



Parks Canada Basic Impact Analysis

1. PROJECT TITLE & LOCATION

St. Andrew's Presbyterian Church roof and fire suppression system (sprinkler) replacement
Bennett, British Columbia

2. PROPONENT INFORMATION

Parks Canada, Yukon Field Unit

3. PROPOSED PROJECT DATES

The project will take place between May 1, 2018 and October 31, 2018.

4. INTERNAL PROJECT FILE NAME

St. Andrew's Church at Bennett

5. PROJECT DESCRIPTION

The reroofing project assessed in this BIA includes three components that are further described in this section:

1. Replacement of the St. Andrew's Church roof (by a contractor);
2. Replacement of the entire fire suppression system associated with the church (by a contractor);
3. The installation of temporary interpretive signage (by Parks Canada).

BACKGROUND

Constructed in 1899, St. Andrew's Church (hereafter, the church) at Bennett, B.C., is a cultural resource of national historic significance at Chilkoot Trail National Historic Site. It is in its original location overlooking Bennett Lake and the White Pass and Yukon railway station. It is also a Recognized Federal Heritage Building because of its historical associations, and its architectural and environmental value. St. Andrew's Church is the last surviving building in Bennett from the gold rush era.

In October 2016, a condition assessment of the church was prepared for Parks Canada by Public Works and Government Services Canada (PWGSC). Information from this report highlights the following issues with the roof, fire suppression system, and the landscaping rock perimeter:

1. Replacement of the St. Andrew's Church roof

Among other items, the cedar shingle roofing on the main church was found to have reached its end of life based on the amount of organic growth, the deterioration of the wood fibres from repeated wetting and drying, the extensive cupping and distortion of the majority of the shingles, and the many missing or broken and split shingles. Rain water shedding directly off the roof has been hitting the large perimeter rocks and splashing up the walls causing staining, premature exfoliation of the bark finish, and possibly decay. Where the water runoff hits a discontinuous flashing in a vertical wall plane or where there is no flashing, water has been running into the building envelope, saturating wood members, and causing decay.

The following points describe the overall roofing observations.

- Distortion in the roof form due to excessive and differential movements in the structural system.
Overall condition: Fair;





- Cedar shingles on the main church building display extensive organic growth, are mostly cupped and distorted, many are missing, broken, or split. Condition: Poor;
- Ridge cap boards are seriously deteriorated. Condition: Poor;
- Building paper beneath shingles is not visible but may have reached the end of its life. Condition: unknown but requires replacement in reroofing project;
- Roof sheathing is not visible from on top of the roof but there are indications of water staining on the underside as seen from inside the church. This will require further investigation when the shingles and building paper are removed to determine if boards are deteriorated and require replacement in kind. Condition: unknown at present;
- Rafter tails forming the east and west roof overhangs are sagging in locations as they may be undersized to cantilever as they do and adequately resist snow and wind loading. Condition: Fair to Poor;
- Fascia boards in various locations have been subject to excessive wetting due to rain water runoff working its way back to the fascia surfaces as the shingle ends do not create an effective drip edge. Condition: Fair to Poor;
- The cricket detail with copper flashing between church roof slope and west wall of bell tower is notionally effective in shedding water from between slope and vertical planes, however, it has been damaged. Furthermore the flashing is not continuous from cricket to extent of roof overhang along junction between roof slope and north and south walls of bell tower. This has resulted in extensive damage to the split log siding boards at the roof level and all the way down the walls in the path of the runoff. Condition: Poor;
- Lack of drip edge flashing at eaves leads to premature water damage to bottom edge of shingles, roof sheathing, and rafter tails. Condition: non-existent.

Roofing on bell tower:

- Minimal distortion in the roof form due to minimal movements in the structural system. Overall condition: Good;
- Cedar shingles on the bell tower display significant organic growth on the north elevation and north facing roof slopes on dormers on east and west elevations. Condition: Poor;
- Gothic arched louvres in the gable dormers. Condition: Fair;
- Finial and the peak cap members require some conservation treatment. Condition: Fair to Poor;
- Pinnacles at four corners of spire base are weathered but intact. Condition: Fair;
- Coping flashing and substrate at base of spire requires additional investigation and replacement of substrate if deteriorated and flashing re-nailed to substrate as required. Condition: Fair
- Hip cap poles are seriously deteriorated. Condition: Poor;
- Louvres in the four gable dormers. Condition: Fair

PWGSC recommended that reroofing (replacing the cedar shingles and related flashing and rain water runoff control work) be completed within a one to five year timeframe. Completing this work sooner rather than later will reduce the negative impacts of excessive moisture in and on the building envelope.

The scope of reroofing includes (Northern Climate Engineering Ltd. And NumberTEN architectural group, 2016):

- Removal and replacement of the connection of the bell tower to the sanctuary roof (cricket and flashings) with a new framed in cricket with the appropriate self-adhesive membrane,





copper/prefinished metal flashing and counter flashing all matching existing, installed behind the neighbouring bell tower roof shingles and bell tower wall cladding.

- Removal of the gable roofs over the sanctuary, bell tower, belfry gabled vents down to and exposing the rafters and structure (allowing for a visual inspection of the rafters and or rafter tails by a structural engineer to ascertain repairs).
- Installation of new rafter tails and or purlins between the rafters at the gable roofs over the sanctuary only for rafters than need to be replaced.
- Sheathing of the exposed portion of the soffit with new linear boards spanning from rafter tail to rafter tail of the same thickness and style as existing, respecting its heritage construction.
- Installation of new cedar shingled roofs "Certigrade" COFI label of same type, size and overlap of existing, using, new stainless steel fasteners, installed over a new self-adhesive sanded membrane.
- Installation of new copper drip flashings over the eave/fascia throughout.
- Replacement of the rebated timber pole caps with matching poles of the same caliber for the hips of the bell tower and the 4-pyramidal spires.
- Removal/modification/repair of the drainage attitude counter flashing at the bell tower pyramidal roof to the bell tower wall intersection to ensure it drains and sheds water effectively.

2. Replacement of the entire fire suppression system associated with the church

The PWGSC report also noted that the "fire suppression system consists of a pump at the shoreline of Bennett Lake and fire hoses extended to the church and running up the roof level. Garden hoses and sprinklers extend out onto the gable roof ridge and sprinkler heads project through the north and east louvres in the bell tower. Additionally, sprinklers are situated around the church in the trees. This fire suppression system relies on early warning and the ability to get the pump started."

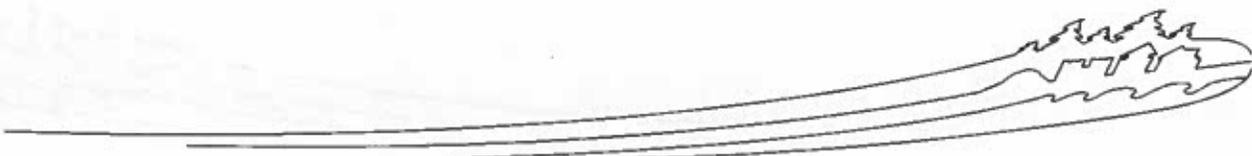
This system will be replaced at the same time that the roof is being rebuilt. The system is being upgraded to new parts to code; no rerouting or other new construction is being conducted. The intake system at the lake will remain essentially the same configuration; it will be upgraded.

3. Installation of temporary interpretive signage

Parks Canada will install temporary interpretive signs adjacent to the construction site in an effort to augment visitor experience due to the disturbance of construction.

WORK COMPONENTS

- A scaffold will be constructed around the church to enable work on the roof and sprinkler system.
- A work camp for 4-8 construction workers be set up at Bennett, within the existing campground.
- A fenced/marked storage location for construction material will be set-up near the church and the church itself will be fenced-in.
- Minor vegetation/tree removal may be required to ensure adequate space for safe helicopter slinging operations.
- Substantial construction material and camp supplies will be hauled by truck from Whitehorse to Log Cabin where they will be transported by helicopter directly to the specified material staging area adjacent to the St. Andrew's Church in Bennett.
- Workers will arrive in Bennett by train and will travel between the train station and their camp/work site on foot; smaller supplies may be carried or transported by wheelbarrow/cart.





- Work will be accomplished with a combination of hand and power tools and a generator will be used.

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

Soil and Landforms: The site is located on a hill overlooking Bennett Lake; the church is approximately 100 meters from the shore and the camp location is 30-40 meters from the shore. The soil is thin and sandy and bedrock outcroppings are common.

Flora: The site is characterized by subalpine boreal forest; subalpine fir, lodgepole pine, willow and alder are predominant. There are no know species at risk in the area.

Fauna: The most common fauna potentially encountered at the site include moose, wolves, black and grizzly bears, porcupine, wolverine, ruffed grouse and white-throated sparrows. SARA-listed Species at Risk (SAR) potentially located at Bennett during the summer months include: Olive-sided Flycatchers, Common Nighthawk, Peregrine Falcon, Western Toad, Little Brown Myotis and Northern Myotis, and Northern Mountain Caribou (Carcross herd). However, the project is not expected to impact these SAR as, if present, the mammals will be transiting through the site and are expected to largely avoid Bennett due to the increase in visitors during the summer months. Birds, bats and Western Toad are not known to be nesting/present in the specific project location.

Cultural Resources: Character-defining elements of the church are as follows:

- The heritage character of St. Andrew's Church resides in its simple yet pleasing proportions, its design and details inspired from the High Victorian Gothic, its use of indigenous materials, its weatherproofing construction techniques, and its environmental qualities.
- The church consists of a simple rectangular wood frame structure with a gable roof, and an adjoining asymmetrically placed tower. The arrangement of openings on the elevations contribute to the balanced composition of the building. The fine proportions of the church and the pattern of opening should be respected.
- The church exhibits in a vernacular and rustic manner the characteristics of High Victorian Gothic, an architectural style which emphasizes verticality, complexity of outline, varied colours and textures. At St. Andrew's Church, verticality is expressed by the steeply pitched roof, the dominant tower, the pointed arch openings and the use of vertical siding for the lower section of the building and lower portion of the gable ends. Complexity is seen in the tower, with its peaked dormers, breaking but reinforcing the thrust of the steep roof, its corner pinnacles and its decorative finial. Varied texture and colour is created by the use of short lengths of slab wood set in several courses and placed in varying patterns - vertically, horizontally and diagonally. The tower has six distinct courses of wooden siding, including one in a lattice design, and basket-weave design. The overall effect is one of a rich textured surface whose shades and shadows intensify the intricate patterns.
- All of the surviving materials should be carefully preserved. A regular maintenance program should be established to protect the original fabric of this important heritage structure. Any repairs done on the building should use indigenous materials, and be done in the spirit of the original design to maintain the rustic frontier aesthetics.
- The functional design of St. Andrew's was simple and the local materials were eminently suitable. The exterior sheathing of split slabs (bark retained) provides an excellent waterproof covering, and





when set diagonally, gives extra strength to the walls. All doors and windows were packed with oakum to reduce drafts. Four inches of dead air space was created between the inner and outer walls with building paper applied to the interior side of the outside wall. All of these construction techniques, which are a response to weatherproofing, should be maintained.

- Nothing remains of the interior finish. The fine leaded windows, set in frames that were faced with rough slabs, are no longer extant. St. Andrew's Church always stood as a prominent structure in its surrounding environment, originally as the centre of a booming town, now as a landmark in a national historic park. The predominance of the church on its surrounding should not be compromised.

The replacement of the roof and of the fire-suppression system touch on many character-defining elements. The planned visitor experience elements also need to be evaluated to assess any impacts to the interior of the building. While nothing remains of the building's interior finish, any changes to the inner walls or floor plan should be evaluated.

There are visible and shallow buried archaeological resources around the church. These include stone retaining walls and raised earthen platforms that delineate the foundations of the former kitchen and woodshed. Scaffolding, signage and other visitor experience additions could impact these archaeological resources.

Visitor Experience: The Chilkoot Trail National Historic Site is one of the Yukon Field Unit's biggest attractions and is visited year round for hiking, skiing, and sightseeing, though visitor numbers in the summer are much higher than in the winter. Bennett is the northern terminus of the Chilkoot Trail and is also commonly accessed in the summer by visitors travelling on the White Pass and Yukon Scenic Railroad; though not accessible on the inside, the church is one of the primary attractions at Bennett with visitors taking photos and walking around the exterior of the building.

7. EFFECTS ANALYSIS

The effects on all valued components will occur during the construction phase of the project.

Soil and Landforms: Soil may be contaminated from waste (e.g., fuel spills when refueling generators, garbage).

Flora: Storage of construction material/equipment may result in compression of natural vegetation. Minor vegetation/tree removal may be required to ensure adequate space for safe helicopter slinging operations.

Fauna: Operation of generators and construction/flying noise may result in temporary habitat displacement/ preferred habitat avoidance, including disturbance to nesting birds and/or their nests. However, the majority of the work will take place on or near existing disturbed areas that do not represent quality nesting habitat; the area of natural vegetated habitat to be disturbed is small and no vegetation clearing is required; and there is a pre-existing high level of human activity on the site (e.g., resulting in noise disturbance).





Cultural Resources: A Cultural Resource Impact Analysis (CRIA) has been undertaken to assess the architectural and archaeological impacts of this project. As part of this process, an Archaeological Overview Assessment (AOA) has been prepared to determine how to mitigate any impacts on the archaeological resources around the church (see Appendix A). All impacts need to be mitigated in accordance with the *Treasury Board Policy on Management of Real Property* (2006), the *Parks Canada Cultural Resource Management Policy* (2013), and *The Standards & Guidelines for the Conservation of Historic Places in Canada* (2010).

Visitor Experience: Visitor experience quality may be adversely affected due to noise and presence of construction equipment/material; decreased aesthetic appeal and impacted viewscape; and restricted access to the church. The project will temporarily decrease the quality of the overall visitor experience but this is limited to the construction period and will result in an improved visitor experience over the long term.

8. MITIGATION MEASURES

General

Work Site Conditions/Staging/Laydown

1. An onsite orientation/start up meeting will be held with onsite project personnel to review the mitigation measures and any site-specific considerations with the Departmental Representative before work begins.
2. Existing pathways will be used to access the construction site unless otherwise approved by the Departmental Representative.
3. Clearly mark staging area, work site and restricted areas with stakes, biodegradable flagging tape, fencing, temporary gates or other means; remove same when project is completed.
4. The maximum on-site contract personnel is eight workers.

Equipment Operation

5. 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.
6. During construction, any required cleaning of tools and equipment must be done off-site to prevent the release of wash water that may contain deleterious substances.
7. Equipment operators must be competent and certified where required.
8. Equipment (e.g., chainsaws, and generators) must be stored, maintained and refuelled on a flat surface at least 100 meters from the shoreline.
9. All lumber must be cut in an area designated by the Departmental Representative
10. All saw dust/lumber ends must be collected on a tarp and contained in a barrel/gravel bag/suitable container for off-site disposal.

Delivery of Contractor Supplied Items

11. A Departmental Representative will oversee heli-slinging operations on the ground at the staging area and work site for any Contractor Supplied Items to be transported to the site by helicopter.
12. The Contractor will maintain responsibility for conducting all phases of helicopter slinging operations, including but not limited to the safe packaging, handling receiving and managing of materials/loads.





13. The Contractor will retain the services of a pilot with experience heli-slinging at Chilkoat Trail NHS for all helicopter slinging operations.
14. Any and all Contractor Supplies Items to be transported by helicopter to and from the site must be packaged to facilitate safe and efficient loading and slinging.
15. The Contractor must supply adequate dunnage to ensure safe and efficient loading and slinging as well as to ensure minimal disturbance occurs to ground at on site storage area
16. The Contractor is responsible for protection from the elements and security of all Contractor Supplied Items until project completion
17. The Departmental Representative will designate areas for staging, storage and work.

Helicopter safety and best practices

18. Safety briefing prior to operations will be mandatory and provided by the pilot
19. All helicopter operations must avoid train times
20. Unload and secure any wildlife attractants as soon as possible (i.e. food, fuels, etc)
21. Ensure helicopter landing sites are clear of debris and other materials which may become an airborne hazard during all landing and takeoff activities.

Camp Site

22. Tents for the construction workers will be placed within the existing campground; provision of these tents is the responsibility of the Contractor.
23. The Contractor must have at least one satellite phone for project/emergency communications
24. The Contractor will be responsible for their own bathing/shower facility. Bathing/shower facilities must be situated more than 30 m away from water sources in an area designated by the Departmental Representative.
25. Biodegradable and unscented soap must be used for bathing/showering.
26. The existing grey water pit in the campground must be used to drain water from cooking and dish washing. Water must be sieved and any food pieces must be disposed in solid waste garbage.
27. Camp must be kept clean; food and wildlife attractants must be stored in a hard sided building (check with Departmental Representative prior to use), existing bear boxes and/or contractor supplied bear proof containers.
28. Existing outhouses will be utilized. Waste (barrels) will be removed by Parks Canada as required.
29. The Contractor will secure food and wildlife attractants when not in use
30. The Contractor must erect and maintain an electric fence of adequate size and voltage to form a perimeter around all food materials and wildlife attractants such as petroleum products.
31. Alcohol and non-prescription drugs are not permitted on site
32. The Contractor will observe quiet hours between 8 PM and 8 AM PST. During these periods only low volume work will be conducted

Bear Safety

42. All bear sightings/incidents (conflict/food reward) must be to be reported to the Departmental Representative.
43. Minimize the use of fatty and smelly foods.
44. Minimize the amount of food kept on site; resupply by train or other means as necessary.

Waste

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





34. All construction waste materials (e.g., construction material, refuse material, waste petroleum, and demolition waste including asphalt) shall be removed from the site upon 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.
35. Existing cedar roof shingles must be separated from the construction waste and provided to the Departmental Representative.
36. Burning of waste is not permitted at the National Historic Site.
37. The Contractor will retain adequate personnel to manage the appropriate disposal of waste at all stages and locations.
38. The Contractor is responsible for all costs associated with project waste disposal

Hazardous Materials

39. Prevent the release of hazardous substances into the environment, including but not limited to, paints, chemicals and petroleum products and their derivatives.
40. All on-site personnel must be briefed on reporting requirements for hazardous materials spills; spills must be reported immediately to the Departmental Representative.
41. The construction sites must be equipped with containers suitable for the secure, temporary storage of hazardous wastes, separated by type.
42. 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.
43. All spills must be contained and cleaned-up as soon as possible. In the event of a major spill, all other work must stop until the spill has been adequately contained and cleaned up.
44. Petrochemical products, paints and chemicals must be stored 100 meters from the shoreline.
45. Any hazardous waste or contaminated material uncovered during 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 Departmental Representative.

Natural Resources

General

46. Waste materials (e.g., organic materials, soil stockpiles, construction waste, plastic wrap and garbage) must not enter the aquatic environment. Securely store in place at all times.
47. Treated wood must be handled, installed, and disposed of according to the [Parks Canada Guide for the Use, Handling and Disposal of Pressure Treated Wood 2009](#).
48. Minimise the number of saw cuts made to treated wood in the field. If unavoidable, cut treated wood more than 30m from the shoreline and over tarps to catch debris. Cuttings, sawdust and other treated wood waste material must not enter the aquatic environment.

Soil and Landforms

49. All construction material/equipment will be stored on dunnage (i.e.: wooden boards, lumber, or raised platforms) to avoid crushing vegetation and historic material.

Flora/Fauna

50. Never approach or harass wildlife (e.g., feeding, baiting, luring).





51. Stay within the construction limit, including staging areas.
52. Use existing disturbed areas whenever possible.
53. Limit construction activities, including the flying in and out of materials/equipment, to the time between dawn and dusk to avoid the illumination of adjacent habitat, disturbing songbirds when they are most active, and to provide opportunities for foraging.
54. No vegetation/tree removal will be conducted without explicit permission and/or authorization from the Departmental Representative.

Cultural Resources (see additional *Site Protection and Avoidance Measures* in attached Archaeological Overview Assessment, page 18 of this document)

55. Careful coordination of some aspects of the sprinkler system installation is essential to minimize the potential negative impact.
56. Penetrations through the building envelope for the new sprinkler system must try to reuse existing holes or keep the number of new holes to a minimum.
57. Where sprinkler system components must be secured to the building or sway braces are to be installed, this should be completed in a fashion that creates as little damage as possible to the building fabric.
58. Where materials are sound and are still performing as needed, every effort should be made to keep the replacement of the rafter tales to a minimum.
59. Protection measures need to be reviewed by the Departmental Representative to ensure that the scaffolding and weathertight enclosure are appropriately engineered and will not inadvertently damage the building.
60. Roof Replacement will require material stockpiling, scaffold placement and general site use by contractor. All these factors have the potential to impact shallow cultural resources of site 1785T as well as the historically recorded kitchen and wood shed. Without care and attention and physical protection to these resources, some impact to cultural resources may be anticipated. Therefore erection of scaffolding should involve above ground anchors and leveling devices. No subsurface excavation is to be allowed. No movement of boulders is allowed. Laydown and material storage should be restricted to areas designated by the Departmental Representative only.
61. Replacement of the fire suppression system, if placed in the same location of existing system, should not impact on archaeological resources or features. A caution remains that care and attention should be made when adjusting and anchoring the intake system at the lake shoreline to avoid the recorded historic features such as the boat slips.
62. Installation of signage should incorporate existing infrastructure such as fences or existing posts and walkways. No new posts or holders that impact the surface should be contemplated.
63. The preferred staging area is located south of the church on the hill side. This location avoids known intact deposits of site 1785T. One historic feature to the south and east should be adequately buffered. The wood shed and kitchen area have both on surface boulders and shallow buried archaeological features located adjacent to the south wall of the church. This area must be covered with protective rubber matting to be provided by the Contractor. Laydown and material storage should be restricted to designated areas only.
64. Apply Accidental Finds Protocol: If significant features (i.e., previously unknown structural remains and/or high artifact concentrations) or human remains are encountered, work should cease in the





immediate area, the work area in relation to the findings photo documented and geo-referenced, and the Parks Canada project manager informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance that will in turn determine what will be required to mitigate the chance find.

65. Any changes to the proposed plans must be submitted to Terrestrial Archaeology for review.

Visitor Experience

66. The trail to the church will remain open throughout the project and, prior to project Parks Canada will install interpretation panels in order to minimize the impacts to the visitor experience at the site.

67. The Contractor will schedule helicopter flights to avoid train presence at Bennett and outside peak visitor hours i.e. early morning or late afternoon.

68. Construction should be completed in as short a time period as is practicable.

69. Maintain the site in as tidy a condition as possible for the duration of work.

70. Safety risks to visitors during construction must be minimized:

- The work site (church and staging/storage areas) must be closed and clearly delineated with fencing, barriers, temporary gates, caution tape, stakes, or combination thereof. These must be removed upon completion of the project.
- 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 direct visitors in this area.
- Secure and clearly mark unattended safety hazards (e.g., debris piles) with fencing, warning signs, caution tape or combinations thereof.
- Ensure any materials long lined into the site are secured and the equipment used is in good working order to prevent the accidental release of materials.
- Ensure that access to areas where helicopters are slinging materials to and from are signed to prevent unauthorized access during activities and there is a person is on site to direct visitors away from work areas.

9. OTHER Considerations

Check all that apply

Public/stakeholder engagement

Aboriginal engagement or consultation. Engagement has occurred with Edna Helm (Carcross Tagish FN), whose cabin is adjacent to the site

Site Inspection/Surveillance: It is recommended that the Project Manager 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.





- 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

Natural Resources: Given the magnitude of effects and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to natural resources.

Cultural Resources: Given the magnitude of effects and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to cultural resources.

Visitor Experience: Given the magnitude of effects, the installation of temporary interpretation signage, and reversibility after construction, the project is unlikely to result in significant residual adverse effects to visitor experience.

11. EXPERTS CONSULTED

<i>Department/Agency/Institution:</i> Parks Canada	<i>Date of Request:</i> 2017-01-25 and ongoing
<i>Expert's Name & Contact Information:</i> Lisa Forbes Parks Canada 30, rue Victoria Gatineau (Québec) lisa.forbes@pc.gc.ca Tel: 819-420-9233	<i>Title:</i> Cultural Resource Management Policy Officer
Expertise Requested: Provide an assessment regarding project impacts on cultural resources.	
Response: Built Heritage and Archaeological advice and mitigation measures have been provided.	
<i>Department/Agency/Institution:</i> Parks Canada	<i>Date of Request:</i> 2017-01-25 and ongoing
<i>Expert's Name & Contact Information:</i> Shelley Bruce Parks Canada 300 - 300 West Georgia St, Vancouver, BC shelley.bruce@pc.gc.ca Tel: 604.666.0078	<i>Title:</i> Built Heritage Advisor, Indigenous Affairs and Cultural Heritage Directorate
Expertise Requested: Provide an assessment regarding project impacts on cultural resources.	
Response: Built Heritage and Archaeological advice and mitigation measures have been provided.	
<i>Department/Agency/Institution:</i> Parks Canada	<i>Date of Request:</i> 2017-01-25 and ongoing





Expert's Name & Contact Information: Brian Smith Parks Canada 145 McDermot Ave. Winnipeg, Manitoba BrianJ.Smith@pc.gc.ca Tel: 204.984.8276	Title: Federal Infrastructure Investments Project Archaeologist
Expertise Requested: Provide an assessment regarding project impacts on archaeological resources.	
Response: Archaeological advice and mitigation measures have been provided.	

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.

FOR SARA REQUIREMENTS:

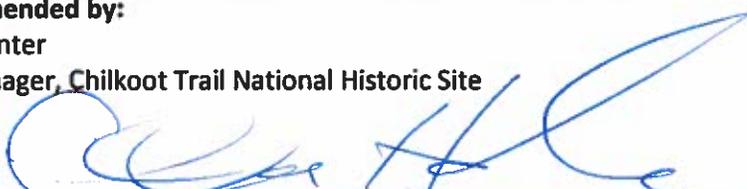
- There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

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

13. RECOMMENDATION AND APPROVAL

(Add additional blocks as required)

Prepared by: Jacquie Bastick Impact Assessment Specialist, Natural Resource Conservation Branch, Parks Canada	Date: January 19, 2018
Recommended by: Chris Hunter Site Manager, Chilkoot Trail National Historic Site 	Date: January 19, 2018
Approval signature: Diane Wilson Field Unit Superintendent, Yukon Field Unit 	Date: Jan 25 / 18 .





14. ATTACHMENTS

Archaeological Overview Assessment – FII Project: Bennett, St. Andrew's Church Rehabilitation (#851) Chilkooot Trail National Historic Site of Canada (CTNHS), British Columbia. Prepared by Parks Canada, December 2017.

Documents Reviewed

Specifications for St. Andrews Church Roof Replacement and Fire Protection Upgrades, Bennett Lake, BC. Issued for 99% Review – February 2017. Public Services and Procurement Canada. Project No. R.075650.001

Drawings for St. Andrews Church Roof Replacement and Fire Protection Upgrades. Issued for 99% Review – March 6, 2017. Kobayashi + Zedda. Project No. R.075650.001 (7 sheets)

Fire Prevention Systems Report. Northern Climate Engineering, November 17, 2016

St. Andrew's Presbyterian Church Condition Assessment. Heritage Conservation Western & Heritage Conservation Directorate, Public Works and Government Services Canada, October 2016

St. Andrews Presbyterian Church RS1 Requirements, Analysis of Project Requirements. NumberTEN architectural group and Northern Climate Engineering Ltd., December 2016

REFERENCES

Chilkoot Trail Commemorative Integrity Statement

St. Andrew's Presbyterian Church Bennett Lake, British Columbia, Heritage Character Statement

St. Andrew's Presbyterian Church, Chilkoot Trail National Historic Park, Bennett Lake, British Columbia. Federal Heritage Buildings Review Office, Building Report 88-176

Standards and Guidelines for the Conservation of Historic Places in Canada (2010)

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***





APPENDIX A: Archaeological Overview Assessment

**Archaeological Overview Assessment
FII Project: Bennett, St. Andrew's Church Rehabilitation (#851)
Chilkoot Trail National Historic Site of Canada (CTNHS), British Columbia**

Brian Smith (FII)
Terrestrial Archaeology, IACHD
December 1, 2017

Introduction

The Yukon Unit (YFU) is planning to undertake rehabilitation of the roof and fire suppression system (sprinkler) of the St. Andrew's Presbyterian Church at Bennett, British Columbia within Chilkoot Trail National Historic Site (CTNHS) on Bennett Lake (Figure 1); the current roof having reached its end of life due to natural deterioration. Construction is scheduled between May 1 and July 31, 2018. Project activities are as follows:

1. Replacement of the St. Andrew's Church roof (by a contractor);
2. Replacement of the entire fire suppression system associated with the church (by a contractor);
3. The installation of temporary interpretive signage (by Parks Canada).

Work components include:

- A scaffold will be constructed around the church to enable work on the roof and sprinkler system.
- A work camp for 4-8 construction workers be set up at Bennett, within the existing campground.
- A fenced/marked storage location for construction material will be set-up near the church and the church itself will be fenced-in.
- Construction material and camp supplies will be hauled by truck from Whitehorse to Carcross, Fraser, or Log Cabin where they will be transported by train to Bennett. In Bennett, they will be moved from the train station to the work site by helicopter.
- Workers will arrive in Bennett by train and will travel between the train station and their camp/work site on foot; smaller supplies may be carried or transported by wheelbarrow/cart.
- Work will be accomplished with a combination of hand and power tools and a generator will be used.

This Archaeological Overview Assessment will evaluate the archaeological potential of the project area and the potential for the proposed work to impact cultural resources. It will determine if an Archaeological Impact Assessment, or like mitigation measures and any specific archaeological requirements are necessary prior to, or in conjunction with, the Bennett St. Andrew's Church Roof Replacement in order to protect CTNHS's cultural resources.

Bennett Church Roof Replacement Project in Chilkoot Trail NHS: Brief Contextual and Archaeological Overview

Chilkoot Trail National Historic Site of Canada (CTNHS), located in the northwest corner of British Columbia commemorates the mass movement of people into the Yukon during the Klondike gold rush. The trail through the Chilkoot Pass, follows an ancient First Nations trade route from tide water at Dyea, Alaska to





the headwaters of the Yukon River at Bennett Lake, British Columbia. Following the establishment of the rail service to Bennett in 1899, and Whitehorse in 1900, the Chilkoot trail fell into disuse as a travel route into the Yukon. Carcross Tagish and Tlingit First Nations people continued to use the area for traditional purposes. Parks Canada began managing the site in 1974. Since that time, thousands of hikers have visited the Chilkoot Trail, to hike the trail and visit the historic gold rush towns. Bennett City was largely abandoned at the turn of the last century, however the legacy of the Klondike gold rush remains in the form of landscape, by St. Andrew's Church, built in 1899; the Bennett Train Station, located adjacent to CTNHS; tent platforms; building foundations; abandoned equipment; can and bottle dumps and other historic materials. Once a bustling metropolis, extending from the north shore of Lindeman Lake, many of the buildings once found at Bennett City have been scavenged or salvaged, although extensive archaeological evidence remains. Contemporary features include, the residence and outbuildings of the Helm family, an interpretive platform, interpretive signage, board walks, stairs, benches and campground with tent pads, picnic tables, signage, visitor shelters and outhouses.

Previous Archaeological Work and Archaeological Potential

In 1986 Greer wrote that, based on regional archaeological site data, there was every reason to believe the Chilkoot Trail NHS had been occupied, if not at least intermittently used, for many millennia prior to the Klondike Gold Rush of the late 1890's. Regional culture history dating back to 9800 BP relates to both Coastal and Interior cultural sequences. Historic ethnographic data indicates the Chilkoot Trail connected both coastal and interior peoples as a trade, travel and resource gathering route; a lifeways pattern and land use that has a lengthy pre-contact history. In the Lindeman - Bennett area three pre-contact sites have been recorded (1785T; 1786T; 1787T) with a program of systematic testing and excavation undertaken in 1995. Each of the sites has suffered from both natural and gold rush era and recent human factors. Although each site contained lithic debitage and tools, these, were non diagnostic as to chronological age, and attempts at radiocarbon dating were inconclusive due to soil conditions and forest fire related factors. These sites do indicate that both intact pre-contact as well as gold rush era archaeological resources can be expected along the Chilkoot Trail (Thomson and Hems 1996).

With reference to the Gold Rush Era archaeological resources, a 1983 summary noted that:

From its beginning at the summit to its end at Bennett, the Canadian portion of the Chilkoot Trail is distinguished by an intensive artifact scatter. For the most part, this scatter is distributed in a linear fashion along the entire length of the Trail. In addition, there are several isolated areas or nodes where the intensity of the scatter increases substantially. These generally correspond to favoured stop-over points where goods were temporarily cached for further transport down the trail or represent semi-permanent encampment sites where the stampeders in their wait for spring breakup. (RD & A Report, on file Parks Canada Agency)

Over the course of the following decades, various archaeological investigations including the Chilkoot Trail Cultural Resource Inventory and Assessment conducted by Parks Canada from 1988-1993 have documented many of the Trail's cultural resources, but this inventory is not exhaustive, is continually being updated and the potential threat to unrecorded sites and features from modern use and NHS development remains high. Periodic monitoring and archeological review of resources at selected locations along the Chilkoot Trail is conducted by site staff. In recent years, archaeological investigations have focused on mitigating the potential impact of new and upgraded infrastructure (Thomson, pers. comm. 2016).





Site 1785T The Bennett Church Site

This pre-contact site, located immediately adjacent to St. Andrew's Church at the northern terminus of the Chilkoot Trail at Bennett Lake (Figure 2) was first recorded in 1988 and re-examined during a field survey in 1995. Artifacts were recovered both on the surface and buried at a shallow 2 cm below surface from a number of excavated test units. The following summarizes the results of the archaeological investigations:

- Portions of Site 1785T are still intact, but are vulnerable to disturbance as cultural material is only 1 – 2 cm below the surface and located along pathways in close proximity to the historic church.
- Site 1785T has already been impacted by foot traffic around the church, and the site area is located on the main access to the campground and train station.

Historic Period Church related / Gold Rush era Structures

There are visible archaeological resources around the church. These include stone retaining walls and raised earthen platforms that delineate the foundations of the former kitchen and woodshed at the rear of the church. Those previously recorded in close proximity to the church are depicted in Figure 3. Between the church and the Bennett Lake shoreline are a number of surface structural features as well as a number of historic period features including boat slips that become exposed as lake water levels recede throughout the summer. These features are mapped in Figure 4.

Assessment of Potential Impact to Archaeological Resources: Bennett St. Andrew's Church Rehabilitation Project, Chilkoot Trail NHS

Roof Replacement St. Andrew's Presbyterian Church

Public Works and Government Services Canada (PWGSC) recommended that reroofing (replacing the cedar shingles and related flashing and rain water runoff control work) be completed sooner rather than later to reduce the negative impacts of excessive moisture in and on the building envelope.

Fire Suppression System Replacement

Fire suppression system for the church consists of a pump at the shoreline of Bennett Lake and fire hoses extended to the church and running up the roof level. Garden hoses and sprinklers extend out onto the gable roof ridge and sprinkler heads project through the north and east louvres in the bell tower. Additionally, sprinklers are situated around the church in the trees.

This system will be replaced at the same time that the roof is being rebuilt. The system is being upgraded to new parts to code; no rerouting or other new construction is being conducted. The intake system at the lake will remain essentially the same configuration; it will be upgraded. The intake at the lake must be extended outward as lake levels drop considerably over the course of the spring to fall months.

Temporary Interpretive Signage Installation

In order to minimize disturbance to the visitor experience during construction when visitor access to the church site is not possible, Parks Canada will install temporary interpretive signs, with pre-construction and historical photographs of the church on/near the fence. Details regarding temporary sign placement are not yet finalized.





Assessment of Project Works: Mitigation of Possible Impacts to Archaeological Resources

Project Work and Impact	Assessment / Concerns
<p><u>Roof Replacement</u> Moderate Archaeological Resource Concerns -the designated area includes the foundations of the kitchen / woodshed and areas around the church where precontact cultural resources are known to be present. Rubber matting must be laid down to protect the kitchen/woodshed foundations from foot traffic. Rubber matting is also required in work areas on the west side of the church, to prevent erosion / exposure of shallow cultural resources.</p>	<p>Roof Replacement will require material stockpiling, scaffold placement and general site use by contractor. All these factors have the potential to impact shallow cultural resources of precontact site 1785T as well as the historically recorded kitchen and wood shed. Without care and attention and physical protection to these resources, some impact to cultural resources may be anticipated. Therefore erection of scaffolding should involve above ground anchors and leveling devices. No subsurface excavation is to be allowed. No movement of cobbles is allowed – these may be associated with gold rush era features. Laydown and material storage should be restricted to designated areas only. A restricted use area has been identified on the south side of the church (Figs. 5, 6). Although foot traffic through this area is permissible, the ground surface must be protected with rubber matting and it cannot be used as a work area.</p>
<p><u>Fire Suppression System Replacement</u> Low - Archaeological Resource Concerns</p>	<p>Replacement of the fire suppression system, if placed in the same location of existing system, should not impact on archaeological resources or features. A caution remains that care and attention should be made when adjusting and anchoring the intake system at the lake shoreline to avoid the recorded historic features such as the boat slips (Figure 4).</p>
<p><u>Temporary Interpretive Signage Installation</u> Low - Nil Archaeological Resource Concerns</p>	<p>Installation of signage should incorporate existing infrastructure such as fences or existing posts and walkways. No new posts or holders that impact the surface should be contemplated.</p>
<p><u>Staging and Work Areas</u> Moderate Archaeological Concerns if contract area remains as proposed Low Archaeological Resource Concerns, with modifications to the proposed contract area</p>	<p>The preferred staging area is located south of the church on the hill side. This location avoids known intact deposits of site 1785T. One historic feature to the south and east should be adequately buffered (Figure 5). The wood shed and kitchen area have both on surface boulders and shallow buried archaeological features located adjacent to the south wall of the church. This area needs to be covered with protective rubber matting (Figures 5, 6). Laydown and material storage should be restricted to designated areas only.</p>





It has been determined from this Archaeological Overview Assessment that the above aspects of the Bennett St. Andrew's Church rehabilitation project works as described if properly managed, will have a low to moderate, very low or nil potential to negatively impact on archaeological / cultural resources. **Therefore no Archaeological fieldwork mitigation measures prior to work commencing will be required.** However, the following requirements will still apply.

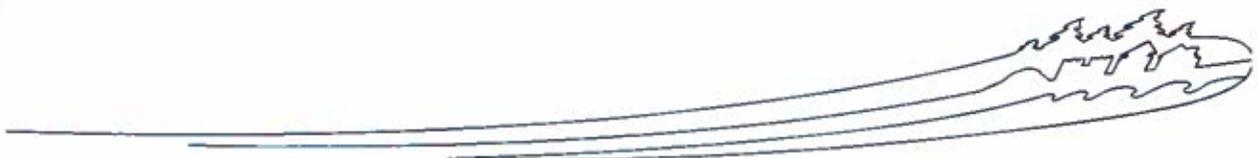
Site Protection and Avoidance Measures

The proposed contract area includes areas of high archaeological potential, where known cultural resources are present. Without modifications, the project would be expected to have moderate impact to these resources. The impacts can be acceptably mitigated by:

1. Restricting use of the area abutting the south side of the church, where the foundations of a former kitchen and woodshed are present (Figs. 5, 6). These foundations are visibly marked by scattered large stone cobbles on the surface. Shallowly buried artifacts are expected to be present. Foot traffic through this area is permissible, but the ground surface must be protected by rubber matting. No work tables, cutting wood, etc. are permitted in this area. Cobbles must not be moved.
2. The contract area must be modified slightly on its east side to provide a greater buffer for a historic tent platform (Fig. 5).
3. Rubber mats must also be used in the work area on the west side of the church (Fig. 5). This will prevent erosion/exposure of shallowly buried artifacts associated with precontact use of the area around the church."

Change of Scope

Any changes to the proposed plans must be submitted to Terrestrial Archaeology for review.





Accidental Finds Protocol

There could be a chance, however low, that features or artifact concentrations are encountered during construction activities. If significant features (i.e., previously unknown structural remains and/or high artifact concentrations) or human remains are encountered, work should cease in the immediate area, the work area in relation to the findings photo documented and geo-referenced, and the Parks Canada project manager informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance that will in turn determine what will be required to mitigate the chance find.

References

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2016 Personal communication.

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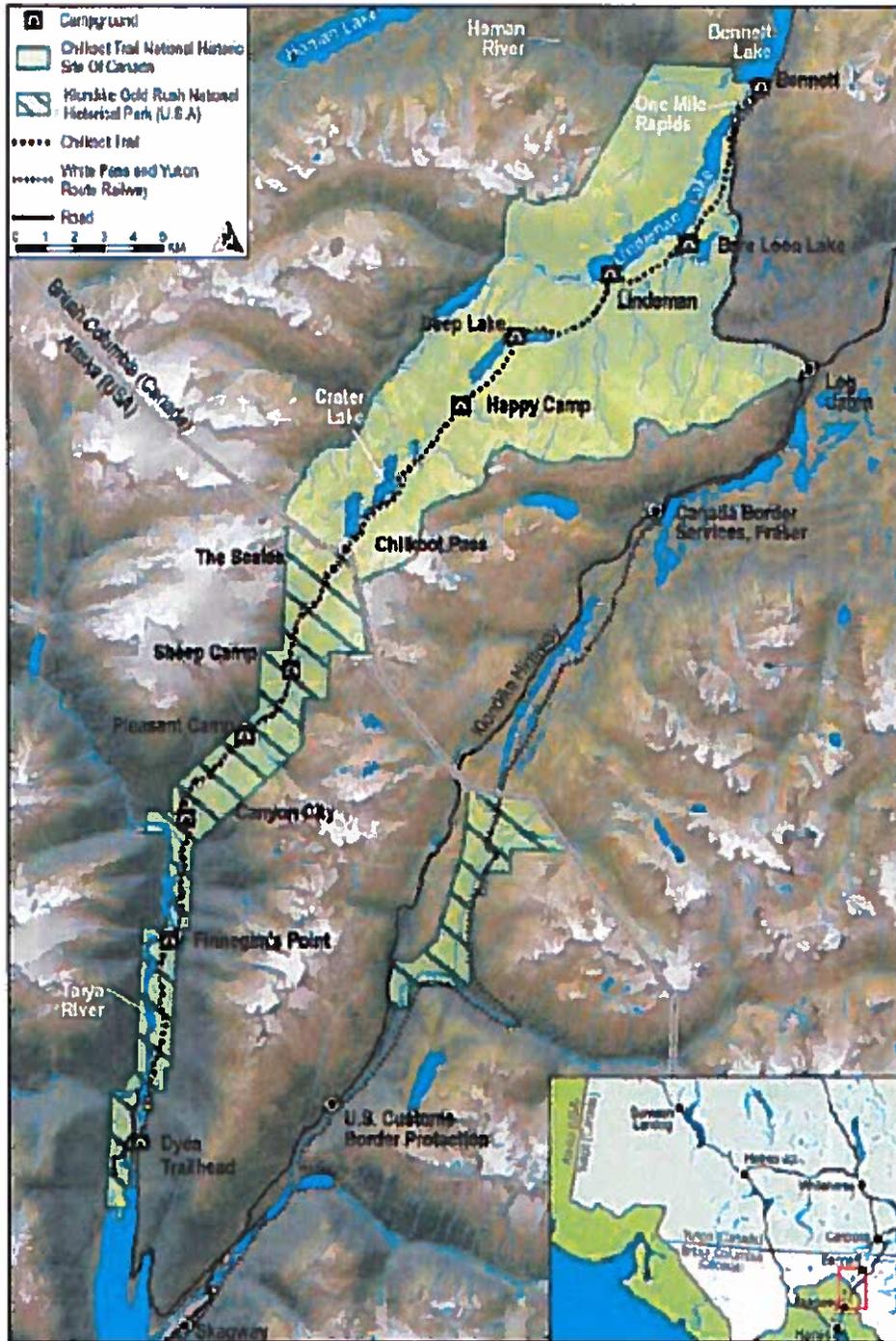


Figure 1: Location of Bennett B.C. at the southern end of Bennett Lake, within the Chilkoot Trail NHS.



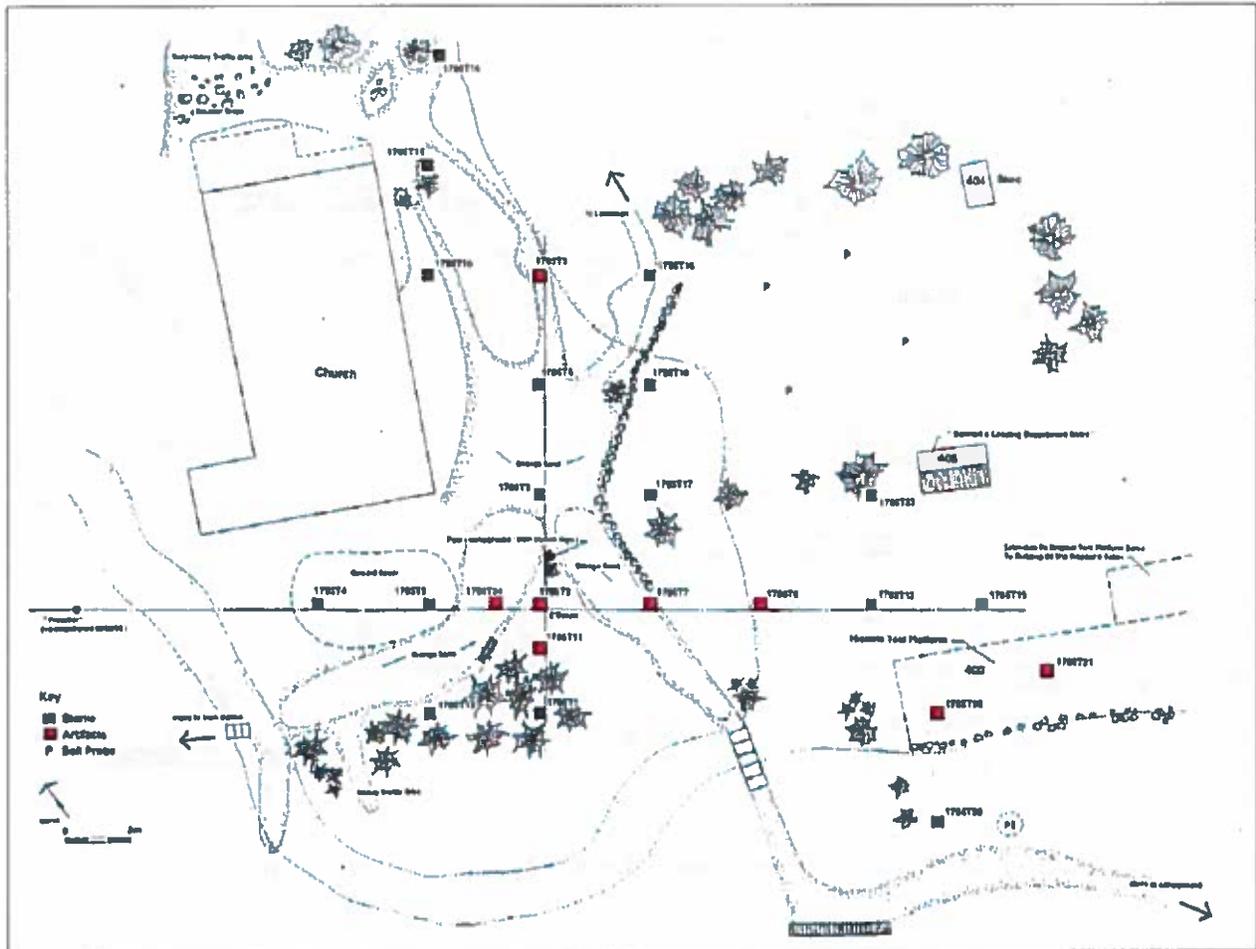


Figure 2: Map of site 1785T in relation to the St. Andrew's Church at Bennett. Boxes shaded red show where precontact artifacts were recovered in archaeological test pits. Results indicate shallowly buried artifacts may be present throughout the work area.



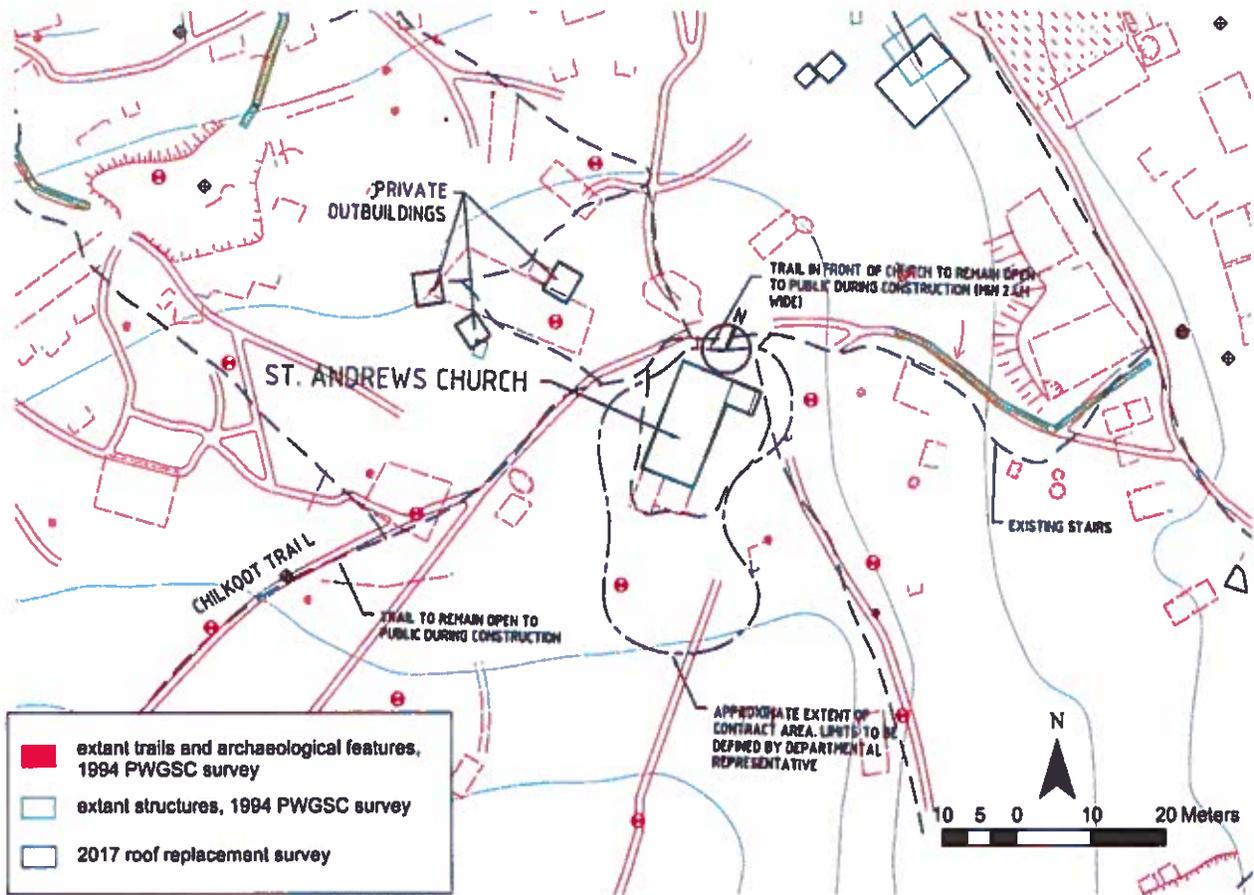


Figure 3: Extant archaeological features recorded in the vicinity of St. Andrew's Church.



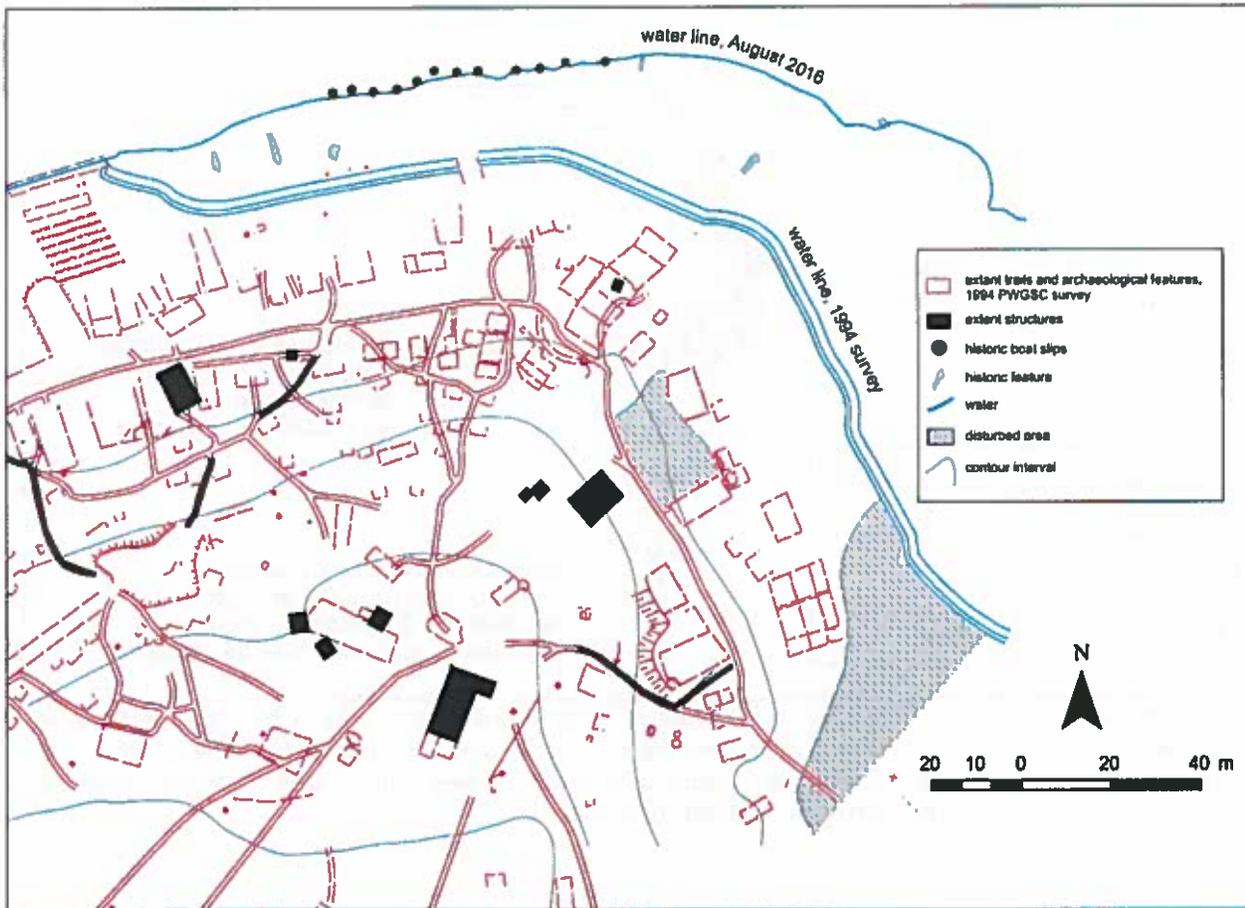


Figure 4: Extant archaeological features recorded in the vicinity of St. Andrew’s Church and Lake Bennett shoreline. Note difference in lake levels in 1994 and 2016.



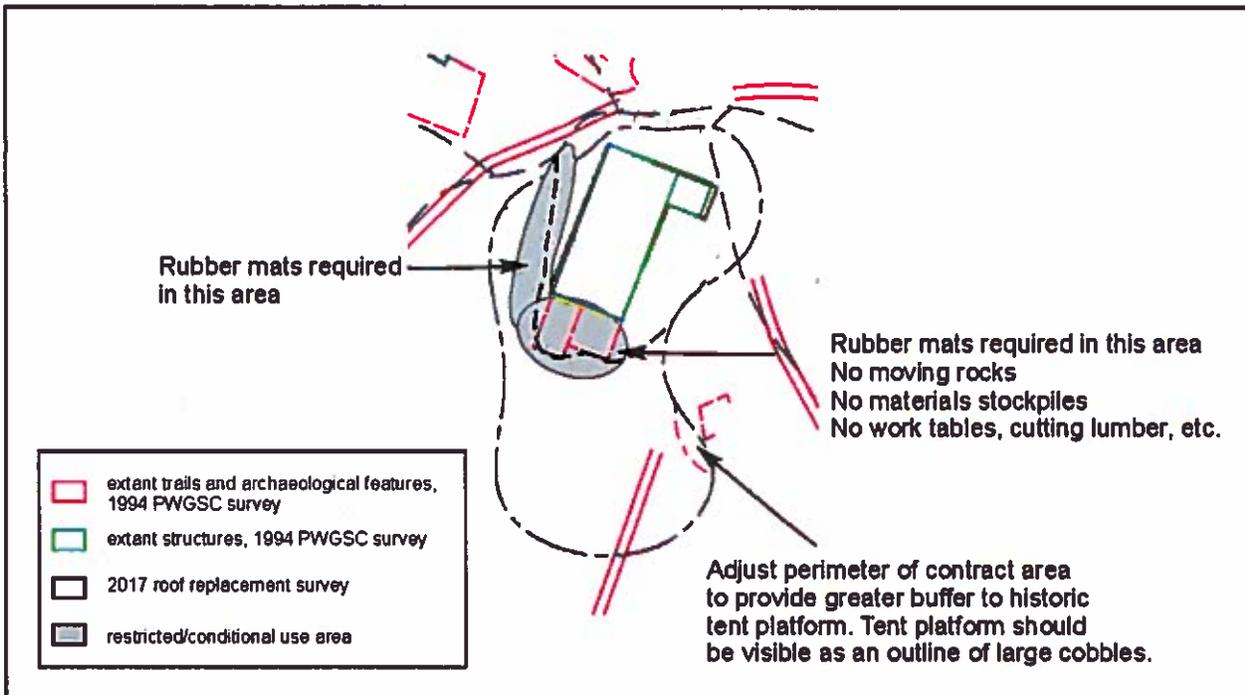


Figure 5: Immediate area surrounding Church, note former kitchen and woodshed area (to be avoided for laydown and protected from foot traffic by rubber matting –see Figure 6) on the south-southwest end of the church. A greater buffer is required for the archaeological feature to the south and east of the church. Preferred laydown or material storage area to be on hillside to the south side of church.



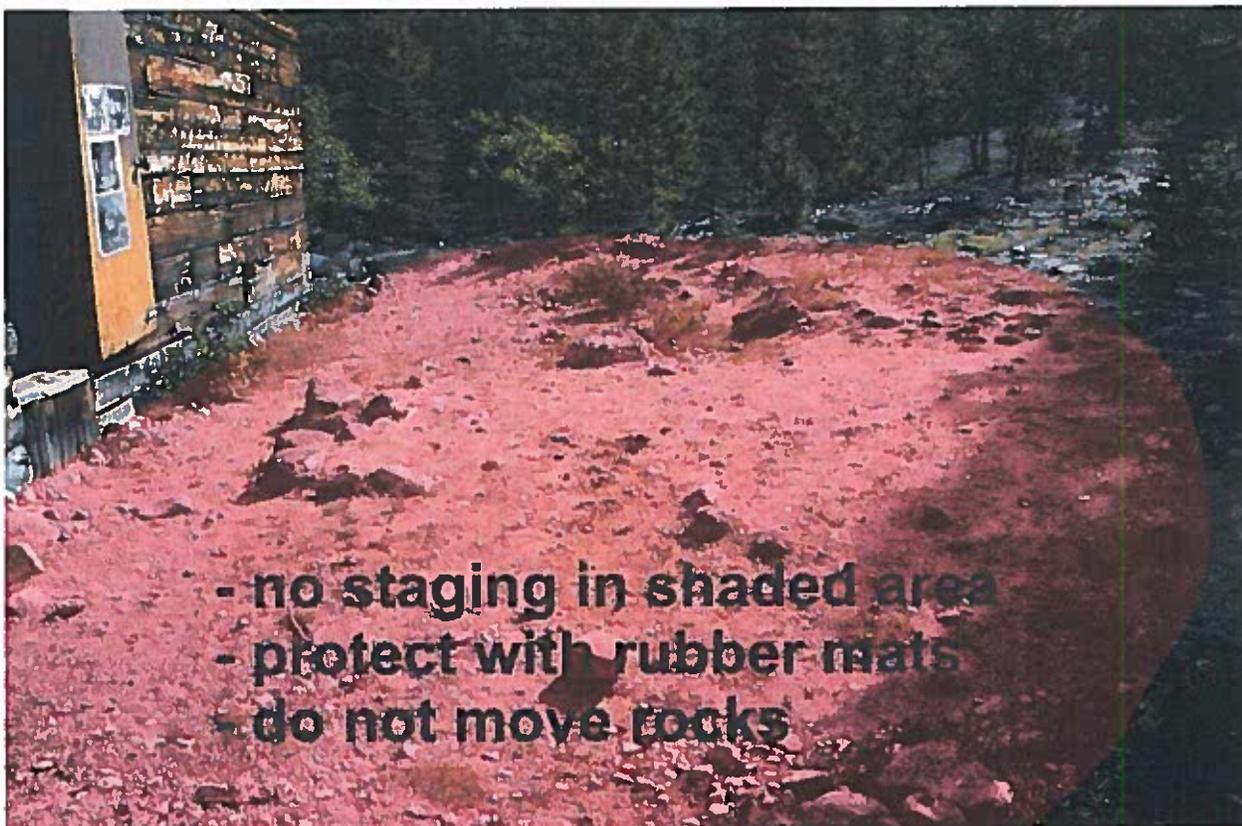


Figure 6: Kitchen and wood shed area at south end of church illustrating area to be protected during project.



