



Parks Canada Basic Impact Analysis

1. PROJECT TITLE & LOCATION

Lighthouse Access Road Recapitalization, Cape Spear Lighthouse National Historic Site

2. PROPONENT INFORMATION

██████████ – Manager, National Historic Sites and Visitor Experience ██████████
██████████ – Project Manager, FII, ██████████

3. PROPOSED PROJECT DATES

Planned commencement: 2016-09-30
Planned completion: 2016-11-10

4. INTERNAL PROJECT FILE #584

5. PROJECT DESCRIPTION

Cape Spear Lighthouse National Historic Site is one of the field unit's biggest attractions, accessible to the public 24/7. In 1962, the Cape Spear Lighthouse was designated a National Historic Site for its age and architecture. It is also designated as Classified according to the *Treasury Board Policy on Management of Real Property* because of its historical association and environmental value.

The access road to the lighthouse is approximately 610 meters in length, roughly following the existing utility corridor. The first 250 meters of the road is asphalt and the rest is gravel. The road network can be described as two distinct sections which are shown as Access Road 'A' and Access Road 'B' in Appendix 1. The first section (Access Road 'A') is approximately 490 m long running from Blackhead Road to the Coast Guard Automated Lighthouse and Visitor Centre. The second section (Access Road 'B') of road connects to the first road at 290 m from Blackhead Road and runs up a steep slope for about 140 m to the Historic Lighthouse. The slope of the road varies greatly over the length but the most problematic section is located on the road to the Historic Lighthouse where grades reach above 20%.

The road is used by park staff on a regular basis for maintenance activities as well as by Fisheries and Oceans Canada to access the Coast Guard Automated Lighthouse. It is also the only vehicular access to the Coast Guard lighthouse and Visitor Center. Although the road is closed to public vehicle traffic, visitors are able to access it and a section of trail leading to the East Coast Trail crosses the upper portion of the road.

The road was not properly constructed and poor drainage is a large contributor to the issues encountered at the site. The lack of shoulder drainage along the road directs all overland flow along the road way, generally from the steeper upper sections down to the gated entrance at Backhead Road. This, combined with the steep slopes, increases the water velocity and results in significant erosion. Access Road 'B' has experienced erosion of the gravel road structure down to existing bedrock and is only accessible by 4x4 trucks. The intent of the project is to focus the work on the most problematic section of the roadway and to have a safe, reliable and accessible road for use year round.

The site is located on an exposed, rocky headland with grass, low scrubby vegetation, minimal trees and points of exposed bedrock. It is subjected to extreme weather events (e.g., high winds, freeze thaw cycles, frequent rain, snow, and ocean wave spray). Construction in the fall of 2016 would coincide with the Atlantic Basin Hurricane Season which extends from June 1 to November 30. The hurricane season





for 2016 is predicted to be more active than average due to the higher than normal temperatures of the Gulf of Mexico and the Atlantic Ocean.

There are no known flora or fauna species at risk in the area. Fox are occasionally observed but there are no known denning sites in the vicinity of the project. The project will take place well outside of the migratory bird nesting season. The marine environment is located on either side of the access road: downslope of Access Road 'A' and across Blackhead Road from the access road entrance and upslope from Access Road 'B' on the opposite side of the lighthouse from the access road. The marine environment is located in close proximity to the proposed staging area at the lower parking lot. There are some wet areas along the road but no freshwater fish-bearing watercourses.

The scope of work includes:

- Access Road 'A' – asphalt removal from the entrance gate and re-surfacing with gravel. The asphalt will be milled and used as fill in the new intersection between Access Road 'A' and 'B'. Original horizontal alignment will be maintained with minor changes to vertical slopes.
- Access Road 'B' - re-shaping and re-alignment of the road and re-surfacing with gravel. The steep grade of this section will be reduced.
- Decommissioning and naturalisation of an existing section of Access Road 'B'
- Drainage improvements: installation of drainage swales, and pipe culvert replacement and installation

Project activities include:

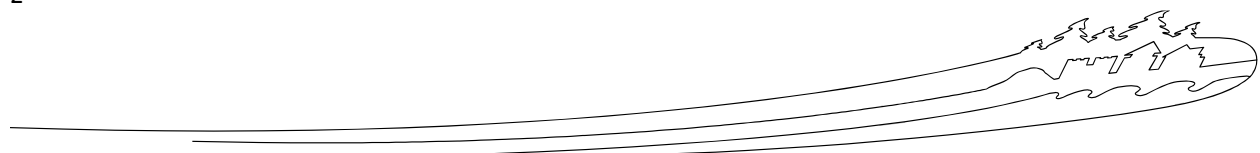
- Site access: The lower parking lot will be used as a staging and material storage area.
- Demolition: asphalt removal (milled and re-used onsite)
- Waste disposal: demolition waste will be sorted by material with on-site separation and disposed of in accordance with industry standards
- Vegetation: clearing and grubbing, removal and stockpiling of sod mats, selective vegetation removal/trimming, tree and shrub preservation, restoration
- Earthworks: soil stripping/stockpiling, topsoil placement and grading, reshaping roadway subgrade, rock removal, excavation, trenching, backfilling, dewatering, erosion and sedimentation control
- Exterior roadwork: granular sub-base, reshaping granular roadbed, aggregate base courses, asphalt paving, dust control, culvert maintenance and installation
- Use of machinery: dump trucks, large and small excavators, graders, milling machine
- Transport of materials and equipment: materials will be transported to the site along Blackhead Road to the staging area at the lower parking lot and from there to the access road.

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

The project will potentially affect *Natural Resources* including Air, Water, Soil and Landforms, Flora and Fauna. It may also affect *Cultural Resources* and *Visitor Experience*.

7. EFFECTS ANALYSIS

The primary effects for all valued components will occur during the construction phase of the project. Refer to Appendix 2: Effects Identification Matrix.





Natural Resources

Air - airborne dust particles from exposed soil and heavy equipment exhaust may result in reduced air quality. The effect is expected to be low given levels of rainfall typical in the Fall, reducing the potential for dust.

Water – wastes (e.g., garbage, litter, fuel and construction materials), erosion and sedimentation and surface water runoff may contaminate groundwater and the marine environment (located close to the staging area at the lower parking lot). The probability of a fuel spill is low, however, the area is subject to high winds and storm conditions. Erosion and sediment control and secure storage of materials will be important.

Soil and Landforms - excavation activities and operation of heavy machinery may result in soil compaction and rutting, soil erosion, loss of topsoil, exposure of subsoils, and soil contamination from waste (e.g., garbage, fuel). The area is historically a disturbed area so effects are expected to be low. Effective restoration of the site will be important.

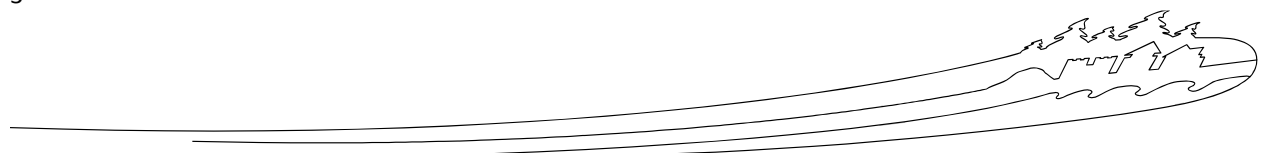
Flora - excavation will require removal of vegetation resulting in disturbance of adjacent natural areas, potential root exposure and physiological stress; ground disturbance may result in the further introduction of invasive alien species, or expansion of existing populations; and there may be impacts on valued vegetation features, in particular the few windswept trees existing in the area. Effects are expected to be low given that the site is historically a disturbed area and there are currently a number of invasive species existing on the site. Effective restoration, however, will be important.

Fauna - operation of heavy equipment, increased human presence and noise may result in temporary habitat displacement/ preferred habitat avoidance (e.g., birds); artificial food sources such as garbage and litter may cause wildlife habituation/attraction (e.g., seabirds, fox); potential fuel spills, sedimentation and runoff may contaminate marine habitat; and potential runoff from fuel spills may cause injury or mortality to marine life. Effects are expected to be low given that construction will take place outside the migratory bird nesting season and at the end of whale season and this is a disturbed area with, at times, high levels of human activity.

Cultural Resources

An Archaeological Overview Assessment (Appendix 3) was completed for the World War II Bunker project located at another section the national historic site. Archaeological monitoring and recording of seven geotechnical test pits in the immediate project area took place on May 23, 2016 (Appendix 4). Potential cultural resources were found at two of the seven test pits (#8 and 9), however they were not significant findings and the area has been previously disturbed from the original road construction. Despite this, earthworks activities could impact archaeological resources (known or potential) during the construction period.

Historic resources - due to the nature of re-grading and re-routing of the access road, there are potential effects on the cultural landscape or landscape features of heritage value during the construction period and possibly post-construction depending on the quality of restoration.





Visitor Experience

The potential effects on Visitor Experience are anticipated to occur during the construction period, including: reduced quality of visitor experience due to noise and presence of construction equipment; decreased aesthetic appeal and impacted viewscape; and potential hazard to visitors and staff due to construction activities (e.g., heavy equipment operation). The project will temporarily decrease the quality of the overall visitor experience but this is limited to the construction period, the area is used mainly for operational purposes and trails will remain accessible to visitors.

8. MITIGATION MEASURES

General

Work Site Conditions/Staging/Laydown:

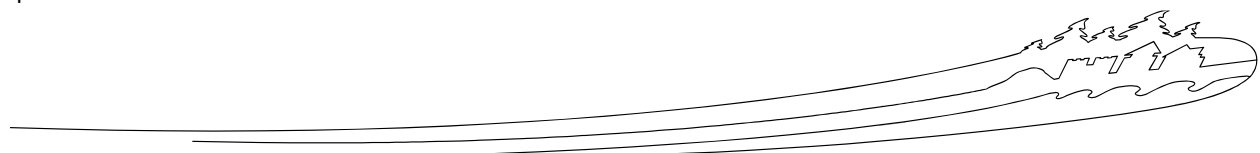
1. A project start up meeting will be held with the key people working onsite to review the mitigation measures, Parks Canada contact information and any site specific considerations with Parks Canada staff before work begins.
2. Staging and parking areas for material and equipment will be located at the lower parking lot and used for project start up and construction only.
3. The existing access road and other existing disturbed areas approved by Parks Canada staff will be used to access the site.
4. Clearly mark staging area, work site and restricted areas with stakes, biodegradable flagging tape, fencing, temporary gates or other means; remove when project is completed.
5. Isolate operations and ground intrusion activities to the footprint of the immediate construction area and limit vehicle access to essential vehicles only.
6. Confirm presence of buried infrastructure prior to excavation and take precautions to avoid damage.

Equipment Operation:

7. Equipment from outside the national historic site must be washed/steam cleaned prior to arrival.
8. Equipment must be properly tuned, clean and free of contaminants, in good operating order, free of leaks (e.g., fuel, oil or grease), and fitted with standard air emission control devices and spark arrestors prior to arrival on site.
9. During construction, any required cleaning of tools and equipment must be done greater than 30 meters from the shoreline to prevent the release of wash water that may contain deleterious substances.
10. Equipment operators must be fully trained and experienced.
11. Use low pressure/rubber tracked equipment or access matting where feasible to minimize soil compaction and ground disturbance.
12. Minimize idling of engines, contingent on operating instructions and temperature consideration.
13. Machinery (e.g., excavators, bobcats, chainsaws, and generators) must be stored, maintained and refuelled on a flat surface at least 100 meters from the ocean and any wetland areas.
14. Only minor repairs and maintenance (e.g., lubrication) of 'non-mobile' equipment such as flatbeds or shovels are permitted; all major repairs must be undertaken at an appropriate offsite location.

Waste:

15. All solid waste will be securely stored and handled according to applicable federal/provincial regulations.





16. All waste materials (e.g., construction material, refuse material, waste petroleum, and demolition waste) shall be removed from the site on project completion and considered, prior to disposal, for reuse, resale or recycling and then disposed of at an approved facility; cover waste loads during transportation.
17. Portable sanitary facilities must be serviced on a regular basis and accumulated waste disposed of at a sanitary waste disposal facility. The facilities must have sufficient capacity and be managed to ensure waste is not discharged to the receiving environment.
18. Burning of waste is not permitted at the National Historic Site.

Hazardous Materials:

19. Prevent the release of hazardous substances into the environment, including but not limited to, petroleum products and their derivatives and chemicals.
20. All on-site personnel must be briefed on reporting requirements for hazardous materials spills; spills must be reported immediately to the designated Parks Canada contact.
21. All construction sites must be equipped with containers suitable for the secure, temporary storage of hazardous wastes, separated by type.
22. A spill contingency response kit including sorbent material and berms to contain 110% of the largest possible spill (i.e., fuel or other toxic liquids) related to the work must be available on site at all times. On-site personnel must be aware of its location and trained in its use. Any contaminants must be recovered at source and disposed of according to applicable laws, policies and regulations.
23. Handle and store hazardous materials as per applicable federal legislation/regulations. The contractor must have all relevant and current Material Safety Data Sheets available onsite.
24. Petrochemical products, paints and chemicals must be stored 100 meters from the shoreline. They must be secured overnight in a Parks Canada approved enclosed area under lock and key.
25. Any hazardous waste or contaminated material uncovered during excavation / construction, must be investigated, source identified, removed and disposed of outside the protected heritage place at an approved facility. Disposal documentation must be provided to the designated Parks Canada contact.

Natural Resources

Air:

26. Implement dust control measures during grading and re-surfacing especially during dry, windy weather.

Water:

27. Ensure all materials (e.g., organic materials, soil stockpiles, construction waste and materials) are securely stored in place, especially during high wind/storm conditions and at the staging area; materials must not enter the marine environment.

Soil and Landforms:

28. The contractor must prepare an erosion and sediment control plan and submit same to the designated Parks Canada contact for approval prior to the start of project activities.
29. Regularly inspect and maintain erosion and sediment control structures during all phases of the project and modify measures as necessary.
30. Use erosion and sediment control products made of 100% biodegradable materials (e.g., jute, sisal or coir fiber) when possible. Ensure backing materials are also biodegradable.

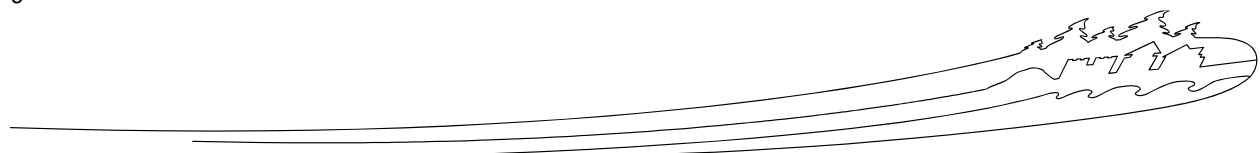




31. Limit duration of soil exposure; phase activities whenever possible and restore disturbed areas as soon as possible.
32. Topsoil separation is required; stockpile topsoil away from subsoils and spoil material and more than 15 meters away from the shoreline, drainage features and/or the top of steep slopes.
33. Salvage topsoil for reclamation activities at this project site or others at Cape Spear.
34. Excavations must be drained (but not directly into any waterbody), back-filled and compacted as soon as possible.
35. Under thawed conditions, backfill material will be compacted prior to topsoil replacement; distribute topsoil evenly over the excavated area as per Parks Canada specifications.
36. Under frozen ground conditions, material will be sufficiently spread over the excavated site to allow for settlement under thawed conditions. Where practical, topsoil replacement will be postponed until the backfill has thawed, settled and dried out.
37. Surface water shall be directed away from work areas. Runoff must not enter any watercourse, waterbody or wetland area; sediment must be removed by filtration or other suitable methods and be directed a minimum of 30 meters away from waterbodies.
38. Remove temporary erosion and sediment control products, especially non-biodegradable materials, when they are no longer required.
39. When excavation is complete, shape loosened soils to match the local terrain and ensure noticeable construction impacts (e.g., ruts, holes, depressions, compacted areas) are appropriately re-graded, back-filled with topsoil, re-contoured and capped in preparation for restoration.
40. During grading, ensure that materials are not pushed, or permitted to enter or erode into water or wetlands and stay within delineated limits.

Flora:

41. Introduction of invasive plant species must be prevented:
 - All soil, gravel, untreated construction lumber, erosion and sediment control products (e.g., hay, straw, mulch), or other applicable materials from outside the protected heritage place must be from a certified weed-free source.
 - Minimise bare soil exposure (e.g., cover stockpiled material with tarps, plant native species, cover with natural mulch/ground coverings).
 - Minimise ground disturbance and vegetation removal, as practical and within project requirements.
42. Clear minimum area necessary. Remove and maintain sod mats for replacement and improved re-vegetation success when work is complete.
43. Trees must be preserved and left in place. If there is no alternative and select trees/shrubs must be removed, all attempts to dig out and preserve for use in restoration efforts associated with this or other projects at Cape Spear must be made. Any alteration to trees and shrubs must be pre-approved by the designated Parks Canada contact.
44. Protect roots of trees to drip line to prevent disturbance or damage. Avoid traffic, dumping or storage of materials over root zone.
45. Restore the decommissioned section of the Access Road 'B' and other areas affected by construction activity as closely as possible to the natural surrounding area. Specifically:
 - Preserve native topsoil from the site, spread over the affected areas, re-grade to natural contour, install effective erosion control measures (e.g., erosion control blankets) on the steepest sections of the road to ensure the soil does not wash away prior to native plant re-population next season.
 - Hydro seeding is not permitted at the site.
 - Use of pesticides, herbicides or fertilizers is not permitted at the site.





Fauna:

46. All wildlife attractants must be secured (e.g., petroleum products, human food, recyclable drink containers and garbage) within wildlife-proof containers, in a secured building or a vehicle. Keep food waste separate from construction waste and remove daily. Notify the designated Parks Canada contact immediately should wildlife gain access to the above mentioned attractants.
47. Minimize the time excavations remain open and cover or fence when left unattended.
48. Never approach or harass wildlife (e.g., feeding, baiting, luring).
49. Alert the designated Parks Canada contact, immediately to any potential wildlife conflict (e.g., aggressive behaviour, persistent intrusion), distress or mortality. In the case of aggressive behaviour or persistent intrusion, stop work and evacuate the area.

Cultural Resources

50. If cultural or archaeological resources are encountered, work must cease in the immediate area and the Parks Canada project manager notified immediately. They will then notify Martin Perron (Tel: 819-420-9558) and Virginia Sheehan (Tel: 819-420-9213), Parks Canada. If features (i.e., structural remains and/or artifact concentrations) are encountered, leave in place, mark the location (e.g. with prominent flagging) and do not disturb prior to archaeological assessment of nature and significance being completed.

Visitor Experience

51. Construction should be completed in as short a time period as is practicable, to allow for visitor access and to ensure visitor safety.
52. Maintain the site in as tidy a condition as possible for the duration of work.
53. Safety risks to visitors during construction must be minimized:
 - The work site must be closed and clearly delineated with fencing, barriers, temporary gates, caution tape, or combinations thereof.
 - Appropriate bilingual signage must be posted at common visitor access points and strategic locations.
 - Maintain a safe working distance between work activities and visitors, especially when transporting machinery and materials between the staging area and the site; consider the use of lookouts to manage traffic and direct visitors in this area.
 - Secure and clearly mark unattended safety hazards (e.g., excavations, debris piles) with fencing, warning signs, caution tape or combinations thereof.

9. OTHER Considerations

- Public/stakeholder engagement
- Aboriginal engagement or consultation
- Surveillance (It is recommended that the environmental surveillance officer assigned to this project visit the site at least twice a week during construction activities to ensure that the mitigation measures detailed in this BIA are adequately carried out and to provide additional mitigation for unforeseen impacts. He or she will be kept informed of project scheduling and will be notified of changes to the schedule at all times. Focus should be placed on erosion and sediment control measures and secure storage of materials.





- Follow-up monitoring, required to evaluate effectiveness of mitigation measures and/or assess restoration success
- Follow-up monitoring, required by legislation or policy (indicate basis of requirement e.g. required by the *Species at Risk Act*)
- SARA Notification

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

Given the magnitude of effects, the short term of the project, the timing and reversibility after construction, the project is not likely to cause significant adverse residual environmental effects to natural resources. The project is anticipated to have negligible to minor changes to cultural resources and visitor experience and as such is not likely to cause significant adverse residual effects to the same.

11. EXPERTS CONSULTED

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

Department/Agency/Institution: Parks Canada	Date of Request: May 2016
Expert's Name & Contact Information: Anne Desgagne Martin Perron	Title: CRM Policy Advisor Built Heritage Advisor
Expertise Requested: cultural resources, archaeological resources	
Response: AOA (Appendix 3) and geotechnical investigations report (Appendix 4)	

12. 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

13. RECOMMENDATION AND APPROVAL

(Add additional blocks as required)

Prepared by: [Redacted]	Date: September 12, 2016
Recommended by: [Redacted]	Date: 09/13/16





<p>[Redacted]</p>	<p>Sept 14/16</p>
<p>Approval signature: [Redacted]</p>	<p>Date: September 14, 2016</p>

14. ATTACHMENTS

- Project Site Map
- Effects Identification Matrix
- Archaeological Overview Assessment
- Archaeological Monitoring of Geotechnical Investigations at Cape Spear National Historic Site, NL, May 23, 2016

15. 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.*)

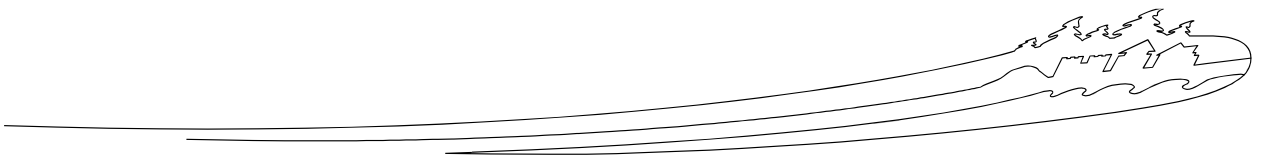
*****Ensure that all required mitigation measures and conditions (e.g. follow-up monitoring requirements) are included in project permits and authorizations*****

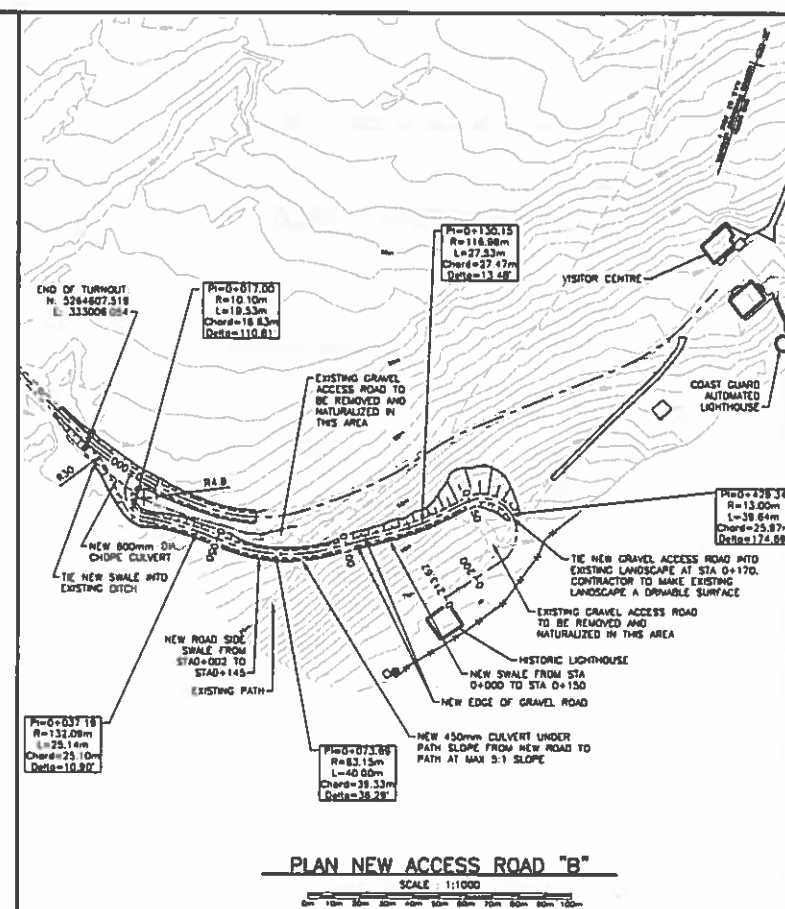
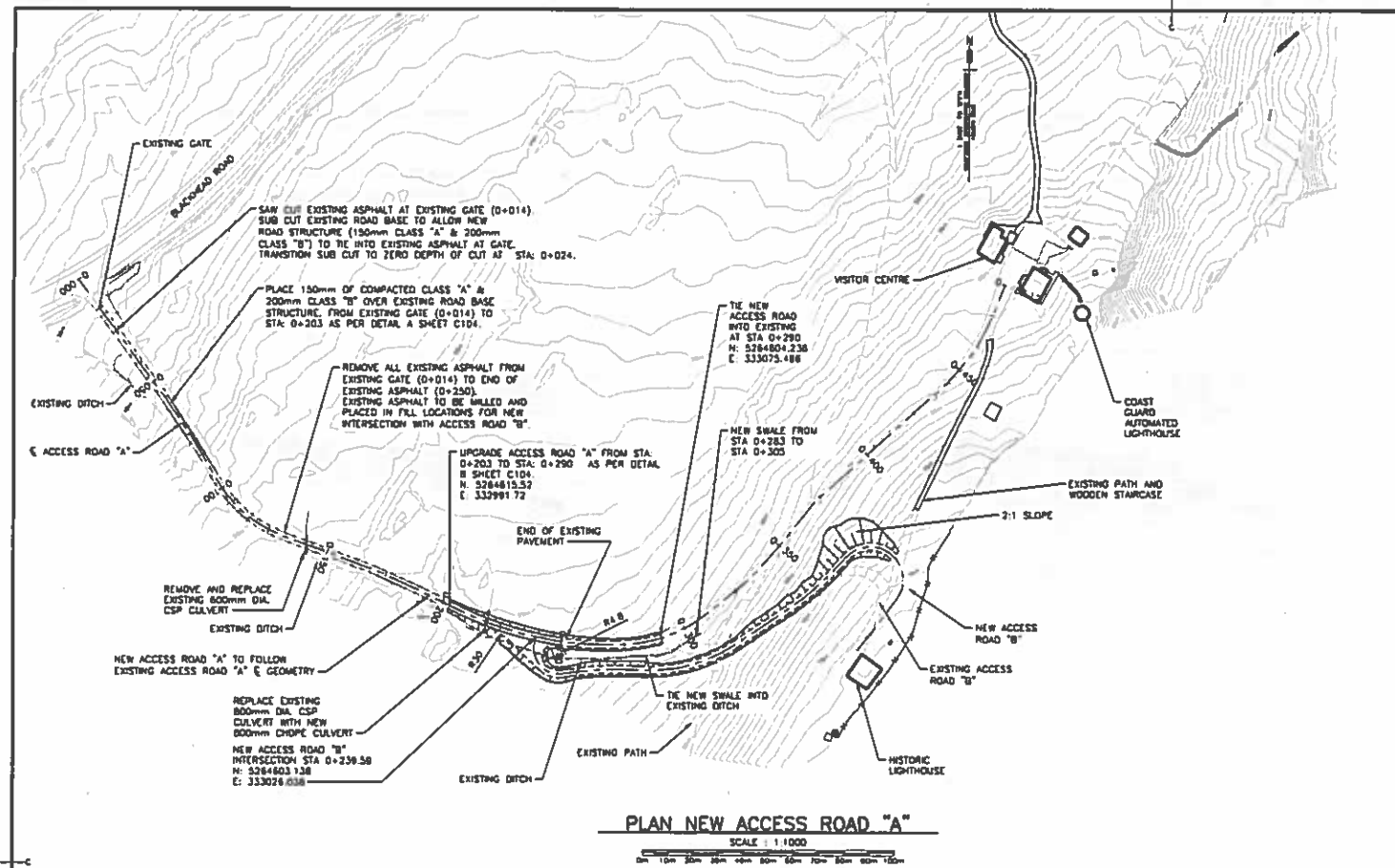


August 2016



Appendix 1: Project Site Map





Stantec

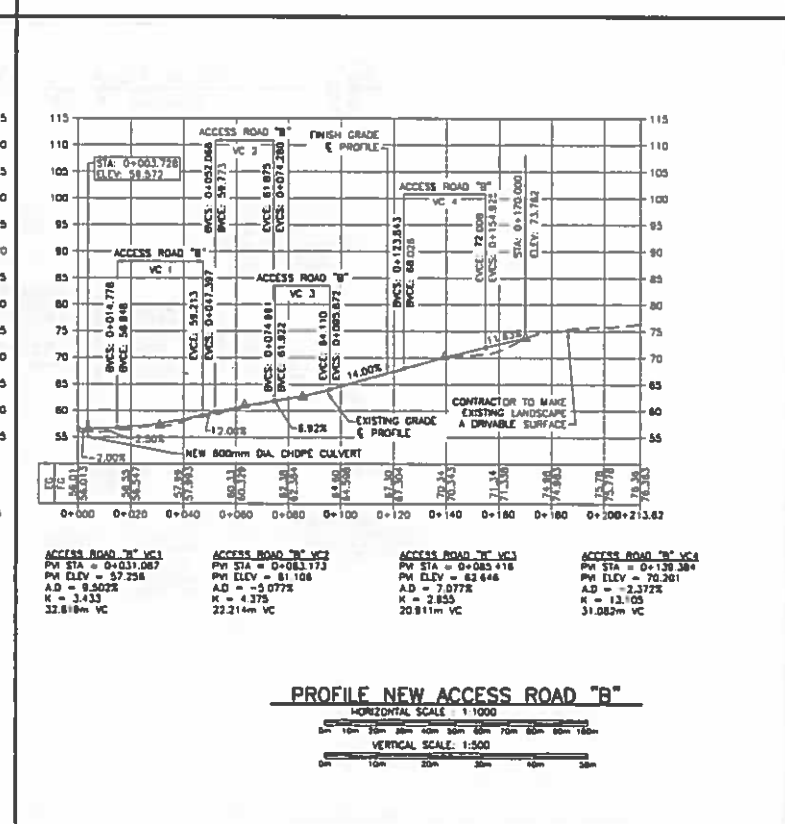
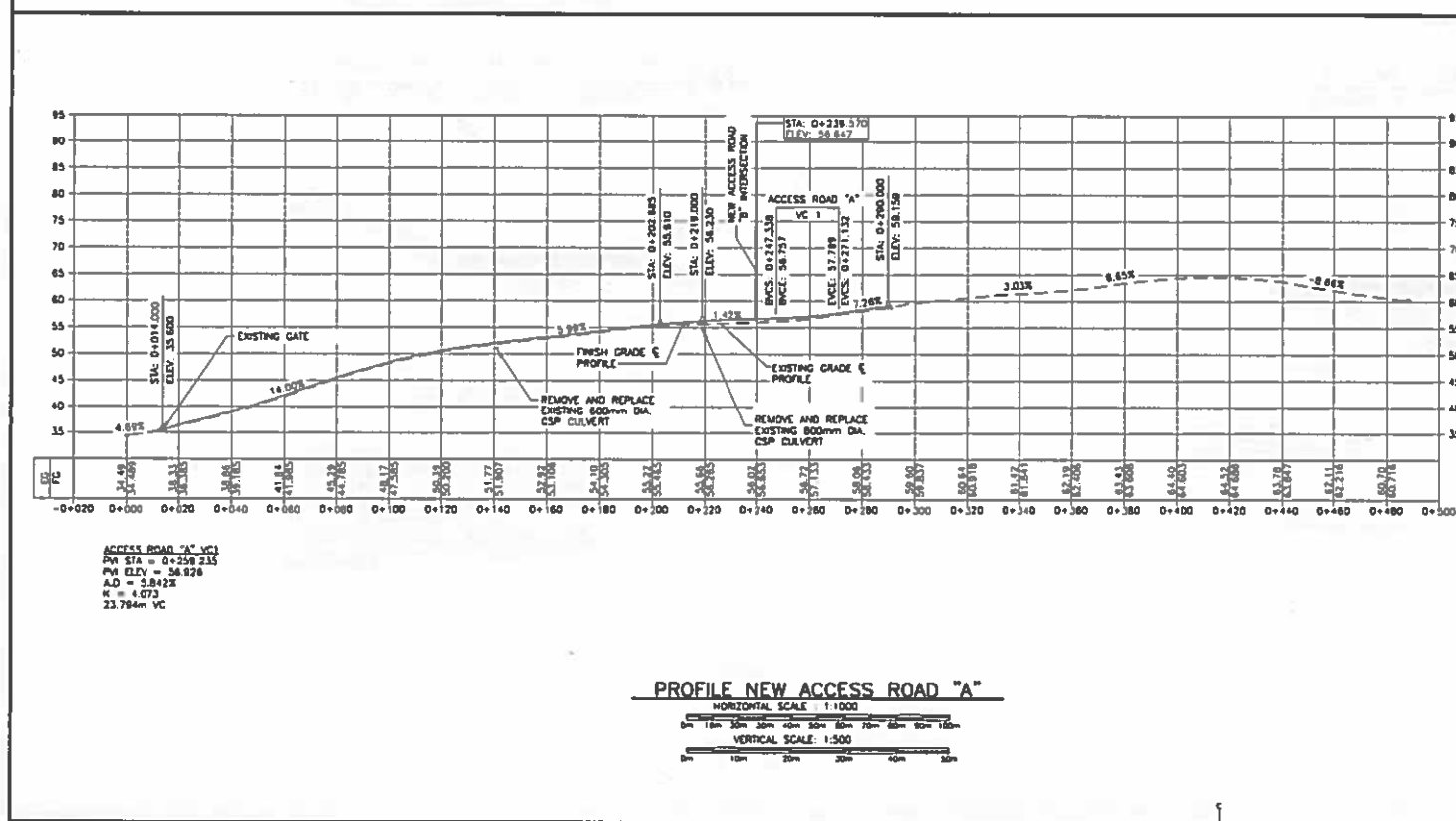
141 West Beaver Creek
Richmond Hill, Ontario
L4B 1N2
Canada

CONSULTANTS PROJECT NO. 1234729

KEY PLAN: N.T.S.

LEGEND:

- EDGE OF GRAVEL ROAD
- EDGE OF PAVED ROAD
- PATHWAY
- ROAD
- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- NEW SWALE
- EX. ASPHALT REMOVAL
- NEW CULVERT
- SLOPE



C	ISSUED FOR 100% REVIEW	09/04/2018
B	ISSUED FOR 80% REVIEW	08/07/2018
A	ISSUED FOR 50% REVIEW	08/01/2018

CAPE SPEAR NHS LIGHTHOUSE ACCESS ROAD RECAPITALIZATION

PROPOSED ACCESS ROAD "A" & "B" PLAN & PROFILE

2016.05.03
2016.07.25
2016.08.04

584

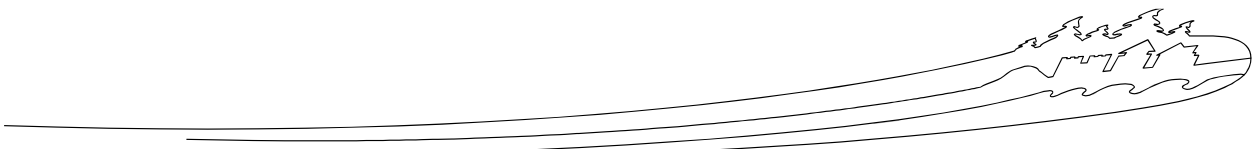
C103



Appendix 2: Effects Identification Matrix

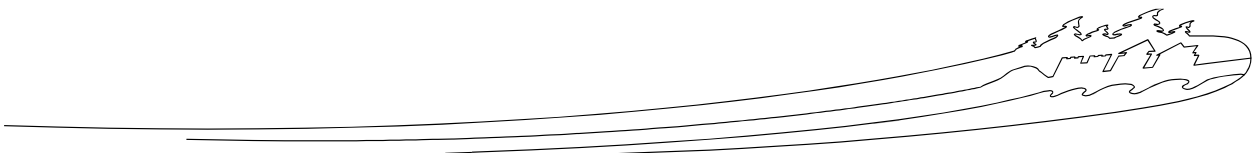
Section A focuses on direct effects of the project and **Section B** on indirect effects that are caused by changes to the environment.

A. Direct Effects									
		Valued components potentially directly affected by the proposed project							
		Natural Resources					Cultural Resources		
			Soil & Landforms	Water Quality (groundwater and marine)	Flora (trees, native species vegetation)	Fauna (marine – seabirds, whales, fish terrestrial-fox, birds)	Archaeological Resources	Historic Resources	
Phase	Examples of Associated Activities								
Project Components	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Clearing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Demolition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Disposal of waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Blasting/ Drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Dredging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Drainage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Excavation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Grading	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Backfilling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Use of machinery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Transport of materials/ equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Building of fire breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Set up of temporary facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		



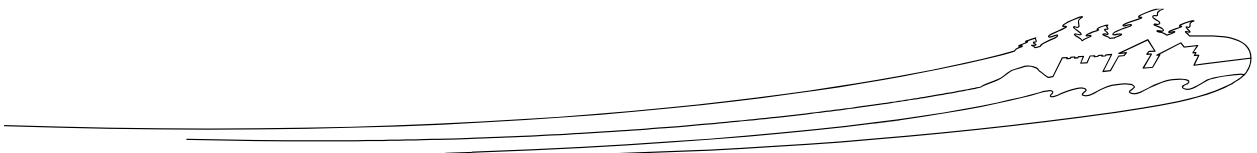


A. Direct effects continued									
		Valued components potentially affected by the proposed project							
		Natural Resources					Cultural Resources		
			Soil & Landforms	Water Quality (groundwater and marine)	Flora (trees, native species vegetation)	Fauna (marine – seabirds, whales, fish terrestrial-fox, birds)	Archaeological Resources	Historic Resources	
Phase	Examples of Associated Activities								
Project Components	Preparation / Construction / Operation / Decommissioning	Waste disposal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Wastewater disposal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use/Removal of temporary facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Active fire stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Prescribed burn cleanup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Planting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Culling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Vehicle Traffic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



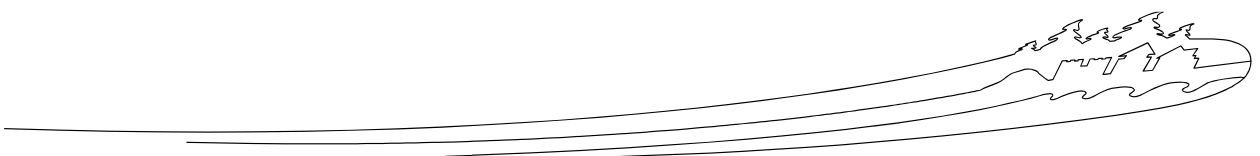


B. Indirect Effects (all phases)							
		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of 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...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>soils and landforms</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Could impacts to <u>water</u> (e.g. surface, ground water and water crossings) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





Appendix 3: Archaeological Overview Assessment



PARKS CANADA ARCHAEOLOGICAL OVERVIEW ASSESSMENT (AOA)

CAPE SPEAR NHS – WWII BUNKER RECAPITALIZATION AND UPGRADES (NEWFOUNDLAND).

*Prepared by Martin PERRON, FII Project Archaeologist, HCCD
January 11th, 2016 – Revised version August 17th, 2016*

BACKGROUND

Located on a rugged sandstone cliff at our continent's most easterly point, the Cape Spear Lighthouse National Historic Site host the oldest surviving lighthouse in Newfoundland and Labrador. Built in 1835 by the British Colony of Newfoundland to signal the approach to St. John's harbour, the Cape Spear Lighthouse is an iconic symbol of the island's mariner history. The structure consists of a stone light tower surrounded by a two-storey square-shaped wooden residence (fig. 1). A variety of alterations were made to the lighthouse during the 19th and 20th century, principally through construction of additions to accommodate the lightkeeper and his extended family (fig. 2). A fog alarm shed (fig. 3), new houses, a well, a new light tower and several amenities and privies were also built and dismantled in the vicinity of the lighthouse during the course of the 19th and 20th centuries (CIS 1999, p. 2; Collins 2001, p. 19-22). Several features belonging to the lighthouse complex and facilities were mapped and recorded during archaeological excavations and field survey carried out on the site in 1976 and 1999 (Phillips Parmenter 1977; Luffman 1999; Parks Canada archaeological sites 5A1-5A5). The Cape Spear lighthouse was designated a national historic site in 1962. Its heritage value lies in the remaining footprint of the original 1835 lighthouse building, its style and influence, its strategic location, and the isolated nature of its site (CIS 1999, p. 6, annexe C; Historic Sites and Monuments Board of Canada, March 1962 Minutes). Cultural resources of national historic significance (Level I) include the 1835 lighthouse and any structural remains of the original lighthouse on site. In 1977, Parks Canada embarked on a five-year restoration of Cape Spear Lighthouse in order to depict its original architecture and to reconstruct the keeper's way of life in the late 1830's.

Cultural resources of other significance (formerly Level II) are also known in the vicinity of the lighthouse. These culture resources include the contemporary 1955's lighthouse complex (fig. 5), the structural remains of the lighthouse additions, fence and privy, footprints of additions to the original lighthouse, footprints and remains of ancillary structures, evidence of pathways/roadways and agricultural activities, the Historic Sites and Monuments Board Plaque, the Memorial Cross, and the plaque commemorating the site's opening. In addition, the archaeological collection and curatorial collection are also valued as level II resources. The World War II Battery located on the edge of the cape is also designated under this classification (CIS 1999, p. 12, article 3.2.2, annexe C).

The World War II military defence complex

Approximately 450 m north/north-east of the 1835 lighthouse lies a World War II military complex. When war was declared in September of 1939, Newfoundland was under Great Britain's administration. Newfoundland's location on a direct air and sea route from Europe, combined with the colony's mining resources that were in demand for the war effort, made it a critical first point of protection for North Americans as part of Canada's defence system during the Battle of the Atlantic (Mosquin 2002, p. 1). To provide protection for convoys from German submarines, a battery and garrison were stationed on the rocky promontory of Cape Spear in 1941.

The World War II Battery consists of a number of interconnected components including concrete bunkers, two gun emplacements, two large 10 inches 30 ton gun barrels, ready room, magazine and connecting trenches (figs. 5-13). It is situated below the lighthouse at the outermost tip of the cape. Near the current parking lot lies the battery plotting room and above the battery are the remains of concrete foundations for a radar hut, antenna platform and search light platform. An extensive complex of barracks, administrative buildings and other structures were located at the base of the ridge (figs. 14-16). Most of the buildings were of temporary construction and, with the exception of the battery complex, were removed after the war. Evidence of these temporary structures still exist. The land in the area used for barracks and administrative structures had been built-up and later graded. As a result their former location is visible by changed vegetation patterns, with the exception of the area now occupied by the visitor parking lot. Similarly, altered vegetation and soil compaction indicate where interconnecting roads, walkways and the water line were located. Other evidence of Fort Cape Spear includes a memorial cross located near the tip of the peninsula and remnants of barbed wire and wire spools that are found intermittently throughout the western half of the site (CIS 1999, p. 10). Few changes have also been made to the site (for the convenience of tourists) in the second half of the 20th century which had an impact upon the gun emplacements. A raised board walk has been placed to one side and one of the gun emplacements is now covered with a wooden deck as a safety precaution and for its use as a stage for summer performances (figs. 5, 7, 13).

PROJECT INTRODUCTION AND OBJECTIVES

The overall objective of the FII project is to recapitalize the existing WWII bunkers which are located on the northern tip of Cape Spear (fig. 17). Also known as the "Battery Complex", the bunker consists of two circular stepped reinforced concrete emplacements each linked by a large opening to a concrete corridor recessed in the cliffs edge. The corridor provides access to six rectangular concrete rooms. The battery plotting room is a small concrete chamber buried in the hillside. A deteriorated flat concrete roof marks its presence on landscape. These bunkers have long been a major component of the visitor experience at the site. However, the complex is nearing the end of its life cycle and the bunkers have become severely deteriorated, to the point that certain sections of them have been closed to public access for safety reasons. Some work was carried out a number of years ago in an effort to stabilize the bunker walls but this was only temporary in nature (see Mosquin 2000, p. 5-6 for details). A significant amount of work is thus required to stabilize the structures and upgrade them to the point that visitors can once again access the site.

The proposed work includes (Rodrigues BIA 2016, p. 2-3; PWGSC Design plan 99%):

- Drainage system – install new drainage system the entire structure, renew existing drainage system (under all tunnels and gun emplacements), decommission the two old pipe outfalls and install new ones.
- Waterproofing membrane – install new water proofing membrane (entire structure), renew existing flashing (gun emplacements) and reinstate ventilation shafts (all Magazines and Ready Rooms).
- Gun Emplacements – epoxy injection of cracks, surface repair exposed rebar (Ready Rooms) and reinstate ventilation shafts.
- Magazines - epoxy injection of cracks (all knee and end walls), surface repair exposed rebar, reinstate ventilation shafts (all Magazines) and spray foam insulation (all Magazines).
- Tunnels – replace sections of tunnel with precast box culvert, epoxy injection of cracks, surface repair exposed rebar and repair/replace embedded steel, restore access/egress at north side of battery, replace/install gates (various locations).
- Electrical – install electrical infrastructure to support next phase.

The scope of work includes:

- Site access: A section of the western edge of the paved visitor parking lot will be used as the staging and material storage area. The site will be accessed via the paved trail used by visitor's to access the Most Easterly Point. The trail is wide enough to accommodate vehicles and equipment access. The trail currently has a hand rail located on the left hand side and a rest area to the right on the way to the Most Easterly Point which will likely be removed to accommodate access as well as to restore the viewscape to a more natural condition. A temporary access road will have to be established to reach the gun emplacement #1 and the tunnel and magazines to the right of it.
- Demolition: manual and machinery facilitated demolition, removal of failed sections of retaining wall, rocks, concrete and other demolition related debris.
- Waste disposal: demolition waste will be sorted by material with on-site separation and disposed of in accordance with industry standards for construction waste.
- Structural repairs: epoxy injections, foam insulation, weather proof membrane installation, concrete surface treatment, concrete finishing and curing, grouting.
- Vegetation: clearing and grubbing, removal and stockpiling of sod mats, selective vegetation removal/trimming.
- Earthworks: soil and topsoil stripping/stockpiling, grading, spreading soil/topsoil, excavation (external to the structure and within tunnel), trenching, rock removal, dewatering, filling, compaction, erosion and sedimentation control.

- Setup of temporary facilities: temporary washroom facilities, office and storage will be situated in the staging area during the construction mobilization phase.
- Use of machinery: dump trucks, large and small excavators, cranes, mobile cranes and lifting devices.
- Transport of materials and equipment: materials will be transported to the site along Blackhead Road to the staging area on the parking lot. From there, materials will be transported to the site along the Most Easterly Point paved trail.

The new repairs will allow for an expanded visitor experience – an offering of new initiatives such as concessions, interpretive programs, exhibits, etc. – within the scope of the “Road to 2017” programme. According to the project manager, the site has undergone extensive analysis of its resources and the planned work should “only affect the bunker structures and not the surrounding area” (see the RPA 446 document).

POTENTIAL FOR CULTURAL RESOURCES

Based on the Project Summary (TOR), PWGSC Construction Design Plan at 99%, the Commemorative Integrity Statement and the existing documentation available at Parks Canada (which includes photographs, fields archaeological reports and plans), our research indicates that the area targeted by the conservation work has a low potential for archaeological resources.

At the exception of the cultural resources of other significance (formerly Level II) associated with the military complex of 1941-1945, no other resources are known in this area of the cape. No archaeological excavations or surveys have been carried out in the area and no known pre-contact or post-contact sites are recorded in the vicinity of the bunkers. However, as several generations of lightkeeper families have lived and worked on Cape Spear, cultural resources associated with their occupation like gardens, pathways, dumps, farming installations, wells, ect., might have been located in this area of the peninsula. The remains of the fog alarm shed may also be in the vicinity of the area targeted by the FII project. However, the construction of the military complex in 1941 must have swept and destroyed most of the surface soils and potential structures or covered them with concrete slabs. Remains of the temporary WWII barracks and WWII artefacts could yet still be visible in the project area.

OBSERVATIONS AND ARCHAEOLOGICAL REQUIREMENTS

Several excavation, trenching and landscaping activities will be carried out at the site. To document, conserve and protect potential archaeological resources, the Terrestrial Archaeology Unit recommends the followings mitigation measures:

- 1) The installation of new drainage and electrical systems will required **archaeological monitoring** during trenching as there will be excavation under and around the battery wall. Although the electrical conduits will be most likely buried above the new drainage system, table 8 mentioned that some electrical infrastructure locations still need to be defined. If some electrical features are to be buried outside the drainage footprint (See drawing S101 of PWGSC Design plan 99%).

- 2) The installation of new water proofing membrane around and over the battery walls (See drawing S104 of PWGSC Design plan 99%) will required **archaeological monitoring** during the removing of the fill and **archaeological recording** of the features brought to light. It is important to document the walls, roofing, foundations, and construction techniques of the battery as well as the different fills used to cover its structure.
- 3) The replacement of tunnel sections with precast box culvert will required a large scale **archaeological recording (pictures, scale drawings, GPS coordinates) of every features seen *in situ* before their removal and replacement. Then, the archaeological features and/or soils found underneath and/or behind the removed/replaced sections will need to be properly recorded.** Excavation is also planned to remove soil above/around the north entrance of the battery. **Archaeological monitoring will be required.**
- 4) **As for staging/laydown/circulation areas,** we recommend that the consultant stores his construction material, circulates and parks his machinery over paved areas (or over bedrock).

To sum up, if the proposed work to restore and repair the WWII Battery requires any soil disturbance (digging, trenching, exposure of below grade structures, use of heavy machinery above known resources, etc.) an archaeological intervention – testing and monitoring – will be required. The mitigation measures presented in this screening report are subject to additions or alterations prior to and during the project. If additional or modified scenarios are considered by the consulting engineering firm and/or the project manager, these mitigation measures will no longer apply and the new or modified plan must be send to Parks Canada for review and evaluation.

Contacts

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

References

- Collins, I. (2001), *Keepers of the light. The Cantwells of Cape Spear, Newfoundland. A family history*, AGMV Marquis, St Johns (NF);
- Cox, R. (2011), *Environmental Assessment Screening Report Stabilization of WWII Bunkers, Cape Spear Lighthouse National Historic Site of Canada*, Parks Canada Agency Environmental Assessment Report TN-2011-09, Newfoundland;
- Eastern Newfoundland Field Unit (1999), *Cape Spear National Historic Site Commemorative Integrity Statement*, Heritage Conservation and Commemoration Directorate Report, Parks Canada, Newfoundland;
- Luffman, E. (1999), *Cape Spear Archaeology, July 1999*, Heritage Conservation and Commemoration Directorate Report, Parks Canada, Newfoundland;
- Mosquin, A. (2002), *Second World War Coastal Defence Complex (Gun battery and battery plotting room), Cape Spear, Newfoundland*, Federal Heritage Buildings Review Office Benchmark Report 00-198, Part II, Heritage Conservation and Commemoration Directorate, Parks Canada, Newfoundland;
- Phillips Parmenter, C. (1977), "Salvage Archaeology at Cape Spear Lighthouse, Newfoundland, September 1976", in Parks Canada National Historic Parks and Sites Branch Manuscript Report no 231 (1975-1976), Ottawa, p. 1-21;
- Canada's historic places website: <http://historicplaces.ca/en/rep-reg/place-lieu.aspx?id=7404>;
- <http://www.encyclopediecanadienne.ca/fr/article/cap-spear/>;

Illustrations



Figure 1. The Cape Spear Lighthouse in 2010.



Figure 2. Cape Spear Lighthouse reconstitutions at the Cape Spear Visitor Center.

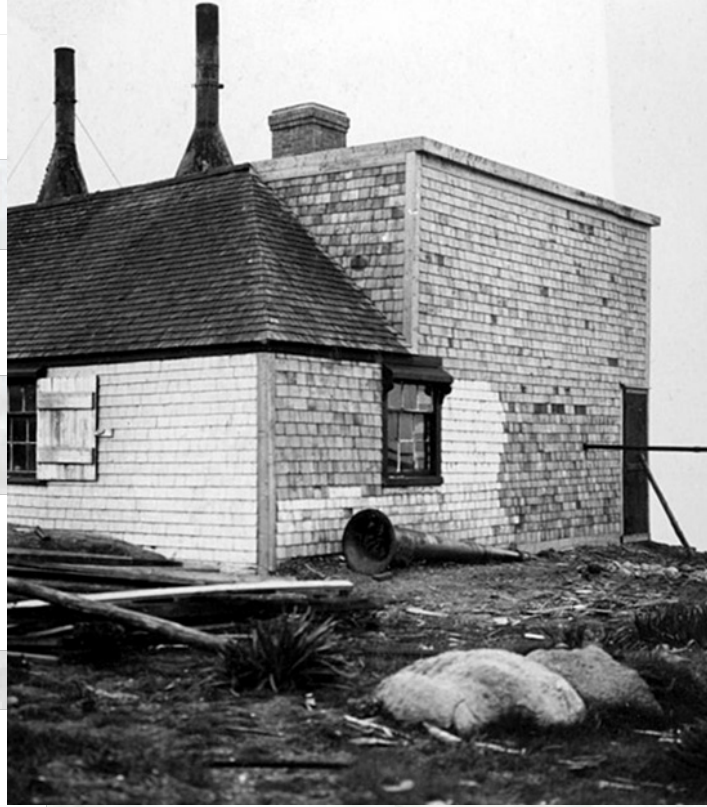


Figure 3. Cape Spear. The fog alarm shed of 1878 located near the project area.



Figure 4. The modern lighthouse complex of 1955 (in 2010).



Figure 5. WWII bunker behind gun emplacement n° 2.



Figure 6. Cape Spear WWII bunker.



Figure 7. WWII bunker behind gun emplacement n° 2.



Figure 8. WWII bunker. Gun emplacement n° 1.



Figure 9. WWII bunker. Gun emplacement n° 1.



Figure 10. WWII bunker. Gun emplacement n° 1.



Figure 11. WWII bunker. Crew shelter behind gun emplacement n° 1.



Figure 12. WWII bunker. Corridors that lead to the ammunition storage rooms.



Figure 13. WWII bunker behind gun emplacement n° 2.



Fig. 14. Aerial view of Fort Cape Spear taken in October 1941, showing barracks buildings and construction underway for war watching station (right foreground). Cape Spear lighthouse and associated buildings at left foreground. Gun emplacements not visible. From Mosquin 2002, fig. 8. (*Parks Canada, Atlantic Region Photograph Collection*).



Figure 15. Aerial view of gun battery at Fort Cape Spear under construction in 1941. From Mosquin 2002, fig. 9. (*Parks Canada Atlantic Region Photograph Collection*).

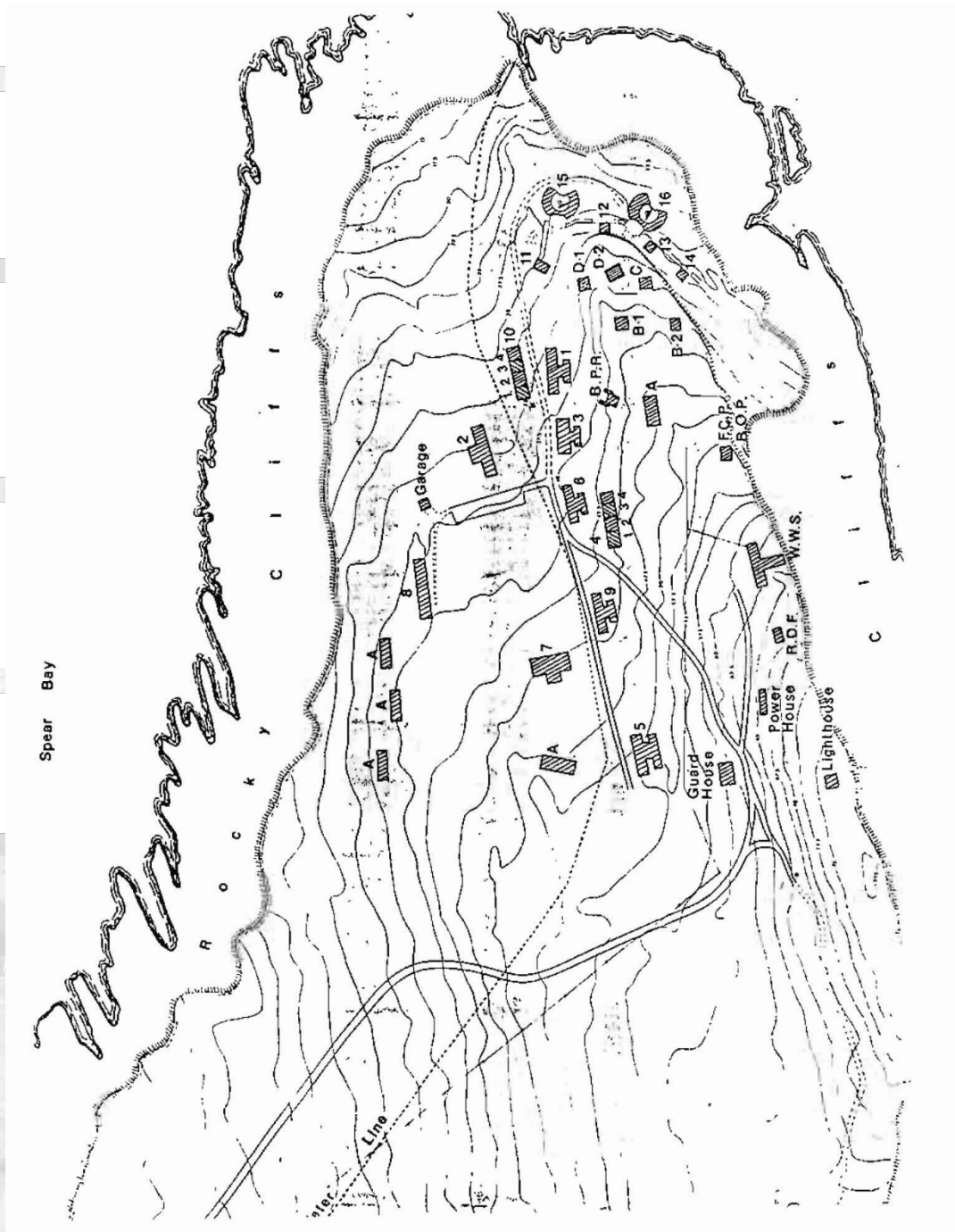


Figure 16. Map of Cape Spear showing all the buildings that were part of Fort Cape Spear. The gun emplacements are indicated by 15 and 16; the ammunition rooms which are linked by covered corridor to the emplacements are numbers 11-14. The battery plotting room is indicated B.P.R. From Mosquin 2002, fig. 10. (*Indian and Northern Affairs, Parks Canada and Atlantic Region Planning, "Cape Spear National Historic Park" n.d.*)

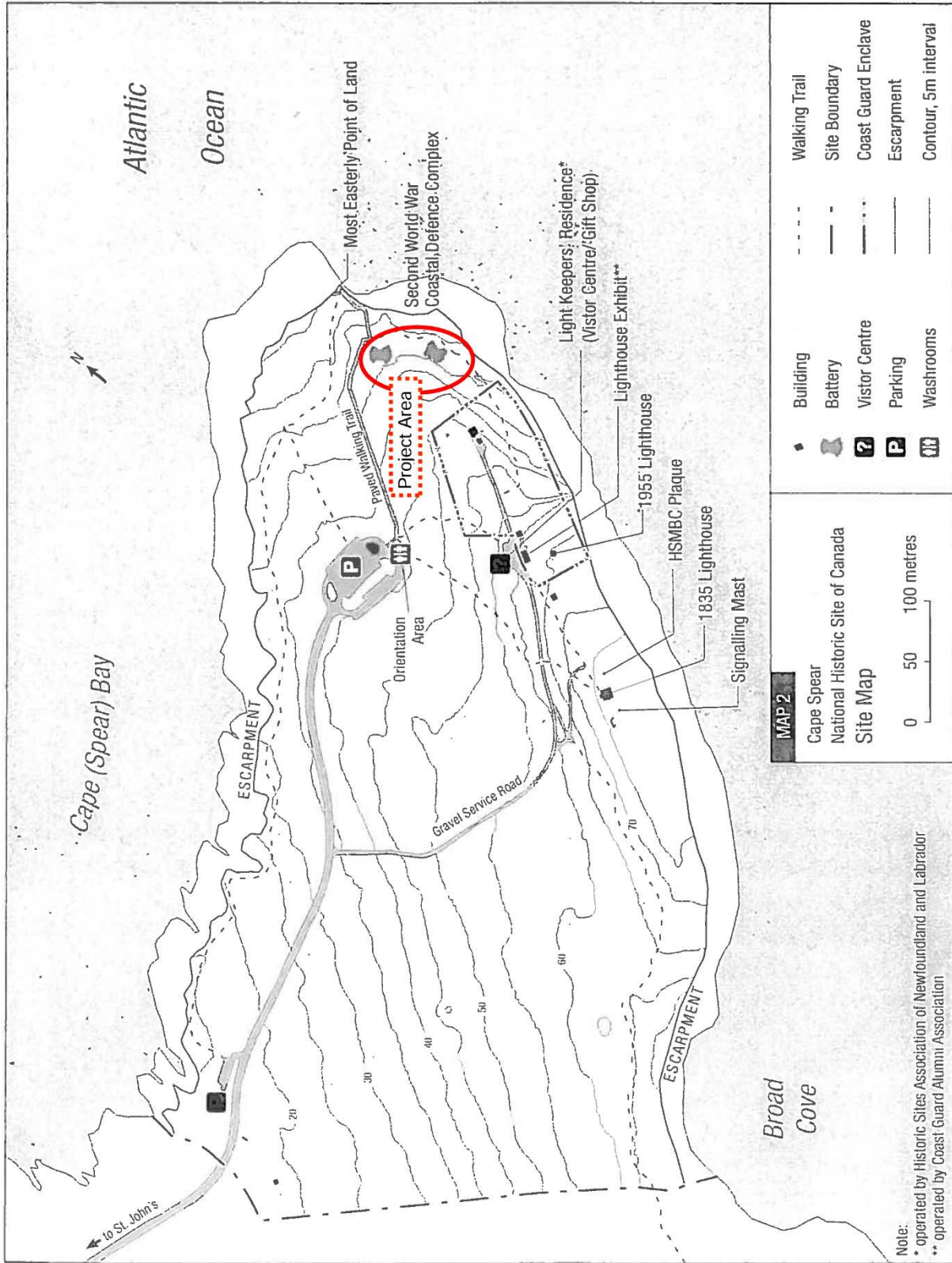
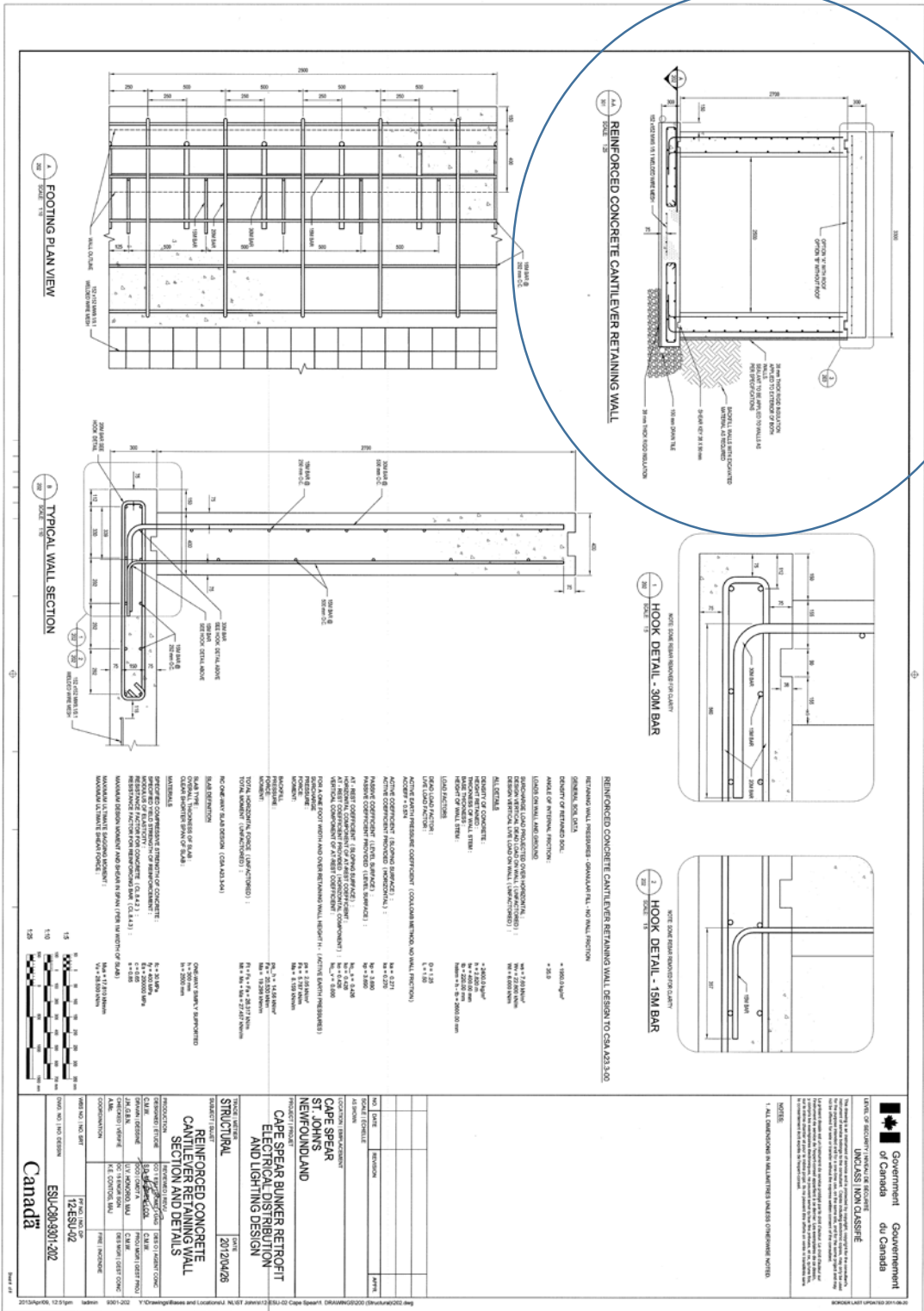
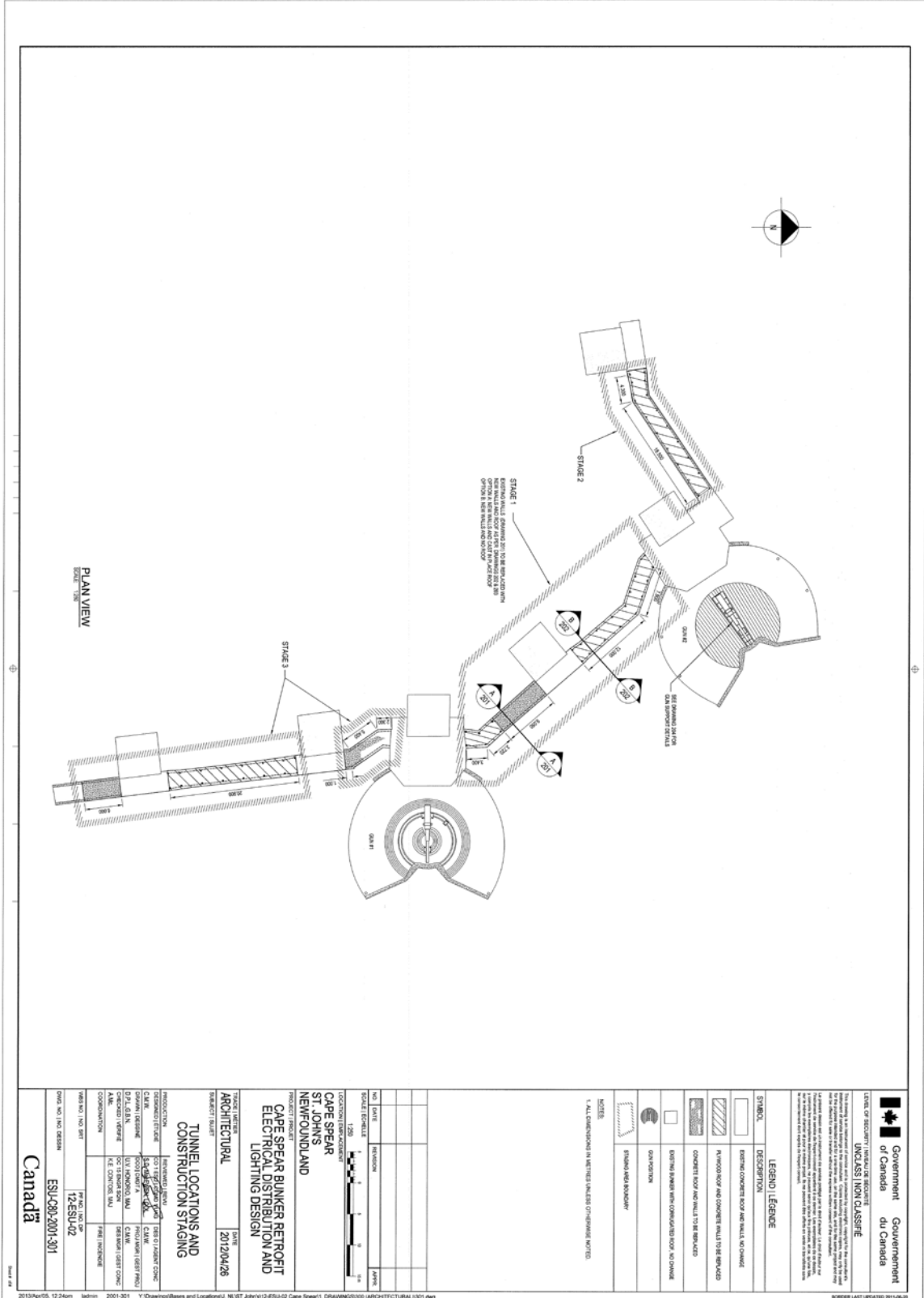


Figure 17. Cape Spear Site Map with the area aimed for the FII Project.

Annex A



Annex B



LEVEL OF SECURITY: UNCLASSIFIED	
<small>This drawing is an unclassified document. It is not to be disseminated outside the project or used for any other purpose without the written consent of the project manager. It is not to be used for any other purpose without the written consent of the project manager. It is not to be used for any other purpose without the written consent of the project manager.</small>	
LEGEND / LÉGENDE	
SYMBOL	DESCRIPTION
	EXISTING CONCRETE FLOOR AND WALLS, NO CHANGE
	PROPOSED CONCRETE FLOOR AND WALLS TO BE BUILT
	EXISTING STRUCTURE WITH CONCRETE FLOOR AND WALLS
	STEEL REINFORCEMENT
	STRUCTURAL MEMBER LOCATION
NOTES 1. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.	
PROJECT INFORMATION PROJECT TITLE: CAPE SPEAR BUNKER RETROFIT ELECTRICAL DISTRIBUTION AND LIGHTING DESIGN PROJECT NUMBER: 17-ESU-02 ARCHITECTURAL DATE: 2012/04/28	
DESIGNER INFORMATION PROJECT MANAGER: [Name] ARCHITECT: [Name] ENGINEER: [Name]	
CLIENT INFORMATION CLIENT: [Name] ADDRESS: [Address]	
SCALE 1:250	
DATE 2012/04/28	
PROJECT LOCATION 17-ESU-02	
PROJECT NUMBER ESU-080-2001-301	
PROJECT TITLE CAPE SPEAR BUNKER RETROFIT ELECTRICAL DISTRIBUTION AND LIGHTING DESIGN	
PROJECT NUMBER 17-ESU-02	
ARCHITECTURAL	
DATE 2012/04/28	
PROJECT LOCATION 17-ESU-02	
PROJECT NUMBER ESU-080-2001-301	
PROJECT TITLE CAPE SPEAR BUNKER RETROFIT ELECTRICAL DISTRIBUTION AND LIGHTING DESIGN	

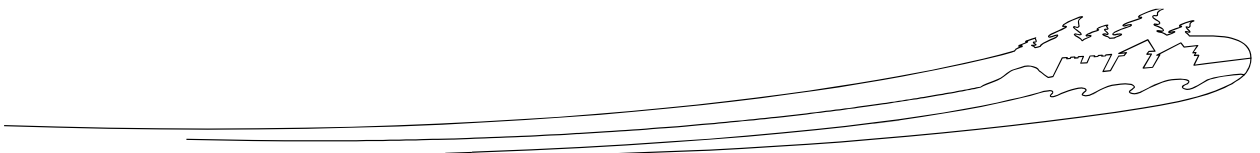
Annex C



August 2016



Appendix 4: Archaeological Monitoring of Geotechnical Investigations at Cape Spear National Historic Site, NL, May 23, 2016





June 10, 2016
File: 121812230

Attention: [REDACTED]
[REDACTED]
Parks Canada
1869 Upper Water St., Suite AH 201
Halifax, NS B3J 1S9

Dear [REDACTED],

RE: TECHNICAL MEMORANDUM - ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT CAPE SPEAR NATIONAL HISTORICAL SITE, NL

Please accept this letter as the preliminary technical memorandum for the archaeological monitoring work that was undertaken in support of the geotechnical investigations at Cape Spear, National Historic Site in Newfoundland and Labrador. A final report will be provided to the Parks Canada Terrestrial Archaeology Representative within thirty days after completion of the fieldwork.

1.0 BACKGROUND

On May 23, 2016, archaeological monitoring and recording of seven (7) geotechnical test pits was conducted at Cape Spear National Historic Site (NHS), Newfoundland and Labrador, under the Parks Canada Research and Collection Permit No. CS-2016-21716. Cape Spear is situated on the east side of the Avalon Peninsula approximately 2 km southeast of Blackhead Village – a community that comprises the most southeastern portion of the City of St. John's.

Built in 1835, the Cape Spear Lighthouse is the oldest surviving lighthouse in Newfoundland and Labrador and was in continuous operation from 1836 to 1955. In 1962, the Cape Spear Lighthouse was designated a NHS of Canada for its age and architecture. Additionally, a number of Canadian and American military batteries and garrisons were established at Cape Spear in 1941 to provide protection for Allied marine convoys from German submarines. With the exception of the battery complex, most of these World War II (WWII) military facilities were of temporary construction and were removed after the war. However, evidence of several temporary structures still exists below the ground surface.

The Statement of Work (SOW) provided by Parks Canada required that archaeological monitoring and recording be conducted at geotechnical Test Pits: #7; #8; #9; #10; #12; #13; and #14. Test pits # 7, # 8, # 9 and # 10 were positioned adjacent to the roadways situated to the southwest of the main, visitor parking area, while Test Pits # 12, # 13, and #14 were located further up-slope to the east, near the historic 19th Century lighthouse.



June 10, 2016

Mr. [REDACTED]

Page 2 of 5

RE: TECHNICAL MEMORANDUM - ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT CAPE SPEAR NATIONAL HISTORICAL SITE, NL

2.0 OBJECTIVES

The primary objective of the archaeological monitoring was to prevent adverse impacts to historic resources during the geotechnical study of the subsurface soils and the underlying bedrock present at each of the test locations. The geotechnical work conducted at Cape Spear NHS was required as part of the WWII Bunker and Lighthouse Access Road Rehabilitation Projects.

3.0 METHODS

The archaeological monitoring and recording of the seven geotechnical test pits at Cape Spear NHS involved four key tasks:

1. submission to Parks Canada of a Research and Collection Permit Application;
2. a desktop review of background documentation and information;
3. a field study consisting of archaeological monitoring during geotechnical work being carried out; and
4. preparation of the necessary reporting on the work.

1.1. RESEARCH AND COLLECTION PERMIT APPLICATION

Prior to commencement of the work, Stantec in Fredericton, New Brunswick, completed and submitted a Research and Collection Permit Application through Parks Canada's online service. This application was filed in the name of the Principal Investigator who conducted the archaeological monitoring and recording project. A Permit for the work was issued to Roy Skanes of Stantec Consulting, St. John's, NL, by Parks Canada on May 18, 2016 (Permit No. CS-2016-21716).

1.2. BACKGROUND RESEARCH

A desktop review of archaeological background documentation provided by Parks Canada was completed in order to facilitate a working knowledge of the project area and the archaeological resources recorded and recovered during previous investigations at the Cape Spear NHS. The Principal Investigator reviewed:

- the Cape Spear NHS Commemorative Integrity Statement (1999);
- the Parks Canada Overview Assessment (AOA) of Cape Spear NHS – WWII Bunker Recapitalization and Upgrades (Newfoundland) (Perron 2016);
- E. Luffman's, Cape Spear Archaeology, July 1999, Parks Canada Report; and
- C.P. Parmenter's, Cape Spear Archaeology 1977, Parks Canada Manuscript Report no. 231.

As an additional component of the desktop review, Stantec obtained from Parks Canada's Terrestrial Archaeology Representative in Halifax (PCTAR) the archaeological site number and other relevant provenience information.



June 10, 2016

Mr. [REDACTED]

Page 3 of 5

RE: TECHNICAL MEMORANDUM - ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT CAPE SPEAR NATIONAL HISTORICAL SITE, NL

1.3. FIELD STUDY

The field study was carried out on May 23, 2016 by [REDACTED]. The majority of excavation at Cape Spear NHS was completed with a backhoe. However, where indicated, a shovel and trowel were used to remove soils from the sides and base of test pits in order to better facilitate the recording of soils and the accurate depth of the underlying bedrock. Additionally, the Principal Investigator recorded all archaeological resources with heritage value encountered during the project, and all recording, where applicable, followed the procedures and guidelines listed in the Parks Canada Archaeological Recording Manual: Excavations and Surveys. The Principal Investigator also:

- recorded field notes and took photographs of the seven identified geotechnical test pits;
- documented the stratigraphy of all test pits monitored, with written descriptions and photographs;
- photographed the seven identified geotechnical test pit locations prior to and after excavation; and
- used archival quality recording material for all field and laboratory recording.

1.4. REPORTING

This Technical Memorandum on the work summarizes the principal findings of the archaeological monitoring and recording program conducted at Cape Spear NHS on May 23, 2016.

The Final Report on the work to be prepared will include a site map of the Project Area showing the locations of all excavations and where archaeological resources were encountered. The Final Report will also include:

- an introduction stating the scope of the archaeological work and context within which it was undertaken;
- the site's historical background, outlining the temporal phases of occupation for the Project Area;
- the method used during all phase of the project, including the documentary, field, laboratory, and analytical methods employed;
- the results of the work, detailing the archaeological resources identified;
- an analysis and interpretation of the archaeological resources encountered in the Project Area;
- conclusions, outlining what archaeological resources are present, the significance of their presence, and their locations; and
- recommendations for any additional investigations or monitoring or recording required to preserve sufficient record of the archaeological resource.



June 10, 2016

Mr. [REDACTED]

Page 4 of 5

RE: TECHNICAL MEMORANDUM - ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT CAPE SPEAR NATIONAL HISTORICAL SITE, NL

The final report for the archaeological work will be signed and submitted by the Principal Investigator, who was granted the Parks Canada Research and Collection Permit, on or before July 4, 2016. The Final Report will be reviewed and approved by the PCTAR. Additionally, all survey and mapping data collected will be submitted, along with the final report in a format compatible with ArcGIS, with the appropriate metadata as described in the SOW.

4.0 RESULTS

During the archaeological research conducted at Cape Spear NHS on May 23, 2016, the following is a summary of the findings from the seven test pits, listed in the order in which they were dug.

- Test Pit # 7 – No findings of historic resources of significance identified, either structures or artifacts. Excavation reached a maximum of 7 cm below surface.
- Test Pit # 8 – No structural remains identified, but recovered two thumb-nail-sized fragments of generally undatable red brick. Excavation reached a maximum of 45 cm below surface.
- Test Pit # 9 – Recovered one small fragment of clear bottle glass of possible 20th Century origin; a hand-sized piece of roofing felt; and a small, extremely deteriorated fragment of what was likely iron or tin, the current state of which is little more than powder / metal residue that cannot be identified as to object-type or age, and does not appear to warrant any conservation treatment.
- Test Pit # 10 – No findings of historic resources of significance identified, either structures or artifacts. Excavation reached a maximum of 60 cm below surface.
- Test Pit # 12 – No findings of historic resources of significance identified, either structures or artifacts. Excavation reached a maximum of 1 m below surface.
- Test Pit # 13 – No findings of historic resources of significance identified, either structures or artifacts. Excavation reached a maximum of 1.75 m below surface.
- Test Pit # 14 – No findings of historic resources of significance identified, either structures or artifacts. Excavation reached a maximum of 1.15 m below surface.

5.0 CLOSING

This report has been prepared as a requirement of the Parks Canada Research and Collection Permit No. CS-2016-21716, for the sole benefit of Parks Canada, and may not be used by any other person or entity, other than for its intended purposes, without the express written consent of Stantec Consulting Ltd. (Stantec) and Parks Canada. Any use which a third party makes of this report is the responsibility of such third party.

The information and recommendations contained in this report are based upon work undertaken in accordance with generally accepted scientific practices current at the time the work was performed. Further, the information and recommendations contained in this report are in accordance with our understanding of the Project as it was presented at the time of our report. The information provided in this report was compiled from existing documents, design information provided by Parks Canada, data provided by regulatory agencies and others, as well as field



June 10, 2016

Page 5 of 5

RE: TECHNICAL MEMORANDUM - ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT CAPE SPEAR NATIONAL HISTORICAL SITE, NL

work carried out in 2016 specifically in support of this report. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, Stantec requests that we be notified immediately, and permitted to reassess the conclusions provided herein. Stantec cautions that it is possible that buried archaeological resources could still exist within the limits of the Project area.

This report was prepared by [REDACTED]. A quality review of this report was conducted by [REDACTED] and an independent review was carried out by [REDACTED]. If you have any questions or comments on the contents of this report, please contact the undersigned. We look forward to continuing to provide you with our services.

Regards,

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

tea v:\1218\active\121812230\1_environmental\5_report\1_technical_memorandum\let_crb_20160610_parks_canada_cape_spear_tech_memo_final.docx