mutually reinforcing.

Conservation is a case-by-case pursuit, based on an understanding of the specific values of an historic place. While the applicability of each standard is unique to each case or *intervention*, nevertheless, there is a consistency in applying the standards to different types of places. Chapter 4, which forms the bulk of this document, provides detailed guidelines for four categories of historic places and materials.

Because the standards are basic principles to be applied using a reasoned process unique to each historic place, it is important to fully understand their meaning. This chapter explains the meaning of each standard and gives examples for their application. Because many of the standards describe multiple principles, it is important to consider every sentence in a standard. The individual principles associated with each standard are separated into part (a), (b), etc. The explanations that follow further define each separate principle.

The first nine standards relate to *Preservation*, which is at the core of all conservation projects. As such, these general standards must be applied to all conservation projects regardless of treatment type. Three additional standards are specific to *Rehabilitation* projects—Standards 10, 11 and 12—and two additional standards are provided for *Restoration*—Standards 13 and 14.

REPAIRING OR REPLACING?

Standards 8, 10 and 13 are related standards; each one describes the importance of repairing before replacing for each of the three treatment types based on the condition of the character-defining elements and the type of evidence available.

- Standard 8, in the context of *Preservation*, where the condition allows more for repair than replacement, assumes that material evidence is available to use as a basis when part of a character-defining element needs to be replaced;
- Standard 10, in the context of *Rehabilitation*, permits compatible, distinguishable new elements to be inserted when replacing elements too deteriorated to repair;
- Standard 13, in the context of *Restoration*, requires that replacement elements be based on evidence from the restoration period.

THE STANDARDS

The Standards are not presented in a hierarchical order. All standards for any given type of treatment must be considered, and applied where appropriate, to any conservation project.

General Standards for Preservation, Rehabilitation and Restoration

1. Conserve the *heritage value* of an *historic place*. Do not remove, replace or substantially alter its intact or repairable *character-defining elements*. Do not move a part of an historic place if its current location is a character-defining element.
2. Conserve changes to an *historic place* that, over time, have become *character-defining elements* in their own right.
3. Conserve *heritage value* by adopting an approach calling for *minimal intervention*.
4. Recognize each *historic place* as a physical record of its time, place and use. Do not create a false sense of historical development by adding elements from other historic places or other properties, or by combining features of the same property that never coexisted.
5. Find a use for an *historic place* that requires minimal or no change to its *character-defining elements*.
6. Protect and, if necessary, stabilize an *historic place* until any subsequent *intervention* is undertaken. Protect and preserve archaeological resources in place. Where there is potential for disturbing archaeological resources, take mitigation measures to limit damage and loss of information.
7. Evaluate the existing condition of *character-defining elements* to determine the appropriate *intervention* needed. Use the gentlest means possible for any intervention. Respect *heritage value* when undertaking an intervention.
8. Maintain *character-defining elements* on an ongoing basis. Repair character-defining elements by reinforcing their materials using recognized conservation methods. Replace in kind any extensively deteriorated or missing parts of character-defining elements, where there are surviving *prototypes*.
9. Make any *intervention* needed to preserve *character-defining elements* physically and visually compatible with the *historic place* and identifiable on close inspection. Document any intervention for future reference.

Additional Standards Relating to Rehabilitation

- 10.** Repair rather than replace *character-defining elements*. Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements. Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the *historic place*.
- 11.** Conserve the *heritage value* and *character-defining elements* when creating any new additions to an *historic place* or any related new construction. Make the new work physically and visually compatible with, subordinate to and distinguishable from the historic place.
- 12.** Create any new additions or related new construction so that the essential form and integrity of an *historic place* will not be impaired if the new work is removed in the future.

Additional Standards Relating to Restoration

- 13.** Repair rather than replace *character-defining elements* from the *restoration* period. Where character-defining elements are too severely deteriorated to repair and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements.
- 14.** Replace missing features from the *restoration* period with new features whose forms, materials and detailing are based on sufficient physical, documentary and/or oral evidence.

STANDARD 1



The character-defining interior features and finishes, such as the birch floors, window frames and views of the city at Habitat 67 in Montreal, have been carefully maintained, repaired and retained.

(a) Conserve the *heritage value* of an *historic place*. (b) Do not remove, replace or substantially alter its intact or repairable *character-defining elements*. (c) Do not move a part of an historic place if its current location is a character-defining element.

Part (a) states that the overarching objective of heritage conservation is to conserve heritage value. If an historic place has been formally recognized, the designating authority will likely have prepared a document outlining the place's values, such as a Statement of Significance. These values are embodied in character-defining elements.

Part (b) outlines how to conserve heritage value by minimizing changes to character-defining elements. Identifying character-defining elements helps guide where necessary interventions should and should not take place.

Part (c) addresses the wholeness of a place and reinforces that spatial relationships can be character-defining. In a garden, for example, moving a central feature to another location affects the heritage value of the entire landscape. In an archaeological site, location may be critical to understanding other elements that are now missing. In an engineering work, machinery moved from its original position can lose part of its meaning, thus diminishing its heritage value.



Centuries ago, the inland Inuit, or Kivallirmiut, recognized the hunting potential of the annual fall crossing of massive herds of caribou and began establishing seasonal camps along the Kazan River. Today Fall Caribou Crossing NHSC in Nunavut, is noted not only for its archaeological remains and former importance to the Kivallirmiut, but also for its natural landscape, continued use as a hunting area and the vitality of the oral history and traditions of the people who know it best. Moving any of these stones would impair heritage value.

STANDARD 2

Conserve changes to an *historic place* that, over time, have become *character-defining elements* in their own right.

It is natural and necessary for places to evolve, reflecting changes in the community and culture of that they are a part. Places may be modified for reasons of taste, for the changing nature of their use, or to adapt to evolving conditions and technologies. Changes that mark significant changes, or that are considered expressions of their time, may be deemed to have a value in their own right.

Factories and other industrial works are constantly adapted. Retaining these adaptations may be important in telling the story of changing technology or the growth of a particular industry. Commercial and residential interiors were often changed with new ownership or passing trends. For example, a 1950s cafeteria in a 1910 office building may have its own distinct value as part of the evolution of that historic place.

A fine old storefront that has been modernized may have lost its heritage value. However, some changes may have acquired value, such as an art-deco stainless steel over-cladding or a marquee added to a popular urban theatre. Not every change to an historic place has heritage value, but those that do should be identified in a Statement of Significance. For historic places that were formally recognized some time ago, the process of determining if there is heritage value associated with later changes is an important step in the conservation process.

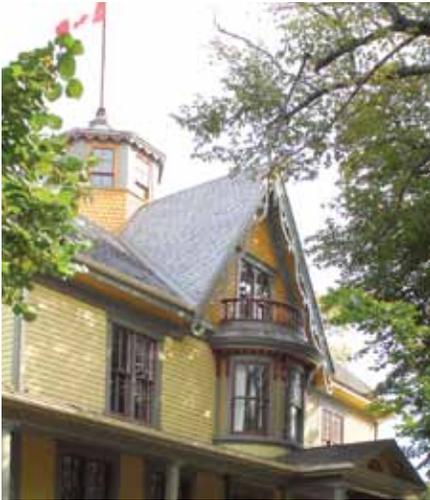


The lean-to is a character-defining element that shows the evolution of the Addison Sod House in Saskatchewan from a rustic sod dwelling to a comfortable home. Removing the later changes to restore the house to an earlier period would not be appropriate because it would remove elements that have heritage value.



Over the years, several landscape architects and architects have made specific contributions to the evolving functions of Vancouver's Stanley Park. These include the play areas, totem groupings and aquarium that are now integral to the park's heritage value.

STANDARD 3



When the windows of Lefurgey House in Summerside, PEI were damaged in a fire, instead of replacing the entire windows, only the broken glass was replaced. The replacement glass, salvaged from a nearby house that was replacing its windows, had similar properties and wavy appearance.

Conserve heritage value by adopting an approach calling for *minimal intervention*.

Minimal intervention in the context of heritage conservation means doing enough, but only enough to meet realistic objectives while protecting heritage values.

Minimal does not mean, doing little or nothing, or the least possible. In fact, enough intervention to arrest and correct deterioration, meet codes, or introduce new services, can be quite extensive. Determining minimal intervention is a matter of rigorous assessment, options analysis and creativity to identify the intervention that balances technical and programmatic requirements with protecting heritage value.

The application of Standard 3 varies depending on the nature of the character-defining element. In a landscape where value resides in living things that mature and die, substantial replanting may be necessary. In the case of an historic bridge that is unable to support current traffic loads, minimal intervention might well mean significant interventions to assure public safety.

For archaeological sites, minimal intervention calls for striking a balance between gaining knowledge from investigations and preserving the resources *in situ*. A certain level of intervention is often necessary to sufficiently understand the heritage value of the archaeological site and to determine the best preservation approach. This can be achieved by selecting the most appropriate and effective research methodology for a specific project such as targeting only necessary excavations and using non-intrusive means of investigation, when appropriate.

Minimal intervention has different meanings for *Preservation*, *Rehabilitation* and *Restoration*. In the context of *Preservation*, it means undertaking sufficient maintenance or repairs to ensure the longevity of the place while protecting heritage value. In the context of *Rehabilitation*, it might mean limiting the proposed new use, addition or changes. In a *Restoration*, minimal intervention is a delicate balance between removals and recreations to represent the historic place's condition at a specific time in its history.



The extensive damage caused by Hurricane Juan to the Halifax Public Gardens required substantial replanting. The large scope of work is still considered a minimal intervention because any less work would have negatively affected the heritage value of the place.

STANDARD 4

(a) Recognize each historic place as a physical record of its time, place and use. (b) Do not create a false sense of historical development by adding elements from other historic places or other properties or by combining features of the same property that never coexisted.

Part (a) of this standard requires us to respect the historic place and to conserve, as best we can, the physical evidence that conveys the significance of the historic place, including its contribution to a specific context and to the social history associated with its uses.

Part (b) discourages the creation of additions that falsify the story of a place. There is always a high risk of loss of authenticity when adding elements from other places or eras.

The materials removed from historic places are often salvaged and reused. Careful consideration must be given to how and where this is done. For example, using a salvaged lamppost from an historic landscape with identifiable characteristics at another site does not conform to the standard. On the other hand, using recycled bricks of the same age and appearance, or reusing identical windows within a building are appropriate from both conservation and *sustainability* standpoints. Where it is deemed critical to the honesty of the work, such additions can be rendered distinguishable in a discreet way.



The Old Strathcona Provincial Historic Area in Edmonton is a diverse historic district. The individuality of each building and evidence of the era of its construction has been maintained. Earlier simply constructed wood buildings stand alongside later more sophisticated masonry buildings and modern infill structures.



The original plans for the Margaret Marin Residence in Edmonton indicate a decorative upper balcony that was never built. During recent renovations, it was decided not to construct this balcony because it would have conveyed a false sense of historical development.

STANDARD 5

Find a use for an *historic place* that requires minimal or no change to its *character-defining elements*.



Despite changing requirements in education, the Lunenburg Academy in Nova Scotia remains in its original building and setting. The Academy was designed using green space, natural lighting and ventilation in a way that is still valid for school use today.

Standard 5 advocates maintaining the use of the place or finding a new viable use that has little impact on its character-defining elements. It is important to find the right function for an historic place to ensure a long-term, stable context for conserving heritage value.

If the current use is a character-defining element, maintaining this use is in accordance with the standard, as long as growth or technological change does not become destructive to its character-defining elements. If maintaining the original use leads to the removal or significant alteration of character-defining elements, the owners and users may need to consider a compatible new use for the historic place.

Finding a new use depends on an analysis of heritage value and physical compatibility with the historic place and its likeliness to provide a lasting, new life for the historic place. Using an old jail as a youth hostel may initially seem like an unusual concept, but it illustrates resourceful, clear-sighted functional analysis as the generator of good reuse: both jails and hostels provide a lot of small rooms for sleeping.

Old buildings are often considered as venues for museums or galleries, but if strict interior environmental conditions are required for that function, complex and potentially destructive interventions may be needed. New uses that require substantial alteration of character-defining elements do not conform to the standard.

In the case of archaeological sites, the intention is seldom to use the archaeological site itself, but rather the space that contains it. It is therefore important that a new use requires minimal intervention and does not alter the character-defining elements that are often submerged or buried underground.



After serving the community for many years as a primary school, the Charlotte Street School in Fredericton now has a new community use as the Charlotte Street Arts Centre. This use required little change to the building's layout and character. Classrooms were maintained to serve as open art studios, dance and music studios and an art gallery. The existing wide corridors and staircases, as well as the classrooms and other spaces, fit the new needs well.



This Dawson City building, originally built to be the temporary location for the government telegraph office, was rehabilitated into housing units.

STANDARD 6

(a) Protect and, if necessary, stabilize an *historic place* until any subsequent *intervention* is undertaken. (b) Protect and preserve archaeological resources in place. Where there is potential for disturbing archaeological resources, take mitigation measures to limit damage and loss of information.

While Standard 5 reinforces the need for an appropriate and sustainable use, part a) of Standard 6 recognizes that there may be a period of vacancy in the life of any historic place, such as a period of inaction at a former industrial site or farm.

Mothballing, the temporary closure of an historic place with measures to protect it from vandalism and weather, is a process that requires planning and continual monitoring. For a landscape, mothballing might include taking measures to diminish the risk of insect infestation or plant disease. Archaeological sites can be particularly vulnerable because the resources are often not visible.

Part b) acknowledges a responsibility to protect archaeological resources, but also reinforces the message that they must be protected and preserved *in situ*. This is a highly regulated aspect of conservation: one must identify and engage the authority having jurisdiction. The information required to best preserve and protect the site is gained from a variety of archaeological interventions. A strategy to recover the information using the most appropriate and effective methods needs to be developed in an effort to strike a balance between gaining knowledge from investigations and preserving the resources *in situ*.



Nearby archaeological resources were protected when stabilizing the Prince of Wales Fort in Manitoba. Strategically placed archaeological investigations on the surface of the ramparts established the extent of artifacts, including their depth below the surface.



These buildings, along with others at St. Luke's Anglican Rectory and Church in the Yukon, were temporarily stabilized using a variety of measures including adding sandwich bracing, cable bracing, heavy frames, roll roofing, and covering door and window openings in order to keep out snow and rain. Stabilization allows the structures to be adequately researched and their eventual restoration to be planned.

STANDARD 7



Ground-penetrating radar was used at McPherson House in Fort Simpson, NT; this guided archaeological excavations limiting the impact on the site.

(a) Evaluate the existing condition of *character-defining elements* to determine the appropriate *intervention* needed. (b) Use the gentlest means possible for any intervention. Respect *heritage value* when undertaking an intervention.

Part (a) of Standard 7 refers to a comprehensive examination and assessment of the physical place. Determining if an intervention is needed, and what an appropriate intervention might be, requires an understanding of the physical condition and behaviour of the character-defining elements and the historic place as a whole. The cause and extent of any decay should be based on evidence from a site investigation.

If the condition evaluation reveals a weakness that threatens the historic place's long-term survival, the standard requires assessments and options analysis to determine the appropriate course of action. This standard, in combination with Standard 3, usually leads to intervening only where the existing condition is actively causing further deterioration or weakening the asset.

Part (b) addresses the course of action once it is clear that an intervention is needed. The gentlest means to achieve a reasonable level of conservation should be selected. This includes the technique or methodology itself and the extent of the intervention being considered.

Investigations themselves are forms of intervention and as such should follow a minimal intervention approach. Investigations should begin with observation and non-invasive probes followed by careful sampling and physical openings or selective disassembly if required. The objective is to obtain enough evidence without unnecessarily disturbing the historic place.



A condition assessment and evaluation undertaken before an intervention at Belvedere Cemetery in St. John's Ecclesiastical District, would reveal that the well-aged and weathered patina found on the grave markers is not damaging. It is in fact a character-defining element of this historic place and should be preserved.

STANDARD 8

(a) Maintain *character-defining elements* on an ongoing basis. (b) Repair *character-defining elements* by reinforcing their materials using recognized *conservation methods*. (c) Replace *in kind* any extensively deteriorated or missing parts of *character-defining elements*, where there are surviving *prototypes*.

This standard introduces the basic hierarchy of interventions. Maintain first, then repair rather than replace the deteriorated parts of character-defining elements. If the replacement of a part is the only option, it should be done *in kind*. This approach is closely tied to *minimal intervention* (Standard 3).

Part (a) of this standard promotes the ongoing maintenance of an historic place, an essential but often undervalued aspect of conservation. Rigorous maintenance reduces long-term costs as well as the frequency of major interventions.

Part (b) emphasizes the use of recognized conservation methods when carrying out repairs. Past experiences in conservation offer many cases where the application of unproven new materials or techniques resulted in more damage than good. Techniques and materials must have proven track records and be based on research, analysis and review.

Part (c) introduces the concept of replacement *in kind*. In kind is defined as: with the same form, material and detailing as seen in the existing elements. If the character-defining element is a wood shingle, the standard states that it must be replaced with a wood shingle, and not an asphalt shingle.

Replacement *in kind* may sometimes be difficult, and substitute materials may be necessary when the original materials are damaging to character-defining elements or hazardous to public health. Some mid-20th century materials are no longer made or cannot be manufactured in small batches. In a place where the heritage value depends on a material that is no longer available, the ongoing loss of the material will eventually lead to a difficult choice: accepting breakage or replacing the entire material or assembly with one that is physically and visually compatible with the original.



Wrecks at Red Bay NHSC, NL, such as this Basque Period wreck, are reburied using sand and tarp to ensure their long-term preservation. Their condition is periodically assessed through monitoring.



When restoring decorative plaster in the Walker Theatre in Winnipeg, moulds were made of existing plaster elements. The deteriorated plaster was then patched and repaired using the moulds to match the original.



A condition assessment of the exterior walls and frame of this Storehouse at Fort Langley, BC found extensive deterioration of some timbers, which required replacement in kind. The dimensions, hewn finish and species of wood used in the repairs matched those replaced. The photograph shows part of one storehouse wall after the repairs were completed, but before the new timbers were whitewashed.

STANDARD 9

(a) Make any *intervention* needed to preserve *character-defining elements* physically and visually compatible with the *historic place* and identifiable on close inspection. (b) Document any *intervention* for future reference.



The new pieces of stone on the Wellington Wall at the Parliament Grounds in Ottawa are clearly visible on close inspection due to a different tooling technique.

Part (a) of this standard speaks to balancing the need for an *intervention* to be appropriate in physical and visual terms and subtly distinguishable. Compatibility can allow for some variation in the finish or patina, which will serve as the distinguishing factor. Generally, repair and replacement work only needs to be identifiable on close inspection. However, honesty requires that new work be clearly distinguishable from the old by subtle visual means or by date stamping in inconspicuous locations.

Part (b) emphasizes the requirement for documentation to help future decision makers better understand the historic place. It is important to keep good records of all conservation work, including *maintenance*, and to plan for easy retrieval of that data in the future.

While the main reason for making interventions identifiable is honesty, it is also a means of keeping a record of the place. The historic place itself is its own best document.



The grand residential estate at Parkwood in Oshawa is a cultural landscape that covers 4.8 hectares. Aerial photography was used to document the large-scale site during the conservation process.

STANDARD 10

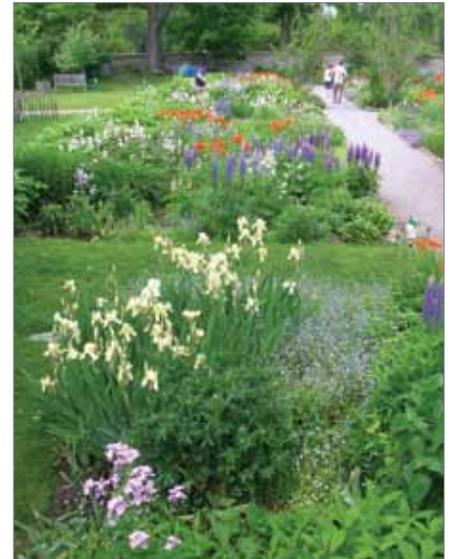
- (a) Repair rather than replace *character-defining elements*.
- (b) Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements.
- (c) Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the *historic place*.

This standard advocates restraint during a *Rehabilitation* project, recognizing that the wholesale replacement of elements will inevitably have an impact on heritage value. *Rehabilitation* is meant to preserve and not diminish the heritage value of a place; a new use or a substantial reinvestment does not justify extensive replacement.

Part (a) discourages replacing elements that can be repaired. In a rehabilitation project, more latitude is available in choosing the techniques and methods of repair. Modifying a technically problematic detail may be required to ensure long-term performance. In archaeological sites, elements are rarely repaired or replaced. However, in some cases, this may be the most appropriate way to slow deterioration and prevent the loss of heritage value.

Part (b) encourages replacing elements with in-kind versions, when the original is too deteriorated to repair, but enough evidence is available to accurately reproduce the element in kind.

Part (c) addresses the case of historic places in a more advanced state of disrepair, or where significant elements or assemblies are missing. A rehabilitation project must conserve the heritage value of the place despite the insertion of a new element. Compatibility with the historic place is achievable through a range of approaches. The new element could be discreet and compatible in form, material and detailing, or contemporary in design, achieving compatibility through proportion, scale or massing. Addressing significant deterioration is an implicit goal of this standard. If deterioration is not properly addressed, it can result in a loss of heritage value.



In areas of Maplelawn and Gardens NHSC in Ottawa where insufficient historical evidence existed, a Rehabilitation approach was taken. New perennial beds were designed using adjacent layouts and historical information from other parts of the garden as inspiration. This approach resulted in compatible new beds that completed the garden and strengthened its overall heritage value.



The character-defining elements of Doukhobor Dugout House NHSC in Saskatchewan, such as the window frames, had suffered visible deterioration from exposure to the elements. A long-term repair solution was necessary to prevent further decay and to preserve the site's heritage value.

Following the reinforcement treatment of treating the logs with preservatives, collapsed character-defining elements were reassembled based on records from previous interventions and existing traces on the site.

STANDARD 11

(a) Conserve the *heritage value* and *character-defining elements* when creating any new additions to an *historic place* or any related new construction. (b) Make the new work physically and visually compatible with, subordinate to, and distinguishable from the historic place.

In a rehabilitation project, additions or new construction may be needed to assure the continued use of an historic place. Part (a) indicates that when this is the case, such additions or new construction must not obscure, radically change or have a negative impact on character-defining materials, forms, uses or spatial configurations.

Part (b) requires physical compatibility with the historic place. This includes using materials, assemblies and construction methods that are well suited to the existing materials. New materials and assemblies should also have compatible service lives or durability, so that *maintenance* and repair work can be undertaken concurrently. Not doing so can lead to prematurely replacing adjacent historic materials for the sake of efficiency.

Part (b) also requires that additions or new construction be *visually* compatible with, yet distinguishable from, the historic place. To accomplish this, an appropriate balance must be struck between mere imitation of the existing form and pointed contrast, thus complementing the historic place in a manner that respects its heritage value.

Part (b) also requires an addition to be subordinate to the historic place. This is best understood to mean that the addition must not detract from the historic place or impair its heritage value. Subordination is not a question of size; a small, ill-conceived addition could adversely affect an historic place more than a large, well-designed addition.



These two additions in Montreal show the range of possibilities for successful additions to historic places. Although the addition to Shaughnessy House by the Canadian Centre for Architecture has a larger footprint than the original building, it demonstrates a subtle approach, using compatible scale, proportions of openings, materials and details, which acknowledges the original building. Pointe-à-Callière Museum of Archaeology and History illustrates a contrasting contemporary approach where an archaeological site has been successfully integrated into a new design in ways that communicate the site's heritage value.

STANDARD 12

Create any new additions or related new construction so that the essential form and integrity of an *historic place* will not be impaired if the new work is removed in the future.

Reversible interventions are those that can be removed at a later date without damaging the character-defining elements of the historic place. This is particularly important if the intervention is related to a new use that may later change. For example, a temporary access ramp could be constructed in a manner that allows for easy dismantling without damaging an adjacent character-defining foundation wall or front garden. Reversible interventions are not destructive. A proposal to tear down a wall and store the stone so that it might someday be rebuilt is not a reversible intervention.

A sound addition can enhance the value of an historic place. An addition, in itself, can be intended to last, and should be designed to be physically compatible. Although a certain amount of irreversible change may be unavoidable, strategies to reduce the size and impact of the addition should be explored. This can be achieved, for example, by using existing window openings to insert a connecting door, or attaching an addition to an elevation that is not character defining.

Interventions to accommodate rapidly evolving technologies or short-lived objectives must be designed with particular attention to reversibility. If the new element is equipment that requires regular replacement, it is important to anticipate a large enough access for future upgrades.



The dome of Melville City Hall was originally an uninsulated, painted-metal covering that caused persistent condensation problems. Applying insulating polyurethane foam with aluminized coating was a cost-effective solution that was compatible with the historic metallic look of the dome. If a more elaborate solution is contemplated in the future, the polyurethane could be removed.



Space to temporarily house the Library of Parliament in the former Bank of Nova Scotia Building on Sparks Street in Ottawa. The entire intervention was designed to be reversible.

STANDARD 13



These cast iron columns were uncovered and restored when CentreBeam Place, in St. John, was rehabilitated.

(a) Repair rather than replace *character-defining elements* from the *restoration* period. (b) Where character-defining elements are too severely deteriorated to repair and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements.

Part (a) of Standard 13 emphasizes repairing deteriorated elements from the restoration period. The act of repairing a character-defining element supports the goal of authenticity.

Part (b) recognizes that elements may deteriorate beyond repair, but their deteriorated state, or the state of adjacent surviving elements, may still contain sufficient physical evidence to allow their accurate replacement. Replacing individual components is an ongoing activity where the loss of small parts, such as decorative finials on a fence post, is common. The value does not reside in a single one of these elements, but their continual loss can eventually compromise the heritage value of the whole.

A preservation or rehabilitation project may also include elements of restoration, such as work on an ornamental fountain in the centre of a formal garden. Any restoration interventions must be based on clear physical, documentary or oral evidence and detailed knowledge of the earlier forms and materials.



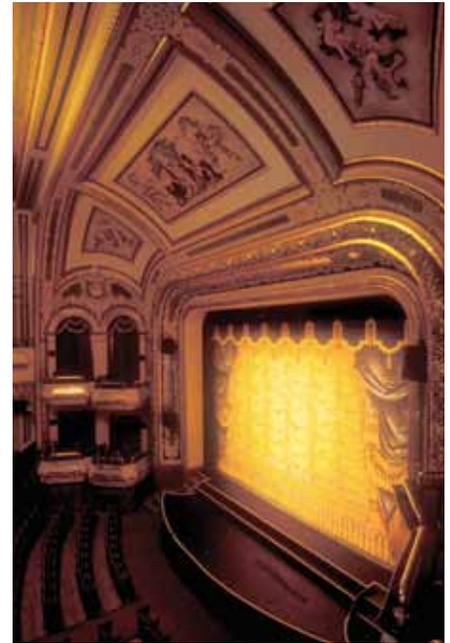
The rhythmic pattern created by the regular spacing of trees along the street is a character-defining element of the Avenue of Trees in Surrey, BC that can be used as evidence to restore the row if a gap develops.

STANDARD 14

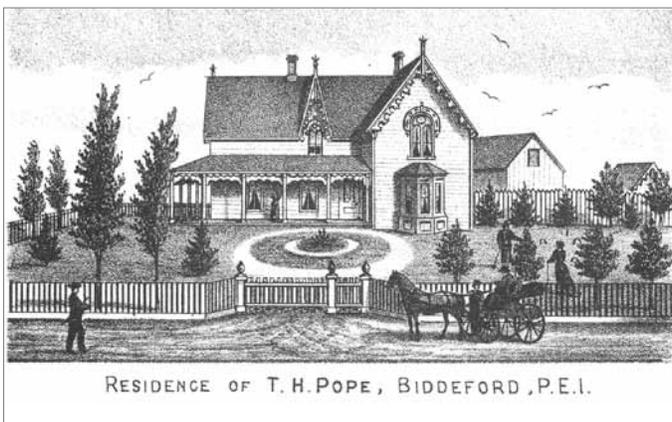
Replace missing features from the *restoration* period with new features whose forms, materials and detailing are based on sufficient physical, documentary and/or oral evidence.

This standard applies mainly to projects where *Restoration* is the primary treatment type and where the absence of character-defining elements from the restoration period has a negative impact on the heritage value of the historic place. Recreating large missing assemblies is challenging because of the extraordinary amount of evidence required to avoid conjecture. Where resources are limited, the urge to restore should be balanced with the practicality of replacing and later maintaining long-missing features.

The reconstruction of an entire historic place is not considered conservation and is not addressed in this document. However, the recreation of a missing built feature in a landscape or heritage district is best regarded as an addition to an historic place, and would be subject to Standards 11 and 12.



In the restoration of the Capitol Theatre in Moncton, photographic and physical evidence supported restoring the interior decorative frescoes in their original colours. Other elements, such as the marquee, were reproduced from documentary photos using new elements to match the forms, materials and detailing.



Based on documentary evidence, including an 1880 engraving, the original fenestration of the Bideford Parsonage Museum in P.E.I. was restored and roof finials replaced.

4

THE GUIDELINES FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA



These examples illustrate the four categories of historic places. Clockwise, from top left: Bar U Ranch in Alberta is a cultural landscape; Saguenay-St. Lawrence Marine Park contains underwater archaeological sites; the Hartt Boot and Shoe Factory in Fredericton is an example of an historic building; and Dredge No. 4 in Dawson City is an engineering work.

4

THE GUIDELINES FOR THE CONSERVATION OF HISTORIC PLACES IN CANADA

Those caring for *historic places* must make specific decisions on how to conserve them, based on a thorough understanding of their *heritage value* and *character-defining elements*. The Guidelines provide direction on how to interpret and apply the *Standards for the Conservation of Historic Places in Canada* to selected aspects of the *conservation* of historic places. The Guidelines provide sound and practical guidance to those involved in conservation planning, bringing them one step closer to an *intervention*, yet stopping short of recommending specific methods or products.

The Guidelines should be consulted throughout the conservation decision-making process. All stakeholders in a conservation process—owners, managers and developers of historic places, conservation professionals and contractors, and regulatory authorities—will benefit from them. The Guidelines are not meant to give case-specific advice or address exceptions or rare examples. Ultimately, it is the responsibility of the owner and the conservation team to understand the particular case and make detailed conservation decisions for the specific historic place.

To cover any and every type of historic place, separate Guidelines are provided for four broad categories of historic places: Cultural Landscapes, Archaeological Sites, Buildings and Engineering Works. Any given historic place may be a mix of these four categories. A thorough understanding of the site will indicate what mix of guidelines could apply to a given project or maintenance activity. All relevant guidelines should be consulted. The introductions to the sections for each

category of historic place should be read first, followed by those guidelines relevant to the given work.

Because materials are common among the different categories of historic places, a fifth category, Guidelines for Materials, addresses the materials that may be part of each. For example, advice related to conserving the wooden shingles of a roof will be found in the Guidelines for Buildings under Roofs, and in the Guidelines for Materials under Wood and Wood Products.

APPLYING THE GUIDELINES

The Guidelines should be consulted only when the element to be intervened upon has been identified as a character-defining element in a Statement of Significance or equivalent document. The General Guidelines apply to all interventions, whether the primary treatment is Preservation, Rehabilitation or Restoration. There are additional guidelines for Rehabilitation and Restoration projects.

The Guidelines are presented in an ascending sequence of lesser to greater intervention—from **documenting**, to **maintaining**, **repairing**, and **replacing** character-defining elements. Because the expressed objective of the Standards is to conserve the heritage value of an historic place, projects should focus on the first activities in the sequence of Guidelines; that is, applying the standard of *minimal intervention* and resorting to the last activities in the sequence only when essential functional goals cannot otherwise be met.

The Guidelines use a **Recommended** and **Not Recommended** format. Approaches or techniques that are consistent with the *Standards for the Conservation of Historic Places in Canada* are listed in the Recommended column on the left. The Not Recommended column on the right identifies actions or approaches that do not conform to the Standards. In cases where a non-recommended action does not enrich the understanding of the advice offered, the Not Recommended column remains blank. The guidelines are numbered for easy referencing. For example, the ninth guideline under 4.3.4, Exterior Walls, can be identified as guideline 4.3.4.9.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

The Guidelines always begin with a recommendation on **understanding** the character-defining element and how it contributes to the heritage value of the historic place.

Next are recommendations on **documenting** the character-defining elements before beginning project work. An overall **assessment** of their physical condition, using methods that respect the principle of minimal intervention, should always begin at this level.

Recommendations are then presented on **protecting and maintaining** elements, with an emphasis on recognized conservation methods, and daily, seasonal and cyclical maintenance. Protection generally represents the least degree of intervention.

Then, recommendations are provided on **retaining** sound elements and elements that can be repaired, rather than removed or replaced.

Recommendations on **stabilizing** fragile and deteriorated elements follow. This typically involves interim structural reinforcement, weather protection or correcting unsafe conditions, as required, until any additional work is undertaken. A limited amount of **repair and replacement** may be acceptable at this point for extensively deteriorated or missing parts of an element, if the repair focuses on using limited reinforcement or well-tested *consolidants*, or if the replacement is done *in kind*, where there are surviving prototypes. See the info-box below on Replacing Character-Defining Elements. Note that in the context of specific historic places and associated character-defining elements, the verb “repair” may not be suitable. For example, as part of the restoration of vegetation features of a cultural landscape, the verbs “re-establish”, “reinstate” or “rejuvenate” may be more appropriate.

ADDITIONAL GUIDELINES FOR REHABILITATION

In each section of the Guidelines, additional guidelines are provided for work that relates to additions or alterations to accommodate an expanded program or a new use, and the application of current codes and standards to meet the requirements of health, safety, security, accessibility and sustainability.

Additions or Alterations to an Historic Place

The construction of an exterior addition in an historic place may seem essential for a proposed new use, but the Guidelines emphasize that such new additions should be avoided, if possible, and considered only after it is determined that those needs cannot be met on another site or by altering secondary, non character-defining interior spaces. An addition should be

designed so that the heritage value of the historic place is not impaired and its character-defining elements are not obscured, damaged or destroyed. The addition should be physically and visually compatible with, subordinate to, and distinguishable from the historic place as stated in Standard 11.

The guidelines on Additions or Alterations found under the Additional Guidelines for Rehabilitation Projects apply to additions that range in size from a new building in a heritage district, to a new wing or storey on an existing historic building, to a new element like an interior partition or handrail. While the same principles of minimal intervention, compatibility and reversibility apply regardless of size, the ultimate goal is to protect heritage value.

In a *Rehabilitation* project, some alterations to an historic place may be needed to assure its continued use. There is a need to find creative solutions that balance health, safety, security, accessibility, sustainability and other regulations, and the preservation of the character-defining elements of an historic place.

Health, Safety and Security

In undertaking work on historic places, consider the impact that compliance with current health and safety codes (public health, occupational health, life safety, fire safety, electrical, seismic, structural and building codes) and increased security requirements will have on an historic place’s heritage value and character-defining elements. Special coordination with the proper code officials may be required. It is often necessary to look beyond the ‘letter’ of code requirements to their underlying objective; most modern codes allow for alternative approaches and reasonable variance to achieve compliance.

Some historic materials (for example, insulation, lead paint, etc.) contain toxic substances that are potentially hazardous to people. Careful investigation and analysis may determine that some form of abatement is required. All workers

involved in the encapsulation, repair or removal of known hazardous materials should be adequately trained and wear proper protective gear as required by applicable legislation. Finally, a maintenance protocol for historic places known to contain such materials should be developed to include proper warnings and precautions.

Increased concerns about security within or around buildings and public places can also lead to introducing new measures, such as equipment and barriers that should be carefully planned to reduce their impact on the heritage value of an historic place. Approaches based on the objectives of minimal intervention and compatibility should be developed for these requirements.

Accessibility

Providing people of all ages, interests and abilities with access to historic places is highly desirable and a frequently mandated social goal. Generally, the solutions that best balance accessibility needs with heritage value are those that enhance the use and appreciation of an historic place for everyone. Work should be carefully planned and undertaken so that impact on an historic place’s heritage value and character-defining elements is minimized: the objective is to provide the highest level of access with the lowest level of impact. To determine the most appropriate solutions, accessibility and conservation specialists, and users, should be consulted early in the planning process.

Sustainability

The goals of environmental *sustainability* should be balanced with heritage conservation objectives when making decisions on sustainability-related interventions. Environmental assessment, which is a legislated requirement in many jurisdictions, identifies possible effects, intended or unintended, on both ecological and cultural resources. Understanding the past and current environmental characteristics and performance of an historic place is

required to identify appropriate solutions. Before adapting or retrofitting historic places to make them more sustainable, the first step should always be to identify and evaluate character-defining features to assess their inherent environmental potential. Any decision to proceed with resource-saving measures involving energy, water or materials should include a step where the environmental benefits of these measures is weighed against their impact on heritage value. Solutions should be found that take advantage of the inherent durability and adaptability of most historic places.

Modifications undertaken to comply with environmental assessment or to meet environmental objectives, such as protecting the nesting area of an endangered species, should not result in the damage or loss of an historic place's heritage value. To determine the most appropriate solutions to meet environmental objectives, experts and officials should be consulted early in the planning process. It may be possible to develop systems, methods, devices or technologies of equivalent or superior effectiveness to those prescribed by regulation to minimize the impact on character-defining elements.

ADDITIONAL GUIDELINES FOR RESTORATION

In each section of the Guidelines, additional guidelines are provided for work that relates to irreversible changes, including removing elements from periods other than the chosen restoration period and recreating missing features from the restoration period. The preservation and restoration of existing elements should be addressed before considering work of this kind.

In a *Restoration* project, the goal is to depict the appearance of an historic place or an individual component as it appeared at a particular period in its history (usually the most significant). Thus, specific guidance is included on **removing** or altering non character-defining features from

periods other than the restoration period. (Because this can result in considerable change to an historic place, *Restoration* should be undertaken only when the place's heritage value relates specifically to a single period in its history.) Before such materials, features, spaces, or finishes

from other periods are altered or removed, they should be well documented.

Additional guidance on **recreating missing features** from the chosen restoration period of an historic place is provided below in the discussion on replacement as part of a restoration project.

REPLACING CHARACTER-DEFINING ELEMENTS

Replacement of all or parts of character-defining elements should only be considered when repair is not possible, and if there is sufficient physical evidence to match the forms, materials and detailing of a sound version of the same element. Replacement may be required because an existing feature is so severely deteriorated or damaged that repair is not possible, or because a feature is missing entirely. In all cases where replacement is required, sound elements that may be part of a larger grouping should be preserved. For example, a few brackets in a cornice, a few windows in a factory or a few plantings in a flowerbed may be salvageable, even though the overall character-defining element is severely damaged.

It is particularly important to understand the distinction between replacement as part of rehabilitation or restoration, as described in Standards 10 and 13.

Replacement as Part of Rehabilitation

In a *Rehabilitation* project, replacing a character-defining feature that is beyond reasonable repair may be appropriate if its essential form and detailing are still evident. Replacing a feature that is missing, but known from physical, documentary and oral evidence, may be appropriate; however, accepting the loss and not intervening is another possibility. (Where an important feature is missing, its replacement is always recommended in these Guidelines as the preferred course of action.) The approach for replacement work will depend on the overall design approach and design intentions, and most particularly, on achieving a visual and functional balance between the new work and the historic place. In some cases, the preferred design approach will be replacement *in kind*; in other cases, substitute forms, materials or detailing may be appropriate. In both situations, the replacement should be visually and physically compatible with, and distinguishable from, the historic place. If the replacement is *in kind*, the work need only be distinguishable on close inspection.

Replacement as Part of Restoration

In a *Restoration* project, replacement, as a rule, should be done *in kind*. Recreating earlier forms, materials, textures, finishes, colours and detailing, and patterns and relationships, can help recover or represent an historic place as it appeared at a particular period in its history. Success is largely a question of accuracy. This requires scrupulous attention to the physical, documentary and oral evidence, and careful monitoring of the replication process. The replacement work is normally distinguishable only on close inspection or as part of the project documentation. If there is insufficient physical, documentary and oral evidence to establish a reasonable level of accuracy, then *Restoration* is probably not an appropriate treatment.

APPLYING THE GUIDELINES TO MONTMORENCY FALLS, A CULTURAL LANDSCAPE THAT INCLUDES BUILDINGS, ENGINEERING WORKS AND ARCHAEOLOGICAL SITES

Designated a historic site in 1994, Montmorency Falls is a place of natural beauty that includes tourism and recreational buildings and built features. In addition to the river and 84 metre high waterfall, the site includes exceptional water and geomorphological features, and six known archaeological sites, as well as landscape elements, structures, buildings and vestiges of 17th century agricultural settlements, 18th century farmhouses, 19th century industry, and 19th and 20th century tourism activities. Framed by a partly wooded escarpment, the site is located on two levels formed by a deep crevasse: the plateau of the Montmorency River and the basin of the falls at the St. Lawrence River level. (Source: Site historique de la Chute-Montmorency, *Canadian Register of Historic Places*.)

Refer to Heritage Value and Character-defining Elements

According to the Quebec government's Statement of Significance (SOS) posted on the *Canadian Register of Historic Places*, "the heritage value of the Montmorency Falls historic site resides in its historic significance, which is linked to various human activities and the surrounding land." The site's character-defining elements include features that relate to its historic significance such as built elements that document the history of varied human activities, vestiges of industrial activities and archaeological sites and potential archaeological resources that remain buried.



The Montmorency Falls Historic Site is a natural site that includes the falls as well as archaeological sites, landscape elements, structures, buildings and vestiges of 17th century agricultural settlements.

"The site's heritage value also stems from its outstanding landscape." Character-defining elements of its landscape include natural features located upstream or near Montmorency Falls, such as the Montmorency River with its wooded banks and the waterfall itself; water resurgences and geological formations visible at this location; park landscaping, lookout belvederes, stairways and many pathways; and views of the site itself and the surrounding panoramas of the St. Lawrence River, Île d'Orléans and Quebec City. Finally, "the site's heritage value also rests on its ethnological significance due to the diversity in cultural events that are evoked."

Conservation Treatments and Standards

A wide variety of conservation work is required for a complex historic place such as the Montmorency Falls Historic Site. This work would include *Preservation*, through maintenance or small repairs of character-defining elements, and *Rehabilitation* for more major repairs, upgrades or additions to address public use, codes and standards. The *Restoration* of deteriorated or missing character-defining elements is less common. *Restoration* is associated with interventions on features where the values are clearly related to a specific period in the past. Depending on the proposed intervention or activity, consult the General Standards (1 to 9) along with the related Additional Standards for Rehabilitation (10 to 12) or Additional Standards for Restoration (13 and 14).

Guidelines for Cultural Landscapes

As a site that has changed over time due to human activities and one that is largely valued today for its natural features, the Montmorency Falls Historic Site is an evolved cultural landscape. Protection and conservation of natural features, such as the hydrological and geomorphological systems and woods and ecosystems, must be balanced with the conservation and ongoing use of structures associated with past and surviving farming, industrial and tourism activities.

For example, for an intervention that might affect the landscape, such as the installation of elevated footpaths above and below the falls along the cliffs, the Guidelines for Visual Relationships, Landforms, Spatial Organization, Circulation, Ecological Features and Water Features should all be considered.

Guidelines for Archaeological Sites

The SoS for Montmorency Falls Historic Site refers to both known archaeological sites and potential archaeological resources that remain buried. Archaeological sites provide evidence of activities from pre-historic times, to early European settlement and industrial uses. Protecting and conserving archaeological sites must be carefully balanced with projects that address their interpretation or public use.

For example, for an intervention that might affect an archaeological site, such as the maintenance of an exposed industrial vestige by removal of vegetation, consult the guidelines for Archaeological Sites as well as the guidelines for Industrial Sites, and Sites in Cultural Landscapes.

Guidelines for Buildings

The SoS for the Montmorency Falls Historic Site identifies multiple buildings as features related to its historic significance including Manoir Montmorency and its outbuildings, St. Mary's Anglican Chapel, the guardhouse and Wolfe's house. It also identifies the Vézina and Claude-Gilbert-et-Claire-Gagnon family



Both known archaeological sites and those that remain buried are mentioned in the Statement of Significance for the site.

homes as “monuments historiques cités” (recognized historic monuments). Protecting and conserving these buildings and their character-defining elements must be balanced with adaptation or upgrades for new uses.

For example, for an intervention that might affect a building, such as the rehabilitation (including an addition) and partial restoration of exterior and

interior elements of the Ste-Marie Chapel, the guidelines for Exterior Form, Interior Arrangement, Roofs, Exterior Walls, Windows, Doors and Storefronts, and Interior Features should all be considered.

In addition, the Guidelines for Materials and the related Guidelines for Cultural Landscapes that guide the treatment of the building setting should be consulted.



St. Mary's Anglican Chapel.

Guidelines for Engineering Works

The SoS for the Montmorency Falls Historic Site refers to engineering works at Montmorency Falls, including civil, industrial and military works. These works include the reconstructed 1759 British redoubt; the bridge spanning the Montmorency Falls; the piers supporting the 1856 bridge; and vestiges of industrial activities, including hydroelectric installations at Montmorency Falls and Marches-Naturelles Falls. Protecting and conserving these works and their character-defining elements must be balanced with adaptation or upgrades for new uses.

For example, for an intervention that might affect an engineering work, such as the stabilization and repair of the piers supporting the bridge over the falls, the guidelines for Constructed Elements and Functional Arrangement should be considered.

As well, the Guidelines for Buildings, the Guidelines for Materials and the related Guidelines for Cultural Landscapes that guide the treatment of the setting should be consulted.



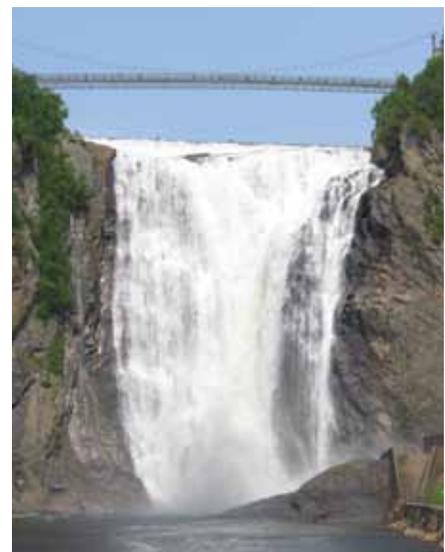
Remains of hydroelectric installations.

Guidelines for Materials

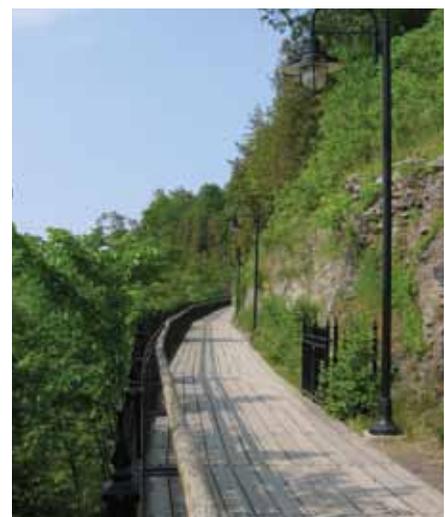
While specific materials are not identified in the SoS, protecting and conserving the materials found in the site's various buildings, built features and constructed elements, including groups of buildings, engineering works and park structures, are essential for conserving these structures and the overall site. Conserving materials that are part of character-defining elements may be necessary in the ongoing maintenance, or in larger conservation projects that address major repairs. Both the general guidelines that apply to all materials and the guidelines that apply to the specific materials of each character-defining element should be consulted.

For example, for an intervention that might affect the materials of a character-defining element, such as the repair and partial replacement of a "tôle à la canadienne" metal roof, the guidelines for All Materials and Metals should be considered, in addition to the appropriate guidelines for Buildings, in this case, Roofs.

As this example illustrates, there is often a strong overlap between the five sections of the guidelines. The guidelines should therefore be used in an integrated manner that balances the conservation objectives of a variety of resource types of historic places with their specific heritage values and character-defining elements. The appropriate guidelines to follow should be determined following an analysis of how the character-defining elements can best be protected in the context of a specific conservation intervention.



The bridge over the falls.



Elevated footpaths along the cliffs.

4.1

GUIDELINES FOR CULTURAL LANDSCAPES, INCLUDING HERITAGE DISTRICTS



Cultural landscapes are divided into three categories and also include heritage districts. Clockwise, from top left: Confederation Centre of the Arts in Charlottetown is an example of a designed landscape; the Victoria Settlement in Alberta illustrates an organically evolved landscape; Xá:ytem (Hatzic Rock) in British Columbia is an associative landscape; and the Winnipeg Exchange District is an urban heritage district.

4.1

GUIDELINES FOR CULTURAL LANDSCAPES, INCLUDING HERITAGE DISTRICTS

From its dense urban areas in the South to the wide open expanses in the North, the Canadian landscape exhibits countless contrasts and subtleties. Natural forces and climatic conditions have combined to form landscapes that are uniquely different from one region to another. Across this land, and across the centuries, the peoples of Canada have continually shaped these landscapes, which today bear witness to their individual histories, traditions and lifestyles.

For the purposes of these guidelines, a *cultural landscape* is defined as any geographical area that has been modified, influenced or given special cultural meaning by people, and that has been formally recognized for its heritage value. Cultural landscapes are often dynamic, living entities that continually change because of natural and human-influenced social, economic and cultural processes.

While the resulting forms may sometimes be simple and other times complex, there is a common language and approach developed for the conservation of cultural landscapes. For example, a widely accepted framework developed by UNESCO places cultural landscapes into three categories: *designed*; *organically evolved (vernacular)*; and *associative* (UNESCO, Operational Guidelines for the Implementation of the World Heritage Convention, 2008, Annex 3).

Cultural landscapes vary dramatically in size and character—from heritage districts, to prehistoric rock art sites, and to designed landscapes, such as parks and gardens. Indeed, cultural landscapes can be as old as ancient land and water routes, or as recent as a mid-20th-century parkway system.



Before undertaking project work affecting character-defining elements, a survey of their characteristics, conditions and interrelationships should be prepared—such as the interrelationship between built features, water, vegetation and viewsapes at Hatley Park near Victoria.



Regular, ongoing maintenance helps extend the life of character-defining elements, and is an essential part of the conservation program. Every year dedicated volunteers spend thousands of hours caring for and preserving the historic garden at Maplelawn and Gardens NHSC in Ottawa.

HERITAGE DISTRICTS

A heritage district is a cultural landscape. The Canadian Register of Historic Places (CRHP) defines a heritage district as “a place comprising a group of buildings, structures, landscapes and/or archaeological sites and their spatial relationships where built forms are often the major defining features and where the collective identity has heritage value for a community, province, territory or the nation.” Heritage districts can be urban or rural. Most heritage districts are governed by municipal by-laws that are complemented by guidelines to protect their heritage value.

Different Canadian jurisdictions use different terms to identify heritage districts, including: “historic district”, “heritage precinct”, “heritage conservation area”, and “secteur patrimonial” and “arrondissement historique” (French). Each jurisdiction provides its own definition of what constitutes this type of historic place.

APPLYING THE GUIDELINES

The Guidelines for Cultural Landscapes are divided into 11 subsections: evidence of land use; evidence of traditional practices; land patterns; spatial organization; visual relationships; circulation; ecological features; vegetation; landforms; water features; and built features. These guidelines pertain to the elements of a cultural landscape or to the spatial or visual relationships between them. The elements may have been introduced or transformed by people or may be natural with a recognized heritage value. Because these elements are usually interrelated, users should refer to other relevant guidelines when conserving a cultural landscape, to ensure that all character-defining elements are protected, and the heritage value of the historic place preserved.

All treatment types apply to cultural landscapes. However, restoration as a primary treatment usually applies only to designed cultural landscapes or organically evolved, relict landscapes for which the heritage value relates to a specific period in time. Restoration as a ‘secondary’ treatment can also apply to specific character-defining elements in an organically evolved, continuing landscape or in an associative landscape (See UNESCO categories of *cultural landscapes* in the Glossary).

Because cultural landscapes can also contain buildings, engineering works and archeological resources, reference should be made to those guidelines when appropriate. Also refer to the Guidelines for Materials, which encompass traditional as well as modern construction and finishing materials.

THE IMPORTANCE OF SETTING IN THE SIGNIFICANCE OF CULTURAL LANDSCAPES

The setting often contributes to the significance of a cultural landscape and may help explain its origins and subsequent development and evolution.

The International Council on Monuments and Sites (ICOMOS) defines the setting of a heritage structure, site or area as “the immediate and extended environment that is part of, or contributes to, its significance and distinctive character” (ICOMOS, Xi’an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 22 November 2005, p. 2).

In a cultural landscape, the setting often corresponds to the visible boundaries (whether natural or human-made) that encompass the site. In most cases, the setting goes beyond the boundaries of the historic place and understandably, interventions within the broader setting, such as the addition of a high-rise building in the sight line of a heritage district, can affect its heritage value.

A good strategy for the preservation of the setting of an historic place is to ensure that adjacent property owners are aware of its heritage value and how interventions on their property can affect that value.

4.1.1 EVIDENCE OF LAND USE

These guidelines provide direction when the evidence of a land use has been identified as a character-defining element of an historic place. They apply specifically to the features that express or support a past or continuing land use when these features have been identified in a *Statement of Significance*.

In the context of these guidelines, land use refers to the human use of the natural environment. It includes activities that significantly modify aspects of the natural environment into a built environment, such as fields, pastures and settlements, but also includes land uses that have a lighter impact, such as hunting and trapping, maple syrup harvesting, or fishing.



Buxton Settlement in Chatham, ON, survives today as a distinct cultural landscape that continues to function as a rural agricultural community while preserving tangible reminders of its historic past. Tree lines and hedgerows are character-defining elements that help define the historic agricultural land use. Preserving the evidence of land use includes maintaining the tree lines and hedgerows and replacing those that are extensively deteriorated.

Land use can evolve over time. When a required change in land use demands changes to the physical form of the landscape, it is important to carefully assess the viability of the proposed changes to avoid consecutive land use changes that might gradually erode the heritage value of the historic place. For example, changing from an industrial use to a residential use in a heritage district may require changing the landscape character or increasing the built density of the historic place.

These guidelines provide general recommendations for the conservation of the features of a cultural landscape that express or support a past or continuing land use. While other guidelines focus on specific evidence of land use, such as built features or circulation, these guidelines address land use as a general consideration. Other relevant guidelines, such as Land Patterns or Evidence of Traditional Practices, should be consulted when appropriate.



The huge and uncluttered lawn of the Parliament Hill Grounds in Ottawa is an outstanding landscape feature that expresses the symbolic importance of Parliament Hill. It continues to be used for many nationally significant events and ceremonies, including the annual celebration of Canada Day.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding land use and how it contributes to the heritage value of the cultural landscape.	
2	Understanding the environmental, economic and social contexts that support past or continuing land uses. This can include climate and ecological processes, available workforce and markets, and consultation with practitioners and community dwellers.	
3	Documenting the evidence of past or continuing land uses and any evolution in land use before beginning project work.	Undertaking interventions that will have an impact on the evidence of past or continuing land uses, without first understanding and documenting the values that contribute to their meaning.
4	Assessing the overall condition of the feature that supports a land use early in the planning process so that the scope of work is based on current conditions.	
5	Protecting and maintaining a feature that supports a land use by adopting non-destructive maintenance methods in daily, seasonal and cyclical tasks to extend the life expectancy.	Allowing the features that support a land use to be altered or lost by incompatible development or neglect.
6	Repairing deteriorated parts of a feature that supports a land use, using recognized conservation methods.	Replacing a feature that supports a land use when that feature can be repaired.
7	Replacing in kind extensively deteriorated or missing parts of a feature that support a land use where there are surviving prototypes.	Replacing an entire feature that supports a land use, when limited replacement of deteriorated and missing parts is appropriate.
8	Documenting all interventions that affect the land use and ensuring that this documentation will be available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
9	Repairing an extensively deteriorated or missing feature that supports a past or continuing land use by using non-destructive methods and materials, such as regenerating a deteriorated pasture at a designated farm site and reintroducing grazing animals to maintain the meadow.	Replacing an entire feature that supports a past or continuing land use, when repair or limited replacement of deteriorated or missing parts is possible.
10	Replacing in kind an entire feature that supports a past or continuing land use when that feature is too deteriorated to repair, such as replanting a clear-cut woodlot with the same tree species that was removed.	Replacing an irreparable feature with a new feature that does not support the past or continuing land use.
11	Replacing a missing historic feature by designing a new built or landscape feature that is compatible with the land use of the cultural landscape, and is based on physical, documentary or oral evidence.	Creating a false historical appearance because the new feature is incompatible, or based on insufficient physical, documentary or oral evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

12	Designing a new feature when required by a new use that is compatible with the past or continuing land use. For example, building a visitor access road along the margin of a field and woodlot in an historic farm site, so that both can continue to function.	Adding a new feature that alters or obscures a continuing land use, such as locating a visitor parking lot in a character-defining farmyard. Introducing a new feature that is incompatible in function with the past or continuing land use.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
13	Repairing a deteriorated feature that supports the land use from the restoration period using a minimal intervention approach.	Replacing an entire feature that supports the land use from the restoration period, when repair is possible.
14	Replacing in kind an entire feature from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented to guide future research and treatment.	Removing an irreparable feature from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

15	Removing or altering non character-defining features that support the land use from periods other than the chosen restoration period.	Failing to remove non character-defining features from another period that confuse the depiction of the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

16	Recreating a missing feature that supports the land use from the restoration period, based on physical, documentary and oral evidence.	Installing a feature that was part of the original plan, but was never actually built, or constructing a feature thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.2 EVIDENCE OF TRADITIONAL PRACTICES

These guidelines provide direction when the evidence of a traditional practice has been identified as a character-defining element of an historic place. They apply specifically to the features that express or support a past or continuing traditional practice when these features have been identified in a *Statement of Significance*.



Located south of Rankin Inlet, NU, Marble Island has a long history of diverse use. Inuit first came to the island as seasonal hunters, followed by European explorers and then by Scottish and American whalers. Today, traces of each group, such as stone tent rings, graves and kayak remnants, can be found among the summer vegetation. Understanding the users' traditional practices and how they have contributed to the heritage value of this cultural landscape is essential to good preservation practice.

Traditional practices are based on the close observation and understanding of a local landscape by a cultural community who has a long association with that place. These practices include the beliefs, wisdom, activities, traditions and skills derived from extended observations of the land and its creatures, weather, seasonality and other cycles, and spiritual associations.

Traditional practices are passed down to generations and provide a sense of continuity for the individuals in the cultural community. The length of association with a place may vary among peoples and different cultural groups may value the same cultural landscape. When planning interventions that could affect the cultural landscape, it is important to balance these interests and ensure that the capacity to express the traditional practices of each community is respected.

Any historic place may have been influenced by traditional practices that evolve over time; for example, stone masonry traditions were transferred and adapted through apprenticeship systems from the Middle Ages to the present day. Traditional practices may be the strongest influence in determining heritage value, even if evidence of any type of construction or human-generated change appears insignificant. The natural landscape may reflect traditional knowledge through beliefs, oral traditions and practices known only to the cultural community.

Material features or landscape patterns or forms that result from traditional practices may be identified as character-defining elements in a cultural landscape. In Aboriginal cultural landscapes, the extent to which such character-defining elements can be identified will depend on how much information the communities are willing and able to share.

These guidelines provide general recommendations for the conservation of the features of a cultural landscape that express or support past or continuing traditional practices. Other relevant guidelines, such as Evidence of Land Use or Land Patterns, should be consulted when appropriate.



Victoria's Chinese cemetery lies near the rocky shore of Harling Point. Here simple markers are found among wildflowers in a setting selected according to the ancient concept of feng shui. Descendants of families buried in this cemetery still visit the site to burn incense, leave offerings of food and artificial paper money following traditional practices. All Preservation activities affecting character-defining elements on this site should only be done after consulting the cultural community.



Preservation of the totems at Nan Sdins, Gwaii Haanas includes their stabilization, while continuing to allow their gradual deterioration. The values associated with the totems include their eventual return to the earth.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding traditional practices and how they contribute to the heritage value of the cultural landscape.	
2	Understanding the local environmental context, including climate, prevailing winds, underlying topography and ecological processes integral to traditional practices.	
3	Documenting aspects of traditional practices prior to beginning project work, including consulting with the cultural community on the ways that traditional practices have changed over time.	Documenting only material features of the cultural landscape, and neglecting to document the traditional practices associated with them.
4	Assessing the overall condition of the features that support traditional practices early in the planning process, so that the scope of work is based on current conditions.	
5	Protecting and maintaining the features that support traditional practices by using non-destructive methods in daily, seasonal and cyclical tasks in keeping with those practices.	Allowing the features that support traditional practices to be altered or lost through incompatible development or neglect.
6	Repairing or rejuvenating deteriorated parts of features that support traditional practices using recognized conservation methods. Where possible, conservation work should be done according to traditional practices.	Replacing features that support traditional practices when those features can be repaired or rejuvenated.
7	Replacing in kind extensively deteriorated or missing parts of features that support traditional practices where there are surviving prototypes. The new work should match the old in form, location, orientation, materials, detailing and craftsmanship.	Replacing an entire feature that supports traditional practices, when limited replacement of deteriorated and missing parts is possible.
8	Documenting all interventions that affect the features that support traditional practices, and ensuring that this documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
9	Repairing or rejuvenating extensively deteriorated or missing features that support traditional practices within the cultural landscape, by using non-destructive methods and materials. For example, using only native plant species significant to the cultural community, when rejuvenating vegetation or ecological features important to traditional practices.	Replacing an entire feature that supports traditional practices when repair or rejuvenation is possible.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Replacing in kind an entire feature that supports traditional practices when that feature is too deteriorated to repair or rejuvenate, such as replanting a clear-cut forest with the type and mix of trees removed.	Replacing an irreparable feature with a new feature that does not support the past or continuing traditional practice.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

11	Designing a new feature when required by a new use that does not obscure, damage or destroy other features also important to traditional practices.	Adding a new feature that detracts from, damages, or destroys features that support traditional practices. Introducing a new feature that is incompatible with the past or continuing traditional practice.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
12	Repairing deteriorated features that support traditional practices from the restoration period using a minimal intervention approach. Where possible, repair activities should be done according to traditional practices.	Replacing an entire feature that supports traditional practices from the restoration period when repair is possible.
13	Replacing in kind an entire feature from the restoration period that is too deteriorated to repair or rejuvenate, using the same configuration and design details. The new work should be well documented to guide future research and treatment.	Removing an irreparable feature from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

14	Removing or altering non character-defining features from periods other than the chosen restoration period that obscure the historic features that support traditional practices within the cultural landscape.	Failing to remove non character-defining features from another period that confuse the understanding of traditional practices during the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

15	Recreating a missing feature that supports traditional practices from the restoration period, based on physical, documentary and oral evidence.	Installing a feature that could have been important to traditional practices, but was never implemented, or introducing a feature thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.3 LAND PATTERNS

These guidelines provide direction when land patterns have been identified as character-defining elements of an historic place. Land pattern refers to the overall arrangement and interrelationship of the larger-scale aspects of a cultural landscape, whether natural or human-made.

Land patterns help us understand how naturally occurring elements, such as forests, meadows, rivers, lakes, hills or valleys, fit together and fit with human-made elements such as farm fields, pastures, significant built features and major circulation systems.



The overall arrangement of landscape may best be appreciated from an aerial perspective. The land patterns created by the interrelationship of larger landscape components, such as the topography, cultivated fields and human settlements of Neubergthal in Manitoba are often more obvious from the air.

Historic aerial photography and maps are important tools for describing land patterns and their changes over time. As well, consultation among communities, Aboriginal groups and ecosystem specialists can help us understand the traditional practices and natural processes that may have shaped land patterns.

Because land patterns refer to the mutual influences and interactions between nature and humans and the interrelationships of large-scale elements, they can be important character-defining elements of a cultural landscape. Land patterns are important for cultural landscapes regardless of whether they are relatively unchanged from their natural state, or highly manipulated through human activity or natural events.

These guidelines provide general recommendations for the conservation of the land patterns of a cultural landscape. Other relevant guidelines, such as Evidence of Land Use or Evidence of Traditional Practices, should be consulted when appropriate.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the land patterns and how they contribute to the heritage value of the cultural landscape.	
2	Understanding the local environmental context, including climate, prevailing winds, geology, underlying topography and ecological processes.	
3	Documenting the overall pattern of the landscape: the size, configuration, proportion and relationship of its larger components, such as forests, fields or subdivisions, and its evolution and condition before beginning project work. This can include identifying the values that contribute to the meaning of land patterns, such as associations from Aboriginal oral traditions, or the expression of cultural traditions that originated from other countries.	Undertaking interventions that will affect land patterns without first documenting and understanding their characteristics, relationships, evolution, conditions, intangible values and environmental context.
4	Assessing the overall condition of the land patterns early in the planning process so that the scope of work is based on current conditions.	
5	Protecting and maintaining features that define land patterns by using non-destructive methods in daily, seasonal and cyclical tasks. This could include limiting the impact of ecological processes, such as erosion, and monitoring sensitive areas.	Allowing land patterns to be altered or lost by incompatible development or neglect.
6	Retaining sound land patterns or deteriorated land patterns that can be repaired or rejuvenated.	
7	Repairing or rejuvenating deteriorated parts of a feature of the land pattern, using recognized conservation methods. Repair may also include the limited replacement in kind of those extensively deteriorated or missing parts of land pattern elements. Repairs should be physically and visually compatible.	Replacing a feature of the land pattern when that feature can be repaired or rejuvenated.
8	Replacing in kind extensively deteriorated or missing parts of land patterns where there are surviving prototypes.	Replacing an entire feature of the land patterns when limited replacement of deteriorated and missing parts is possible.
9	Documenting all interventions that affect the land pattern, and ensuring that this documentation will be available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Repairing or rejuvenating an extensively deteriorated or missing feature that defines a land pattern, by using non-destructive methods and materials, such as regenerating a deteriorated meadow.	Replacing an entire feature that defines a land pattern when repair or limited replacement of deteriorated or missing parts is possible.
11	Replacing in kind an entire feature that defines a land pattern when that feature is too deteriorated to repair, such as replanting a clear-cut woodlot. The replacement feature should be as similar as possible to the original, both visually and functionally.	Replacing an irreparable feature with a new feature that does not respect the land pattern.
12	Replacing a missing historic feature by designing a new feature that is compatible with the land patterns of the cultural landscape, and is based on physical, documentary and oral evidence.	Creating a false historical appearance because the new feature is incompatible with the land pattern, or based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

13	Designing a new feature when required by a new use that does not obscure, damage or destroy character-defining land patterns, such as locating a new road along the edge of a forest.	Introducing a new feature that is incompatible in size, scale or design with the land pattern.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
14	Repairing or rejuvenating a declining feature that defines a land pattern from the restoration period using a minimal intervention approach.	Replacing an entire feature that defines a land pattern from the restoration period, when repair or rejuvenation is possible.
15	Replacing in kind an entire feature that defines a land pattern from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable feature that defines a land pattern from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

16	Removing or altering non character-defining features from periods other than the chosen restoration period, which intrude on the land patterns.	Failing to remove non character-defining features from another period that confuse the depiction of the land patterns during the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

17	Recreating a missing feature important to the land patterns that existed during the restoration period, based on physical, documentary and oral evidence.	Installing a feature that was part of the original land pattern, but was never actually built, or constructing a feature of the land pattern that was thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.4 SPATIAL ORGANIZATION

These guidelines provide direction when spatial organization has been identified as a character-defining element of an historic place. Spatial organization refers here to the arrangement of spaces in a cultural landscape.

Landscape features, whether natural or human-made, can define the volume of an outdoor space. In small landscapes, the vertical planes of an outdoor space

may be formed by vegetation, such as hedges, garden beds or forest margins, or by the exterior walls of buildings, earthen ramparts, fences or stone walls. The ground plane may be made of natural materials, such as earth, sand or grass; or manufactured materials, such as pavers, asphalt or gravel. The overhead plane can be provided by the tree canopy, but can also be defined by built features such as *pergolas*.

The position of natural and built elements, and how they are visually and physically connected, are also important when describing spatial organization, especially as it relates to the intended user experience. The functional relationships between the spaces are also important; for example, building living quarters on a ranch in relation to barns and roads are critical to the efficiency of its operation.

In urban heritage districts, land use, buildings, streets and topography often define or influence spatial organization. The buildings' siting, the open spaces between them and the circulation corridors, are often identified as character-defining elements in urban heritage districts. In natural environments, the spatial organization of the features of the landscape can have spiritual significance.

Because buildings and their landscapes were often designed together, it is important to understand and respect their relationships. Architects and landscape architects often worked together to design sites as a whole, making the exterior spaces an integral part, or extension of the interior spaces, and vice versa.

These guidelines provide general recommendations for spatial organization in a cultural landscape. Other relevant guidelines, such as Visual Relationships and Circulation, should be consulted when appropriate. When spatial organization is part of an engineering work, refer to Functional Arrangement in the Guidelines for Engineering Works; for buildings, refer to Exterior Form or Interior Arrangement.



The character-defining spatial organization of Motherwell Homestead in Saskatchewan was conserved when the landscape was restored. The orientation, alignment, size, configuration and interrelationships of its component features, including the formal tennis lawn and ornamental garden (foreground), the household vegetable garden (beside the implement shed) and the grain fields beyond, were carefully preserved.



Ministers Island is a 2km² island in Passamaquoddy Bay near the town of St. Andrews, NB. This cultural landscape includes the entire island that encompasses a shell midden archaeological site, the home of Loyalist and Anglican minister Samuel Andrews and the summer estate of Sir William Cornelius Van Horne. The island's spatial organization as a grand estate with a core residential area, formal gardens, recreational spaces, agricultural spaces and forest is a character-defining element of the site.



The Bonar Law House is a 9 hectare property along the north side of the Richibucto River in the Village of Rexton, NB. This complex contains a simple 19th century wood farm house facing the river and a barn and wagon shed. Board fencing connects the buildings to form an enclosed courtyard. New community facilities are being implemented to increase community use while maintaining the site's original spatial organization.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the spatial organization and how it contributes to the heritage value of the cultural landscape.	
2	Understanding the function and form of designed landscapes, and the planning principles behind the spatial organization of the cultural landscape.	
3	Documenting the spatial organization of the cultural landscape, including the orientation, alignment, size, configuration and interrelationships of its component features; the relationship of features to the overall landscape; and its evolution and condition before beginning project work.	Undertaking interventions that affect the spatial organization without first documenting and understanding its characteristics, relationships, evolution, conditions and intangible values.
4	Assessing the overall condition of the spatial organization early in the planning process, so that the scope of work is based on current conditions.	
5	Protecting and maintaining the features that define the spatial organization by using non-destructive methods in daily, seasonal and cyclical tasks.	Allowing the spatial organization to be altered by incompatible development or neglect.
6	Retaining sound or deteriorated features of the spatial organization that can be repaired or rejuvenated.	
7	Repairing or rejuvenating deteriorated parts of a feature of the spatial organization, using recognized conservation methods. Repair may also include the limited replacement in kind of those extensively deteriorated or missing parts of the spatial organization.	Replacing a feature of the spatial organization when repair or limited replacement of deteriorated or missing parts is possible.
8	Replacing in kind extensively deteriorated or missing parts of the spatial organization where there are surviving prototypes.	Replacing an entire feature of the spatial organization when limited replacement of deteriorated and missing parts is possible.
9	Documenting all interventions that affect the spatial organization, and ensuring that this documentation will be available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Repairing or rejuvenating extensively deteriorated features that define the spatial organization, by using non-destructive methods and materials.	Replacing an entire feature that defines the spatial organization when repair or limited replacement of deteriorated or missing parts is possible.
11	Replacing in kind an entire feature of the spatial organization that is too deteriorated to repair. The replacement feature should be as similar as possible to the original, both visually and functionally.	Replacing an irreparable feature with a new feature that does not respect the landscape's spatial organization.
12	Replacing missing historic features by designing new features that are compatible with the spatial organization of the cultural landscape, and are based on physical, documentary and oral evidence.	Creating a false historical appearance because the new feature is incompatible, or based on insufficient physical, documentary and oral evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

13	Designing a new feature when required by a new use that is compatible with the character-defining spatial organization.	<p>Adding a new feature that alters or obscures the spatial organization, such as constructing a farmhouse addition on an area that was traditionally used as a kitchen garden.</p> <p>Introducing a new feature that is incompatible in size, scale or design with the spatial organization.</p>
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
14	Repairing or rejuvenating declining features from the restoration period that define the spatial organization using a minimal intervention approach.	Replacing an entire feature that defines the spatial organization from the restoration period when repair or rejuvenation is possible.
15	Replacing in kind an entire feature from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented to guide future research and treatment.	Removing an irreparable feature from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

16	Removing or altering non character-defining features from periods other than the chosen restoration period.	Failing to remove non character-defining features from another period that confuse the depiction of the spatial organization during the restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

17	Recreating a missing feature important to the spatial organization from the restoration period, based on physical, documentary and oral evidence.	Installing a feature of the spatial organization that was part of the original design, but was never actually built, or constructing a feature that was thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.5 VISUAL RELATIONSHIPS

These guidelines provide direction when visual relationships have been identified as a character-defining element of an historic place. They pertain to the visual relationships between an observer and a landscape or landscape feature (a viewscape) or between the relative dimensions of landscape features (scale).



Small unit pavers provide appropriate texture and give a pedestrian scale to Dalhousie Square which is part of a larger plan to revitalize the east end of the Old Montreal historic district. The new paving patterns of the square combine a range of materials, forms and scales to evoke the former location of the 18th century fortification walls and country road, as well as the 19th century train lines of the adjacent former Canadian Pacific train station.



The Saskatchewan Legislative Building and Grounds balance the formal and the picturesque by using informal spaces, organized plantings and promenades, and strategically placed statues and monuments. Visual Relationships are also important character-defining elements of the site: the viewscape across Wascana Lake establishes a connection with downtown Regina and contributes to the site's heritage value.



The Bar U Ranch NHSC visitor centre was built beyond the immediate view of the historic ranch complex, which preserves the historic viewscape.

A viewscape can include scenes, panoramas, vistas, visual axes and sight lines. In designed landscapes, a viewscape may have been established following the rules of pictorial composition: elements are located in the foreground, middle ground and background. A viewscape may also be the chief organizing feature when a succession of focal points is introduced to draw the pedestrian onward through a landscape.

The scale of a cultural landscape can produce emotional responses in people. Large landscapes either intimidate or inspire us, while small landscapes tend to make us feel comfortable. The texture of a given surface can also affect the perception of scale. For example, a street or courtyard covered in cobblestones or brick seems smaller than the same area covered in asphalt, a much smoother surface.

The visual relationships between elements of natural or designed landscapes, or heritage districts, can influence the user experience. For example, a tall building in a low-rise heritage district may be perceived as out of scale.

The addition of green technologies to a cultural landscape, such as wind turbines or solar panels, may affect its heritage value. While recognizing the importance of renewable energy sources, it is important to consider the visual impact these technologies may have on the cultural landscape. Visual impact assessments need to be integrated at an early stage in project planning so that potential impacts on the heritage value of the cultural landscape are clearly understood.

These guidelines provide general recommendations for the conservation of the visual relationships in a cultural landscape. Other relevant guidelines, such as Built Features and Vegetation, should be consulted when appropriate.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the visual relationships and how they contribute to the heritage value of the cultural landscape.	Undertaking interventions without understanding their impact on the visual relationships in the cultural landscape; for example, removing vegetation that was intended to frame an important view in the historic place.
2	Understanding designed landscapes, and the planning principles behind the visual relationships in the cultural landscape.	
3	Understanding the evolution of visual relationships. This could include using historic photographs or artwork to understand how the visual relationships may have changed or been lost over time.	
4	Documenting the visual relationships in the cultural landscape, including viewsapes and their foreground, middle ground and background; landmarks, edges and skyline; prospects, both to and from the historic place; and condition, before beginning project work.	Undertaking interventions that affect the visual relationships without completing a survey of characteristics and conditions.
5	Assessing the overall condition of the visual relationships early in the planning process so that the scope of work is based on current conditions.	
6	Protecting and maintaining the features that define the visual relationships by using non-destructive methods in daily, seasonal and cyclical tasks, such as pruning, to retain sight lines. This could also include maintaining the size and massing of vegetation and built features that contribute to the overall scale of the historic place.	Allowing visual relationships to be altered by incompatible development or neglect. Using maintenance methods that alter or obscure the visual relationships in the cultural landscape, such as removing planting that reduces the perceived size of a parking lot to make winter snow removal easier.
7	Retaining sound features that define the visual relationships in the cultural landscape, or deteriorated features that can be repaired or rejuvenated.	
8	Repairing or rejuvenating deteriorated parts of features that define the visual relationships using recognized conservation methods. Repair may also include the limited replacement in kind of those extensively deteriorated or missing parts of features. Repairs should match the existing work as closely as possible, both physically and visually.	Replacing a feature that defines the visual relationships when that feature can be repaired or rejuvenated. Using a substitute material for the replacement part that neither conveys the same appearance as the surviving parts of the feature, nor is physically and visually compatible.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
9	Replacing in kind extensively deteriorated parts of features that define the visual relationships where there are surviving prototypes. The new work should match the old in form and detailing.	Replacing an entire feature that defines the visual relationships when limited replacement of deteriorated or missing parts is possible.
10	Documenting all interventions that affect the visual relationships and ensuring that this documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
11	Rehabilitating the visual relationships, if an evaluation of their overall condition determines that more than preservation is required.	
12	Repairing or rejuvenating features that define the visual relationships, by using non-destructive methods and materials, such as regenerating vegetation that frames an important view.	Failing to perform necessary work, resulting in the loss of character-defining visual relationships. Replacing a feature that defines the visual relationships when repair is possible.
13	Replacing in kind an entire feature that is too deteriorated to repair.	Replacing an irreparable feature with a new feature that does not respect the visual relationships in the cultural landscape.
14	Replacing missing historic features by designing new features that are compatible with the visual relationships in the cultural landscape, based on physical and documentary evidence.	Introducing new features that are incompatible in size, scale, material, style and colour. Creating a false historical appearance because the new feature is based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

15	Designing a new feature when required by a new use that respects the historic visual relationships in the cultural landscape. This can include matching established proportions and densities, such as maintaining the overall ratio of open space to building mass in an urban heritage district when designing an infill building.	Introducing a new feature that alters or obscures the visual relationships in the cultural landscape, such as constructing a new building as a focal point, when a character-defining vista was traditionally terminated by the sky.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
16	Repairing or rejuvenating a deteriorated or declining feature that defines the visual relationships from the restoration period using a minimal intervention approach.	Replacing an entire feature that defines the visual relationships from the restoration period when repair or rejuvenation is possible. Using a substitute material for a replacement part that neither conveys the same appearance of the surviving features from the restoration period, nor is physically or visually compatible.
17	Replacing in kind an entire feature that defines the visual relationships from the restoration period when that feature is too deteriorated to repair, using the same configuration and design details. The new work should be well documented to guide future research and treatment.	Removing an irreparable feature from the restoration period and not replacing it, or replacing it with a new feature that does not respect the visual relationships in the cultural landscape.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

18	Removing or altering non character-defining features from periods other than the chosen restoration period.	Failing to remove non character-defining features from another period that confuse the visual relationships of the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

19	Recreating a missing feature important to the visual relationships that existed during the restoration period, based on physical, documentary and oral evidence.	Introducing a feature that was part of the original design, but was never actually built, or a feature that was thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.6 CIRCULATION

These guidelines provide direction when a circulation system or feature has been identified as a character-defining element of an historic place. Circulation refers to individual elements that facilitate or direct movement and travel, such as human or animal paths, traditional trails, roads, parkways, highways, railways, canals and portages. The linkages of such elements create circulation systems.



Circulation systems largely define the character of the Sault Ste. Marie Canal NHSC where a historic canal, paths, roadways, parking lots and railways converge in a very small area. Protecting and maintaining this landscape requires carefully managing the site's circulation infrastructure.

Various aspects of circulation can be character-defining. For example, in an urban context, historical circulation needs and subsequent patterns typically determined the alignment of streets. The water levels needed to maintain waterborne traffic are also important character-defining elements of a canal.

When describing a circulation feature or system, important characteristics may include: alignment; width; finished grade or gradients; surface materials; edge treatment; infrastructure and relationships with neighbouring features.

These guidelines provide general recommendations for the conservation of the circulation systems or features in a cultural landscape. Other relevant guidelines, such as Land Patterns and Spatial Organization, should be consulted when appropriate.



The Carré Royal in Sorel-Tracy, QC was first used for military exercises in 1780. In 1785, a military engineer drew up site plans in the shape of the Union Jack. In 1868, it was opened to the public as an urban park, which continues to this day. Its original layout of walkways, configured to match the original cross patterns of the Union Jack flag, is in full evidence. This is a fine example where a circulation pattern is considered an important character-defining element of a cultural landscape.



Alterations or new construction designed to meet requirements, such as accessibility, need to be carefully considered to respect the character-defining elements of a historic place. Accessibility requirements at Province House in Charlottetown required careful landscape assessment and rehabilitation in order to respect the original approach to the building. Here, the change in grade was limited to the building's middle section to preserve the view of the base course and sections of the original steps.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the heritage value of the circulation patterns and systems, and how they contribute to the heritage value of the cultural landscape.	
2	Understanding the evolution of circulation systems, including using aerial photographs to understand a transportation corridor's change from a two-lane road to a six-lane highway, or using archaeological methods and historical maps to locate pathways and roads not obvious from surface investigation. It may also include researching oral traditions and written documents to understand the heritage values that may be associated with circulation systems.	Undertaking project work without understanding the evolution of the circulation systems, such as changing road alignments and widths.
3	Documenting the characteristics of circulation systems, such as location, alignment, surface treatment, edge, grade, materials, infrastructure and condition before beginning project work.	Undertaking interventions that affect character-defining circulation systems, without preparing a survey of their characteristics and condition.
4	Assessing the overall condition of circulation systems early in the planning process, so that the scope of work is based on current conditions.	
5	Protecting and maintaining circulation systems by using non-destructive methods in daily, seasonal and cyclical tasks, including seasonal clearing of trails, or using rubberized blade edges on snow plows to prevent damaging stone curbs.	Using materials such as salts and chemicals that can accelerate the deterioration of surfaces.
6	Retaining sound circulation systems or deteriorated circulation systems that can be repaired.	
7	Stabilizing a deteriorated circulation system by using structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	
8	Repairing a deteriorated circulation system by patching, consolidating, or otherwise reinforcing, using recognized conservation methods. Repair may also include the limited replacement in kind of those extensively deteriorated or missing parts of the circulation systems.	Removing a deteriorated circulation system that could be stabilized or repaired.
9	Replacing in kind extensively deteriorated parts of the circulation system where there are surviving prototypes. The new work should match the old in form and detailing.	Replacing an entire feature, such as a stone curb, when limited replacement of deteriorated and missing parts is possible.
10	Documenting all interventions that affect the circulation system, and ensuring that this documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
11	Repairing extensively deteriorated circulation features by using non-destructive methods and materials.	Replacing or altering features and materials of a circulation system when repair is possible.
12	Replacing a deteriorated circulation feature by using the physical evidence of its form, detailing and alignment to reproduce it. If using the same kind of material is not technically, economically or environmentally feasible, then a compatible substitute material may be considered; for example, replacing the decayed timber edge in kind along an historic trail. The replacement feature should be as similar as possible to the original, both visually and functionally.	Replacing an irreparable feature with a new feature that does not convey the same visual appearance.
13	Replacing a missing historic feature by designing a new feature compatible with the circulation of the cultural landscape, based on physical and documentary evidence.	Creating a false historical appearance because the new feature is incompatible, or based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

14	Designing and installing a new circulation feature, when required by a new use, that is compatible with the heritage value of the historic place, including controlling and limiting new access points and intersections along an historic road.	<p>Installing a new circulation feature in a way that detracts from the historic circulation pattern; for example, creating a new bike path when an existing path can accommodate the new use.</p> <p>Introducing a new circulation feature that is visually incompatible in terms of scale, alignment, surface treatment, width, edge treatment, grade, materials or infrastructure.</p>
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ACCESSIBILITY CONSIDERATIONS

15	Complying with accessibility requirements in a manner that conserves character-defining circulation systems or features.	Damaging character-defining circulation systems or features while making modifications to comply with accessibility requirements.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
16	Repairing a deteriorated circulation feature from the restoration period using a minimal intervention approach.	Replacing an entire circulation feature from the restoration period when repair is possible.
17	Replacing in kind an entire circulation feature from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable circulation feature from the restoration period that is beyond repair and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

18	Removing or altering non character-defining circulation features from periods other than the chosen restoration period.	Failing to remove non character-defining circulation features from another period that confuse the depiction of the circulation system during the restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

19	Recreating a missing circulation feature that existed during the restoration period, based on physical, documentary and oral evidence, such as duplicating paving patterns based on surviving prototypes.	Installing a circulation feature that was part of the original design, but was never actually built, or constructing a new circulation feature thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.7 ECOLOGICAL FEATURES

These guidelines provide direction when an ecological feature has been identified as a character-defining element of an historic place. In the context of these guidelines, an ecological feature is a natural element, such as a marsh, a pond or a stand of trees, which can be part of a larger ecosystem. While ecosystems at an historic place should be evaluated and managed for their natural values by ecologists and other natural resource specialists, these guidelines apply only to the features of those ecosystems determined to have heritage value.



The Melanson Settlement in Annapolis, NS reflects Acadian family communities that settled along the Dauphin (now Annapolis) River, and a form of agriculture unique in North America. One of the site's character-defining elements is the nearness of this settlement to salt marshes that embody natural and ecological values. Documenting and understanding the structure, function and dynamics of this ecological feature is an important step before working on the site.

Ecological features vary in size but are typically studied at the scale of a pond or stand of trees. Character-defining ecological features are also found in urban areas. When using these guidelines, it is important to work with natural resource conservation and environmental assessment specialists, and where appropriate, with aboriginal groups and other partners and stakeholders to ensure that diverse knowledge and information are used to conserve the natural structure, function and dynamics of the entire ecosystem.

The potential for adverse environmental impacts (e.g., introduction or re-introduction of invasive species) must also be considered, regardless of whether it is required by environmental assessment or related legislation. The pan-Canadian approach to ecological restoration described in the "Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas" (Parks Canada and the Canadian Parks Council, 2008) provides additional guidance on integrating consideration of natural and cultural heritage values in conservation planning and intervention. This document is particularly relevant when rehabilitation or restoration is the selected approach.

Ecological features are character-defining elements of many Aboriginal cultural landscapes where traditional practices have been sustained for centuries. In addition, ecological features associated with an historic place can extend far beyond its established boundaries.

These guidelines provide general recommendations for the conservation of ecological features in a cultural landscape. Other relevant guidelines, such as Vegetation and Water Features, should be consulted when appropriate.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the ecological features and how they contribute to the natural and cultural heritage value of the cultural landscape.	
2	Understanding the natural structure, function and dynamics of the ecological feature and of the ecosystem of which it is part.	
3	Documenting the characteristics and condition of the ecological feature and its relationship with the ecosystem of which it is a part, before beginning project work. Documentation should combine the best available scientific and traditional knowledge.	Undertaking interventions that affect a character-defining ecological feature without first documenting and understanding its characteristics, relationships, evolution and condition.
4	Assessing the overall condition of the ecological feature early in the planning process, so that the scope of work is based on an understanding of current conditions and predicted changes.	
5	Protecting and maintaining the ecological feature by using non-destructive methods in daily, seasonal and cyclical tasks.	Allowing ecological features to degrade by incompatible development or neglect. Using maintenance methods that damage or destroy an ecological feature.
6	Retaining intact ecological features and degraded ecological features that can be returned to good ecological condition.	Replacing degraded ecological features that could be returned to good ecological condition; for example, clear cutting a declining forest stand to create a parking lot or meadow.
7	Repairing degraded ecological features or parts of ecological features using recognized methods and trained personnel; for example, using a certified arborist to heal a mature tree. The work should be physically and visually compatible with the cultural and natural heritage values of the cultural landscape.	Removing ecological features or parts of ecological features that could be conserved, or using untested methods and untrained personnel, thus causing further damage to fragile features and relationships.
8	Replacing extensively degraded or missing ecological features or parts of ecological features based on physical and documentary evidence; for example, replanting a documented shrub species lost through erosion, with the same native species from a local source.	Replacing an entire ecological feature, such as a stand of trees, when limited replacement of deteriorated and missing parts (e.g., one or a few trees) is possible.
9	Documenting all interventions that affect the ecological feature, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Repairing or rejuvenating extensively deteriorated ecological features by using non-destructive methods and materials, such as planting native species to facilitate the regeneration of a deteriorated meadow.	Failing to perform necessary work, including removing invasive species, resulting in the loss of ecological features and their components.
11	Replacing in kind an entire ecological feature that is too deteriorated to repair, such as replanting a clear-cut stand of trees with locally obtained saplings, and in similar density.	

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

12	Introducing a new element, when required by a new use, that does not have a negative impact on the heritage value and condition of the ecological feature.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
13	Restoring an ecological feature if an evaluation of its overall condition determines that more than preservation is required; i.e., if an intervention on the ecological feature is necessary to sustain it into the future. For example, removing invasive tree species from a character-defining escarpment and replanting it with a mix of plant material corresponding to the natural conditions of the escarpment. This work should be based on physical and documentary evidence.	Restoring an ecological feature to an historic condition that is no longer sustainable given current physical and ecological conditions, including climate.
14	Repairing or rejuvenating a declining ecological feature that contributes to the sustainability of the cultural landscape, by using non-destructive methods.	Replacing an entire ecological feature when repair or rejuvenation is possible, or using destructive repair or rejuvenation methods, causing further damage to the ecological feature.
15	Replacing in kind an entire ecological feature that contributes to the sustainability of the cultural landscape when that feature is too deteriorated to repair or rejuvenate. The new work should be well documented to guide future research and treatment.	Removing an ecological feature that is beyond repair and not replacing it, or replacing it with an inappropriate ecological feature.

4.1.8 VEGETATION



Honeywood Nursery in Saskatchewan was established and operated by Dr. A. J. (Bert) Porter, a self-taught, award-winning horticulturalist who developed many fruits and ornamental plants capable of thriving on the Prairies. The property's planting beds, orchards and examples of various plant varieties are character-defining elements that illustrate Mr. Porter's contributions to the development of Saskatchewan's horticulture.

These guidelines provide direction when vegetation has been identified as a character-defining element of an historic place. For direction on how to treat vegetation as part of a natural system that is a character-defining element, also refer to the Guideline on Ecological Features.

Vegetation refers to trees, shrubs, herbaceous plants, grasses, vines, aquatic and wetland plants, and other living plant material. Vegetation may include individual plants, such as a sentinel (single specimen) tree in a pasture, or specimen trees in a garden; designed groupings, such as hedges, *allées* and perennial borders; and groupings used to control sun and wind patterns.

Vegetation can also refer to planted crops, re-forested hillsides and naturally occurring plant communities.

Vegetation may have historical associations as well as functional and aesthetic qualities. As well, vegetation may have historical and scientific value, which can contribute to maintaining the biodiversity of native, horticultural or agricultural varieties.

Vegetation in a cultural landscape can also represent the genetic repository of species once present, but now largely disappeared.

Vegetation is often the most dynamic and memorable feature in a cultural landscape. In addition to the continuous cycle of growth and decay, there will be variations in form, colour and canopy across the seasons. In describing vegetation as a character-defining element, the following concepts should be considered: growth habit, including juvenile or mature form; leaf and bloom; colour and texture; bark; bloom periods; fruit; fragrance; and context. Vegetation also contributes to other character-defining elements, such as land patterns, visual relationships and spatial organization.

These guidelines provide general recommendations for the conservation of vegetation in a cultural landscape. Other relevant guidelines, such as Ecological Features and Spatial Organization, should be consulted when appropriate.



The Trappist Monastery Ruins recall a complex of religious architecture unique to Manitoba and the early French-speaking Métis community. Damaged by fire in 1983, the stabilized ruins, and the grounds featuring mature trees, expanses of lawn and open fields, now form the Trappist Monastery Provincial Heritage Park. Protecting and maintaining the vegetation is essential to preserving the site's historical values.



A large site in Calgary's inner city that evolved during the early 20th century, this naturalistic rock garden is significant for its association with the noted horticulturalist William Reader and as a botanical laboratory to study the receptivity of Alberta's soils to a variety of plant species. The extensive arrangements of local rocks and plantings, many of which had become overgrown, were meticulously restored using careful plant analysis and by referring to William Reader's own detailed documentation.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding vegetation and how it contributes to the heritage value of the cultural landscape.	
2	Understanding the evolution of a landscape's vegetation over time, using archival resources, such as plans and photographs or, when appropriate, archaeological analysis or minimally destructive techniques. This could include using resistivity testing to determine the age of a tree, or understanding the heritage value of a vegetation feature, such as the oak as a symbol of fortitude.	Undertaking interventions, such as indiscriminately clearing a woodland understorey without understanding its impact on historic vegetation.
3	Understanding the roles of people, animals and insects in producing and maintaining the existing vegetation.	
4	Documenting the extent and condition of vegetative cover in forests, woodlands, meadows, planted and fallow fields, and the genus, species, calibre, height, colour, form and texture of significant, individual tree specimens, before beginning project work.	Undertaking interventions that affect character-defining vegetation, without preparing a survey of existing plant material and its condition.
5	Assessing the overall condition of the vegetation early in the planning process so that the scope of work is based on current conditions.	
6	Protecting and maintaining the vegetation by using non-destructive methods and daily, seasonal and cyclical tasks, including pruning or establishing colonies of beneficial insects that protect fruit trees from pests.	Failing to perform preventive maintenance on character-defining vegetation.
7	Using maintenance practices that respect the habit, form, colour, texture, bloom, fruit, fragrance, scale and context of the vegetation.	Using maintenance practices and techniques that fail to recognize the individual plant materials' uniqueness. Examples include poorly timed pruning or application of insecticide, which may alter fruit production.
8	Using traditional horticultural and agricultural maintenance practices when those techniques are critical to maintaining the vegetation's character, such as manually removing dead flowers to ensure continuous bloom.	
9	Retaining and perpetuating vegetation by preserving seed collections and stock cuttings to preserve the genetic pool.	Failing to propagate vegetation from original stock cuttings, when few or no known sources for replacement are available.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
10	Securing and protecting deteriorated vegetation by structural reinforcement, or correcting unsafe conditions, as required, until additional work is undertaken; for example, using steel cables to support large branches.	Failing to secure and protect deteriorated vegetation, thus putting it at risk of further deterioration.
11	Replacing in kind extensively deteriorated or missing parts of vegetation where there are surviving prototypes. The new plantings should match the old in species, colour and texture.	<p>Removing deteriorated vegetation that could be stabilized and conserved, or using untested techniques and untrained personnel, thus causing further damage to fragile elements.</p> <p>Introducing or re-introducing a species or variety that is known or suspected to be invasive.</p> <p>Replacing entire vegetation when limited replacement of deteriorated and missing parts is appropriate.</p> <p>Using replacement material that does not match the historic vegetation.</p>
12	Documenting all interventions that affect the vegetation, and ensuring that this documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
13	Rejuvenating historic vegetation by corrective pruning, deep-root fertilizing, aerating the soil, renewing seasonal plantings, and/or grafting onto historic root stock.	Replacing vegetation when rejuvenation is possible, including removing a deformed or damaged plant when corrective pruning could be successfully employed.
14	Replacing a deteriorated or declining vegetation feature with a new feature, based on the physical evidence of its composition, form and habit. If using the same kind of material is not technically, economically or environmentally feasible, then a compatible substitute material may be considered. For example, a diseased sentinel tree in a meadow may be replaced with a disease-resistant tree of similar type, form, shape and scale.	Replacing a deteriorated feature with a new feature that does not convey the same appearance, such as replacing a large, declining canopy tree with a dwarf flowering tree.
15	Replacing missing historic features by installing a new vegetation feature. It may be a new feature that is compatible with the habit, form, colour, texture, bloom, fruit, fragrance, scale and context of the historic vegetation; for example, replacing a lost vineyard with hardier stock similar to the historic plant material.	Creating a false historical appearance because the replacement vegetation is based on insufficient physical, documentary and oral evidence.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
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ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

16	<p>Introducing new vegetation, when required by a new use, to ensure that the heritage value of the cultural landscape is preserved, including planting a hedge to screen new construction.</p>	<p>Placing a new feature where it may cause damage or is incompatible with the character of the historic vegetation; for example, erecting a new building or structure that adversely affects the root systems of historic vegetation.</p> <p>Locating a new vegetation feature that detracts from, or alters the historic vegetation; for example, introducing exotic species in a landscape historically comprised of only indigenous plants.</p> <p>Introducing a new vegetation feature that is incompatible in terms of its habit, form, colour, texture, bloom, fruit, fragrance, scale or context.</p>
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
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17	<p>Rejuvenating declining vegetation from the restoration period by corrective pruning, deep-root fertilizing, aerating the soil, renewing seasonal plantings, and/or grafting onto historic stock.</p>	<p>Replacing vegetation from the restoration period when rejuvenation is possible, or using destructive repair methods, thus causing further damage to fragile plant material.</p>
18	<p>Replacing in kind a declining vegetation feature from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the feature. The new work should be well documented to guide future research and treatment.</p>	<p>Removing a deteriorated vegetation feature from the restoration period and not replacing it, or replacing it with a new feature that does not convey the same appearance.</p>

REMOVING EXISTING FEATURES FROM OTHER PERIODS

19	<p>Removing or altering non character-defining vegetation from periods other than the chosen restoration period, such as removing later foundation planting or aggressive exotic species.</p>	<p>Failing to remove non character-defining vegetation from another period that confuses the depiction of the chosen restoration period.</p>
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

20	<p>Recreating a missing vegetation feature that existed during the restoration period, based on physical, documentary and oral evidence. For example, replanting crop types based on pollen analysis.</p>	<p>Planting vegetation that was part of the original design, but was never installed, or installing vegetation thought to have existed during the restoration period, but for which there is insufficient documentation.</p>
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4.1.9 LANDFORMS

These guidelines provide direction when a landform has been identified as a character-defining element of an historic place. Landform refers to the shape of the Earth's surface at a particular place.

Some naturally occurring landforms include mountains, hills, canyons, valleys and plains. Human-made landforms include terraces, embankments, *ramparts*, *berms*, ditches and *swales*. When describing a particular landform, whether natural or built, it is important to consider shape, slope, dimensions and geological material, such as sand and silt.



Landforms can be natural, such as hills and plains, or they can be human-engineered. Dramatic examples of human-engineered landforms are the early 20th century tailing fields in the Yukon's Klondike Gold Fields. These views help define and interpret Dredge #4 NHSC.

Naturally occurring landforms may have been significant factors in determining the location and development of a cultural landscape; for example, choosing to build a fortress on high land for military advantages.

Throughout history, human beings have used landforms as landmarks and manipulated natural topography for functional and aesthetic reasons: *swales* remove water from building foundations; ditches keep roads dry; *berms* provide wind shelter or hide undesirable views; *ramparts* and *glacis* provide unobstructed surveillance; and paired embankments frame views.

These guidelines provide general recommendations for the conservation of the landforms of a cultural landscape. Other relevant guidelines, such as Evidence of Land Use and Circulation, should be consulted when appropriate.



The Frank Slide is the site of a catastrophic landslide in spring 1903 that destroyed part of the town of Frank, Alberta. One of the largest landslides in Canadian history, it is historically significant for its impact on the area's mining communities. It is geologically interesting for the information it yields on the dynamics of large-scale rock slides. Barren of vegetation and devoid of buildings, the boulder-strewn debris field extending across the valley floor is a character-defining landform that is maintained due to a moratorium on development.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding landforms and how they contribute to the heritage value of the cultural landscape.	
2	Understanding the evolution of landforms over time, using archival resources, such as plans and aerial photographs. This can also include archaeological analysis or oral history to understand the landforms and any cultural values associated with them.	Undertaking interventions without understanding its impact on historic landforms.
3	Documenting the geological material, elevation, slope, shape, orientation, contour, condition and function of landforms before beginning project work.	Undertaking project work that will affect landforms without documenting the existing topographic variation, condition and function.
4	Assessing the overall condition of landforms early in the planning process so that the scope of work will be based on current conditions.	
5	Protecting and maintaining landforms by using non-destructive methods in daily, seasonal and cyclical tasks. This may include mowing vegetative cover to reveal the landform.	Allowing landforms to be altered by incompatible development or neglect.
6	Retaining sound landforms or deteriorated landforms that can be repaired or reinstated.	
7	Repairing or reinstating a deteriorated feature of the landform, using recognized conservation methods. Repair may also include the limited replacement in kind of those extensively deteriorated or missing parts of landforms. Repairs should match the existing work as closely as possible, both physically and visually.	Replacing landforms that can be repaired or reinstated.
8	Replacing in kind extensively deteriorated or missing parts of the landform where there are surviving prototypes. The new work should match the old in form and detailing.	Replacing an entire feature of the landform when limited replacement of deteriorated or missing parts is possible.
9	Documenting all interventions that affect the landform, and ensuring that this documentation will be available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Repairing or reinstating an extensively deteriorated or missing landform. This could include re-excavating a silted swale through appropriate re-grading, or re-establishing an eroding agricultural terrace.	Modifying the shape, slope, elevation or contour of a landform when repair is possible.
11	Replacing in kind an entire feature of a landform, using the physical evidence of its form and composition.	Replacing an irreparable feature with a new feature that does not convey the same visual appearance, for example, changing stepped terracing to a graded slope.
12	Replacing missing historic features by designing new features that are compatible with the landforms of the cultural landscape, based on physical, documentary and oral evidence.	Creating a false historical appearance because the new feature is based on insufficient physical, documentary or oral evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

13	Designing a new feature when required by a new use that is compatible with the character-defining landform.	Introducing a new feature where it may alter the character-defining landform. This could include failing to provide proper drainage for a new feature, resulting in the decline or loss of an historic landform.
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ACCESSIBILITY CONSIDERATIONS

14	Respecting the landform when locating new accessibility-related features. For example, introducing a gently sloped walkway instead of a constructed ramp with handrails.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
15	Repairing or reinstating a declining landform feature from the restoration period using a minimal intervention approach.	Replacing an entire landform feature from the restoration period when repair or reinstatement is possible.
16	Replacing in kind an entire landform feature from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented to guide future research and treatment.	Removing a deteriorated landform feature from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

17	Removing or altering non character-defining landform features from periods other than the chosen restoration period.	Failing to remove non character-defining features from another period that confuse the depiction of the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

18	Recreating a missing landform feature from the restoration period, based on physical, documentary and oral evidence; for example, recreating a trench and fortification from the restoration period based on stratigraphic research.	Introducing a feature that was part of the original plan but that never actually existed, or a feature that was thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.10 WATER FEATURES

These guidelines provide guidance when a water feature is identified as a character-defining element of an historic place. Water features can include constructed elements, such as canals, ponds, reflecting pools and fountains as well as natural elements, such as lakes, rivers and streams. Their role may be functional or aesthetic, or a combination of both.

Water features may be part of the natural hydrology of the historic place, or fed artificially from a separate, dedicated water source. When assessing a constructed water feature, the water supply, drainage and mechanical system required for its functioning should be identified. Additionally, shape, dimensions, materials, water level and quality, flow rate, reflectivity and associated plant and animal life should be listed as important characteristics.

These guidelines provide general recommendations for the conservation of water features in a cultural landscape. For direction on conserving natural water features that are part of a larger ecosystem, refer to the Guidelines for Ecological Features. For recommendations on specific materials that make up constructed water features, refer to the Guidelines for Materials. Other relevant guidelines, such as Built Features and Vegetation, should be consulted when appropriate.



Beaver Lake is a constructed pond that has become a central feature in Montreal's Mount Royal Park, within the natural and historic district of Mount Royal. Its intense use throughout the seasons puts great pressure on its condition. Protecting and maintaining water features includes daily, seasonal and cyclical tasks. Maintaining a constructed water feature's mechanical, plumbing and electrical systems is essential to ensure the appropriate depth and quality of water.



GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the water feature and how it contributes to the heritage value of the cultural landscape.	
2	Understanding the evolution of water features over time and their role in the overall hydrology of the landscape. This includes using archaeological techniques to determine the changing path of a watercourse, using infrared aerial photographs to map hydrological patterns.	Undertaking interventions without understanding the evolution of water features.
3	Documenting water features before beginning project work. Documentation should include shape, edge and bottom condition and materials; water level, sound and reflective qualities; associated plant and animal life; water quality; natural erosion and flooding; and overall condition.	Undertaking interventions that affect the water features and associated hydrology, without undertaking a survey of their character and condition.
4	Assessing the overall condition of water features early in the planning process, so that the scope of work is based on current conditions.	
5	Protecting and maintaining water features by using non-destructive methods in daily, seasonal and cyclical tasks, such as cleaning leaf litter or mineral deposits out of drainage inlets or outlets.	Allowing water features to be altered by incompatible development, maintenance methods or neglect.
6	Retaining sound or deteriorated water features that can be repaired or rejuvenated.	
7	Stabilizing deteriorated water features by using structural reinforcement, weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	
8	Repairing deteriorated water features using recognized conservation methods. Repair may also include the limited replacement in kind of extensively deteriorated or missing parts of water features. Repairs should match the existing work as closely as possible, both physically and visually.	Removing deteriorated water features that could be stabilized or repaired.
9	Maintaining a built water feature's mechanical, plumbing and electrical systems to ensure appropriate depth of water or direction of flow, including maintaining the timing and sequencing mechanisms for irrigation systems.	Allowing mechanical systems to fall into a state of disrepair, resulting in degradation of the water feature. For example, allowing algae to develop because a pool's aeration system is not maintained.
10	Replacing in kind extensively deteriorated or missing parts of water features where there are surviving prototypes. The new work should match the old in form and detailing.	Replacing an entire water feature when limited replacement of deteriorated and missing parts is possible

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Testing interventions to establish appropriate replacement materials, quality of workmanship and methodology. This includes reviewing samples, testing products, methods or assemblies, or creating a mock-up.	
12	Documenting all interventions that affect the water features, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
13	Repairing extensively deteriorated water features by reinforcing materials or improving mechanical systems. For example, patching a crack in a pond liner, or repairing a failed pump mechanism.	Replacing or removing water features or systems when repair is possible.
14	Replacing in kind a deteriorated water feature by using the existing physical evidence of its form, depth and detailing, to reproduce it. If using the same kind of material is not technically or environmentally feasible, then a compatible substitute material may be considered; for example, replacing a lead pond liner with a plastic one. The replacement feature should be as similar as possible to the original, both visually and functionally.	Replacing a water feature with a new feature that does not convey the same appearance, including, replacing a single orifice nozzle with a spray nozzle, changing an historic fountain's appearance from a single stream of water to a mist-like stream.
15	Replacing missing historic features by designing new features compatible with the water features of the cultural landscape, based on physical, documentary and oral evidence. For example, a lost irrigation feature may be replaced by using materials that convey the same appearance.	Introducing new features that are incompatible in size, scale, material, style and colour, such as replacing a natural pond with a manufactured pool. Creating a false historical appearance because the replaced features are based on insufficient physical, documentary and oral evidence.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
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ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

16	Designing and installing a new water feature, when required, by a new use in a way that preserves the cultural landscape's heritage value. For example, locating a new retention basin in a secondary or non-character-defining space.	Placing a new water feature where it may cause damage or is incompatible with the heritage value of the cultural landscape, such as, locating a Baroque fountain within a Picturesque-style garden.
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HEALTH AND SAFETY CONSIDERATIONS

17	Complying with the health and safety requirements, in a manner that minimizes the impact on heritage value.	Damaging or destroying features while making modifications to comply with health and safety requirements.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
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18	Repairing deteriorated water features from the restoration period by reinforcing the materials that comprise those features. Repairs include the limited replacement in kind of those extensively deteriorated or missing parts of features, when there are surviving prototypes.	Replacing an entire water feature from the restoration period, when repair or limited replacement of deteriorated or missing parts is appropriate, or using destructive repair methods that damage the water feature.
19	Replacing an entire water feature from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing a deteriorated water feature from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

20	Removing or altering non character-defining water features from periods other than the chosen restoration period, such as a later retention pond that is no longer needed.	Failing to remove non character-defining water features from another period that confuses the depiction of the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

21	Recreating a missing water feature that existed during the restoration period, based on physical, documentary and oral evidence. An example could include recasting a fountain from its original mould.	Creating a water feature that was part of the original design, but was never actually built, or constructing a water feature thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.1.11 BUILT FEATURES

These guidelines provide direction when the built features of a cultural landscape have been identified as character-defining elements of an historic place. Built features can include archaeological remains; residential, commercial and institutional buildings; structures, such as dams or bridges; and caribou fences. A building may play a role as a character-defining element in a cultural landscape, in



The East Gate Entrance Building at Manitoba's Riding Mountain National Park is a character-defining element of this cultural landscape that needs to be protected.

addition to having its own heritage value. Smaller features, such as gazebos, fences, free-standing walls and *statuary*, as well as site furnishings, such as benches, light standards and drinking fountains, are also built features. Built features may also include culturally significant objects or constructed symbols, such as *inukshuks*, crosses and medicine wheels.

Modern cultural landscapes, such as campuses and plazas, were planned and designed as a cohesive whole. Adding new features to satisfy regulatory requirements, such as ramps, guardrails and *bollards*, could affect their heritage value. Additions to recent cultural landscapes should be undertaken with the utmost respect and care, and complement the heritage value of the historic place.

Interpretive panels and directional signs are often added to historic places. If appropriate, these interventions should be integrated into the landscape in a manner that does not impair its heritage value.

These guidelines provide general recommendations for built features in a cultural landscape. When the built feature is an archaeological site, a building, or part of an engineering work, refer to the specific guidelines for those categories of historic places. For recommendations on specific materials that make up built features, refer to the Guidelines for Materials. Other relevant guidelines, such as Water Features and Spatial Organization, should be consulted when appropriate.



Key elements that define the modern heritage character of the former Ottawa City Hall include the ornamentation of the building's exterior with publicly commissioned art work. Exterior elements that contribute to the heritage value of a place should be part of a cyclical maintenance program to the same level as the building itself.



The original weathered sandstone gravemarker for John Parot's Grave is one of the oldest in Newfoundland and Labrador. It was replaced with a wooden replica made by a local resident, while the original was taken away for conservation.



The character-defining elements of Habitat 67 in Montreal include modern urban concrete furniture. These built features of the landscape complement and reinforce the building's forms, materials and colour.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the built features and how they contribute to the heritage value of the cultural landscape.	
2	Understanding the evolution of built features over time. Examples could include, using historic aerial photographs to understand the relationship of windmills, silos and water troughs in a ranch compound, or the placement of cairns on a jump site.	Undertaking project work without understanding the evolution of built features.
3	Documenting the function, condition, materials and surroundings of built features and the relationship of those features to each other and to the historic place, before beginning project work.	Undertaking interventions that affect the built features without conducting a survey of conditions, materials, surroundings and interrelationships.
4	Assessing the overall condition of built features early in the planning process so that the scope of work is based on current conditions.	
5	Protecting and maintaining the built features by using non-destructive methods in daily, cyclical and seasonal tasks. This may include limited rust or paint removal and reapplication of protective coating systems in kind.	Using maintenance practices and materials that are abrasive or unproven; for example, using potentially damaging cleaning methods, such as grit blasting on wood, brick or soft stone, or using harsh chemicals on masonry or metals.
6	Retaining sound built features or deteriorated built features that can be repaired.	
7	Stabilizing a deteriorated built feature by using structural reinforcement, weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	
8	Repairing a deteriorated built feature by using recognized conservation methods. Repair may also include the limited replacement in kind of those extensively deteriorated or missing parts of built features.	Removing a deteriorated built feature that could be stabilized or repaired.
9	Replacing in kind extensively deteriorated parts of built features where there are surviving prototypes. The new work should match the old in form and detailing.	Replacing an entire built feature when limited replacement of deteriorated and missing parts is possible.
10	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This may include reviewing samples, testing products, methods or assemblies, or creating a mock-up.	
11	Documenting all interventions that affect the built features, and ensuring that this documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
12	Repairing extensively deteriorated built features by using non-destructive methods and materials.	Replacing an entire built feature when repair or limited replacement of deteriorated or missing parts is possible.
13	Replacing in kind an entire built feature by using the physical evidence of its form, material and detailing to reproduce it. If using the same kind of material is not technically, economically or environmentally feasible, then a compatible substitute material may be considered; for example, replacing redwood decking with cedar, a less endangered species. The replacement feature should be as similar as possible to the original, both visually and functionally.	Replacing an irreparable built feature with a new feature that does not convey the same visual appearance.
14	Replacing missing historic features by designing new built features that are compatible with the cultural landscape and based on physical, documentary and oral evidence.	Creating a false historical appearance because the new built feature is incompatible, or based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO A CULTURAL LANDSCAPE

15	Designing a new built feature, when required by a new use, to be compatible with the heritage value of the cultural landscape. For example, erecting a new farm outbuilding, using traditional form and materials, or installing signs and lighting compatible with the cultural landscape.	Locating a new built feature in a manner that undermines the heritage value of the cultural landscape. Introducing a new built feature, such as an interpretive panel, that is visually incompatible with the cultural landscape.
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HEALTH AND SAFETY CONSIDERATIONS

16	Complying with the health and safety requirements, in a manner that minimizes impact on the character-defining elements of the cultural landscape.	
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ACCESSIBILITY CONSIDERATIONS

17	Finding solutions to meet accessibility requirements that are compatible with the built feature. For example, introducing a gently sloped walkway instead of a constructed ramp with handrails in a manner that does not detract from the built feature.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
18	Repairing deteriorated built features from the restoration period by reinforcing the materials and assemblies that comprise those features. Repairs will also generally include the limited replacement—preferably in kind—of those extensively deteriorated or missing parts of features when there are surviving prototypes. The new work should be unobtrusively dated to guide future research and treatment.	Replacing an entire built feature from the restoration period when repair or limited replacement of deteriorated or missing parts is possible, or using destructive repair methods, causing further damage to fragile historic material.
19	Replacing in kind an entire built feature from the restoration period that is too deteriorated to repair, using the same configuration and design details. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing a deteriorated built feature from the restoration period and not replacing it, or replacing it with an inappropriate new feature.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

20	Removing or altering non character-defining built features from periods other than the chosen restoration period.	Failing to remove non character-defining built features from another period that confuse the depiction of the chosen restoration period.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

21	Recreating a missing built feature that existed during the restoration period, based on physical, documentary and oral evidence, such as duplicating a corn crib from an existing <i>prototype</i> .	Installing a built feature that was part of the original design, but was never actually built, or constructing a built feature that was thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.2

GUIDELINES FOR ARCHAEOLOGICAL SITES



Archaeological sites fall under several categories and settings. Clockwise, from top left: the excavations at the Mansion House at Ferryland in Newfoundland and Labrador are an example of historical archaeology; Fathom Five National Marine Park in Ontario illustrates underwater archaeology; Writing-on-Stone Provincial Park in Alberta contains specimens of rock art; and Sirmilik National Park in Nunavut is a pre-contact site.

4.2

GUIDELINES FOR ARCHAEOLOGICAL SITES

Archaeological sites are places or areas where tangible evidence of past human activity is located *in situ* on, below or above ground, or on lands under water. In the context of historic places, Archaeological sites fall under two categories, and these guidelines apply to both. They are:

1. Archaeological sites that are historic places because they have been formally recognized by an authority as having *heritage value*;
2. Archaeological sites that are part of an historic place, such as a building, engineering work, cultural landscape or heritage district, and that contribute as *character-defining elements* to that historic place's *heritage value*.

An archaeological site is characterized by its environment including stratified deposits with physical traces of the site's formation that help determine its age and interpret its complexity. A site can also include one, or a combination of, the following character-defining elements:

- Features, such as postholes, hearths, stone tool manufacture areas, industrial staging areas, cairns and rock art, and natural features that have cultural significance;
- Structures, such as remains of stone walls, industrial machinery, fish weirs, tent rings and wharves, which can be below or above-ground, or underwater;



Because their character-defining elements are often submerged or underground, a large number of archaeological sites are not accessible. Communicating their heritage value is a challenge. Exposed remains, such as at the ones at Champs-de-Mars, Montreal not only add to our knowledge of past times and people, but they can also enrich our environment.

- *Archaeological objects*, such as artifacts, soil and botanical samples, animal remains, pollen, or any specimen associated with the site that provides information on its characteristics, function and significance;
- Physical places with evidence of human activity identified through local knowledge or oral tradition;
- Spatial relationships between the features, structures, objects and physical places identified above.

These elements embody the heritage value of the archaeological site. *Character-defining elements* may include elements of aesthetic, historic, scientific, cultural, social or spiritual importance, and intangible qualities and uses. A site's heritage value may lie as much in the information contained in the elements as in their evocative force, as vestiges of past histories.

Federal, provincial and territorial authorities maintain extensive inventories of archaeological sites that often include information on location, type of resources, state of conservation and time period. However, only a fraction of known archaeological sites are formally recognized in Canada. When such information is available in the inventories, it should be taken into account before conducting an intervention that may affect archaeological resources.

In principle, archaeological sites should be preserved *in situ* by limiting negative impacts on the site's physical integrity. However, in situations where preservation is threatened, a controlled archaeological investigation should be undertaken, using the highest recording standards to document the site's physical features. This would include situations where:

- Natural impacts threaten the site;
- Assessment demonstrates that unavoidable conflicts with a proposed project could jeopardize the site's heritage value;
- An archaeological research project is planned to enhance the site's heritage value by contributing to knowledge about the site or historic place.

ARCHAEOLOGICAL SITES AND THE NATURAL ENVIRONMENT

The maintenance of archaeological sites relies on periodic evaluations, and focuses on the archaeological site and its natural environment. Monitoring environmental conditions can help preserve archaeological sites and maintain the balance between the site and its environment.



The physical integrity of this excavated archaeological site at Fort Battleford, Saskatchewan, was temporarily protected from accidental disturbance by covering the ground with plastic sheets and erecting a small barrier fence. As required by law, the archaeological intervention was authorized and a permit was obtained before excavation began.

Any intervention or maintenance activity on historic places should endeavour to safeguard archaeological sites based on their contribution to the historic place's *heritage value*. An intervention planned on an archaeological site or area containing an archaeological site should involve an archaeologist and, where appropriate, other field scientists, conservators, architects, engineers, Elders and other knowledge keepers.

Before a conservation intervention takes place, essential steps must be taken to implement an appropriate conservation strategy. This would include, understanding the historic place's heritage value and character-defining elements; thoroughly planning the proposed intervention; and identifying an appropriate use of the place. Additionally, most jurisdictions require that archaeological impact assessments be performed before any project is undertaken.

When carrying out interventions at an historic place, new archaeological resources may be discovered that directly relate to the historic place's heritage value. In this situation, impact assessments should be carried out to evaluate the significance of a newly discovered resource, and how this will impact on the historic place's heritage value.

Because most archaeological investigations in Canada are performed as impact assessments, these guidelines are useful in guiding the evaluation, planning and mitigation measures required at historic places. The principle of minimal intervention should always guide any actions affecting archaeological sites.

Archaeology and the Law

All provinces and territories have legislation that protects, to varying degrees, the physical evidence connected to archaeological sites. Generally, this legislation provides for:

- Protecting and managing archaeological sites and resources;
- Issuing permits to qualified archaeologists for archaeological investigations;
- Carrying out archaeological impact assessments prior to development, or activities that may have an impact on the site;
- Identifying repositories for the archaeological objects collected;
- Discussing plans with affected groups;
- Issuing stop work orders when accidental discoveries are made, and/or human remains are discovered.

There is no federal legislation specific to archaeological sites on federal lands. The *Canadian Environmental Assessment Act* is the main, relevant federal legislation. The Act covers the impacts of development projects on the environment and on cultural and archaeological resources. Under the *Canada Shipping Act, 2001* (CSA 2001), all recovered material of wrecks (ships and aircrafts) must be reported directly to the regional Receiver of Wreck, an officer of Transport Canada. Any person who recovers material from a wreck during an activity, such as fishing or diving, or during an archaeological excavation, has to comply with the CSA 2001. The federal government also has various policies and departmental directives that support archaeological assessment and mitigation, when projects could potentially disturb archaeological resources on federal land.

In some parts of Canada, Aboriginal land claim agreements address issues such as archaeological site protection, ownership and access rights, consultation, permit and reporting requirements and conservation planning.

EVALUATING AN ARCHAEOLOGICAL SITE

Archaeological sites should not be impaired prior to evaluation. As with other types of heritage places, an archaeological site must be evaluated before an intervention, and its heritage value and character-defining elements identified. However, given the nature of archaeology, interventions often uncover new data, in which case, the heritage value of new finds will need to be evaluated. As such, an archaeological site may be subject to re-evaluation as new information is gathered.

Cemeteries, Burial Grounds and Other Culturally Sensitive Places

Culturally sensitive places are defined here as officially recognized places that have been given special meaning by a group or a community. Those places can include burial grounds, above-ground burials, abandoned cemeteries and other sites that may have cultural or spiritual value to a community.

Each province or territory has its own heritage/archaeology/cemetery statutes that relate to burial sites and human remains. In addition, some settled land claims agreements set out obligations related to burial sites and human remains.

It is best practice to inform, and in some cases mandatory to consult, the local and/or culturally affiliated Aboriginal and non-Aboriginal communities before visiting or intervening on a culturally sensitive place, or before removing human remains and funerary objects considered archaeological.

ACCIDENTAL DISCOVERIES

Where archaeological resources are inadvertently discovered, the appropriate archaeological authorities should be contacted and an archaeologist assigned to evaluate the site. A clear understanding of the value of the archaeological site is crucial to determining the appropriate course of action.

In the case of human remains, all activities should be halted and the police authorities or coroner must be contacted. If the police authorities determine that the remains are not the subject of a police or coroner's investigation, then the appropriate archaeological authorities in the jurisdiction should be contacted.

APPLYING THE GUIDELINES

The Guidelines for Archaeological Sites contain guidelines that apply to Archaeological Sites, regardless of setting, and guidelines related to archaeological sites in seven settings, including: the urban environment; industrial sites; sites in cultural landscapes; sites in protected natural areas; sites underwater; rock art and culturally modified trees; and culturally sensitive places. When conserving any archaeological site, first refer to the guidelines for Archaeological Sites and then to the subsequent guidelines related to the setting in which the archaeological site is located, if applicable.

These guidelines cover two conservation treatments:

1. *Preservation*, which applies to all projects involving archaeological sites;
2. *Rehabilitation*, which covers interventions to sites that will be made accessible and visible, and interventions to sites that will be incorporated into a contemporary project in an *historic place*.

An intervention an archeological site will focus on *Preservation* first, but may also include *Rehabilitation*. *Restoration*, on the other hand, is never applied to the conservation of archeological sites.

These guidelines should not be used in isolation. As there may be heritage value in the relationships between archaeological sites and cultural landscapes, buildings or engineering works, those guidelines should also be consulted, and applied where appropriate, before undertaking an intervention.

UNDERSTANDING AND ARCHAEOLOGY

Archaeological resources differ from extant resources because their character-defining elements are often hidden or unknown. Depending on the information on hand, understanding and documenting the heritage value of an historic place before carrying out an intervention may require archaeological research, in addition to documentary research and local knowledge. Such endeavours must be grounded in the principle of minimal intervention. Archaeological investigation includes surveying, testing and excavation. Throughout the process, all work is documented. Documenting an archaeological site involves the recording of information gained through a variety of methods, including, but not limited to: written documents, such as field notes generated by fieldwork; photographic documents, such as rectified photographs; and non-photographic documents, such as maps and plans drawn from results of surveys.



This tent ring overlooking an unnamed lake in Tuktut Nogait National Park, Northwest Territories, is part of a larger site that includes several large tent rings and hunting blinds. Moving any of the stones forming the tent ring would cause a loss of heritage value.

4.2.1 ARCHAEOLOGICAL SITES

These guidelines provide direction for the conservation of archaeological sites when formally recognized as an historic place, or part of an historic place.

At archaeological sites, remnants of the past may be deeply buried, leaving no indication of their existence, or they may be partially or completely submerged in a lake, river, or sea (for example, a shipwreck). They can also rest above ground, or on the surface of the ground, such as the remains of a dugout house.



At the Colony of Avalon site in Ferryland, Newfoundland, its heritage value lies as much in character-defining elements, such as the in-situ archaeological remnants of early 17th century plantation life, as in the continued public use of the traditional fishing premises.

Archaeological excavations are conducted to better understand the occupation of the site by the Beothuks, seasonal European fishermen and settlers such as David Kirke.

Preservation

Preservation may involve documenting, stabilizing, sheltering, capping or reburying the site. This may be the primary treatment when:

- The historic place's materials, features and spaces are essentially intact, thus conveying the heritage value without extensive repair or replacement;
- When the historic place's materials, features and spaces could be disturbed by natural or human-induced activities, resulting in the loss of *heritage value*.

A *Preservation* plan should be developed before the works begin.

Rehabilitation

Rehabilitation involves actions to present and convey the *heritage value* of an archaeological site. These actions may include reassembly; integration; ground markings; pathways or trails; and structures, such as *interpretive constructs*.

Reassembly refers to putting back together existing but dismembered parts, based on research, and performed as part of the site's *Rehabilitation*. Minimal repairs and replacement of deteriorated features should only be considered when the original material cannot be retained. These interventions should be identifiable.

Integration can involve incorporating the archaeological site's *heritage value* and *character-defining elements* in a project, such as the archaeological remains of a stone wall into a new construction. The project should be designed so that the site's *heritage value* is neither affected nor its *character-defining elements* obscured, damaged or destroyed. Integration may be considered when the archaeological site's *heritage value* has been considered in a project that protects it; or when the archaeological site is a *character-defining element* of an historic place that contributes to the *heritage value* of that historic place; or when the archaeological site acquires a contemporary function while retaining its *heritage value*.

Ground markings, such as stones or vegetation, are often used to identify the presence of an archaeological site when it is not visible. Markings should be kept to a minimum to avoid cluttering the site. Alternative methods, such as self-guided tour maps and escorted walking tours, should also be considered as a means to provide information.

Pathways or trails may be required to provide access to and between archaeological sites. The new pathway can either follow an historic access route, provided that the archaeological resources are not impaired, or be situated in a non character-defining area of the site.

Structures, such as shelters and *interpretive constructs*, should avoid disturbing surviving archaeological evidence. In addition, *interpretive constructs*, such as plaques or panels, should take into account evidence from all available sources to communicate the site's *heritage value*, and be clearly identifiable.



Identifying the presence of archaeological features by using ground markings is an excellent way to communicate the heritage value of a site. The location and size of the northwest tower of the second Habitation de Champlain, uncovered at Place-Royale in the arrondissement historique de Québec, has been highlighted with ground markings without affecting the site's character-defining elements.

When considering a new use for an archaeological site, the use should be determined from the planning phase after a clear understanding of the site's *heritage value* has been obtained through archaeological investigations and other research. If the use of an historic place is part of its *heritage value*, then that use should be retained. This is particularly relevant for spiritual places and places of memory that have a strong archaeological dimension.

Rehabilitation may be considered as the primary treatment when the archaeological site's features, structures and objects have been stabilized, and there is an opportunity to allow access and convey its *heritage value*. A plan for Rehabilitation should be developed before work is undertaken. When planning a *Rehabilitation* project on archaeological sites, also consult the Guidelines for Materials.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the character-defining elements of the archaeological site and how they contribute to its heritage value.	
2	Understanding the archaeological site through documentary research, local knowledge and archaeological investigations.	
3	Documenting the historic place and surroundings before beginning project work, or in anticipation of future projects, particularly where the terrain will be altered, to determine the presence of archaeological sites and the potential impact on them from the project work.	Proceeding with an intervention without properly documenting the historic place to determine the potential presence of an archaeological site.
4	Documenting the archaeological site to determine the natural and human impacts that could affect it.	
5	Documenting , protecting and maintaining the archaeological site's heritage value and character-defining elements, by reaching a reasonable balance between the objectives of archaeological research and their preservation <i>in situ</i> . Choices should be periodically reassessed during the investigation.	Carrying out archaeological investigations without periodically weighing the benefits of pursuing the excavation against those of ceasing the work.
6	Protecting an archaeological site from disturbances by planning and undertaking the necessary archaeological investigation and mitigation work. The work should involve qualified individuals and be undertaken only when there is potential for disturbance.	Allowing unqualified personnel to perform archaeological mitigation work and data recovery, resulting in the loss of important archaeological data or material.
7	Protecting and maintaining the physical integrity of an archaeological site, including soil, stratigraphy and spatial distribution of artifacts, from natural and human-induced deterioration by identifying, evaluating, minimizing and monitoring the disturbance to the archaeological site and its setting.	Disturbing the context of an archaeological site, thus compromising its physical integrity and associated scientific and research information.
8	Protecting and maintaining the physical integrity of character-defining elements, including archaeological objects and records that relate to the site, from natural and human-induced deterioration, during and after excavations. This could include appropriate installations, such as fences, caps, shelters or infill, or proper long-term storage for objects and records.	Introducing a use, activity, feature or equipment into areas where it disturbs or damages the archaeological site.
9	Protecting and maintaining an archaeological site by striking a balance with the objectives of conserving its natural environment.	Damaging an archaeological site as a consequence of efforts to preserve, rehabilitate, or restore a natural environment.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
10	Protecting and maintaining the environment of an archaeological site, for example, by preventing water penetration and maintaining proper drainage in dry environments, and preventing dehydration of waterlogged character-defining elements in wet environments.	
11	Stabilizing deteriorated, collapsed or deformed features and structures through appropriate and reversible methods, such as structural consolidation, shelters, capping, or infill.	
12	Assessing the factors that will affect protective and stabilizing installations, such as shelters or caps. For capping, factors could include soil composition, level of humidity, terrain, presence or absence of vegetation, compression strength and permeability. For shelters, factors could include the geological structure that supports the site, the nature of the materials and environmental and human-induced stressors.	
13	Designing protective and stabilizing structures, such as caps, shelters or fences in a manner that does not disturb or affect character-defining elements.	Designing protective and stabilizing structures that disturb or affect character-defining elements, such as resting a fencepost on the remains of a stone wall,
14	Protecting character-defining elements when installing protective and stabilizing structures. This includes activities associated with setting up the structures, such as the placement of soil and mineral layers and the circulation of heavy machinery.	Using materials to mark the location of a site without assessing their physical properties and their effect on resources.
15	Marking the location of the site and the limits of the excavated area with a reversible protective layer such as a geotextile membrane.	Using materials that can be confused with the site's cultural layers.
16	Infilling or backfilling the archaeological site, when appropriate, to stabilize the <i>in situ</i> remains and the stratigraphic profiles, using excess excavation sediments or new fill. This will provide a proper preservation environment that balances appropriate levels of humidity, soil acidity, compaction and protection from roots.	Infilling or backfilling the archaeological site in ways that negatively impact on the character-defining elements.
17	Removing fragile objects, features or structures with surrounding soil from environments that prove difficult to control, such as a wet environment or permafrost.	
18	Stabilizing the archaeological object, feature or structure before its removal.	

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
19	Documenting the state of conservation of the archaeological object, feature or structure at the time of its removal.	
20	Preserving the archaeological object once removed from its discovered location. The work should be performed by qualified individuals.	
21	Retaining sound wooden and masonry elements, earthworks or deteriorated elements that can be repaired.	
22	Cleaning objects, features and structures, using recognized preservation methods, when necessary, to halt deterioration.	
23	Carrying out surface cleaning tests to determine the gentlest method possible and the appropriate level of cleanliness. The test should be observed over a sufficient period of time to determine its immediate and long-term effects.	
24	Developing a maintenance strategy that considers both existing vegetation and new appropriate vegetation. Monitoring the effects of vegetation on the character-defining elements.	Allowing for vegetation to grow, or removing vegetation without considering the potential effects on the <i>in situ</i> resource, and failing to monitor the effects of changes in vegetation.
25	Monitoring the effectiveness of protective and stabilizing structures regularly to assess whether they are achieving expected preservation results.	
26	Documenting interventions that affect the archaeological site, and ensuring that the documentation is readily available to those responsible for future work.	

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
27	Preserving and revealing the character-defining elements to convey the site's heritage value. This should be based on sound and up-to-date research.	
28	Repairing deteriorated, collapsed, deformed, or incorrectly placed components of features and structures through minimal intervention. This could include resetting, reassembling, retying and jointing, using original building methods and materials whenever possible.	Repairing deteriorated, collapsed, deformed or incorrectly placed components of features and structures, using incompatible contemporary building methods and materials. This could include such approaches as dismantling and <i>in situ</i> reconstruction, or reassembling without proper documentation.
29	Repairing and stabilizing deteriorated wooden or masonry elements with structural reinforcement and weather protection, or correcting unsafe conditions, as required, until any additional work is undertaken. Repairs should be physically and visually compatible with the heritage value of the archaeological site.	Proceeding with physically and visually incompatible temporary repairs and stabilizing work.
30	Balancing the need to preserve the site's heritage value and character-defining elements with the desire to allow public access for educational purposes.	Allowing access while compromising heritage value and character-defining elements.
31	Exhibiting archaeological sites only when the proposed project maintains the site's heritage value.	Exhibiting archaeological sites, i.e., exposing character defining elements, when such actions impair heritage value.

REASSEMBLY

32	Reassembling components of character-defining elements, using the least intrusive method when the information about their original location and materials, degree of deterioration and human-induced and natural pressures have been recorded and assessed. Reassembly should only be performed if it contributes to the heritage value of the archaeological site and does not impact on its character-defining elements, either directly or indirectly.	Considering the reassembly of components of the site's character-defining elements, without adequately assessing and recording the site's original location and materials, its degree of deterioration, and human-induced and natural pressures.
33	Replacing missing components by designing new components that are compatible with the character-defining elements of the archaeological site, based on physical, documentary or oral evidence. The new work should be well documented, distinguishable, and unobtrusively dated to guide future research and treatment.	Replacing missing elements in a manner that confuses the authenticity of the site's character-defining elements.

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
INTEGRATION		
34	Integrating an archaeological resource into a landscape, building or structure in a manner that communicates its heritage value and preserves its character-defining elements.	Integrating an archaeological resource into a landscape, building or structure in a manner that affects its heritage value and character-defining elements, such as creating a design where a structural load is supported by the archaeological remains.
35	Preserving archaeological resources through appropriate maintenance of the new landscape, building or structure.	
GROUND MARKINGS		
36	Ground marking in areas where the archaeological site was found, surveyed, recorded and preserved <i>in situ</i> . Ground marking should only be considered when there is no risk of negatively affecting the site's heritage value and character-defining elements.	
37	Protecting archaeological resources by using a design and materials that do not affect the physical integrity of the character-defining elements, such as installing surface stones to delineate the perimeter of a buried foundation wall. The materials should be compatible with the setting, texture, colour and shape of the site.	Selecting a design or materials that are incompatible with the site's heritage value.
PATHWAYS OR TRAILS		
38	Introducing new pathways or trails in a manner that does not affect the physical integrity of the character-defining elements, such as locating them in areas of the site free of archaeological resources. New pathways or trails should not follow the course of historic circulation routes unless this can be achieved without damaging character-defining elements.	Introducing new pathways or trails directly on top of former historic routes.
39	Selecting new materials that are compatible with those used in existing circulation patterns, with the setting, and with the site's heritage value.	
40	Designing pathways or trails that allow access to the character-defining elements, while protecting the archaeological site. If a new access point is required, it should be distinguishable and have minimal impact on the site's heritage value.	
41	Providing safe and secure access to the archaeological site while protecting heritage value.	Compromising the heritage value of an archaeological site in an attempt to allow safe and secure access.

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
STRUCTURES		
42	Installing a shelter that respects the heritage value of the archaeological site and its setting, where appropriate.	Installing a shelter that obscures the site or the understanding of its heritage value.
43	Designing and building structures, such as shelters, buildings or <i>interpretive constructs</i> , that neither affect the physical integrity of the character-defining elements, nor the historic place's heritage value.	
44	Selecting materials and forms in designing structures that are physically and visually compatible with the site and setting.	Selecting materials and forms that are incompatible with the historic place's heritage value and character-defining elements.
45	Designing interpretive constructs, speculative components and access points in a manner that clearly distinguishes what is historic and what is new.	Creating interpretive constructs and speculative components that could be confused with the site's character-defining elements, thus creating a false sense of history.
46	Maintaining structures from decay to protect the historic place's character-defining elements.	

4.2.2 SITES IN URBAN ENVIRONMENTS

These guidelines provide direction when an archaeological site is located in an urban environment and contributes to its heritage value. Urban environments refer to settlements, such as villages, towns and cities that have been densely populated over an extensive period. They potentially provide a large concentration and complexity of archaeological sites, including historic period structures and features, such as burials, buildings and remains of public works, and Aboriginal sites.



Urban sites potentially provide a large concentration and complexity of archaeological sites. A witness of market, civic, commercial and residential uses for over two centuries, the Market Square Heritage Conservation District in Kingston ON, contains significant archaeological resources. Archaeological investigations have revealed a series of surfaces from different time periods. Qualified personnel expose a cobblestone surface as daily market activities continue beyond the fence.



Conserving archaeological sites in urban environments, such as the St-Louis Forts and Château National Historic Site of Canada in Québec City beside the heavily visited Château Frontenac and Dufferin Terrace, faces numerous challenges such as pollution, new constructions, upgrades for public works and intensive traffic.

Conserving archaeological sites in urban environments includes two perspectives: the challenges of preserving archaeological sites in densely populated areas, or archaeology in the city; and the study of the evolution of the settlement itself, or archaeology of the city. Both perspectives are essential in preserving the relationship between individual sites and the settlement as a whole. Maps and historical accounts can help us understand this evolution, but certain elements of the evolution can be missing from these sources, such as an Aboriginal presence. Archaeological surveys are a key resource in providing this missing information. The intent is to focus on preserving components whose significance contributes to an understanding of the whole.

Urban environments are rapidly changing, which may lead to the disappearance of past functions and uses. Having to deal with numerous stakeholders and uses, such as private owners, intensive traffic, pollution, new construction, upgrades to public works, and pressures for private development or public activities can also be a challenge. The proximity of archaeological sites to public services makes them more accessible to the local community, while also making them vulnerable to damage.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites. When conducting work on archaeological sites in an urban environment, also consult the Guidelines for Cultural Landscapes, including Heritage Districts.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the urban environment of the archaeological site before any intervention is undertaken.	
2	Documenting archaeological sites, including determining their individual significance in the settlement history of an urban environment.	Documenting archaeological sites individually, without considering the evolution of the urban environment to which it belongs.
3	Preserving archaeological sites in urban environments <i>in situ</i> , through minimal interventions, such as stabilization and consolidation.	Preserving archaeological sites in urban environments <i>in situ</i> , without adequately protecting the site from the potentially harmful effects of contemporary uses.
4	Documenting the site thoroughly when contemporary uses could threaten archaeological resources.	
5	Preserving links with nearby features and settlement patterns to better understand the heritage value of the archaeological site.	Preserving the archaeological site in isolation or destroying significant elements of the settlement pattern resulting in the loss of the understanding of the settlement's evolution.
6	Protecting the character-defining elements from excess traffic by limiting access to and around the archaeological site.	Allowing access to and around the archaeological site without adequately protecting the character-defining elements.
7	Maintaining and preserving archaeological sites by controlling vegetation, cleaning traces of pollution, and removing graffiti from character-defining elements using recognized conservation methods.	Failing to take actions to adequately maintain the site and preserve the character-defining elements.

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
8	Revealing the presence of archaeological sites in urban environments with ground markings, interpretive constructs, or other appropriate methods.	
9	Creating a buffer area around the site to enhance visitor experience. The buffer area should help to communicate the site's heritage value and not detract from it.	
10	Integrating archaeological sites in the urban environment while preserving their heritage value, including finding uses or activities that complement the heritage value of the site.	Allowing uses or activities that undermine the heritage value of the archaeological site.

4.2.3 INDUSTRIAL SITES

These guidelines provide direction when an archaeological site is associated with, or is a part of an industrial site, and contributes to its heritage value.



This partially uncovered hydraulic turbine at Pointe-des-Seigneurs, Lachine Canal National Historic Site of Canada in Montreal was installed and used by the Caledonian Iron Works Co. in the late 19th century.

Conserving archaeological remains of industrial components *in situ*, such as this turbine, contributes to our understanding of industrial processes and helps illustrate a site's functional arrangement.

In a comprehensive approach, industrial archaeology deals with all the components that contribute to understanding and communicating the knowledge and values associated with an industrial site. Industrial archaeological sites contain physical elements organized in a system constructed and used for industrial activities. The purpose of these sites often resides in their design, or in the concept behind their functions, reflecting an industrial process that is inherent in the interrelations of the site's material remains. As such, industrial archaeology aims to conduct a systematic study of structures and archaeological objects to better understand the industrial past. The process of industrial archaeology is usually part of a co-ordinated multidisciplinary approach.

Conserving an industrial site involves not only preserving physical remains, but also recognizing the site's development phases by studying the physical remains and how they evoke the human activities that took place at the site. Appreciating physical industrial remains is based on understanding the knowledge, values and messages they convey. A successful rehabilitation helps to understand the connection between a conserved physical record and the site, and to appreciate the interdependence of the site's character-defining elements. The chain of production, brand image, various technologies and social trends underlying this cultural heritage, are often studied. As well, physical and visual connections can communicate the interrelations between the industry, communication networks and adjacent human communities.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites. When conducting work on an industrial archaeological site, it is important to also consult the Guidelines for Cultural Landscapes, the Guidelines for Buildings and the Guidelines for Engineering Works.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the industrial environment of the archaeological site before any intervention is undertaken.	
2	Documenting and protecting character-defining archaeological remains <i>in situ</i> , such as industrial components, where possible, to illustrate the functional arrangement of the industrial site.	Removing, damaging or destroying industrial components and storing them in a location that impairs their heritage value. Failing to prepare an adequate inventory of the industrial components.
3	Researching and documenting industrial processes and operations contributing to the knowledge of the site, including oral history accounts of former workers, where appropriate.	Failing to undertake adequate research to document various aspects of operations.
4	Preserving documentary and corporate written records associated with the industrial site and making them accessible for future research.	
5	Protecting and maintaining the remains of industrial machinery <i>in situ</i> to preserve their heritage value.	Moving the remains of industrial machinery thus affecting their heritage value.
6	Carrying out archaeological work to collect data before the archaeological site is disrupted by soil decontamination operations.	Failing to consider the archaeological work when planning decontamination operations, thus running the risk of losing information in last-minute salvage operations.

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
7	Respecting the symbolic and associative value of the character defining elements of the site when developing the rehabilitation concept.	
8	Ensuring consistent comprehension of the various components of the industrial site by drawing from its constructed elements, industrial components and objects, and their functional arrangement.	
9	Preserving the remains of industrial structures and components <i>in situ</i> to retain their functional arrangement.	Removing or relocating the remains of industrial structures and components that contribute to the site's heritage value.
10	Integrating a new structure into an existing industrial archaeological site in a manner that respects its heritage value and character-defining elements.	
11	Maintaining , re-establishing or illustrating the functional arrangement of the industrial archaeological site when new structures are added.	

4.2.4 SITES IN CULTURAL LANDSCAPES



The heritage value of the Fortress of Louisbourg NHSC in Nova Scotia resides in a number of character-defining elements, including preserved elements of an 18th Century cultural landscape and a number of known and unknown archaeological resources. Several of these archaeological resources, in particular those situated along the coastline, are at risk due to the storm surges hitting the site in the past years.

These guidelines provide direction when an archaeological site is located in a cultural landscape and contributes to its heritage value. In this document, a cultural landscape is defined as any geographical area that has been modified, influenced or given special cultural meaning by people. Cultural landscapes are often dynamic, living entities, continually changing because of natural and human-influenced social, economic and cultural processes. Archaeological sites in cultural landscapes can be components of Aboriginal landscapes, city parks, or rural areas. Those landscapes may include gardens, hunting and fishing sites, bison jumps, medicine wheels, cairns and Aboriginal sites that have a spiritual dimension.

An appropriate conservation approach should consider the relationship between dispersed archaeological sites and between the sites and their environment. Factors, such as the visual impacts of interventions, must be considered

to preserve the cultural landscape. In addition, these can be living sites where local communities still carry out activities. Archaeological sites located in cultural landscapes can be identified by traditional archaeological techniques. The evolution of these sites can also be documented through oral history of local communities or groups; written records, such as censuses; and visual records, such as aerial photographs and historic artwork.

Archaeological sites in cultural landscapes can be vulnerable to natural erosion, animal grazing and burrowing, and land alteration. Human factors, such as plowing, infrastructure development and recreational activities, can also affect an archaeological site in a cultural landscape.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites. When conducting work on archaeological sites in cultural landscapes, also consult the Guidelines for Cultural Landscapes.



Kejimikujik National Historic Site of Canada in Nova Scotia has been designated as a Mi'kmaq cultural landscape. Archaeological remains of fishing and sites such as fish weirs, are part of the cultural landscape. Stone alignments set across a stream, with baskets and wooden traps, helped the Mi'kmaq harvest seasonal runs of fish on the Mersey River. The stone vestiges of weirs, as well as their position in the cultural landscape, must be preserved.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the cultural landscape in which the archaeological site is located before any intervention is undertaken.	
2	Documenting , protecting and maintaining the patterns of archaeological sites located in a cultural landscape where their multiplicity constitutes a character-defining element.	Documenting sites individually, without documenting their pattern on the cultural landscape.
3	Preserving archaeological sites <i>in situ</i> ; for example, when numerous sites form a network, such as military sites on a defensive line.	Preserving a sample of <i>in situ</i> resources without considering the relationship between the selected sites, thus affecting the heritage value.
4	Preserving representative samples <i>in situ</i> as well as their spatial relationships.	
5	Protecting and maintaining past links connecting archaeological sites, such as roads, trails, paths and visual relationships.	Damaging or altering former links connecting archaeological sites.
6	Protecting and maintaining the environmental conditions in which the archaeological site has been preserved.	Altering environmental conditions that could result in damage to the archaeological site.
7	Protecting character-defining elements from the impacts of agricultural activities, by selecting sensitive agricultural practices, such as lifting the plowshare or cultivator; avoiding identified areas; managing grazing by livestock; and assessing appropriate stock levels.	Selecting agricultural practices without considering their potential effects on the site's character-defining elements.
8	Stabilizing archaeological sites by maintaining appropriate vegetation. The potential impact of the planting material on the character-defining elements should be evaluated.	Failing to maintain vegetation, or using inappropriate vegetation, resulting in a deterioration of the archaeological site and loss of information.
9	Protecting and maintaining character-defining natural features and environments, such as cliffs, hills, shores and viewscales.	Damaging character-defining natural features and environments; for example, remodelling or reshaping the landscape, or installing structures that negatively impact on the site and the viewscales.
10	Protecting and maintaining archaeological sites by developing a vegetation management strategy, including opening up the landscape by thinning or removing trees from the archaeological site, without compromising its heritage value.	Altering the landscape, without previously developing a vegetation management strategy based on the archaeological site's heritage value.

4.2.5 SITES IN PROTECTED NATURAL AREAS

These guidelines provide direction when an archaeological site is located in a protected natural area — such as a national or provincial park, conservation area or wetland — and contributes to its heritage value. Large areas of historical significance, such as rural heritage districts, can also include protected natural areas or ecosystems that contribute to the historic place's heritage value.



Archaeological sites in natural protected areas, such as these remains of a caribou fence near Firth River, in Ivvavik National Park, Yukon, contribute to our understanding of the evolution and the human settlement of these areas.

Ecological restoration programs can be an opportunity to maintain or enhance the preservation of archaeological sites. They can also be destructive if archaeological investigations are not conducted. When engaging in the ecological preservation or restoration of a protected natural area, it is important to understand the area's evolution and human settlement to preserve the archaeological site and the environmental conditions that allowed its preservation.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites. For additional information, consult the guidelines for Ecological Features (4.1.7) and the “Principles and Guidelines for Ecological Restoration in Canada’s Protected Natural Areas” (Parks Canada and the Canadian Parks Council, 2008).



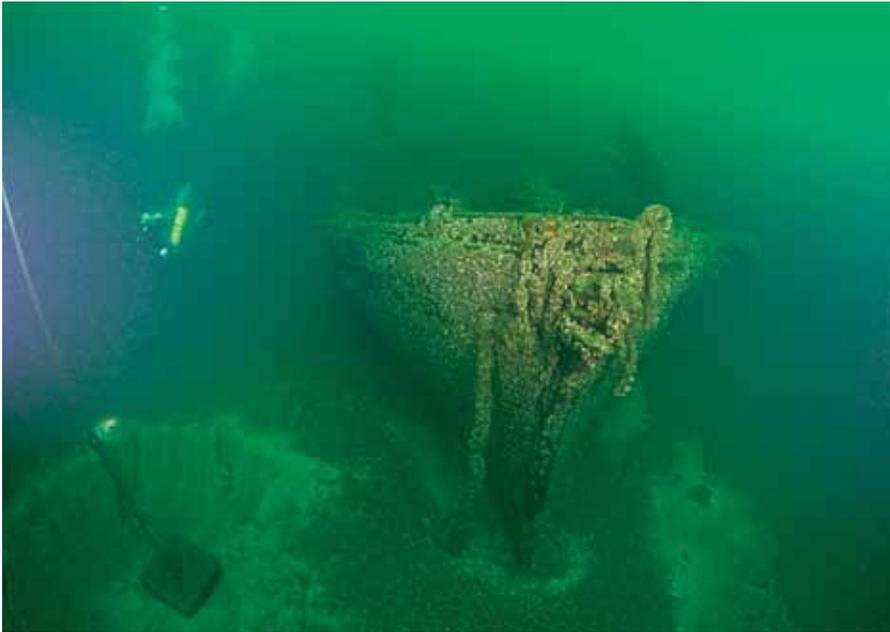
Non-intrusive activities, such as surveying this wreck in the Saguenay-St. Lawrence National Marine Park in Quebec, help preserve both the site's character-defining elements and the area's ecosystem.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the protected natural area where the archaeological site is located, before any intervention is undertaken.	
2	Understanding the heritage value of archaeological sites in a protected natural area, including understanding the effects of human settlement on the environment.	Failing to understand the effects of human settlement on the environment of a protected natural area.
3	Preserving the heritage value and character-defining elements of an archaeological site <i>in situ</i> without compromising the ecological integrity of the protected natural area.	Destroying archaeological sites to preserve the ecological integrity of the protected natural area.
4	Protecting and preserving the heritage value and character-defining elements of an archaeological site when developing and implementing ecological restoration strategies.	
5	Protecting and maintaining the environmental conditions that preserve the archaeological site.	Altering the environmental conditions without considering their role in preserving the archaeological site.
6	Stabilizing an archaeological site with the appropriate use of vegetation to preserve both its heritage value and character-defining elements, and the area's ecosystem. The potential impact of the planting material on the character-defining elements should be evaluated.	Planting vegetation that would negatively affect the preservation of archaeological sites.
7	Protecting and maintaining an archaeological site by developing and implementing a vegetation management strategy that preserves both its heritage value and character-defining elements, and the area's ecosystem.	Developing and implementing a vegetation management strategy that negatively affects the heritage value and character-defining elements of the archaeological site, or the ecosystem of the protected natural area.
8	Protecting and maintaining the character-defining natural features and environment of an archaeological site, such as cliffs, hills, shores and viewscapes.	Altering landscape features to maintain the ecosystem, without considering the effects on the heritage value of the archaeological site.

4.2.6 SITES UNDERWATER

These guidelines provide direction when an archaeological site is located underwater. Underwater archaeological sites can be submerged, or in intertidal or wetlands environments, and include sites as varied as shipwrecks and their debris fields, intertidal structures, such as fishing weirs or canoe runs, harbour works, wharves and submerged landscapes. They also include archaeological sites on land inundated by reservoirs or rises in sea level.



Installing permanent boat mooring systems away from the archaeological site's structures and features is an excellent way to prevent visitors from mooring and anchoring their boats on a site's structure, which could damage the character-defining elements.



Interventions, such as this archaeological excavation of a Basque period wreck at Red Bay National Historic Site of Canada, Newfoundland and Labrador, are documented in many ways such as field notes, drawings, photographs, as well as videos.

Although found in diverse environments, these sites are usually partially or wholly submerged in water, whether by the sea, lakes, rivers, marshes or bogs. They can be subjected to cyclical wet-dry exposure due to tides or other water level fluctuations. Found on a range of substrates, from rock to soft sediments, sites underwater can be completely uncovered, buried, or periodically revealed due to sediment movement caused by waves and currents. Some sites are reached easily, while others are found in deeper water far from shore and accessible only by diving or other underwater investigation methods. Like terrestrial sites, they host a range of plant and animal life.

Natural environmental factors affect a site's condition. Underwater sites usually settle into equilibrium with their environment, which can foster slow rates of decay and promote good site preservation for hundreds, or even thousands of years. Underwater sites, particularly those buried by sediment, are particularly rich in organic material, which creates a significant conservation and preservation challenge. All underwater archaeological sites can be damaged, not only by complex and dynamic natural forces, but also by human activities, such as construction, dredging, commercial fishing and some forms of recreational diving and anchoring, as well as vandalism and looting. Sites, such as shipwrecks, can retain a high level of structural integrity similar to a heritage building on land. In some cases, it is possible to mitigate naturally induced deterioration. Non-intrusive approaches that promote *in situ* conservation, *minimal intervention* and non-intrusive study and appreciation are recommended.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the underwater site and its environment before any intervention is undertaken, including factors such as water depth, temperature, salinity, currents and biological activity.	Conducting an intervention without understanding the underwater site and its environment.
2	Preserving the underwater archaeological resources <i>in situ</i> .	
3	Removing artifacts under exceptional circumstances and only after thorough documentation and surveying have been carried out.	
4	Protecting underwater sites from human impacts, such as marine construction, dredging, log salvage, shoreline development, anchoring and unauthorized artifact removal.	Failing to protect underwater archaeological sites from damaging human impacts and unauthorized activities.
5	Creating protected zones, where appropriate, to control and monitor human access and activities.	
6	Maintaining and stabilizing environmental conditions to preserve character-defining elements, where possible and practicable.	Modifying the environmental conditions that contribute to preserving the site's character-defining elements.
7	Protecting underwater resources by installing specialized protective and stabilizing systems; for example, structural reinforcement, replenishing sand, ballasted tarps, sandbagging, sacrificial anodes and sediment traps, only after measures are taken to document and maintain the integrity of the character-defining elements.	Installing specialized protective and stabilizing measures without prior documenting.
8	Monitoring and maintaining underwater protective and stabilizing interventions.	Stabilizing underwater sites using methods that damage their character-defining elements, or failing to monitor and maintain underwater protective and stabilizing interventions.
9	Removing flora and fauna only when necessary to protect or record underwater resources.	Removing flora, such as kelp, or fauna, such as mussels, from the underwater resources, resulting in the loss of heritage value.

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
PATHWAYS OR TRAILS		
10	Preserving and exhibiting the site's heritage value through low-impact diving practices using pre-planned trail and signage systems.	Allowing visitors to access sites with no instruction, code of practice, preventive signage, or trail system to help protect the site's integrity.
11	Protecting submerged archaeological sites from visiting divers and charter boats, by installing permanent boat mooring systems independent of the site's structures or features.	Attaching boat moorings directly to a site's structure and anchoring into a site to provide access to visiting divers.
12	Monitoring visitor impact on underwater archaeological sites.	

4.2.7 ROCK ART AND CULTURALLY- MODIFIED TREES

These guidelines provide direction when an archaeological site includes or consists of rock art, or *culturally-modified trees* (CMTs) that contribute to its heritage value. Rock art and CMTs are more susceptible to environmental and human impacts than most types of archaeological sites because they are often more

exposed and visible. They usually have a strong association with their natural surroundings and may be associated with a local community.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites.



Rock art, such as this 1847 grave marker at the spiritual site of Merrymakedge Cemetery at Kejimikujik National Historic Site of Canada in Nova Scotia, should be preserved *in situ*.



It is recommended to document culturally modified trees, such as these ancient adze marks made by Haida ancestors, at Bag Harbour, Gwaii Haanas, using non-intrusive methods such as photography and drawings.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the heritage value of rock art and culturally-modified trees before any intervention is undertaken.	
2	Documenting rock art and culturally-modified trees using non-intrusive methods, such as photography and drawing.	Enhancing faint engravings and paintings by wetting paintings and chalking engravings to better record the rock art. This can destroy evidence and make analysis and dating difficult.
3	Preserving and stabilizing rock art and culturally modified trees <i>in situ</i> .	Highlighting, repainting or regrooving faded rock art or adding new images for aesthetic purposes, thus compromising heritage value.
4	Removing non character-defining graffiti from rock art, as needed, to preserve the site's heritage value, only after recording graffiti and character-defining motifs, and documenting removal.	Removing graffiti to an extent that affects the heritage value.
5	Avoiding over-cleaning and infilling the damaged spaces within the character-defining motifs. If the character-defining motifs of rock art are badly damaged and infill is necessary, it should be done by qualified individuals, and distinguishable as an addition.	
6	Protecting rock art from animals, wind, sunlight, water, natural growths, such as algae and fungi, and dust. In all cases, a proper assessment should be undertaken to understand the materials and natural forces before work begins.	Proceeding with preservation methods against animals, wind, sunlight, water, natural growths, and dust without assessing their impact on the rock art's heritage value.
7	Monitoring the stability of the rock surface, salt and moisture distribution, and levels of air pollution so that appropriate measures are taken to protect the rock art.	Proceeding with preservation methods without first monitoring the stability of the rock surface, salt and moisture distribution, and levels of air pollution.
8	Protecting and maintaining the surroundings of culturally-modified trees and archaeological rock art sites by regular maintenance and cleaning by specialized personnel, as required.	Failing to maintain and clean the surroundings of rock art sites and culturally-modified trees.
9	Protecting and preserving culturally-modified trees <i>in situ</i> .	Removing dead culturally-modified trees or relocating culturally-modified trees when their preservation <i>in situ</i> is possible.
10	Protecting and maintaining culturally-modified trees by monitoring environmental impacts, such as insects, fungi and water.	Failing to protect and maintain the surroundings of culturally-modified trees, resulting in loss of information and inappropriate environmental conditions.
11	Protecting culturally-modified trees by identifying them, using non-intrusive and non-permanent methods.	Identifying culturally-modified trees, using intrusive methods that leave visible, permanent traces. Altering culturally-modified trees; for example, by regrooving graffiti.

ADDITIONAL GUIDELINES FOR REHABILITATION

	Recommended	Not Recommended
12	Removing recently deposited dust on rock art for preservation and rehabilitation purposes.	Removing surface accretions to make rock art more visible or attractive, when the surface accretions may contain valuable information.
13	Limiting access to rock art sites and culturally-modified trees through guided tours and visitor quotas, to control deterioration from visitor contact.	
14	Protecting rock art sites and culturally-modified trees by installing barriers that allow visual contact. These barriers should be discreet and removable, and not be supported by the character-defining elements.	Protecting rock art and culturally-modified trees with an installation supported by the character-defining elements that is physically and visually incompatible with the site and its surroundings, and cannot be removed without damaging, in part or in whole, the archaeological site.
15	Providing effective and simple installations for remote sites to indicate their importance, such as a visitor registry that explains the site's heritage value and provides a place for visitors to record comments and impressions.	
16	Protecting rock art sites and culturally-modified trees by installing removable structures, pathways, trails and boardwalks to allow access and viewing. They should be designed to avoid trampling the site, stirring up dust particles, scratching the rock surface, and damaging vegetation and rock features	Installing structures, pathways, trails and boardwalks, where installation or removal could affect the character-defining elements.

4.2.8 CULTURALLY- SENSITIVE PLACES

These guidelines provide direction when an archaeological site is considered to be, or is located in, a culturally-sensitive place. This document defines culturally-sensitive places as formally recognized places that have been given special meaning by a group or a community. These places include burial grounds, above-ground burials, and abandoned cemeteries, Aboriginal spiritual places, such as medicine wheels and effigies, and other sites that may have spiritual value for a community.

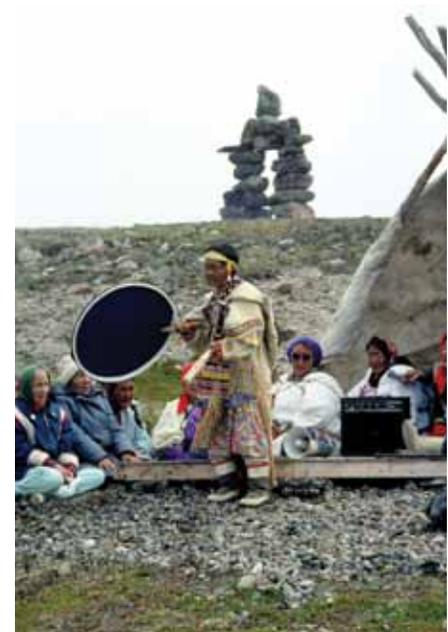


Planning archaeological investigations should be done, when appropriate, in consultation with local Elders or other knowledge keepers.

Culturally-sensitive places deserve a separate section in these guidelines because their *heritage value* most often resides in their cultural, social and spiritual significance. The heritage value of culturally sensitive places is not always proportional to the extent or state of their physical remains. Therefore, great sensitivity is required so that conservation strategies preserve the associated values of these places, even when there is little tangible evidence on or in the ground. These types of archaeological sites can be found in many contexts, in urban as well as natural environments.

If human remains are discovered, all activities must stop, and the proper authorities must be contacted. Any action on human remains should only be performed according to provincial and territorial legislation and be supported by the affiliated community.

These guidelines should be used in conjunction with section 4.2.1, Archaeological Sites.



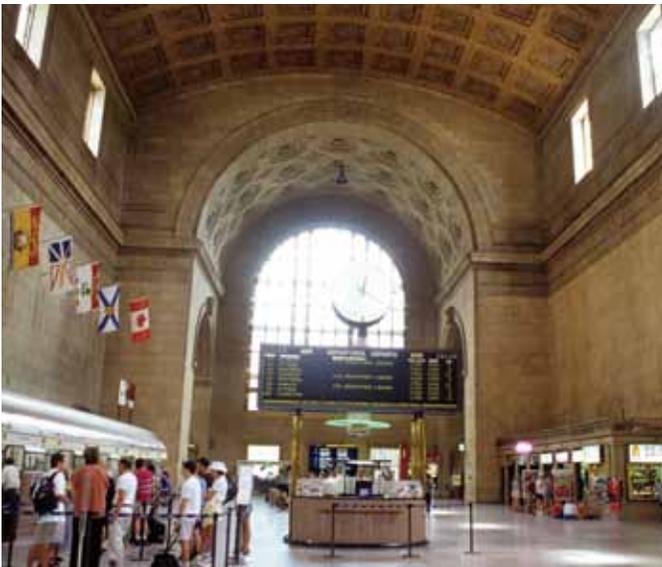
Preserving relationships with a site, such as this traditional gathering held at Arvia'juaq and Qikiqtaarjuk National Historic Site in Nunuvut can contribute to the site's heritage value. Access to sites should be balanced with the need to preserve their character-defining elements.

GENERAL GUIDELINES FOR PRESERVATION AND REHABILITATION

	Recommended	Not Recommended
1	Understanding the potentially sensitive nature of an archaeological site and its environment, for a group or community, before any intervention is undertaken.	
2	Protecting and preserving the landscape and its natural features that directly contribute to the site's heritage value.	
3	Recording without disturbance the elements that contribute to the heritage value in consultation with the affiliated community.	Recording the elements that contribute to the heritage value, using methods that disregard the sensitive nature of the sites.
4	Stabilizing the character-defining elements, using methods that do not affect the site's heritage value.	
5	Working with interested parties, particularly the affiliated community, to define acceptable activities at a culturally sensitive place.	Allowing activities in culturally sensitive places, without notifying interested parties, resulting in negative impacts on the heritage value.
6	Preserving the heritage value of a site by enabling a continued relationship between cultural groups and culturally-sensitive places, when this relationship contributes to the heritage value of the site. This includes access and use for rituals, ceremonies and traditional gatherings, while ensuring measures to protect heritage value are in place. The need to preserve the community's relationship with the place should be balanced with the need to preserve the character-defining elements.	
7	Protecting the archaeological context of burials to preserve associated information.	
8	Removing , when appropriate, human remains with associated funerary objects and surrounding soil, with the support of the affiliated community and after documenting their position.	Removing human remains without the support of the affiliated community, and without including information about context and location, such as soil, position, funerary objects, etc.

4.3

GUIDELINES FOR BUILDINGS



The historic buildings illustrated on this page are clockwise, from top left: the old Anglican Church in Tulita, Northwest Territories; a stone farmhouse at Minister's Island in New Brunswick; the Bloedel Conservatory in Vancouver; and Union Station in Toronto.

4.3

GUIDELINES FOR BUILDINGS

Buildings illustrate the evolution of Canadian architecture in terms of their form and setting and their assemblies, systems and materials. Buildings can express cultural, regional, local or individual uses, or construction practices, and embody meanings that evolve over time.

The broad range of buildings that are considered historic varies from modest to monumental, ancient to recent, and private to public. Buildings in a heritage district, or in a complex of buildings, may not be formally recognized individually, but may be recognized as contributing to the larger historic place. There is no typical historic building. Each is valued for its own reasons and faces its own challenges.

Buildings can represent identifiable expressions of one or more of the many different cultural, religious or interest groups that make up Canada's multicultural population. They can also be designated because they demonstrate an appropriate and/or innovative response to their climate and setting. Often the heritage value of a building, or group of buildings, illustrates a specific phase, or various phases, in the development of a particular building type, style or aesthetic. Some buildings are historic places because of their association with a particular person, event, theme or achievement.

These guidelines provide general recommendations appropriate to all types of buildings. However, because buildings can also be part of cultural landscapes, engineering works and archaeological sites, those guidelines should be consulted when appropriate. Also refer to the Guidelines for Materials that include traditional as well as modern building and finishing materials.



A building's setting can be as important to its interpretation and understanding of a historic place as is the structure itself. A train station moved away from its tracks is clearly out of context. A lighthouse is equally connected to its setting. The character-defining elements of the Head Harbour Light Station in New Brunswick includes all of the 3,000 square metres of the rocky outcropping and two nearby rocks as well as the five buildings on the site.

BALANCING CONSERVATION PRINCIPLES AND SUSTAINABILITY OBJECTIVES

Both heritage conservation and sustainability aim to conserve. In the case of heritage buildings, this includes considering the inherent performance and durability of their character-defining assemblies, systems and materials, and the minimal interventions required to achieve the most effective sustainability improvements. For example, it may be possible to improve the energy efficiency of an historic building by insulating the attic and basement rather than removing or concealing character-defining brick or plaster to insulate the walls.

APPLYING THE GUIDELINES

The Guidelines for Buildings are divided into three main groups: Form, Assemblies and Systems. Traditional construction methods, and the complex assemblies and systems found in recent heritage buildings, are both addressed.

Form

Most interventions to an historic building—including interventions to its architectural assemblies, engineered systems and materials—have some impact on its overall appearance. This impact is particularly apparent when constructing additions or making modifications to the building form. Two sets of guidelines are provided to address the impact of additions and alterations on form: Exterior Form and Interior Arrangement.

Assemblies

Many building interventions involve preserving or modifying one or more architectural assemblies. In these guidelines, architectural assemblies are seen as complex elements composed of distinct parts and materials that work together to help the building fulfill its purpose. Assemblies also define a building's architectural expression. Five sets of guidelines address architectural assemblies: Roofs; Exterior Walls; Windows, Doors and Storefronts; Entrances, Porches and Balconies; and Interior Features.



Ongoing maintenance is the simplest, most effective and least glamorous method to ensure the lasting conservation of buildings. The Hôpital général de Québec built between 1671 and 1692, is a model example of the result of centuries of appropriate ongoing maintenance.

Systems

Building interventions often involve adding, removing, replacing or modifying engineered systems. For the purposes of these guidelines, engineered systems are composed of connected elements that work together to ensure that an historic place is capable of fulfilling its design or modified purpose, and/or providing a safe and comfortable environment. Two sets of guidelines pertain to systems: Structural Systems, and Mechanical and Electrical Systems.

INHERENT VICE

Inherent vice is an old concern with a new significance with respect to recent heritage. It can include faulty assemblies or details, such as binding together galvanic materials, but also experimental materials that are unable to perform their intended function over the long term. The overarching requirement is to conserve the heritage value of an historic place. Defective details or inappropriate material choices should not be duplicated when improvements are possible without significantly affecting the place's value.

4.3.1 EXTERIOR FORM

These guidelines provide direction when a building's exterior form is identified as a character-defining element of an historic place. They also give direction on how to minimize the impact of alterations and additions on the building's exterior due to a change in use or regulations.

Exterior form refers to a building's orientation, scale, massing, composition, proportions, colour and texture. A building's exterior form is also related to its surroundings, which includes spatial relationships with adjacent buildings, plazas or natural features, views, climatic considerations and circulation for vehicles and pedestrians.



St. Jean Baptiste Church and Rectory are situated on a single, large town lot on Main Street in Morinville, AB. The church steeple is clearly visible on the landscape and helps convey the Catholic Church's role in the settlement of the district.

The exterior form usually expresses ideas on how to locate and plan a building. The location, massing, aesthetics, style, plan form, roof shape and position of entrances may have responded to orientation, topography or functional requirements. The interrelationships of site and setting with broader environmental considerations are addressed in more detail in the Guidelines for Cultural Landscapes.

Typical interventions that are addressed here include large and small additions, including both building expansions and smaller interventions, such as stairway, elevator or mechanical equipment enclosures. Exterior form often has a strong relationship with the Interior Arrangement of a building, thus the impact on Interior Arrangement should be considered when making changes to the exterior form.

These guidelines offer practical advice for conserving character-defining elements, such as the size, number, form, proportion and position of openings, or the form and articulation of walls and roofs. Specific guidelines for related assemblies or systems are found in the Guidelines for Roofs; Exterior Walls; Windows, Doors and Storefronts; Entrances, Porches and Balconies; and Mechanical and Electrical Systems.



Undertaking a successful large-scale addition to a historic place is challenging. For certain buildings with a distinctive form it may be almost impossible. The Fraser Octagon House in Tatamagouch, NS is a one-and-a-half storey wood frame structure built to a near octagonal plan form. A large addition to this unusual character-defining form would be very challenging.



A compatible addition to the rear of the Yukon Sawmill Co. Office provides space for services. If necessary, it could be removed without affecting the building's historic fabric. One window opening and the surrounding wall framing were altered to provide space for a connecting door.

THE RELATIONSHIP BETWEEN EXTERIOR FORM AND SETTING

In heritage districts and modern campus-like landscapes, the exterior form of buildings often plays an important role in defining plazas, open spaces and streetscapes. Prior to making any changes to the exterior form of a building, it is important to understand how the proposed changes affect the setting of the historic place. The definition of setting and its interrelationship with the broader environment are addressed in more detail in the Introduction to the Guidelines for Cultural Landscapes.



A new rear addition to the Strathcona Public Library in Edmonton respects the primary value on the site—the historic library—while expanding the floor space to better serve the neighbourhood in the future. The addition is a successful example of meeting requirements for a new addition to be subordinate, distinguishable and compatible.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the exterior form and how it contributes to the heritage value of the historic building.	
2	Understanding the design principles used by the original designer or builder, and any changes made to the exterior form over time.	
3	Documenting the building's exterior form before undertaking an intervention, including the form and massing, and viewscales, sunlight and natural ventilation patterns.	Undertaking an intervention that affects the building's exterior form without first documenting building, site and setting relationships.
4	Assessing the condition of the building's exterior form early in the planning process so that the scope of work is based on current conditions.	
5	Protecting and maintaining elements of the building's exterior form through cyclical or seasonal maintenance work.	
6	Retaining the exterior form by maintaining proportions, colour and massing, and the spatial relationships with adjacent buildings.	
7	Stabilizing deteriorated elements of the exterior form by using structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated elements that could be stabilized or repaired.
8	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	
9	Documenting all interventions that affect the exterior form, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Reinstating the exterior form by recreating missing, or revealing obscured parts to re-establish character-defining proportions and massing.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
ADDITIONS OR ALTERATIONS TO THE EXTERIOR FORM		
11	Accommodating new functions and services in non-character-defining interior spaces as an alternative to constructing a new addition.	Constructing a new addition when the proposed functions and services could be accommodated by altering existing, non-character-defining interior spaces.
12	Selecting a new use that suits the existing building form.	Selecting a use that dramatically alters the exterior form; for example, demolishing the building structure and retaining only the street façade(s).
13	Selecting the location for a new addition that ensures that the heritage value of the place is maintained.	Constructing a new addition that obscures, damages or destroys character-defining features of the historic building, such as relocating the main entrance.
14	Designing a new addition in a manner that draws a clear distinction between what is historic and what is new.	Duplicating the exact form, material, style and detailing of the original building in a way that makes the distinction between old and new unclear.
15	Designing an addition that is compatible in terms of materials and massing with the exterior form of the historic building and its setting.	Designing a new addition that has a negative impact on the heritage value of the historic building.
HEALTH, SAFETY AND SECURITY CONSIDERATIONS		
16	Adding new features to meet health, safety or security requirements, such as an exterior stairway or a security vestibule in a manner that respects the exterior form and minimizes impact on heritage value.	Constructing a new addition to accommodate code-required stairs or elevators on a highly visible, character-defining elevation, or in a location that obscures, damages or destroys character-defining elements.
17	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to the exterior form without first exploring equivalent health, safety and security systems, methods or devices that may be less damaging to the character-defining elements and overall heritage value of the historic building.
ACCESSIBILITY CONSIDERATIONS		
18	Finding solutions to meet accessibility requirements that are compatible with the exterior form of the historic building. For example, introducing a gently sloped walkway instead of a constructed ramp with handrails in front of an historic building.	Radically altering the building's exterior form to comply with accessibility requirements. Relocating primary entrances when undertaking interventions to accommodate accessibility-related features.
19	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the historic building.	Altering character-defining elements, without consulting the appropriate specialists and users.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
SUSTAINABILITY CONSIDERATIONS		
20	Adding new features to meet sustainability requirements, such as solar panels or a green roof, in a manner that respects the exterior form and minimizes impact on character-defining elements.	Adding a new feature to meet sustainability requirements in a location that obscures, damages or destroys character-defining elements.
21	Working with sustainability and conservation specialists to determine the most appropriate solution to sustainability requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to the exterior form, without first exploring alternative sustainability solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.
22	Complying with energy efficiency objectives in a manner that minimizes impact on the character-defining elements and overall heritage value of the historic building.	Damaging or destroying character-defining elements or undermining their heritage value, while making modifications to comply with energy efficiency objectives.
23	Accommodating functions requiring a controlled environment, such as artefact storage or exhibits in an addition, while using the historic building for functions that benefit from existing natural ventilation and/or daylight.	Introducing new mechanical systems based on airtight building envelope design in buildings that were designed to use natural ventilation.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
24	Reinstating the building's exterior form from the restoration period, based on documentary and physical evidence.	

REMOVING EXISTING FEATURES FROM OTHER PERIODS

25	Removing a non character-defining feature of the building's exterior form, such as an addition built after the restoration period.	Failing to remove a non character-defining feature of the building's exterior form that confuses the depiction of the building's chosen restoration period. Removing a feature from a later period that serves an important function in the building's ongoing use, such as a fire escape.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

26	Recreating missing features of the exterior form that existed during the restoration period, based on physical or documentary evidence; for example, duplicating a dormer or restoring a carport that was later enclosed.	Constructing a feature of the exterior form that was part of the building's original design but was never actually built, or a feature thought to have existed during the restoration period but for which there is insufficient documentation.
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4.3.2 INTERIOR ARRANGEMENT

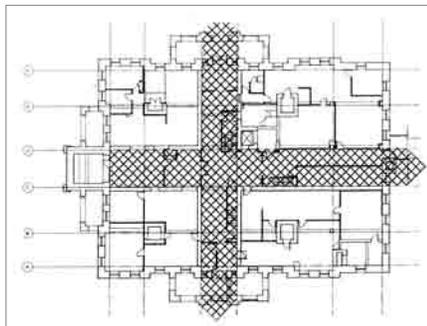
These guidelines provide direction when a building's interior arrangement is identified as a character-defining element of an historic place. They also give direction on how to minimize the impact on heritage value of additions or alterations to the building's interior due to a change in use or regulations.



The interior arrangement and planning principles employed in a building are often character defining. When considering adaptive reuse, it is important to select a new use that is compatible with the existing interior arrangement such as converting one wing of this convent (Monastère-des Augustines-de-l'Hôtel-Dieu-de-Québec) into temporary accommodations for the parents of sick children in the hospital.



Having served a number of different denominations over the years, the Free Meeting House in Moncton was restored to its earliest, 1821 interior configuration by following floor marks and other physical and documented evidence. Missing features from the selected restoration period were replaced.



Changing or reorganizing the way one moves through a building, such as the Calgary City Hall, shown here, can greatly affect heritage character. The procession through a series of spaces, or the inter-relationship between certain rooms, may be character defining. This should be considered when providing space for security desks or when free entry into certain parts of a building must be prevented. Every attempt should be made to continue the original flow of movement.

Interior arrangement refers to the overall organization or layout of a building's interior spaces, including the configuration and relationship of rooms and circulation spaces. These guidelines also apply to the elements that define the quality of the interior spaces and arrangement, such as interior walls, ceilings and floors. Interior arrangement also relates to the relationship between a building's interior design and use, and its exterior form.

Interior arrangement includes the functional relationships between spaces, such as the connection between a kitchen and dining room. It also includes circulation patterns and layout of rooms, including their proportions and scale, and planning associated with a style or period, such as the open plan and modular proportions of a modernist office tower interior.

Some non character-defining interior features may be replaced without altering the interior arrangement. For example, a theatre may still retain its original spatial arrangement, including balconies and stage openings, even if the furnishings and finishes are replaced. More recent interior interventions may also acquire value.

Typical interventions in an interior arrangement include adaptations to meet contemporary regulations, such as redesigning a lobby to meet security requirements, providing universal accessibility, or adding fire separations and exits. The interior arrangement often has a strong relationship with the building's exterior form, thus the impact on the exterior form should be considered when making any changes to the interior arrangement. The deterioration or loss of interior features can affect the overall heritage value of an historic building.

These guidelines provide general recommendations appropriate to all types of interior arrangements. For recommendations on specific architectural assemblies of interiors, refer to Interior Features. When spatial relationships are part of an engineering work, refer also to Functional Arrangement in the Guidelines for Engineering Works.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the interior arrangement and how it contributes to the heritage value of the historic building.	
2	Understanding the planning principles used by the original designer or builder, and any changes made to the interior arrangement over time.	
3	Documenting the interior arrangement, including the form and relationship between circulation patterns and interior spaces, and the condition, interrelationships and evolution of the elements that define the arrangement, before undertaking an intervention.	Undertaking an intervention that affects the interior arrangement, without first documenting the existing arrangement.
4	Assessing the integrity of the interior arrangement early in the planning process so that the scope of work is based on current conditions.	
5	Protecting and maintaining elements of the building's interior arrangement through cyclical or seasonal maintenance work.	
6	Retaining the interior arrangement by maintaining historic circulation patterns and spatial relationships.	Altering the interior arrangement by modifying or obscuring circulation patterns and spatial relationships.
7	Protecting adjacent character-defining elements from accidental damage, or exposure to damaging materials during maintenance or repair work.	
8	Documenting all interventions that affect the interior arrangement, and ensuring the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
9	Re-establishing the interior arrangement by reinstating missing or obscured parts of the arrangement, such as removing a drop ceiling to reveal the proportions of a character-defining space.	
10	Designing interior spaces and circulation that are compatible with the interior arrangement of the historic building.	Altering or destroying character-defining interior spaces by inserting floors, lowering ceilings, or adding or removing walls. Relocating an element related to circulation patterns, such as a staircase or main entrance, thereby altering the interrelationship between interior spaces and exterior form.

ADDITIONS OR ALTERATIONS TO THE INTERIOR ARRANGEMENT

11	Accommodating service functions, such as bathrooms, mechanical equipment and office machines required by the building's new use in non-character-defining spaces, such as previously undeveloped attics or storage spaces.	
12	Designing a new, compatible interior addition in a manner that draws a clear distinction between what is historic and what is new.	Duplicating the exact form, material, style and detailing of interior features, in a manner that makes the distinction between old and new unclear.
13	Installing permanent partitions in secondary spaces, and making use of demountable partitions, when subdivision of a character-defining space is required to accommodate a new use.	Installing permanent partitions that damage or obscure character-defining spaces.
14	Adding a new floor in a manner that minimizes the impact on character-defining interior spaces, features and finishes.	Inserting or removing floors in a manner that radically changes the interior space, or obscures, alters or destroys the decorative detailing or windows of the building.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

15	Adding new features to meet health, safety or security requirements, such as a fire separation in a lobby or an interior stairway, in a manner that respects the interior arrangement and minimizes impact on heritage value.	Constructing a new feature to meet health, safety and security requirements in a location that obscures, damages or destroys character-defining elements.
16	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to the interior arrangement without first exploring equivalent health, safety and security systems, methods or devices that may be less damaging to the character-defining elements and overall heritage value of the historic building.
17	Placing new functional or code-required stairways or security screening functions in the building's secondary and service areas.	Radically changing, damaging or destroying character-defining spaces, features or finishes when adding new functional or code-required features.
18	Complying with requirements, such as seismic standards, in a way that minimizes impact on the interior arrangement.	Damaging or destroying character-defining aspects of the interior arrangement when adding seismic reinforcement.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
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ACCESSIBILITY CONSIDERATIONS

19	Respecting the interior arrangement of the building when locating new accessibility-related features, such as ramps and lifts.	Radically altering the building's interior arrangement or circulation patterns to comply with accessibility requirements.
20	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the historic building.	Altering character-defining elements, without consulting the appropriate specialists and users.
21	Locating public functions strategically to limit changes to the building. For example, providing new functions for the public on the ground floor or in areas already served by exits.	Relocating primary entrances or stairways when undertaking intervention to accommodate accessibility-related features.

SUSTAINABILITY CONSIDERATIONS

22	Adding new features to meet sustainability requirements, in a manner that respects the interior arrangement and minimizes impact on character-defining elements.	Adding a new feature to meet sustainability requirements in a location that obscures, damages or destroys character-defining elements.
23	Working with sustainability and conservation specialists to determine the most appropriate solution to sustainability requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to the interior arrangement, without first exploring alternative sustainability solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.
24	Retaining or reinstating character-defining aspects of the interior arrangement which contribute to the historic building's inherent sustainability, such as natural daylight and ventilation.	Destroying character-defining interior arrangements to introduce daylight or ventilation into a space where it never existed.
25	Accommodating equipment designed to increase energy efficiency in secondary, non character-defining spaces, such as service areas.	

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
26	Reinstating the interior arrangement from the restoration period by reintroducing the layout, circulation patterns and spatial relationships, based on physical and documentary evidence.	

REMOVING EXISTING FEATURES FROM OTHER PERIODS

27	Removing a non character-defining feature of the building's interior arrangement, such as a wall added to subdivide a character-defining room.	<p>Failing to remove a non character-defining feature of the building's interior arrangement that confuses the depiction of the building's chosen restoration period.</p> <p>Removing a feature from a later period that serves an important function in the building's ongoing use, such as an accessible washroom or exit stairway.</p>
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

28	Recreating a missing feature of the interior arrangement that existed during the restoration period, based on physical or documentary evidence.	Constructing a feature of the interior arrangement that was part of the building's original design but was never actually built, or a feature thought to have existed during the restoration period but for which there is insufficient documentation.
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4.3.3 ROOFS

These guidelines provide direction when a roof or roof element is identified as a character-defining element of an historic place. Roof assemblies include both visible elements, such as cupolas, turrets, cresting, chimneys, gutters, weathervanes, gables, eaves, parapets, dormers, soffits and fascias, and components, such as the cladding, substructure, insulation, vapour controls, flashing and ventilation, that are critical in providing a weatherproof enclosure for the building.

As the most exposed architectural assembly, the roof is vital in protecting the rest of the building from the weather. A deteriorated roof can cause catastrophic damage to interiors and to the building structure. The roof is also an important architectural feature that contributes to a building's form and aesthetics. The profile and details of a flat roof may also be character-defining despite its more understated appearance compared to a large hip or gable roof.



The steep copper roof of the Fort Garry Hotel in Winnipeg is defined by a multitude of small shed- and hip-roofed dormers, highly elaborate stone dormer facades at the corners, a wealth of pinnacles and large ornate chimneys.



The Rehabilitation of the Truro Post Office, in Truro, NS included restoring its distinctive slate roof. In Rehabilitation, the replacement of missing historic features with a replica based on physical and documentary evidence, as in this project, is acceptable, as is a new design that is compatible with the heritage value of the historic place.



When restoring the former post office in Dawson, YK, the metal roofing surface, which was too deteriorated to repair, was replaced in kind. Physical evidence from the restoration period was used as a model to reproduce the characteristic standing seam detail.



In order to accommodate new condominium units in the upper floor of this building on Queen Street in Charlottetown, new dormers were added. In Rehabilitation, the design of new elements should be compatible with the heritage value of the historic place.

Given the constant exposure to the environment, roofing materials do not last indefinitely. While some materials, such as copper sheeting and slate shingles, can last for many decades if properly designed and maintained, other materials, such as wood and asphalt shingles and membrane roofing, need to be replaced more frequently. The need for regular replacement makes roofs vulnerable to changes that may affect their heritage value. Careful attention must be given to the detailing, pitch, exposure, material and shape when replacing a roof. Preserving durable roofing materials will prolong the building's service life, sometimes by decades.

These guidelines provide general recommendations appropriate to all types and shapes of roofs. For recommendations on form and structural issues related to roofs, refer to Exterior Form and Structural Systems, respectively. For specific materials that make up roofs, refer to the Guidelines for Materials.



A surviving pressed metal shingle was used as a prototype for manufacturing replacement shingles when restoring the main house at the Motherwell Homestead near Abernathy, SK. In Restoration, repairs or replacements of extensively deteriorated or missing parts of features are done in kind, and are based on physical, documentary and oral evidence.



It is important to consider the expected life span of all elements that make up a roof assembly when repairing or replacing a roof such as this one on St. Dunstan's Basilica in Prince Edward Island. Roofing materials, such as copper and slate, need to be matched with flashings of a similar life span.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the roof and how it contributes to the heritage value of the historic building.	
2	Understanding the properties and characteristics of the roof as well as changes and previous maintenance practices.	Failing to consider the impact of previous changes and maintenance practices on the roof.
3	Documenting the form, materials and condition of roof assemblies before undertaking an intervention, including the roof's pitch, shape, decorative and functional elements, and materials, and its size, colour and patterning.	Undertaking an intervention that affects character-defining roofs and roof elements, without first documenting their existing character and condition.
4	Assessing the condition of the roof assembly and materials early in the planning process so that the scope of work is based on current conditions.	
5	Determining the cause of a roof's distress, damage or deterioration through investigation, monitoring and minimally invasive or non-destructive testing techniques.	
6	Protecting and maintaining a roof by cleaning and maintaining the gutters, downspouts and flat roof drains, and replacing deteriorated flashing in kind. Roof sheathing should also be checked for proper venting to prevent moisture condensation and water penetration, and to ensure that materials are free from insect infestation.	Failing to maintain roofs on a cyclical basis. Failing to replace deteriorated flashing, or to clean and properly maintain gutters and downspouts and flat roof drains so that water and debris collect and damage roof fasteners, sheathing and the underlying structure.
7	Retaining sound or deteriorated roof assemblies that can be repaired.	Stripping the roof of sound or repairable character-defining materials, such as slate, clay tile, wood and architectural metal.
8	Stabilizing deteriorated roofs by structural reinforcement, weather protection or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated roof elements that could be stabilized or repaired.
9	Repairing parts of roofs by patching, piecing-in, consolidating, or otherwise reinforcing, using recognized conservation methods. Repair may also include the limited replacement in kind, or with a compatible substitute material, of extensively deteriorated or missing parts of the roof. Repairs should match the existing work as closely as possible, both physically and visually.	
10	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Replacing in kind extensively deteriorated or missing parts of roof assemblies where there are surviving prototypes.	Replacing an entire roof element, such as a dormer, when limited replacement of deteriorated and missing parts is possible. Using a substitute material for the replacement part that neither conveys the same appearance as the surviving parts of the roof element, nor is physically or visually compatible.
12	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
13	Documenting all interventions that affect the building's roof, and ensuring that the documentation is available to those responsible for future interventions	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
14	Repairing a roof assembly, including its functional and decorative elements, by using a minimal intervention approach. Such repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of irreparable or missing elements, based on documentary or physical evidence.	Replacing an entire roof element, such as a cupola, dormer or lightning rod, when the repair of materials and limited replacement of deteriorated or missing elements is feasible. Failing to reuse intact roofing materials when only the roofing structure or sheathing needs replacement.
15	Improving the detailing of roof elements, following recognized conservation methods, to correct faulty details. For example, adjusting the slope of a cornice to prevent ponding, or introducing a new drip edge at the eave to better direct water runoff away from a masonry wall. Such improvements should be physically and visually compatible.	
16	Replacing in kind an entire element of the roof that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model to reproduce the element. This can include a large section of roofing, a dormer, or a chimney. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered.	Removing a roof element that is irreparable, such as a chimney or dormer, and not replacing it, or replacing it with a new element that does not convey the same appearance or serve the same function. Replacing deteriorated roof elements and materials that are no longer available with physically or visually incompatible substitutes.
17	Replacing missing historic features by designing and constructing a new roof feature, based on physical and documentary evidence, or one that is compatible in size, scale, material, style or colour.	Creating a false historical appearance because the replicated feature is incompatible or based on insufficient physical and documentary evidence.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

Recommended	Not Recommended
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ADDITIONS OR ALTERATIONS TO ROOFS AND ROOF ELEMENTS

18	Modifying or replacing a roof or roof element, to accommodate an expanded program, a new use, or applicable codes and regulations, in a manner that respects the building's heritage value.	Constructing an addition that requires removing a character-defining roof. Changing the configuration of a roof by adding new elements, such as dormer windows, vents or skylights, in a manner that negatively affects its heritage value.
19	Selecting appropriate rooftop mechanical and service equipment and associated piping and cabling, such as air-conditioning components, transformers or solar collectors, and installing the equipment as inconspicuously as possible, while respecting the building's heritage value and character-defining elements.	Selecting inappropriate rooftop mechanical or service equipment, or installing such equipment in a manner that compromises the building's heritage value and character-defining elements. Adding significant loads to a roof without assessing the impact on the building's structure.
20	Designing and constructing additions to roofs, such as access stairs, elevator or mechanical equipment housing, decks and terraces, and dormers and skylights that are inconspicuous from the public right of way and do not damage or obscure character-defining elements.	Designing and constructing a roof addition that compromises the building's character-defining roof elements, its structural integrity, or its overall appearance. Constructing a rooftop addition that blocks natural light patterns or important views.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

21	Complying with health and safety requirements, by providing lightning protection, or snow and ice guards, or roof anchors in a manner that conserves the roof's heritage value and minimizes impact on its character-defining elements.	Damaging or destroying character-defining elements while making modifications to comply with health and safety requirements.
22	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to character-defining roofs, without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements and heritage value of the historic building.
23	Removing or encapsulating hazardous materials, such as asbestos insulation, using the least-invasive abatement methods possible, and only after thorough testing has been conducted.	
24	Protecting roofs against loss or damage by identifying and assessing the specific fire risks, and by implementing an appropriate fire-protection strategy that addresses those risks.	Covering flammable character-defining elements with fire-resistant sheathing or coatings that alter their appearance. Replacing wood roof elements with alternate materials, without carefully considering other options for reducing fire spread. Failing to take proper fire protection precautions when using a technique that could endanger the building, such as applying membranes on wood roofs using heat.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
SUSTAINABILITY CONSIDERATIONS		
25	Complying with energy efficiency objectives in upgrades to the roof assembly in a manner that respects the building's character-defining elements, and considers the energy efficiency of the building envelope and systems as a whole.	Damaging or destroying character-defining elements while making modifications to comply with energy efficiency requirements.
26	Working with energy efficiency and sustainability specialists to determine the most appropriate solution to energy efficiency and sustainability requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to the roof assembly, without first exploring alternative sustainability solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.
27	Exercising caution and foreseeing the potential effects of insulating the roof on the building envelope to avoid damaging changes, such as displacing the <i>dew point</i> and creating <i>thermal bridges</i> , or increasing the snow load.	Installing insulation without anticipating its potential impact on the building envelope. Inserting thermal insulation in roof assemblies, without providing appropriate vapour barriers or ventilation.
28	Installing thermal insulation in non-character-defining roof spaces, such as attics, without adversely affecting the building envelope.	Installing insulation in habitable attic spaces without considering its effect on character-defining interior features such as mouldings.
29	Ensuring that structural, drainage and access requirements to improve the roof's energy efficiency can be met without damaging character-defining elements.	
30	Assessing the addition of vegetated roof systems (green roofs) or storm water cisterns to flat-roof assemblies, and their impact on the building's heritage value and structural integrity, before work begins.	Adding a vegetated or reflective membrane roof system that might compromise the building's heritage value or its structural integrity.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
31	Repairing a roof assembly from the restoration period by reinforcing its materials.	Replacing an entire roof feature from the restoration period, such as a cupola or dormer, when the repair of materials and limited replacement of deteriorated or missing parts is possible.
32	Replacing in kind an entire roof feature from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the feature. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable roof feature from the restoration period and not replacing it, or replacing it with an inappropriate new roof feature. Reinstating a roof detail that is damaging to character-defining elements.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

33	Removing or altering a non character-defining roof or roof element, such as a later dormer or asphalt roofing, dating from a period other than the restoration period.	Failing to remove a non character-defining roof or roof element from another period that confuses the depiction of the building's chosen restoration period.
34	Retaining alterations to roof assemblies that address problems with the original design if those alterations do not have a negative impact on the building's heritage value.	Removing a roof element from a later period that serves an important function in the building's ongoing use, such as a skylight for natural daylight, or a vent for natural ventilation.

RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

35	Recreating a missing roof element that existed during the restoration period, based on physical or documentary evidence; for example, reinstating a dormer or cupola.	Constructing a roof element that was part of the building's original design, but never actually built, or constructing a feature thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.3.4 EXTERIOR WALLS

These guidelines provide direction when exterior walls and their elements are identified as character-defining elements of an historic place. Exterior walls include foundation walls, structural masonry or log walls, and wood, concrete or steel framing with an exterior cladding, such as *curtain-wall systems*. The guidelines also provide direction on how to minimize the negative impact of additions or alterations on exterior walls.



Because they are largely below the surface, foundations are often dismissed as not contributing to a building's heritage character. However, it is important to remember that heritage value is not only found in what can be seen. Construction methods, materials and techniques can all be character defining, as is the case for the Grange Alexander-Salomon-Wallbridge in Quebec.

Log, stone and concrete foundations are visually and functionally very different. The decision to repair, replace in kind or rehabilitate a foundation should be determined by both the condition of the foundation and its compatibility with the heritage values of the place.

Exterior walls perform many functions, including those of structure, weatherproofing, thermal protection, daylight control and ventilation. Traditional load-bearing walls, such as log or masonry walls, perform all of these functions in a single composition. Later, the development of frame-based structural systems led to the separation of these functions. In modern buildings, components, such as cladding, air barriers and insulation, are combined to create a complex exterior wall assembly. These components act both independently and as a whole; consequently, there may be specific conservation issues associated with the materials concealed in the core or cavity of the assembly.

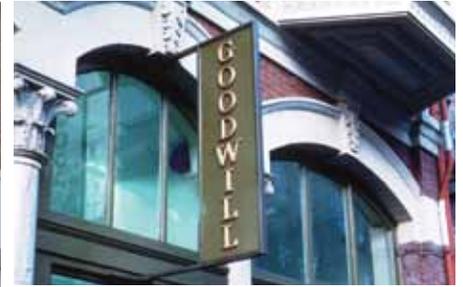


A modern building envelope includes multiple materials, such as a concrete structure, metal curtain wall mullions and glazed panels. Each of these materials ages differently and reacts in its own way to stresses, heat and cold. For a face-sealed curtain wall like this one, it is important to select sealants that make the assembly weathertight and that are compatible with all the materials with which they come into contact. Sealant materials generally have a shorter service life than adjacent materials and will eventually fail due to exposure to weather, stress and age. Regularly replacing appropriate sealants is an important part of building maintenance.

When frame-based cladding and curtain walls were developed, air and vapour barriers were introduced, as well as mechanical heating, ventilating and air conditioning (HVAC) systems that changed the thermal and moisture conditions in the walls. Changes to existing HVAC systems, or introducing mechanical systems in buildings where the walls were designed without insulation or air barriers, often led to the deterioration of exterior wall assemblies. It is, therefore, important to understand how the exterior wall relates to the building systems.

Curtain wall systems present a range of new conservation challenges, because they were the result of an era of experimentation in structures and materials, and predate higher standards for energy efficiency. Their conservation should be examined on a case-by-case basis, taking into account the heritage value of the design and the actual conditions and causes of deterioration, while planning for extended or improved performance.

These guidelines provide general recommendations appropriate to all types of exterior walls. For recommendations on associated issues related to walls, refer to the individual guidelines for Exterior Form, Windows, Doors and Storefronts; and Structural Systems. For specific materials that make up exterior walls, refer to the Guidelines for Materials.



New signs (top right) should be compatible with the building in terms of size, scale, material, style and colour. They should also not obscure, damage or destroy character-defining elements. In some cases, as Mel's Tea Room in Sackville, NB (left), signs added later become character-defining elements in their own right. Character defining signage should also be maintained despite a change in use, such as this painted sign for the Hartt Boot and She Factory in Fredericton (bottom right), which has been converted into apartments.



Responding to the dangers of arctic exploration and the loss of the Franklin Expedition, Kellett's Storehouse in Nunuvut was built in 1853 for sailors in distress. Constructed from local stone, it was filled with enough provisions to maintain a large group for several months. Conserving building remains or above-ground archaeological resources pose unique challenges. In this case, the walls and foundations were stabilized and an insulated floor was installed allowing remaining soil layers and associated artifacts to be left in place while being protected from theft and further exposure to the elements.



The impact of adding insulation to an exterior wall assembly that was not historically insulated should be carefully considered, including by measurement of the current performance of the wall and energy modelling the performance of different approaches. Adding insulation on the exterior or interior of solid masonry or log walls may impact on heritage character and lead to deterioration of the wall, if not based on a thorough understanding of the wall's physical characteristics and context, including its exposure to air, water and vapour pressures. Any changes to an exterior wall should be based on the building envelope science for the type of historic assembly.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the exterior walls and how they contribute to the heritage value of the historic building.	
2	Understanding the properties and characteristics of the exterior walls as well as changes and previous maintenance practices.	Failing to consider the impact of previous changes to the exterior wall assembly, such as the addition of insulation and vapour barriers, or new heating or cooling systems.
3	Documenting the composition, form, materials, details, dimensions and condition of exterior wall assemblies before undertaking an intervention. This includes geometry, scale, proportions, openings, form and supporting frames or structures.	Undertaking an intervention that affects exterior wall assemblies without first documenting their existing character and condition.
4	Assessing the condition of wall assemblies and their materials early in the planning process so that the scope of work is based on current conditions.	
5	Determining the cause of distress, damage or deterioration of exterior walls through investigation, monitoring and minimally invasive or non-destructive testing techniques.	
6	Protecting and maintaining exterior walls by cleaning and repairing damaged materials, and checking exterior wall assemblies for moisture penetration and insect infestation, taking corrective action, as necessary and as soon as possible.	Failing to maintain exterior walls on a cyclical basis. Failing to correct causes of deterioration of the exterior wall assembly, such as failed sealants.
7	Retaining sound or deteriorated exterior wall assemblies that can be repaired.	
8	Stabilizing deteriorated exterior walls by using structural reinforcement, weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated exterior wall elements that could be stabilized or repaired.
9	Repairing parts of exterior walls by patching, piecing-in, consolidating, or otherwise reinforcing, using recognized conservation methods. Repair may also include the limited replacement in kind, or with a compatible substitute material, of extensively deteriorated or missing parts of the exterior wall assembly. Repairs should match the existing work as closely as possible, both physically and visually.	
10	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Replacing in kind extensively deteriorated or missing parts of exterior wall assemblies where there are surviving prototypes.	Replacing an entire exterior wall assembly when only limited replacement of deteriorated and missing parts is possible. Using a substitute material for the replacement part that neither conveys the same appearance as the surviving parts of the element, nor is physically or visually compatible.
12	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
13	Documenting all interventions that affect the exterior walls, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
14	Repairing an exterior wall assembly, including its functional and decorative elements, by using a minimal intervention approach. Such repairs might include the limited replacement in kind, or replacement using an appropriate substitute material of irreparable or missing elements, based on documentary or physical evidence. Repairs might also include dismantling and rebuilding a masonry or wood wall, if an evaluation of its overall condition determines that more than limited repair or replacement in kind is required.	Over-cladding a deteriorated or poorly insulated exterior wall with a new material or assembly, without considering the impact on heritage value or the condition of underlying materials. Replacing an entire exterior wall assembly when the repair and limited replacement of deteriorated or missing elements is feasible. Failing to reuse intact cladding when only the internal parts of the wall assembly need replacement.
15	Improving the drying ability of exterior wall assemblies through suitable heating and/or ventilation measures.	Damaging the masonry of an exterior wall by drilling drainage holes into the masonry units or into the joints, with a drill bit wider than the mortar joints. Introducing a vapour barrier in an exterior wall that was constructed to be permeable or breathable.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
16	Accommodating the thermal expansion and contraction of masonry, concrete and curtain wall assemblies, by introducing expansion or control joints, and incorporating those joints into existing crack patterns, where feasible, to minimize impact on character-defining elements.	Filling moving cracks or expansion joints in exterior wall assemblies with materials that inhibit or prevent thermal expansion and contraction.
17	Replacing in kind an irreparable exterior wall assembly, based on documentary and physical evidence. If using the same kind of material is not environmentally sound, or technically or economically feasible, then a compatible substitute material may be considered.	Removing an irreparable exterior wall assembly, such as a cornice or <i>brise-soleil</i> , and not replacing it, or replacing it with a new element that does not convey the same appearance or serve the same function. Replacing deteriorated elements and materials in curtain wall assemblies that are no longer available, with physically and visually incompatible substitutes.
18	Replacing missing historic features by designing and constructing a new portion of the exterior wall assembly, based on physical and documentary evidence, or one that is compatible in size, scale, material, style and colour.	Creating a false historical appearance, because the replicated feature is incompatible or based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO EXTERIOR WALLS

19	Modifying exterior walls to accommodate an expanded program, a new use, or applicable codes and regulations, in a manner that respects the building's heritage value.	
20	Designing a new addition in a manner that preserves the character-defining exterior walls of the historic building.	Constructing an addition that requires the removal of character-defining exterior walls.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

21	Complying with health, safety and security requirements in a manner that conserves the heritage value of the exterior wall assembly and minimizes impact on its character-defining elements.	Damaging or destroying elements while making modifications to comply with health, safety or security requirements.
22	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to exterior walls, without first exploring equivalent systems, methods or devices that may be less damaging to character-defining elements and the heritage value of the historic building.
23	Removing or encapsulating toxic materials, using the least-invasive abatement methods possible, and only after thorough testing has been conducted.	
24	Protecting exterior walls against loss or damage by identifying and assessing specific risks, and by implementing an appropriate fire-protection and blast protection strategy that addresses those risks.	Covering flammable character-defining walls with fire-resistant sheathing or coatings that alter their appearance.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
SUSTAINABILITY CONSIDERATIONS		
25	Complying with energy efficiency objectives in upgrades to exterior wall assemblies in a manner that respects the building's character-defining elements, and considers the energy efficiency of the building envelope and systems as a whole.	<p>Changing the composition or materials of the exterior wall assembly in a manner that compromises the building's character-defining elements and the durability of its materials.</p> <p>Replacing single pane glazing with sealed thermal units, without considering the impact on interrelated elements, such as curtain wall connections.</p>
26	Assessing the potential impacts of adding insulation to the building envelope, such as displacing the <i>dew point</i> and creating <i>thermal bridges</i> .	<p>Inserting thermal insulation in exterior wall cavities, in attics, and in unheated cellars and crawl spaces, that might adversely affect the building's envelope and character-defining elements.</p> <p>Installing insulation on the inside of exterior walls without considering the effect on character-defining interior mouldings or detailing.</p>
27	Working with energy efficiency specialists to determine the most appropriate solution to energy efficiency requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to the exterior walls, without first exploring alternative energy efficiency solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
28	Repairing an exterior wall assembly from the restoration period by reinforcing its materials; for example, using heavier gauge metal to reinforce a mullion in a curtain wall.	Replacing an entire exterior wall assembly from the restoration period when the repair of materials and limited replacement of deteriorated or missing parts is possible.
29	Replacing in kind an entire exterior wall assembly from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the assembly. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable exterior wall assembly from the restoration period and not replacing it, or replacing it with an inappropriate exterior wall assembly. Reinstating an exterior wall detail that is damaging to adjacent character-defining elements.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

30	Removing or altering a non character-defining exterior wall assembly or element from a period other than the restoration period.	Failing to remove a non character-defining exterior wall assembly or element from another period that confuses the depiction of the building's chosen restoration period.
31	Retaining alterations to exterior wall assemblies that address problems with the original design, if those alterations do not have a negative impact on the building's heritage value.	Removing an exterior wall assembly or element from a later period that serves an important function in the building's ongoing use.

RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

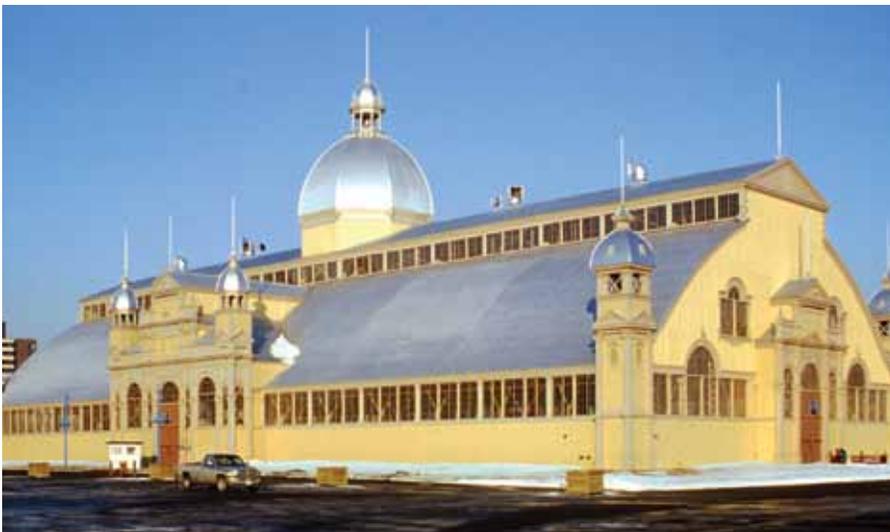
32	Recreating a missing exterior wall assembly from the restoration period, based on physical or documentary evidence.	Constructing an exterior wall assembly that was part of the building's original design, but was never actually built, or constructing a feature thought to have existed during the restoration period, but for which there is insufficient documentation.
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4.3.5 WINDOWS, DOORS AND STOREFRONTS

These guidelines provide direction when windows, doors or storefronts are identified as *character-defining elements* of an historic place. They also give direction on how to minimize the impact of introducing a new element, or changing existing non-character-defining windows, doors and storefronts in an historic building.



The character-defining form and features of the Byrnes Block storefronts in Gastown, Vancouver, including their large plate-glass display windows with multi-pane transom windows above and recessed central doorways, have been retained through Preservation.



The windows of the Aberdeen Pavilion in Ottawa, a building that is valued as an example of a large-scale exhibition structure from the 19th century, include monitor windows at the top of the curved roof structure to provide daylight to the wide open space from above. Preservation of the character-defining wood windows involved scraping, sanding, re-puttying and repainting. While some replacement in kind was undertaken, almost all the original windows were retained, including the glass. Wholesale replacement of window units is not an appropriate Preservation treatment.



Doors are often targets for replacement because of security, energy efficiency or fire separation needs. Often it is possible to meet all these needs while retaining a historic door. Adding weather stripping can contribute greatly to a door's efficiency. Modern locks and locking mechanisms can often be installed with little damage. The fire rating of a solid wood door may meet certain code requirements.

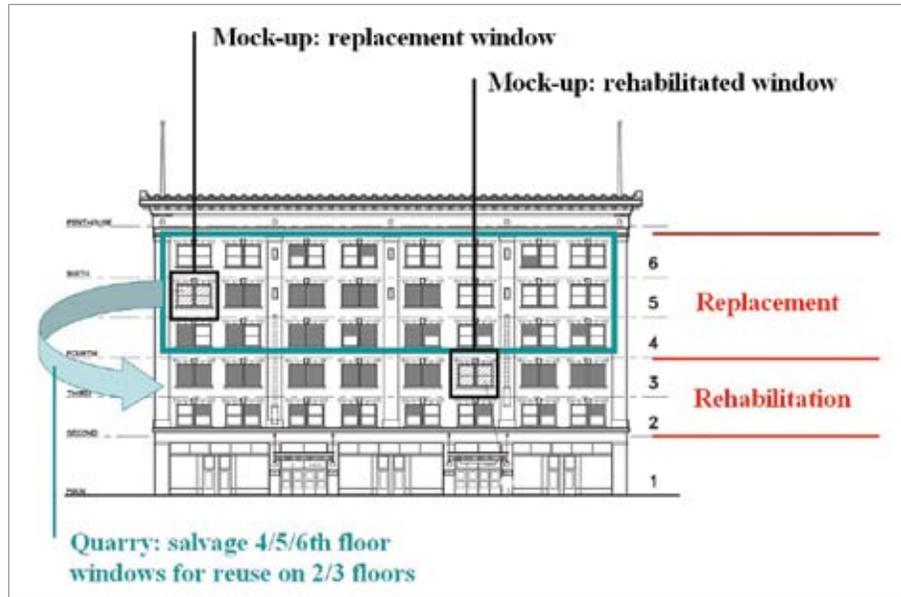
Windows and doors range from traditional wood and steel assemblies to modern sealed units, skylights, conservatories and revolving doors. They also come with a wide range of functional and decorative components, including frames, sashes, *muntins*, stained glass, glazing, hardware, sills, *hoodmoulds*, panelled or decorated jambs and mouldings, and interior and exterior shutters.

Windows, doors and storefronts are among the most conspicuous of any building's features. They punctuate the façade or, in the case of curtain wall construction, are integral to the exterior wall assembly. In addition to their function—providing light, views, fresh air and access to the building—their arrangement and design is fundamental to the building's appearance and heritage value. Each window, door or storefront is, in itself, a complex assembly whose function and operation must be considered as part of its conservation.

Windows and doors are vulnerable to wear and tear, changing tastes and functional requirements. The ongoing need for maintenance and upgrades can, however, motivate interventions that can have a negative impact on their heritage value. Often, windows and doors are replaced with newer units that have a much shorter service life, in the name of energy efficiency.

Storefronts often provide display space and are susceptible to rapidly changing commercial requirements. They are included in this section along with their functional and decorative features, such as windows, doors, transoms, cornices, corner posts, awnings, signs and lighting.

These guidelines provide general recommendations for windows, doors and storefronts. For recommendations on related issues, refer to the individual guidelines for Exterior Form and Mechanical and Electrical Systems. For materials that make up these assemblies, refer to the Guidelines for Materials.



While rehabilitating the Lougheed Building in Calgary, the windows in the best condition were repaired and consolidated on the lower levels where they were most visible from the street. New windows based on the existing were specially constructed for the upper levels. The location and reuse of the windows was carefully and clearly documented both for construction purposes and for future reference.



The Leopold Roy House in Saint-Quentin NB is a good example of a window, door and storefront restoration. Based on photographic and physical evidence, the original finishes and designs were uncovered and repaired or replaced in kind.



These large windows on King Street in St. John were originally slated for removal and replacement as part of the CentreBeam Place rehabilitation project. Instead, a condition revealed that the original windows could be retained and repaired, with the addition of interior storm to meet energy efficiency requirements.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding windows, doors and storefronts and how they contribute to the heritage value of the historic building.	
2	Understanding the properties, operation and characteristics of the windows, doors and storefronts as well as changes and previous maintenance practices.	Failing to consider the impact of previous changes and maintenance practices, such as sealed windows or the removal of awnings or sunshades.
3	Documenting the form, materials and condition of windows, doors and storefronts, and their elements, before undertaking an intervention. This includes the configuration, style, method of operation and materials.	Undertaking an intervention that affects windows, doors and storefronts without first documenting their existing character and condition.
4	Assessing the condition of windows, doors and storefronts, including hardware, early in the planning process so that the scope of work is based on current conditions.	
5	Determining the cause of distress, damage, or deterioration of windows, doors and storefronts through investigation, monitoring, and minimally invasive or non-destructive testing techniques.	
6	Protecting and maintaining windows, doors and storefronts by using appropriate surface treatments, such as cleaning, rust removal, limited paint removal, and reapplying protective coating systems in kind.	Failing to adequately maintain windows, doors and storefronts on a regular basis.
7	Making windows, doors and storefronts weather tight and energy efficient by re-puttying and replacing or installing weatherstripping, adjusting hardware, and sealing openings and joints.	
8	Retaining sound and repairable windows, doors and storefronts, including their functional and decorative elements, such as hardware, signs and awnings.	Removing or replacing windows, doors and storefronts that can be repaired. Peeling paint, broken glass, stuck sashes, loose hinges or high air infiltration are not, in themselves, indications that these assemblies are beyond repair.
9	Stabilizing deteriorated windows, doors and storefronts by using structural reinforcement, and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Adding protective glazing or exterior storms to stained glass elements, without the involvement of a specialist conservator.
10	Repairing parts of windows, doors, or storefronts, by patching, piecing-in, consolidating, or otherwise reinforcing, using recognized conservation methods. Repair may also include the limited replacement in kind, or with a compatible substitute material, of those extensively deteriorated or missing parts of windows, doors and storefronts. Repairs should match the existing work as closely as possible, both physically and visually.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Protecting adjacent character-defining elements from accidental damage, or exposure to damaging materials during maintenance or repair work.	
12	Replacing in kind extensively deteriorated or missing parts of windows, doors and storefronts, where there are surviving prototypes.	Replacing an entire functional or decorative element, such as a shutter with a broken louver, or a door with a missing hinge, when only limited replacement of deteriorated or missing part is possible. Using a substitute material for the replacement part that neither conveys the same appearance as the surviving parts of the element, nor is physically or visually compatible.
13	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
14	Documenting all interventions that affect the building's windows, doors and storefronts, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
15	Repairing windows, doors and storefronts by using a minimal intervention approach. Such repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of irreparable or missing elements, based on documentary or physical evidence.	Replacing an entire window, door or storefront when the repair of materials and limited replacement of deteriorated or missing elements is feasible. Failing to reuse serviceable hardware, such as sash lifts and sash locks, hinges and doorknobs.
16	Replacing in kind irreparable windows, doors or storefronts based on physical and documentary evidence. If using the same materials and design details is not technically or economically feasible, then compatible substitute materials or details may be considered.	Removing an irreparable window, door or storefront and not replacing it, or replacing it with a new one that does not convey the same appearance or serve the same function. Stripping storefronts of character-defining materials or covering over those materials.
17	Replacing missing historic features by designing and installing new windows, doors and storefronts based on physical and documentary evidence, or one that is compatible in size, scale, material, style and colour.	Creating a false historical appearance because the new window, door or storefront is incompatible, or based on insufficient physical and documentary evidence.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
18	Designing and constructing a new window, door or storefront when it is completely missing, with a new design that is compatible with the style, era and character of the historic place, or a replica based on documentary evidence.	Changing the number, location, size, or configuration of windows, doors and storefronts, by cutting new openings, blocking in existing openings, or installing replacement units that do not fit the opening.
19	Using signs, awnings, canopies or marquees of a scale and design that is compatible with the historic building.	Introducing a new design that is incompatible in size, scale, material, style or colour.

ADDITIONS OR ALTERATIONS TO WINDOWS, DOORS AND STOREFRONTS

20	Designing and installing new windows, doors or storefronts required by a new use on non-character-defining elevations in a manner that is compatible with the building's style, era and character.	Installing new windows, doors or storefronts that are incompatible with the building's style, era and character, or that obscure, damage or destroy character-defining elements.
21	Providing a setback in the design of drop ceilings, when required, to allow for full height window openings.	Inserting new floors or drop ceilings that cut across windows openings, changing the interior and exterior appearance of the building, and reducing access to daylight.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

22	Complying with health, safety and security requirements in a manner that conserves the heritage value of the windows, doors and storefronts and minimizes impact on its character-defining elements.	Damaging or destroying elements while making modifications to comply with health, safety and security requirements.
23	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to windows, doors or storefronts without first exploring equivalent health, safety and security systems, methods or devices that may be less damaging to the character-defining elements of the historic building.
24	Removing or encapsulating hazardous materials, such as lead-based paint, using the least-invasive abatement methods possible, and only after thorough testing has been conducted.	
25	Protecting windows, doors or storefronts against loss or damage by identifying and assessing specific risks, and by implementing an appropriate fire protection strategy that addresses those risks. For example, replacing a character-defining wood door with a compatible fire-rated door, only after carefully considering other options.	Implementing a generic fire-protection strategy, or one that does not appropriately address the specific fire risks of the historic building. Covering flammable, character-defining elements with fire-resistant sheathing or coatings that alter their appearance.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
ACCESSIBILITY CONSIDERATIONS		
26	Complying with accessibility requirements in a manner that conserves, where possible, character-defining doors and storefronts, including their decorative and operating hardware. This can include using an automatic door opener instead of providing the required manoeuvring space for wheelchairs at doors.	Installing new hardware that damages character-defining doors and mouldings without considering alternate means of meeting accessibility requirements
27	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the historic building.	Altering character-defining windows, doors and storefronts without consulting the appropriate specialists and users.
SUSTAINABILITY CONSIDERATIONS		
28	Complying with energy efficiency objectives in upgrades to character-defining doors, windows and storefronts by installing weather-stripping, storm windows, interior shades and, if historically appropriate, blinds and awnings. The energy efficiency of the building envelope and systems as a whole should be considered.	Replacing character-defining, multi-paned sashes with new thermal sashes with false <i>muntings</i> .
29	Working with specialists to determine the most appropriate solution to energy efficiency requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to windows, doors or storefronts without first exploring alternative energy efficiency solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.
30	Maintaining the building's inherent energy-conserving features in good operating condition, such as operable windows or louvered blinds for natural ventilation.	Replacing repairable windows with new ones, without evaluating the performance and remaining service life of the existing windows.
31	Installing interior storm windows where original windows are character-defining and exterior storms are inappropriate.	

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
32	Repairing windows, doors and storefronts from the restoration period, using a minimal intervention approach, such as patching, splicing, consolidating, or otherwise reinforcing their materials and improving weather protection.	Replacing an entire window, door or storefront from the restoration period, when the repair of materials and limited replacement of deteriorated or missing parts is possible.
33	Replacing in kind an entire window, door or storefront from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the assembly. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable window, door or storefront and not replacing it, or replacing it with an inappropriate window, door or storefront. Reinstating a window, door or storefront detail that is damaging to character-defining elements.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

34	Removing or altering non character-defining windows, doors or storefronts, or their associated functional or decorative elements, from a period other than the restoration period.	Failing to remove a non character-defining window, door or storefront from another period that confuses the depiction of the building's chosen restoration period.
35	Retaining alterations to windows, doors or storefronts that address problems with the original design, if those alterations do not have a negative impact the building's heritage value.	Removing a window, door or storefront from a later period that serves an important function in the building's ongoing use, such as an emergency exit door.

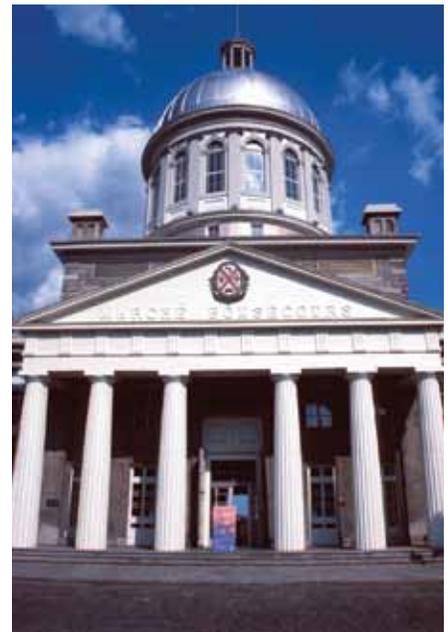
RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

36	Recreating a missing window, door or storefront from the restoration period, based on physical or documentary evidence.	Installing a window, door or storefront that was part of the building's original design, but was never actually built, or constructing a feature thought to have existed during the restoration period, but for which there is insufficient documentation.
37	Recreating missing signage, awnings or canopies where sufficient physical or documentary evidence exists, and the building's current use allows.	Installing signs, awnings, canopies or marquees, for which there is insufficient physical or documentary evidence.

4.3.6 ENTRANCES, PORCHES AND BALCONIES

These guidelines provide direction when entrances, porches and balconies are identified as a *character-defining element* of an historic place. Lobbies, vestibules, stairs, canopies, verandas, overhangs, *widow's walks* and *pergolas*, and their decorative and functional elements, such as pilasters, entablatures, fire escapes, lights and balustrades are also included, as well as features that allow access to the building by car, such as a drive-through, ramp, canopy or carport.

Entrances, porches and balconies contribute to a building's aesthetic and retain heat, block sun, or provide natural ventilation. Because entrances, porches and balconies are exposed to the elements, they require regular maintenance. Modifications may also be needed due to new functional requirements, code compliance, or accessibility. The addition of a new ramp or security clearance area are common interventions that may affect the layout and functional configuration of both the interior and exterior of an entranceway.



In Rehabilitation, deteriorated features should be repaired, whenever possible, and replaced when the severity of the damage makes it necessary. The stone steps of this house entrance were cracked. Appropriate work included repairing the stone steps and walls and installing a compatible metal handrail to meet building code requirements.

Porches, such as this portico on the old Bonsecours Market in Montreal (built 1844–1847) with its striking Greek Doric cast iron columns, can play a significant role in defining a building's character. Maximizing the retention of character-defining elements, including the portico, was the primary conservation objective when the building was rehabilitated into a municipal offices, exhibition spaces and restaurants.

The guidelines address these types of projects and provide general recommendations appropriate to all types of entrances, porches and balconies. For recommendations on associated issues, refer to the individual guidelines for Interior Arrangement; Roofs; Doors, Windows and Storefronts; Exterior Walls; and Structural Systems. For recommendations on specific materials that make up entrances, porches and balconies, refer to the Guidelines for Materials.



In Restoration, reinstating the historic paint colours from the restoration period should be based on physical or documentary evidence such as on-site paint analysis and colour photographs.



The curved, ornate metal canopy extending over the sidewalk at the Maltese Cross Building in Winnipeg's Exchange District clearly marks one of the buildings main entrances. Not using this entrance or establishing a new primary entrance in a different location would be inappropriate.



Adding a ramp to meet accessibility requirements should be designed to be compatible with a building's character. This new ramp at Province House in Charlottetown was discretely integrated into one side of an existing entrance porch.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding entrances, porches or balconies and how they contribute to the heritage value of the historic building.	
2	Understanding the functions, properties and characteristics of entrances, porches and balconies, as well as changes and previous maintenance practices.	Failing to consider the impact of previous changes and maintenance practices, such as the removal of an awning or porch.
3	Documenting the form, materials and condition of entrances, porches and balconies before undertaking an intervention.	Undertaking an intervention that affects entrances, porches and balconies without first documenting their existing character and condition.
4	Assessing the condition of entrances, porches and balconies early in the planning process so that the scope of work is based on current conditions.	
5	Determining the cause of distress, damage or deterioration of entrances, porches and balconies through investigation, monitoring and minimally invasive or non-destructive testing techniques.	
6	Protecting and maintaining entrances, porches and balconies, by using appropriate surface treatments, such as cleaning, rust removal, limited paint removal, and reapplying protective coating systems in kind.	Failing to maintain paint and coatings, to replace damaged flashings, and to prevent the growth of plants and access by animals.
7	Retaining sound or repairable entrances, porches and balconies and their functional and decorative elements.	Removing sound or repairable elements, such as decorative woodwork, wrought iron detailing, or terra cotta tile.
8	Stabilizing deteriorated entrances, porches and balconies by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated entrances, porches or balconies that could be stabilized or repaired.
9	Repairing parts of entrances, porches or balconies by patching, piecing-in, consolidating, or otherwise reinforcing, using recognized conservation methods. Repair might also include the limited replacement in kind, or with a compatible substitute material, of those extensively deteriorated or missing parts of entrances, porches and balconies. Repairs should match the existing work as closely as possible, both physically and visually.	
10	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Replacing in kind extensively deteriorated or missing parts of entrances, porches or balconies where there are surviving prototypes.	Replacing an entire functional or decorative element when limited replacement of deteriorated and missing parts is possible. Using a substitute material for the replacement part that neither conveys the same appearance as the surviving element, nor is physically or visually compatible.
12	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include, reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
13	Documenting all interventions that affect the building's entrances, porches and balconies, and ensuring the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
14	Repairing an entrance, porch or balcony by using a minimal intervention approach. Such repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of irreparable or missing elements, based on documentary or physical evidence.	Replacing an entire entrance, porch or balcony when the repair of materials and limited replacement of deteriorated or missing elements is feasible.
15	Replacing in kind an irreparable entrance, porch or balcony based on physical and documentary evidence. If using the same materials and design details is not technically or economically feasible, then compatible substitute materials or details may be considered.	Removing an irreparable entrance, porch or balcony and not replacing it, or replacing it with a new one that does not convey the same appearance or serve the same function.
16	Replacing missing historic features by designing and constructing a new entrance, porch or balcony, based on physical and documentary evidence, or one that is compatible in size, scale, material, style or colour.	Creating a false historical appearance because the new entrance, porch or balcony is incompatible, or based on insufficient physical and documentary evidence.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

Recommended	Not Recommended
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ADDITIONS OR ALTERATIONS TO ENTRANCES, PORCHES AND BALCONIES

<p>17 Modifying, replacing or designing a new entrance, porch or balcony required by a new use or applicable codes and regulations, in a manner that is compatible with the building’s style, era and character.</p>	<p>Altering a secondary entrance to give it the appearance of a main entrance.</p> <p>Enclosing a porch or balcony in a manner that has a negative impact on the building’s heritage value.</p> <p>Removing character-defining entrances, porches or balconies that are no longer needed for the new use.</p> <p>Constructing an addition that requires the loss of a character-defining entrance, porch, or balcony.</p>
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HEALTH, SAFETY AND SECURITY CONSIDERATIONS

<p>18 Adding new features to meet health, safety and security requirements, such as a new handrail, in a manner that conserves the heritage value of the entrance, porch or balcony and minimizes impact on its character-defining elements.</p>	<p>Damaging or destroying an entrance, porch or balcony while making modifications to comply with health, safety and security requirements.</p>
<p>19 Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.</p>	<p>Making changes to entrances, porches or balconies without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements of the historic building.</p>
<p>20 Exploring all options for modifications to existing entrances, porches and balconies to meet code and regulation requirements, prior to considering removal or replacement.</p>	<p>Removing an entrance, porch or balcony that does not comply with codes or regulations, and not replacing it with a compatible new assembly.</p>
<p>21 Removing or encapsulating hazardous materials, using the least-invasive abatement methods possible, and only after thorough testing has been conducted.</p>	
<p>22 Protecting entrances, porches or balconies against loss or damage by identifying and assessing specific risks, and by implementing an appropriate fire-protection strategy that addresses those specific risks.</p>	<p>Covering flammable, character-defining elements with fire-resistant sheathing or coatings that alter their appearance.</p>

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
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ACCESSIBILITY CONSIDERATIONS

23	Respecting the location of existing entrances, and porches when providing new accessibility-related features, such as ramps and lifts. For example, providing new functions for the public on the ground floor, or in areas already served by exits.	Relocating a main entrance when undertaking interventions to accommodate accessibility-related features.
24	Exploring all options for modifications to existing entrances, porches and balconies to meet accessibility requirements prior to considering removal or replacement.	Removing an entrance, porch or balcony that does not meet accessibility requirements, and not replacing it with a compatible new assembly.
25	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the historic building.	Altering character-defining entrances, porches and balconies without consulting the appropriate specialists and users.

SUSTAINABILITY CONSIDERATIONS

26	Complying with energy efficiency objectives by maintaining inherent energy conserving features, such as overhangs, awnings and vestibules while preserving heritage value.	Removing character-defining vestibules, porches and balconies that contribute to the inherent energy efficiency of the historic building.
27	Working with specialists to determine the most appropriate solution to energy efficiency requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to entrances, porches and balconies without first exploring alternative energy efficiency solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
28	Repairing entrances, porches and balconies from the restoration using a minimal intervention approach, such as patching, splicing, consolidating or otherwise reinforcing its materials and improving weather protection.	Replacing an entire entrance, porch or balcony from the restoration period when the repair of materials and limited replacement of deteriorated or missing parts is possible.
29	Reinstating an open porch or balcony that was enclosed.	
30	Replacing in kind an entire entrance, porch or balcony from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the assembly. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable entrance, porch or balcony from the restoration period and not replacing it, or replacing it with an inappropriate entrance, porch or balcony. Reinstating an entrance, porch or balcony detail that is damaging to character-defining elements.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

31	Removing or altering a non character-defining entrance, porch or balcony from a period other than the restoration period.	Failing to remove a non character-defining entrance, porch or balcony from another period that confuses the depiction of the building's chosen restoration period.
32	Retaining alterations to entrances, porches or balconies that address problems with the original design, if those alterations do not have a negative impact on the building's heritage value.	Removing alterations to an entrance, porch or balcony that serve an important function in the building's ongoing use, such as a ramp or handrail.

RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

33	Recreating a missing entrance, porch or balcony, or one of its features, from the restoration period, based on physical or documentary evidence; for example, duplicating a fanlight or porch column.	Constructing an entrance, porch or balcony that was part of the building's original design but was never actually built, or a feature thought to have existed during the restoration period but for which there is insufficient documentation.
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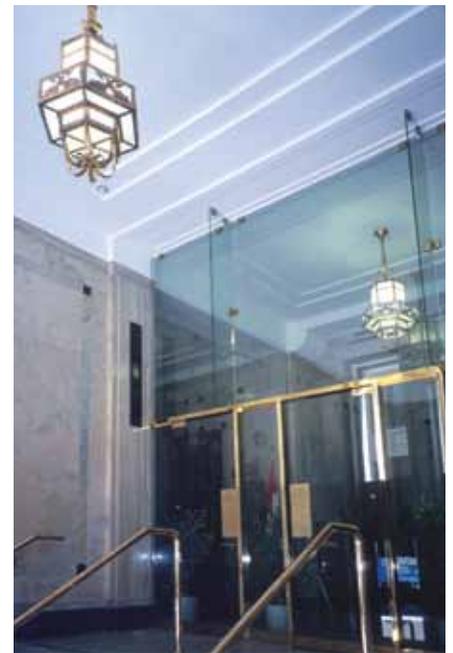
4.3.7 INTERIOR FEATURES

These guidelines provide direction when a building's interior features are identified as *character-defining elements* of an historic place. They also give direction on how to preserve those features through maintenance and repair, or when a change in use or regulations dictates the need for alterations or additions.

Interior features can include elements such as interior walls, floors and ceilings, mouldings, staircases, fireplace mantels, faucets, sinks, built-in cabinets, light fixtures, hardware, radiators, mail chutes, telephone booths and elevators. Because their heritage value resides not only in their physical characteristics, but also in their location in the historic building, it is important to protect them from removal. This is particularly true of doors, banisters, church pews, fireplace mantels, sinks and light fixtures, which are often replaced instead of being upgraded. Reuse in their original location not only protects their heritage value, but is also a more sustainable approach to conserving these artefacts.



Artwork, including sculpture and murals may contribute to the character of an interior. The murals in the Saskatchewan Legislature Building required the expertise of art conservators for their repair and cleaning undertaken for the Saskatchewan Centennial.



When adding any new features to meet functional requirements, adjacent character-defining elements should be conserved. A new glass wall in the Dominion Public Building in Halifax was carefully designed to complement the quality of the lobby's materials and finishes, and installed to avoid damaging the adjacent character-defining plasterwork and stone wainscoting.

These guidelines provide general recommendations appropriate to all types of interior features. For recommendations on associated issues related to interior features, refer to Interior Arrangement. For recommendations on specific materials that make up interior features, refer to the Guidelines for Materials.



Functional elements, such as radiators and decorative grilles, can contribute to the overall heritage character of a place. Opportunities to retain these features when upgrading or replacing mechanical systems should be explored. This heating grate is one of many that were retained and repaired for use with a new heating plant when the Dawson City Telegraph office was rehabilitated into housing.



These large light fixtures in the main hall of the Jasper train station were rewired and adapted to accept compact fluorescent bulbs in order to meet sustainability and current health and safety concerns. Light fixtures of any scale can be similarly rehabilitated rather than being replaced.



Historic guards and handrails often do not conform to current codes and safety regulations. Modifying historic balustrades in a compatible way to meet these requirements is recommended over replacement. The balustrade at the National Archives and Library in Ottawa underwent a sensitive rehabilitation to meet current requirements for spacing between balusters.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding interior features and how they contribute to the heritage value of the historic building.	
2	Understanding the properties and characteristics of interior features as well as changes and previous maintenance practices; for example, investigating the reconfiguration of a staircase or removal of a reception counter, or testing the loading capacity of a period elevator.	Failing to consider the impact of previous changes and maintenance practices on the interior features.
3	Documenting the form, materials and condition of interior features before undertaking an intervention.	Undertaking an intervention that affects interior features without first documenting their character and condition.
4	Assessing the condition of interior features early in the planning process so that the scope of work is based on current conditions.	
5	Determining the cause of distress, damage or deterioration of interior features through investigation, monitoring and minimally invasive or non-destructive testing techniques.	
6	Protecting and maintaining interior features through appropriate repairs to their functional parts and by using appropriate surface treatments, such as cleaning, rust removal, limited paint removal and reapplying protective coating systems in kind.	Failing to maintain interior features on a regular basis.
7	Using proven cleaning methods. More aggressive cleaning should be considered only after other gentler methods have proven to be ineffective.	Changing the texture and patina of interior features and finishes through the use of abrasive methods to remove paint or finishes.
8	Using paint or coating systems of appropriate colour and texture.	
9	Preserving the method of operation of interior features that contribute to the heritage value of the historic place. For example, continuing to use a fireplace.	Altering or eliminating the method of operation of interior features that contributes to the heritage value of the historic building.
10	Retaining sound and repairable interior features.	Removing character-defining interior features, such as light fixtures, radiators and wood work. Applying paint, plaster or other finishes to surfaces that have historically been unfinished. Removing paint, plaster or other finishes from historically finished surfaces, such as removing plaster to expose a brick wall, or stripping paint from doors and trim work.
11	Stabilizing deteriorated interior features by structural reinforcement, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated interior features that could be stabilized or repaired.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
12	Repairing parts of interior features by patching, piecing-in, consolidating or otherwise reinforcing, using recognized conservation methods. Repair may also include the limited replacement in kind, or with a compatible substitute material, of those extensively deteriorated or missing parts of interior features. Repairs should match the existing work as closely as possible, both physically and visually.	
13	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	Failing to protect interior features against damage, theft or vandalism during construction.
14	Replacing in kind extensively deteriorated or missing parts of interior features where there are surviving prototypes.	Replacing an entire interior feature when only limited replacement of deteriorated and missing parts is possible. Using a substitute material for the replacement part that neither conveys the same appearance as the surviving interior feature, nor is physically or visually compatible.
15	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
16	Documenting all interventions that affect the building's interior features, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
17	Repairing interior features by using a minimal intervention approach. Such repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of irreparable or missing elements, based on physical or documentary evidence.	Replacing an entire interior feature, such as a staircase, paneled wall, parquet floor or cornice, when the repair of materials and limited replacement of deteriorated or missing parts is feasible.
18	Replacing in kind an irreparable interior feature based on physical and documentary evidence. Examples include wainscoting, a pressed-metal ceiling or interior stairs. If using the same material and design details is not technically or economically feasible, then compatible substitute material or details may be considered.	Removing an element that is irreparable and not replacing it, or replacing it with a new feature that does not convey the same appearance or serve the same function.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
19	Replacing missing historic features by designing and installing a new interior feature, based on physical and documentary evidence, or one that is compatible in size, scale, material, style or colour.	Creating a false historical appearance because the new interior feature is incompatible or based on insufficient physical and documentary evidence.
20	Operating and using a functioning interior feature that is important to the heritage value of the historic building, such as rewiring a character-defining light fixture according to the appropriate safety codes.	Ceasing use of or altering a functioning interior feature that is important in defining the heritage value of the historic building.

ADDITIONS OR ALTERATIONS TO INTERIOR FEATURES

21	Designing , locating and installing new interior features, such as stairways, cabinetwork or fireplaces, in a manner that respects the building's heritage value.	Introducing a new interior feature that is incompatible in size, scale, material, style or colour with the existing features.
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HEALTH, SAFETY AND SECURITY CONSIDERATIONS

22	Upgrading interior features to meet health, safety and security requirements, in a manner that preserves the existing feature and minimizes impact on its heritage value.	Damaging or destroying interior features while making modifications to comply with health, safety and security requirements.
23	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to interior features, without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements of the historic building.
24	Exploring all options for modifications to existing interior features to meet functional requirements prior to considering removal or replacement.	Removing an interior feature, such as a security desk, without investigating options to meet current requirements.
25	Removing or encapsulating hazardous materials, such as friable asbestos insulation, using the least-invasive abatement methods possible, and only after thorough testing has been conducted.	Neglecting to maintain and repair the cladding protecting encapsulated asbestos insulation.
26	Installing sensitively designed fire-suppression systems that retain character-defining elements and respect heritage value.	Covering flammable character-defining elements with fire-resistant sheathing or coatings that alter their appearance.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
ACCESSIBILITY CONSIDERATIONS		
27	Finding solutions to meet accessibility requirements that minimize impact on interior features, such as locating public functions strategically to limit changes to the interior.	
28	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the historic building.	Altering character-defining interior features, without consulting the appropriate specialists and users.
29	Respecting the location of existing staircases when providing new accessibility-related features, such as ramps and lifts.	Locating accessibility-related features in secondary or service areas, when making compatible modifications to primary vertical circulation areas is possible.
30	Exploring all options for modifications to existing interior features, prior to considering removal or replacement.	
SUSTAINABILITY CONSIDERATIONS		
31	Complying with energy efficiency objectives by maintaining energy-conserving interior features, such as interior shutters, transoms and vestibules.	Failing to incorporate interior features, such as ventilation grilles or radiator covers, as part of upgrades to heating and ventilation systems.
32	Complying with energy-efficiency objectives by upgrading rather than replacing character-defining light fixtures.	
33	Working with specialists to determine the most appropriate solution to energy efficiency requirements with the least impact on the character-defining elements and overall heritage value of the historic building.	Making changes to interior features, without first exploring alternative energy efficiency solutions that may be less damaging to the character-defining elements and overall heritage value of the historic building.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
34	Repairing interior features from the restoration period by using a minimal intervention approach such as patching, splicing, consolidating or otherwise reinforcing its materials.	Replacing an entire interior feature from the restoration period, such as a staircase, when the repair of materials and limited replacement of deteriorated or missing parts is possible.
35	Replacing in kind an entire interior feature from the restoration period that is too deteriorated to repair, using the physical evidence as a model for reproduction. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable interior feature from the restoration period and not replacing it, or replacing it with an inappropriate interior feature. Reinstating a detail of an interior feature that is damaging to character-defining elements.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

36	Removing or altering a non character-defining interior feature from a period other than the restoration period.	Failing to remove a non character-defining interior feature from another period that confuses the depiction of the building's chosen restoration period.
37	Retaining alterations to interior features that address problems with the original design if those alterations do not have a negative impact on the building's heritage value.	Removing an interior feature that serves an important function in the building's ongoing use, such as a security desk or accessible washroom.

RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

38	Recreating a missing interior feature from the restoration period, based on physical or documentary evidence; for example, duplicating a marble mantel or staircase.	Constructing an interior feature that was part of the building's original design but never actually built, or a feature thought to have existed during the restoration period but for which there is insufficient documentation.
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4.3.8 STRUCTURAL SYSTEMS

These guidelines provide direction when a structural system is identified as a *character-defining element* of an historic place. They also provide direction on maintaining, repairing and replacing structural components or systems.

Structural systems are the deliberate assembly of distinct components that ensure a structure or building will stand up. A structural system must meet life safety requirements (i.e., it should not collapse) and serviceability requirements for the architectural elements and finishes attached to it (i.e., it should not bend or deform excessively). Structural systems are typically composed of two distinct components: the substructure or foundation; and the superstructure above. Structural systems can take many forms, such as post and beam, arches, domes, trusses or frames, and use many different materials, such as stone, brick, steel, wood or concrete.

The regulations to which building structures must perform have evolved considerably over time. Building codes first appeared in Canada in the 1940s, and now include requirements to resist loads such as earthquakes, that were never considered in earlier times. Modern codes also no longer address materials and construction techniques that were used to build many historic building structures. Despite these changes, early structural systems, when properly interconnected and maintained in good condition, can be made to work effectively. The challenge of conserving the structures often lies in confirming whether they can achieve the level of performance expected from today's building codes. The services of a professional engineer are mandatory whenever a structural system is investigated, analysed or modified. Knowledge of structural behaviour and period materials and technology are essential to the investigation and analysis of an historic structure.



In Preservation, visible structural systems that are important in defining a building's overall character should not be removed or obscured. When evaluating the physical condition of the structural system (using minimally destructive techniques) indicates that repairs of deteriorated parts are required, they should match the old in form and detailing and have adequate strength.



Analyzing structural systems built using traditional materials and assemblies can be challenging. These historic materials and assemblies often have variable properties, and can include flaws or deterioration that have developed over time. Testing can give some insight into these properties. However, extrapolating findings from localized tests to describe the strength and stiffness of a larger structural assembly is not always straightforward. Thus, any analysis should account for the variability of the materials and assemblies, and should be repeated using different assumptions to arrive at a range of results predicting how the assembly will behave.

These guidelines provide general recommendations appropriate for all types of structural systems. Because structural systems can also form the wall assembly, such as in load-bearing masonry or log structures, it may be difficult to perform work on a structural system without adversely affecting character-defining architectural components and assemblies.

When intervening on an historic building's structure, refer to the related Guidelines for Buildings. For recommendations on specific materials that make up structural systems, refer to the Guidelines for Materials. When undertaking any excavation work, consult the Guidelines for Archaeological Sites. Structural systems are also present in many engineering works, therefore, the Guidelines for Engineering Works should be referred to when conserving those types of historic places.



It is important to adapt interim stabilization interventions to the anticipated lifespan of the intervention and make it as reversible as possible. Temporary steel cross bracing supports an exterior wall at St. Peter's Dynevor Anglican Church Rectory in Selkirk MB.



When a building's structure has performed satisfactorily for many years, and has had no recent change in use, its structure is likely satisfactory for wind and gravity loads. The National Building Code of Canada, Commentary L, describes applying this logic when evaluating and upgrading an existing building. This logic, however, cannot be applied when there is significant deterioration, a change in use is planned or seismic strength is in question. Under these circumstances, a detailed engineering investigation and analysis is necessary to verify the structure's performance.

The McLeod Building, an early terra-cotta high-rise in Edmonton, was rehabilitated from office space to condominiums with no need for alterations to the structural system.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the structural system and how it contributes to the heritage value of the historic place.	
2	Understanding the techniques and materials used in the construction of the structural system, any subsequent alterations and their effects, and the loads it was subjected to over its history.	
3	Documenting the form, materials, function and condition of structural systems before undertaking an intervention.	Undertaking an intervention that affects structural systems, without first documenting their existing character and condition.
4	Assessing the condition of structural systems, including the foundations, early in the planning process so that the scope of work is based on current conditions.	Carrying out a level of conservation work that exceeds what is required, or taking action based on assumptions or rules of thumb.
5	Determining the physical condition of structural systems or their components, and the cause of distress, damage or deterioration through investigation, analysis, monitoring and minimally invasive or non-destructive testing techniques.	Using highly destructive probing or sampling techniques that damage or destroy structural systems or their components. Failing to identify, evaluate and treat the causes of distress, damage or deterioration of structural systems or their components. Carrying out a repair that does not treat or address the cause of the problem.
6	Verifying the theoretical characteristics of structural systems by testing them in place to determine their actual characteristics, provided the appropriate precautions are taken to avoid their failure or destruction.	Reinforcing or replacing structural systems or their components that are theoretically overloaded, without validating the analysis through an accurate comparison with their actual, observed performance.
7	Taking into account the past performance and load history of structural systems or their components when determining their present or future capacity.	
8	Reviewing the requirements of codes and regulations for structural performance, and involving experts and code officials early in the process to investigate systems, methods or devices that minimize the impact on character-defining elements.	Forcing generic or conventional code solutions on an historic place, without thoroughly assessing their effect on character-defining elements and rigorously investigating alternatives with the authority.
9	Determining the appropriate performance requirements that must be applied in assessing the condition and performance of an historic structural system.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
10	Protecting and maintaining structural systems by maintaining the building envelope—roof to foundation—including roofing, flashings, gutters and downspouts, wall components of masonry, concrete, wood and metals; ensuring positive drainage away from foundations; and ensuring that structural members are free of fungal decay and insect infestation.	Failing to adequately maintain structural systems and their components on a cyclical basis, causing the materials to deteriorate.
11	Imposing limits on the acceptable use of structures based on their actual characteristics and capacities, to protect them from damage; balancing present and anticipated usage demands with heritage value; and avoiding, where possible, any use that would damage or destroy the structural system.	
12	Retaining sound structural systems or deteriorated structural systems that can be repaired.	Replacing or rebuilding structural systems that can be repaired. Relocating structural components when their location is part of their heritage value.
13	Stabilizing deteriorated structural systems by structural reinforcement, weather protection or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated structural systems that could be stabilized or repaired. Leaving known structural problems untreated.
14	Repairing deteriorated structural systems and their components in a manner that is physically and visually compatible with the historic building or structure.	Replacing an entire structural system or component when repair or limited replacement of deteriorated or missing parts is possible.
15	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	
16	Accommodating the thermal expansion and contraction of structural systems by introducing expansion or control joints, and incorporating such joints into existing crack patterns of masonry and concrete structures where possible.	Filling moving cracks or expansion joints with materials that inhibit or prevent the thermal expansion and contraction of the structural system.
17	Replacing in kind extensively deteriorated or missing parts of structural systems where there are surviving prototypes. The new work should match the old as closely as possible in form, materials and detailing, and have adequate strength.	Replacing an entire structural system or component when limited replacement of deteriorated and missing parts is possible. Altering a structural system by adding new structural members that alter the load-carrying system of the original structure.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
18	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
19	Documenting all interventions that affect structural systems, and ensuring the documentation is available to those responsible for future interventions.	

GENERAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
20	Repairing structural systems by augmenting or upgrading individual components, such as <i>sistering joists</i> with new wood to improve structural efficiency. Repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of irreparable or missing elements, based on documentary or physical evidence. Repairs might also include dismantling and rebuilding a masonry or timber structure, if an evaluation of its overall condition determines that more than limited repair or replacement in kind is required.	Upgrading a structural system in a manner that alters the character-defining exterior of an historic building, or damages character defining interior features or spaces. Replacing a structural member or component when it could be augmented and retained.
21	Repairing deteriorated structural systems or their components, using new technologies where the original technology has been found to accelerate deterioration. The new technology should be chosen based on its compatibility with the historic element, its reliability and its visual impact on the character-defining elements and structural system as a whole.	Repairing deteriorated structural systems or their components, using new technologies to improve durability when the original technology performs adequately. Reinforcing structural systems or their components, without verifying the effectiveness or the level of benefit achieved by the reinforcement work.
22	Replacing in kind an irreparable structural system or component based on physical and documentary evidence.	
23	Replacing missing historic features by designing and installing a new structural system or component based on physical and documentary evidence, or one that is compatible in size, scale, material, style and colour.	Creating a false historical appearance because the new structural system or component is incompatible, or based on insufficient physical and documentary evidence.

GENERAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
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ADDITIONS OR ALTERATIONS TO STRUCTURAL SYSTEMS

24	Designing the structural system of a new addition or altering an existing structure in a manner that is compatible with the building's structural system and respects its heritage value.	Radically changing character-defining interior spaces, or damaging or destroying interior features or finishes, while attempting to correct structural deficiencies in preparation for a new use.
25	Limiting new excavations adjacent to foundations to avoid undermining the stability of the structural system or adjacent structures.	

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

26	Complying with health, safety and security requirements, such as seismic upgrades or blast protection, in a manner that conserves the structural system and minimizes impact on its heritage value.	Damaging or destroying character-defining elements, while making modifications to comply with health, safety and security requirements.
27	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic place.	Making changes to structural systems without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements of the historic place.
28	Removing or encapsulating hazardous materials, using the least-invasive abatement methods possible, and only after thorough testing has been conducted.	
29	Protecting structural systems against loss or damage by identifying and assessing specific risks, and by implementing an appropriate fire-protection strategy that addresses those specific risks.	Covering flammable, character-defining structural components with fire-resistant sheathing or coatings that alter their appearance.
30	Applying fire retardant materials that do not damage or obscure character-defining structural systems. For example, applying fire-retardant, <i>intumescent paint</i> to an exposed column to further protect its steel.	

SUSTAINABILITY CONSIDERATIONS

31	Working with specialists to determine the most appropriate solution to energy efficiency and sustainability requirements with the least impact on the character-defining elements and overall heritage value of the historic place.	Making changes to character-defining structural systems, including foundations, without first exploring alternative sustainability solutions that may be less damaging to the character-defining elements and overall heritage value of the historic place.
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
32	Repairing the structural system from the restoration period by stabilizing, reinforcing or otherwise upgrading individual components in a manner that is consistent with the restoration period.	Replacing an entire structural system or its component from the restoration period when the repair or limited replacement of deteriorated or missing components is possible.
33	Replacing in kind an entire structural system or component from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the system or component. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable structural system or component from the restoration period and not replacing it, or replacing it with an inappropriate new system or component.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

34	Retaining alterations to structural systems that address problems with the original design, if those alterations do not have a negative impact on the building's heritage value.	Removing alterations to structural systems or components that serve an important function in the building's ongoing use.
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

35	Recreating a missing structural component from the restoration period, based on physical or documentary evidence.	Installing a structural system or component that was part of the building's original design but never actually built, or constructing a structural system or component thought to have existed during the restoration period but for which there is insufficient documentation.
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4.3.9 MECHANICAL AND ELECTRICAL SYSTEMS

These guidelines provide direction when a mechanical or electrical system is identified as a *character-defining element* of an historic place. They also give information on how to minimize the impact of introducing a new, or changing an existing non-character-defining mechanical or electrical system. Conserving these systems can be a challenge because their construction and operation are governed by stringent safety codes and regulations, and because historic installations and materials may no longer meet code requirements.



In modern buildings, reinforced concrete is often left exposed or simply painted in order to display a distinctive structural form, such as this waffle slab ceiling in the Victoria City Hall Annex. Inserting new wiring or services into such spaces can be challenging. Discreetly using conduit is recommended rather than installing false ceilings or walls that cover the historic structure.

Mechanical systems (heat, ventilation, air conditioning and refrigeration) control a building's interior environment. They also include systems that provide necessary services, such as septic systems, potable water supply and fire suppression. The most visible components of mechanical systems include interior features such as radiators, vents, fans, grilles and plumbing fixtures.



When upgrading the mechanical system at the George Brown House in Toronto, the design solution integrated original heating and ventilation systems, such as operable windows and the existing hot water radiator system, with technological interventions to provide increased levels of controlled cooling and heating. The original boiler was restored and incorporated into a modern hot water radiator system, and the interior finishes were retained by strategically locating drop ceilings and reusing historic fireplace flues and 'warm' and 'foul' air shafts.



During the rehabilitation of the Gooderham & Worts Distillery district in Toronto much of the original alcohol production equipment was retained in place, this included distribution piping that traveled throughout the large site, within and between buildings.

A cyclone blower and related ductwork on the 5th floor of the granary was also retained. Some of the lengths of duct were adjusted to accommodate a new concrete floor and other lengths were removed where they blocked access or were a hazard.

Contemporary building design typically uses an active approach to controlling the building environment with fans, blowers, boilers, furnaces, ducts and plenums. In some cases, the systems are deliberately exposed as an aesthetic display or an architectural expression of the component's functionality. More traditional building designs, however, often used passive techniques that were integrated into the building's design. These passive designs can include character-defining elements such as high ceilings, open corridors and transoms that facilitate air circulation, operable windows and shutters, and canopies and plantings that provide shade and act as windbreaks.

Electrical systems include power and communication systems such as electric lighting, intercoms, doorbells, telephones, buzzers, alarm systems and detectors. The proliferation of equipment such as computers, telephones and lighting can place extreme demands on electrical systems necessitating their upgrade or replacement. While the conservation of electrical and communications systems often focuses on fixtures, other aspects should also be considered, such as sounds made by alarms, bells or buzzers, and lighting design, including light levels and colour, and relationships to sources of natural light.

These guidelines provide general recommendations for mechanical and electrical systems. For recommendations on the conservation of mechanical and electrical fixtures, refer to Interior Features. For recommendations on architectural features and assemblies related to passive mechanical and lighting systems, refer to Windows, Doors and Storefronts; Exterior Walls; Exterior Form; and Interior Arrangement. Mechanical systems can also form an important part of an engineering work; the Guidelines for Engineering Works should be referred to when conserving those types of historic places.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the mechanical or electrical system and how it contributes to the heritage value of the historic building.	
2	Understanding the construction history, theory and design behind the mechanical or electrical system, and its relationship with the building's site and climate.	
3	Documenting the form, materials, function and condition of mechanical and electrical systems before undertaking an intervention.	Undertaking an intervention that affects a mechanical or electrical system without first documenting its components, layout, materials, operation and condition.
4	Assessing the condition of mechanical and electrical systems and their components early in the planning process so that the scope of work is based on current conditions.	
5	Determining the physical condition of mechanical and electrical systems or their components, and the cause of distress, damage or deterioration through investigation, analysis, monitoring and minimally invasive or non-destructive testing techniques.	Using highly destructive probing or sampling techniques that damage or destroy mechanical and electrical systems or their components. Failing to identify, evaluate and treat the causes of distress, damage or deterioration of mechanical and electrical systems, or their components. Carrying out a repair that does not treat or address the cause of the problem.
6	Testing mechanical and electrical systems or their components to determine their actual characteristics provided the appropriate precautions are taken to avoid their failure or destruction.	
7	Protecting and maintaining mechanical or electrical systems and their components through cyclical cleaning and other appropriate measures.	
8	Preserving abandoned systems that are character-defining, such as wire bell pull systems, speaking tubes and mail drops.	
9	Preserving the method of operation of mechanical and electrical systems that contribute to the heritage value of the historic place. For example, maintaining a passive ventilation system in a building, rather than switching to forced air ventilation.	Altering or eliminating the method of operation of mechanical and electrical systems that contributes to the heritage value of the historic building.
10	Retaining sound mechanical and electrical systems or deteriorated systems that can be repaired.	Replacing or removing mechanical and electrical systems or their components that can be repaired.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Repairing deteriorated mechanical or electrical systems and their components in a manner that is physically and visually compatible with the historic place.	Replacing an entire mechanical or electrical system or component, when repair or limited replacement of deteriorated or missing parts is possible.
12	Protecting adjacent character-defining elements from accidental damage or exposure to damaging materials during maintenance or repair work.	
13	Replacing in kind extensively deteriorated or missing parts of mechanical or electrical systems where there are surviving prototypes. The new work should match the old as closely as possible in form, materials and detailing and have adequate capacity.	
14	Operating and using functioning mechanical and electrical systems that are important in defining the heritage value of the historic place, according to the appropriate safety codes.	Ceasing to use or altering a functioning mechanical or electrical system that is important in defining the heritage value of the historic place.
15	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
16	Documenting all interventions that affect the building's mechanical and electrical systems, and ensuring that the documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
17	Repairing mechanical and electrical systems that contribute to the heritage value of the historic place. Such repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of irreparable or missing components, based on documentary or physical evidence.	Replacing a mechanical or electrical system or component that could be upgraded and retained.
18	Repairing deteriorated mechanical and electrical systems or their components, using new technologies when the original technology has been found to accelerate deterioration. The new technology should be chosen based on its compatibility with the historic element, its reliability, and its visual impact on the character-defining elements and mechanical or electrical system as a whole.	Repairing deteriorated character-defining mechanical and electrical systems or their components, using new technologies to improve durability when the original technology performs adequately.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
19	Replacing in kind those portions or components of mechanical and electrical systems that are either extensively deteriorated or missing, when there are surviving prototypes.	Installing a visible replacement element that does not convey the same appearance.
20	Replacing missing historic features by designing and installing new mechanical or electrical systems or components, based on physical and documentary evidence, or one that is compatible in size, scale, material, style or colour.	Creating a false historical appearance because the new mechanical or electrical system or component is incompatible, or based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO MECHANICAL AND ELECTRICAL SYSTEMS

21	Using planned additions to provide space for new functions requiring controlled ambient conditions, such as exhibition or storage spaces in a museum, while using the historic building for functions that can be accommodated by the existing systems.	Introducing functions that require a controlled environment in buildings that were designed for natural light or ventilation. Locating additions where they block existing windows or skylights that provide natural ventilation and daylight.
22	Installing a new mechanical or electrical system, if required by the new use, while ensuring the least alteration possible to the building's interior arrangement and exterior form, and the least damage to the character-defining elements of the historic building.	Concealing systems in walls or ceilings causing the removal of character-defining elements.
23	Placing new mechanical or electrical systems in existing, non-character-defining spaces, rather than constructing a new addition.	Installing a drop ceiling to hide mechanical equipment when it alters the proportions of character-defining interior spaces.
24	Installing new heating/air conditioning units in a manner that does not damage or obscure character-defining elements and generate excessive moisture.	Installing heating/air conditioning units in window frames rather than improving the efficiency and operation of the existing mechanical system.
25	Installing individual heating/air conditioning units in window frames, if necessary, so that sashes and frames are protected. Consider window installations only when all other viable heating/cooling systems would result in significant damage to character-defining materials.	Radically changing the appearance of the historic building, or damaging or destroying windows by installing heating/air conditioning units in character-defining windows.
26	Installing the vertical runs of ducts, pipes and cables in non-character-defining spaces, such as closets, service rooms and wall cavities.	Installing vertical runs of ducts, pipes and cables in places where they will damage, radically alter, or obscure character-defining elements.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
HEALTH, SAFETY AND SECURITY CONSIDERATIONS		
27	Removing or encapsulating hazardous materials using the least-invasive abatement methods possible, and only after thorough testing has been conducted.	Neglecting to maintain and repair the cladding protecting encapsulated asbestos insulation.
28	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the historic place.	Making changes to mechanical and electrical systems without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements of the historic place.
SUSTAINABILITY CONSIDERATIONS		
29	Reinstating , where possible, character-defining natural ventilation and daylight, such as operable transom windows and atrium skylights.	Introducing airtight mechanical systems and artificial lighting in buildings that were designed for natural daylight and ventilation.
30	Ensuring that the introduction of new types of mechanical and electrical systems, such as solar, geothermal or heat-exchange systems, will have minimal impact on the character-defining elements of the historic building.	
31	Working with specialists to determine the most appropriate solution to energy efficiency requirements with the least impact on the character-defining elements and overall heritage value of the historic place.	Making changes to character-defining mechanical and electrical systems, without first exploring alternative energy efficiency solutions that may be less damaging to the character-defining elements and overall heritage value of the historic place.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
32	Repairing mechanical and electrical systems by stabilizing, reinforcing, or otherwise upgrading individual components in a manner that is consistent with the restoration period.	Replacing an entire mechanical or electrical system from the restoration period when the repair or limited replacement of deteriorated or missing components is possible.
33	Replacing in kind an entire mechanical or electrical system or component from the restoration period that is too deteriorated to repair, using the physical evidence as a model to reproduce the system or component. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable mechanical or electrical system or component and not replacing it, or replacing it with an inappropriate new system or component.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

34	Removing or altering non character-defining mechanical and electrical systems from a period other than the restoration period.	Failing to remove visible, non character-defining components of mechanical or electrical systems from another period that confuse the depiction of the building's chosen restoration period.
35	Retaining alterations to mechanical or electrical systems that address problems with the original design, if those alterations do not have a negative impact on the building's heritage value.	Removing alterations to mechanical or electrical systems or components that serves an important function in the building's ongoing use.

RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

36	Recreating a missing mechanical or electrical system or component from the restoration period, based on physical or documentary evidence.	Installing a mechanical or electrical system or component that was part of the building's original design but never actually built, or a system or component thought to have existed during the restoration period but for which there is insufficient documentation.
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4.4

GUIDELINES FOR ENGINEERING WORKS, INCLUDING CIVIL, INDUSTRIAL AND MILITARY WORKS



Engineering Works fall under three categories. Clockwise, from top left: Fort Rodd Hill in BC is an example of a military work; the grain elevator in Hepburn, Saskatchewan is an industrial work, and the SS Klondike in Whitehorse and the Quebec Bridge illustrate civil engineering works.

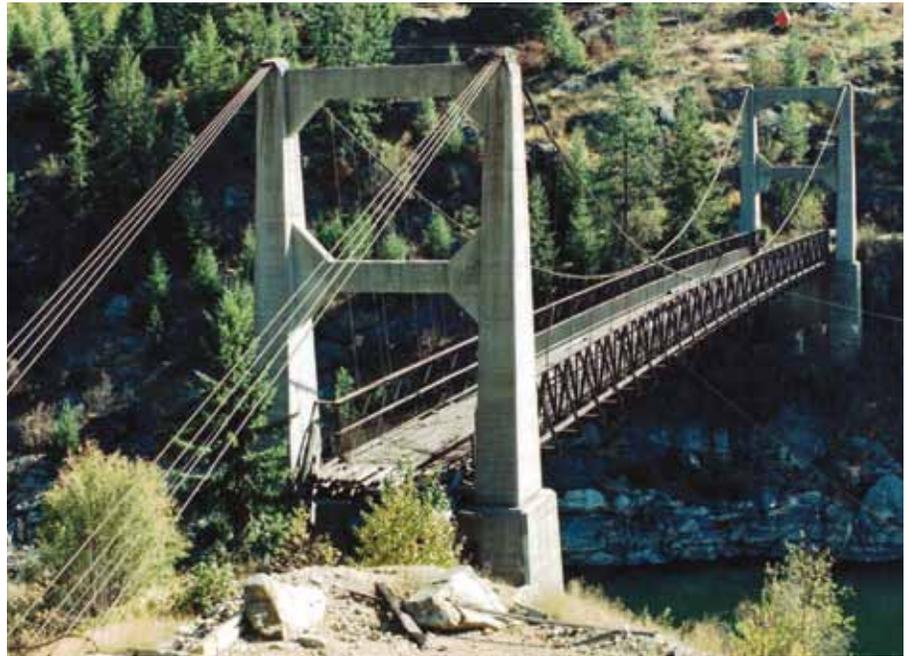
4.4

GUIDELINES FOR ENGINEERING WORKS, INCLUDING CIVIL, INDUSTRIAL AND MILITARY WORKS

Engineering works, including civil, industrial and military works, are constructions built or sites transformed for purposes other than habitation; they exist primarily to produce goods or provide services for the benefit of human needs. Major engineering works have stimulated and facilitated development across Canada—significant innovations made in resource extraction, industry, transportation, and communications have contributed towards developing new, or adapting existing technologies to suit Canada’s climate and geography.

Civil works can include constructions associated with:

- Transportation of humans or goods by land, rail, water or air, such as historic roads and routes, bridges, tunnels, highways, ships, lighthouses, and railways, canals, airports, harbours, subways and their associated supporting infrastructure;
- Energy-generation and transmission facilities and infrastructure, such as hydroelectric dams, powerhouses, power-generating stations and transmission towers and systems;
- Communications facilities and infrastructure, such as telephone, microwave, radio and television networks and systems; and,
- Water supply, flood control and irrigation facilities and infrastructure, such as waterworks, pump houses, sewer networks and water treatment plants, dams, canals, floodways and aqueducts.



The Doukhobor Suspension bridge, near Castlegar, BC, is an example of a civil engineering work with significant cultural symbolic value. Erected by members of the Doukhobor community, its construction represents a major achievement for a pioneer community and demonstrates the considerable capabilities of a people acting communally.

Industrial works can include constructions associated with:

- Manufacturing or industry, such as mills, factories and warehouses;
- Resource exploitation facilities and infrastructure, such as mines, quarries, oil wells and drilling sites, collieries, dredges, concentrators, laboratories and refineries; and,
- Agriculture and food processing facilities and infrastructure, such as farms, ranches, packing houses, grain elevators, breweries and canneries.

Military works can include defence-related constructions associated with:

- Fortifications or military ships;
- Naval, army and air bases, or missile ranges; and,
- Unique constructions, such as the *DEW line* or the *Diefenbunker*.

The heritage value of engineering works may be historical, technological, social, scientific or architectural. Some works may also have considerable aesthetic value due to the quality of their architecture, design or planning. Often, there is also heritage value in the relationship between an engineering work and adjoining or nearby archaeological sites, cultural landscapes or buildings.



The Percival Windmill, restored in 1995, is valued for its association with Saskatchewan's rural water system. Because of the semi-arid climate and general lack of standing water in the south of the province, windmills gave many early residents access to underground water during the settlement period. Windmills were particularly important prior to the 1950s when widespread rural electrification enabled electric pumps to become regular farm features.

Engineering works should not be viewed as being exclusively the work of professional engineers. Achievements in *empirical engineering*, inventions and innovations made by lay-persons, and achievements associated with *artisanal technologies* can also be considered engineering works.



The Brooks Aqueduct, in Newell County, AB, is a significant civil engineering work from the development of irrigation in Alberta, and a significant example of the role the Canadian Pacific Railway (CPR) played in settling the region. It is one of the largest aqueducts of its kind in the world. An integral part of a larger irrigation system, it brought water to over 50,000 hectares of land that was susceptible to drought. The system allowed the CPR to open the area to agricultural settlement and supplied water to area farmers from 1914 to 1979.

Finding sustainable uses for engineering works is a significant challenge because their condition can range from archaeological resources to fully functioning installations. The continued use of an industrial or military work can seldom be accommodated when its original function has become redundant or obsolete. The engineering work may also have been abandoned for a long time, or the new planned use may have significantly different requirements for human comfort and safety than was required when it was originally built.

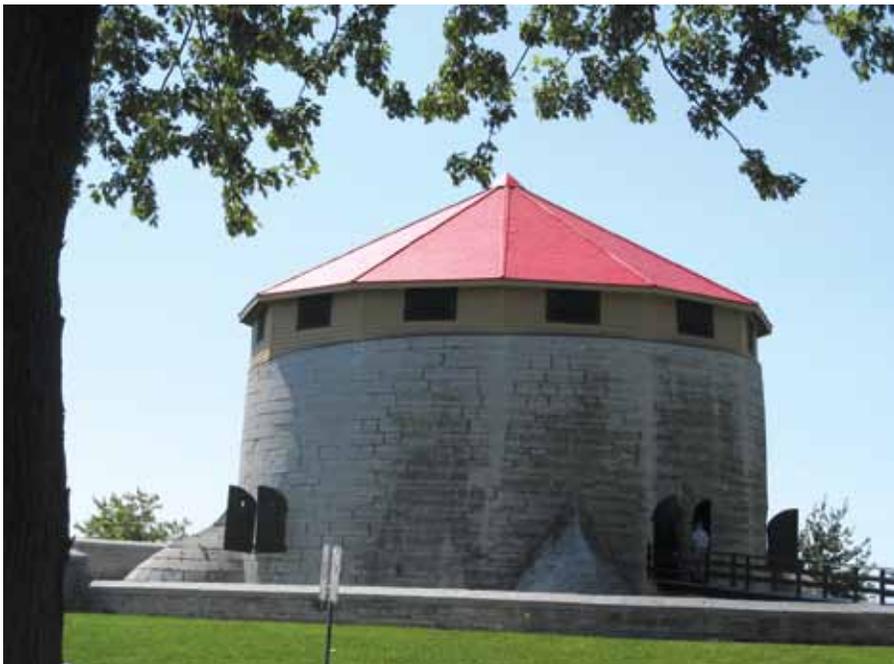
Civil works, such as bridges, dams and canals, present a different challenge. These works often remain fully functional and so must meet stringent contemporary safety codes that did not exist at the time of their construction. Their continued use is contingent on meeting these standards, often necessitating significant rehabilitation.

Engineering works can also be challenging to conserve because of possible site contamination issues, or because of the considerable evolution they may have undergone during their operating life, resulting in multiple constructions from varying eras that may or may not have heritage value.

APPLYING THE GUIDELINES

The Guidelines for Engineering Works are presented in two main groups: Constructed Elements and Functional Arrangement. This grouping is designed to help the reader to understand how these concepts apply to the engineering work, and how they interact. The user should always refer to both subsections when conserving an engineering work to ensure that the physical features (Constructed Elements) and their spatial configuration (Functional Arrangement) are protected.

These guidelines provide general recommendations appropriate to all types of engineering works. Because many engineering works incorporate buildings, contain archaeological resources (i.e. industrial archaeology), and are located within cultural landscapes, reference should be made to those guidelines when appropriate. Also consult the Guidelines for Materials that contain traditional as well as modern construction and finishing materials, and the guidelines for Structural Systems under Buildings when appropriate.



Murney Tower, in Kingston, ON, is a martello tower that forms part of the defence system built for Kingston Harbour during the Oregon Crisis of 1845–1846. It is a squat round tower with four hive-like caponiers at its base and a conical roof and is surrounded by a dry ditch. Murney Tower is valued for its excellent portrayal of the martello tower military structure, its built and landscaped forms, and also its strategic setting and defensive inter-relationship with other parts of the Kingston Fortifications.



The Lachine Canal, in Montréal, is a 14.5 kilometre-long canal that runs from the old port of Montréal to Lake Saint-Louis. It contains a significant number of civil engineering and industrial works. Opened to shipping in 1825, it was closed in 1970 after the St. Lawrence Seaway was built. The Lachine Canal was the forerunner of the early 19th century transportation revolution in Canada and played an important role in the industrial development of Montréal. The canal corridor was also one of the main manufacturing production centres in Canada until the Second World War. The LaSalle Coke crane located on the banks of the canal and formerly used for unloading coal, is a prominent engineering work of the Canal.

4.4.1 CONSTRUCTED ELEMENTS

These guidelines provide direction when the constructed elements of an engineering work are identified as *character-defining elements* of an historic place.

Constructed elements are the distinct constructions that were built, erected or fabricated for the operation or use of the engineering work. Constructed elements can also be associated with the evolution of the work or with the transformation of the landscape resulting from the creation or operation of the work, which can include remnants, such as ore tailings from mining or dredging operations.

The types of constructions that can be considered constructed elements are extremely varied, including, for example:

- Structures that housed a warehouse, mill, factory, refinery, cannery or hydro-generating station;
- Landforms such as earth embankments and retaining walls of a dry ditch at a fort;
- Bridge superstructures;
- Tunnels, rock cuts and fills for a railway or highway right-of-way;
- Locks, dams and weirs of a canal system;
- Industrial machinery at a factory, or operational equipment inside a refinery, such as piping and steam tunnels;
- Ships such as paddle steamers or dredges; and,
- Ancillary equipment such as liquid or gas storage tanks, ore bins, cranes, derricks, chutes, conveyors or smokestacks at a factory.

Constructed elements offer a physical record of the work; its purpose, operation and evolution; the engineering innovation and design it embodies; and its impact on the environment. Their form, scale, massing, materials and construction type can all have heritage value, because they illustrate the purpose, operation and use of the work. Constructed elements help to illustrate and demonstrate the process, operation or activity that is, or once occurred, in the work. The condition of the constructed elements (including patina, graffiti and signs of wear) and the remnants or by-products from their operation (such as debris), can also hold value by demonstrating the evolution and function of the work in its environment.



The deteriorated heavy timber bow gantry frame of Dredge No. 4, in Dawson City, YK, was dismantled and replaced in kind with a new frame, built from new timbers sized to match the original timbers and reusing all original metal brackets and fixtures. The bow gantry, which supports the digging ladder, is a significant constructed element in the dredge's operational design.

These guidelines focus on stationary constructed elements; that is, character-defining machinery and ancillary equipment that are fixed in place. Movable equipment and artifacts are not covered under these guidelines, although they are often indispensable in helping to explain, interpret and illustrate the distinct stages of processes that once occurred in the works.

These guidelines provide general recommendations for constructed elements of an engineering work. When the constructed element is a building or part of a building, a built feature in a cultural landscape or an archaeological resource, also refer to the corresponding guidelines when appropriate. For recommendations on specific materials that make up constructed elements, refer to the Guidelines for Materials.



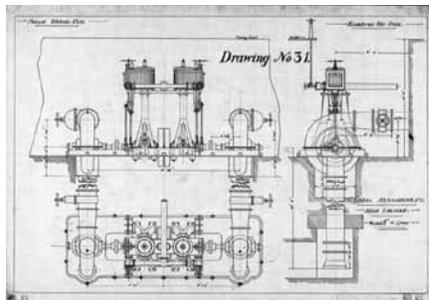
The Eagle Creek Cement Bridge in Saskatchewan is a good example of the nearly 90 reinforced concrete bowstring bridges that were constructed during the 1920s and 1930s as part of a comprehensive road building program in southern Saskatchewan. The graceful bowstring arches of these bridges, which blended functional engineering technology with aesthetically pleasing design, are character-defining elements. Repair or replacement of any parts of the bowstring arches should carefully designed for compatibility, matching the original form, materials and detailing of the arches.



Before beginning project work, the form, materials and condition of engineering works should be documented. Heritage recording of the Powerscourt Covered Bridge, National Historic Site of Canada in Powerscourt, QC, the only surviving bridge that uses the McCallum inflexible arch construction, included detailed measurements and a photographic record.



Completed in 1904, the tall wood frame Clearwater Canadian Pacific Railway Water Tower in Manitoba is an excellent example of an intact railway water tower. Twelve thick timbers are set on concrete bases and are strengthened with cross-braces that support the cedar-lined water tank, which occupies the top half of the structure. The water tower retains many of the original pipes, valves and controls used in filling and using the tank. When ceasing operation at a work such as this, the character defining pipes, valves and controls should continue to be subjected to regular maintenance to prevent their deterioration.



Fully understanding the complexity and behaviour of a constructed element, such as pumps at the Kingston Dry Dock and Pumphouse can include determining its original design, purpose, operating theory, construction, operation, evolution over time, structural behaviour, structural performance over time including load history, performance under environmental loads, current condition and the deterioration mechanisms of its construction and materials.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the constructed element and how it contributes to the heritage value of the engineering work.	
2	Understanding the construction history, theory, functional basis and design behind the constructed element.	
3	Documenting the form, materials and condition of the constructed element before undertaking an intervention.	Undertaking an intervention that affects a constructed element without first documenting its existing character and condition.
4	Documenting the operation and maintenance of constructed elements in sufficient detail to fully understand their operational characteristics. This can include obtaining an oral history of operation procedures, recording the machinery in operation or preserving records associated with the engineering work, and making these available for future research.	
5	Assessing the overall condition of constructed elements early in the planning process so that the scope of work is based on current conditions.	Carrying out a level of intervention that exceeds what is required, or taking action based on assumptions or rules of thumb.
6	Determining the appropriate level of investigation and analysis required to understand the overall condition of constructed elements, and analyzing the constructed elements in sufficient detail to fully understand their complexity and behaviour.	
7	Determining the physical condition of constructed elements or their components, including the causes of distress, damage or deterioration through investigation, analysis, monitoring and minimally invasive or non-destructive testing techniques.	Using highly destructive probing or sampling techniques that damage or destroy constructed elements or their components. Carrying out a repair that does not treat or address the cause of the problem.
8	Testing constructed elements or their components in place to determine their characteristics, provided the appropriate precautions are taken to avoid their failure or destruction.	
9	Taking into account the past performance and load history of constructed elements or their components when determining their present or future capacity.	
10	Protecting constructed elements through appropriate and regular maintenance.	Failing to adequately maintain constructed elements on a cyclical basis, causing their components to deteriorate.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Protecting evidence of the evolution process or operation of constructed elements that contribute to the heritage value of the engineering work, including protecting patinas, soiling or debris, wear patterns and graffiti, resulting from the operation of the work or its associated machinery. For example, cleaning machinery just enough to reduce deterioration and danger to the public, rather than attempting to clean it to a “like new” condition.	
12	Preserving the method of operation of an engineering work or its constructed elements that are important in defining the overall heritage value of the historic place. For example, continuing to hand-operate a canal lock gate mechanism, rather than switching to a motor.	
13	Imposing limits on the acceptable use of constructed elements, based on their actual characteristics and capacities to protect them from damage. There is a need to balance present and anticipated usage demands with heritage value, and to avoid, if possible, any use that would damage or destroy the constructed elements.	Subjecting constructed elements to uses that could overload existing systems, such as installing equipment or systems that undermine the heritage value of the engineering work.
14	Balancing the need to alter constructed elements to meet current safety codes and standards (to allow continued use) with the need to preserve the heritage value of the work’s functionality and operation.	
15	Retaining sound constructed elements or deteriorated constructed elements of engineering works that can be repaired.	Replacing or rebuilding constructed elements that can be repaired.
16	Stabilizing deteriorated constructed elements on an interim basis by structural reinforcement, weather protection, or correcting unsafe conditions, as required, until any additional work is undertaken.	Neglecting to treat known conditions that threaten the constructed elements of engineering works.
17	Adapting interim stabilization interventions to the anticipated lifespan of the constructed element, so that they remain as reversible as possible.	
18	Repairing deteriorated parts of constructed elements in a manner that is physically and visually compatible with the engineering work.	Failing to undertake necessary repairs, resulting in the loss of constructed elements. Replacing an entire constructed element when repair or limited replacement of deteriorated or missing parts is possible.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
19	Protecting adjacent character-defining elements and components of constructed elements from accidental damage or exposure to damaging materials during maintenance or repair work.	
20	Replacing in kind extensively deteriorated or missing parts of constructed elements using physical and documentary evidence as a model for reproduction. The new work should match the old as closely as possible in form, materials and detailing, and have adequate strength.	Replacing an entire constructed element when limited replacement of deteriorated and missing parts is possible.
21	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
22	Operating and using a functioning engineering work or its constructed elements appropriately and according to applicable codes, to preserve the functional purpose of the work that is important in defining the overall heritage value of the historic place. For example, maintaining a canal route open to navigation, or reinforcing a highway bridge so that it can remain in service.	<p>Ceasing to use or altering the functional purpose of a functioning work, or its constructed elements, that is important in defining the overall heritage value of the historic place.</p> <p>Operating and using a functioning engineering work without providing appropriate and timely maintenance, or without appropriate safety equipment, guards or training.</p>
23	Documenting all interventions that affect constructed elements, and ensuring that this documentation will be available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
24	Repairing constructed elements or their components using recognized conservation methods. Repairs might include the limited replacement <i>in kind</i> , or replacement with an appropriate substitute material, of irreparable or missing components, based on physical or documentary evidence.	<p>Failing to undertake necessary repairs, resulting in the loss of constructed elements.</p> <p>Replacing or demolishing an entire constructed element, when repair and limited replacement of deteriorated or missing parts is possible.</p>
25	Proof-testing repairs to reinforce constructed elements or their components in place, to confirm their actual rather than theoretical performance, provided the appropriate precautions are taken to avoid their failure or destruction.	Reinforcing constructed elements or their components, without verifying the effectiveness or the level of benefit achieved by the reinforcement work.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
26	Replacing in kind an entire constructed element that is too deteriorated to repair, using physical and documentary evidence as a model for reproduction. The new work should match the old as closely as possible in form, materials and detailing, and have adequate strength.	Replacing a constructed element with one that does not follow the same engineering concept as the original. For example, replacing a character-defining mass masonry retaining wall with a reinforced concrete retaining wall faced with stone.
27	Replacing missing historic features by designing and installing a new constructed element based on physical or documentary evidence, or one that is compatible in size, scale, material, style or colour.	Creating a false historical appearance by replacing a constructed element with one that is based on insufficient physical and documentary evidence.

ADDITIONS OR ALTERATIONS TO CONSTRUCTED ELEMENTS

28	Designing additions for a new use in a manner that is compatible with the constructed element and respects the heritage value of the engineering work.	Introducing additions to constructed elements that are incompatible with the character of the engineering or that alter the historic relationships of the work.
29	Building an addition to a constructed element that retains as many of the historic materials as possible, and ensures that the constructed elements are not obscured, damaged or destroyed, or the heritage value undermined.	
30	Designing a new addition to a constructed element in a manner that draws a clear distinction between what is historic and what is new.	Duplicating the exact form, material, style and detailing of the original constructed element so that the new work appears to be part of the historic place.
31	Considering the design of an attached exterior addition in terms of its relationship to the engineering work. The design for the new work may be contemporary or refer to design motifs from the historic place. In either case, it should be compatible in terms of massing, materials and colour, yet be distinguishable from the historic place.	Designing and building new additions that negatively affect the heritage value of the engineering work, including its design, materials, workmanship, location or setting.
32	Placing a new addition on a non-character-defining elevation and limiting its size and scale in relation to the engineering work.	Designing a new addition that obscures, damages or destroys constructed elements, or undermines the heritage value of the engineering work.
33	Undertaking soil mechanics studies and limiting new excavations adjacent to constructed elements to avoid undermining the structural stability of the engineering work or adjacent historic structures. Archaeological investigations should be undertaken before any excavation to avoid damaging potential archaeological resources. Refer to the Guidelines for Archaeological Sites for additional recommendations on excavation work.	Carrying out excavations or re-grading that could cause constructed elements or adjacent historic structures to settle, shift or fail, or that could damage archaeological resources.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
34	Correcting the structural deficiencies of constructed elements when preparing for a new use in a manner that preserves their character-defining elements and the overall heritage value of the engineering work.	
35	Designing and installing new mechanical or electrical systems or equipment when required for the new or continued use, in a manner that minimizes adverse effects on the constructed elements.	
36	Adding a new structural system to a constructed element when required for the new or continued use, in a manner that does not obscure, damage or destroy character-defining elements.	
37	Creating a habitable space when required for the new use, in a manner that assures that character-defining elements will be preserved.	
38	Removing non character-defining constructed elements when required by the new use.	Removing, relocating and displaying non character-defining constructed elements in a new location, creating a false impression of the engineering work.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
HEALTH, SAFETY AND SECURITY CONSIDERATIONS		
39	Adding new features to meet health, safety or security requirements, in a manner that conserves the constructed elements and minimizes impact on the heritage value of the engineering work.	
40	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the engineering work.	Making changes to constructed elements, without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements of the engineering work.
41	Protecting constructed elements against loss or damage by identifying and assessing specific risks, and by implementing an appropriate fire protection strategy that addresses those specific risks.	Implementing a generic fire protection strategy or one that does not appropriately address the specific fire risks of the engineering work.
42	Installing sensitively designed fire-suppression systems, such as sprinklers, that retain the character-defining elements and respect the heritage value of the engineering work.	Installing fire-suppression systems in a manner that damages or destroys character-defining elements.
43	Applying fire retardant or protective materials that do not damage or obscure constructed elements. For example, applying fire-retardant, <i>intumescent paint</i> to a deck to further protect its steel.	Covering flammable, character-defining constructed elements or their components with fire-resistant sheathing or coatings that alter their appearance.
44	Removing hazardous materials from engineering works, their constructed elements or their components, only after thorough testing has been conducted and less-invasive abatement methods have been shown to be inadequate. Where applicable, archaeological work to collect data should be carried out before the site is disrupted by soil decontamination operations.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
ACCESSIBILITY CONSIDERATIONS		
45	Introducing a new feature to meet accessibility requirements in a manner that conserves the constructed element and respects the overall heritage value of the engineering work.	
46	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the engineering work.	Altering character-defining constructed elements without consulting the appropriate specialists and users.
SUSTAINABILITY CONSIDERATIONS		
47	Complying with energy-efficiency objectives in upgrades to the constructed elements in a manner that respects the engineering work's character-defining elements.	Damaging or destroying constructed elements and undermining the heritage value of the engineering work while making modifications to comply with energy-efficiency objectives.
48	Working with specialists to determine the most appropriate solution to energy efficiency requirements with the least impact on the character-defining elements and overall heritage value of the engineering work.	Making changes to constructed elements, without first exploring alternative energy efficiency solutions that may be less damaging to the character-defining elements and overall heritage value of the engineering work.
CEASING OPERATION OF AN ENGINEERING WORK		
49	Following appropriate <i>mothballing</i> procedures when ceasing operation of an engineering work so as to maintain the potential for future operation of the work or its constructed elements, including installing appropriate safety shut-offs, and carrying out regular maintenance on the shut-down mechanisms to prevent their deterioration.	

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
50	Repairing constructed elements from the restoration period using a minimal intervention approach, such as patching, splicing, consolidating or otherwise reinforcing its materials and improving weather protection.	Replacing an entire constructed element from the restoration period when the repair of materials and limited replacement of deteriorated or missing parts is possible.
51	Replacing in kind an entire constructed element from the restoration period that is too deteriorated to repair using the physical evidence as a model to reproduce the element. The replacement should have the same form, appearance and material properties as the replaced element, and have adequate strength or load-bearing capabilities. The new work should be unobtrusively dated to guide future research and treatment.	Removing an irreparable constructed element from the restoration period and not replacing it, or replacing it with an inappropriate new element.

REMOVING EXISTING FEATURES FROM OTHER PERIODS

52	Removing or altering a non character-defining constructed element or component from a period other than the restoration period.	<p>Failing to remove a non character-defining constructed element or component from another period that confuses the depiction of the engineering work's chosen restoration period.</p> <p>Removing a feature from a later period that serves an important function in the engineering work's ongoing use, such as an emergency exit door, or signage associated with a new use.</p>
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RECREATING MISSING FEATURES FROM THE RESTORATION PERIOD

53	Recreating a missing constructed element from the restoration period, based on physical or documentary evidence.	Installing a constructed element that was part of the engineering work's original design but was never actually built, or a constructed element that was thought to have existed during the restoration period but for which there is insufficient documentation.
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RESTORING OPERATION TO AN ENGINEERING WORK

54	Restoring operation to an engineering work that is important in defining its heritage value.	Keeping an engineering work in a non-operational state when the operation of the work is important in defining its heritage value.
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4.4.2 FUNCTIONAL ARRANGEMENT

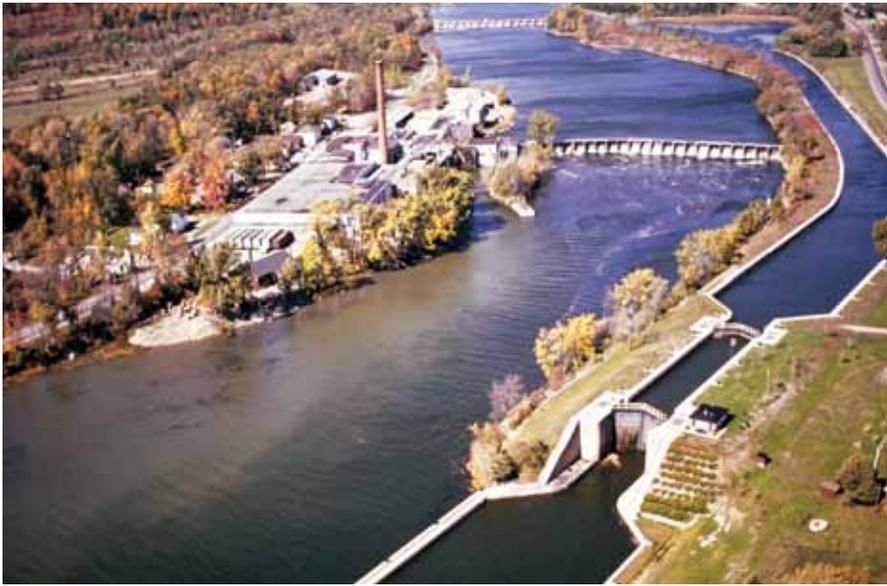
These guidelines provide direction when the functional arrangement of an engineering work is identified as a character-defining element of an historic place.

Functional arrangement, in the context of these guidelines, is the interrelationship of the constructed elements of the engineering work. Essentially, it is the layout of the work.

On a large scale, functional arrangement can include a landscape that envelops and extends beyond the engineering work, such as the right-of-way of a railway passing through a mountain range, or a canal route that connects lakes and rivers across great distances. On a more moderate scale, functional arrangement can be limited to the site of the engineering work, such as the grouping of different buildings and equipment that supports a manufacturing or refining process. On a small scale, functional arrangement can be limited to what is internal to a single constructed element of the engineering work, such as the layout of a building that was determined by the process housed in that building.

The functional arrangement of the work can often be as important and valuable an aspect of the engineering work as the design of its constructed elements. For example, the routing of the Rideau Canal and the locations and interrelationships of its dams, weirs, lockstations and blockhouses are all character-defining elements of that historic place. The functional arrangement is often directly related to the human and engineering struggle encountered in imposing the work on the environment, to the distinct stages of the manufacturing or reduction process carried out at the work and to the patterns of circulation and activity involved in operating the work.

These guidelines provide general recommendations for the functional arrangement of an engineering work. When the engineering work is part of a cultural landscape, also refer to Spatial Relationships in the Guidelines for Cultural Landscapes.



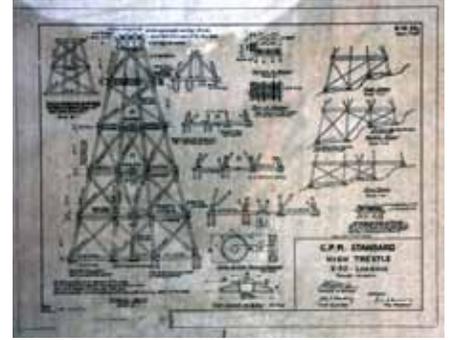
Large-scale Functional Arrangement: The Trent–Severn Waterway is an example of large-scale Functional Arrangement at a civil engineering work. The nearly 400 kilometre-long natural and human-made waterway crosses central Ontario linking Georgian Bay to the Bay of Quinte. The waterway’s character-defining elements include many Functional Arrangement elements such as: the route of the waterway; the unity and completeness of the waterway, its engineering structures and buildings that support it, and the special cultural landscapes it has generated; the disposition and relationship of the waterway’s Constructed Elements to their surroundings; and the legibility of the cultural landscapes and patterns between and among the Constructed Elements.

THE RELATIONSHIP BETWEEN AN ENGINEERING WORK AND ITS SETTING

There is often a strong connection between the functional arrangement of an engineering work and its setting. The setting explains the location of a civil, industrial or military work. Prior to making any changes to the functional arrangement of an engineering work, it is important to understand how the proposed changes will affect its relationship with the setting, and the heritage value of the engineering work. The definition of setting and its relationship with the broader environment are addressed in more detail in the Introduction to the Guidelines for Cultural Landscapes.



Moderate-scale Functional Arrangement: Claybank Brick Plant, located near Claybank, SK, consists of about 132 hectares containing over 20 Constructed Elements, including a brick plant, clay-pits, houses, rail spur and a rail siding. An example of a moderate-scale functional arrangement at an industrial work, the plant includes distinct areas for brick production and storage; internal transportation systems for both clay and bricks; transportation facilities for shipping out finished brick; an administration area; and residential areas that reflect the roles and relationships of members of this industrial community such as the location of the detached residences and bunkhouse.



The routing of the Kettle Valley Railway through the Myra Canyon in British Columbia used a network of trestles, tunnels, rock cuts and fills. Constructed in 1915 as part of a secondary main line route that operated across southern British Columbia, the construction and positioning of the trestles greatly reduced the amount of rock excavation required to route the railway through the canyon. In 2003, a forest fire destroyed 12 of the 16 wooden trestles and damaged two steel structures in the canyon. The wooden trestles were rebuilt based on original construction specifications.



Small-scale Functional Arrangement: The interior of the Britannia Mines Concentrator, in Britannia Beach, BC, is an example of a small-scale Functional Arrangement at an industrial work. The concentrator processed copper ore for one of Canada's largest mining operations in the 1920s and 1930s. The concentrator used innovative technologies and took advantage of gravity to move the ore downwards through the building at each stage. The functional layout of the building's interior, and particularly the definition and respective locations of special-purpose areas, is a character-defining element.



The *Diefenbunker* is valued for the comprehensive physical evidence it presents confirming Canada's determination to survive and function as a nation during a nuclear attack. The Functional Arrangement of the Diefenbunker, including the relative placement of the surrounding buildings associated with its operations (the guard house and related shelter, the underground garage, the fibreglass tuning hut, the underground communications vault), is a character-defining element. Any new functions or services at the site should be located in a manner that does not obscure or alter this arrangement.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the functional arrangement and how it contributes to the heritage value of the engineering work.	
2	Understanding the construction history, theory, and functional basis and design behind the functional arrangement.	
3	Documenting the functional arrangement, including the circulation patterns and process sequence, and the orientation, alignment, size, juxtaposition and interrelationships of the constructed elements that define their organization, evolution and condition, before undertaking an intervention.	Undertaking an intervention that will affect the functional arrangement without first documenting the existing arrangement.
4	Assessing the physical integrity of the functional arrangement early in the planning process so that the scope of work is based on current conditions.	
5	Protecting the functional arrangement by securing and maintaining the circulation patterns and process sequence, and the orientation, alignment, size, juxtaposition and interrelationships of the constructed elements.	Allowing the functional arrangement to be altered by incompatible development or neglect.
6	Retaining the functional arrangement by maintaining the circulation patterns and process sequence as well as the orientation, alignment, size, juxtaposition and interrelationships of the constructed elements.	Altering the functional arrangement by removing or relocating sound or repairable constructed elements that define the functional arrangement.
7	Retaining the functional arrangement by maintaining the relationship between the engineering work and its site, when this relationship is part of its heritage value.	Removing or relocating an engineering work when its location is character-defining, thus affecting the relationship between the work and its site.
8	Documenting all interventions that affect functional arrangement, and ensuring that this documentation is available to those responsible for future interventions.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
9	Rehabilitating the functional arrangement by re-establishing the circulation patterns and process sequence, and the orientation, alignment, size, juxtaposition and interrelationships of the constructed elements, using physical and documentary evidence as a model for reproduction.	
10	Rehabilitating the functional arrangement by replacing missing constructed elements that define the arrangement. Designing and installing new constructed elements using physical and documentary evidence as a model for reproduction.	Allowing the functional arrangement to be obscured by failing to replace a missing constructed element that defines the arrangement.

ADDITIONS OR ALTERATIONS TO THE FUNCTIONAL ARRANGEMENT

11	Locating new functions and services in existing non-character-defining spaces, in a manner that does not obscure or alter the functional arrangement.	Radically changing the functional arrangement to adapt to a new use.
12	Introducing new circulation in a way that respects character-defining circulation patterns and process sequence, and the functional arrangement of the constructed elements.	
13	Removing the non character-defining constructed elements that do not contribute to the functional arrangement, when required by the new use.	Altering the functional arrangement to suit a new use by removing character-defining constructed elements. Relocating non character-defining constructed elements to a new location, in a manner that alters or impairs the functional arrangement, thus creating a false impression of the engineering work.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

14	Adding new features to meet health, safety and security requirements in a manner that conserves the functional arrangement of the engineering work and minimizes impact on its character-defining elements.	Damaging or destroying character-defining elements while making modifications to comply with health, safety and security requirements.
15	Working with code specialists to determine the most appropriate solution to health, safety and security requirements with the least impact on the character-defining elements and overall heritage value of the engineering work.	Making changes to the functional arrangement without first exploring equivalent systems, methods or devices that may be less damaging to the character-defining elements of the engineering work.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
ACCESSIBILITY CONSIDERATIONS		
16	Introducing a new feature to meet accessibility requirements in a manner that conserves the functional arrangement and respects the overall heritage value of the engineering work.	
17	Working with accessibility and conservation specialists and users to determine the most appropriate solution to accessibility issues with the least impact on the character-defining elements and overall heritage value of the engineering work.	Altering character-defining elements without consulting the appropriate specialists and users.
CEASING OPERATION OF AN ENGINEERING WORK		
18	Following appropriate <i>mothballing</i> procedures when ceasing the operation of an engineering work so as to maintain the potential for future operation of the work.	

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
19	Reinstating the functional arrangement from the restoration period by re-establishing the circulation patterns and process sequence, and the orientation, alignment, size, juxtaposition and interrelationships of the constructed elements that define the arrangement, using documentary and physical evidence as a model for reproduction. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Replacing a constructed element that defines the functional arrangement from the restoration period when repair is possible, or using destructive repair methods, thus causing further damage to fragile historic materials.
20	Replacing in kind entire constructed elements that define the functional arrangement from the restoration period that are too deteriorated to repair, using physical evidence as a model to reproduce the element. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing a constructed element from the restoration period that is beyond repair and not replacing it, or replacing it with a new constructed element that does not respect the functional arrangement of the engineering work.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

Recommended	Not Recommended
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REMOVING EXISTING ARRANGEMENTS FROM OTHER PERIODS

21	<p>Removing or altering a non character-defining functional arrangement from a period other than the restoration period.</p>	<p>Failing to remove a non character-defining functional arrangement from a period other than the restoration period that confuses the depiction of the engineering work's chosen restoration period.</p> <p>Removing a functional arrangement from a later period that serves an important function in the engineering work's ongoing use.</p>
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RECREATING MISSING ARRANGEMENTS FROM THE RESTORATION PERIOD

22	<p>Recreating a missing functional arrangement from the restoration period, based on physical or documentary evidence.</p>	<p>Establishing a functional arrangement that was part of the original design, but was never actually built, or creating a functional arrangement that was thought to have existed during the restoration period, but for which there is insufficient documentation.</p>
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RESTORING OPERATION TO AN ENGINEERING WORK

23	<p>Restoring operation to an engineering work that is important in defining its heritage value.</p>	<p>Keeping an engineering work in a non-operational state when the operation of the work is important in defining its heritage value.</p>
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4.5

GUIDELINES FOR MATERIALS



The following section addresses many types of materials. Clockwise, from top left are examples of landscape materials, masonry, fabric, and glass and concrete.

4.5

GUIDELINES FOR MATERIALS

The guidelines apply to the materials that compose buildings, built features of cultural landscapes and constructed elements of engineering works. Because materials are often identified as character-defining, they contribute to the heritage value of historic places and should be conserved. The ongoing care of materials, including appropriate maintenance and repair, contributes to the integrity and lifespan of an historic place.

In-kind materials should be used whenever possible. Sourcing materials for repair and replacement can be challenging, especially if the materials are from an historic source that no longer exists, such as a quarry, an old-growth forest, or a manufacturing facility that has closed down. It may be possible to find salvaged materials from other buildings or, in some cases, find the needed materials elsewhere in the historic place to use for small repairs.

DURABILITY

Traditional building materials, such as masonry and wood, are inherently durable. Over time, they have demonstrated a significant capacity to withstand surface degradation without losing structural capacity, or frequent repairs as long as basic maintenance is carried out.

PATINA

There is a fine distinction between patina and decay. Patina is the natural aging of materials; an organic and superficial surface degradation that is usually not harmful to the material. It can also be caused by use and wear. Understanding patina and its heritage value in the context of an historic place is part of assessing the condition of materials. It may be important to conserve patina for reasons of appearance, such as moss growing on a mature tree or the changed colour of a building stone, or for natural protection, such as on metals, where corrosion may form a protective coating.

Substitute Materials

Substitute materials should be explored only after all other options for repair and replacement have been ruled out. They should be used only when the original materials or craftsmanship are no longer available, when the original materials are of poor quality or damage adjacent character-defining materials, or when specific regulations rule out using hazardous materials. Because there are so many unknowns about the long-term performance of substitute materials, their use should not be considered without a thorough investigation of their composition, compatibility, durability and installation. The importance of finding visually and physically compatible substitute materials cannot be overstated.

APPLYING THE GUIDELINES

The Guidelines for Materials contain guidelines that apply to all materials, and guidelines related to specific materials. When conserving any material, first refer to the guidelines for All Materials and then to the guidelines related to the specific material: Wood and Wood Products, Masonry, Concrete, Architectural and Structural Metals, Glass and Glass Products, or Plaster and Stucco. The Miscellaneous Materials subsection includes general guidance for the conservation of materials that do not fall into one of these categories.

The Guidelines for Materials should not be used in isolation, but in conjunction with the appropriate section for the related building assembly, built feature, or constructed element.

4.5.1 ALL MATERIALS

These guidelines provide direction when a material is identified as a character-defining element of an historic place. The material may have been identified specifically, or may be an integral part of a character-defining element. These guidelines provide direction on documentation, condition assessment, testing and maintenance activities, repair and replacement in kind that apply to all materials. For the investigation, analysis and modification of materials that are part of engineering works, the services of a professional engineer are required by code.

The Guidelines for All Materials do not provide complete guidance on materials conservation; they provide general advice common to all materials. As such, they should be referred to in conjunction with the following guidelines for specific materials:

4.5.2 Wood and Wood Products

4.5.3 Masonry

4.5.4 Concrete

4.5.5 Architectural and Structural Metals

4.5.6 Glass and Glass Products

4.5.7 Plaster and Stucco

4.5.8 Miscellaneous Materials.



Wood: An example of “limited replacement in kind” describes an appropriate scope of work in the Preservation treatment. Only the damaged corner of a stair’s newel post at the Commissioner’s Residence in Dawson City, has been replaced (it will be stained to match). Only repairing deteriorated parts meant that most of the character-defining elements were retained.



Masonry: In this rehabilitation project of the Rideau Canal, some of the original limestone blocks remained in good condition. Others, which were too deteriorated to repair, were replaced in kind with new limestone blocks.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the materials that comprise the historic place and how they contribute to its heritage value.	
2	Documenting all interventions that affect materials, and ensuring that the documentation is available to those responsible for future interventions.	
3	Determining the appropriate level of investigation required to understand the properties and overall condition of the material.	Failing to undertake an appropriate level of investigation and analysis before identifying the level of conservation work required.
4	Assessing materials fully to understand condition, evolution over time, deterioration and mechanical and chemical properties. This should be done early in the planning process so that the scope of work is based on current conditions.	Carrying out a level of conservation work that exceeds what is required, or taking action based on assumptions or rules of thumb. Failing to assess the impact of maintenance practices on materials. Failing to consider the relationship between materials and adjacent elements as a source of deterioration.
5	Testing and examining materials and coatings to determine their properties and causes of deterioration, damage or distress, through investigation, monitoring and minimally invasive or non-destructive testing techniques.	Using highly destructive probing or sampling techniques that damage or destroy materials. Undertaking work without understanding the mechanical and chemical properties of the material. Carrying out a repair that does not treat or address the cause of the problem.
6	Testing proposed interventions to establish appropriate replacement materials, quality of workmanship and methodology. This can include reviewing samples, testing products, methods or assemblies, or creating a mock-up. Testing should be carried out under the same conditions as the proposed intervention.	
7	Maintaining materials on a regular basis, as described in the relevant material subsection.	Failing to adequately maintain materials, or carrying out maintenance on an ad-hoc basis.
8	Carrying out regular monitoring and inspections of materials to proactively determine the type and frequency of maintenance required.	
9	Developing a maintenance plan, where appropriate, that includes schedules for monitoring and inspection.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
10	Updating and adapting maintenance activities, as conditions and knowledge about the materials and maintenance products and methods evolve.	
11	Cleaning materials only when necessary, to remove heavy soiling or graffiti. The cleaning method should be as gentle as possible to obtain satisfactory results.	
12	Carrying out cleaning tests, after it has been determined that a specific cleaning method is appropriate.	
13	Protecting adjacent materials from accidental damage during maintenance or repair work.	Allowing character-defining elements to be exposed to accidental damage by nearby work.
14	Repairing or replacing materials to match the original as closely as possible, both visually and physically.	Using inappropriate or untested materials or consolidants, or using untrained personnel for repair work.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
15	Replacing character-defining materials with compatible substitute materials, when the original is found to accelerate deterioration and only after thorough analysis and monitoring confirms that the material or construction detail is problematic. Substitute materials should be as durable as the overall assembly to maintain its expected service life.	Using new materials and new technologies that do not have a proven track record. Replacing deteriorated character-defining elements using new materials or technologies to improve durability, when the original material performs adequately.

ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
16	Documenting materials dating from periods other than the restoration period before their alteration or removal. If possible, selected samples of these materials should be stored to facilitate future research.	Failing to document materials that are not from the restoration period before removing them.

4.5.2 WOOD AND WOOD PRODUCTS

These guidelines provide direction when wood and wood products are identified as character-defining elements of an historic place. They also give direction on maintaining, repairing and replacing wood or wood products.

Wood and wood products refer to wood elements used in exterior or interior systems and assemblies. Wood elements include logs, sawn or hewn timbers, and milled or sculpted lumber. Wood products include plywood, glue-laminated timber, or composites, such as particleboard or wafer board. Both wood and wood products can be found in roofs, cladding, structure, windows and doors, interior finishes, carvings and fences.



It is important to identify the cause of any damage to a wooden building element before beginning a Preservation treatment. For the former machine shop of the North Pacific Cannery in Port Edward BC, exposure to marine conditions caused the exterior wood cladding to deteriorate.

An organic material, wood has a wide range of physical properties that vary significantly, depending on species, cut, grade and age. Wood is especially vulnerable to fire, moisture, ultraviolet radiation and insect infestation, thus protection from these threats is crucial to its conservation. This includes applying and maintaining suitable coatings and treatments, such as paints, stains, varnishes and preservatives.



Using minimally destructive testing methods can help evaluate the condition of wood without damaging it. Here a resistance measuring micro drill is being used to evaluate the condition of a log wall at Fort Walsh, NHSC in Saskatchewan. A drilling needle penetrates the wood at a constant speed and measures the resistance encountered to advance the drill bit. The resistance the wood offers indicates its condition: low resistance can indicate decay.

Repairing wood elements typically involves consolidating or replacing decayed or damaged wood, and correcting the conditions that caused the decay or damage. The use of traditional carpentry techniques in repairing architectural and structural wood elements is well established. However, repairing more recently introduced wood products, such as plywood and composites, may not be possible, due to the manufacturing process involved and their modular nature. In this case, replacement in kind may be more appropriate. The difficulty in locating a sustainable source for replacement in kind of old growth or exotic wood may result in the need to select an appropriate replacement material.

These guidelines provide general recommendations for wood and wood products and should be used in conjunction with 4.5.1, All Materials. Because wood can form part of the structure or envelope of a building or engineering work, also refer to the specific system or assembly in the Guidelines for Buildings.



Deteriorated logs at the John Walter Historic Site in Edmonton were replaced in kind with hewn logs that used the originals as templates to reproduce tooling marks on visible surfaces. On close inspection, this distinguishes the new materials if the logs are separated in the future.



Wood was often used in modern buildings as a finish to contrast with more industrial materials, or as part of an acoustical treatment on ceilings and walls. The wood ceiling and column claddings of the Beaver Lake Pavilion in Montreal were carefully preserved as part of the recent rehabilitation of the pavilion.



Preserving the wood doors of the Langevin Block in Ottawa included carefully dismantling the doors to permit the damaged and decayed wood to be repaired.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of wood and its finishes or coatings, such as its species, grade, strength and finish, or the chemical make-up of its coating.	
2	Documenting the location, dimension, species, finish and condition of wood before undertaking an intervention.	Undertaking an intervention that affects wood, without first documenting its existing characteristics and condition.
3	Protecting and maintaining wood by preventing water penetration; by maintaining proper drainage so that water or organic matter does not stand on flat, horizontal surfaces or accumulate in decorative features; and by preventing conditions that contribute to weathering and wear.	Failing to identify, evaluate and treat the causes of wood deterioration.
4	Creating conditions that are unfavourable to the growth of fungus, such as eliminating entry points for water; opening vents to allow drying out; removing piled earth resting against wood and plants that hinder air circulation; or applying a chemical preservative, using recognized conservation methods.	
5	Inspecting coatings to determine their condition and appropriateness, in terms of physical and visual compatibility with the material, assembly, or system.	
6	Retaining coatings that help protect the wood from moisture, ultraviolet light and wear. Removal should be considered only as part of an overall maintenance program that involves reapplying the protective coatings in kind.	Stripping paint or other coatings to reveal bare wood, thus exposing historically coated surfaces to moisture, ultraviolet light, accelerated weathering and mechanical wear.
7	Removing damaged, deteriorated, or thickly applied coatings to the next sound layer, using the safest and gentlest method possible, then recoating in kind.	Using destructive coating removal methods, such as propane or butane torches, sandblasting or water-blasting. These methods can irreversibly damage woodwork.
8	Using the gentlest means possible to remove paint or varnish when it is too deteriorated to recoat, or so thickly applied that it obscures details.	Using thermal devices improperly in a manner that scorches the woodwork. Failing to neutralize the wood thoroughly after using chemical strippers, thereby preventing the new coating from adhering. Allowing detachable wood elements to soak too long in a caustic solution, causing the wood grain to raise and the surface to roughen. Stripping historically coated wood surfaces to bare wood, then applying a clear varnish or stain.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
9	Applying compatible coatings following proper surface preparation, such as cleaning with tri-sodium phosphate.	Failing to follow the manufacturer's product and application instructions when applying coatings.
10	Ensuring that new coatings are physically and visually compatible with the surface to which they are applied in durability, chemical composition, colour and texture.	
11	Applying chemical preservatives to unpainted wood elements that are not exposed to view.	Using chemical preservatives, such as copper naphthanate, if these materials have not been used historically, and are known to change the appearance of wood elements.
12	Preventing the continued deterioration of wood by isolating it from the source of deterioration. For example, blocking windborne sand and grit with a windbreak, or installing wire mesh over floor joists in a crawlspace to thwart rodents.	Neglecting to treat known conditions that threaten wood, such as abrasion, animal gnawing, fungal decay, or insect infestation.
13	Treating active insect infestations by implementing an extermination program specific to that insect.	
14	Retaining all sound and repairable wood that contributes to the heritage value of the historic place.	Replacing wood that can be repaired, such as wood components from old growth timber that is inherently more durable.
15	Stabilizing deteriorated wood by structural reinforcement, weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated wood that can be stabilized or repaired.
16	Repairing wood by patching, piecing-in, consolidating, or otherwise reinforcing the wood, using recognized conservation methods.	Replacing an entire wood element, when repair and limited replacement of deteriorated or missing parts is appropriate.
17	Replacing in kind extensively deteriorated or missing parts of wood elements, based on documentary and physical evidence.	Using a substitute material for the replacement part that neither conveys the same appearance as the wood element, nor is physically or chemically compatible.
18	Replacing in kind the entire panel of an extensively deteriorated or missing modular wood product, such as plywood, on a unit-by-unit basis.	

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
19	Repairing wood elements by patching, piecing-in, consolidating or otherwise reinforcing the wood, using recognized conservation methods. Repair might include the limited replacement in kind, or replacement with compatible substitute material, of extensively deteriorated or missing wood, where there are surviving prototypes. Repairs might also include dismantling and rebuilding a timber structure or wood assembly, if an evaluation of its overall condition determines that more than limited repair or replacement in kind is required.	
20	Replacing in kind an irreparable wood element, based on documentary and physical evidence.	Removing an irreparable wood element and not replacing it, or replacing it with an inappropriate new element.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

21	Removing or encapsulating hazardous materials, such as lead paint, using the least-invasive abatement methods, and only after adequate testing has been conducted.	
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SUSTAINABILITY CONSIDERATIONS

22	Selecting replacement materials for character-defining old-growth, exotic, or otherwise unavailable wood, based on their physical and visual characteristics.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
23	Repairing , stabilizing and securing fragile wood from the restoration period, using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable on close inspection for future research.	<p>Removing wood from the restoration period that could be stabilized and conserved.</p> <p>Replacing an entire wood element from the restoration period when repair and limited replacement of deteriorated or missing parts is possible.</p> <p>Using a substitute material for the replacement that neither conveys the same appearance as the surviving wood, nor is physically or chemically compatible.</p>
24	Replacing in kind a wood element from the restoration period that is too deteriorated to repair, based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable wood element from the restoration period and not replacing it, or replacing it with an inappropriate new element.

4.5.3 MASONRY

These guidelines provide direction when masonry is identified as a character-defining element of an historic place. They also give direction on maintaining, repairing and replacing masonry elements.

Masonry refers to mortared or dry laid natural stone as well as brick, cast stone, terra cotta and concrete block. The aesthetic characteristics of the masonry, such as the finish dressing, texture and colour of the stone, brick or mortar, the coursing pattern, and the joint width and profile, along with the careful integration of decorative sculptural and functional elements, such as band courses, lintels, water tables, cornices, scuppers and carvings, all contribute to its heritage value and require careful consideration.

Masonry construction in Canada ranges from statues and simple stone pathways, to massive fortifications and modern brick veneers on high-rise buildings. In many early uses, masonry played a dual role, acting as both the structural system and the building envelope. When conserving these types of masonry, it is important to consider both of these roles.



Sandblasting was once a popular method of removing paint from brick; however, it also removed the brick's outer hardened "crust" causing the brick to deteriorate.



The harsh climate in many parts of Canada can seriously damage masonry elements. This wall has suffered irreversible damage from water penetrating the brick façade and freezing, causing the faces of many bricks to pop off. To avoid such damage, repair failed flashings, deteriorated mortar joints or other mechanical defects, but do not apply water-repellent coatings, which can trap moisture inside the masonry.



Preserving the exterior of the British Columbia Legislative Building (its rear façade shown here), including its masonry walls, steps, columns, pilasters, window surrounds, decorative details and cornices, began with documenting the material, form, jointing, tooling, bonding patterns, coatings, colour and conditions of these elements before beginning project work.



Masonry should be cleaned only when necessary to halt deterioration or remove heavy soiling. If surface cleaning is appropriate, test to select the gentlest cleaning method possible, and observe the result over time to determine the immediate and the long-term effects. Test cleaning the left portion of this brick and stone wall (using low pressure water and detergents, when there was no chance of freezing) created an acceptably clean wall.

A wide variety of stone has been used in historic places. Each type has different properties and behaviours that must be understood to ensure their proper conservation. Because stone is a natural material, it can possess inclusions of minerals or clay that can weaken it and reduce its durability. Poor-quality design and workmanship can aggravate these inherent weaknesses.

Brick is a solid or hollow masonry unit, typically made of clay, calcium-silicate, or concrete, and used for both cladding and structural work. Terra cotta is also made of clay mixed with sand. It is used for ornamental work, roof and floor tiles, interior partitions and as fire proofing for metal structures. Terra cotta is not a load-bearing material.

The preservation of masonry can best be ensured through appropriate and timely maintenance. Cleaning treatments for purely aesthetic purposes should be avoided because they can aggravate and accelerate deterioration.

These guidelines provide general recommendations for masonry and should be used in conjunction with 4.5.1, All Materials. Because masonry can form part of the structure or envelope of a building or engineering work, also refer to Structural Systems and to Exterior Walls in the Guidelines for Buildings.



One of the primary causes of deterioration of glazed architectural terra cotta, like that shown on the Confederation Life Building in Winnipeg is water. Water-related damage to the glazed units, mortar, metal anchors or masonry backfill can be repaired only after eliminating the sources of that water. In order to ensure that the actual root problem is being solved, investigation work would need to be completed prior to any repairs in order to identify that source.



Deteriorated slate pavers should be replaced in kind from the same source of the original material. If the original quarry is closed, a suitable match should be located and attention given to the stone's composition, strength and colour.



Tenby School in Lansdowne MB is a well-preserved and rare example of a village school built with concrete blocks, a material commonly used between 1890 and 1905 for homes and commercial buildings in southern Manitoba. The blocks were artfully formed on site by using three distinct moulds.



Using brick masonry in interiors is a long lasting, almost indestructible finish for public spaces. Brick walls and floors are character defining in many modern interiors such as the Joseph Shepard Building in Toronto. It is not recommended to apply paint or other coatings to masonry that has been historically unpainted or uncoated.



Many stone masonry monuments, such as the Brock Monument in Queenston, ON, are historic places. A monument does not face many of the challenges of historic buildings or engineering works. Its purpose and use are the same today as when it was built. A monument is expected to remain constant and unchanged despite time, deterioration and weathering. Continuous maintenance and repairs are required and interventions or major repairs must be carefully considered to evaluate their potential impact on each part of the monument.



Masonry used on the exterior of modern buildings is generally a cladding attached to a separate structure. Clips, anchors or shelf angles are used to attach the stone panels or brick masonry. The deterioration of these anchors is an area of potential deterioration and failure. Monitoring the condition of these anchors is a vital part of a maintenance plan, as their failure can lead to very significant damage.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of the masonry of the historic place.	
2	Documenting the form, materials and condition of masonry before undertaking an intervention. For example, identifying the particular characteristics and source of the type of stone or brick used, and the composition of the mortar.	Undertaking an intervention that affects masonry without first documenting its existing character and condition.
3	Protecting and maintaining masonry by preventing water penetration, and maintaining proper drainage so that water or organic matter does not stand on flat surfaces, or accumulate in decorative features.	Failing to identify, evaluate and treat the causes of masonry deterioration. Applying water-repellent coatings to stop moisture penetration when the problem could be solved by repairing failed flashings, deteriorated mortar joints, or other mechanical defects.
4	Applying appropriate surface treatments, such as breathable coatings, to masonry elements as a last resort, only if masonry repairs, alternative design solutions or flashings have failed to stop water penetration, and if a maintenance program is established for the coating.	
5	Sealing or coating areas of <i>spalled</i> or blistered glaze on terra cotta units, using appropriate paints or sealants that are physically and visually compatible with the masonry units.	
6	Cleaning masonry, only when necessary, to remove heavy soiling or graffiti. The cleaning method should be as gentle as possible to obtain satisfactory results.	Over-cleaning masonry surfaces to create a new appearance, thus introducing chemicals or moisture into the materials. Blasting brick or stone surfaces, using dry or wet grit sand or other abrasives that permanently erode the surface of the material and accelerate deterioration. Using a cleaning method that involves water or liquid chemical solutions when there is a possibility of freezing temperatures. Cleaning with chemical products that damage masonry or mortar, such as using acid on limestone or marble. Failing to rinse off and neutralize appropriate chemicals on masonry surfaces after cleaning. Applying high-pressure water cleaning methods that damage the masonry and mortar joints and adjacent materials.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
7	Carrying out masonry cleaning tests after it has been determined that a specific cleaning method is appropriate.	Cleaning masonry surfaces without sufficient time to determine long-term effectiveness and impacts.
8	Inspecting painted masonry surfaces to determine whether paint can successfully be removed without damaging the masonry, or if repainting is necessary. Testing in an inconspicuous area may be required.	
9	Removing damaged or deteriorated paint only to the next sound layer, using the gentlest method possible; for example, hand scraping before repainting.	Removing paint that is firmly adhering to masonry surfaces. Using methods of removing paint that are destructive to masonry, such as sandblasting, application of caustic solutions, or high-pressure water blasting.
10	Re-applying compatible paint or coatings, if necessary, that are physically compatible with the previous surface treatments and visually compatible with the surface to which they are applied.	Applying paint, coatings or stucco to masonry that has been historically unpainted or uncoated. Removing paint from historically painted masonry, unless it is damaging the underlying masonry. Removing stucco from masonry that was historically never exposed.
11	Retaining sound and repairable masonry that contributes to the heritage value of the historic place.	Replacing or rebuilding masonry that can be repaired.
12	Stabilizing deteriorated masonry by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	
13	Repairing masonry by repointing the mortar joints where there is evidence of deterioration, such as disintegrating or cracked mortar, loose bricks, or damp walls.	Removing sound mortar.
14	Removing deteriorated or inappropriate mortar by carefully raking the joints, using hand tools or appropriate mechanical means to avoid damaging the masonry.	Using rotary grinders or electric saws to fully remove mortar from joints before repointing. In some instances it may be acceptable to make a single pass with a cutting disk to release tension in the mortar before raking the joint. Extreme caution must be used to prevent accidental damage.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
15	Using mortars that ensure the long-term preservation of the masonry assembly, and are compatible in strength, porosity, absorption and vapour permeability with the existing masonry units; pointing mortars should be weaker than the masonry units; bedding mortars should meet structural requirements; and the joint profile should be visually compatible with the masonry in colour, texture and width.	Repointing with mortar of a higher Portland cement content than in the original mortar. This can create a bond stronger than the historic material (brick or stone) and cause damage as a result of the differing expansion coefficients and porosity of the materials. Repointing with a synthetic caulking compound. Using a 'scrub' coating technique to repoint instead of using traditional repointing methods.
16	Duplicating original mortar joints in colour, texture, width and joint profile.	
17	Replacing in kind extensively deteriorated or missing parts of masonry elements, based on documentary and physical evidence	Using a substitute material for the replacement part that neither conveys the same appearance as the masonry element, nor is physically or chemically compatible.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
18	Repairing masonry by patching, piecing-in or consolidating, using recognized conservation methods. Repair might include the limited replacement in kind, or replacement with a compatible substitute material, of extensively deteriorated or missing masonry units, where there are surviving prototypes. Repairs might also include dismantling and rebuilding a masonry wall or structure, if an evaluation of its overall condition determines that more than limited repair or replacement in kind is required.	
19	Replacing in kind an irreparable masonry element, based on documentary and physical evidence.	Removing an irreparable masonry element and not replacing it, or replacing it with an inappropriate new element.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

20	Removing hazardous materials from masonry, using the least-invasive abatement methods, and only after adequate testing has been conducted.	
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SUSTAINABILITY CONSIDERATIONS

21	Selecting replacement materials from sustainable sources, where possible. For example, replacing deteriorated stone units using in-kind stone recovered from a building demolition.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
22	<p>Repairing, stabilizing and securing masonry elements from the restoration period, using recognized conservation methods. Repairs should be physically and visually compatible and identifiable on close inspection for future research.</p>	<p>Removing masonry elements from the restoration period that could be stabilized and conserved.</p> <p>Replacing an entire masonry element from the restoration period, when repair and limited replacement of deteriorated or missing parts is possible.</p> <p>Using a substitute material for the replacement that neither conveys the same appearance as the surviving masonry, nor is physically or chemically compatible.</p>
23	<p>Replacing in kind a masonry element from the restoration period that is too deteriorated to repair, based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.</p>	<p>Removing an irreparable masonry element from the restoration and not replacing it, or replacing it with an inappropriate new element.</p>

4.5.4 CONCRETE

These guidelines provide direction when concrete is identified as a character-defining element of an historic place. They also give direction on maintaining, repairing and replacing concrete elements.



Cape Race Lighthouse, on the southernmost tip of the Avalon Peninsula in Newfoundland and Labrador, is Canada's most prominent landfall marker. Built in 1906–1907, Cape Race was the first Canadian lighthouse to be constructed in reinforced concrete and probably the second lighthouse constructed in reinforced concrete in the world.

Early uses of concrete were typically utilitarian and formed part of structures that were hidden from view. The earliest concrete was massive, un-reinforced, cast-in-place construction containing variable aggregates that were obtained from local sources. Beginning in the early 1900s, the use of concrete as an aesthetic material became more common and was fully embraced by the middle of the 20th century. Reinforced concrete began appearing in the early 1900s, introducing more efficient designs of concrete members and structures. This, in turn, allowed for increased spans and the creation of architectural features, such as sculptural staircases and organic roof forms. Pre-cast concrete, where the members are fabricated off-site and brought to the site for erection, was first used in the 1930s. This coincided with the increased use of concrete as an exposed architectural, decorative and functional element, such as paving tiles and exterior wall cladding.



Special formwork or chemical or mechanical treatments can create a wide variety of concrete finishes, such as these pre-cast panels with exposed Laurentian granite aggregate at the National Arts Centre in Ottawa. Recreating these finishes when repairing or replacing-in-kind should be preceded by a mock up to ensure that the new work will be compatible with the historic place.

Architectural uses for concrete include exterior cladding, flooring and paving. The aesthetic qualities of concrete can include the texture created by formwork, such as smooth or board formed, and the colour and finish, such as exposed aggregate or terrazzo.

Finding recognized conservation techniques for concrete can be a challenge because these are part of a relatively new area of conservation. Some repair techniques may not have been thoroughly tested. A significant industry exists in Canada for repairing recent concrete structures; however, commonly used repair techniques and materials are usually not suited to historic concrete. The monolithic nature of concrete complicates its repair. High-quality workmanship and compatible materials are necessary in any repair to reduce the abrupt altering of the properties of the matrix, which could lead to shrinkage cracking.

These guidelines provide general recommendations for concrete and should be used in conjunction with 4.5.1, All Materials. Because concrete can also form part of the structure or cladding of a building or engineering work, also refer to Structural Systems or Exterior Walls in the Guidelines for Buildings.



Deterioration of concrete is a significant conservation issue, particularly in the Canadian climate. Deterioration typically results from environmental factors, such as moisture, temperature and the presence of salts and carbon dioxide, which can corrode the steel reinforcements. Durability factors related to the original materials and workmanship, and improper maintenance, can also significantly affect concrete.



Important properties to match when patching concrete can include the modulus of elasticity, cement to aggregate ratio, aggregate gradation, compressive and shear strength, and coefficient of thermal expansion. In this case the coarse aggregate in the repair patch does not match that of the original concrete.



In the early 20th century, concrete was still an experimental material. The early designers and fabricators did not have full knowledge about the properties and characteristics of the concrete or its performance in the Canadian environment. Early examples of concrete construction often have inherent problems, are in poor condition and can require considerable conservation work.



The skills and expertise to repair or replace sections of cracked and chipped terrazzo flooring are still available. These specialised skills should be sought out when repairs are needed. The colourful, decorative and functional finish of this crest in the floor at the Royal Canadian Legion Branch N° 1 in Regina is an important character-defining feature of the building.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of the concrete of the historic place.	
2	Documenting the form, composition, strength, colour, texture, details and condition of the concrete before undertaking an intervention. For example, identifying the particular characteristics and source of the type of aggregate used.	Undertaking an intervention that affects concrete, without first documenting its existing character and condition.
3	Protecting and maintaining concrete by preventing moisture penetration; maintaining proper drainage; improving water shedding; and by preventing damage due to the overuse of ice-clearing chemicals.	Failing to identify, evaluate and treat the various causes of concrete deterioration. Applying water-repellent coatings to above-grade concrete to stop moisture penetration, when the problem could be solved by repairing failed flashings or other mechanical defects.
4	Cleaning concrete, only when necessary, to remove heavy soiling or graffiti. The cleaning method should be as gentle as possible to obtain satisfactory results.	Over-cleaning concrete surfaces to create a new appearance, thus introducing chemicals or moisture into the concrete. Using a cleaning method that involves water or liquid chemical solutions when there is a possibility of freezing temperatures. Cleaning with chemical products that damage the concrete. Failing to rinse off and neutralize appropriate chemicals on concrete surfaces after cleaning. Blasting the concrete with abrasives that permanently erode the surface and damage soft or delicate materials adjacent to it. Applying coatings or paint over the concrete to present a uniform appearance.
5	Testing cleaning methods in inconspicuous areas before cleaning the entire concrete surface, and observing the results of the cleaning tests over a sufficient period of time to determine their immediate and long-term effect.	
6	Inspecting painted concrete surfaces to determine whether repainting is necessary.	
7	Removing damaged or peeling paint, using the gentlest method possible before repainting.	Removing paint that is firmly adhered to concrete.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
8	Reapplying compatible paint or coatings, if necessary, that are physically and chemically compatible with the previous surface treatment, and visually compatible with the surface to which they are applied.	Removing paint from historically painted concrete unless it is damaging the underlying concrete. Removing stucco or cement parging from concrete that was historically never exposed.
9	Selecting an appropriate approach to corrosion protection to minimize damage to the concrete, including regular inspection and maintenance.	Introducing a corrosion protection system for the concrete, without verifying the effectiveness or the level of benefit achieved by the work, or without taking appropriate steps to address the cause of the corrosion.
10	Retaining sound and repairable concrete elements that contribute to the heritage value of the historic place.	Removing deteriorated concrete that could be stabilized or repaired.
11	Stabilizing deteriorated concrete elements by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	
12	Repairing deteriorated concrete by patching or consolidating, using appropriate conservation methods.	Repairing concrete without treating the cause of deterioration. Replacing an entire concrete element when selective repair or replacement is possible. Using coatings or finishes to cover and hide surface repairs.
13	Minimizing damage to early concrete by limiting the size of the chipping equipment to better control the degree of removal, remembering that the compressive strength of early concrete may be much lower than modern concrete.	
14	Cleaning concrete before repair to remove contaminants, dirt and soil, so that the new concrete patches match the cleaned surface.	
15	Sealing inactive cracks in concrete by pointing with a cementitious mortar, or injecting epoxies to prevent moisture from entering the concrete mass.	Sealing active cracks with hard mortars or other hard materials that could prevent seasonal movements. Repairing cracks in concrete elements, without first determining the cause or significance of the crack.
16	Replacing in kind extensively deteriorated or missing parts of concrete elements, based on documentary and physical evidence.	Using replacement material that is incompatible with adjacent concrete work Recreating formwork finishes, such as form lines, wood grain, or knots, using grinders or trowels.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
17	Repairing and reinforcing deteriorated concrete by encasing it in a jacket of new concrete, using appropriate conservation methods.	Failing to maintain the proportions or form of deteriorated concrete elements, when repairing by jacketing with new concrete.
18	Replacing in kind an irreparable concrete element, based on documentary and physical evidence.	Removing an irreparable concrete element and not replacing it, or replacing it with an inappropriate new element.
19	Applying appropriate surface treatments, such as breathable coatings, to concrete as a last resort, only if repairs, alternative design solutions, or flashings have failed to stop water penetration, and if a maintenance program is established for the coating.	Applying coatings to concrete instead of correcting the problem that caused the damage.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

20	Removing hazardous materials from concrete by using the least-invasive abatement methods and only after thorough testing has been conducted.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
21	Repairing deteriorated concrete from the restoration period by patching or consolidating, using recognized conservation methods. Repairs should be physically and visually compatible and identifiable on close inspection for future research.	<p>Removing concrete from the restoration period that could be stabilized and conserved.</p> <p>Replacing an entire concrete element from the restoration period when repair and limited replacement of deteriorated or missing parts is possible.</p> <p>Using a substitute material for replacement that neither conveys the same appearance as the surviving concrete, nor is physically or chemically compatible.</p>
22	Replacing in kind a concrete element from the restoration period that is too deteriorated to repair, based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable concrete element from the restoration period and not replacing it, or replacing it with an inappropriate new element.

4.5.5 ARCHITECTURAL AND STRUCTURAL METALS

These guidelines provide direction when architectural or structural metals are identified as character-defining elements of an historic place. They also give direction on maintaining, repairing and replacing metal elements.

Structural metals typically include steel or iron columns, beams, trusses, or frames. Architectural metals encompass all other metal elements, which include a wide variety of architectural elements, such as sculpture, roofing, flashings, cladding, cresting, windows, doors, curtain-wall mullions and spandrel panels, railings and banisters, stairs, bathroom fixtures and partitions, hardware, gates, fences, and sign posts.

The metals used in the construction of historic places throughout Canadian history include, but are not limited to, iron (cast and wrought), steel, stainless steel, galvanized steel, tin, copper and copper alloys, zinc, aluminum, lead, nickel and bronze.

The long-term performance of metal components depends on their physical and chemical properties, the environment they are exposed to, design details, and their proximity to other metallic and non-metallic components. Typical forms of metal deterioration include corrosion, erosion, abrasion, deformation, cracking and fatigue, and flaws due to original design, manufacture or assembly.



Some metal elements of a historic place may originally have been finished with a protective coating under shop conditions that are difficult to reproduce on site when repairs are required. In this case, the character-defining black anodized aluminium mullions and spandrel panels have deteriorated due to decades of exposure to sunlight. The approach to repair should be based on the analysis of all repair options, thorough testing of the chosen techniques, and careful protection of the curtain wall from further damage during all interventions.



The first step in preserving architectural metals is to identify the type of metal. Before cleaning, determine that the method is appropriate for the particular metal: removing the patina from these bronze doors would not be appropriate if the patina is a character-defining finish of the metal, or if it provides a protective coating. Testing is recommended to ensure that the gentlest cleaning method possible is used.

Generally, metal components tend to be durable, but components that are not suited to a particular location or function, or not receiving adequate maintenance, may become fragile. To correct damage to a metal component, the cause of its deterioration must be understood and the type of metal correctly identified. If the metal's properties are not understood, inappropriate treatment may cause an adverse reaction and further deterioration. Some metals, such as wrought iron, cast iron and steel, are easy to recognize, but alloys can be challenging to identify. Accurately identifying an alloy may require help from a metals conservator or conservation professional.

These guidelines provide general recommendations for architectural and structural metals, and should be used in conjunction with 4.5.1, All Materials. For structural metals, also refer to Structural Systems in the Guidelines for Buildings.



Under certain circumstances, substitute materials may be appropriate. As part of a Rehabilitation project, new finials were designed based on original remains. The originals were fabricated of wafer-thin galvanized metal soldered together. The substitute material used in the new design was plate aluminum.



Most historic lighthouses have faced accelerated deterioration due to changes in how they operate; in addition, wet, salty coastal environments are challenging conditions in which to conserve metals. The heat produced by the original light source once helped keep the lantern dry, as did roof top ventilators and gutter systems. Electric lights and the lack of regular on-site personnel to maintain and operate these features have necessitated a pro-active conservation approach and likely the involvement of metal conservators.



The two remaining decorative sheet metal urns at the top of the façade of the M & J Hardware Building in Lacombe, AB were determined to be beyond repair due to weathering over time. A third sheet metal urn (centre) was missing. The existing deteriorated elements and photographic documentation were used to replicate these elements. The M & J Hardware Building is an example where missing features from the restoration period have been re-instated based on physical and documentary evidence.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of metals and their finishes or coatings.	
2	Documenting the form, composition, and condition of metals, before undertaking an intervention.	Undertaking an intervention that affects metals without first documenting their characteristics and condition.
3	Protecting and maintaining metals from corrosion by preventing water penetration and maintaining proper drainage, so that water or organic matter does not stand on flat surfaces or accumulate in decorative features.	Failing to identify, evaluate and treat the causes of corrosion.
4	Ensuring that incompatible metals are not in contact with each other by installing an appropriate separator to prevent galvanic corrosion.	
5	Identifying the type of metal and the most appropriate cleaning method, and testing it in an inconspicuous area to ensure an appropriate level of cleanliness.	Over-cleaning metal elements. Using cleaning methods that alter or damage the character-defining colour, texture and finish of the metal.
6	Determining the appropriate level of patina before cleaning, and ensuring that this level is maintained for the entire element.	Removing the character-defining patina of a metal element.
7	Cleaning painted metals using appropriate techniques and products to remove corrosion and layers of paint, if required, before repainting.	Exposing metals intended to be protected from the environment. Applying paint or other coatings to metals that were meant to be exposed.
8	Cleaning soft metals, such as lead, tin, copper, aluminum, brass, silver, bronze and zinc, with appropriate non-abrasive methods.	Using abrasives on soft metals.
9	Using the gentlest cleaning methods for hard metals, such as cast iron, wrought iron and steel, to remove excessive paint build-up and corrosion.	
10	Applying an appropriate protective coating to an unpainted metal element that is subject to frequent use and handling, such as a bronze door or brass hardware, or to corrosion due to environmental factors, such as abrasives in winter. The coating should be regularly reapplied, as required, to ensure ongoing protection.	

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
11	Re-applying appropriate paint or coating systems after cleaning to decrease the corrosion rate of painted or coated metals.	
12	Retaining all sound and repairable metals that contribute to the heritage value of the historic place.	Replacing metals that can be repaired.
13	Stabilizing deteriorated metals by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated metals that could be stabilized or repaired.
14	Repairing parts of metal elements by welding, soldering, patching, or splicing, using recognized conservation methods.	Replacing an entire metal element, when repair and limited replacement of deteriorated or missing parts is possible.
15	Replacing in kind, extensively deteriorated or missing parts of metal elements, based on physical and documentary evidence.	Replacing an entire metal element, when limited replacement of deteriorated and missing parts is appropriate. Using a substitute material that neither conveys the appearance of the surviving parts of the metal element, nor is physically or chemically compatible.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
16	Repairing metal elements by welding, soldering, patching, or splicing, using recognized conservation methods. Repair may also include the limited replacement in kind, or replacement with a compatible substitute material, of extensively deteriorated or missing metal elements, where there are surviving prototypes.	
17	Reinforcing metal elements, following recognized conservation methods to improve their strength. Reinforcement should be physically and visually compatible.	Replacing an entire metal element when reinforcement is feasible.
18	Replacing in kind an irreparable metal element, based on documentary and physical evidence.	Removing an irreparable metal element and not replacing it, or replacing it with an inappropriate new element.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

19	Removing hazardous materials from metals using the least-invasive abatement methods and only after adequate testing has been conducted.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
20	Repairing , stabilizing and conserving fragile metal elements from the restoration period, using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable on close inspection for future research.	Removing metal elements from the restoration period that could be stabilized and conserved.
21	Replacing in kind a metal element from the restoration period that is too deteriorated to repair, based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable metal element from the restoration period and not replacing it, or replacing it with an inappropriate new element.

4.5.6 GLASS AND GLASS PRODUCTS

These guidelines provide direction when glass and glass products are identified as character-defining elements of an historic place. They also give direction on maintaining, repairing and replacing glass elements.

Glass and glass products refer to the glass used in exterior and interior windows, doors and storefronts, built-in cabinetry and floors, and the glazing used in curtain walls, mirrors, floors, skylights and conservatories.



Historic glass has certain characteristics that cannot be matched by modern production techniques. Coloured, patterned or curved glass can be expensive or impossible to replace. Careful recording and regular monitoring of conditions are the most effective ways to conserve historic glass. If repairs are required, an experienced stained-glass conservator can assess and recommend appropriate repair techniques.

Stained glass panels are susceptible to distortion over time, which may cause the glass to crack. Interventions to reinforce panels or protect windows with a second sash should be overseen by a conservator specializing in stained glass. The placement and method of installation of such work must be carefully designed to ensure that this does not cause further deterioration.

Glass elements can be considered character-defining due to their aesthetic or functional characteristics, including translucency or opacity, colour, texture, reflectivity or treatment. Glass varies in size and form, from tiny mosaic pieces to large flat sheets, or curved panes for corner windows. Glass elements may also be valued as artifacts from specific periods in the development of glass technologies, such as prismatic glass associated with the strategies to improve daylight in commercial spaces. Stained glass has been widely used in Canadian churches, colleges and public buildings, and to some extent in houses, in a range of aesthetic expressions. Conserving glass, particularly stained glass, requires specialists who may involve art conservators.



The type of glass and its division into multiple lights often defines the character of windows in historic buildings. The reflective quality of double-glazing from double sashes or storm windows is different than that of modern insulated glass. Inspections should be undertaken regularly to ensure that glazing putty is in good condition.



The character-defining transparency of the glass-enclosed factory wings of the National Printing Bureau in Gatineau, QC was preserved during conservation work on the glass and aluminium curtain walls. After the thin aluminium frames were cleaned, the opaque ribbed glass and clear plate glass were carefully reset in their original positions that reflect the pattern of solids and voids in the masonry wall behind.

In the 20th century, a number of glass products were developed in response to curtain wall technology and other modern architectural forms. These products include *spandrel glass*, laminated glass, coloured glass panels or structural glass, and glass block, as well as thermally-insulated double- or triple-pane glazing units that are the norm today.

Interventions to improve building envelope performance should focus on improving the efficiency of the entire wall assembly, rather than focusing on replacing glass or glass products such as windows. Double glazing changes the reflectivity and colour of the glass, and often requires changes to the framing or wall system supporting it.



Glass block has been manufactured in many different shapes, sizes, patterns and opacities. All these features should be considered when seeking a replacement block. Searching architectural salvage yards and contacting manufacturers may locate compatible replacements.

These guidelines provide general recommendations for glass and glass products and should be used in conjunction with 4.5.1, All Materials. Because these materials are usually part of an assembly, their conservation must be closely coordinated with the related framing and structural elements and surrounding materials such as wood, metals or masonry. For recommendations on these assemblies, refer to Windows, Doors and Storefronts and Exterior Walls in the Guidelines for Buildings and to other appropriate sections in the Guidelines for Materials.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of glass and glass products, such as age and thickness, and the composition of any applied coatings.	Undertaking work that affects glass and glass products without first understanding their mechanical and chemical properties.
2	Documenting the composition, colour, texture, reflectivity, treatment and condition of glass and glass products before undertaking an intervention.	Undertaking an intervention that will affect glass and glass products without first documenting their existing characteristics and condition.
3	Identifying all of the different types of glass and glass products used and their unique properties.	
4	Assessing and treating the causes of glass damage, breakage, or deterioration of its frame or structure.	Failing to consider the impact and condition of surrounding frames or structural elements, before identifying the level of conservation work required.
5	Protecting glass from breakage, chipping and abrasion caused by ongoing maintenance.	
6	Assessing the impact of previous maintenance practices on glass and adjacent materials.	Failing to replace deteriorated sealants at glass joints to prevent moisture penetration. Failing to clean glass surfaces to prevent the accumulation of corrosive grease or dirt.
7	Identifying the type of glass and the most appropriate cleaning method, and testing it in an inconspicuous area to ensure an appropriate level of cleanliness.	Using cleaning methods that alter or damage the colour, texture or finish of the glass elements.
8	Retaining sound or deteriorated glass elements that can be repaired.	Removing or radically changing glass elements that contribute to the heritage value of the historic place.
9	Securing and protecting deteriorated glass by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated glass elements that could be stabilized or repaired. Adding protective glazing or exterior storms to stained glass elements, without the involvement of a specialist conservator.
10	Repairing parts of glass elements by patching, piecing-in, or otherwise reinforcing, using recognized conservation methods.	Using a substitute material for the replacement part that neither conveys the same appearance as the surviving parts of the glass element, nor is physically or chemically compatible.
11	Replacing in kind irreparable or missing glass, based on documentary and physical evidence.	Replacing an entire glass element when repair and limited replacement of deteriorated and missing parts is possible.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
12	Repairing a glass element using recognized conservation methods. Repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of extensively deteriorated or missing glass elements, where there are surviving prototypes.	Using an inappropriate substitute material. Failing to repair the deteriorated frame or structure around the glass element.
13	Replacing in kind an irreparable glass element based on documentary and physical evidence.	Removing an irreparable glass element and not replacing it, or replacing it with an inappropriate new glass element.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

14	Removing hazardous materials from glass, such as lead paint, by using the least-invasive abatement methods, and only after adequate testing has been conducted.	
15	Monitoring , stabilizing and repairing glazing systems used in character-defining curtain walls, skylights and atriums, to ensure that any loose or cracked pieces are detected to prevent further deterioration.	Applying security film that cannot be removed at a later date.

SUSTAINABILITY CONSIDERATIONS

16	Retaining and carefully storing historic glass elements and making them available for reuse.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
17	Repairing , securing and conserving fragile glass from the restoration period using appropriate methods and materials. Repairs should be physically and visually compatible and identifiable on close inspection for future research.	Removing glass from the restoration period that could be stabilized and conserved.
18	Replacing in kind a glass element from the restoration period that is too deteriorated to repair, based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing an irreparable glass element from the restoration period and not replacing it, or replacing it with an inappropriate new element.

4.5.7 PLASTER AND STUCCO

These guidelines provide direction when plaster or stucco is identified as a character-defining element of an historic place. They also give direction on maintaining, repairing, and replacing plaster and stucco and their coatings.

Plaster and stucco are finishing or surface materials made by applying a lime, gypsum or cement-based coating to a supporting lath or substrate. Plaster is an interior finishing material, while stucco is usually an exterior material. The supporting substrate, which may be lath, masonry or wood frame, is an integral component of the assembly that requires as much careful consideration as the plaster and stucco itself.



Before repairing or patching historic plaster or stucco, such as on the Commanding Officer's Residence at Fort Battleford NHSC in Saskatchewan, it is important to determine the composition of the material. Patches and repairs should be both visually and physically compatible with the existing historic material. Materials with different physical characteristics will likely not properly adhere to one another, necessitating repeated maintenance in the near future.



Certain stucco treatments, such as pebble-dash stucco, are difficult to replicate. Applying glass or rocky aggregate to the wet stucco is an art that is all but lost. Pebbles imported from Scotland for the Dr. Woods House in Leduc, AB are virtually impossible to replicate. The repairs resulted in a sound exterior envelope, but are clearly distinguishable from the original.

In the 20th century, technologies for applying plaster and stucco evolved to include new types of supports and finishes. These finishes could be character-defining, such as specific finishes applied to concrete, or specialty treatments, such as pebble-dash stucco.

As these materials continued to evolve, synthetic versions were developed. These synthetic stucco and plaster materials have different characteristics and should be avoided when repairing traditional stucco or plaster.

These guidelines provide general recommendations for plaster and stucco, and should be used in conjunction with 4.5.1, All Materials. Because these materials are usually part of an architectural assembly, their conservation must be closely coordinated with the assemblies and elements that support these materials, such as exterior walls, interior partitions, ceilings and columns. For recommendation on these assemblies, refer to Exterior Walls and to Interior Features in the Guidelines for Buildings.



The repair of a deteriorated intricate plaster cornice should involve recognized conservation techniques, such as consolidation of the original materials in good condition. One goal should be to limit the amount of introduced material. Surface repairs may be filled with a compatible traditional plaster mix, but for larger elements, some form of adhesive or fastener may be required, and should be carefully selected.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of the plaster or stucco of the historic place.	Undertaking work that affects plaster or stucco without understanding its mechanical and chemical properties.
2	Documenting the properties, characteristics and condition of the plaster or stucco before undertaking an intervention; for example, the chemical composition of the material and the type of substrate to which it is applied.	Undertaking an intervention that affects plaster or stucco, without first documenting its existing characteristics and condition.
3	Protecting and maintaining plaster and stucco from damage by preventing moisture penetration, accumulation of organic matter, and structural movement.	
4	Applying an appropriate coating or paint system. The selection of the system should be based on its compatibility with previous layers of character-defining paint, colour, finish and texture.	Using coatings of inappropriate colour, finish or texture that will have a negative impact on the heritage value of the historic place.
5	Removing layers of paint from plaster details to make them legible, using recognized conservation methods.	Using paint removal methods and materials that damage plaster details. Failing to test paint removal methods in an inconspicuous location before beginning the work.
6	Retaining sound or deteriorated plaster and stucco that can be repaired.	Removing or radically changing plaster or stucco that contributes to the heritage value of the historic place.
7	Securing and protecting deteriorated plaster and stucco by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated plaster or stucco that could be stabilized or repaired.
8	Repairing plaster or stucco by patching, piecing-in, consolidating, or otherwise reinforcing, using recognized conservation methods.	Using a substitute material that neither conveys the same appearance as the surviving parts of the plaster or stucco, nor is physically or chemically compatible.
9	Replacing in kind irreparable or missing parts of plaster or stucco elements, based on documentary and physical evidence.	Replacing an entire plaster or stucco element when repair and limited replacement of deteriorated or missing parts is possible.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
10	Repairing plaster or stucco following recognized conservation methods. Such repairs might include the limited replacement in kind, or replacement with an appropriate substitute material, of extensively deteriorated or missing plaster or stucco, where there are surviving prototypes.	
11	Repairing plaster or stucco by removing the damaged material and patching with new stucco or plaster that duplicates the old in strength, composition, colour, porosity, and texture.	Removing sound plaster and stucco, or repairing with new material that does not match the old in strength, composition, colour, porosity and texture.
12	Replacing in kind an irreparable plaster or stucco element, based on documentary and physical evidence.	Removing an irreparable plaster or stucco element and not replacing it, or replacing it with an inappropriate new element or material.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

13	Removing or encapsulating hazardous materials contained in plaster or stucco, such as asbestos, by using the least-invasive abatement methods, and only after adequate testing has been conducted.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
14	Repairing , securing and retaining plaster and stucco from the restoration period, using appropriate methods and materials. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.	Removing plaster or stucco from the restoration period that could be stabilized and conserved.
15	Replacing in kind, plaster or stucco from the restoration period that is too deteriorated to repair, based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing irreparable plaster or stucco from the restoration period and not replacing it, or replacing it with inappropriate new material.

4.5.8 MISCELLANEOUS MATERIALS

These guidelines provide direction when a material, other than those specified above, is identified as a character-defining element of an historic place. This section includes recent materials produced by a fabrication process and interior and exterior materials that are not clearly categorized. Due to the range of materials these guidelines apply to, general guidance is given to help with maintaining, repairing, and replacing miscellaneous materials.

These diverse materials may be character-defining in their own right, or used in character-defining assemblies or systems. Materials, such as plastic, plexiglass, asbestos, asphalt, rubber, thatch, sod and fiberglass, have served a multitude of uses in construction. Flooring surfaces, including cork, linoleum, carpet or ceramic tile, and decorative or functional treatments, such as fabrics, wall coverings and acoustical panels, may also be character-defining. Modern materials, such as plastic have been used as lighter, less breakable alternatives to glass, metal or wood in exterior cladding, interior partitions, canopies, screens and signage.



Plastic and fiberglass can be moulded into a variety of shapes to create decorative, colourful wall panels. These green moulded panels are unique and difficult to replicate if damaged. Removing intact panels from a less visible part of the building to replace broken panels in a more prominent area is one possible strategy.



Mass-produced elements, such as ceramic tiles, are frequently used in buildings. Finding matching replacements for repair work can be almost impossible. If tile needs to be removed from one area, it is good conservation practice to save and stockpile it for later use elsewhere in the building. These tiles from the washrooms in Union Station in Toronto were removed from one set of washrooms in order to provide a stockpile of tiles to use in the repair of the remainder of the washrooms.

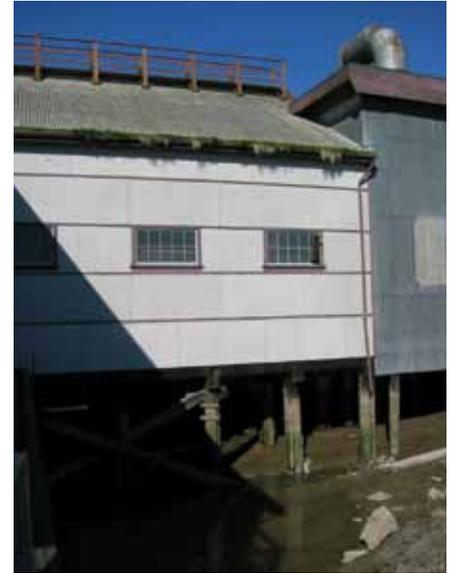
Some miscellaneous materials are not expected to last indefinitely, such as carpeting or a fabric awning. Others may be difficult to clean or maintain when they age, such as plastics that can become brittle or discoloured, or experimental materials that have not stood the test of time. Some materials manufactured in factories using specialized techniques and processes are more difficult to repair than traditional materials, and almost impossible to replace, if the original manufacturing process has been discontinued. Other natural and synthetic materials historically used in construction have since been found to be toxic and can pose health risks. A material's properties, characteristics and contribution to the heritage value of the historic place must be fully understood before undertaking an intervention.

Information on the repair and maintenance of rare materials may be difficult to find. Even seemingly simple cleaning instructions may no longer be available. Research and testing may be the only way to understand the material.

These guidelines provide general recommendations for materials not covered in sections 4.5.2 to 4.5.7 above, and should be used in conjunction with 4.5.1, All Materials.



Fabric awnings are subject to damaging environmental effects including sunlight, wind and water, which eventually may cause the loss of the historic awning fabric. Repairing the original frame or mechanism and installing new awning fabric are recommended and will also help provide shade. Awning manufacturers may be able to match or provide similar fabrics compatible with the character of the place, as was done at Laurier House in Ottawa.



Asbestos is an extremely durable material that is often found in excellent condition. Although loose asbestos fibres pose health risks, tightly bound asbestos found in extant siding or tile, such as at the Gulf of Georgia Cannery NHSC in Steveston, BC are not hazardous and should be retained where they contribute to the heritage character of the place. Broken or missing siding would need to be replaced with another material that matches its appearance as asbestos products are no longer manufactured.



Sod was a simple, inexpensive and accessible roofing material used widely throughout the North and shown here at Knut Lang's place in the Northwest Territories. It is both waterproof and insulating and would last for decades before needing to be replaced. Frequently, when it began to fail, canvas was used as a temporary cover until a new sod layer could be applied.

GENERAL GUIDELINES FOR PRESERVATION, REHABILITATION AND RESTORATION

	Recommended	Not Recommended
1	Understanding the properties and characteristics of miscellaneous materials and their finishes or coatings, such as the age and availability of replacements and the chemical make-up of the product.	
2	Documenting the properties, characteristics and condition of miscellaneous materials before undertaking an intervention; for example, the chemical composition of the material and the type of substrate to which it is applied.	Undertaking an intervention that affects miscellaneous materials, without first documenting their characteristics and condition.
3	Protecting and maintaining miscellaneous materials by protecting fragile elements and preventing exposure to damaging environmental conditions.	Failing to identify, evaluate and treat the causes of deterioration of miscellaneous materials, such as exposure to ultraviolet light, airborne pollution, and excessive moisture.
4	Cleaning miscellaneous materials using appropriate cleaning methods and products.	
5	Retaining or reapplying coatings that help protect miscellaneous materials from wear, moisture or ultraviolet light.	Removing appropriate coatings that protect surfaces. Ignoring the manufacturer's product information and application instructions when reapplying protective coatings.
6	Ensuring that new coatings are compatible with the material, its earlier treatments and its environment.	
7	Retaining sound and repairable miscellaneous materials that contribute to the heritage value of the historic place.	Replacing miscellaneous materials that can be repaired.
8	Stabilizing deteriorated miscellaneous materials by structural reinforcement and weather protection, or correcting unsafe conditions, as required, until repair work is undertaken.	Removing deteriorated miscellaneous materials that could be stabilized or repaired.
9	Repairing miscellaneous materials by patching, piecing-in, consolidating, or otherwise reinforcing, using recognized conservation methods.	Replacing an entire element when repair and limited replacement of deteriorated or missing parts are appropriate.
10	Replacing in kind extensively deteriorated or missing parts of miscellaneous materials, based on documentary and physical evidence.	Replacing an entire element when limited replacement of deteriorated and missing parts is possible.

ADDITIONAL GUIDELINES FOR REHABILITATION PROJECTS

	Recommended	Not Recommended
11	Repairing miscellaneous materials by patching, piecing-in, consolidating, or otherwise reinforcing the material. Repair might include the limited replacement in kind, or replacement with an appropriate substitute material, of extensively deteriorated or missing materials, where there are surviving prototypes.	Replacing an entire material, when repair and limited replacement of deteriorated or missing parts is possible. Using a substitute material for replacement that neither conveys the same appearance, nor is physically or chemically incompatible with adjacent materials.
12	Testing repair methods before undertaking work when there are no established conservation methods.	
13	Replacing in kind irreparable miscellaneous materials, based on physical and documentary evidence. If using the same material is not technically or economically feasible, a compatible substitute material may be considered.	Removing miscellaneous materials and not replacing them, or replacing them with an inappropriate new material that does not convey the same appearance, or is physically or chemically incompatible with adjacent materials.

HEALTH, SAFETY AND SECURITY CONSIDERATIONS

14	Removing hazardous materials, using the least-invasive abatement methods, and only after adequate testing has been conducted.	Removing or destroying character-defining materials by neglecting to conduct testing first.
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SUSTAINABILITY CONSIDERATIONS

15	Salvaging character-defining miscellaneous materials that are no longer manufactured for reuse elsewhere in the building.	
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ADDITIONAL GUIDELINES FOR RESTORATION PROJECTS

	Recommended	Not Recommended
16	Repairing , stabilizing and conserving fragile miscellaneous materials from the restoration period, using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable on close inspection for future research.	Removing miscellaneous materials from the restoration period that could be stabilized and conserved.
17	Replacing in kind miscellaneous materials from the restoration period that are too deteriorated to repair based on documentary and physical evidence. The new work should be well documented and unobtrusively dated to guide future research and treatment.	Removing irreparable miscellaneous materials from the restoration period and not replacing them, or replacing them with inappropriate new materials.

REFERENCES

REFERENCES

GLOSSARY

Accessibility: (*accessibilité*) The degree to which an historic place is easy to access by as many people as possible, including people with disabilities.

Allée: (*allée*) A pathway or road between two rows of trees.

Ancillary structure: (*structure secondaire*) A structure, machine or component that plays a secondary or supporting role in the functions of a civil engineering, industrial or military work.

Archaeological object: (*objet archéologique*) An artifact, a sample or any material that is of archaeological interest.

Artisanal technology: (*technologie artisanale*) Technology that is based on tradition rather than the application of scientific knowledge.

Atrium: (*atrium*) An interior courtyard that is open to the weather; or a significant interior space, often skylighted.

Berm: (*talus*) A mound created to reduce noise, act as a screen, or protect a construction from flooding.

Bollard: (*bollard*) A thick post used for securing ropes or to limit access to an area.

Brise-soleil: (*brise-soleil*) A screen, usually louvered, placed on the outside of a building to shield windows from direct sunlight.

Canadian Register of Historic Places (CRHP): (*Répertoire canadien des lieux patrimoniaux*) The pan-Canadian list of historic places of local, provincial, territorial and national significance. The CRHP is administered by the Government of Canada, in collaboration with provincial and territorial governments.

Character-defining elements: (*éléments caractéristiques*) The materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of an historic place, which must be retained in order to preserve its heritage value.

Conservation: (*conservation*) All actions or processes that are aimed at safeguarding the character-defining elements of a cultural resource so as to retain its heritage value and extend its physical life. This may involve “Preservation,” “Rehabilitation,” “Restoration,” or a combination of these actions or processes.

Consolidant: (*consolidant*) Repair material that penetrates and strengthens a deteriorated element.

Cultural landscape: (*paysage culturel*) Any geographical area that has been modified, influenced, or given special cultural meaning by people.

- Designed cultural landscapes were intentionally created by human beings;
- Organically evolved cultural landscapes developed in response to social, economic, administrative or religious forces interacting with the natural environment. They fall into two sub-categories:
 - Relict landscapes in which an evolutionary process came to an end. Its significant distinguishing features are, however, still visible in material form.
 - Continuing landscapes in which the evolutionary process is still in progress. They exhibit significant material evidence of their evolution over time.
- Associative cultural landscapes are distinguished by the power of their spiritual, artistic or cultural associations, rather than their surviving material evidence.

Curtain wall: (*mur-rideau*) An exterior wall that is fastened to a frame and protects the building from the weather; it has no structural function, and supports only its own weight.

DEW line: (*ligne DEW*) The Distant Early Warning line was a system of radar stations in the far northern Arctic region of Canada. It was set up to detect potential invasions during the Cold War.

Dew point: (*point de rosée*) Temperature at which a parcel of air must be cooled in order to reach full saturation.

Diefenbunker: (*Diefenbunker*) A nuclear fallout shelter built secretly between 1959 and 1961 to protect Canadian government officials against a nuclear attack. Its name was inspired by Prime Minister John G. Diefenbaker who commissioned its construction. The Diefenbunker is a large underground complex containing offices, dormitories, radio transmitting facilities and decontamination chambers.

Empirical engineering: (*génie empirique*) Design or construction based on practical experience, observation, trial and error, or experimental data, rather than the application of scientific method, knowledge or theory.

Glacis: (*glacis*) A slope extending down from a fortification.

Herbaceous plants: (*plantes herbacées*) Plants with stems that are soft and not woody.

Heritage value: (*valeur patrimoniale*) The aesthetic, historic, scientific, cultural, social or spiritual importance or significance for past, present or future generations. The heritage value of an historic place is embodied in its character-defining materials, forms, location, spatial configurations, uses and cultural associations or meanings.

Historic place: (*lieu patrimonial*) A structure, building, group of buildings, district, landscape, archaeological site or other place in Canada that has been formally recognized for its heritage value.

Hoodmould: (*larmier*) A projecting molding over the head of an arch over a window or door opening, to throw off the rain.

In kind: (*à l'identique*) with the same form, material, and detailing as the existing.

Inspecting: (*inspecter*) Carrying out a survey or review of the condition of an historic place and its elements to determine if they are functioning properly; to identify signs of weakness, deterioration or hazardous conditions; and to identify necessary repairs. Inspections should be carried out on a regular basis as part of a maintenance plan.

In situ: (*sur place*) This term means 'in place' and as used in this document, it refers to the action of protecting, maintaining and/or stabilizing the existing materials in the location where they were found.

Interpretive Construct: (*éléments interprétatifs*) construction designed to support or present the interpretation of an archaeological site and its character-defining elements, and to help communicate its heritage value. Examples of interpretive constructs include plaques and panels.

Intervention: (*intervention*) Any action, other than demolition or destruction, that results in a physical change to an element of a historic place.

Intumescent paint: (*peinture intumescence*) A type of paint that when heated swells to form a fire-protective coating.

Inukshuk: (*inukshuk*) An Inuit stone cairn having the rough outline of a human figure.

Joist sistering: (*doublage des poutrelles*) Reinforcement or repair of joists by doubling.

Maintenance: (*entretien*) Routine, cyclical, non-destructive actions necessary to slow the deterioration of an historic place. It entails periodic inspection; routine, cyclical, non-destructive cleaning; minor repair and refinishing operations; replacement of damaged or deteriorated materials that are impractical to save.

Minimal intervention: (*intervention minimale*) The approach that allows functional goals to be met with the least physical intervention.

Mock-up: (*maquette*) A full-sized model of a structure or intervention used for demonstration, study or testing.

Monitoring: (*surveillance*) The systematic and regular inspection or measurement of the condition of the materials and elements of an historic place to determine their behavior, performance, and rate of deterioration over time.

Mothballing: (*mise sous cocon*) To temporarily close up a building or other structure to protect it from the weather as well as to secure it from vandalism.

Muntin: (*meneau*) A strip of wood or metal separating and holding panes of glass in a window or a vertical framing member set between two rails in a door.

Non-destructive testing: (*essai non-destructif*) Testing that does not result in the permanent deformation or damage of the element being tested.

Past performance: (*rendement antérieur*) The demonstration of a structure's ability to satisfactorily resist loads based on its history. Buildings and structures built in accordance with good building practices, prior to the development of building codes, may be considered to have proven their capacity to resist loads based on the fact that they have already been subjected to, and successfully resisted, these loads in the past.

Pergola: (*pergola*) An arbor or a passageway of columns supporting a roof of trelliswork on which climbing plants are trained to grow.

Piecing in: (*rapiéçage*) To repair or add to by inserting a piece.

Preservation: (*préservation*) The action or process of protecting, maintaining, and/or stabilizing the existing materials, form, and integrity of a historic place or of an individual component, while protecting its heritage value.

Prototype: (*prototype*) An original model on which something is patterned.

Rampart: (*rempart*) A wide bank of earth, usually with a parapet on top, built around a fort to help defend it.

Rehabilitation: (*réhabilitation*) The action or process of making possible a continuing or compatible contemporary use of a historic place or an individual component, while protecting its heritage value.

Repointing: (*rejointoiement*) To repair masonry joints with mortar.

Restoration: (*restauration*) The action or process of accurately revealing, recovering or representing the state of a historic place or of an individual component, as it appeared at a particular period in its history, while protecting its heritage value.

Spalled: (*effrité*) Breaking up of a masonry surface into chips or fragments.

Spandrel (panel): (*tympan/panneau d'allège*) Panel of wall between adjacent columns or pilasters; in multi-storey buildings, a panel between the top of one window and the sill of the window in the storey above.

Splicing: (*jointer*) To join two pieces by overlapping and binding at the ends.

Statement of Significance (SoS): (*énoncé d'importance*) A statement that identifies the description, heritage value, and character-defining elements of an historic place. A Statement of Significance is required in order for an historic place to be listed on the *Canadian Register of Historic Places*.

Statuary: (*statues*) A collection of statues

Stratigraphy: (*stratigraphie*) The composition and arrangement of geographic strata or layers of earth in a particular area.

Stressors: (*facteurs de stress*) Elements or events that could potentially disturb or put pressure on the archaeological site's character-defining elements and/or heritage value.

Sustainability: (*durabilité*) A group of objectives (economic, social and environmental) that must be coordinated and addressed to ensure the long term viability of communities and the planet.

Swale: (*baissière*) A low, usually wet piece of land.

Terrace: (*terrasse*) A flat level of land, often a component of a series of step-like flat levels on a slope.

Thermal bridge: (*pont thermique*) An element made of a material that is a poor heat insulator and that is placed in an assembly (between other materials, or between interior and exterior).

Truss: (*ferme*) A structural framework, made of either timber or metal, that is composed of individual members fastened together in a triangular arrangement.

Understorey: (*sous-étage*) Underlying layer of vegetation, especially the plants that grow beneath a forest's canopy.

Vernacular: (*vernaculaire*) Indigenous, made locally by inhabitants; made using local materials and traditional methods of construction and ornament; specific to a region or location.

Widow's walk: (*promenade des veuves ou plate-forme d'observation*) A railed platform atop a roof, typically on a coastal house, that was used to look out for returning ships.

Windbreak: (*brise-vent*) A row of trees or bushes planted to provide protection from the wind and, often, to prevent soil erosion.

BIBLIOGRAPHY

References included below include a representative range of publications and internet-based documents, and not an exhaustive bibliography. They are listed according to the content in the chapters, although many of the more general references may apply in more than one area. Current URLs (web links) are provided where appropriate, but these are subject to change.

Chapters 1–3: The Conservation Decision-Making Process; The Conservation Treatments: Preservation, Rehabilitation and Restoration; and The Standards for the Conservation of Historic Places in Canada

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Acronyms of Heritage Organizations (in alphabetical order)

APTI: Association for Preservation Technology International
www.apti.org/

AQPI : Association québécoise pour le patrimoine industriel
www.aqpi.qc.ca/actions.html

DOCOMOMO: international committee for documentation and conservation of buildings, sites and neighbourhoods of the modern movement
www.docomomo.com/

EH: English Heritage (UK)
www.english-heritage.org.uk/

FHBRO: Federal Heritage Buildings Review Office
www.pc.gc.ca/progs/beefp-fhbro/index_e.asp

HCF: Heritage Canada Foundation
www.heritagecanada.org/eng/main.html

HELM: Historic Environment Local Management (UK)
www.helm.org.uk/

ICOMOS: International Council on Monuments and Sites
www.icomos.org/

ICOMOS CANADA
<http://canada.icomos.org/home-E.html>

ISCARSAH: International Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage
<http://iscarsah.icomos.org/>

NPS: National Parks Service (USA)
www.nps.gov/index.htm

PCA: Parks Canada Agency
www.pc.gc.ca/eng/index.aspx

SIA: Society for Industrial Archaeology
www.siahq.org/

TICCIH: The International Committee for the Conservation of the Industrial Heritage
www.mnactec.cat/ticcih/

UNESCO - WHC: United Nations Educational, Scientific and Cultural Organization - World Heritage Centre
<http://whc.unesco.org/>

Provincial and Territorial Heritage Branches (November 2010)

Alberta, Culture and Community Spirit –
Historic Resources Management
<http://culture.alberta.ca/heritage/resourcemanagement/default.aspx>

British Columbia, Ministry of Tourism, Trade and
Investment – Heritage Branch
www.tca.gov.bc.ca/heritage/index.htm

Manitoba, Culture Heritage and Tourism –
Historic Resources Branch
www.gov.mb.ca/chc/hrb/index.html

New Brunswick, Wellness, Culture and Sport –
Heritage Branch
www.gnb.ca/0131/heritage-e.asp

Newfoundland and Labrador, Tourism,
Culture and Recreation – Heritage
www.tcr.gov.nl.ca/tcr/heritage/index.html

Nova Scotia, Tourism, Culture and Heritage
www.gov.ns.ca/Tch/heritage_mandate.asp

Northwest Territories, Education, Culture and
Employment – Culture and Heritage
www.pwnhc.ca

Nunavut, Culture, Language, Elders and Youth
www.gov.nu.ca/cley/

Ontario, Ministry of Tourism and Culture – Heritage
www.culture.gov.on.ca/english/heritage/act.htm

Prince Edward Island, Tourism and Culture –
Culture, Heritage and Libraries
www.gov.pe.ca/go/heritageplaces

Québec, Culture, Communications et Condition féminine
– Patrimoine et muséologie
www.mcccf.gouv.qc.ca/index.php?id=24

Saskatchewan, Tourism, Parks, Culture and Sport –
Heritage Conservation Branch
www.tpcs.gov.sk.ca/heritage

Yukon, Tourism and Culture –
Historic Sites + Heritage Resources
www.yukonheritage.com/

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Province of Alberta

HISTORICAL RESOURCES ACT

Revised Statutes of Alberta 2000
Chapter H-9

Current as of June 2, 2021

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Note

All persons making use of this consolidation are reminded that it has no legislative sanction, that amendments have been embodied for convenience of reference only. The official Statutes and Regulations should be consulted for all purposes of interpreting and applying the law.

Regulations

The following is a list of the regulations made under the *Historical Resources Act* that are filed as Alberta Regulations under the Regulations Act

	Alta. Reg.	<i>Amendments</i>
Historical Resources Act		
Archaeological and Palaeontological		
Research Permit	254/2002	93/2007, 183/2008, 133/2013, 20/2021
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HISTORICAL RESOURCES ACT

Chapter H-9

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HER MAJESTY, by and with the advice and consent of the Legislative Assembly of Alberta, enacts as follows:

Definitions

1 In this Act,

- (a) “archaeological resource” means a work of humans that
 - (i) is primarily of value for its prehistoric, historic, cultural or scientific significance, and
 - (ii) is or was buried or partially buried in land in Alberta or submerged beneath the surface of any watercourse or permanent body of water in Alberta,and includes those works of humans or classes of works of humans designated by the regulations as archaeological resources;
- (b) “donation” includes any gift, testamentary disposition, deed of trust or other form of contribution;
- (c) repealed 2019 c15 s23;
- (d) “historic object” means any historic resource of a movable nature including any specimen, artifact, document or work of art;
- (e) “historic resource” means any work of nature or of humans that is primarily of value for its palaeontological, archaeological, prehistoric, historic, cultural, natural,

scientific or esthetic interest including, but not limited to, a palaeontological, archaeological, prehistoric, historic or natural site, structure or object;

- (f) “historic site” means any site that includes or consists of an historical resource of an immovable nature or that cannot be disassociated from its context without destroying some or all of its value as an historical resource and includes a prehistoric, historic or natural site or structure;
- (g) “Minister” means the Minister determined under section 16 of the *Government Organization Act* as the Minister responsible for this Act;
- (h) “palaeontological resource” means a work of nature consisting of or containing evidence of extinct multicellular beings and includes those works of nature or classes of works of nature designated by the regulations as palaeontological resources;
- (i) “Provincial Historic Resource” means an historic resource that is designated under section 20(1) as a Provincial Historic Resource.
- (j) repealed 2020 c39 s5.

RSA 2000 cH-9 s1;2019 c15 s23;2020 c39 s5

Part 1 Historical Resources Generally

Duty re historic resources

2 The Minister is responsible for

- (a) the co-ordination of the orderly development,
- (b) the preservation,
- (c) the study and interpretation, and
- (d) the promotion of appreciation

of Alberta’s historic resources.

RSA 1980 cH-8 s2

Staff

3 In accordance with the *Public Service Act*, there may be appointed the employees necessary for the administration of this Act.

RSA 1980 cH-8 s3;1991 c17 s2;1997 c12 s2

Experts and advisors

4(1) The Minister may from time to time engage the services of experts or persons having special technical or other knowledge to advise the Minister or to inquire into and report to the Minister on matters under this Act.

(2) A person whose services are engaged under this section may be paid the remuneration and expenses that the Minister may prescribe.

RSA 1980 cH-8 s4

Acquisition of property

5(1) The Minister may

- (a) acquire by purchase, gift, bequest, devise, loan, lease or otherwise any historic object, building or historic site;
- (b) sell, lease, exchange or otherwise dispose of any historic object, building or historic site so acquired;
- (c) lend or lease any historic objects or any other objects acquired under this Act;

on any terms the Minister considers appropriate.

(2) The Minister may acquire by gift, devise, bequest or loan, any building, site or other thing of historic, scientific or artistic interest whether or not having a bearing on the heritage of Alberta.

(3) Any property acquired by the Minister under this section by gift, devise, bequest or loan is subject to any terms and conditions stipulated by the person giving, devising, bequeathing or lending the property.

RSA 1980 cH-8 s5

Minister's powers

6(1) The Minister may

- (a) exhibit and display the property acquired under this Act, including exhibitions outside Alberta, as the Minister considers desirable;
- (b) classify, preserve, index and catalogue the historic resources and other property acquired under this Act;
- (c) for the purpose of public sale
 - (i) cause to be prepared or acquired books, pamphlets, souvenirs, photographs, reproductions and similar items, and

- (ii) cause information and studies to be compiled or prepared;
 - (d) fix the sale price of items sold under this Act and establish fees or charges for services provided under this Act;
 - (e) undertake, support or sponsor educational or research programs relevant to the purposes of this Act;
 - (f) provide assistance, advisory services and training programs to individuals, institutions, agencies and organizations in Alberta having aims and objectives similar to those of this Act;
 - (g) do or authorize to be done all other things that are incidental to or conducive to the attainment of the purposes and objects of this Act.
- (2)** The Minister may make regulations
- (a) fixing the times, terms and conditions of public access to collections, property and locations under the Minister's control;
 - (b) respecting the use and protection of property under the Minister's control;
 - (c) generally for the operation, conduct and management of properties under the Minister's control;
 - (d) governing the conditions on which research permits may be issued under section 30;
 - (e) prescribing the standards of curatorship to be maintained in institutions to which the Minister has given custody of historic resources.

RSA 1980 cH-8 s6;1991 c17 s3

Grants

- 7(1)** The Minister may make grants if
- (a) the Minister is authorized to do so by regulations under this section, and
 - (b) there is authority available in a supply vote for the purpose for which the grant is to be made.
- (2)** The Lieutenant Governor in Council may make regulations
- (a) authorizing the Minister to make grants;

- (b) prescribing the purposes for which grants may be made;
 - (c) governing applications for grants;
 - (d) prescribing the persons or organizations or classes of persons or organizations eligible for grants;
 - (e) specifying the conditions required to be met by any applicant for a grant to render that person eligible for the grant;
 - (f) prescribing the conditions on which a grant is made and requiring the repayment of it to the Government if the conditions are not met;
 - (g) providing for the payment of any grant in a lump sum or by instalments and prescribing the time or times at which the grant or the instalments may be paid;
 - (h) limiting the amount of any grant or class of grant that may be made;
 - (i) authorizing the Minister to delegate in writing to any employee of the Government any duty, power or function respecting the payment of any grant;
 - (j) requiring any person receiving a grant to account for the way in which the grant is spent in whole or in part;
 - (k) authorizing the Minister to enter into an agreement with respect to any matter relating to the payment of a grant.
- (3) A regulation under subsection (2) may be specific or general in application.

RSA 1980 cH-8 s7

Committees

- 8(1)** The Minister may appoint committees from time to time as the Minister considers advisable or necessary for the purposes of this Act.
- (2)** The Minister may, with respect to any committee established under this section,
- (a) appoint or provide for the manner of appointment of its members,
 - (b) prescribe the term of office of any member,
 - (c) designate a chair, vice-chair and secretary, and

- (d) authorize, fix and provide for the payment of remuneration and expenses to members.

RSA 1980 cH-8 s8

Museum objects**9** The Minister may

- (a) provide for the operation, maintenance and development of The Provincial Museum of Alberta;
- (b) cause to be exhibited and displayed specimens, artifacts, documents and works of art depicting the history of Alberta, or any other subjects that may be of public interest from time to time;
- (c) receive from other institutions, produce, exchange and display loan and circulating exhibits for use both in and out of Alberta;
- (d) undertake, support or sponsor educational and research programs relevant to the purposes of this Part;
- (e) publish information and studies;
- (f) co-operate with other agencies and societies and, in particular, provide advisory services, training, grants and assistance to museums in Alberta;
- (g) maintain and operate museums placed under the Minister's care and custody and enter into agreements with other institutions, agencies and organizations for the operation of museums;
- (h) provide for the operation, maintenance and development of the Provincial Archives of Alberta for
 - (i) the preservation, storage, publication and public exhibition of public records, and
 - (ii) the acquisition, preservation, publication and public exhibition of documents, parchments, manuscripts, records, books, maps, plans, photographs, magnetic tapes or other materials, regardless of physical form, the preservation of which is in the public interest.

RSA 1980 cH-8 s9;1983 cD-25.5 s23

Copies as evidence

- 10** A copy of any original public record or other document in the custody of the Provincial Archives of Alberta, certified by the Provincial Archivist to be a true copy, shall be admitted in evidence

as proof, in the absence of evidence to the contrary, of the authenticity and correctness of the document and of the contents of the original without proof of the signature or appointment of the Provincial Archivist.

RSA 1980 cH-8 s10

Part 2 Repealed 2019 c15 s23.

Part 3

Historic Resource Management

Powers re historic sites

16 The Minister may

- (a) designate and protect historic resources;
- (b) undertake programs of research into and documentation of matters relating to the heritage of Alberta and maintain records of Provincial Historic Resources;
- (c) place markers, signs, cairns or other interpretive facilities in any suitable location for the interest and guidance of the public;
- (d) administer, maintain, restore, record, conduct research and educational services, provide interpretive exhibits and carry out any functions required in the proper management and interpretation of Provincial Historic Resources that are owned by the Crown or wholly located on Crown lands;
- (e) carry out surveys, investigate, document and excavate any site in Alberta;
- (f) report on the investigation, documentation or excavation of any site;
- (g) enter into agreements with persons to carry out surveys and excavations and prepare reports on them;
- (h) co-operate with other agencies, societies or persons in carrying out any program likely to promote or enhance the preservation, protection and interpretation of historic sites;
- (i) provide programs for the information and benefit of persons interested in archaeology or the conservation of historic sites.

RSA 2000 cH-9 s16;2020 c39 s5

Historic Sites Co-ordinating Committee

17(1) The Minister may appoint an Historic Sites Co-ordinating Committee composed of a chair and any other persons the Minister considers appropriate.

(2) The Historic Sites Co-ordinating Committee shall establish liaison between and co-ordinate the activities of departments in relation to actions and programs that may have effect on the preservation and development of historic sites.

RSA 1980 cH-8 s12

Geographical names

18(1) The name of any place or other geographical feature in Alberta that

- (a) was approved after March 31, 1949 and before January 1, 1975 by the Geographic Board of Alberta under *The Geographical Names Act*, RSA 1970 c159,
- (b) was approved or changed after December 31, 1974 by the Historic Sites Board pursuant to this Act,
- (c) was approved or changed before March 31, 2020 by the Alberta Historical Resources Foundation pursuant to this Act, or
- (d) is approved or changed by the Minister pursuant to subsection (2),

is the authorized name of that place or feature for all purposes.

(2) The Minister may approve a name for, or approve a change of the name for, any place or other geographical feature in Alberta.

(3) When the Minister approves the name or changes the name of any place or other geographical feature under this section, the Minister shall publish in *The Alberta Gazette* a notice setting out the name approved or the change of name and the location of the place or other geographical feature to which the name applies.

(4) Repealed 2019 c15 s23.

RSA 2000 cH-9 s18;2019 c15 s23

19 Repealed 2020 c39 s5.

Designation as Provincial Historic Resource

20(1) The Minister may by order designate any historic resource the preservation of which the Minister considers to be in the public interest, together with any land in or on which it is located and

adjacent land that may be specified in the order, as a Provincial Historic Resource.

(2) The Minister shall

- (a) serve notice of the Minister's intention to make an order under subsection (1) on the owner of the historic resource and on the owner of any land that will be subject to the order, and
- (b) publish notice of the Minister's intention to make an order under subsection (1) in The Alberta Gazette

at least 60 days prior to the date on which the Minister proposes to make the designation.

(3) A notice under subsection (2) shall contain a description of the historic resource that the Minister proposes to designate and shall state the reasons for the proposed designation.

(4) Any interested person may, within 30 days after the publication of the notice in The Alberta Gazette, advise the Minister that the person wishes to make representations concerning the proposed designation.

(5) At the conclusion of the 30-day period, the Minister shall notify all persons who have advised the Minister of their intention to make representations of a date fixed by the Minister for the hearing of the representations, which must be not fewer than 15 days prior to the date on which the Minister proposes to make the designation.

(6) The Minister, after considering any representations made at the hearing referred to in subsection (5), may make an order under subsection (1) and as soon as possible after making the order the Minister shall

- (a) serve a copy of the order on the owner of the historic resource and on the owner of any land that is subject to the order,
- (b) publish a notice of the designation, including a description of the historic resource and any land that is subject to the order, in The Alberta Gazette, and
- (c) if the order relates to or includes any land, cause a certified copy of the order to be registered in the appropriate land titles office.

(7) On the registration of a certified copy of an order in the appropriate land titles office, the Registrar of Land Titles shall endorse a memorandum on the certificate of title to any land affected by the order.

(8) An order under subsection (1) is effective

- (a) as against the owner of the historic resource and the owner of any land that is subject to the order, when the owner is served with a copy of the order or when the notice under subsection (6)(b) is published in The Alberta Gazette, whichever occurs first, and
- (b) as against all other persons, when the notice under subsection (6)(b) is published in The Alberta Gazette.

(9) Notwithstanding any other Act, no person shall

- (a) destroy, disturb, alter, restore or repair any historic resource or land that has been designated under this section, or
- (b) remove an historic object from an historic resource that has been designated under this section

without the written approval of the Minister.

(10) The Minister, in the Minister's absolute discretion, may refuse to grant an approval under subsection (9) or may make the approval subject to any conditions the Minister considers appropriate.

(11) The owner of an historic resource that is subject to an order under subsection (1) shall, at least 30 days before any sale or other disposition of the historic resource, serve notice of the proposed sale or other disposition on the Minister.

(12) When a person inherits an historic resource that is subject to an order under subsection (1), that person shall notify the Minister of the inheritance within 15 days after the historic resource is transferred to the person.

(13) On service of a notice of intention under subsection (2), subsections (8) to (12) apply to the historic resource and land as if an order under subsection (1) had been made and was effective under subsection (8), until the time the Minister makes the order or revokes the notice of intention or until the expiry of 120 days from service of the notice.

(14) Notwithstanding subsection (13), a person who has been served with a notice of intention under subsection (2) may apply to

the Court of Queen's Bench for an order shortening the period of 120 days mentioned in subsection (13).

(15) If the Minister rescinds an order made under subsection (1), the Minister shall

- (a) serve a copy of the rescinding order on the owner of the historic resource and the owner of any land that is subject to the order,
- (b) publish a notice of the rescinding order in The Alberta Gazette, and
- (c) if the order under subsection (1) was registered against the certificate of title to any land, cause a certified copy of the rescinding order to be registered in the appropriate land titles office.

(16) On the registration of a certified copy of a rescinding order in the appropriate land titles office, the Registrar of Land Titles shall endorse a memorandum on the certificate of title to any land concerned cancelling the registration of the order under subsection (1).

RSA 2000 cH-9 s20;2009 c53 s81;2019 c15 s23

Service of notice

21 A notice, order or other document under section 20 may be served by personal service or registered mail or in any other manner as the Court of Queen's Bench may direct.

RSA 2000 cH-9 s21;2020 c39 s5

Crown owned historic resource

22 If the historic resource that is the subject of an order under section 20(1) is an historic resource that is owned by the Crown or wholly situated on Crown land,

- (a) section 20(2), (4), (5), (6)(a), (11) to (14) and (15)(a) do not apply with respect to that historic resource,
- (b) at least 60 days prior to the date of making an order under section 20(1), the Minister shall give notice of the Minister's intention to make the order to the Minister of the Crown who has the administration of the land or historic resource,
- (c) no sale or other disposition of property that is the subject of an order under section 20(1) may be made without giving the Minister at least 60 days' notice, and
- (d) the Minister may

- (i) restore, alter or demolish any structure located within the area designated as a Provincial Historic Resource, and
- (ii) make regulations governing the management and development of the Provincial Historic Resource.

RSA 1980 cH-8 s18;1989 c17 s10;1992 c16 s6

Maintenance and repair

23 The Minister may

- (a) make regulations governing standards of maintenance of Provincial Historic Resources,
- (b) make regulations governing signs and billboards on Provincial Historic Resources, and
- (c) by order require specific repairs or other measures to be made or taken to preserve any particular Provincial Historic Resource.

RSA 1980 cH-8 s19

Provincial Historic Area

24(1) The Lieutenant Governor in Council may by regulation establish any area of Alberta as a Provincial Historic Area.

(2) If the Lieutenant Governor in Council establishes a Provincial Historic Area, the Lieutenant Governor in Council may, with respect to the Area, by regulation

- (a) prohibit or regulate and control the use, development or occupation of land or buildings;
- (b) prohibit or regulate and control the exercise of any power specified in the regulations by
 - (i) a specified Minister of the Crown, or
 - (ii) a government agency;
- (c) prohibit or regulate and control the demolition, removal, repair, construction or reconstruction of buildings or other things;
- (d) authorize the acquisition by purchase or expropriation by a specified Minister of the Crown of any estate or interest in the land;
- (e) authorize any specified Minister of the Crown, government agency or any other person to consent to or approve any

particular kind of use, development or occupation of land or to exempt any particular kind of use, development or occupation from the operation of any provision of the regulations made under this section;

- (f) regulate and control the construction, height, location or size of buildings;
- (g) make any or all of the provisions of the *Surface Rights Act* inapplicable to land of the Crown;
- (h) prohibit, with respect to any land of the Crown in the area, any expropriation to which the *Expropriation Act* applies;
- (i) confer on any specified Minister of the Crown, with or without conditions, any power or duty under the regulations.

(3) In this section, “government agency” means a corporation that is an agent of the Crown in right of Alberta, a government official and any corporation, commission, board or other body empowered to perform quasi-judicial or governmental functions and whose members are appointed by an Act of the Legislature, the Lieutenant Governor in Council or a Minister of the Crown or any combination of them.

(4) Unless the contrary is expressly declared in regulations made under this section, the regulations operate notwithstanding Part 17 of the *Municipal Government Act*.

RSA 1980 cH-8 s20;1995 c24 s100

Registration of notice of Provincial Historic Area regulation

25(1) If a Provincial Historic Area is established pursuant to section 24, the Minister shall file a notice to that effect, together with a certified copy of the regulation, with the Registrar of Land Titles, and the Registrar shall endorse a memorandum of the notice on each certificate of title pertaining to land within the Area.

- (2)** If a regulation made pursuant to section 24 is amended,
- (a) the Minister shall file a further notice respecting the amending regulation together with a certified copy of the amending regulation,
 - (b) the Registrar of Land Titles shall keep the further notice with the original notice and shall treat them as one document, and
 - (c) subject to subsections (3) and (4), the Registrar of Land Titles shall not make any further endorsement on any certificate of title in respect of the further notice.

(3) If a regulation made pursuant to section 24 is amended and the effect of the amendment is to add land to the Area, the Registrar shall, on receiving the further notice under subsection (2), endorse on each certificate of title for the additional land a memorandum of the original notice under subsection (1) and the further notice under subsection (2).

(4) If a regulation made pursuant to section 24 is amended and the effect of the amendment is to remove any land from the Area, the Registrar of Land Titles shall, on receiving the further notice under subsection (2), cancel the memorandum of the original notice under this section on each certificate of title to the land so removed.

(5) If a regulation made under section 24 is rescinded and not replaced, the Minister shall file a notice to that effect and a copy of the rescinding regulation with the Registrar of Land Titles who shall cancel the memorandum of the original notice on each certificate of title to the land previously within the Area.

(6) If a regulation made pursuant to section 24 is rescinded and replaced by another regulation under this section, the Minister shall file with the Registrar of Land Titles a notice to that effect and a certified copy of the new regulation and the Registrar shall,

- (a) with respect to land that was subject to the rescinded regulation and is also subject to the new regulation, cancel the memorandum on the certificate of title for the land of the notice pertaining to the rescinded regulation and endorse a memorandum on the certificate of title of the notice pertaining to the new regulation, which shall be then treated as a notice under subsection (1),
- (b) with respect to land that was subject to the rescinded regulation but is not subject to the new regulation, cancel the memorandum of the notice on the certificate of title for the land, and
- (c) with respect to land that was not subject to the rescinded regulation but is subject to the new regulation, treat the notice as a notice under subsection (1) and act accordingly.

(7) On the filing with a Registrar of a notice under subsection (1), (2), (5) or (6), the Registrar of Land Titles shall send a notification respecting the filing of the notice, but without sending a copy of the regulation, amending regulation or rescinding regulation to which the notice relates, by mail or otherwise, to each registered owner on whose title a memorandum of the notice is endorsed.

(8) The Minister shall send, by mail or otherwise, to each person shown on a certificate of title as having an estate or interest in the land affected by any regulation, amending regulation or rescinding regulation referred to in subsection (1), (2), (5) or (6), at the last reasonably ascertainable address of the person, a copy of the regulation, amending regulation or rescinding regulation, as the case may be, together with a notification relating to it containing the information that the Minister considers necessary.

(9) The validity or operation of a regulation made pursuant to section 24 is not dependent on the filing of any notice by the Minister with a Registrar under this section.

RSA 1980 cH-8 s21;1996 c32 s5(34)

Designation as Municipal Historic Resource

26(1) In this section and in sections 27 and 28,

- (a) “council” means the council of a city, town, village, summer village or municipal district;
- (b) “municipality” means a city, town, village, summer village, municipal district, improvement district or special area.

(2) A council of a municipality, after giving the owner 60 days’ notice, may by bylaw designate any historic resource within the municipality whose preservation it considers to be in the public interest, together with any land in or on which it is located that may be specified in the bylaw, as a Municipal Historic Resource.

(3) A council that designates an historic resource as a Municipal Historic Resource under subsection (2) shall

- (a) cause a copy of the bylaw to be served on the owner of the historic resource and on the owner of any land that will be subject to the bylaw, and
- (b) if the bylaw relates to or includes any land, cause a certified copy of the bylaw to be registered at the appropriate land titles office.

(4) On the registration of a certified copy of the bylaw at the appropriate land titles office, the Registrar of Land Titles shall endorse a memorandum on the certificate or certificates of title to any land affected by the bylaw.

(5) A bylaw under subsection (2) is effective when it is passed.

(6) Notwithstanding any other Act, no person shall

- (a) destroy, disturb, alter, restore or repair an historic resource that has been designated under this section, or
- (b) remove any historic object from an historic resource that has been designated under this section,

without the written approval of the council or a person appointed by the council for the purpose.

(7) The council or the person appointed by the council, in its or the appointee's absolute discretion, may refuse to grant an approval under subsection (6) or may make the approval subject to any conditions it or the appointee considers appropriate.

(8) On the service of a notice of intention under subsection (2), subsection (6) applies to the historic resource and land as if a bylaw under subsection (2) had been passed until the council passes the bylaw or revokes the notice of intention or until the expiry of 120 days from the receipt of the notice.

(9) Notwithstanding subsection (8), a person who has been served with a notice of intention under subsection (2) may apply to the Court of Queen's Bench for an order shortening the period of 120 days mentioned in subsection (8).

(10) If the council repeals a bylaw made under subsection (2), it shall

- (a) cause a copy of the repealing bylaw to be served on the owner, and
- (b) if the bylaw under subsection (2) was registered against the certificate or certificates of title to any land, cause a certified copy of the repealing bylaw to be registered in the appropriate land titles office.

(11) On the registration of a certified copy of the repealing bylaw in the appropriate land titles office, the Registrar of Land Titles shall endorse a memorandum on the certificate or certificates of title to the land concerned cancelling the registration of the bylaw under subsection (2).

(12) A notice or bylaw under this section may be served on the owner by personal service or registered mail or in any other manner as the Court of Queen's Bench may direct.

RSA 2000 cH-9 s26;2009 c53 s81

Designation as Municipal Historic Area

27(1) If it is of the opinion that the preservation of the historical character of any part of the municipality is in the public interest, a council may by bylaw

- (a) designate that part of the municipality as a Municipal Historic Area, and
- (b) prohibit or regulate and control the use and development of land and the demolition, removal, construction or reconstruction of buildings within the Municipal Historic Area.

(2) A bylaw under subsection (1) is deemed to form part of the land use bylaw of the municipality and Part 17 of the *Municipal Government Act* relating to a land use bylaw applies to the bylaw under subsection (1).

(3) Notwithstanding subsection (2), if the municipality has no land use bylaw, Part 17 of the *Municipal Government Act* is nevertheless applicable to the bylaw under subsection (1) as though a land use bylaw for the municipality were in existence and the bylaw under subsection (1) were part of that land use bylaw.

RSA 1980 cH-8 s23;1995 c24 s100

Compensation

28(1) If a bylaw under section 26 or 27 decreases the economic value of a building, structure or land that is within the area designated by the bylaw, the council shall by bylaw provide the owner of that building, structure or land with compensation for the decrease in economic value.

(2) If the council and the owner can not agree on the compensation payable under subsection (1), the owner or the council may apply to the Land and Property Rights Tribunal established under the *Land and Property Rights Tribunal Act* to determine the amount of compensation payable by the council to the owner for the decrease in economic value.

(3) When an application is made to the Land and Property Rights Tribunal according to subsection (2), the *Expropriation Act*, the *Land and Property Rights Tribunal Act* and the regulations made under these Acts respecting the determination of compensation, hearings and procedures, including interest, costs and appeals, apply to the application with all necessary modifications.

(4) The council may, with the agreement of the owner, provide the compensation under subsection (1) by grant, tax relief or any other means.

(5) This section does not apply with respect to a Municipal Historic Resource that is designated as part of a TDC scheme under the *Alberta Land Stewardship Act*.

RSA 2000 cH-9 s28;2009 cA-26.8 s79;2020 cL-2.3 s31

Condition or covenant on land

29(1) A condition or covenant, relating to the preservation or restoration of any land or building, entered into by the owner of land and

- (a) the Minister,
- (b) the council of the municipality in which the land is located, or
- (c) repealed 2019 c15 s23,
- (d) an historical organization that is approved by the Minister,

may be registered with the Registrar of Land Titles.

(2) When a condition or covenant under subsection (1) is presented for registration, the Registrar of Land Titles shall endorse a memorandum of the condition or covenant on any certificate of title relating to that land.

(3) A condition or covenant registered under subsection (2) runs with the land and the person or organization under subsection (1) that entered into the condition or covenant with the owner may enforce it whether it is positive or negative in nature and notwithstanding that the person or organization does not have an interest in any land that would be accommodated or benefited by the condition or covenant.

(4) A condition or covenant registered under subsection (2) may be assigned by the person or organization that entered into it with the owner to any other person or organization mentioned in subsection (1), and the assignee may enforce the condition or covenant as if it were the person or organization that entered into the condition or covenant with the owner.

(5) If the Minister considers it in the public interest to do so, the Minister may by order discharge or modify a condition or covenant registered under subsection (2), whether or not the Minister is a party to the condition or covenant.

(6) If the Minister discharges or modifies a condition or covenant under subsection (5), the Minister shall register a copy of the order with the Registrar of Land Titles and the Registrar of Land Titles

shall endorse a memorandum discharging or modifying the condition or covenant on the certificate of title to the land.

(7) This section applies notwithstanding section 48 of the *Land Titles Act*.

(8) No condition or covenant under this section is deemed to be an encumbrance within the meaning of the *Land Titles Act*.

RSA 2000 cH-9 s29;2019 c15 s23

Excavation permit

30(1) Subject to subsection (2), no person shall make an excavation on any land in Alberta for the purpose of seeking or collecting historic resources unless the person is the holder of a valid permit issued under this section.

(2) The Minister may exempt any person from the requirements of subsection (1) on any conditions the Minister considers appropriate.

(3) The Minister may issue permits authorizing the person named in the permit to make excavations for the purpose of seeking or collecting historic resources on any land in Alberta described in the permit.

(4) A research permit shall be subject to the following conditions:

- (a) the holder shall, within any time that may be specified on the permit, furnish to the Minister a progress report on the work done in any detail that the Minister may require;
- (b) the holder shall, after completion of the excavation, restore the site to its normal condition insofar as it is reasonably possible to so do unless the Minister otherwise authorizes;
- (c) the holder shall deliver possession of all historic resources recovered while excavating pursuant to the research permit to any public institution that the Minister may designate;
- (d) any condition prescribed pursuant to the regulations;
- (e) any other conditions that the Minister may consider necessary.

(5) A research permit is valid for the period specified in the permit but may be sooner cancelled by the Minister if the Minister is of the opinion that the holder of the permit is not complying with the conditions specified in the permit or with this Act or the regulations.

RSA 1980 cH-8 s26

Notice of discovery of historic resource

31 A person who discovers an historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery.

RSA 1980 cH-8 s27

Title to archaeological property

32(1) Subject to subsections (2) and (3), the property in all archaeological resources and palaeontological resources within Alberta is vested in the Crown in right of Alberta.

(2) No sale or other disposition of land belonging to the Crown in right of Alberta shall operate as a conveyance of an archaeological resource or palaeontological resource situated on or under the land unless the sale or other disposition expressly states that it does so operate.

(3) The Minister may, in accordance with the regulations, sell, lease, exchange or otherwise dispose of any archaeological or palaeontological resource on any terms the Minister considers appropriate.

RSA 1980 cH-8 s28;1987 c26 s2

Transport of historic resources out of Alberta

33(1) Subject to subsection (2), no person shall transport any of the following out of Alberta without the written permission of the Minister:

- (a) archaeological resources;
- (b) palaeontological resources;
- (c) historic resources that are the subject of an order under section 20.

(2) Subsection (1) does not apply to an archaeological or palaeontological resource that has been sold, leased, exchanged or otherwise disposed of by the Minister pursuant to section 32(3).

RSA 2000 cH-9 s33;2020 c39 s5

Damage prohibited

34(1) Subject to subsection (2), no person shall alter, mark or damage an archaeological resource or palaeontological resource unless the person is the holder of a valid permit under section 30 or has the written permission of the Minister to do so.

(2) Subsection (1) does not apply to an archaeological or palaeontological resource that has been sold, leased, exchanged or otherwise disposed of by the Minister pursuant to section 32(3).

RSA 1980 cH-8 s30;1987 c26 s4

Regulations

35 The Minister may make regulations

- (a) respecting the sale, lease, exchange or disposition of archaeological and palaeontological resources;
- (b) exempting any person or class of person from the operation of section 33(1) or 34(1).

RSA 1980 cH-8 s31;1987 c26 s5

Effect of issue of research permit

36(1) The issue of a research permit does not entitle any person to enter on the land that is the subject of the permit unless

- (a) the person has the permission of the owner and any person in possession or occupation of the land, or
- (b) when the land is owned by the Crown in right of Alberta, the person obtains the permission of, or a disposition from, the Minister responsible for the administration of that land.

(2) No liability attaches to the Crown by reason of the issue of a research permit.

RSA 1980 cH-8 s32

Right of entry

37(1) The Minister may authorize any person to enter at any reasonable hour and after notice to the owner or occupant

- (a) any land for the purpose of
 - (i) making surveys for, or
 - (ii) inspecting
 - historic resources that the Minister has reason to believe may qualify as a Provincial Historic Resource, or
- (b) any Provincial Historic Resource for the purpose of examining, surveying or recording the site or carrying out excavations and works required for the preservation or development of the site as an historic resource.

(2) When the Minister is of the opinion that any operation or activity that may be undertaken by any person will, or is likely to,

result in the alteration, damage or destruction of historic resources, the Minister may order that person

- (a) to carry out an assessment to determine the effect of the proposed operation or activity on historic resources in the area where the operation or activity is carried on,
- (b) to prepare and submit to the Minister in accordance with the order, a report containing the assessment of the effect of the proposed operation or activity referred to in clause (a), and
- (c) to undertake all salvage, preservative or protective measures or take any other action that the Minister considers necessary.

(3) Notwithstanding anything in any other Act, when the Minister makes an order under subsection (2) the Minister may also require any municipality or other authority in Alberta, the issuance of whose licence, permit, consent or similar authorization is a condition precedent to the commencement or continuation of the operation or activity, to withhold or suspend the licence, permit, consent or other authorization until the Minister is satisfied that any assessment that the Minister has required under subsection (2)(a) or any measure or action that the Minister has required under subsection (2)(c) has been carried out to the Minister's satisfaction.

RSA 2000 cH-9 s37;2020 c39 s5

Part 4 Repealed 2019 c15 s23.

Part 5 General

Temporary Stop Order

49(1) When the Minister is of the opinion that a person is engaged in an activity that the Minister considers likely to result in damage to or destruction of an historic resource that could be designated as a Provincial Historic Resource, the Minister may issue an order called a "Temporary Stop Order" requiring that person to cease the activity or the portion of it that the Minister specifies in the Temporary Stop Order for a period not exceeding 15 days.

(2) When it appears that the historic resource qualifies for designation as a Provincial Historic Resource, the Lieutenant Governor in Council may, on the recommendation of the Minister, order suspension of the activity or any part of it for a further specified period in order to allow salvage, recording or excavation of the historic resource and investigation of alternatives to its

destruction including its designation as a Provincial Historic Resource.

(3) If a person feels himself or herself aggrieved by an order issued pursuant to this section, the person may appeal to the Court of Queen's Bench on 2 days' notice and the Court may confirm, vary or rescind the order appealed from.

RSA 2000 cH-9 s49;2009 c53 s81;2020 c39 s5

Compensation

50(1) The Minister may authorize the payment of compensation in accordance with the regulations to any person who has suffered loss as the result of the application of this Act, other than sections 26, 27 and 28, or the regulations.

(2) The Lieutenant Governor in Council may make regulations governing the manner of determining compensation paid by the Minister under subsection (1).

RSA 1980 cH-8 s46

Exemption from building code

51(1) The Minister may make regulations exempting Provincial Historic Resources from the application of any provision contained in any building code that would otherwise be applicable pursuant to any Act, regulation or municipal bylaw when the enforcement of that provision would prevent or seriously hinder the preservation, restoration or use of all or any portion of the site or monument.

(2) A regulation under subsection (1) may be general or particular in application.

RSA 2000 cH-9 s51;2020 c39 s5

Offence and penalty

52(1) A person who contravenes this Act or the regulations, the conditions of a permit, or a direction of the Minister under this Act is guilty of an offence and liable to a fine of not more than \$50 000 or to imprisonment for a term of not more than one year or to both fine and imprisonment.

(2) When a Provincial Historic Resource is altered or destroyed in any way in contravention of this Act, the regulations or a direction of the Minister pursuant to this Act, the Minister may restore it and the Crown may recover the cost of that restoration from the person causing the alteration or destruction by an action in debt.

(3) When a Provincial Historic Resource is altered or destroyed in contravention of this Act, the regulations or an order of the Minister pursuant to this Act in a manner that it is not possible to effect restoration, the Crown may by action recover damages for

the alteration or destruction from the person causing the alteration or destruction.

RSA 1980 cH-8 s48

Act binds Crown

53 The Crown is bound by this Act except sections 26, 27 and 52.

RSA 1980 cH-8 s49

Registered Historic Resources — transitional

54(1) In this section, “Registered Historic Resource order” means an order made under

- (a) section 19(1) of this Act before the coming into force of this section,
- (b) section 15(1) of the *Historical Resources Act*, RSA 1980 cH-8,
- (c) section 17(1) of *The Alberta Historical Resources Act*, SA 1973 c5, or
- (d) section 17(1) of *The Alberta Heritage Act*, 1973, SA 1973 c5.

(2) Every Registered Historic Resource order in effect immediately before the coming into force of this section is rescinded.

(3) Where, on the coming into force of this section, a certified copy of a Registered Historic Resource order is registered on the certificate of title to any land, the Registrar of Land Titles shall, as soon as practicable after the coming into force of this section, endorse a memorandum on the certificate of title cancelling the registration of that order.

(4) The Minister may maintain records of any historic resources that were the subject of a Registered Historic Resource order before the coming into force of this section.

2020 c39 s5



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November 18, 2016

VIA EMAIL
Jocelyn.gray@pc.gc.ca

Jocelyn Gray
Palisades Bldgs., Parks Canada
Jasper , AB T0E 1E0

Attention: **Jocelyn Gray**
 Project Manager
 780-883-0603

Re: **Building Material Assessment – Asbestos Survey**
 Palisades Bldgs. – Machine Shed
 BSS Project: PALMACHINEAS

As requested by Jocelyn Gray, Barrow Safety Services (BSS) performed an asbestos containing materials (ACM) survey at the above-referenced building. BSS understands that the information is required for due diligence purposes.

SCOPE OF WORK

The scope of work included a general inspection of the following items:

- structural materials,
- structural components,
- flooring materials, building materials.

Identification of suspect ACM regulated by Occupational Health and Safety was performed through sample collection of suspect materials. The field work was performed on November 15, 2016 by Glen Barrow of Barrow Safety Services.

BUILDING CONSTRUCTION

The building is a one story wood bungalow building constructed in mid 1900's. Interior walls and ceilings are comprised of wood and painted drywall. The interior ceiling has drywall on it. The outside walls are painted wood. The roof wood is comprised of wood

shakes. No insulation found in the interior walls. The floor is carpet and lino. The building has two accommodation rooms in it.

SURVEY METHODOLOGY

Suspect ACMs were identified by visual inspection, the collection of bulk samples and verification through laboratory analysis. Select samples were collected of each homogenous building material suspected to contain asbestos. Fibreglass insulation and cellulose was identified visually and was not tested. Enviro-Works Inc. examined the samples by polarized light microscopy (PLM) following the NIOSH 9002 methodology.

Visual extrapolation of suspect asbestos containing materials was conducted. If a floor tile size and pattern was observed multiple locations, it was assumed that the sample result is the same (either positive or negative) for both locations.

LIMITATIONS

Based on the nature of the building construction, limitations exist which had an effect on the thoroughness of the survey. The survey did not include demolition and sampling of roofing, mastics, light fixture heat shields, electrical cloth/wiring, caulking or putties or heating & ventilation system. The survey did not include the attic.

REGULATION OF ASBESTOS CONTAINING MATERIALS

Alberta Occupational Health & Safety (OH&S) regulates provincial workers for handling of asbestos in the workplace and outlines the requirements to include risk assessment, identification, management, work procedures, worker training and air monitoring.

An asbestos-containing material is defined by OH&S as any manufactured article or other material which contains 1% or more asbestos by weight at the time of manufacture, or which contains 1% or more asbestos.

Asbestos-containing materials must be removed prior to any renovation and demolition activities in accordance with appropriate work procedures set out by OH&S and disposed of in accordance with Alberta Environment.

RESULTS & RECOMMENDATIONS

A total of two (2) samples of suspect asbestos-containing building materials were collected and analyzed. Refer to Appendix I for laboratory results of suspect materials.

One of the samples collected by BSS were reported to **contain asbestos** and the other one sample collected was reported to **non-asbestos**.

Palisades – Machine Shed Bldg. (PALMACHINEASAS)

- Sample #1 – Concrete Base – No Asbestos Detected
- Sample #2 – Bathroom Lino – Asbestos Detected
 - Chrysotile Asbestos – >75%



Asbestos-containing materials must be removed prior to renovation and demolition activities by a qualified contractor in accordance with appropriate work procedures and disposed of in accordance with Alberta Environment. Occupational Health & Safety must be notified in writing before the removal, encapsulation or enclosure of any asbestos containing material. Barrow Safety Services can be contacted for further direction on how to go about asbestos abatement, demolition or renovation.

All asbestos containing materials within the building must be managed through the development and implementation of an Asbestos Management Program. Barrow Safety Services can be contacted for further direction on this Management Program.

If you have any questions regarding this report, please contact the undersigned.

Sincerely,

Authored by:



Barrow Safety Services Inc.

Per

Glen Barrow
Manager
(780)865-7763 Office

File: Palisades Machine Shed_asbestos survey report



Certificate of Analysis

Bulk (ACM) Identification:

Visual ID (Area Estimation) NIOSH 9002 (modified)

Revision# : 0
 Client:
 Barrow Safety Services
 Edmonton, Ab

Report Number:
 PALMACHINEAS
 Report Date: Wednesday, November 16, 16
 Samples Collected: Tuesday, November 15, 16
 Date Received: Wednesday, November 16, 16
 Turn Around Requested: Rush 3 hr

Contact: Glen Barrow
 COC#: 42691

EWI Log #	Sample #	Client Sample Information	Phases/Color/Fibrous/Non-Fibrous/Homogeneity	Asbestos Content Type & %	Other Materials Detected	Analyst
107831-1	1	CONCRETE BASE	100% Grey hard mix/ non homogenous/ non fibrous	ND	NFM	FK
107831-2	2	BATHROOM LINO	100% Beige vinyl mosaic sheet with grey backing/ non homogenous/ fibrous	Chrysotile >75	NFM	FK

NFM=Non fibrous materi
 ND=None detected
 VM=Vermiculite & mica
 GF=Glass fibre
 MW=Mineral wool
 P=Perlite
 SF=Synthetic fibre
 *=Estimated
 percentage of asbestos

Reviewed By:

Cherie Laplante
 Cherie Laplante, B.Sc.,
 Lab Manager

Enviro-Works Inc. is a proficient Member of the AIHA BAPAT Quality Control Program. Samples will be stored for 90 days after sample submission date. EWI is not responsible for any sample collection or interpretation of results and does not provide any consultation of results. This report only reflects the materials submitted and tested at our lab. Enviro-Works Inc. privacy policy includes the limitation that any results will only be discussed with the client listed on this report. All other interested parties must contact the client on the report directly.



Preapproved Routine Impact Assessment Frontcountry Areas

Parks Canada National Office
IAA 2019

Preapproved Routine Impact Assessments (PRIA) are pre-determined environmental management and mitigation measures for a defined class of routine, repetitive projects or activities with well understood and predictable effects. Approved PRIAs are an acceptable Impact Assessment pathway as they fulfill Parks Canada's obligations under the *Impact Assessment Act* (IAA) as a manager of federal lands.

This PRIA applies to the installation, modification, maintenance, repair, replacement, decommissioning or abandonment of buildings or other structures that are carried out on developed land that is accessible by road within a national historic site including historic canals or any area of a national park that is zoned "Zone IV" or "Zone V" in accordance with the management plan.

Construction, expansion of buildings or related activities such as additional parking lots or trail expansion is not included in this PRIA.

Buildings or other structures include, but are not limited to, playgrounds, staff offices, washroom facilities (e.g. dry and flush toilets, showers), service lines, trailhead area amenities, cook shelters, staff kiosks and accommodations or storage sheds. Examples of other structures that meet the scope of this PRIA are: sidewalks, boardwalks, pathway, fences, railings, electric vehicle charging stations, class B pedestrian bridges, generators, interpretive displays and exhibits, fireplaces or monuments.

Service lines include underground and aboveground service lines for water, sanitary waste, storm water, natural gas, power and communication. Utilities (water, sanitary sewer, storm water, natural gas) that are provided in pipes are usually located under roadways.

Developed land is a land that is permanently altered from its natural state for human use or is landscaped and maintained for human use.

Expansion is an increase in the exterior dimensions or the production capacity of a physical work.

Water body includes a lake, a canal, a reservoir, an ocean, a river and its tributaries and a wetland, up to the annual high-water mark, but does not include sewage or waste treatment lagoon, a mine tailings pond, an artificial irrigation pond, a dugout or a ditch that does not contain fish habitat as defined in subsection 2(1) of the *Fisheries Act*.

High water mark is the usual or average level to which a body of water rises at its highest point and remains for a sufficient time so as to leave a mark on the land. (Fisheries and Oceans Canada, 2015.) Upper Controlled Water Elevation (UCWE) is used as definition of high water mark in managed waterways.

<p>Scope of Application:</p>	<p>This PRIA includes:</p> <ul style="list-style-type: none"> • Modification, maintenance, repair, replacement, decommissioning or abandonment of buildings. • Installation, modification, maintenance, repair, replacement, decommissioning or abandonment of other structures. • Construction, installation, maintenance, repair, decommissioning or abandonment of sidewalks, boardwalks, fences or railings. • Maintenance, repair, decommissioning or abandonment of existing service lines. • Construction or burial of hook-up power lines.
<p>Conditions and Exceptions:</p>	<p>This PRIA does not apply under the following exceptions/conditions:</p> <p>Location:</p> <ul style="list-style-type: none"> • In backcountry or in zone I, II, and III • Project results in residual adverse effects to sensitive natural or cultural resources (e.g., nests, dens and roosts, fish spawning areas, cultural resources, riparian areas, wildlife corridors, rare ecotypes, or areas of management concern) • Project that involve the placement of temporary or permanent fill in a waterbody <p>Buildings, other structures and service lines:</p> <ul style="list-style-type: none"> • Projects that alter the purpose or function of or results in an expansion of a physical work • Projects that result in increased visitor capacity • Projects that involve historic buildings and/or structures, known archaeological resources or extant archaeological resources, unless the work has been pre-approved by a Parks Canada Cultural Resource Management Advisor and/or Archaeologist <p>For modification, repair, replacement, decommissioning or abandonment projects:</p> <ul style="list-style-type: none"> • Installation or modification of a septic field • Cutting or removing trees through the use of heavy equipment (e.g. skidders, harvesters or excavators) <p>General:</p> <ul style="list-style-type: none"> • The project permanently alters the characteristics of a water body¹ (e.g., temperature, pH, turbidity, flow, water level, water body bed). <ul style="list-style-type: none"> ○ This includes fill placed in a water body or permanently increasing a physical work's footprint below the high water mark; dredging; and construction of a permanent diversion channel.

¹ Water body includes a lake, a canal, a reservoir, an ocean, a river and its tributaries and a wetland, up to the annual high water mark, but does not include a sewage or waste treatment lagoon, a mine tailings pond, an artificial irrigation pond, a dugout or a ditch that does not contain fish habitat as defined in subsection 2(1) of *the Fisheries Act*.

	<ul style="list-style-type: none"> • The project results in residual adverse effects on migratory birds or their nests. <ul style="list-style-type: none"> ○ Refer to the draft- <i>Parks Canada Guidance on Reducing Risk to Migratory Birds</i> and associated draft- <i>Conservation Measures for Minimizing Impacts to Migratory Birds During the Nesting Period</i>. • The project results in residual adverse effects on an individual, a residence or the critical habitat of a listed species at risk under the <i>Species at Risk Act</i>. <ul style="list-style-type: none"> ○ Determine if mitigations are needed to ensure no residual adverse effects to species at risk. Such mitigations should be included in the Supplementary Mitigations section. • The project is likely to require an approval² under the <i>Canadian Navigable Waters Act</i> (s. 5(1)). • The project is likely to require an authorization³ under the <i>Fisheries Act</i> (s.35(1) or 36(3)). • The project involves the removal of or causes damage to cultural resources of heritage value, for example, heritage buildings designated by the Federal Heritage Buildings Review Office, archaeological sites, historical and archaeological objects, or cultural landscapes. • The project involves the removal of or causes damage to paleontological resources. • The project results in loss or reduction in size of a wetland. • The project adversely impacts sites of significance to Indigenous peoples or current access and use of areas where hunting, fishing or gathering rights are exercised by Indigenous peoples.
Other Considerations:	<p>Use of the PRIA may not be appropriate in circumstances such as:</p> <ul style="list-style-type: none"> • If the building, other structure or service line is in a zone susceptible to natural hazards such as a land slide zone, floodplain, or area vulnerable to storm surge and sea level rise or in natural, previously undeveloped areas.
Approved Geographic Areas of Application:	<p>This PRIA may be used on developed land that is accessible by road within a national historic site including historic canals or any area of a national park that is zoned “Zone IV” or “Zone V” in accordance with the management plan.</p>
Parks Canada Specialists:	<p><u>Impact Assessment:</u> If there are any questions on how to apply this PRIA, consult a member of the Impact Assessment Team.</p> <p><u>Species at Risk:</u></p>

² Check if your project is a Major Works in any Navigable Water or Works in Navigable Waters Listed on the Schedule: <https://www.tc.gc.ca/eng/programs-623.html>

³ Check if your projects needs a review: <http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-003-eng.html>

	<p>If there is any uncertainty regarding potential adverse effects to species at risk, consult a member of the Species Conservation Team.</p> <p><u>Environmental Management:</u> If there are questions on environmental management issues (e.g., treated wood, contaminated sites, hazardous materials or greening operations), consult a member of the Environmental Management Team.</p> <p><u>Cultural Resources:</u> If there is any uncertainty regarding potential adverse effects to known or potential cultural resources, consult a member of the Cultural Resource Management Protection Team or, if applicable, the local Field Unit specialist.</p>
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Valued Components and Effects Analysis

Soil/Land Resources	<ul style="list-style-type: none"> • Soil contamination from wastes (e.g., garbage, litter, sewage, fuel) • Increased disturbance footprint • Soil compaction and rutting • Soil erosion, loss of topsoil and exposure of subsoil • Change in slopes, landforms and landscape
Air/Noise Quality	<ul style="list-style-type: none"> • Temporary decreased ambient air quality (e.g., dust, equipment emissions) • Increased ambient noise level
Water Quality	<ul style="list-style-type: none"> • Reduced water quality due to transportation of debris and contamination (i.e. from leaks and accidental spills, etc.) • Localized changes to surface water hydrology
Wildlife and Vegetation	<ul style="list-style-type: none"> • Wildlife habituation/attraction to artificial food sources • Impeded/altered wildlife movement • Habitat destruction or alteration • Mortality from project activities • Introduction of invasive species, or expansion of existing populations • Damage to and removal of vegetation, disturbance of adjacent natural areas, root exposure and physiological distress
Visitor Experience and Safety	<ul style="list-style-type: none"> • Reduced quality of visitors experience due to noise and presence of construction equipment • Reduced accessibility to portions of the site where work is taking place • Hazard to visitors and staff due to construction activities
Cultural Resources	<ul style="list-style-type: none"> • Adverse effects to the heritage value or character-defining elements of a cultural resource or a heritage place • Impacts to archaeological resources (known or potential) from displacement or destruction, resulting in loss of heritage value • Impacts to cultural landscapes, buildings, objects, engineering works.

Mitigation Measures

Pre-Project Planning:

- 1) Work within the vicinity of waterbodies or wetlands may require a site specific Erosion and Sediment Control Plan.
- 2) Schedule work to avoid wet, windy and rainy periods or very dry periods that may increase erosion and sedimentation.
- 3) Clearly identify and avoid sensitive environmental features and habitats in the work area and schedule work to avoid critical wildlife life stages. If useful, complete the Environmental Timing Windows Table. Work with a Cultural Resource Management (CRM) Advisor and CRM specialists (archaeologists, historians, and built heritage advisors) to assess the impact of intervention to cultural resources and identify necessary mitigation measures.
- 4) A Spill Response Plan should be developed prior to work starting.
- 5) Treated wood is prohibited in certain situations and must be handled, installed, and disposed of according to current guidance prepared by Parks Canada.

Example: Environmental Timing Windows Table (to be deleted or adapted)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fish	AVOID INSTREAM WORK					Least risk window for work in and around freshwater, June 15 – Sept 15				AVOID INSTREAM WORK		
Birds	Reduced risk for harm to birds			AVOID VEGETATION REMOVAL Bird Nesting Period: April - Mid August				Reduced risk for harm to birds				
Bats	Bat in Hibernacula				Bats Nursing Pups							Bat in Hibernacula
Turtles	Hibernation		Road Mortality	Nesting -avoid disturbance		Road Mortality		Hatchlings – avoid disturbing	Road Mortality	Hibernation		
Snakes	Avoid disturbance of Hibernacula				Road Mortality	Peak : breeding, live young Mitigate road mortality			Migration Road mortality	Avoid disturbance of Hibernacula		

Work Site Conditions/Staging/Laydown:

- 6) Key contacts and their respective roles and responsibilities must be identified prior to work starting and communicated to all on-site workers.
- 7) People working on the project/activities must review the mitigation measures and any site specific considerations with designated Parks Canada staff before work begins.
- 8) Clearly mark the work site and restricted areas with stakes, biodegradable flagging tape or other means to minimize the disturbance footprint; remove when the project is completed.
- 9) Staging areas, material/equipment drop sites, and parking areas must be identified and within an existing disturbed footprint (e.g., roadways, gravel surface, previously disturbed areas with high resiliency) or approved by designated Parks Canada staff.
- 10) Use existing roadways, trails, disturbed areas or other areas as approved by designated Parks Canada staff for site access, travel within the site and construction activities.

Wildlife:

- 11) When possible, conduct any clearing of vegetation outside critical wildlife timing windows such as the bird nesting period and bat maternity season.
- 12) On-site workers must receive any required wildlife awareness training, according to field unit policy.
- 13) On-site workers must be made aware of and subsequently report any incidental sightings of species at risk immediately to designate Parks Canada staff.
- 14) If active nests, dens or roosts are discovered, stop work and contact designated Parks Canada staff immediately for direction.
- 15) When possible, conduct activities during daylight hours, avoiding critical foraging times (dusk and dawn). Consult with Parks Canada staff for site-specific advice.
- 16) Minimize the time excavations remain open and cover or fence when left unattended to reduce the potential for wildlife injury.
- 17) Never approach or harass wildlife (e.g., feeding, baiting, luring). If wildlife is observed at or near the work site, allow the animal(s) the opportunity to leave the work area.
- 18) Designated Parks Canada staff must be alerted immediately to any potential wildlife conflict (e.g., aggressive behaviour, persistent intrusion), distress or mortality.

Vegetation:

- 19) All clearing activities must be flagged and plans pre-approved by designated Parks Canada staff.
- 20) Clear minimum area necessary; trees should be removed only if necessary for project completion or visitor/staff safety.
- 21) When felling trees, precautions must be taken to minimize damage to surrounding vegetation.
- 22) The felling of trees with obvious wildlife use (e.g., snags with cavity nests, large trees with stick nests) must be avoided wherever possible; if unavoidable, Parks Canada staff consultation and approval is required.
- 23) All cut wood is the property of Parks Canada; consult with designated Parks Canada staff to determine appropriate cutting methods, use and disposal of cut wood and other plant material.
- 24) Employ pruning techniques to minimize risk of tearing the bark and harming the tree; ensure that only branch tissue is removed and stem or trunk tissue is left undamaged (refer to Appendix 1).
- 25) Protect roots of trees to drip line to prevent disturbance or damage. Avoid traffic, dumping and storage of materials over root zone.
- 26) Retain a 15-30 meter vegetated buffer, from the high water mark of waterbodies. In sloped areas, buffers should increase in width as the slope increases.
- 27) Removal of riparian vegetation should be kept to a minimum and undertaken only when absolutely required. Ensure the root structure and stability are maintained.
- 28) Where re-vegetation is required, use native plants/soils/seed mix approved by designated Parks Canada staff.

Invasive Alien Species:

- 29) All construction equipment from outside the Parks Canada protected heritage place must be washed outside the site prior to arrival to minimize risk of introducing invasive weed species. Proof that this mitigation was applied may be requested before equipment is permitted into the protected heritage place.
- 30) If invasive species are a serious issue, consider more effective cleaning methods such as pump and high pressure hose or high pressure water unit.

- 31) Work in uninfested sites before moving to infested sites.
- 32) All soil, gravel, untreated construction lumber, erosion and sediment control products or other applicable materials from outside the protected heritage place must be approved by the designated Parks Canada staff.
- 33) Organic material (e.g, topsoil, borrow and fill material, gravel) taken from the construction site will not be used in other parts of the protected heritage place unless approved by the designated Parks Canada staff.
- 34) Minimize ground disturbance, vegetation removal and bare soil exposure (e.g., cover stockpiled material with tarps, plant native species, cover with natural mulch/ground coverings).
- 35) Stabilize and re-vegetate disturbed areas as soon as possible. If there is insufficient time remaining in the growing season, stabilize the site to prevent erosion and vegetate the following spring.
- 36) Monitor disturbed and re-vegetated areas until native vegetation is growing successfully and invasive alien species spread is prevented.

Visitor Experience and Safety:

- 37) If possible, schedule noisy activities outside peak visitor season or adjust hours of noisy work to minimise disturbance to visitors using the area.
- 38) Close and mark the work site and safety hazards with appropriate signage while active construction, repair or maintenance is underway; consider temporary detours or reroutes as appropriate.
- 39) If closing the area is not possible, maintain a safe working distance between work activities and visitors. If traffic control is required, a flag person should manage traffic through the construction/hazard area.
- 40) Visitor access trails and roads outside the construction area must be free of construction materials, waste, machinery and equipment.

Cultural Resources:

- 41) The designated Parks Canada staff should ensure that on-site workers receive appropriate cultural resource awareness training if required.
- 42) Avoid known potential cultural resources and archaeological sites.
- 43) Apply additional mitigation measures (in supplementary mitigation section) that may have been previously identified by a Parks Canada archaeologist or cultural resource advisor for the immediate area of work.
- 44) If cultural resources (i.e., structural remains and/or artifact concentrations) are encountered, work must cease in the immediate area, the site secured and the designated Parks Canada staff contacted for further direction.

Equipment Operations:

- 45) Use low pressure or rubber tracked equipment or access matting where feasible to minimize soil compaction and ground disturbance.
- 46) Select equipment appropriate to the nature of work being conducted (e.g., avoid using large scale machinery when hand tools or smaller scale machinery could be used).
- 47) Heavy equipment operating on paved surfaces should be equipped with street pads; damage to paved surfaces must be restored to original conditions.

- 48) Equipment must be properly tuned, clean and free of contaminants, in good operating order, free of leaks (e.g., fuel, oil or grease), and fitted with standard air emission control devices and spark arrestors prior to arrival on site.
- 49) Machinery must be stored, maintained and refuelled on a flat surface, outside the dripline of trees and above the High Water Mark and in such a way as to prevent any deleterious substances from entering the water. Increase the buffer zone depending on the level of risk and site-specific conditions.
- 50) Refuelling must take place on an impermeable fuel mat with a berm or within a container. Leaks and spills during refuelling must be cleaned up, reported and contaminated materials must be disposed of appropriately. Fuel must never be dispelled or deposited into the environment or any water body.
- 51) Any required cleaning of tools and equipment should be done off-site. If it must be on-site, it must be in an appropriate area at least 30m from a waterbody.
- 52) Gas generators must be secured to prevent movement during the operation and set up on an impermeable fuel mat with a berm or within a container that can contain 110% of the volume of fuel in the generator.

Demolition:

- 1) Prior to commencement of demolition activities, all structures must be surveyed by experienced personnel from within or approved by Parks Canada for the presence of wildlife (e.g., roosting bats, nests, dens). Should wildlife be discovered, work will cease in the immediate area and designated Parks Canada staff contacted for further direction.
- 2) Prior to commencement of demolition activities, water and septic systems, lines and/or fields must be identified and precautions taken during the operation of heavy equipment to avoid damaging them.
- 3) Residual septic systems, water lines and wells of no further use must be removed, capped or decommissioned according to the appropriate federal or provincial legislation.
- 4) If undocumented contamination is found, cease work immediately and contact designated Parks Canada staff.
- 5) Consult with designated Parks Canada staff to determine whether full excavation and removal of all subsurface infrastructure (e.g., pipes, cement structures, wires) is required. Backfill any excavation with clean, weed-free topsoil.
- 6) Ensure wastes from demolition activities do not enter waterbodies (e.g., use tarps to capture debris). Any waste that does fall into a waterbody will be immediately retrieved, provided worker safety is not compromised, and if removal can be done without excessive disturbance of bottom sediment.

Site Clean-up and Waste Management:

- 7) All wildlife attractants must be secured (e.g., petroleum products, human food, recyclable drink containers and garbage) in wildlife-proof containers, a secure building or vehicle. When possible, keep food waste separate from construction waste and remove daily.
- 8) All salvageable, non-combustible and non-hazardous materials will be removed, reused and recycled to the greatest extent possible. Remaining material considered to be waste and demolition debris is to be disposed of at an approved disposal facility.

- 9) Secure all materials (e.g., construction waste and materials, excavation, vegetation) above the high water mark of nearby waterbodies and ensure wastes do not enter waterbodies (e.g., use tarps to capture debris). Any waste that does fall into a waterbody will be immediately retrieved, provided worker safety is not compromised, and if removal can be done without excessive disturbance of bottom sediment.
- 10) Contain wastes and transport to an approved waste landfill site outside the Parks Canada site unless otherwise directed; cover waste loads during transportation.
- 11) Any hazardous material (e.g. asphalt shingles, creosote treated wood, asbestos, lead paint, moulds, animal excrement, paints, automotive products, electrical equipment) and pollutants such as fuels and solvents found on-site will be separated and disposed of contaminated materials at provincially or territorially certified disposal sites.
- 12) All construction materials must be removed from the site on project completion. Burning or burying is not permitted unless approved by Parks Canada.
- 13) Concrete mixing activities must take place over tarps and a minimum of 30 meters from waterbodies. Fresh, wet, uncured concrete and concrete dust must not come into contact with waterbodies. Secondary containment measures such as collection/drip trays and berms lined with air and water-tight material such as plastic and a layer of sand, and double-lined fuel tanks are required.
- 14) Excess concrete must be disposed of at an appropriate facility outside of the Parks Canada protected heritage place. If excess concrete from pump trucks must be dumped prior to transport outside the protected heritage place, it must be deposited in a location approved by Parks Canada and removed following hardening for disposal at an approved facility.
- 15) If present, portable sanitary facilities must be serviced on a regular basis and accumulated waste disposed of at a sanitary waste disposal facility. The portable facilities must have sufficient capacity and be managed to ensure waste is not discharged to the receiving environment.

Spill Response Plans and Hazardous Material Management:

- 16) A Spill Response Plan should be developed prior to work starting.
- 17) Ensure that all on-site workers receive a briefing about the Spill Response Plan and are aware of the location and use of spill kits and containment devices.
- 18) Follow all applicable regulations and codes for the management and handling of hazardous waste.
- 19) Spill containment equipment must be present on-site. A spill contingency response kit including sorbent material and berms to contain 110% of the largest possible spill related to the work must be available on site at each location of potential spills (sites where equipment is working and at refuelling, lubrication, and repair locations).
- 20) All spills must be contained and cleaned-up as soon as it is possible to safely do so. In the event of a major spill, all other work must stop until the spill has been adequately contained and cleaned up.
- 21) Notify the designated Parks Canada staff and the emergency contact immediately of any spill. In the event of a major spill, call the first contact authority.
- 22) Contaminants must be recovered at the source and disposed of according to applicable laws, policies and regulations. The site will be inspected by Parks Canada staff to ensure completion to expected standards.
- 23) Petrochemical products, paints and chemicals must be used and stored in such a way as to prevent any deleterious substances from entering the water.

- 24) If hazardous waste or potentially contaminated material is uncovered during excavation / construction, work must stop and excavated materials must be secured onsite in a manner that prevents contamination of the surrounding environment, including leaching. The designated Parks Canada staff must be contacted for further direction.

Trenching and Excavation:

- 25) Erosion control measures that prevent sediment transport into any waterway, water body or wetland shall be implemented.
- 26) Select erosion and sediment control measures that correspond with the nature and duration of the project and they must be installed before starting work, especially within 30 meters of a waterbody.
- 27) Regularly inspect and maintain erosion and sediment control structures during all phases of the project and alter measures when necessary.
- 28) Use erosion and sediment control products made of 100% biodegradable materials (e.g., jute, sisal or coir fibre) when possible. Ensure backing materials are also biodegradable.
- 29) Use of hay or straw in erosion and sediment control must be approved by designated Parks Canada staff.
- 30) Use sediment and erosion control products that reduce potential for wildlife entanglement⁴ when possible. These options include:
- a) Net-less erosion control blankets made of excelsior or loose mulch and unreinforced silt fences.
 - b) Netting with a loose-weave wildlife safe design.
- 31) Limit duration of soil exposure; phase activities whenever possible and restore disturbed areas as soon as possible.
- 32) Avoid equipment operation on steep or unstable slopes unless absolutely necessary.
- 33) Manage water flowing onto the site as appropriate for the project:
- a) Divert uplands surface runoff away from exposed areas.
 - b) Filter water being pumped/diverted from the site; silt-laden water must not be pumped directly into a waterbody (e.g., pump/divert water to a vegetated area 30 meters from the waterbody, a constructed settling basin or other filtration system).
 - c) Minimize slope length and gradients of disturbed areas.
 - d) Cover erodible soils with mulch, vegetation, or rip rap.
 - e) Construct check dams or similar devices in constructed swales and ditches.
- 34) Any trenches to be dug for services e.g., electrical lines, must follow an existing “right of way” as much as possible.
- 35) Topsoil separation is required; stockpile topsoil away from subsoil and spoil material and above the high water mark or top of bank of nearby waterbodies and ensuring sediment re-entry to the watercourse is prevented.
- 36) Stockpiled material must not be permitted to damage or bury known cultural resources.
- 37) Reuse excavated material on site, unless there are any indicators of potential contamination.
- 38) Excavations must be drained (but not directly into a waterbody), backfilled and compacted as soon as possible.

⁴ Source: http://www.coastal.ca.gov/nps/Wildlife-Friendly_Products.pdf

- 39) Under thawed conditions, backfill material will be compacted prior to topsoil replacement; distribute topsoil over the excavated area.
- 40) Under frozen ground conditions, material will be sufficiently spread over the excavated site to allow for a settlement under thawed conditions
- 41) Re-vegetation must be undertaken in consultation with designated Parks Canada staff.
- 42) Maintain effective sediment and erosion control measures until any required re-vegetation of disturbed areas is achieved.
- 43) Remove temporary erosion and sediment control products, especially non-biodegradable materials, when they are no longer required.

Supplementary Mitigations

- 44) In the application of PRIAs, a few supplementary mitigation(s) may be required to ensure all potential impacts are mitigated. Include any site-specific mitigation measures here.

Approvals

Julia Tompa
Director, Natural Resource Management Branch

Date

Kalvin Mercer
Director, Asset Management and Project Delivery Branch

Date

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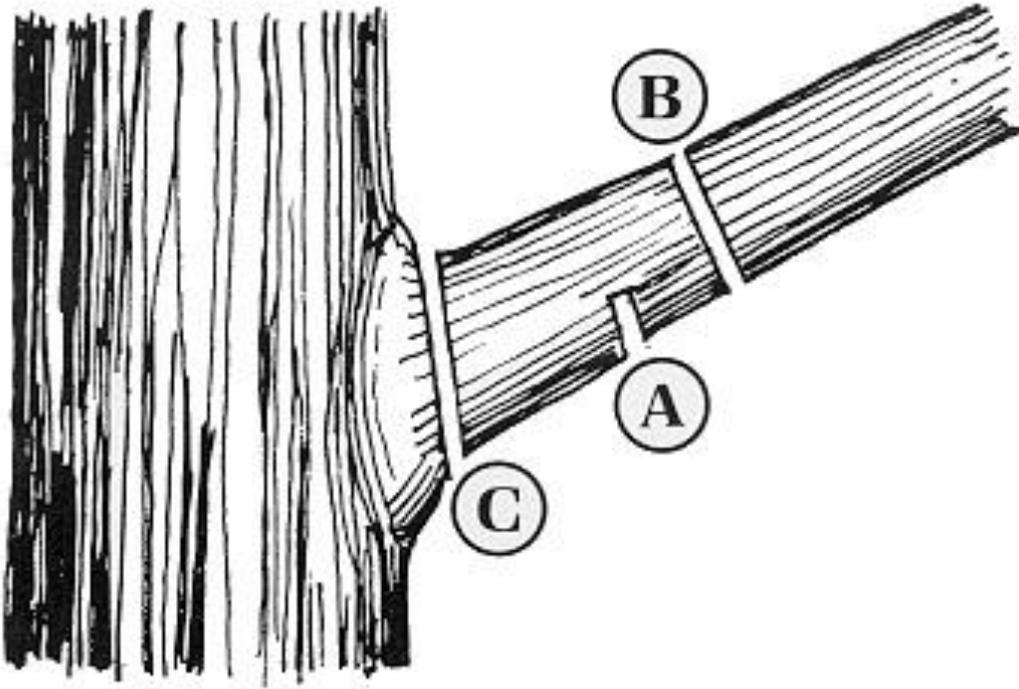
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Parks Canada. 2017. *National Best Management Practices for Common Activities.*

Appendix A – Proper Pruning Method



To find the proper place to cut a branch, look for the branch collar, an often visible swelling that forms at the base of a branch where it is attached to its parent branch or to the tree's trunk. On the upper surface, there is usually a branch bark ridge that runs (more or less) parallel to the branch angle, along the stem of the tree. A proper pruning cut does not damage either the branch bark ridge or the branch collar.

A – The first cut is a shallow undercut to prevent bark tearing.

B – The second cut completely removes the limb.

C- The third cut removes the stub and is cut flush with the branch collar



Évaluation d'impact courante préapprouvée Sites dans l'avant-pays

Bureau national de Parcs Canada
Loi sur l'évaluation d'impact 2019

Les Évaluations d'Impact Courantes Préapprouvées (EICP) sont des mesures prédéterminées de gestion de l'environnement et d'atténuation qui s'appliquent à une catégorie définie d'activités ou de projets courants et répétitifs dont les effets sont bien compris et prévisibles. Les EICP sont un mécanisme d'évaluation d'impact acceptable, car elles permettent à Parcs Canada de satisfaire aux exigences de la *Loi sur l'évaluation d'impact* (LEI) en tant que gestionnaire de territoire domaniale.

La présente EICP s'applique à la modification, à l'entretien, à la réparation, au remplacement, à la désaffectation et à l'abandon de bâtiments ou autres structures sur des parcelles aménagées accessibles par route au sein d'un lieu historique national, y compris les canaux historiques, ou dans tout secteur d'un parc national qui fait partie de la zone IV ou de la zone V, conformément au zonage du plan directeur du site.

La construction ou l'agrandissement des bâtiments et de terrains de stationnement sortent du cadre de la présente EICP. Cependant, l'installation des autres structures est permise.

Bâtiments et autres structures : Installations englobant notamment les terrains de jeux, les bureaux du personnel, les installations sanitaires (p. ex. toilettes sèches, toilettes à chasse, douches), les conduites de services, les aménagements des points de départ de sentiers, les abris-cuisines, les kiosques et les logements du personnel ainsi que les remises d'entreposage. Des exemples de **d'autres structures** qui cadrent avec le champ d'application de cette EICP sont : trottoirs, promenades, allées piétonnes, clôtures, rampes, points de recharge des véhicules électriques, passerelles pour piétons de classe B, génératrices, expositions d'interprétation, foyers ou monuments.

Conduite de services : Canalisation installée sous la terre ou en surface pour l'eau, les eaux usées sanitaires, les eaux pluviales, le gaz naturel, l'électricité et les télécommunications. Les conduites de services publics (eau, eaux usées sanitaires, eaux pluviales, gaz naturel) sont généralement situées sous la chaussée des routes.

Parcelle aménagée : Parcelle naturelle modifiée en permanence pour un usage humain ou transformée en espace paysager et entretenue pour un usage humain.

Agrandissement : Augmentation des dimensions extérieures ou de la capacité de production d'un ouvrage.

Plan d'eau : Lacs, canaux, réservoirs, océans, rivières et de leurs affluents ainsi que les terres humides, s'étendant jusqu'à la laisse ou limite annuelle des hautes eaux —, à l'exclusion des étangs de traitement des eaux usées ou des déchets, des étangs de résidus miniers ainsi que des réservoirs d'irrigation artificiels, des étangs-réservoirs et des fossés qui ne contiennent pas d'habitat du poisson au sens du paragraphe 2(1) de la *Loi sur les pêches*.

Ligne naturelle des hautes eaux : Niveau habituel ou moyen auquel s'élève un plan d'eau à son point culminant et auquel il reste pendant un délai suffisant pour laisser une trace sur le sol (Pêches et Océans Canada, 2015). L'expression *Limite supérieure du niveau des eaux contrôlées* est employée pour définir la ligne naturelle des hautes eaux dans les voies navigables gérées.

Champ d'application :	<p>La présente EICP vise les projets suivants :</p> <p><u>Bâtiments, autres structures et conduites de services</u></p> <ul style="list-style-type: none">• Modification, entretien, réparation, remplacement, désaffectation ou abandon de bâtiments.• Installation, modification, entretien, réparation, remplacement, désaffectation ou abandon d'autres structures• Construction, installation, entretien, réparation, désaffectation ou abandon de trottoirs (de béton ou de bois), de clôtures ou de garde-fous.• Entretien, réparation, remplacement, réhabilitation, désaffectation ou abandon de conduites de services existantes.• Construction ou enfouissement de lignes de transport d'électricité.
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Conditions et exceptions :	<p>La présente EICP ne s'applique pas dans le cas des exceptions / conditions suivantes :</p> <p>Emplacement :</p> <ul style="list-style-type: none">• dans l'arrière-pays ou dans les zones I, II et III;• lorsque le projet entraîne des effets négatifs résiduels sur des ressources naturelles ou culturelles sensibles (p. ex. nids, terriers et dortoirs, frayères de poissons, herbiers de zostère, ressources culturelles, habitat essentiel ou résidence d'espèces en péril, zones riveraines, corridors fauniques, écotypes rares ou secteurs préoccupants pour la gestion); <p>Bâtiments, autres structures et conduites de services :</p> <ul style="list-style-type: none">• ouvrage qui modifie la vocation ou la fonction de l'ouvrage physique ou en prévoit l'agrandissement• ouvrages qui se traduisent par une capacité d'accueil accrue• le projet ne vise pas les bâtiments et/ou les structures historiques ou encore les ressources archéologiques connues ou existantes, à moins que les travaux n'aient pas été approuvés au préalable par un conseiller en gestion des ressources culturelles ou un archéologue de Parcs Canada. <p>Pour les projets de modification, réparation, remplacement, démantèlement ou abandon :</p> <ul style="list-style-type: none">• implique l'installation ou la modification d'un champ d'épuration• implique la coupe ou l'abattage d'arbres à l'aide d'équipements lourds (débusqueurs, abatteurs, excavateurs, etc.).
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	<p>Généralité :</p> <ul style="list-style-type: none"> • Le projet modifie en permanence les caractéristiques d'un plan d'eau (p. ex. température, pH, turbidité, débit, niveau d'eau, lit du plan d'eau). <ul style="list-style-type: none"> ○ Il pourrait s'agir notamment du dépôt temporaire ou permanent de remblai dans le plan d'eau ; de l'accroissement permanent de l'empreinte d'un ouvrage sous la ligne naturelle des hautes eaux ; de travaux de dragage ou de la construction d'un canal de dérivation permanent. • Le projet a des effets négatifs résiduels sur les oiseaux migrateurs ou leurs nids. <ul style="list-style-type: none"> ○ Consulter l'ébauche sur l'<i>Orientation de Parcs Canada sur la réduction des risques pour les oiseaux migrateurs</i> et l'ébauche des <i>Mesures de conservation visant à minimiser les impacts sur les oiseaux migrateurs pendant la période de nidification</i>. • Le projet a des effets négatifs résiduels sur un individu, une résidence ou l'habitat essentiel d'une espèce inscrite à la <i>Loi sur les espèces en péril</i>. <ul style="list-style-type: none"> ○ Déterminer si des mesures d'atténuation sont nécessaires pour éviter les effets négatifs résiduels sur les espèces en péril. Ces mesures d'atténuation devraient être incluses dans la section Mesures d'atténuations supplémentaires. • Le projet devra probablement faire l'objet d'une approbation¹ en vertu de la <i>Loi sur les eaux navigables canadiennes</i> [par. 5(1)]. • Le projet devra probablement faire l'objet d'une autorisation² en vertu de la <i>Loi sur les pêches</i> [par. 35(1) ou 36(3)]. • Le projet entraîne la perte ou une diminution de superficie d'un milieu humide. • Le projet inclut l'enlèvement ou l'endommagement de ressources culturelles revêtant une valeur patrimoniale, par exemple des bâtiments patrimoniaux désignés par le Bureau d'examen des édifices fédéraux du patrimoine, des sites archéologiques, des objets historiques ou archéologiques ou des paysages culturels. • Le projet inclut l'enlèvement ou l'endommagement de ressources paléontologiques. • Le projet a des incidences négatives sur des sites importants pour les peuples autochtones, sur l'accès et l'utilisation des sites où les peuples autochtones exercent leurs droits de chasse, de pêche ou de cueillette.
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¹ Vérifier si le projet est un ouvrage majeur dans une eau navigable ou un ouvrage dans des eaux navigables figurant à l'annexe: <https://www.tc.gc.ca/fra/programmes-623.html>

² Vérifiez si votre projet doit être soumis à un examen : <http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-003-fra.html>

Autres facteurs à considérer :	L'utilisation de l'EICP peut ne pas être appropriée dans des circonstances telles que : <ul style="list-style-type: none"> le projet est réalisé dans un milieu instable qui pourrait nuire au bâtiment, autre structure ou conduite de services, par exemple une zone sujette aux glissements de terrain, une plaine, une zone vulnérable aux ondes de tempête et à l'élévation du niveau de la mer ou est réalisé sur des parcelles naturelles qui n'ont jamais été aménagées.
Zones géographiques approuvées pour l'application :	La présente EICP peut être appliquée à des parcelles aménagées qui sont accessibles par la route dans un lieu historique national, y compris dans un canal historique, ou dans tout secteur d'un parc national qui fait partie de la zone IV ou de la zone V, conformément au zonage du plan directeur.
Spécialistes de Parcs Canada	<p><u>Évaluation d'impact :</u> Pour toute question liée à l'application de la présente EICP, prière de consulter un membre de l'équipe de l'évaluation d'impact.</p> <p><u>Espèces en péril :</u> En cas de doute concernant les potentiels effets négatifs sur les espèces en péril, prière de consulter un membre de l'équipe de conservation des espèces.</p> <p><u>Gestion de l'environnement :</u> Pour toute question liée à la gestion de l'environnement (p. ex. bois traité, sites contaminés, matières dangereuses ou opérations d'écologisation), prière de consulter un membre de l'équipe de gestion de l'environnement.</p> <p><u>Ressources culturelles :</u> En cas de doute concernant les potentiels effets négatifs sur des ressources culturelles connues ou potentielles, prière de consulter un membre de l'équipe de gestion et protection des ressources culturelles ou, s'il y a lieu, le spécialiste local de l'unité de gestion.</p>

Composantes valorisées et analyse des effets

Sol et ressources terrestres	<ul style="list-style-type: none"> Contamination du sol par des déchets (p. ex. ordures, détritiques, eaux usées, carburant) Agrandissement de l'empreinte de perturbation Compactage du sol et formation d'ornières Érosion du sol, perte de la couche arable et exposition du sous-sol Modification des pentes, du relief et du paysage
Qualité de l'air et bruit	<ul style="list-style-type: none"> Diminution temporaire de la qualité de l'air ambiant (p. ex. poussière, émissions de la machinerie) Accroissement du niveau de bruit ambiant
Qualité de l'eau	<ul style="list-style-type: none"> Réduction de la qualité de l'eau due au transport des débris et à la contamination (p. ex. fuites et déversements accidentels) Changement localisé de l'hydrologie de l'eau de surface
Faune et végétation	<ul style="list-style-type: none"> Accoutumance/attraction de la faune pour des sources de nourriture artificielles Déplacements fauniques entravés/modifiés Destruction ou altération de l'habitat

	<ul style="list-style-type: none"> • Mortalité causée par les activités du projet • Introduction d'espèces envahissantes ou essor de populations existantes • Endommagement ou enlèvement de la végétation, perturbations causées aux aires naturelles adjacentes, exposition des racines et détresse physiologique
Expérience du visiteur et sécurité publique	<ul style="list-style-type: none"> • Appauvrissement de la qualité de l'expérience du visiteur en raison du bruit et de la présence de matériel de chantier • Accès restreint aux parties du chantier où les travaux ont lieu • Dangers pour les visiteurs et le personnel en raison des activités de construction
Ressources culturelles	<ul style="list-style-type: none"> • Effets négatifs sur la valeur patrimoniale ou les éléments caractéristiques d'une ressource culturelle ou d'un lieu patrimonial • Déplacement ou destruction de ressources archéologiques (connues ou potentielles) entraînant une perte de valeur patrimoniale • Effets sur des paysages culturels, des bâtiments, des objets ou des ouvrages de génie

Mesures d'atténuation

Planification préalable au projet :

- 1) Les travaux à proximité des plans d'eau ou les zones humides nécessiteront d'un plan de contrôle de l'érosion et des sédiments spécifique au site.
- 2) Planifier les opérations de façon à éviter les périodes humides, venteuses et pluvieuses ou les périodes de sécheresse pouvant favoriser l'érosion et la sédimentation.
- 3) Définir clairement les caractéristiques environnementales et les habitats sensibles du chantier et les éviter, et établir le calendrier des travaux de manière à éviter les périodes critiques du cycle biologique de la faune. Au besoin, remplir le tableau des périodes cruciales sur le plan de l'environnement.
- 4) Travailler avec un conseiller en gestion des ressources culturelles et des spécialistes de la gestion des ressources culturelles (archéologues, historiens et conseillers en patrimoine bâti) afin d'évaluer les effets d'une intervention sur les ressources culturelles et de définir les mesures d'atténuation nécessaires.
- 5) Avant le début des travaux, élaborer un plan d'intervention en cas de déversement.
- 6) Manipuler, installer et éliminer le bois traité conformément aux directives en vigueur de Parcs Canada. L'utilisation du bois traité fait l'objet de restrictions selon l'agent de préservation utilisé, le genre d'usage qui en est fait et l'environnement récepteur. Consulter les [normes et les lignes directrices de l'Agence Parcs Canada](#).

Exemple : Tableau des périodes cruciales sur le plan de l'environnement-

Parc National Jasper du Canada

	Janv.	Févr.	Mars	Avr.	Mai	Juin	Juil.	Août	Sept.	Oct.	Nov.	Déc.
Oiseaux	Moindre risque de nuire aux oiseaux			ÉVITER D'ENLEVER LA VÉGÉTATION Période de nidification des oiseaux : 19 avril au 24 août				Moindre risque de nuire aux oiseaux				
Chauves-souris	Chauves-souris présentes dans les hibernacula			Période de croissance des bébés chauves-souris : 15 avril au 1 ^{er} septembre						Chauves-souris présentes dans les hibernacula		

Conditions propres au chantier/à l'aire de rassemblement/à l'aire de stockage :

- 7) Identifier les personnes-ressources clés, définir leurs responsabilités et leurs rôles respectifs et communiquer cette information à l'ensemble des travailleurs sur place avant le début des travaux.
- 8) Veiller à ce que les personnes affectées au projet/aux activités passent en revue les mesures d'atténuation et les considérations propres au chantier avec le personnel désigné de Parcs Canada avant le début des travaux.
- 9) Délimiter clairement le chantier et les zones d'accès restreint à l'aide de piquets, de ruban de signalisation biodégradable ou d'un autre moyen afin de réduire au minimum l'empreinte perturbée ; enlever les repères une fois le projet terminé.
- 10) Délimiter les aires de rassemblement, les aires de dépôt du matériel/équipement et les aires de stationnement au sein d'une empreinte perturbée existante (p. ex. route, surface en gravier, aire déjà perturbée à forte résilience) ou les faire approuver par le personnel désigné de Parcs Canada.
- 11) Pour accéder au chantier, s'y déplacer et y exécuter les travaux de construction, utiliser des routes ou des sentiers existants, des aires déjà perturbées ou d'autres aires approuvées par le personnel désigné de Parcs Canada.

Gestion de la faune :

- 12) Si possible, enlevez la végétation en dehors de la période de reproduction des oiseaux et de la saison de la maternité des chauves-souris.
- 13) Veiller à ce que les travailleurs sur place reçoivent toute formation requise sur la sensibilisation à la faune, conformément à la politique de l'unité de gestion.
- 14) Sensibiliser les travailleurs sur place aux espèces en péril et s'assurer que, par la suite, ils signalent immédiatement toute observation fortuite au personnel désigné de Parcs Canada.
- 15) En cas de découverte de nids, de terriers ou de dortoirs actifs, arrêter les travaux et communiquer immédiatement avec le personnel désigné de Parcs Canada afin d'obtenir des directives.
- 16) Dans la mesure du possible, réaliser les activités pendant les heures de clarté, afin d'éviter les périodes cruciales de recherche de nourriture (crépuscule et aube). Consulter le personnel de Parcs Canada pour obtenir des conseils propres au chantier.
- 17) Réduire au minimum la période pendant laquelle les trous creusés restent à ciel ouvert et les recouvrir ou les clôturer avant de les laisser sans surveillance, afin de réduire les risques de blessures des animaux.
- 18) Ne jamais s'approcher d'un animal sauvage ou le harceler (p. ex. le nourrir, l'appâter ou l'attirer). Si des animaux sauvages sont observés à l'intérieur ou à proximité du chantier, leur donner la possibilité de quitter les lieux.

- 19) Informer immédiatement le personnel désigné de Parcs Canada de tout conflit possible (p. ex. comportement agressif ou intrusion persistante), de tout signe de détresse ou de toute mortalité.

Végétation :

- 20) Signaler toutes les activités d'enlèvement de la végétation et en faire approuver les plans au préalable par le personnel désigné de Parcs Canada.
- 21) Enlever le moins de végétation possible ; n'abattre des arbres que s'il est indispensable de le faire pour mener à bien le projet ou pour assurer la sécurité des visiteurs ou du personnel.
- 22) Pendant les travaux d'abattage des arbres, prendre toutes les précautions nécessaires pour limiter le plus possible les dommages causés à la végétation environnante.
- 23) Éviter autant que possible d'abattre les arbres manifestement utilisés par la faune (p. ex. chicots comportant des cavités de nidification, grands arbres abritant des nids de branches) ; si l'abattage est inévitable, consulter le personnel de Parcs Canada et obtenir son approbation.
- 24) Tout le bois coupé appartient à Parcs Canada ; consulter le personnel désigné de Parcs Canada pour connaître les méthodes de coupe appropriées, de même que les moyens d'utiliser et d'éliminer le bois coupé et les autres matières ligneuses.
- 25) Employer des techniques d'élagage qui réduisent le plus possible les risques de déchirement de l'écorce et d'endommagement de l'arbre ; veiller à ne retirer que le tissu de la branche et à laisser la tige ou le tronc indemne (voir l'annexe 1).
- 26) Protéger les racines des arbres jusqu'à la périphérie du feuillage pour éviter les perturbations et les dommages. Éviter de circuler ainsi que de décharger ou d'entreposer des matériaux au-dessus du réseau racinaire.
- 27) Conserver une zone tampon végétalisée de 15 à 30 m à partir de la ligne naturelle des hautes eaux des plans d'eau environnants. Sur les terrains en pente, accroître la largeur des zones tampons au fur et à mesure que la pente augmente.
- 28) Restreindre les travaux d'enlèvement de la végétation riveraine au strict minimum nécessaire. Préserver la structure et la stabilité des racines.
- 29) S'il faut reverdir le chantier, utiliser un mélange de plantes, de terre et de graines indigènes approuvé par le personnel désigné de Parcs Canada.

Espèces exotiques envahissantes :

- 30) Tous les équipements de construction provenant de l'extérieur du site doivent être lavés à l'extérieur du lieu patrimonial protégé avant l'arrivée afin de minimiser les risques d'introduction d'espèces envahissantes. La preuve que cette mesure d'atténuation a été appliquée peut être demandée avant que l'équipement ne soit autorisé à pénétrer dans le lieu patrimonial protégé.
- 31) Si les espèces envahissantes représentent un problème grave, envisager des méthodes de nettoyage plus efficaces, telles qu'une pompe et un tuyau à haute pression ou une pompe à eau à haute pression.
- 32) Travailler dans des zones non infestées avant de passer aux zones infestées.
- 33) Faire approuver par le personnel désigné de Parcs Canada la terre, le gravier, le bois de construction non traité, les produits de lutte contre l'érosion et la sédimentation ou les autres matériaux applicables provenant de l'extérieur du lieu patrimonial protégé.
- 34) Ne pas utiliser les matières organiques (p. ex. couche arable, matériaux d'emprunt et de remblai, gravier) prélevées sur le chantier de construction dans d'autres parties du lieu patrimonial protégé, à moins d'obtenir l'approbation du personnel désigné de Parcs Canada.

- 35) Réduire au minimum la surface de sol perturbée, les travaux d'enlèvement de la végétation et la superficie du sol exposé (p. ex. recouvrir les matériaux stockés des bâches, planter des espèces indigènes, couvrir avec du paillis naturel/des couvre-sols).
- 36) Stabiliser et reverdir les parcelles perturbées le plus rapidement possible. Si la saison de croissance est trop avancée, stabiliser le sol pour prévenir l'érosion et reverdir le printemps suivant.
- 37) Surveiller les parcelles perturbées et reverdies jusqu'à ce que la végétation indigène y ait repoussé et que la propagation d'espèces exotiques envahissantes soit évitée.

Expérience du visiteur et sécurité publique :

- 38) Dans la mesure du possible, planifier les activités bruyantes de manière à ce qu'elles aient lieu en dehors de la saison touristique de pointe ou ajuster les heures de travaux bruyants à la quiétude des visiteurs qui fréquentent et utilisent les terrains de camping.
- 39) Fermer le chantier lorsque des activités de construction, de réparation ou d'entretien sont en cours et utiliser des panneaux appropriés pour le délimiter et pour signaler les dangers. Envisager des déviations ou des itinéraires de rechange temporaires, au besoin.
- 40) S'il n'est pas possible de fermer le secteur, maintenir une distance de travail sécuritaire entre les activités de construction et les visiteurs. S'il faut contrôler la circulation, affecter un signaleur à cette tâche dans le chantier ou la zone dangereuse.
- 41) Veiller à ce que les routes et sentiers d'accès des visiteurs en dehors du chantier soient exempts de matériaux, de déchets, de machinerie ou d'équipement de construction.

Ressources culturelles :

- 42) Le personnel désigné de Parcs Canada doit veiller à ce que les travailleurs sur place reçoivent une formation appropriée de sensibilisation aux ressources culturelles.
- 43) Éviter les ressources culturelles et les sites archéologiques connus ou potentiels.
- 44) Le cas échéant, appliquer toute mesure d'atténuation supplémentaire (voir la section Mesures d'atténuation supplémentaires) précédemment définie par un archéologue ou un conseiller en ressources culturelles de Parcs Canada pour le chantier.
- 45) En cas de découverte de ressources culturelles (c.-à-d. vestiges structuraux ou concentrations d'artefacts), cesser les travaux dans le secteur immédiat, sécuriser les lieux et communiquer avec le personnel désigné de Parcs Canada pour obtenir des directives supplémentaires.

Utilisation de l'équipement :

- 46) Dans la mesure du possible, utiliser de la machinerie à faible pression ou à chenilles de caoutchouc ou des tapis d'accès afin de réduire au minimum la perturbation et le compactage du sol.
- 47) Choisir l'équipement adapté à la nature du travail à exécuter (p. ex. éviter d'utiliser la machinerie lourde si des outils manuels ou de petites machines peuvent convenir).
- 48) Équiper de patins caoutchoutés la machinerie lourde utilisée sur des surfaces asphaltées ; réparer les dommages causés aux surfaces asphaltées de façon à les ramener à leur état original.
- 49) Avant l'arrivée sur le chantier, veiller à ce que l'équipement soit correctement réglé, propre et exempt de contaminants, en bon état de marche, exempt de fuites (p. ex. carburant, huile ou graisse) et doté de pare-étincelles et de dispositifs anti-émissions standards.
- 50) Ranger, entretenir et ravitailler la machinerie sur une surface plane, à l'extérieur de la périphérie du feuillage³ des arbres et au-dessus de la ligne naturelle des hautes eaux, de manière à empêcher

³ La surface définie par la circonférence du couvert végétal, là où l'eau s'égoutte sur le sol.

toute substance nocive de pénétrer dans l'eau. Élargir la zone tampon en fonction du niveau de risque et des conditions du chantier.

- 51) Effectuer le ravitaillement sur un tapis à carburant imperméable avec une berme ou à l'intérieur d'un contenant. Les fuites et les déversements occasionnés par le ravitaillement doivent être nettoyés et reportés et les matériaux contaminés éliminés de façon appropriée. Ne jamais déposer ou disperser le carburant dans l'environnement ou dans un plan d'eau.
- 52) Nettoyer les outils et l'équipement à l'extérieur du chantier. Si les travaux de nettoyage doivent être réalisés sur le chantier, le faire dans une zone appropriée à au moins 30 m de tout plan d'eau.
- 53) Assujettir les génératrices à essence pour les empêcher de bouger pendant qu'elles sont en marche et les installer sur un tapis à carburant imperméable avec une berme ou dans un contenant pouvant recevoir 110 % de leur volume de carburant.

Démolition :

- 54) Avant le début des activités de démolition, toutes les structures doivent être inspectées par du personnel expérimenté de Parcs Canada ou approuvé par Parcs Canada afin de détecter la présence d'animaux sauvages (p. ex., chauves-souris, nids, tanières). Si des animaux sauvages sont découverts, les travaux cesseront dans les environs immédiats et le personnel désigné de Parcs Canada sera contacté pour obtenir des instructions.
- 55) Avant le début des travaux de démolition, les systèmes hydrauliques et septiques, les conduites et / ou les champs doivent être identifiés et les précautions prises lors de l'utilisation d'équipements lourds pour éviter de les endommager.
- 56) Les fosses septiques résiduelles, les conduites d'eau et les puits inutilisables doivent être enlevés, scellés ou mis hors service conformément à la législation fédérale ou provinciale applicable.
- 57) En cas de contamination non documentée, cesser immédiatement les travaux et contacter le personnel désigné de Parcs Canada.
- 58) Consulter le personnel désigné de Parcs Canada pour déterminer si l'excavation complète et l'enlèvement de toutes les infrastructures souterraines (p. ex., conduites, structures en béton, câbles) sont nécessaires. Remblayez toute excavation avec de la terre végétale propre et sans mauvaises herbes.
- 59) Assurez-vous que les déchets issus des travaux de démolition ne pénètrent pas dans les plans d'eau (utilisez des bâches pour capturer les débris, par exemple). Tous les déchets qui tombent dans un plan d'eau seront immédiatement récupérés, à condition que la sécurité des travailleurs ne soit pas compromise et que l'élimination puisse être effectuée sans perturbation excessive des sédiments de fond.

Nettoyage du chantier et gestion des déchets :

- 60) Conserver dans un véhicule, un bâtiment sécurisé ou des contenants à l'épreuve de la faune tous les produits susceptibles d'attirer les animaux (p. ex. produits pétroliers, nourriture humaine, contenants de boissons recyclables et déchets). Dans la mesure du possible, séparer les déchets alimentaires des déchets de construction et les éliminer tous les jours.
- 61) Tous les matériaux récupérables, non combustibles et non dangereux seront enlevés, réutilisés et recyclés dans la mesure du possible. Les matériaux restants considérés comme des déchets et des débris de démolition doivent être éliminés dans une installation d'élimination agréée.
- 62) Sécuriser tous les déchets (p. ex. déchets et matériaux de construction, déblais, végétation) au-dessus de la ligne naturelle des hautes eaux et assurez-vous que les déchets ne pénètrent pas dans les plans d'eau (utilisez des bâches pour capturer les débris, par exemple). Tous les déchets qui

tombent dans un plan d'eau seront immédiatement récupérés, à condition que la sécurité des travailleurs ne soit pas compromise et que l'élimination puisse être effectuée sans perturbation excessive des sédiments de fond

- 63) Sauf indication contraire, confiner les déchets et les transporter vers un lieu d'enfouissement approuvé en dehors du site de Parcs Canada ; couvrir les déchets pendant le transport.
- 64) Toute matière dangereuse (par exemple, bardeaux d'asphalte, bois traité à la créosote, amiante, peinture au plomb, moisissures, excréments d'animaux, peintures, produits pour l'automobile, équipement électrique) et les polluants tels que carburants et solvants trouvés sur le site seront séparés et les matériaux seront éliminés sur des sites d'élimination certifiés par les provinces ou les territoires.
- 65) Éliminer les matières contaminées dans des décharges agréées par le gouvernement provincial ou territorial hors du site de Parcs Canada.
- 66) Retirer tous les matériaux de construction du chantier à la fin du projet. Éviter de les brûler ou d'enfouir, sauf si Parcs Canada l'autorise.
- 67) Mélanger le ciment sur des bâches à au moins 30 m de tout plan d'eau. Éviter que le ciment frais, mouillé et non durci de même que la poussière de béton n'entrent en contact avec les plans d'eau. Recourir à des mesures de confinement secondaire telles que des plateaux collecteurs/plateaux d'égouttage, des bermes revêtues de matériaux étanches à l'air et à l'eau comme du plastique et une couche de sable, et des réservoirs de carburant à double paroi.
- 68) Éliminer le ciment excédentaire dans une installation appropriée à l'extérieur du lieu patrimonial protégé de Parcs Canada. Si du ciment excédentaire contenu dans les bétonnières doit être déchargé avant son transport hors du lieu patrimonial protégé, le déposer à un endroit approuvé par Parcs Canada et l'en retirer après le durcissement en vue de son élimination dans une installation approuvée.
- 69) Le cas échéant, entretenir régulièrement les installations sanitaires portatives et éliminer les déchets accumulés dans une installation d'élimination appropriée. Les installations portatives doivent avoir une capacité suffisante et être gérées de façon à éviter que des déchets ne soient rejetés dans l'environnement récepteur.

Plans d'intervention en cas de déversement et gestion des matières dangereuses :

- 70) Veiller à ce que tous les travailleurs sur place reçoivent une séance d'information sur le plan d'intervention en cas de déversement et soient au courant de l'emplacement et du mode d'emploi des trousse d'intervention et des dispositifs de confinement.
- 71) Respecter tous les règlements et les codes applicables à la gestion et à la manipulation des déchets dangereux.
- 72) Veiller à ce qu'il y ait de l'équipement de confinement des déversements sur le chantier. Une trousse d'intervention d'urgence en cas de déversement, y compris des matériaux absorbants et des bermes pouvant contenir 110 % du plus grand déversement qui pourrait être associé aux travaux, doit être disponible à chaque lieu de déversement possible (lieux où l'équipement est en marche et points de ravitaillement, de lubrification et de réparation).
- 73) Confiner et nettoyer tous les déversements dès qu'il est possible de le faire sans danger. En cas de déversement majeur, cesser tous les autres travaux jusqu'à ce que le déversement ait été adéquatement confiné et nettoyé.

- 74) Signaler immédiatement tout déversement au personnel désigné de Parcs Canada et à la personne à contacter en cas d'urgence. En cas de déversement majeur, appeler la première personne-ressource.
- 75) Tout matériau considéré comme présentant un risque de contamination des sols, des eaux de surface ou des eaux souterraines doit être éliminé de manière appropriée hors site, conformément aux lois, politiques et réglementations en vigueur (consulter [l'équipe de gestion de l'environnement](#)).
- 76) Utiliser et ranger les produits pétrochimiques, la peinture et les produits chimiques de manière à empêcher toute substance nocive de pénétrer dans l'eau.
- 77) En cas de découverte de déchets dangereux ou de matières potentiellement contaminées pendant l'excavation/construction, interrompre les travaux et sécuriser les matières sur place de façon à prévenir la contamination du milieu environnant, y compris par lixiviation. Communiquer avec le personnel désigné de Parcs Canada pour obtenir d'autres instructions.

Creusement de tranchées et excavation :

- 78) Des mesures de lutte contre l'érosion empêchant le transport de sédiments dans tout plan d'eau ou zone humide doivent être installées.
- 79) Planifier les opérations de façon à éviter les périodes humides, venteuses et pluvieuses ou les périodes de sécheresse pouvant favoriser l'érosion et la sédimentation.
- 80) Choisir des mesures de lutte contre l'érosion et la sédimentation qui correspondent à la nature et à la durée du projet et les appliquer avant le début des travaux, en particulier si ceux-ci ont lieu à moins de 30 m d'un plan d'eau.
- 81) Inspecter et entretenir régulièrement les structures de lutte contre l'érosion et la sédimentation pendant toutes les phases du projet et modifier les mesures au besoin.
- 82) Utiliser des produits de lutte contre l'érosion et la sédimentation fabriqués avec des matériaux 100% biodégradables (p. ex. jute, sisal ou fibre de coco) dans la mesure du possible. Veiller à ce que les matériaux de soutien soient eux aussi biodégradables.
- 83) Faire approuver par le personnel désigné de Parcs Canada l'utilisation de paille ou de foin pour la lutte contre l'érosion et la sédimentation.

- 84) Dans la mesure du possible, utiliser des produits de lutte contre la sédimentation et l'érosion qui réduisent les risques d'enchevêtrement⁴ chez les animaux sauvages. Voici quelques options :
 - a) tapis anti-érosion sans filet fabriqués avec de la laine de bois ou du paillis non tassé et clôtures anti-érosion non renforcées;
 - b) filets lâches sans danger pour la faune.
- 85) Limiter la durée d'exposition du sol. Réaliser les activités par étapes dans la mesure du possible et remettre en état les parcelles perturbées dès que possible.
- 86) Éviter de faire fonctionner de la machinerie sur des pentes abruptes ou instables, à moins que ces travaux ne soient absolument indispensables.
- 87) Gérer l'écoulement de l'eau vers le chantier, selon ce qui est approprié pour le projet :

⁴ Source : https://www.coastal.ca.gov/nps/Wildlife-Friendly_Products.pdf (en anglais seulement)

- a) Détourner l'eau de ruissellement d'amont à l'écart des zones exposées.
 - b) Filtrer l'eau pompée/détournée. Éviter de pomper de l'eau chargée de limon directement dans un plan d'eau (p. ex. pomper/détourner l'eau vers une parcelle de verdure à au moins 30 m du plan d'eau, vers un bassin de décantation construit ou vers un autre système de filtration).
 - c) Réduire le plus possible la longueur et l'angle de la pente des parcelles perturbées.
 - d) Couvrir les sols susceptibles de s'éroder de paillis, de végétation ou de perrés.
 - e) Construire des barrages submersibles ou des dispositifs semblables dans les dépressions et les fossés construits.
- 88) Creuser les tranchées nécessaires à l'installation de conduites de services (p. ex. transport d'électricité) sur une « emprise » existante, dans la mesure du possible.
- 89) Contenir et stabiliser les déchets au-dessus de la ligne naturelle des hautes eaux afin de les empêcher de pénétrer dans un plan d'eau.
- 90) Séparer la terre végétale ; l'empiler à l'écart du sous-sol ou des déblais, au-dessus de la ligne naturelle des hautes eaux ou au-dessus de la berge des plans d'eau avoisinants et empêcher les sédiments de pénétrer de nouveau dans l'eau.
- 91) Éviter que les matériaux empilés n'endommagent ou n'ensevelissent les ressources culturelles connues.
- 92) Réutiliser sur place les matériaux de déblai, sauf en présence d'indicateurs d'une contamination possible.
- 93) Assécher les trous creusés (sans faire dévier l'eau directement dans un plan d'eau), les remblayer et compacter les matériaux de remblayage le plus rapidement possible.
- 94) Pendant les périodes de dégel, compacter les matériaux de remblayage avant la remise en place de la couche arable. Distribuer cette terre sur la parcelle excavée.
- 95) Sur les sols gelés, répartir les matériaux sur la parcelle excavée de manière à ce qu'ils se tassent au dégel.
- 96) Entreprendre le reverdissement après avoir consulté le personnel désigné de Parcs Canada.
- 97) Maintenir des mesures efficaces de lutte contre la sédimentation et l'érosion jusqu'à ce que toute revégétalisation requise des zones perturbées soit réalisée.
- 98) Retirer les produits temporaires de lutte contre l'érosion et la sédimentation, surtout les matériaux non biodégradables, dès qu'ils ne sont plus nécessaires.

Mesures d'atténuation supplémentaires

- 99) Quelques mesures d'atténuation supplémentaires peuvent être nécessaires pour s'assurer que tous les impacts potentiels sont atténués :

Approbaton

Version originale signée par Julie Tompa

13 décembre 2019

Julie Tompa

Date

Directrice, Direction de la gestion des ressources naturelles

Version originale signée par Calvin Mercer

9 décembre 2019

Kalvin Mercer

Date

Directeur exécutif, Gestion des actifs et Exécution de projets

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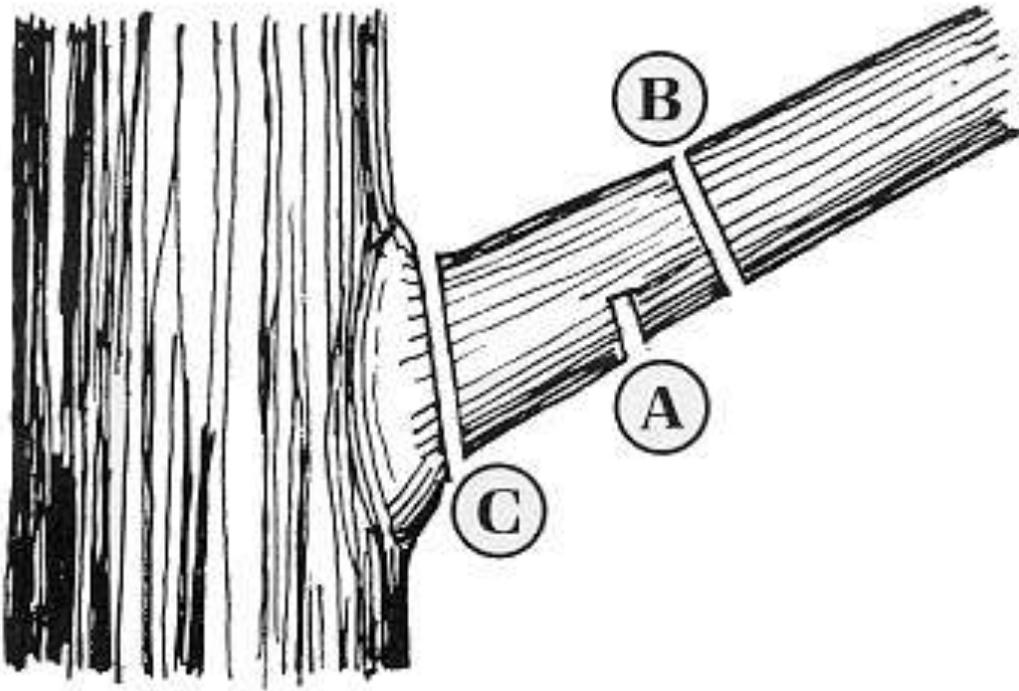
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Annexe A – Méthode d'élagage appropriée



Pour trouver le bon endroit où tailler une branche, chercher le collet de la branche, un renflement souvent visible qui se forme à la base d'une branche, là où elle s'attache à la branche principale ou au tronc de l'arbre. Sur la face supérieure de la branche, il y a habituellement une arête dans l'écorce qui court le long du tronc de l'arbre, plus ou moins parallèlement à l'angle de la branche. Une coupe d'élagage correcte n'endommage ni l'arête d'écorce ni le collet de la branche.

- A – La première coupe est une entaille de direction peu profonde afin d'éviter que l'écorce ne se déchire.
- B – La deuxième coupe retire complètement la branche.
- C – La troisième coupe retire le chicot et se situe au ras du collet de la branche.