Public Works and Government Services Canada

Requisition No. EZ899-162132/A

MERX I.D. No. _____

SPECIFICATIONS
For
Gitwangak Battle Hill Stair Replacement
Kitwanga, BC

Project No. R.076123.001 December 2015

PROVINCE OF BRITISH COLUMBIA
R. MASTSCHUCH
PROFESSIONAL ENGINEER
27198
DESIGNATED STRUCTURAL ENGINEER

18 DEC, 2015

APPROVED BY:

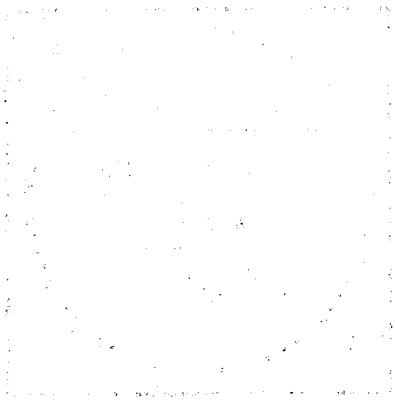
_____ 2016-01-07
Regional Manager, A&E Services Date

_____ 2016-01-07
Construction Safety Coordinator Date

TENDER:

_____ 15/01/07
Project Manager Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
#641 - 800 Burrard Street, Vancouver, B.C. V6Z 2V8



SPECIFICATIONS:

DRAWINGS:

Bound separately

APPENDICES:

1. Codes

.1 Perform work to CURRENT Codes, Construction Standards and Bylaws, including Amendments up to the TENDER closing date

2. Description of Work

.1 Work under this Contract covers a work on two staircases at the Gitwangak Battle Hill National Historic Site in Kitwanga, B.C.:

More exact locations of the staircases are shown on the key plan of the drawing S-1.

.2 Work to be performed under this Contract includes, but is not limited to, the following items covered further in the Contract documents:

.1 Replace with new and dispose out of site, the existing east and west staircases, east stair boardwalk and platform components - wood framing, wood guardrail, wood posts, steel grab rail, wire mesh guard, wire mesh anti-slip surface, aluminum anti-slip nosing, steel brackets and fasteners and connections of the staircases as shown on the drawings.

.2 Excavate for wood posts, install wood posts and backfill with original material.

.3 Install reinforced concrete footings and beams, as shown.

.4 Install pathway between staircases, as shown on drawing S-1.

.5 Retain services of testing agency for concrete mix design review and concrete testing per Section 033000 Cast in Place Concrete.

.6 Provide compaction report for pathway and its subbase per section 31 00 00.01 Earthwork.

.7 Retain a Qualified Environmental Professional (QP) for environmental protection scope of work (See Clauses 26 and 27).

.8 Retain services of geotechnical Engineer to review bearing conditions under concrete foundations and wood posts, as well as, review of the compaction reports for subbase and granular fill for the new gravel pathways and foundation/post backfill. Submit compaction reports and geotechnical review reports to Departmental Representative.

.9 Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from landfill.

.10 Coordinate archaeological investigation, analysis and monitoring with the consultant (Golder Associates) prior and during construction. Allow for longer excavation time due to the archaeological work.

3. Contract Documents

.1 The Contract documents, drawings and specifications are intended to complement each other, and to provide for and include everything necessary for the completion of the work.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

4. Division of Specifications

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

5. Time of Completion

.1 Complete the project, site ready for use within **12 weeks** after Contract Award.

.2 Although in-stream work in this project is not anticipated, contractor to be aware of the fact that all in-stream work must be completed in adherence with Fisheries and Oceans Canada general fisheries timing window for in-stream work in Skeena Region
http://www.env.gov.bc.ca/wsd/regions/ske/wateract/terms_conditions_skr.pdf

6. Work Schedule

.1 Carry on work as follows:

.1 Within 10 working days after Contract award, provide a "phasing bar chart" and a schedule showing anticipated progress stages and final completion of the work within the time period required by the Contract documents.

Indicate the following:

.1 Submission of shop drawings, product data, MSDS sheets and samples.

.2 Commencement and completion of work of each section of the specifications or trade for each phase as outlined.

.3 Final completion date within the time period required by the Contract documents.

.2 Do not change approved Schedule - without notifying Departmental Representative.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

7. Cost Breakdown

.1 Before submitting the first progress claim, submit a breakdown of the Contract lump sum prices in detail as directed by the Departmental Representative.

8. Codes, Bylaws, Standards

.1 Perform work in accordance with the National Building Code 2010 and other codes and standards listed in the technical sections of the contract documents, Construction Standards and/or any other Code or Bylaw of local application.

.2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.

.3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.

.4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

9. Documents Required

.1 Maintain 1 copy each of the following at the job site:
.1 Contract drawings.
.2 Contract specifications.
.3 Addenda to Contract documents.
.4 Copy of approved work schedule.
.5 Reviewed/approved shop drawings.
.6 Change orders.
.7 Other modifications to Contract.
.8 Field test reports.
.9 Reviewed/approved samples.

.10 Manufacturers' installation and application instructions.
.11 One set of record drawings and specifications for "as-built" purposes.
.12 NBC 2010
.13 Current construction standards of workmanship listed in technical Sections.
.14 Safety Plan.
.15 Any issued Permits.

10. Regulatory Requirements

.1 Obtain and pay for - Building Permit, Certificates, Licenses and other permits required by regulatory municipal, provincial or federal authorities to complete the work.

.2 Provide inspection authorities with plans and information required for issue of acceptance certificates.

.3 Furnish inspection certificates in evidence that the work installed conforms with the requirements of the authority having jurisdiction.

11. Contractor's Use of Site

.1 Use of site:
.1 Exclusive and complete for execution of work.
.2 Act as a Prime Contractor and assume responsibility for assigned premises for performance of this work.
.3 Be responsible for coordination of all work activities on site, including the work of other contractors engaged by the Departmental Representative.

.2 Perform work in accordance with Contract documents. Ensure work is carried out in accordance with indicated phasing.

.3 Do not unreasonably encumber site with material or equipment.

12. Examination

.1 Recommended is to examine site and be familiar and conversant with existing conditions likely to affect work.

.2 Recommended is to provide photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.

13. Existing Services

.1 Where work involves breaking into or connecting to existing services, carry out work at times directed by the authorities having jurisdiction.

14. Setting Out of Work

.1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Provide devices needed to lay out and construct work.

.3 Supply such devices as templates required to facilitate Departmental Representative's inspection of work.

15. Acceptance of Substrates

.1 Each trade shall examine surfaces prepared by others and job conditions which may affect his work, and shall report defects to the Departmental Representative. Commencement of work shall imply acceptance of prepared work or substrate surfaces.

16. Quality of Work

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 The workmanship, erection methods and procedures to meet minimum standards set out in the NBC 2010 and the Construction Standards listed in the contract documents.

.3 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

17. Works Coordination

.1 Coordinate work of subtrades:

.1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.

.2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.

.1 Provide each subcontractor with complete plans and specifications for Contract, to assist them in planning and carrying out their respective work.

.2 Develop coordination drawings when required, illustrating potential interference between work of various trades and distribute to affected parties.

.3 Facilitate meeting and review coordination drawings. Ensure subcontractors agree and sign off on drawings.

.4 Publish minutes of each meeting.

.5 Plan and coordinate work in such a way to minimize quantity of service line offsets.

.6 Submit copies of coordination drawings and meeting minutes to Departmental Representative for information purposes.

.3 Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

.4 Work cooperation:

.1 Ensure cooperation between trades in order to facilitate general progress of work and avoid situations of spatial interference.

.2 Ensure that each trade provides all other trades reasonable opportunity for completion of work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed work.

.3 Ensure disputes between subcontractors are resolved.

.5 Departmental Representative is not responsible for, or accountable for extra costs incurred as a result of Contractor's failure to coordinate work.

.6 Maintain efficient and continuous supervision.

18. Approval of Shop Drawings, Product Data and Samples

.1 In accordance with Section 013300, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.

.2 **Allow 2 weeks for the following:**

.1 Review of product data.
.2 Approval of shop drawings.
.3 Review of re-submission.
.4 Ordering of approved material and/or products - refer to Section 016110 Product Requirements and Sections of Divisions 02 to 31.

.5 Review of site specific safety plan.

19. Relics and Antiquities

.1 Relics and antiquities and items of historical or scientific interest shall remain property of Department. Protect such articles and request directives from Departmental Representative.

.2 Give immediate notice to Departmental Representative if evidence of archeological finds are encountered during excavation/construction, and await Departmental Representative's written instructions before proceeding with

work in this area.

.3 Allow for site monitoring by Archaeologist (Golder Associates Inc.) for excavation and any sensitive works, in accordance with Archaeological requirements and monitoring programs.

.4 Obtain and pay for any permits, if required by jurisdictions and recommended by RPCA. Coordinate with Archaeological consultant (Golder Associates Inc.). Send copy of approvals, permits and reports to Departmental Representative.

.5 Allow for site monitoring by First Nation, retain representative of First Nation if required, in parallel with the monitoring of the Archaeologist.

20 Project Meetings

.1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

21. Testing and Inspections

.1 Particular requirements for inspection and testing to be carried out by testing service or laboratory approved by the Departmental Representative are specified in the technical sections.

.2 The Contractor will appoint and pay for the services of testing agency or testing laboratory as specified, and where required for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Where tests or inspections by designated testing laboratory reveal work is not in accordance with the Contract requirements,
Contractor shall pay costs for additional tests or inspections as the Departmental Representative may require verification of acceptability of corrected work.

.4 The Contractor shall furnish labour and facilities to:

.1 Notify Departmental Representative in advance of planned testing.

.5 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.6 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.

.7 The Departmental Representative may require, and pay for, additional inspection and testing services not included in Paragraph 21.1.

.8 Provide Departmental Representative with testing laboratory reports in pdf format as soon as they are available.

.9 Ensure that work to be inspected is complete at the time of inspection and in accordance with the contract documents. Additional inspections required due to the incomplete work or poorly executed work, as judged by the departmental representative, as well as additional design or remedial work caused by deviations from these drawings, may be charged to the contractor.

.10 A minimum 72 hours' notice shall be given to the departmental representative by the contractor for any inspection to be carried out.

22. As-Built Documents

.1 The Departmental Representative will provide 2 sets of drawings, 2 sets of specifications, and 2 copies of the original AutoCAD files for "as-built" purposes.

.2 As work progresses, maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings and shop drawings as changes occur.

23. Cleaning

.1 Daily conduct cleaning and disposal operations. Comply with local ordinances and anti-pollution laws. Refer to Section 017411 – Cleaning.

.2 **Ensure cleanup of the work areas each day after completion of work.**

.3 Keep construction areas clean and continue cleaning on an as-needed basis until work in Section 2 is sufficiently completed or ready to be open to the public.

.4 In preparation for interim and final inspections:

.1 Examine all sight-exposed surfaces.
.2 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight surfaces.

24. General Requirements For Waste Management And Disposal

.1 All debris and deleterious substances generated during project activities shall be contained in the immediate work area, collected and appropriately disposed of in accordance with all applicable legislation, guidelines, and best management practices or as prescribed in the list of mitigation measures.

.2 At no time shall any waste material be allowed to enter any watercourse associated with the works.

.3 The Contractor/Operator shall be responsible for assuring that all reasonable efforts are implemented to eliminate or minimize waste production.

.4 At work sites and camping locations all food wastes and discarded food items shall be stored in closed, leak-proof storage containers that prevents access by wildlife. All material which can be recycled, such as paper and cardboard products, glass bottles and plastic and metal containers will be recycled where possible. The Contractor/Operator is responsible for the proper collection, storage and transportation of garbage and recyclable waste to disposal facilities.

.5 Open burning of waste is strictly prohibited, unless authorized by regulating bodies. For burning of untreated wood in metal containers, see Section 017411 – Cleaning.

25. Dust Control

.1 Provide temporary dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.

26. Environmental Protection

.1 Prevent extraneous materials from contaminating air beyond construction area, by providing temporary enclosures during work.

.2 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.

.3 Ensure proper disposal procedures in accordance with all applicable territorial regulations.

.4 As a minimum, adhere to Parks Canada regulations and guidelines for wildlife available online,

Living with Wildlife:
http://www.pc.gc.ca/eng/pn-np/bc/pacificrim/visit/visit9.aspx#cont

Bare Campsite Program:
http://www.pc.gc.ca/eng/pn-np/bc/glacier/visit/visit17.aspx

.5 Adhere to the Construction Environmental Management Plan prepared by the Qualified Environmental Professional (QP).

.6 Immediately report any spills of sediments, debris, concrete fines, wash or contact water of reportable quantities to the Provincial emergency program Environmental Emergency

management plan Incident Reporting hotline 1-800-663-3456

27. Mitigation Measures for Work in Streams

.1 Retain a Qualified Environmental Professional (QP) to provide a Construction Environmental Management Plan (CEMP) and Environmental and Construction Operations plan (ECO) for mitigation methods, timing, work plan and monitoring. Before commencing work, submit the CEMP and ECO plan and schedule to Departmental Representative for approval and issuance of permit. Follow any permit issued for the project, issued by provincial and federal environmental authorities. Submit regular monitoring reports to Departmental Representative during construction.

.2 The mitigation methods provided by QP shall include the following components, as required:

.1 Full time monitoring by QP during the in-stream work and sensitive activities

.2 Schedule of works to adhere to regional reduced risk timing windows to avoid works when species at risk are present

.3 Prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any other deleterious substance into water course or ravine

.4 Prevent release of concrete or cement into water course or ravine. Isolate cast-in-place concrete for min. 48 hours after pouring from water course or ravine.

.5 Emergency mitigation and clean-up measures.

.6 Isolation of work area from any flowing water.

.7 Salvage of fish and wildlife

.8 Erosion and sediment control

.9 Vegetation Management

.10 Site restorations

.11 Temporary diversions if applicable

.3 Immediately report any spills of sediments, debris, concrete fines, wash or contact water of reportable quantities to the Provincial emergency program Environmental Emergency management plan Incident Reporting hotline 1-800-663-3456 and DFO's Observe, Record and Report Hotline 1-800-465-4336. Implement emergency mitigation and clean-up measures.

28. Access, Delivery, Staging and Accommodation

.1 Approval from Parks Canada and Departmental Representative is required for access and delivery to the Gitwangak National Historic Site.

.2 Maintain for duration of Contract.

.3 Staging area is at the top of the site. If larger area for staging is required, contractor to contact Parks Canada.

.4 Accommodations and food for construction crew must be provided. Contractor to contact Parks Canada whether the camping is acceptable on site during the construction period.

29. Storage Facilities

.1 Storage space will be limited to the area of construction in the locations approved by Departmental Representative.

30. Power

.1 Electrical power and lighting is not available. Contractor is to provide his own source of power generators. Type and the locations to be approved by Departmental Representative.

31. Water Supply

.1 Fresh water supply is not available, contractor to provide his own supply of any water.

32. Sanitary Facilities

.1 Existence of washroom facilities are limited. Existing designated washroom facilities. Contractor is allowed to bring portable washrooms that shall be located in approved locations by Departmental Representative.

33. Scaffolding

.1 Construct and maintain scaffolding in rigid, secure and safe manner.

34. Hard Copy Drawings

.1 The Departmental Representative will furnish 2 sets of Contract documents for use by the Contractor at no cost. Should more than 2 sets of documents be required the Departmental Representative will provide them at additional cost.

35. Frequency of Payments

.1 Monthly progress payments will be used.

36. Familiarization with Site

.1 Before submitting tender, recommended is a site visit - as indicated in tender documents and become familiar with

all conditions likely to affect the cost of the work.

37. Submission of Tender

.1 Submission of a tender is deemed to be confirmation of the fact that the Tenderer has analyzed the Contract documents and inspected the site, and is fully conversant with all conditions.

END OF SECTION

1. Approvals

.1 Approval of shop drawings and samples: refer to Section 011155, Clause 18.

2. General

.1 This Section specifies general requirements and procedures for the Contractor's submissions of shop drawings, product data, samples and other requested submittals to Departmental Representative for review. Additional specific requirements for submissions are specified in individual technical sections.

.2 Present shop drawings, product data and samples in SI Metric units.

.3 Where items or information is not produced in SI Metric units, converted values are acceptable.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submissions.

.5 Notify Departmental Representatives in writing at time of submission, identifying deviations from requirements of Contract documents and stating reasons for deviations.

.6 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Departmental Representative's review of submission unless Departmental Representative gives written acceptance of specific deviations.

.7 Make any changes in submissions which Departmental Representative may require consistent with Contract documents and resubmit as directed by Departmental Representative.

.8 Notify Departmental Representatives in writing, when resubmitting, of any revisions other than those requested by Departmental Representative.

.9 Do not proceed with work until relevant submissions are reviewed and approved by the Departmental Representative.

3. Submission Requirements

.1 Coordinate each submission with the requirements of the work and the Contract documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow two weeks for Departmental Representative's review of

each submission, unless noted otherwise.

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

.4 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract documents.
- .5 Details of appropriate portions of work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions (including identified field dimensions) and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Selfweight.
  - .8 Relationship to adjacent work.

.5 After Departmental Representative's review, distribute copies.

4. Shop Drawings

.1 Shop drawings: original drawings or modified standard drawings provided by Contractor to illustrate details of portions of work which are specific to project requirements.

.2 Maximum sheet size: 850 x 1050 mm.

.3 Submit shop drawings in pdf format for each requirement requested in the specification sections and/or as requested by the Departmental Representative.

.4 Cross-reference shop drawing information to applicable portions of the Contract documents.

5. Shop Drawings Review

.1 Review of shop drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with the general concept.

.2 This review shall not mean that the Departmental Representative approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same.

.3 This review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and Contract documents.

.4 Without restricting the generality of the foregoing, the Contractor is responsible for:

.1 Dimensions to be confirmed and correlated at the job site.

.2 Information that pertains solely to fabrication processes or to techniques of construction and installation.

.3 Coordination of the work of all sub-trades.

6. Product Data

.1 Product data: manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other specified information.

.2 Delete information not applicable to project.

.3 Supplement standard information to provide details applicable to project.

.4 Cross-reference product data information to applicable portions of Contract documents.

.5 Submit 6 copies of product data.

7. Samples

.1 Samples of submissions are not required.

8. Progress Schedule

.1 Submit work schedule and cost breakdown as required in Section 011155.

9. Test Results and Inspection Reports

.1 Submit test results and inspection reports in pdf format required by the following Sections:

03 20 00 – Concrete Reinforcing
03 30 00 – Cast-in-Place Concrete
31 00 00.01 - Earthwork

END OF SECTION

1. References

.1 Government of Canada.
- .1 Canada Labour Code - Part II
- .2 Canada Occupational Health and Safety Regulations.

.2 National Building Code of Canada (NBC):
- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 Canadian Standards Association (CSA) as amended:
.1 CSA S269, Falsework for Construction Purposes
.2 CSA S269.2, Access Scaffolding for Construction
.3 CSA S350, Code of Practice for Safety in Demolition of Structures

.4 Fire Protection Engineering Services, HRSDC:
- .1 FCC No. 301, Standard for Construction Operations.
- .2 FCC No. 302, Standard for Welding and Cutting.

.5 American National Standards Institute (ANSI):
- .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

.6 Province of British Columbia::
- .1 Workers Compensation Act Part 3-Occupational Health and Safety.
- .2 Occupational Health and Safety Regulation

2. Related Sections

.1 Refer to the following sections as required:

.1	General Instructions	Section 01 11 55
.2	Shop Drawings, Product Data and Samples	Section 01 33 00
.3	Health & Safety Requirements	Section 01 35 33
.4	Product Requirements	Section 01 61 10
.5	Cleaning	Section 01 74 11
.6	Structure Demolition	Section 02 41 16
.7	Concrete Forming and Accessories	Section 03 10 00
.8	Concrete Reinforcing	Section 03 20 00
.9	Cast-in-Place Concrete	Section 03 30 00
.11	Rough Carpentry	Section 06 10 00
.12	Earthwork	Section 31 0000

3. Workers' Compensation Board Coverage

.1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

4. Compliance with Regulations

.1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

5. Submittals

.1 Submit to Departmental Representative submittals listed for review in accordance with Section 013300.

.2 Work effected by submittal shall not proceed until review is complete.

.3 Submit the following:

- .1 Health and Safety Plan.
- .2 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .3 Copies of incident and accident reports.
- .4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.4 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.

.5 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.

.6 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:

.1 Be construed to imply approval by the Departmental Representative.
.2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
.3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

6. Responsibility

.1 Act as a Prime Contractor and 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.

7. General Conditions

.1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.
.2 Secure site at night time as deemed necessary to protect site against entry.

8. Project/Site Conditions

.1 Refer to the drawing S-1 for project site locations and specific drawings for staircase locations. Refer to Section 011155 General Instruction for access and staging areas in order to develop Health and Safety Plan.

9. Regulatory Requirements

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

.2 In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

10. Work Permits

.1 Obtain specialty permits related to project before start of work.

11. Filing of Notice

.1 The General Contractor is to complete and submit a Notice of Project as required by provincial authorities.

.2 Provide copies of all notices to the Departmental Representative.

12. Health and Safety Plan

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

.1 Primary requirements:
- .1 Contractor's safety policy.
- .2 Identification of applicable compliance obligations.
- .3 Definition of responsibilities for project safety/organization chart for project.
- .4 General safety rules for project.
- .5 Job-specific safe work, procedures.
- .6 Inspection policy and procedures.
- .7 Incident reporting and investigation policy and procedures.
- .8 Occupational Health and Safety Committee/Representative procedures.
- .9 Occupational Health and Safety meetings.
- .10 Occupational Health and Safety communications and record keeping procedures.

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.

.3 List hazardous materials to be brought on site as required by work.

.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

.5 Identify personal protective equipment (PPE) to be used by workers.

.6 Identify personnel and alternates responsible for site safety and health.

.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

13. Emergency Procedures

.1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

.1 Designated personnel from own company.
.2 Regulatory agencies applicable to work and as per legislated regulations.
.3 Local emergency resources.
.4 Departmental Representative.

.2 Include the following provisions in the emergency procedures:

.1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
.2 Evacuate all workers safely.
.3 Check and confirm the safe evacuation of all workers.
.4 Notify the fire department or other emergency responders.
.5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
.6 Notify Departmental Representative.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:

.1 Work at high angles.
.2 Work in confined spaces or where there is a risk of entrapment.

.3 Work with hazardous substances.
.4 Underground work.
.5 Work on, over, under and adjacent to water.
.6 Workplaces where there are persons who require physical assistance to be moved.

.4 Design and mark emergency exit routes to provide quick and unimpeded exit.

.5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

14. Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:

.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS.
.2 In conjunction with Departmental Representative, schedule to carry out work during "off hours" when tenants have left the building.
.3 Provide adequate means of ventilation.

15. Overloading

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

16. Falsework

.1 Design and construct falsework in accordance with CSA S269.1.

17. Scaffolding

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA –S269.2 and B.C. Occupational Health and Safety Regulations.

18. Powder-Actuated Devices

.1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

19. Fire Safety and Hot Work

.1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried

out on site.

.2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

20. Fire Safety Requirements

.1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

21. Unforeseen Hazards

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

22. Posted Documents

.1 Post legible versions of the following documents on site:

- .1 Health and Safety Plan.
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshaling station, and the emergency transportation provisions.
- .5 Notice of Project.
- .6 Floor plans or site plans.
- .7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
- .8 Workplace Hazardous Materials Information System (WHMIS) documents.
- .9 Material Safety Data Sheets (MSDS).
- .10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from

the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

23. Meetings

.1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

24. Correction of Non-Compliance

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

.3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

END OF SECTION

1. Products/Material and Equipment

.1 Use NEW products/material and equipment unless otherwise specified. The term "products" is referred to throughout the specifications.

.2 Use products of one manufacturer for material and equipment of the same type or classification unless otherwise specified.

.3 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.4 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions. Departmental Representative will designate which document is to be followed.

.5 Provide metal fastenings and accessories in the same texture, colour and finish as base metal in which they occur.

- .1 Prevent electrolytic action between dissimilar metals.
- .2 Use hot dip zinc galvanized fasteners, anchors and spacers for securing exterior work.

.6 Fastenings which cause spalling or cracking are not acceptable.

.7 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.8 Use heavy hexagon heads, semi-finished unless otherwise specified.

.9 Bolts may not project more than one (1) diameter beyond nuts.

.10 Types of nuts and washers as follows:

- .1 Plain type washers: use on structural steel-to-steel.
- .2 Double nut or lock nut: use on hangers and steel plates against wood.

.11 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

.12 Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from site.

.13 Store products in accordance with suppliers' instructions.

.14 Touch up damaged factory finished surfaces to Departmental Representative's satisfaction.

- .1 Use primer or enamel to match original.
- .2 Use Zinc rich paint for surfaces on steel.

.3 Do not paint over nameplates.

2. Quality of Products

.1 Products, materials and equipment (referred to as products) incorporated into work shall be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of the products provided.

.2 Defective products will be rejected regardless of previous inspections.

.1 Inspection does not relieve responsibility, but is precaution against oversight or error.

.2 Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Retain purchase orders, invoices and other documents to prove that all products utilized in this Contract meet the requirements of the specifications. Produce documents when requested by the Departmental Representative.

.4 Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative based upon the requirements of the Contract documents.

.5 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

3. Availability of Products

.1 Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.

.2 If delays in supply of products are foreseeable, notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the work.

.3 In event of failure to notify Departmental Representative at the start of work and should it subsequently appear that the work may be delayed for such reason, the Departmental Representative

reserves the right to substitute more readily available products of similar character, at no increase in either the Contract price or the Contract time.

4. Manufacturer's Instructions

.1 Unless otherwise indicated in the specifications, install or erect products in accordance with the manufacturer's instructions.

.1 Do not rely on labels or enclosures provided with products.

.2 Obtain written instructions directly from the manufacturer.

.2 Notify Departmental Representative in writing of conflicts between the specifications and the manufacturer's instructions so that the Departmental Representative may establish the course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to require removal and re-installation at no increase in either the Contract price or the Contract time.

5. Contractor's Options for Selection of Products for Tendering

.1 Products are specified by "Prescriptive" specifications: select any product meeting or exceeding specifications.

.2 Products specified under "Acceptable Products": select any one of the indicated manufacturers, or any other manufacturer meeting or exceeding the Prescriptive specifications and indicated Products.

.3 Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.

.4 Products specified to meet particular design requirements or to match existing materials: use only material specified Approved Product. Alternative products may be considered provided full technical data is received in writing by Departmental Representative in accordance with "Special Instructions to Tenderers".

.5 When products are specified by a referenced standard or by or Performance specifications, upon request of Departmental Representative obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the

specified requirements.

6. Substitution After Contract Award

.1 No substitutions are permitted without prior written approval of the Departmental Representative.

.2 **Proposals for substitution may only be submitted after Contract award.** Such request must include statements of respective costs of items originally specified and the proposed substitution.

.3 Proposals will be considered by the Departmental Representative if:

.1 products selected by tenderer from those specified are not available;

.2 delivery date of products selected from those specified would unduly delay completion of Contract, or

.3 alternative product to that specified, which is brought to the attention of and considered by Departmental Representative as equivalent to the product specified, and will result in a credit to the Contract amount.

.4 **Should the proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as result of substitution.**

.5 Amounts of all credits arising from approval of the substitutions will be determined by the Departmental Representative, and the Contract price will be reduced accordingly.

END OF SECTION

1.1 Related Requirements

.1 Section 011155 - General Requirements

.2 Section 013533 - Health and Safety Requirements

1.2 Project Cleanliness

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Departmental Representative or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Burning of waste materials on site is prohibited, unless approved by Departmental Representative.

.3 All equipment used on site must be clean a free of contaminants.

.4 Equipment such as concrete mixers, wheel barrows, shovels, trowels and other tools used for cast in place concrete work shall only be cleaned in areas approved by engineer. Cleaning equipment in or directly adjacent to any watercourse or intertidal area is prohibited.

If concrete wash water is produced during clean-up activities, it shall be contained on site to allow sediment to settle out and to reach a neutral pH before being released to the environment (typically 48 hours).

.5 Open burning is strictly prohibited, unless authorized by regulating bodies.

.6 Clear snow and ice from access to staircases, as required, bank/pile snow in designated areas only.

.7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.8 Provide on-site leak proof containers for collection of waste materials and debris.

.9 See Section 011155 - General Requirements for waste and food containers.

.10 Provide and use marked separate bins for recycling. Refer to Section 011155 that includes General Requirements for Waste Management and Disposal.

.11 Use local disposal facilities for waste materials and debris and

appropriate recycling facilities for recyclable items.

.12 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.13 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 Final Cleaning

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris including that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. See clauses 1.3.5. and 1.3.6 above for burning wood on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Broom clean walks, steps and surfaces; rake clean other surfaces of grounds.

.8 Remove dirt and other disfiguration from exterior surfaces.

.9 Remove snow and ice from bridges and access walkways.

1.4 Waste Management and Disposal

.1 Separate waste materials for recycling in accordance with Section 011155 that includes General Requirements for Waste Management and Disposal.

1.5 Disposal of Treated Wood

.1 All cutting and other treated wood waste materials will be collected and disposed of at an approved landfill site in accordance with Provincial Waste Management and Environment Canada regulations. Burning of treated wood waste products is prohibited.

.2 Before use, all treated products must be visually inspected to ensure that excessive residual preservative is not present on the wood surface. Material with excessive residual product will not be used and will be removed from the work site at the earliest

opportunity.

.3 Employ construction methods and purchase materials in sizes which minimize the number of timber saw cuts needing field treatment with wood preservative.

.4 If on-site treatment of wood is required, these activities will be conducted in a contained upland location when possible.

.5 All treated wood sawdust should be collected in a plastic bin (e.g. Rubbermaid) or tarpaulin and disposed of off-site.

.6 Sawing of treated wood should be avoided in locations that may expose workers, site staff and visitors to sawdust.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 Related Requirements

.1 Section 01 35 33 – Health and Safety Requirements.

.2 Section 01 74 11 – Cleaning

1.2 References

.1 Reference standards:

.1 CSA International

.1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.

1.3 Quality Assurance

.1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Provincial/Territorial and Municipal regulations.

1.4 Site Conditions

.1 Environmental protection:

.1 Ensure Work is done in accordance with Section 011155 General Instructions for Environmental Procedures.

.2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Fires and burning of waste or materials is not permitted on site, except untreated wood in metal containers as noted in Section 017411 – Cleaning.

.4 Do not bury rubbish waste materials.

.5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.

.1 Ensure proper disposal procedures are maintained throughout project.

.6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

.7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance as directed by Parks Surveillance Officer.

.8 Protect trees, plants and foliage on site and adjacent properties where indicated.

.9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary

enclosures during demolition work.

.10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.5 Existing Conditions

.1 Structures to be demolished are based on their condition on date that tender is accepted.

.1 Remove, protect and store salvaged items as directed by Departmental Representative. Salvage items as identified by Departmental Representative. Deliver to Departmental Representative as directed.

Part 2 Products

2.1 Equipment

.1 Equipment and heavy machinery:

.1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.2 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.

.2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 Preparation

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: requirements of authorities having jurisdiction, specific to site.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Protection of in-place conditions:

.1 Work in accordance with Section 011155 General

Instructions for Environmental Procedures.

.2 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, adjacent grades, properties, parts of existing building to remain.

.1 Provide bracing, shoring and underpinning as required.

.2 Repair damage caused by demolition as directed by Departmental Representative.

.3 Support affected structures and, if safety of structure being demolished adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

.4 Prevent debris from entering surrounding area surface drainage system.

3.2 Demolition

.1 Provide Temporary Barriers and Enclosures for demolition work in accordance with Parks Canada and Regional regulations.

.2 Blasting operations are not permitted.

.3 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

.4 To permit construction as indicated.

.5 Remove obstacles where required.

.6 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.

.7 Remove parts of structural framing that is being replaced by new framing as shown on the structural drawings.

.8 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.

.9 Remove and dispose of demolished materials except where noted otherwise outside national park and in accordance with authorities having jurisdiction.

.10 Use natural lighting to do Work where possible.

.1 Shut off lighting except those required for security purposes at end of each day.

3.3 Cleaning

.1 Waste Management: separate waste materials for recycling in accordance with Section 01 74 11 – Cleaning.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Divert excess materials from landfill to site approved by Departmental Representative.

.3 Designate appropriate security resources / measures to prevent vandalism, damage and theft.

.4 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.

.5 Dispose of materials in accordance with applicable regulations.

.1 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

Part 1 General

1.1 Related Requirements

.1 Section 03 20 00 - Concrete Reinforcing

.2 Section 03 30 00 - Cast-in-Place Concrete

.3 Section 01 74 11 - Cleaning

1.2 References

.1 Canadian Standards Association (CSA International)

- .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-O86-09 Engineering Design in Wood.
- .3 CSA O141-05, Softwood Lumber
- .4 CSA O121-08, Douglas Fir Plywood.
- .5 CSA O151-09, Canadian Softwood Plywood.
- .6 CAN/CSA-O325-07, Construction Sheathing.
- .7 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
- .8 CAN/CSA-S269.3-M92(R2003), Concrete Formwork, National Standard of Canada

.2 Underwriters' Laboratories of Canada (ULC).

1.3 Action and Informational Submittals

.1 Submittals in accordance with Section 01 33 00 – Shop Drawings, Product Data, and Samples.

1.4 Delivery, Storage and Handling

.1 Waste Management and Disposal:

- .1 Separate waste materials for recycling in accordance with 017411 Cleaning.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Divert wood materials from landfill to a recycling facility as approved by Departmental Representative.
- .4 Divert plastic materials from landfill to a recycling facility as approved by Departmental Representative.
- .5 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Departmental Representative.

Part 2 Products

2.1 Materials

.1 Formwork materials:

- .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121 and CAN/CSA-O86.
- .2 For concrete exposed to view use smooth, square edged plywood panels to clause 6.5 CSA-A23.1.
- .3 Use sealed formwork to eliminate contamination of river with fresh concrete.

.2 Form ties:

- .1 Use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.3 Form liner:

- .1 Plywood: medium density overlay, Douglas Fir to CSA O121, sanded grade, square edge, 17 mm thick.

.4 Form release agent: non-toxic, biodegradable, low VOC.

.5 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene.

.6 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 Fabrication and Erection

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain Departmental Representative's approval for use of earth forms and framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1 and WorkSafe BC regulations.

.5 Do not place shores and mud sills on frozen ground.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances

required by CSA-A23.1/A23.2.

.8 Align form joints and make watertight.

.1 Keep form joints to minimum of 3mm.

.9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless noted otherwise on the drawings.

.10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections..

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 Removal and Reshoring

.1 Leave formwork in place for following periods of time after placing concrete.

.1 As directed by shoring engineer retained by the contractor, but minimum 3 days.

.2 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 Related Requirements

.1 Section 03 10 00 – Concrete Forming and Accessories.

.2 Section 03 30 00 – Cast-in-Place Concrete Short Form.

.3 Section 01 74 11- Cleaning

1.2 References

.1 CSA International

.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A23.3-04 (R2010), Design of Concrete Structures.

.3 CAN/CSA-A23.4-09, Precast Concrete – Materials and Construction

.4 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.

.5 CSA-G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 Quality Assurance

.1 Submit as described in PART 2 - SOURCE QUALITY CONTROL. Allow for field reviews of reinforcing prior to pours by Departmental representative as per Section 011155 General Instructions.

.1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with Section 01 61 10 - Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site

in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

.4 Develop Waste Reduction Workplan related to Work of this Section.

Part 2 Products

2.1 Materials

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: billet steel, grade 400, weldable, deformed bars to CSA-G30.18, unless indicated otherwise.

.3 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.4 Mechanical splices: subject to approval of Departmental Representative.

.5 Do not use plain round bars, wire ties, wire fabric or welded wire mesh.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 Source Quality Control

.1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request inform Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 Field Bending

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.2 Placing Reinforcement

.1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.

.2 Reinforcing to be free of grease, scale and other coatings, unless noted otherwise on structural drawings.

.3 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.4 Ensure cover to reinforcement is maintained during concrete pour.

3.3 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - 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 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 017411 -Cleaning.

END OF SECTION

Part 1 General

1.1 Related Requirements

.1 Section 03 10 00 – Concrete Forming and Accessories

.2 Section 03 20 00 – Concrete Reinforcing

.3 Section 01 74 11 - Cleaning

1.2 References

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.

.2 CSA International

.1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.3 Canadian Council of Independent Laboratories (CCIL)

1.3 Action and Informational Submittals

.1 Provide submittals in accordance with Section 01 33 00 – Shop Drawings, Product Data, and Samples.

.2 At least 4 weeks prior to beginning Work, inform Departmental Representative of source of fly ash.

.1 Do not change source of fly ash without written approval of Departmental Representative.

.3 Retain services of concrete testing agency to review concrete mixes, to take samples of concrete poured on site for concrete testing and for laboratory testing of concrete. Send mix design and test reports for review by the testing agency and Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.4 Laboratories of the concrete testing agency to be certified by the Canadian Council of Independent Laboratories (CCIL). Personnel of the concrete testing agency to be certified by the Canadian Standards Association (CSA).

.5 Each mix design to conform to requirements listed in clause 2.4 below and to show area of use, strength, exposure class, max W/C, percentage of coarse aggregate, flyash and slump range, as a minimum.

.6 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 Quality Assurance

.1 Provide to Departmental Representative, 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements.

.2 If concrete test results indicate concrete is not to the specified criteria, the owner to have rights as listed in CSA-A23.1 Clause 4.4.6.7.

1.5 Delivery, Storage and Handling

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching, unless concrete retardants approved by the concrete agency are used.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by the Departmental Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.3 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, packaging materials in accordance with Section 017411 Cleaning and the Environmental Management Plan.

Part 2 Products

2.1 Design Criteria

.1 Alternative 1 – Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 Performance Criteria

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 -

QUALITY ASSURANCE.

2.3 Materials

.1 Cement: to CSA A3001, Type MS for moderate sulphate exposure.

.2 Supplementary cementing materials: As specified in section 2.4.1.2., below.

.3 Water: To clause 4.2.2 and to table 9 limits for chlorides and alkalis CSA A23.1/A23.2.

.4 Aggregate: normal density fine and coarse aggregate to clause 4.2.3 including clause 4.2.3.5 on deleterious reactions.

.5 Other concrete materials: to CSA A23.1/A23.2.

2.4 Mixes

.1 Alternative 1 - Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in Part 3.4 – Field Quality Control.

.2 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: S-3.

.2 Supplementary cementing materials: as per CAN/CSA A3001 and A3004-C8.

.3 Entrainment air of 4-7%.

.4 Maximum water / cement ratio of 0.5.

.5 Compressive strength at 28days: 30MPa minimum.

.6 Intended application: footings and beams.

.7 Aggregate size 20 mm maximum.

.8 Curing type 1- curing for 3 days ≥ 10°C as per table 20 of CSA A23.1

.3 Concrete supplier's certification.

.4 Provide quality management plan to ensure verification of concrete quality to specified performance.

Part 3 Execution

3.1 Preparation

.1 Provide Departmental Representative 72 hours' notice before each concrete pour for field review of reinforcing.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Protect previous Work from staining.

.5 Clean and remove stains prior to application of concrete finishes.

3.2 Installation/ application

.1 Provide and have the Departmental Representative review mitigation measures as per Section 011155 when placing near river bed or stream

.2 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.

.3 Protect concrete: for hot weather conditions when air temperature is 27°C or higher as per clause 7.4.2.4. Protect concrete for cold weather conditions when air temperature is 5°C or lower (or likely to fall below 5°C within 24 hours of placing) as per clause 7.4.2.5.

.4 Provide minimum concrete cover: over principal reinforcing steel unless noted otherwise on the structural drawings:

75mm poured against ground

50mm formed surfaces

.5 Sleeves and inserts:

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.

.2 Sleeves and openings greater than 100 mm x 100 mm not indicated must be reviewed by Departmental Representative.

3.3 Finishes

.1 Formed surfaces exposed to view: smooth-form finish in accordance with CSA A23.1/A23.2.

3.4 Field Quality Control

.1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by General Contractor. Compression tests (sample taken at each pour) are required.

.2 Send electronic photos of completed work to Departmental Representative for review, as follows: reinforcing before pour and once a week send progress photos of completed concrete elements as a minimum.

.3 Schedule site visits:

.1 Upon completion of the Work, after cleaning is carried out.

3.5 Cleaning

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Use trigger operated spray nozzles for water hoses.

.3 Designate cleaning area for tools to limit water use and runoff.

.4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 11 - Cleaning.

.1 Divert unused concrete materials from landfill to local facility after receipt of written approval from Departmental Representative.

.2 Provide appropriate area on job site where concrete trucks and be safely washed.

.3 Divert admixtures and additive materials from landfill to approved official hazardous material collections site after receipt of written approval from Departmental Representative.

.4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

END OF SECTION

Part 1 General

1.1 Related Requirements

.1 Section 06 10 00 – Rough Carpentry.

1.2 References

.1 ASTM International

.1 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.

.2 ASTM A116, Metallic-Coated, Steel-Woven Wire Fence Fabric

.2 CSA International

.1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA S16-09, Design of Steel Structures.

.4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.

.5 CSA W59-03(R2008), Welded Steel Construction, (Metal Arc Welding).

1.3 Action and Informational Submittals

.1 Submit in accordance with Section 01 33 00 – Shop Drawings, Product Data, and Samples.

.2 Product Data:

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

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 43 - Health and Safety Requirements.

.3 Shop Drawings:

.1 Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners and welds. Indicate welds by CSA W59, welding symbols.

.2 Proposed welding procedures to be stamped and approved

by Canadian Welding Bureau.

.3 Submit description of methods, temporary bracing and strengthening, sequence of erection and type of equipment proposed for use in erecting structural steel.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with Section 01 61 10 - Product Requirements and with manufacturer's written instructions.

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

.1 Ensure Departmental Representative has delivery schedules 7 days minimum prior to shipping.

.3 Storage and Handling Requirements:

.1 Provide protective blocking for lifting, transportation and storing.

.1 Exercise care during fabrication, transportation and erection of girders, beams and trusses.

.2 Do not notch edges of members.

.3 Do not cause excessive stresses.

.2 Ensure that no portion of steel comes into contact with ground.

.1 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 017411 Cleaning.

1.5 Quality Assurance

.1 Preconstruction Testing:

.1 Provide suitable facilities and cooperate with inspection organization and Departmental Representative in carrying out inspection and tests required.

Part 2 Products

2.1 Materials

.1 Structural steel: to CSA G40.20/G40.21, grade and types 300W,

.1 Hot dip zinc galvanize all steel and connection material including threaded rods, lag screws, bolts, wire mesh, nuts and washers.

.2 Anchor bolts, bolts, carriage bolts, carriage bolts, lag screws,

threaded rods, washers and nuts: to CSA G40.20/G40.21, grade 300W or grade A36 to ASTM F1554.

.3 Grade 60, square 50x50mm - 6.4mm diameter woven wire mesh for fences

.4 Grade 60, 1-1/2 #9 (10ga) expanded standard mesh for anti-slip surface of wood landings and platforms fastened with staples per manufacturer's recommendations.

.5 Aluminum anti slip stair nosing L 85mmx25mm-4.8mm thick, installed with stainless screws per manufacturer.

.6 Welding electrodes: E49XX to CSA W48 series.

.7 Hot dip galvanizing: to CAN/CSA G164, minimum zinc coating of 600 g/m² on structural steel, class 3 coating on wire mesh fence and anti-slip mesh.

.8 Field applied paint is prohibited, unless approved in writing by the Departmental Representative. Field applied paint to achieve galvanic protection, the dry extract to have a zinc concentration of at least 95%. The paint to resist expansion and shrinking once applied to the metal due to temperature variations. Paint to be approved by Departmental Representative.

2.2 Source Quality Control

.1 Steel producer qualifications: certified in accordance with CSA G40.20/G40.21.

.2 Provide suitable facilities and co-operate with inspection organization and Departmental Representative in carrying out inspection and tests required.

Part 3 Execution

3.1 Examination

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for structural steel installation in accordance with manufacturer's written instructions.

.1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Preparation

.1 Clean steel surfaces as directed by Departmental Representative

when staining or defacing occurs.

.2 Verify location of substructure units, elevations of bearing seats and location of anchor bolts before erection of structural steel; report discrepancies to Departmental Representative.

.3 Restrict drifting during assembly to minimum required to bring parts into position without enlarging or distorting holes, and without distorting, kinking or sharply bending metal of any unit.

.1 Enlarge holes if necessary by reaming only after receipt of written approval from Departmental Representative.

.2 Ensure reamed holes are 2 mm maximum larger than bolt size used.

.4 Place anchor lag screws at elevations and locations indicated.

3.3 Installation

.1 Do falsework in accordance to CSA S269.1.

.2 Do fabrication and erection of structural steel in accordance with NBC 2010.

.3 Do welding in accordance with CSA W59, except where specified otherwise.

.1 Do welding in shop unless shown otherwise on the drawings or permitted by Departmental Representative.

.2 Weld only at locations indicated.

.4 Finish: members true to line, free from twists, bends, open joints, sharp corners and sharp edges.

.5 Allowable tolerance for bolt holes:

.1 Matching holes for bolts to line up so that dowel 2 mm less in diameter than hole passes freely through assembled members at right angles to such members.

.2 Finish holes not more than 2 mm in diameter larger than diameter of bolt unless otherwise specified by Departmental Representative.

.3 Centre-to-centre distance between any two holes of group to vary by not more than 1 mm from dimensioned distance between such holes.

.4 Centre-to-centre distance between any two groups of holes to vary not more than maximum of the following:

Centre-to-Centre distance in metres	Tolerance in plus or minus mm
less than 10	1

10 to 20	2
20 to 30	3

.5 Correct mispunched or misdrilled members only as directed by Departmental Representative.

.6 Shop splices:

.1 Use complete joint penetration groove welds finished flush.

.2 Details of butt joints to CSA W59.

.3 Use only as approved by Departmental Representative.

.7 Mark members in accordance with CSA G40.20/G40.21.

.1 Do not use die stamping.

.2 Place marking at locations hidden when viewed from exterior after erection when steel is to be left in unpainted condition.

.8 Match marking: shop mark bearing assemblies and splices.

.9 Paint field welds or field cut ends with zinc rich paint, see 2.1.6. Grind galvanized area off the connection before welding.

3.4 Field Quality Control

.1 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, protecting and cleaning of steel.

.2 Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Ensure manufacturer's representative is present before installation, during critical periods of installation and during construction of field joints and testing.

.4 Send electronic photos of completed work to Departmental Representative for review once a week as a minimum.

.5 Schedule site visits:

.1 Upon completion of the Work after cleaning is carried out.

3.5 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - 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 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 011155. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 Related Requirements

.1 Section 01 74 11 – Cleaning

1.2 References

.1 ASTM International

.1 ASTM A123/A123M-08, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 CSA International

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.2 CSA O121-08, Douglas Fir Plywood.

.3 CSA O141-05(R2009), Softwood Lumber.

.4 CSA O86-09 Engineering Design in Wood

.5 CSA O325-07, Construction Sheathing.

.3 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

1.3 Action and Informational Submittals

.1 Submit in accordance with Section 01 33 00 – Shop Drawings, Product Data, and Samples.

.2 Product Data:

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

.3 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

1.4 Quality Assurance

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

.2 Plywood in accordance with CSA and ANSI standards.

1.5 Delivery,

.1 Deliver, store and handle materials in accordance with Section

Storage and Handling

01 61 10 - Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

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

.2 Store and protect wood from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 017411 Cleaning.

.5 Packaging Waste Management: remove for and return of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 11 55.

Part 2 Products

2.1 Framing Structural And Panel Materials

.1 Lumber: Natural Untreated Red Cedar, NLGA No. 1 or better grade for beams, joists and guardrail posts and No.2 or better grade for other lumber; S4S, moisture content 19% (S-dry) or less in accordance with following standards:

.2 CSA O141.

.3 NLGA Standard Grading Rules for Canadian Lumber.

.2 Douglas fir plywood (DFP): to CSA O121, standard construction.

.3 Canadian softwood plywood (CSP): to CSA O151, standard construction.

2.2 Accessories

.1 Nails and spikes: to CSA B111. Nails to be common nails. Gun nails to be the same size as common nails, with round heads (no notches). Staples or furring nails are not acceptable.

.2 Bolts (steel-to-wood and wood-to-wood): 19 mm diameter unless indicated otherwise, complete with nuts and washers, to ASTM A307. Use carriage bolts where shown on drawings.

.3 Lag screws: 12 mm diameter unless noted otherwise, to CSA B34.

.4 Self-drilling wood screws to be 6mm diameter 100mm long with hexagonal heads, unless noted otherwise.

.5 Fastener Finishes:

.1 Galvanizing: to ASTM A123/A123M, use hot dip zinc galvanized fasteners, including accessories (nuts and washers, etc.).

.6 Wood Preservative: untreated.

Part 3 Execution

3.1 Examination

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative

3.2 Installation

.1 Install members true to line, levels and elevations, square and plumb with max. 1mm gap between members.

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

.3 Install spanning members, if warped, with "crown-edge" (not "cup-edge") up.

.4 Select exposed framing for appearance. Install panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

.5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.

.6 Install wood posts in the ground as indicated.

.7 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.8 Countersink bolts only where shown on the structural drawings. Provide double nuts on all the bolts through wood.

.9 Pre-drill holes in the timbers for lag screws. Make hole diameters 70% of the lag screw shank diameter and 100% for counterbore

holes for non-threaded portion of the lag screw. Hole/shank ratios for the hole to receive threaded portion of the lag screw to be as follows: 9mm/13mm, 11mm/16mm and 13mm/19mm.

3.3 Field quality control

.1 Send electronic photos of completed work to Departmental Representative for review, as follows: framing and connections before covering up but once a week as a minimum.

.1 Schedule site visits:

.1 Upon completion of the Work, after cleaning is carried out.

3.4 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - 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 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 01 1155.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 Protection

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION

Part 1 General

1.1 Related Requirements

1.2 References

.1 ASTM International

.1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.2 CSA International

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CSA A3000-08, Cementitious Materials Compendium.

.3 Appendix A of this specification

.4 Section 01 74 11 - Cleaning

1.3 Action and Informational Submittals

.1 Site Quality Control Submittals: submit in accordance with Section 013300 Shop Drawings, Product data and Samples.

.1 Submit condition survey of existing conditions to Departmental Representative prior to the excavations if different than the survey provided in the Appendix A.

.2 Submit testing and inspection reports as described in PART 3.4 - FIELD QUALITY CONTROL.

.2 Sustainable Design Submittals:

.1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with authorities having jurisdiction.

.2 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements..

Part 2 Products

2.1 Materials

.1 Use excavated site inorganic soil as a foundation and wood post backfill, only where shown on drawings.

.2 Crushed Granular 20-0 for new gravel pathway and for wood post

subbase.

Part 3 Execution

3.1 Examination

.1 Evaluation and Assessment:

.1 Before commencing work verify requirements for relocation of plants, if required by the environmental assessment, and as directed by Departmental Representative.

3.2 Preparation

.1 Temporary erosion and sedimentation control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent area and stream, according to the mitigation measures in Section 011155.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

.2 Protection of in-place conditions:

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

.3 Removal:

.1 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.

3.3 Excavation

.1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial regulations.

.2 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.

.1 Stockpile topsoil on site for later use.

.3 Excavate as required to carry out work per structural drawings and survey drawings in Appendix A.

.1 Do not disturb soil or rock below bearing surfaces.

.2 Extend underside of foundation to dense native mineral soil or intact bedrock.

.3 Notify Departmental Representative when excavations are complete.

.4 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.

.5 Excavation taken below depths shown without Departmental Representative's written authorization to be filled with approved compacted granular material at Contractor's expense.

3.4 Field Quality Control

.1 Retain services of geotechnical Engineer to review bearing conditions under concrete foundations and wood posts, as well as, review compaction reports for subbase and granular fill for the new gravel pathways and foundation/post backfill. Submit compaction reports and geotechnical review reports to Departmental Representative.

3.5 Backfilling

.1 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.2 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.

.3 Compaction of subgrade: compact existing subgrade under pathway and foundations to same compaction as fill.

.1 Footings and posts to be backfilled with the original material found on site, unless otherwise directed by Departmental Representative on site.

.4 Placing:

.1 Place granular material in 150 mm lifts: add water as required to achieve specified density.

.5 Compaction: compact each layer of material to following densities for material to ASTM D698:

.1 Underside of base courses: 95%.

.2 Base courses: 100%.

.6 Against foundations: excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

.7 Backfilling any excavations with concrete is acceptable only where shown on drawings and concrete to be poured into watertight membrane, spillage of fresh concrete onto the ground is prohibited.

3.6 Grading

.1 Grade so that water will drain away from walls to disposal areas approved by Departmental Representative.

3.7 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Dispose of cleared and grubbed material off site daily.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 1155.

END OF SECTION

GITWANGAK BATTLE HILL STAIR REPLACEMENT

PWGSC Survey Drawings

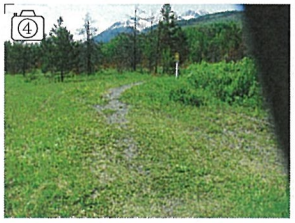
SITE PLAN OF GITWANGAK BATTLE HILL
LOT 1, DISTRICT LOT 1320, CASSIAR DISTRICT PLAN 8463.

B.C.G.S. 103P.020

Scale 1:400

10 0 5 10 15 20 25

All Distances are in Meters



Public Works and Government Services Canada Geomatics Services
Travaux Publics et Services gouvernementaux Canada

219–800 Burrard St.
Vancouver, B.C.
V6Z 0B9
604–775–7079

PWGSC LANDSCAPE D

This Plan lies within the Kitimat–Stikine Regional District

THIS PLAN CERTIFIED CORRECT COMPLETED ON THE 9th DAY OF JUNE 2015

Ian R. Robertson, B.C.L.S.

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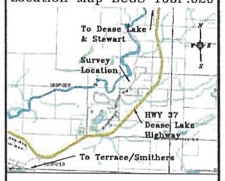
Public Works and Government Services Canada Geomatics Services
Travaux Publics et Services gouvernementaux Canada

Location Map BCGS 103P.020



Kitwangak,
British Columbia

Date of Survey: May 27–28, 2015.
By I.R.Robertson, BCLS

SF#3440.00, FB#038, Pg 65–75

project
GITWANGAK BATTLE HILL
KITWANGAK,
B.C.

drawing
Site Plan
of
Battle Hill

drawn S. M. KAVANAGH
2015-05-08

approved I. R .ROBERTSON
2015-05-09

Tender

PWC Project Manager Administrateur de projets TPC

project number
R.076123.001

drawing no.
SK # 5487.00

NOTES:

Elevations are Orthometric and derived from dual frequency carrier phase GPS observations processed using Active Control Points BCPR – 637272 and BCTE – 722959.

Control Point Datum:
NAD83(CSRS) 4.0.0.BC.1
Control Point Vertical Datum: CGVD 28
Control Point Projection: UTM Zone 9

All Distances Shown are Ground

Legend:

- HUB WITH CONTROL TAG
- DENOTES CULVERT
- DENOTES TREE
- DENOTES SIGN
- DENOTES NO POST
- DENOTES EDGE OF PAVEMENT
- DENOTES RAILING
- DENOTES FENCELINE

EDRM Document no. 529034

PROFILES OF THE EAST AND WEST STAIRS ATGITWANGAK BATTLE HILL
LOT 1, DISTRICT LOT 1320, CASSIAR DISTRICT PLAN 8463.

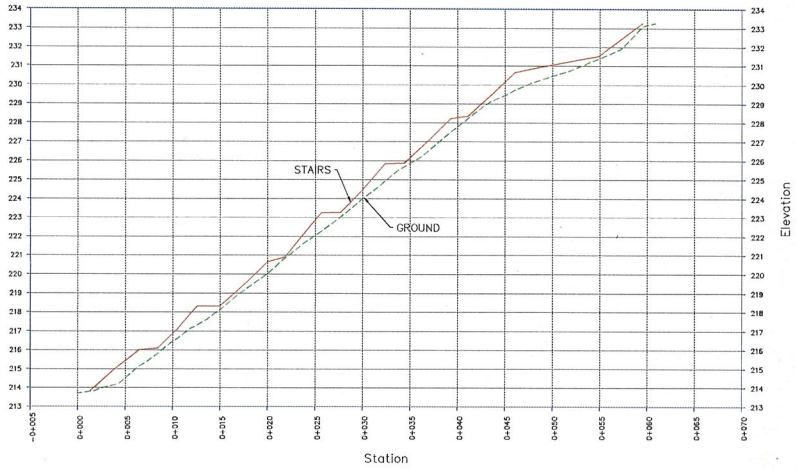
B.C.G.S. 103P.020

Scale 1:400

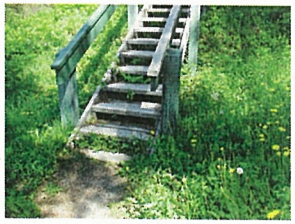
10 0 5 10 15 20 25

All Distances are in Meters

EAST STAIRS PROFILE



NOTE:
THIS PROFILE HAS BEEN VERTICALLY EXAGGERATED BY 2X



Scale 1:400

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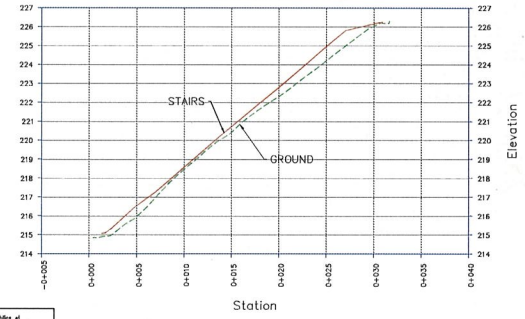
WEST STAIRS PROFILE



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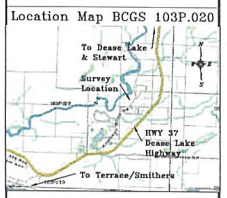
Ian R. Robertson, B.C.L.S.

Location Map BCGS 103P.020



Kitwangak,
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Date of Survey: May 27–28, 2015.
By I.R.Robertson, BCLS

SF#3440.00, FB#038, Pg 65–75

project
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KITWANGAK,
B.C.

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drawn S. M. KAVANAGH
2015–05–08

approved I. R .ROBERTSON
2015–05–09

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PWGSC LANDSCAPE D

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0 10 20mm 40 60 80 100 120 140 160 180 200mm

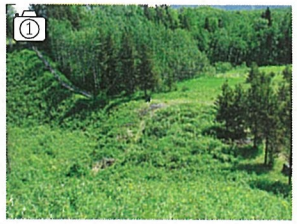
EDRM Document no. 529034

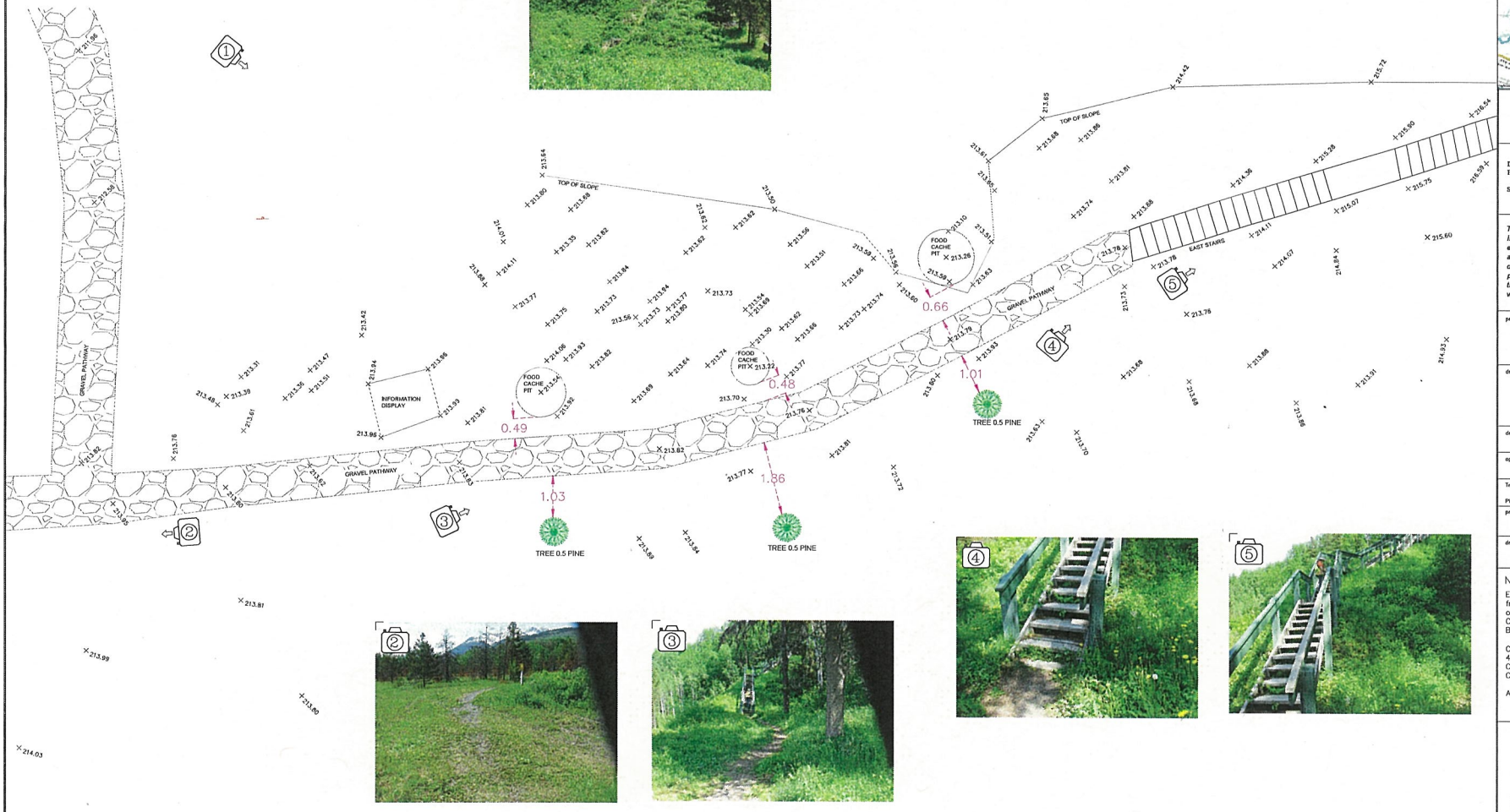
SITE PLAN OF THE BOTTOM OF THE WEST STAIRS AT GITWANGAK BATTLE HILL
LOT 1, DISTRICT LOT 1320, CASSIAR DISTRICT PLAN 8463.

B.C.G.S. 103P.020

Scale 1:50

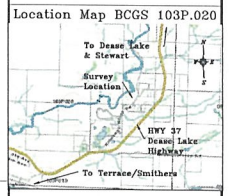
All Distances are in Meters





Public Works and Government Services Canada Geomatics Services
Travaux Publics et Services gouvernementaux Canada

Location Map BCGS 103P.020



Kitwangak,
British Columbia

Date of Survey: May 27–28, 2015.
By I.R.Robertson, BCLS

SP#3440.00, FB#038, Pg 65–75

This Plan was prepared for survey information purposes and is for the exclusive use of our client. The signatory accepts no responsibility or liability for any damages that may be suffered by a third party as a result of reproduction, transmission or alteration to this document without consent of the signatory.

project
GITWANGAK BATTLE HILL
KITWANGAK,
B.C.

drawing
Site Plan
of
Battle Hill

drawn S. M. KAVANAGH
2015-05-08

approved I. R .ROBERTSON
2015-05-09

Tender

PWC Project Manager Administrateur de projets TPC

project number
R.076123.001

drawing no.
SK # 5487.00

NOTES:

Elevations are Orthometric and derived from dual frequency carrier phase GPS observations processed using Active Control Points BCPR – 637272 and BCTE – 722959.

Control Point Datum: NAD83(CSRS) 4.0.0.BC.1
Control Point Vertical Datum: CGVD 28
Control Point Projection: UTM Zone 9

All Distances Shown are Ground

Legend:
- HUB WITH CONTROL TAG
- DENOTES CULVERT
- DENOTES TREE
- DENOTES SIGN
- DENOTES NO POST
- DENOTES EDGE OF PAVEMENT
- DENOTES RAILING
- DENOTES FENCELINE

Public Works and Government Services Canada Geomatics Services
Travaux Publics et Services gouvernementaux Canada
219–800 Burrard St.
Vancouver, B.C.
V6Z 0B9
604–775–7079

This Plan lies within the Kitimat–Stikine Regional District

THIS PLAN CERTIFIED CORRECT COMPLETED ON THE 9th DAY OF JUNE 2015

Ian R. Robertson, B.C.L.S.

PWGSC LANDSCAPE D

R:\RPS-PTS\Geomatics\Legal Projects 2015-2016\Parks Canada\Gitwangak Battle Hill\DWG\Kitwangak Battle Hill.dwg

SHEET 3 OF 3

EDRM Document no. 529034

GITWANGAK BATTLE HILL STAIR REPLACEMENT

EXISTING DRAWINGS

Indian and Northern Affairs / Affaires indiennes et du Nord

revisions / date

A detail no. / détail no
B location/dwg. no. / sur dessin no
C drawing no. / dessin no

drawn by / tracé par: J. R. LISOWAY
scale / échelle: 1" to 50'
designed by / établi par:
checked by / vérifié par: J.R. LISOWAY
FIELDWORK - NOV 1976 BOOK No. 676 / 1-1
job captain / chef du projet: L. BLIGHT
responsible officer / officier responsable: L. BAKER

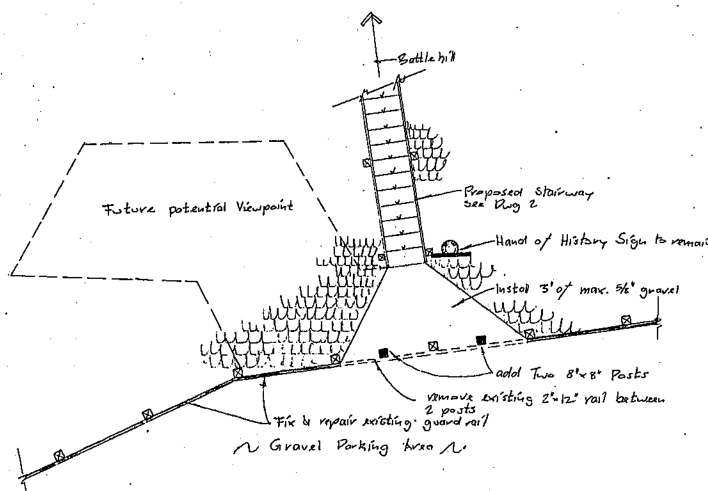
project title / titre du projet

KITWANGA
NATIONAL HISTORIC SITE
KITWANGA - BRITISH COLUMBIA

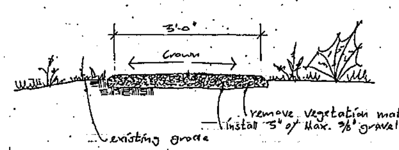
drawing title / titre du dessin

SITE PLAN

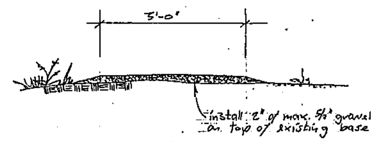
reference no. / no de référence: KWBC. 77/R1
dwg no. / dessin no: 1 of 1



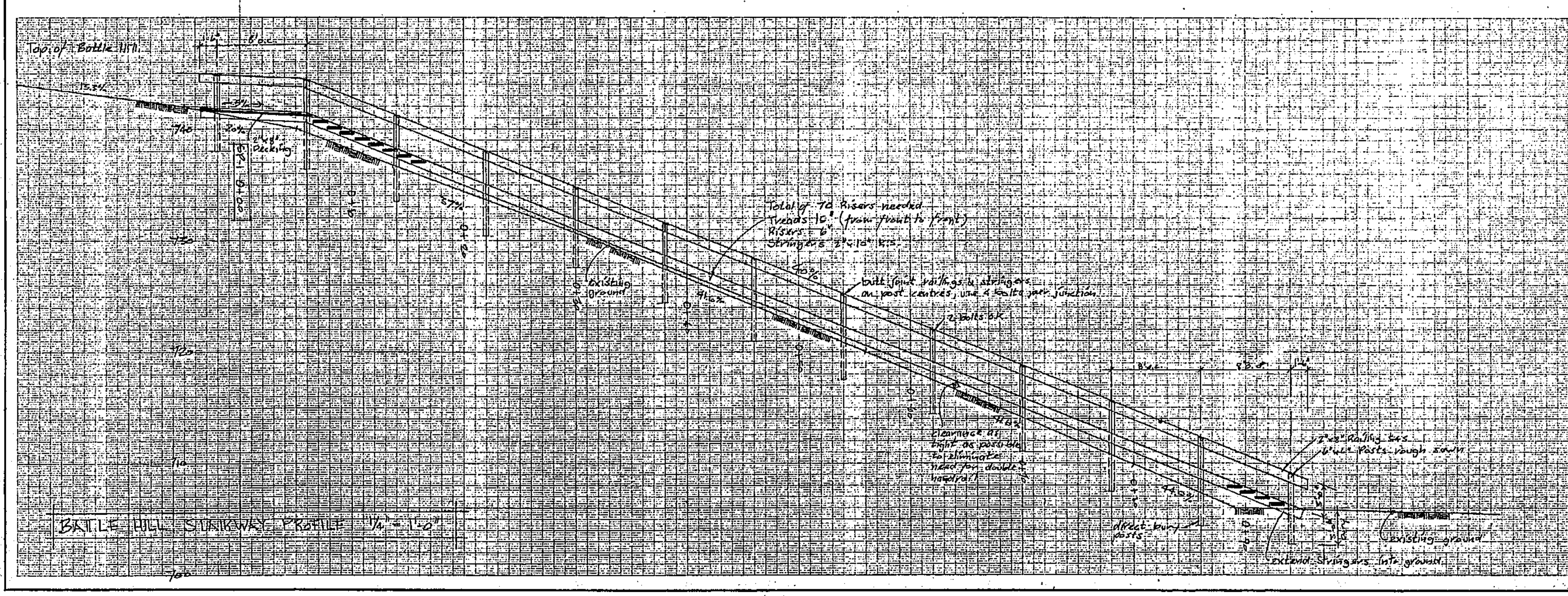
TRAILHEAD PLAN 1/4"=1'-0"



TYPICAL SURFACE TRAIL 1"=1'-0"
'Through existing vegetation cover'



TYPICAL SURFACE TRAIL 1"=1'-0"
'On Top of existing Service Road'



BATTLE HILL STAIRWAY PROFILE 1/4"=1'-0"

Indian and Northern Affairs / Affaires indiennes et du Nord

revisions | date

drawn by / tracé par | scale / échelle: 1/4"=1'-0"
designed by / établi par: O. Hammer, June 1980
checked by / vérifié par

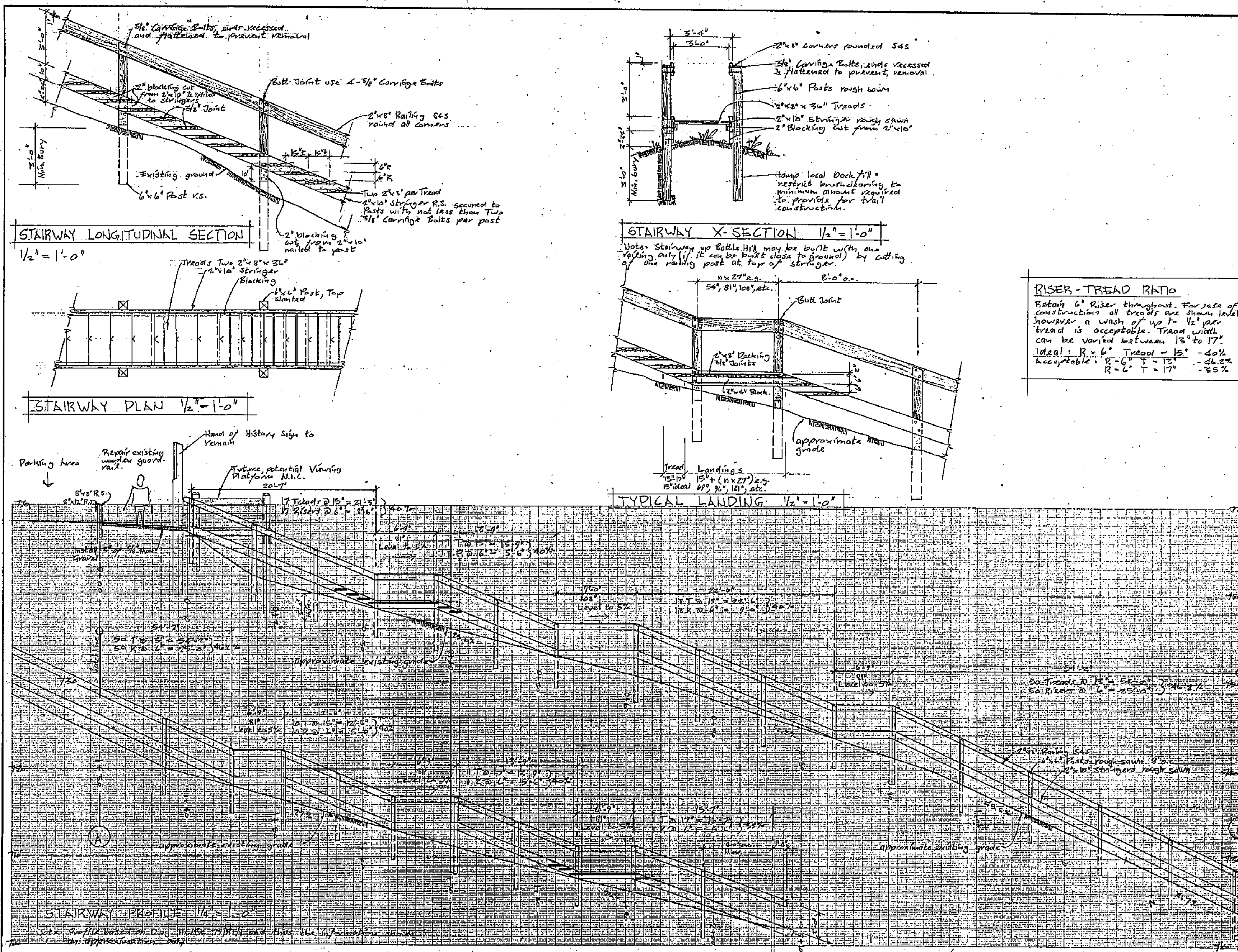
job engineer / chef du projet: 80-07-02
responsible officer / officier responsable: 80-07-02

project title / titre du projet:
KITWANGA NATIONAL HISTORIC SITE

drawing title / titre du dessin:
TRAIL UP BATTLE HILL & DETAILS

reference no. / no de référence: HWBC 80/81
dwg no. / dessin no: 3 of 3

BCHB

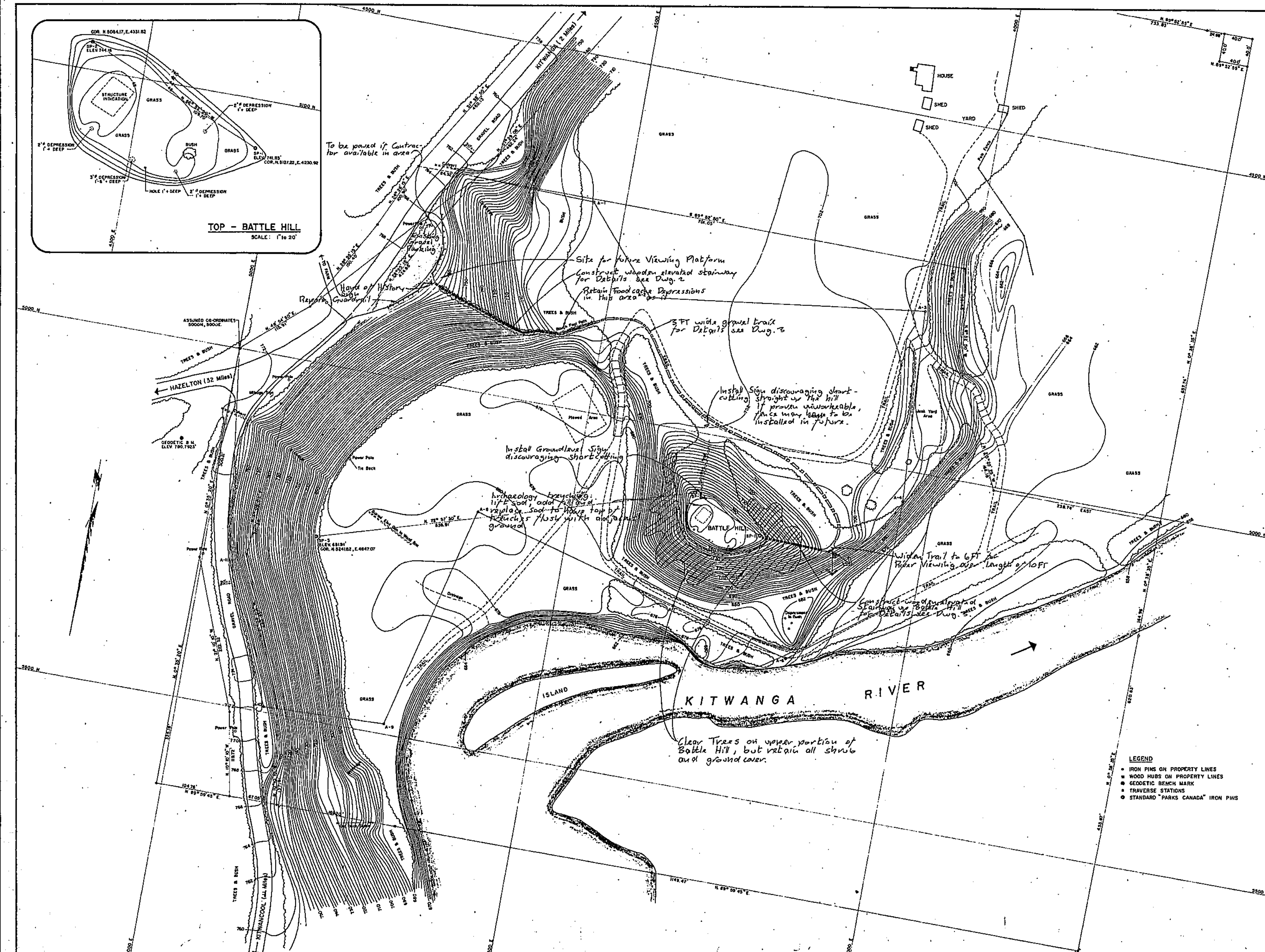


revisions	date
drawn by / tracé par	scale / échelle: As Shown
designed by / établi par: O. Hammer	June 1980
checked by / vérifié par	
job leader / chef de projet	80-07-02
responsible officer / officier responsable	80-07-02

project title / titre du projet: KITWANGA NATIONAL HISTORIC SITE

drawing title / titre du dessin: TRAIL DOWN FROM PARKING & DETAILS

reference no. / no de référence: HWBC 80/RI — dwg. no. / dessin no: 2 of 3



Indian and Northern Affairs | Affaires indiennes et du Nord

revisions | date

A detail no. | détail no
B location dwg. no. | sur dessin no
C drawing no. | dessin no

drawn by / tracé par: J. R. LISOWAY | scale / échelle: 1" to 50'
designed by / établi par: O. Hammer | June 1980
checked by / vérifié par: J. R. LISOWAY
FIELDWORK - NOV 1976, BOOK No. 076/I-I
job captain / chef du projet | date: 80-07-02
responsible officer / officier responsable | date: 80-07-02

project title | titre du projet

KITWANGA

NATIONAL HISTORIC SITE

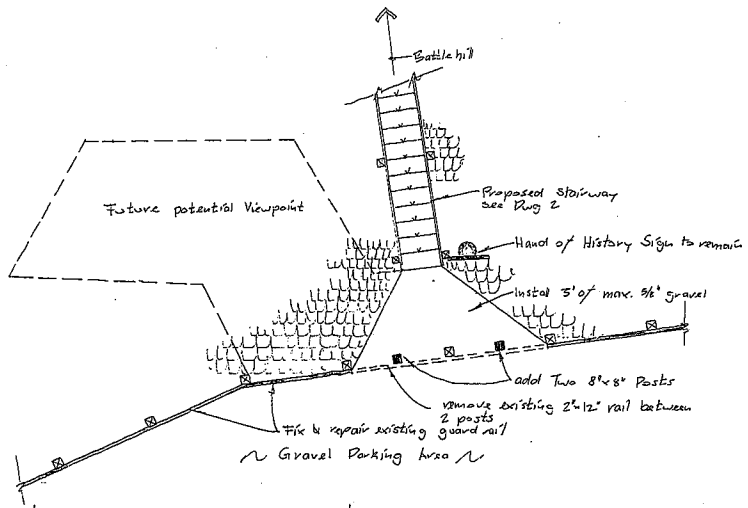
KITWANGA - BRITISH COLUMBIA

drawing title | titre du dessin

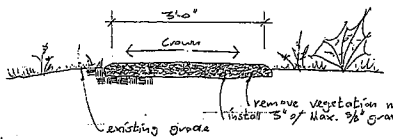
SITE DEVELOPMENT PLAN

reference no. / no de référence: HWBC 80/R1 | dwg no. / dessin no: 1 of 3

IAND 34-81 (9-72) 7530-21-029-1318



TRAILHEAD PLAN 1/4" = 1'-0"



TYPICAL SURFACE TRAIL 1" = 1'-0"
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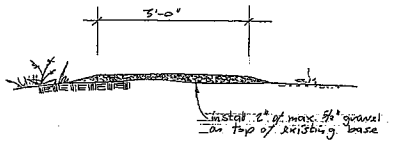

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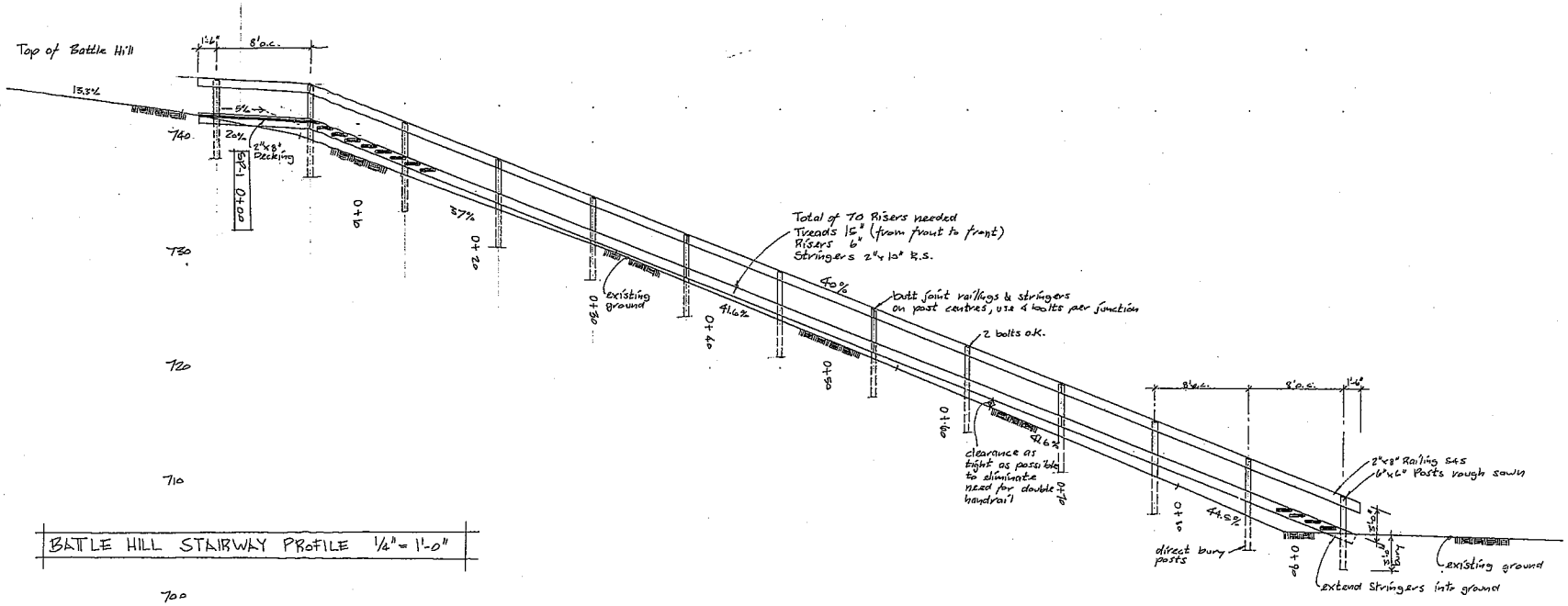


BATTLE HILL STAIRWAY PROFILE 1/4" = 1'-0"

Indian and Northern Affairs / Affaires indiennes et du Nord

revisions / date

A detail no. / détail no
B location dwg. no. / sur dessin no
C drawing no. / dessin no

drawn by / tracé par
scale / échelle 1/4" = 1'-0"

designed by / établi par D. Hainsworth
June 1980

checked by / vérifié par

job captain / chef de projet — date 81-07-02

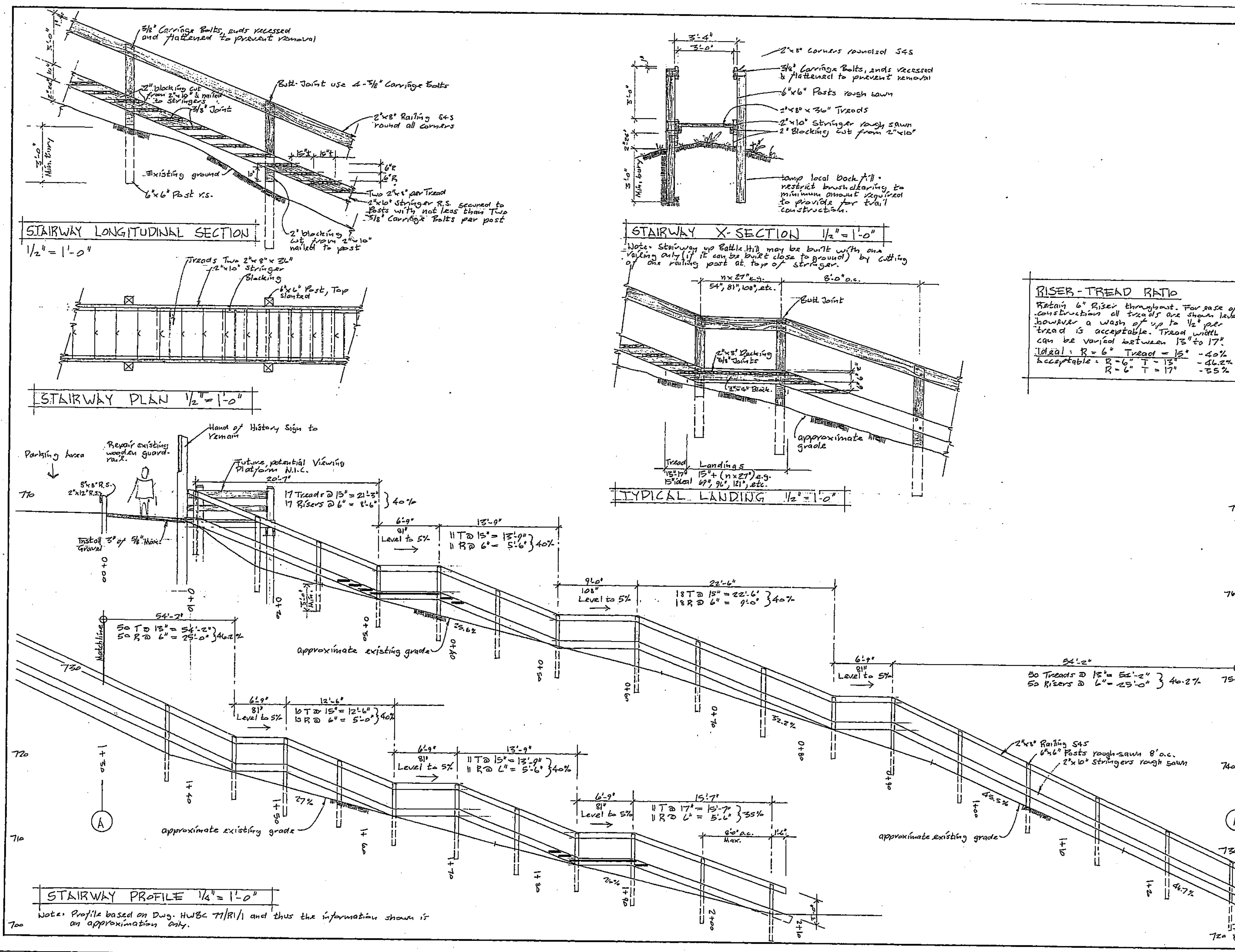
responsible officer / officier responsable — date 80-07-02

project title / titre du projet
KITWANGA NATIONAL HISTORIC SITE

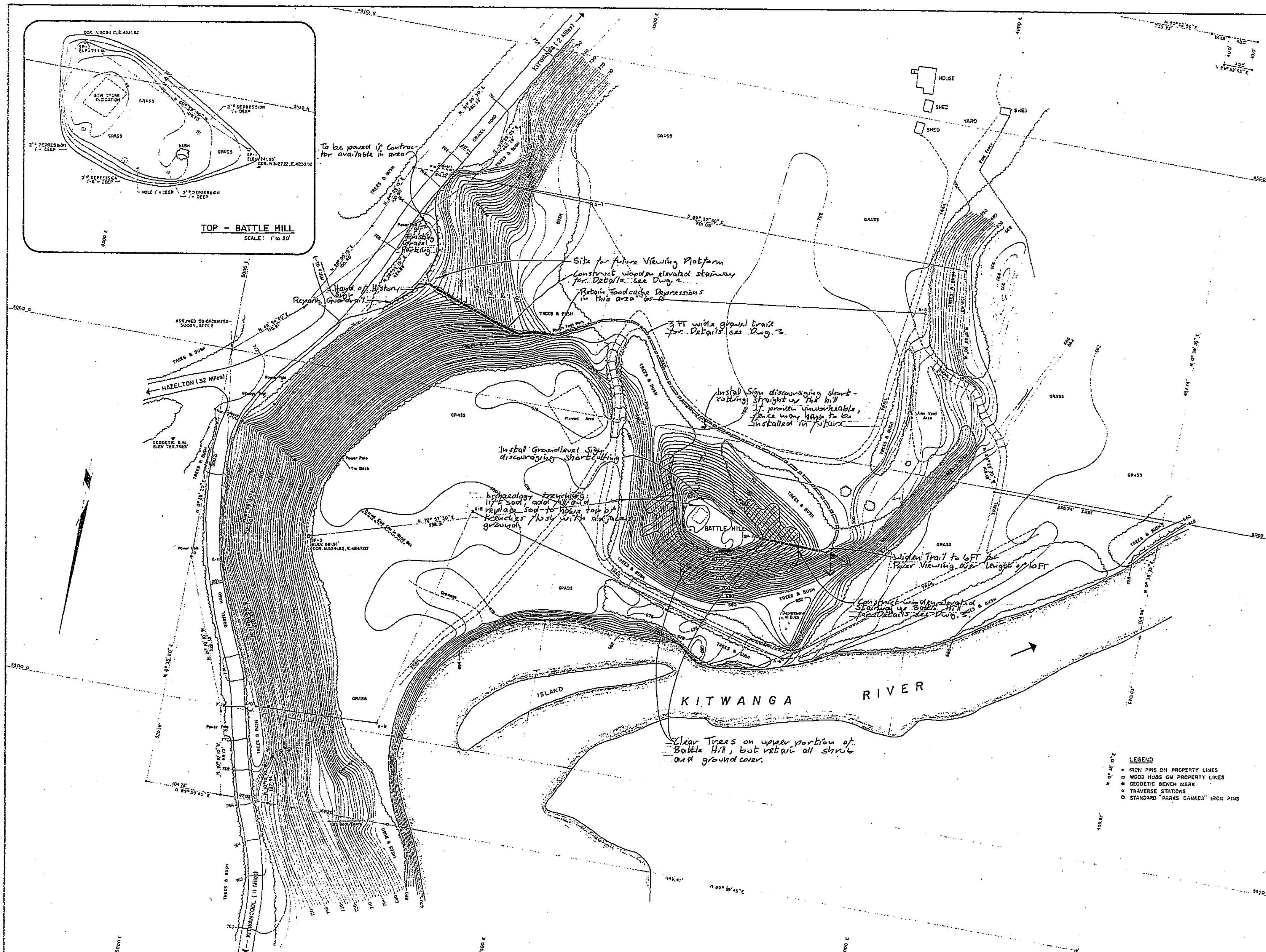
drawing title / titre du dessin
TRAIL UP BATTLE HILL & DETAILS

reference no. / no de référence HWBC 80/81

dwg no. / dessin no 3 of 3


STAIRWAY LONGITUDINAL SECTION
1/2" = 1'-0"
5/8" Carriage Bolts, ends recessed and flattened to prevent removal
Butt-Joint use 4-5/8" Carriage Bolts
2" blocking cut from 2"x10" & nailed to stringers
2"x8" Railing S4S round all corners
Existing ground
6"x6" Post r.s.
Two 2"x8" per Tread
2"x10" Stringer R.S. secured to Posts with not less than Two 5/8" Carriage Bolts per post
2" blocking cut from 2"x10" nailed to post
3'-0" Min. Bury
STAIRWAY PLAN 1/2" = 1'-0"
Treads Two 2"x8"x36"
2"x10" Stringer
Blocking
6"x6" Post, Top slanted
STAIRWAY X-SECTION 1/2" = 1'-0"
2"x8" Corners rounded S4S
5/8" Carriage Bolts, ends recessed & flattened to prevent removal
6"x6" Posts rough sawn
2"x8"x36" Treads
2"x10" Stringer rough sawn
2" Blocking cut from 2"x10"
tamp local back fill. restrict brushclearing to minimum amount required to provide for trail construction.
Note: Stairway up Battle Hill may be built with one railing only (if it can be built close to ground) by cutting of one railing post at top of stringer.
TYPICAL LANDING 1/2" = 1'-0"
n x 27" e.g. 54", 81", 108", etc.
6'-0" o.c.
Butt Joint
2"x8" Blocking 6/8" Joints
2"x4" Block
approximate grade
Tread 13"-17" 15" ideal
Landings 15" + (n x 27") e.g. 69", 96", 121", etc.
RISER-TREAD RATIO
Retain 6" Riser throughout. For ease of construction all treads are shown level however a wash of up to 1/2" per tread is acceptable. Tread width can be varied between 13" to 17".
Ideal: R = 6" Tread = 15" -40%
Acceptable: R = 6" T = 13" -46.2%
R = 6" T = 17" -35%
STAIRWAY PROFILE 1/4" = 1'-0"
Note: Profile based on Dwg. HWBC 77/R1/1 and thus the information shown is an approximation only.
Parking Area
Repair existing wooden guard-rail.
Hand of History Sign to remain
Future, potential Viewing Platform N.I.C.
Install 3" of 5/8" Max. Gravel
17 Treads @ 15" = 21'-3"
17 Risers @ 6" = 8'-6" } 40%
6'-9" 81" Level to 5%
13'-9" 11 T @ 15" = 13'-9" 11 R @ 6" = 5'-6" } 40%
9'-0" 108" Level to 5%
22'-6" 18 T @ 15" = 22'-6" 18 R @ 6" = 9'-0" } 40%
54'-2" 50 Treads @ 13" = 54'-2" 50 Risers @ 6" = 25'-0" } 46.2%
12'-6" 10 T @ 15" = 12'-6" 10 R @ 6" = 5'-0" } 40%
15'-7" 11 T @ 17" = 15'-7" 11 R @ 6" = 5'-6" } 35%
8'-0" o.c. Max.
2"x8" Railing S4S
6"x6" Posts rough-sawn 8' o.c.
2"x10" Stringers rough sawn
approximate existing grade
Matchline
25.6%
32.2%
27%
45.5%
46.7%

Indian and Northern Affairs	Affaires indiennes et du Nord
drawn by / tracé par	scale / échelle: As Shown
designed by / établi par: O. Hammer	June 1980
checked by / vérifié par	
job captain / chef de projet	date: 80.07.02
responsible officer / officier responsable	date: 80.07.02
project title / titre du projet	KITWANGA NATIONAL HISTORIC SITE
drawing title / titre du dessin	TRAIL DOWN FROM PARKING & DETAILS
reference no. / no de référence: HWBC 80/R1	dwg no. / dessin no: 2 of 3



Indian and Northern Affairs / Affaires indiennes et du Nord

revisions | date

A detail no. / B location dwg. no. / C drawing no.	détail no / sur dessin no / dessin no
drawn by / tracé par: J.R. LISOWAY	scale / échelle: 1" to 50'
designed by / établi par: O. Hammer	June 1980
checked by / vérifié par: J.R. LISOWAY	
FIELDWORK - NOV. 1976, BOOK No. 67G/1-1	
job captain / chef de projet	date: 80-07-02
responsible officer / officier responsable	date: 80.07.02

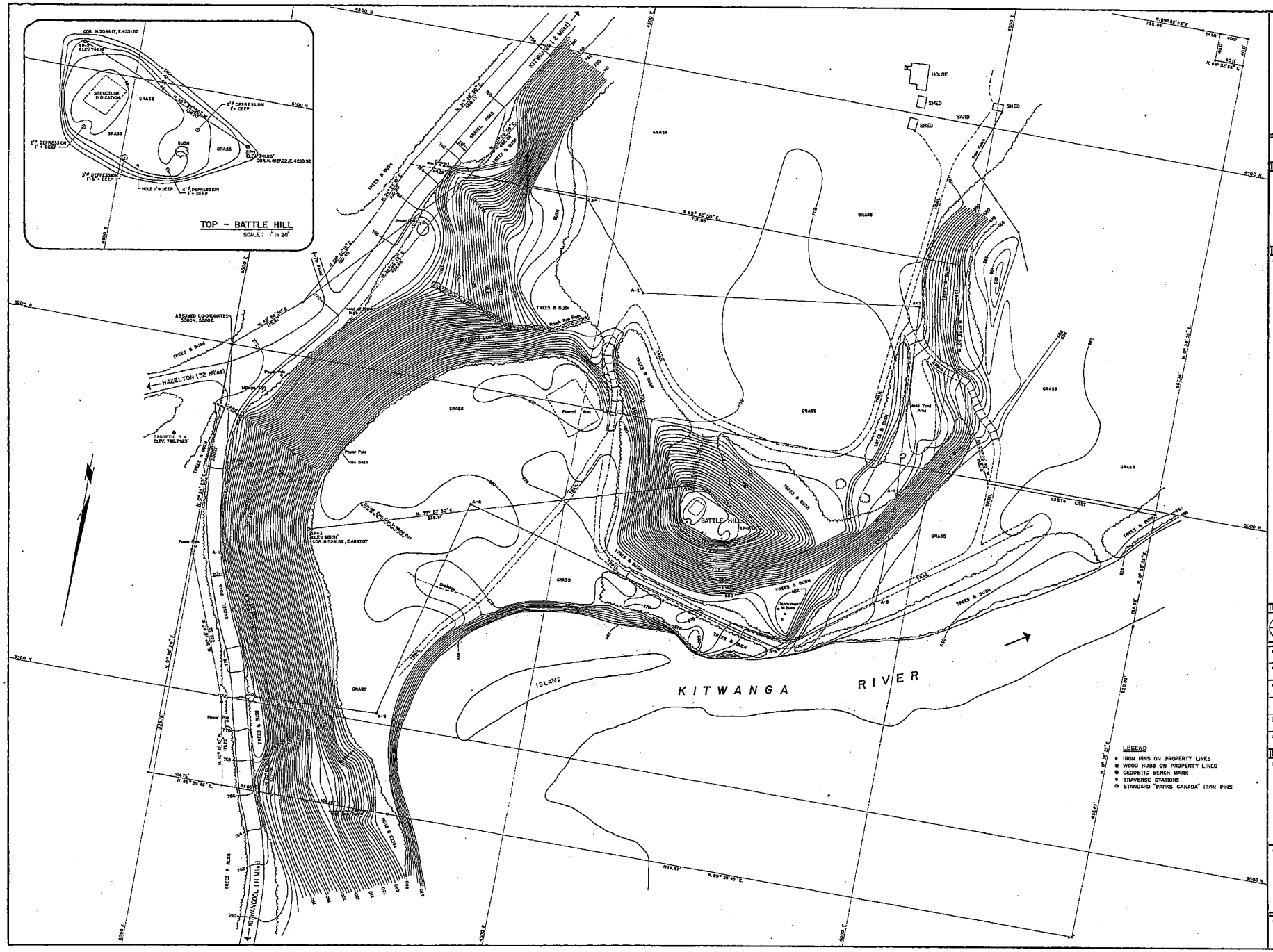
project title / titre du projet

KITWANGA
NATIONAL HISTORIC SITE
KITWANGA - BRITISH COLUMBIA

drawing title / titre du dessin

SITE DEVELOPMENT PLAN

reference no. / no de référence: HWBC 80/R1 — dwg no. / dessin no: 1 of 3



Indian and Northern Affairs / Affaires indiennes et du Nord

revisions / date

A detail no. / detail no
B location dwg. no. / no dessin on
C drawing no. / dessin no

drawn by / tracé par: J. R. LISOWAY
scale / échelle: 1" to 50'
designed by / dressé par:
checked by / vérifié par: J. R. LISOWAY
FIELDWORK - NOV. 1976 BOOK No. 676/1-1
job captain / chef du projet: L. BLIGHT
responsible officer / autorité responsable: L. BAKER

project title / titre du projet

KITWANGA
NATIONAL HISTORIC SITE
KITWANGA - BRITISH COLUMBIA

drawing title / titre du dessin

SITE PLAN

reference no. / no de référence: HWBC 77/RI
dwg no. / dessin no: 1 of 1

GITWANGAK BATTLE HILL STAIR REPLACEMENT

Parks Canada Basic Impact Analysis

Parks Canada Basic Impact Analysis Template

Instructions for this form are available (see the Guidance and Tools section of the Parks Canada Impact Assessment intranet site or request from Parks Canada impact assessment staff).

1. PROJECT TITLE & LOCATION:

Gitwangak Battle Hill Stairway Reconstruction, Gitwangak Battle Hill National Historic Site, Kitwanga, BC. Gwaii Haanas Field Unit.

Battle Hill is located off Highway 16 between Terrace and Smithers, 4.3 kilometers up Highway 37 and 1.7 km along Kitwanga Road. It is situated within the Hazelton and Buckley Mountain Ranges in northwest BC, on the east bank of the Kitwanga River, approximately 5 km north of the Village of Kitwanga (Gitwangak). The site encompasses 7.3 hectares and includes Parks Canada archaeological site 71 (GgTa-1).The Kitwankul Grease Trail, named for the candlefish (eulachon) oil that was transported along the Nass to the Skeena River, is located immediately adjacent to the Battle Hill site (Parks Canada 2003).

2. PROPONENT INFORMATION:

Dale Redford P.Eng. - Asset Management Advisor Coastal B.C. /Gwaii Haanas Parks Canada
2220 Harbour Rd. Sidney BC V8L 2P6
dale.redford@pc.gc.ca
Tel : (250) 247-7693
Cell : (604) 329-7353

3. PROPOSED PROJECT DATES

Planned commencement: 2015-09-14
Planned completion: 2016-03-31

4. INTERNAL PROJECT FILE # - R.076123.001

5. PROJECT DESCRIPTION

The project involves the replacement of two existing non-compliant deteriorating east and west wooden staircases, east stair case boardwalk and platform components (wood framing. wood guardrail, wood posts) and expansion of the landing located at the base of the east staircase. The size of the landings will be increased at the base of the staircases and a boardwalk will be added at the base of the parking lot staircase. This increase in size is required to match Code compliance and will increase the stairway footprint overall.

Excavation below ground will be done for wood posts and involve post installation and backfilling with original material. Construction of the new boardwalk at the base of the east staircase will require the installation of concrete footings and beams at the base of the east stair case, placement and compaction of crushed stone between the east and west stair cases, placement and compaction along the north trending path that provides access to the river and installation of cedar timbers on the ground surface secured by steel rods (re-bar) to delineate the path. Concrete will be cast on site and compaction will be carried out on pathway. All waste material will be disposed off-site.

It is understood that grubbing, brush clearing, grading or levelling the ground surface will not be required or undertaken to complete proposed improvements.

Site Sensitivity and Current design change recommendations: Due to the nature of the site sensitivity (below ground), it is recommended that:

- the modified map of the site be used on BIA copies to be posted on public sites,
- digging be done by hand, and
- that ground disturbance/excavation be minimized through the staircase and associated structure design by having them sit above the existing grade.

Additional recommendations are contained in Section 8: Mitigation Measures; Archaeological Concerns.

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

Use the Effects Identification Matrix (*Appendix 1*), as required, to identify potential interactions between the project and the surrounding environment.

7. EFFECTS ANALYSIS

8. MITIGATION MEASURES

Environmental Mitigations

Environmental concerns for species at risk have been addressed with two reports (Burton, P.J and Burton C.M, 2002 and Pojar, R. 2002) and there have been no species listed as extirpated, endangered or threatened in Schedule 1 of SARA found on the site.
The following Mitigation measures should address environmental concerns:

1. All vegetation management should be in accordance with the Landscape Management Plan mentioned ii TA'AWDZEP KITWANGA FORT National Historic Sites of Canada Management Plan (2005).
2. The State of the Site Reporting for Gitwangak Battle Hill National Historic Site in a vegetation 2010 update (in threats to natural processes) one of the two mitigation measures listed is that pursuant to CEAA an assessment was undertaken in 2010 to guide brush clearing. Annual site visits ensure **that vegetation is maintained regularly and clearing of brush is done in accordance with the site's environmental assessment guidelines. This is done by hand, with no heavy equipment and the vegetation that has been cut down is cleared away. The vegetation is cut but the roots are not disturbed.**
3. All movement and storage of building materials on the site should be done to minimize introduction of noxious weeds identified as high priority regionally. Where possible the use of tarpaulin material should be used to minimize possibility of introduced plant material and seed contacting the ground.
4. Some soil compaction will occur due to the nature of the construction, but attempts to minimize this should be made.

5. Movement of materials should be done along existing footprint and paths.

Archaeological Mitigations

Archaeological mitigation have been addressed here in the BIA and in the attached Technical Memorandum report (reference No; 1533354-003 -TM-Rev1). This report is attached in Appendix 3 (Figures below refer to those in the attachment in Appendix 3 of this report).

Below are the mitigations (Section 6) from the Golder report.

6.0 RECOMMENDATIONS

The Project area is located within Parks Canada Site 7T (GgTa-1), a significant proto-historic archaeological site with evidence of multiple cultural features and artifacts. It is recommended that impacts to archaeological features (cultural depressions, house depressions), materials and deposits be avoided during construction.

To facilitate this, Golder (Nov 25, 2015) recommends that:

1. Cultural depressions within 15 m of the Project area be added to the Public Works and Government Services Site Plan by a legal land surveyor.
2. Existing east stair case be removed utilizing methods that cause the least disturbance to the ground surface and subsurface soils and sediments (i.e., lifting the existing structure as opposed to excavating it out).
3. Full-time archaeological monitoring by a qualified archaeologist and Gitwangak community member (if available) is recommended during the following Project components:
   a. removal of east and west stair case structures;
   b. excavation works and installation of posts associated with the east and west stair cases; and
   c. any works undertaken within the trail at the base of the east and west stair cases in proximity to the cultural depressions.
4. For the Chance Find Management Zone shown on Figure 2 Appendix 3), including the area along the north trail and the central portion of the trail between the east and west stair cases, it is recommended that a Project specific Archaeological Chance Find Management Plan be developed and communicated during an on-site briefing to contractors.
5. To prevent inadvertent impacts to the Battle Hill site (GaTa-1), Golder recommends a **No-Work-Zone** be established. This No-Work-Zone is located immediately north of the existing trail to the toe of the slope of Battle Hill and east to the north trending trail (Figure 2).
6. As a precautionary measure we recommend that the No-Work-Zone be demarcated with orange snow fencing prior to commencement of the Project.
7. An equipment mobilization and laydown area has been identified on Figure 2 to the south of the trail, towards the fence line. To prevent damage to surface soils and sediments, including rutting, in advance of equipment mobilization and laydown, it is recommended that ground protection measures be put in place. For example, construction grade lay-down rubber matting

could be placed along the ground surface in areas that will be subject to equipment and foot travel and equipment/materials storage.

9. PUBLIC/STAKEHOLDER ENGAGEMENT & ABORIGINAL CONSULTATION

9 a) Indicate whether public/stakeholder engagement was undertaken in relation to potential adverse effects of the proposed project:

☒ No

☐ Yes (describe the process to involve relevant parties and indicate how comments were taken into consideration).

9 b) Indicate whether Aboriginal consultation was undertaken in relation to potential adverse effects of the proposed project:

☒ No

☐ Yes (describe the process to involve relevant parties and how the results were taken into consideration).

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

11. SURVEILLANCE

☐ Surveillance is not required

☒ Surveillance is required (provide details such as the proposed schedule and the focus of inspections)

Requirements for surveillance are documented in the Golder (Nov 25) and Golder (Dec 09) documents include instructions for chance find as well as the mapping.

12. FOLLOW-UP MONITORING

Follow-up monitoring is:

☐ not required

☐ legally required (e.g. under the *Species at Risk Act* or *Fisheries Act)*

☒ required in accordance with the *Parks Canada Cultural Resource Management Policy*

13. SARA NOTIFICATION

Notification is:

☒ not required

☐ required under the *Species at Risk Act* (outline the nature of and response to any notification).

14. EXPERTS CONSULTED

Include Parks Canada experts. Add as many entries as necessary for the project.

Department/Agency/Institution: Parks Canada	Date of Request: 2015-09-21
Expert's Name & Contact Information: Steve Oates	Title: Environmental Assessment Scientist | Natural Resource Conservation Branch |
Expertise Requested: Guidance with checklist, Review of the BIA and suggestions regarding sensitivity	
and posting on Sharepoint.	
Department/Agency/Institution: Golder Associates	Date of Request: 2015-09-09

Expert's Name & Contact Information: Adrienne Marr	Title: Archaeologist
Expertise Requested: Archaeological and Cultural Resources Assessment	
Response: Attached technical memorandum.	
Department/Agency/Institution: Parks Canada	Date of Request: 2015-09-21
Expert's Name & Contact Information: Camille Collinson	Title: Cultural Resource Management Advisor
Expertise Requested: Review of checklist and Review of research permit and reports from Golder	

15. DECISION

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

- ☒ not likely to cause significant adverse environmental effects.
- ☐ likely to cause significant adverse environmental effects.

NOTE: If the project is identified as likely to cause significant adverse effects, CEAA 2012 prohibits approval of the project unless the Governor in Council (Cabinet) determines that the effects are justified in the circumstances. A finding of significant effects therefore means the project CANNOT go ahead as proposed.

FOR SARA REQUIREMENTS:

- ☒ There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

OR, the SARA-Compliant Authorization Decision Tool (Appendix 2) was used and determined:

- ☐ There is no contravention of SARA prohibitions
- ☐ Project activities contravene a SARA prohibition and CAN be authorized under SARA
- ☐ Project activities contravene a SARA prohibition and CANNOT be authorized

16. RECOMMENDATION AND APPROVAL

(Add additional blocks as required)

Prepared by: Heather Stewart , Ecologist Team leader,	Date: YYYY-MM-DD 2015-11-25
Recommended by: Marvin Pearson, Asset Manager	Date: YYYY-MM-DD 2015-11-25
Approved by: Ernie Gladstone, Field Unit Superintendent	Date: YYYY-MM-DD
Signature:	

17. ATTACHMENTS

Yes, Appendix 3: Technical Memorandum from Golder Associates, Adrienne Marr, November25, 2015 and Update Dec 09, 2015. These documents lay out an adequate mitigation plan for Archaeology.

Detailed mapping for site has been removed from Nov 25 Technical memorandum and replaced in Dec 09 with Chance fins management Map.

18. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM

☒ Project registered in tracking system

☐ Not yet registered *(CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system* ***by the end of April*** *to enable reporting.*

*****Ensure that all required mitigation measures and conditions (e.g. follow-up monitoring requirements) are included in project permits and authorizations*****

References:

Burton,P.J and Burton, C.M. 2002. Floristic Inventory of Kitwanga Fort National Historic Site: Species at Risk, Ethnobotany, and Considerations for Historical Ecosystem Restoration. Symbios Research and Restoration, Smithers B.C. 24p.

Golder Associates. Nov 25, 2015. Cultural Resources Impact Assessment of a proposed Stair and Trail Improvement Project GITWANGAK BATTLE HILL NATIONAL HISTORIC SITE. Technical Memorandum. Reference #: 1533354-003-TM-RevA.

Golder Associates. Dec 09, 2015. UPDATE Cultural Resources Impact Assessment of a proposed Stair and Trail Improvement Project GITWANGAK BATTLE HILL NATIONAL HISTORIC SITE. Technical Memorandum. Reference #: 1533354-003-TM-Rev1.

Parks Canada, 2002. Available online http://www.pc.gc.ca/eng/lhn-nhs/bc/gitwangak/plan/plan3.aspx

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Pojar, R. 2002. Kitwanga Fort National Historic Site: Inventory of Species at Risk and Survey of Other Breeding Bird Species. Report prepared for Ecosystem Services, Western Canada Service Centre, Parks Canada, Vancouver, B.C. Mountainview Ecological Services, Smithers, B.C. 7 p.

Sumpter, Langemann & Heitzmann. 1992. 1990/1991 EARP Salvage Archaeology program. Western Region of National Parks and National Historic Sites.

Appendix 1 Environmental Impact Analysis Tools: Effects Identification Matrix

Section A *focuses on direct effects of the project and* ***Section B*** *on indirect effects that are caused by changes to the environment.*

A. Direct Effects										
	You may wish to change the components listed under the headings to specify the natural or cultural resources that are priority considerations for your PCA site or for the specific project being reviewed.		**Valued components potentially directly affected by the proposed project**							
			Natural Resources					Cultural Resources		
			Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Insert heritage values	Insert heritage values
	Phase	Examples of Associated Activities							
Project Components	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials	☐	☒	☐	☒	☐	☐	☐
		Burning	☒	☒	☐	☒	☐	☐	☐
		Clearing	☐	☒	☐	☒	☐	☐	☐
		Demolition	☐	☒	☐	☐	☐	☐	☐
		Disposal of waste	☐	☒	☐	☐	☒	☐	☐
		Blasting/ Drilling	☐	☐	☐	☐	☐	☐	☐
		Dredging	☐	☐	☐	☐	☐	☐	☐
		Drainage	☐	☒	☒	☒	☐	☐	☐
		Excavation	☐	☒	☒	☐	☐	☐	☐
		Grading	☐	☒	☐	☒	☐	☐	☐
		Backfilling	☐	☒	☐	☐	☐	☐	☐
		Use of machinery	☒	☒	☒	☒	☐	☐	☐
		Transport of materials/ equipment	☒	☒	☐	☐	☐	☐	☐
		Building of fire breaks	☐	☐	☐	☐	☐	☐	☐
		Use of Chemicals	☐	☐	☐	☐	☐	☐	☐
		Set up of temporary facilities	☐	☐	☐	☐	☐	☐	☐
		Soil Compaction	☐	☒	☒	☒	☐	☐	☐

A. Direct effects continued

			Valued components potentially affected by the proposed project						
	You may wish to change the components listed under the headings to specify the natural or cultural resources that are priority considerations for your PCA site or for the specific project being reviewed.		Natural Resources					Cultural Resources	
			Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Insert heritage values	Insert heritage values
	Phase	**Examples of Associated Activities**							
Project Components	Preparation / Construction / Operation / Decommissioning	Waste disposal	☐	☐	☐	☐	☐	☐	☐
		Wastewater disposal	☐	☒	☒	☐	☐	☐	☐
		Maintenance	☒	☐	☐	☒	☐	☐	☐
		Use	☐	☐	☐	☐	☐	☐	☐
		Use/Removal of temporary facilities	☐	☒	☐	☒	☐	☐	☐
		Use of Chemicals	☐	☐	☐	☐	☐	☐	☐
		Active fire stage	☐	☐	☐	☐	☐	☐	☐
		Prescribed burn cleanup	☐	☐	☐	☐	☐	☐	☐
		Planting	☐	☐	☐	☒	☐	☐	☐
		Culling	☐	☐	☐	☐	☐	☐	☐
		Vehicle Traffic	☐	☒	☐	☐	☐	☐	☐
		Other...	☐	☐	☐	☐	☐	☐	☐

Section B *of the matrix should be used to identify potential indirect effects that may result from impacts of the project to components of the environment you have identified on the preceding pages (see Section A - direct effects to natural resources). Consideration of indirect effects is required under CEAA 2012 Sections 5(1)(c) and 5(2)(b), and by the PCA mandate. For example:*

- *if the proposed project could lead to adverse effects to water quality and quantity, could this then effect the quantity and quality of water resources (e.g. potable water) used by an Aboriginal community?*
- *could there also be adverse socio-economic effects to a community that relies on recreational fishing tourism?*
- *could changes to the environment (e.g. digging, clearing) affect visitor access, opportunities, or safety?*

B. Indirect Effects (all phases)							
You may wish to change the components listed under the headings to specify the natural or resources that are priority considerations for your PCA site or for the specific project being reviewed.		**Impacts as a result of changes to the environment**					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommod'n opportunities	Safety
Phase	**Natural resource components affected by the project**						
Preparation /construction operation/implementation/decommissioning	Could impacts to <u>air</u> lead to adverse effects on...	☐	☐	☐	☐	☐	☐
	Could impacts to <u>soils and landforms</u> lead to adverse effects on...	☐	☐	☐	☐	☐	☐
	Could impacts to <u>water</u> (e.g. surface, ground water and water crossings) lead to adverse effects on...	☐	☐	☐	☐	☐	☐
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...	☐	☐	☐	☐	☐	☐
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...	☐	☐	☐	☐	☐	☐
	Other...	☐	☐	☐	☐	☐	☐

Appendix 2: SARA-Compliant Authorization Decision Tool

- **This tool is for use when the BIA has determined that project activities will lead to residual adverse effects to THR, EN, or EX species at risk** (i.e. even after mitigation measures are applied, there are effects to individuals, residences or critical habitat of THR, EN or EX species at risk).
- This tool provides a structured process to determine if a SARA authorization is required, if it can be issued, and how to issue it.
- **Guidance for each question is provided within the form and should be deleted from the final version.**
- Consultation with a representative of the Species Conservation and Management (SCM) team is encouraged to help ensure consistent application of this tool.

Part A – Does a SARA authorization need to be considered for this activity?

1. Will the activity lead to residual adverse effects that contravene a SARA prohibition for a listed endangered (En), threatened (Th) or extirpated (Ex) species at risk, its residence or its critical habitat?
No Authorization is required as no listed SAR are located on the property. Prior assessment has documented this.

SARA prohibitions: s.32 - Cannot: kill, harm, harass, capture, or take individuals; possess, collect, buy, sell or trade individuals or parts of individuals; s.33 – Cannot damage or destroy residences; s.58 – Cannot destroy any part of critical habitat; s.80 - Cannot carry out an activity that is prohibited under a protection order.

☐ **Yes. Residual adverse effects of the activity will contravene a SARA prohibition.**

Document how activities will contravene a SARA prohibition. Then **continue to Question 2.**

2. Is the activity authorized under S. 83 of SARA?

☐ **Yes. A SARA authorization is NOT required.** The activity is authorized in a recovery strategy or action plan;

OR

☐ **Yes. A SARA authorization is NOT required.** The activity is required for public safety, health or national security **AND** authorized by or under another Act of Parliament.

Document below:

- The specific section of the published recovery strategy or action plan that makes reference to section 83 of SARA

OR

- Why the activity is needed for public safety, health or national security and reference the Act of Parliament under which the activity is authorized (*you **MUST** consult a member of the SCM team if you plan to use the section 83 exception).*

If all activities that would contravene a SARA prohibition are already authorized under SARA s.83, **check the first box in Part D and submit for approval.**

☐ **No. A SARA authorization is required. Continue to Part B.**

Part B – Is the activity eligible for authorization under SARA?

****Complete ONLY if you have answered NO to Question 2, above****

3. Does the activity fall into one of the following three categories?

Select the appropriate box (check only one) and **continue to Question 4** OR, If the proposed activity DOES NOT fit in any of the three categories below the activity CANNOT be authorized, and you can check the second box in **Part D and submit for approval.**

- ☐ The activity is scientific research related to the conservation of the species and conducted by qualified persons; **OR**
- ☐ The activity benefits the species or is required to enhance its chance of survival in the wild ; OR
- ☐ Affecting the species is incidental to the activity (i.e. the purpose of the activity is not to engage in an activity that is prohibited under SARA (e.g., kill, harm, harass…an individual; destroy a residence or critical habitat). For example, fishing for a listed species cannot be permitted, but accidental by-catch *may* be.

4. Alternatives that would reduce the impact(s) on the species have been considered and the best solution adopted

Document below and **continue to Question 5**. *This question is an additional requirement to the questions in the BIA template.*

- Identify and explain all reasonable alternatives considered to reduce the impact(s) on the species (alternatives to the project and alternative means of carrying out the project, including a "no action" alternative).
- This explanation must demonstrate that the best solution has been adopted.

5. All feasible measures must be taken to minimize the impact of the activity

Ensure that the mitigations identified in Section 8 of the BIA template to address effects to species at risk are as comprehensive as possible, and continue to **Question 6.**

6. Will the activity jeopardize the survival or recovery of the species?

Document here your analysis of whether the activity will jeopardize survival or recovery of the species. The analysis must consider and refer to relevant SARA recovery documents (e.g. COSEWIC status reports, recovery strategies, action plans), and/or Parks Canada Detailed Assessments for the species, if available. In particular, refer to the population and distribution objectives, the threats to the species, and the identification of critical habitat (including the location, amount - if available, biophysical attributes, and the activities likely to destroy).

*NOTE: If the BIA determines there are no alternatives or mitigation measures that can prevent destruction of critical habitat or non-compliance with a protection order, you **MUST** consult a member of the SCM team for further advice.*

☐ **Yes. The activity CANNOT be authorized.**

Check analysis with the SCM team. **Then check the second box in Part D and submit for approval. ENSURE THIS CONCLUSION IS TAKEN INTO CONSIDERATION IN SECTION 10 OF THE BIA TEMPLATE (SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS) AND DOCUMENTED IN THE BIA TEMPLATE, SECTION 15 – DECISION.**

☐ **No. The activity CAN be authorized.** Complete explanation and continue to **Part C**.

Clearly document how you considered potential jeopardy to the survival or recovery of the species. Check analysis with the SCM team.

Part C - Prepare the SARA authorization and posting explanation

7. Prepare the authorization

The authorization will be issued using the EIA process and SARA s.74

Issue the SARA authorization using the **template on the intranet** and complete Question 8 to prepare the posting for the SAR Public Registry.

8. Provide description for posting

SARA requires that an explanation of why a SARA authorization is issued be posted in the SARA Public Registry in both official languages within 30 days of the authorization being issued. Prepare the explanation, using the information you entered in the BIA and previous sections of this Appendix. Your regional SCM representative will have the explanation translated and will publish it on the SARA registry.

Regional or Local Number:
Provide the authorization number issued by Parks Canada (in this instance, the file number of the EIA)

Purpose – *select the answer indicated in Section 3 of this Appendix:*

- Affecting the species is incidental to the activity; OR
- The activity is necessary of beneficial to the species, OR
- The activity is scientific research related to the conservation of the species and conducted by qualified persons

Description of the Activity
Provide a one-paragraph summary of the activity and how it will affect the listed species (using the information in sections 5 & 10 of the BIA template)

- Start Date of Authorization: XXX End Date of Authorization: XXX
- Issuing Authority: Parks Canada Agency
- Authority Used: *(see section 7 of this Appendix)*
- Location of Activity *(province, territory or ocean): XXX*
- Affected Species: *Limit your list to potentially affected species that are listed under SARA as Extirpated, Endangered or Threatened*

Pre-Conditions - *limit your explanation to species for which the authorization will be issued:*
Provide a half-page summary of proposed mitigation measures and the significance of residual effects (from the BIA) and provide summary of sections 4, 5 and 6 of this Appendix.

Contact Person(s)
Provide name and coordinates of a PCA contact.

Part D – SARA Authorization Decision
Select the appropriate answer and continue to Part E.
☒ This activity does not require a SARA authorization, as indicated in Questions 1 and 2.
☐ This activity requires a SARA authorization but CANNOT be authorized because it does not fit into one of the three required categories (see response to Question 3) OR it does not meet one of the SARA pre-conditions (see responses to Questions 4-6).
This activity meets the SARA authorization requirements; an authorization may be issued (see response to Questions 3-6). The residual adverse effects (effects remaining after mitigations have been applied) MAY contravene the following SARA prohibition: ☐ s.32 - Cannot: kill, harm, harass, capture, or take individuals; possess, collect, buy, sell or trade individuals or parts of individuals; ☐ s.33 – Cannot damage or destroy residences; ☐ s.58 – Cannot destroy any part of critical habitat; ☐ s.80 - Cannot carry out an activity that is prohibited under a protection order

Part E – SARA Authorization Recommendation and Approval	
Prepared by *(add additional blocks as required)*: Name & Position of Author(s), Collaborator(s), Reviewer(s):	Date: YYYY-MM-DD
Recommended by: Name & Position:	Date: YYYY-MM-DD
Decision Approval	
Name & Position (*FUS/Director of a Waterway, or Delegate*):	
Signature:	Date: YYYY-MM-DD

Appendix 3- Golder Associates -Technical Memorandum (Dec 09, 2015)

TECHNICAL MEMORANDUM

DATE December 9, 2015 **REFERENCE No.** 1533354-003-TM-Rev1

TO Richard Mastschuch, Structural Project Manager
WSP Canada Inc.

FROM Adrienne Marr **EMAIL** Adrienne_Marr@golder.com

CULTURAL RESOURCE MANAGEMENT RECOMMENDATIONS FOR THE PROPOSED STAIR AND TRAIL IMPROVEMENT PROJECT AT GITWANGAK BATTLE HILL NATIONAL HISTORIC SITE

1.0 PREAMBLE

Further to Golder Associates' Ltd (Golder) Technical Memorandum dated November 25, 2015, and at the request of WSP Canada Inc. (WSP), Golder has prepared this technical memorandum to address and assist with the management of cultural resources associated with the proposed Stair and Trail Improvement Project (the Project) at Gitwangak Battle Hill National Historic Site (Battle Hill).

Presented below is a summary of a confidential cultural resources impact assessment (CRIA) conducted for this Project, including recommendations for the protection of cultural materials and features during demolition and construction related activities associated with proposed upgrades to the existing staircase and pedestrian trail at Battle Hill. It is understood that this information will be included in the tender documents provided to contractors interested in pursuing this Project.

2.0 CONSTRUCTION RECOMMENDATIONS

The Project area is located within Parks Canada Archaeological Site 7T (GgTa-1) (Figure 1). It has been recommended in the CRIA that cultural features (i.e., cultural depressions), materials and deposits be avoided during construction.

Golder also recommends the following measures be undertaken during construction and related activities:

- All work within areas shown in **green** in Figure 1 to occur under **Archaeological Chance Find Management Procedures** without an archaeologist present. If cultural deposits are identified during construction under these Procedures, all work in the vicinity must stop until a professional archaeologist can be contacted to determine appropriate next steps;
- Work in **all other areas** (including laydown and staging area) **require an archaeologist on site to monitor all development activities that may impact surface soils and sediments;** The existing east stair case is to be removed by lifting or pulling out the existing structure, minimizing any excavation activities that may impact buried soils and sediments;
- No grubbing, brush clearing, grading or levelling that may impact surface soils and sediments are to occur during the Project; and,
- That ground protection measures be put in place in the Laydown Area (Figure 1) to prevent damage to surface soils and sediments in advance of equipment mobilization and laydown. For example, construction grade lay-down rubber matting could be placed along the ground surface in areas that will be subject to equipment travel and equipment/materials storage

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Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Any construction and related activities proposed beyond the areas shown in green (the Archaeological Chance Find Management Zones) and orange (Archaeological Monitoring Zones) on Figure 1 should only be completed after consultation with the archaeologist.

3.0 CLOSURE

These recommendations were prepared for the use of WSP Canada Inc. Any use, reliance, or decisions made by third parties on the basis of this report are the sole responsibility of such third parties.

GOLDER ASSOCIATES LTD.

Adrienne Marr

Adrienne Marr, B.A., RPCA
Archaeologist

Ben Hjermstad, M.A.
Associate, Senior Archaeologist

AM/SH/BH/lih

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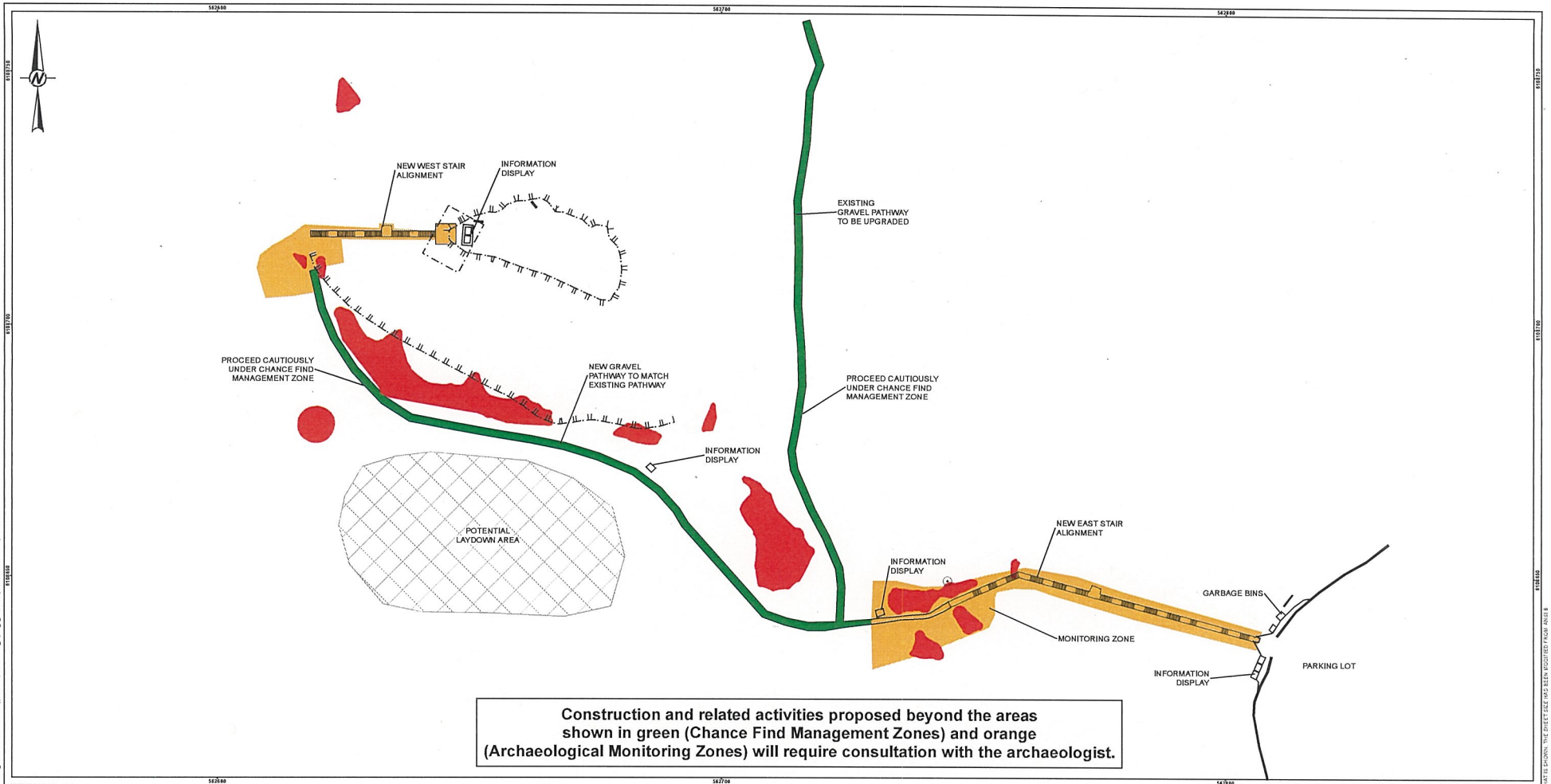

Construction and related activities proposed beyond the areas shown in green (Chance Find Management Zones) and orange (Archaeological Monitoring Zones) will require consultation with the archaeologist.

LEGEND

- STUMP
- PROJECT INFRASTRUCTURE
- TOE OF SLOPE
- ARCHAEOLOGICAL MONITORING ZONE
- CHANCE FIND MANAGEMENT ZONE
- POTENTIAL LAYDOWN AREA
- PREVIOUS OPERATION AREA GENERALLY OUTLINING HOUSE DEPRESSIONS AS MAPPED BY MACDONALD[1]
- ARCHAEOLOGICALLY SENSITIVE AREA

0 20 40
1:750 METRES

NOTE
1. AREAS BEYOND THE CHANCE FIND MANAGEMENT AND MONITORING ZONES ARE NO-GO ZONES AND ARE CONSIDERED HIGHLY SENSITIVE – MACHINE AND PEDESTRIAN FREE AREAS NOT SUITABLE FOR LAYDOWN.

REFERENCES
1. MACDONALD, GEORGE. 1989. KITWANGA FORT REPORT, CANADIAN MUSEUM OF CIVILIZATION, HULL, QUEBEC.
2. ARCHAEOLOGY DATA OBTAINED FROM PUBLIC WORKS AND GOVERNMENT SERVICES CANADA. DATE OF SURVEY: MAY 27-28, 2015.
3. ARCHAEOLOGICAL SURVEY DATA OBTAINED FROM GOLDER ASSOCIATES.
DATUM: NAD 83 PROJECTION: UTM ZONE 9

CLIENT
WSP CANADA INC.

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-12-09
DESIGNED	AM
PREPARED	GI
REVIEWED	AM
APPROVED	BH

PROJECT
GITWANGAK BATTLE HILL PARKS CANADA SITE 7T
NATIONAL HISTORICAL SITE IMPROVEMENT PROJECT
PARKS CANADA, RESEARCH AND COLLECTIONS PERMIT NO. GWA-2015-20336

TITLE
ARCHAEOLOGICAL CHANCE FIND MANAGEMENT

PROJECT NO.	CONTROL	REV.	FIGURE
1533354		0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

GITWANGAK BATTLE HILL STAIR REPLACEMENT

Archaeological Chance Find Management Plan

January 27, 2016

GITWANGAK BATTLE HILL NATIONAL HISTORIC SITE STAIR AND TRAIL IMPROVEMENT PROJECT

Archaeological Chance Find Management Plan

Submitted to:
WSP Canada Inc.
Suite 200 - 1985 West Broadway
Vancouver, BC
V6J 4Y3

REPORT

Report Number: 1533354-004-R-Rev0

Distribution:

2 Copies - WSP Canada Inc.
1 Copy - Golder Associates Ltd.

Golder Associates

Table of Contents

1.0 INTRODUCTION

The intent of this Chance Find Management Plan (CFMP) is to provide WSP Canada Inc. (WSP) and its contractors with general guidelines for the appropriate response to the discovery of known or suspected archaeological materials, including human remains, during development activities associated with the Stair and Trail Improvement Project (the Project) at Gitwangak Battle Hill National Historic Site (Battle Hill).

The objectives of these guidelines are to promote the preservation and proper management of archaeological materials and/or features that are unexpectedly encountered during Project activities and to minimize disruption to construction activities and scheduling, if possible.

2.0 GENERAL GUIDELINES FOR MANAGING ARCHAEOLOGICAL AND HUMAN REMAINS CHANCE FINDS

2.1 Chance Find Management Zone – Work Procedures

The Project Archaeologist from Golder Associates Ltd. (Golder) will provide contractors with an on-site briefing that includes a review of the procedures outlined in the CFMP. The chance find procedures will apply to those areas outlined in Appendix A and are referred to as Chance Find Management Zones. Areas that fall beyond the Chance Find Management Zones will require archaeological monitoring. In these areas, the archaeologist will be on site to monitor construction and related activities that have the potential to impact surface soils and sediments.

A step-by-step response procedure is provided below in the event that archaeological resources are encountered during construction or related activities when an archaeologist is not present. Contact names and telephone numbers are provided in Appendix B. Basic archaeological site criteria are provided in Appendix C.

2.1.1 Initial Response by Contractor

If suspected archaeological materials or features (either intact or disturbed) are encountered, the following procedures apply:

- **Step 1:** **Immediately stop work in the immediate vicinity of the suspected archaeological resource and secure the area.** Do not undertake further work that could disturb the find spot. Do not move soil from the vicinity of the find, including adjacent spoil material. Do not move or collect the find. Be prepared to transmit detailed information about the find.
- **Step 2:** Contact the Project Archaeologist for further guidance (Appendix B).
  - Adrienne Marr, Project Archaeologist, (Golder Terrace) (250) 635-3444; cell (250) 641-1337.
  - Alternate: Senior Archaeologist Shauna Huculak, (Golder Vancouver) (604) 296-2898; cell (250) 213-1965
- **Step 3:** The Project Archaeologist will advise on further action.

2.1.2 Further Action by the Project Archaeologist

Depending on the nature of the situation, one of the following responses by the archaeologist is likely:

- Based on a telephone description of the incident, it may be decided that there are no further concerns, allowing construction and associated activities to continue as planed; or,
- A field visit by the Project archaeologist may be recommended in consultation with the WSP representative. In the event that the find is of archaeological concern, the Project Archaeologist will notify WSP, Parks Canada and the Gitwangak First Nation. The Project Archaeologist will assess the find and provide interim management measures, including staking off the location, if warranted. Parks Canada will provide direction on appropriate follow-up procedures.

2.1.3 Management Options

In the event that archaeological materials or features (intact or disturbed) are in fact present, the Project Archaeologist will coordinate discussions with Parks Canada Archaeologist, WSP, their contractors and the Gitwangak First Nation as appropriate, to evaluate management options. Some common management options for the preservation of archaeological materials and/or features are provided below.

- **Option 1:** Avoidance through partial project redesign or relocation. This results in minimal impact to the archaeological site and is the preferred option from a cultural resource management perspective. It can also be the least expensive option from a construction perspective. A site investigation may be required to define archaeological site limits;
- **Option2:** Application of site protection measures. Site protection measures may include both temporary and long terms plans. Temporary measures could include fencing or a barricade to protect the archaeological site. Appropriate protection measures will be identified in consultation with Parks Canada. Monitoring may be required during construction and related activities to verify that the protection measures are effective;
- **Option 3:** Salvage archaeological excavation, if necessary. This option is destructive to the archaeological site and can result in dealy's to construction by several weeks; and
- **Option 4:** Monitoring of construction activities by a professional archaeologist. Monitoring is appropriate where project impacts cannot be predicted or evaluated before construction, especially near the margins of an archaeological site.

2.2 Chance Find Procedures for Human Remains

If suspected human remains (either intact or disturbed) are encountered, the following responses are required:

- **Step 1:** **Immediately stop work in the vicinity of the remains and secure the area.** Do not handle the remains, and do not undertake further work that could disturb the remains. Do not move soil in the vicinity of the remains, including adjacent spoil or associated material(s) such as stones. Be prepared to transmit detailed information about the find;
- **Step 2:** Contact the Project Archaeologist for further guidance (Appendix B).
  - Adrienne Marr, Project Archaeologist, (Golder Terrace) (250) 635-3444; cell (250) 641-1337

- Alternate: Shauna Huculak, Project Archaeologist, (Golder Vancouver) (604) 296-2898; cell (250) 213-1965

- The Project Archaeologist will advise on further action, including when work can resume.

2.2.1 Further Action by the Project Archaeologist

- The Project Archaeologist will notify and request direction from the Gwaii Haanas Nation Park Reserve and Haida Heritage Site Superintend: Ernie Gladstone;
- The Project Archaeologist will notify the Coroner's Office and local policing authority, if appropriate; and
- An archaeologist or a designate who has specialized training in physical anthropology will visit the site with a Gitwangak community representative (if available).

2.2.2 Archaeological Human Remains Management Options

If it is determined that the remains are human and archaeological in nature, an appropriate protocol for handling human remains will be developed in accordance with the terms outlined in the Project Parks Permit (No. GWA-2015-20336) and in consultation with WSP, Parks Canada and the Gitwangak First Nation. Two possible mitigation strategies are suggested below:

- Option 1: Avoidance through Project redesign or relocation. This would protect the remains from further disturbance; or
- Option 2: If deemed appropriate, systematic excavation of the remains followed by reburial in a mutually agreed upon location that respects Gitwangak First Nation cultural protocols.

WSP and their contractors must be aware that the excavation of human remains and subsequent reburial may involve certain ceremonies or procedures that could delay construction.

SHOULD WSP OR ANY OF THEIR CONTRACTORS HAVE ANY CONCERNS ABOUT ARCHAEOLOGICAL DEPOSITS OR HUMAN REMAINS. THE PROJECT ARCHAEOLOGIST SHOULD BE CONTACTED FOR DIRECTION.

GOLDER ASSOCIATES LTD.

Adrienne Marr

Adrienne Marr, B.A., RPCA
Archaeologist

Ben Hjermstad, M.A.
Associate, Senior Archaeologist

AM/BH/lih

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APPENDIX A

Chance Find Management Zones

APPENDIX B

Contact Names and Numbers

APPENDIX C

Basic Archaeological Site Identification Information

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Typical criteria that may signal the presence of an archaeological site are described and illustrated in the sections below. This list in not exhaustive, but it includes the most common archaeological features and artifact types that may be encountered at the Gitwangak Battle Hill National Historic Site (Battle Hill).

FEATURE – CULTURAL DEPRESSIONS

Circular, rectangular, square or oval depressions in varying sizes, related to habitation features such as plank houses and house pits or associated with subsistence such as the collection, processing and storage of food (e.g., food cache pits or roasting pits). Circular, ovoid and rectangular cultural depressions are located within the Gitwangak Battle Hill National Historic Site.

Look for: rectangular or circular depressions, usually with a defined rim (Photograph 1).

Photograph 1: A cultural depression feature(© Golder Associates Ltd.).

FEATURE – POST MOLD

Post mold features are the archaeological signature of structural supports for dwellings, fish drying racks, etc., and represent soil-filled voids that are left when the wooden supports deteriorate with the passage of time. Features of this type are typically found in cut bank exposures (e.g., ditches, excavation walls) and are often associated with other archaeological features and objects (e.g., house floors, hearths, etc.).

Look for: columnar, soil filled voids extending into sterile deposits exposed in the wall of an excavation unit or road cut (Photograph 2).

Photograph 2 - Three post hole features extending into sterile gravel deposits exposed in excavation wall (© Andrew Mason).

FEATURE – HEARTHS

Hearth features are typically the remains of cooking fires, and consist of concentrations of charcoal, ash, and fire- reddened soil. These features may contain small stone fragments, fire-altered rock or small, uniform-sized cobbles that were heated and used to boil water.

Look for: concentrations of charcoal and fractured cobbles **with signs of having been burnt in a fire (Photograph 3).**

Photograph 3 - Hearth feature composed of lenses of charcoal and ash with fire-cracked rock (© Andrew Mason).

ARTIFACTS – STONE, BONE, ANTLER, OR SHELL

Portable object(s) manufactures or modified by human beings. These items may include chipped or ground stone objects, or implements made from bone, antler or shell (Photograph 4-8)

Look for: intentionally formed stone objects or pieces of stone that have been chipped and/or ground, or unusual rock types that are not common to the area. Bone and antler artifacts will exhibit obvious modification (*e.g.*, cutting, shaping, incision, etc.).

Photograph 4 - Lithic artifact scatter. Note how the flakes (black stone) stand out from the background (© Golder Associates Ltd.).

Photograph 5 - Unmodified "waste" flakes (© Golder Associates Ltd.).

Photograph 6 – Leaf-shaped projectile point (© Golder Associates Ltd.).

Photograph 7 - Bone bipoints (© Golder Associates Ltd.).

Photograph 8 - Antler tine wedges (© Golder Associates Ltd.).

FIRE ALTERED ROCK (FAR)

Heat fractured stone result from rapid or alternate heating and cooling associated with cultural activities such as stone boiling or utilizing a campfire.

Look for: concentrations of fractured pebbles with signs of being burnt in a fire (Photograph 9).

Photograph 9 - Fire-cracked rock. Note the angular nature of the breakage pattern and evidence of exposure to fire (© Andrew Mason).

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