

Part 1 General

- .1 This addendum consists of two pages plus the following list of drawings:

<u>No.</u>	<u>Drawing Title</u>	<u>Issue Date</u>
E1	Electrical New Construction	22 October 2018
Fig 1 of 1	Existing Site Plan	22 October 2018
C01	Grading Plan	12 September 2018
C02	Grading Plan	12 September 2018

1.2 CHANGES TO THE PROJECT MANUAL

- .1 SECTION 01 22 10 – CONTRACT UNIT PRICES

- .1 **Delete** paragraphs 1.5.14 – Item: Subgrade preparation and paragraph 1.5.15 – Item: 19 mm minus – Type 1 Crushed Gravel, 300 mm depth.

- .2 SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

- .1 **Add** Items to Item 2.2.6 as follows:

2.2.6.3 In accordance with CSA A23.1, provide grid of saw-cuts in floor slabs spaced no more than 25 times the slab depth on center, and cut to depth of ¼ of the slab.

2.2.6.4 Apply water-based modified acrylic curing and sealing compound, to ASTM C309, Type 1, Class A and B. Apply product to manufacturer's directions.

- .3 APPENDIX – ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

- .1 **Append** attached EIA to Project Manual.

1.3 CHANGES TO DRAWINGS

- .1 DRAWING S6 – FOUNDATION SECTIONS

- .1 **Expand** top of slab/floor elevation to include Finished Floor Elevations (FFE) as indicated on Civil drawings:

.1 Sections 1/S6, 2/S6, and 7/S6: Top of slab elevation for Saddling Barn 100 000 (FFE = 1290.37).

.2 Sections 3/S6 and 4/S6: Top of floor elevation for the weather shelter 99 345 (FFE – 1289.70).

.3 Sections 5/S6 and 6/S6: Top of floor elevation for the bunk house and alpine cottage 100 155 (FFE – 1290.66).

.4 Sections 8/S6 and 9/S6: Top of floor elevation for the boarding barn 99 760 (FFE 1290.11).

- .2 DRAWING E1 – ELECTRICAL NEW CONSTRUCTION

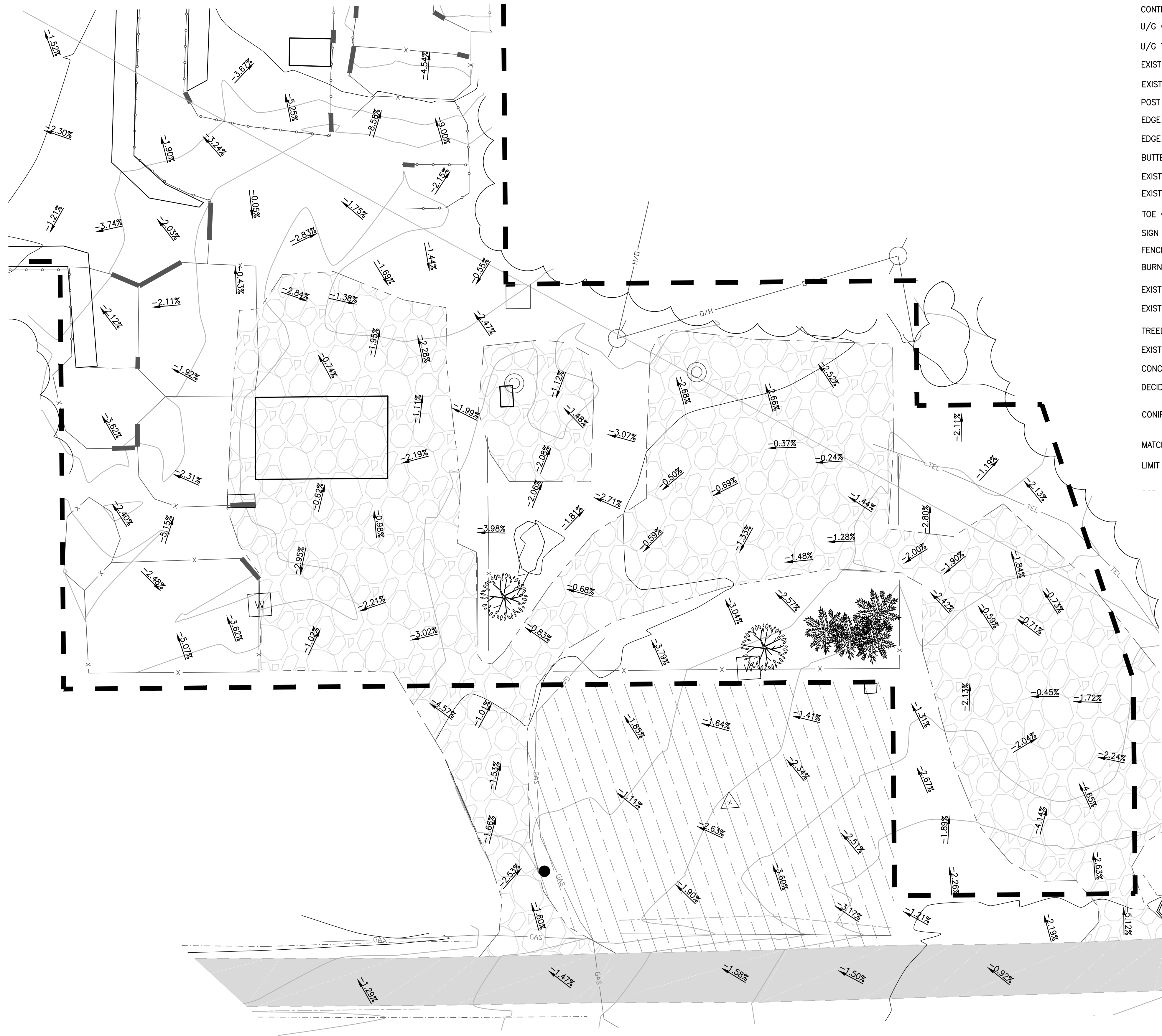
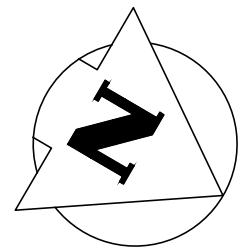
- .1 Refer to revised Drawing E1 as attached. Revisions are indicated in revision clouds.

- .3 EXISTING SITE PLAN

- .1 Refer to attached Figure for information.

- .4 DRAWING C01 – GRADING PLAN
 - .1 Refer to attached drawing for information.
- .5 DRAWING C02 – GRADING PLAN
 - .1 Refer to attached drawing for information.

END OF ADDENDUM NUMBER NO. 1



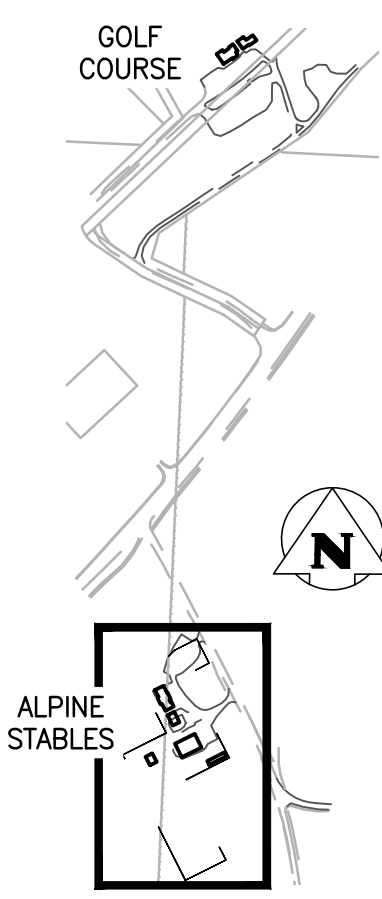
1
C04

EXISTING SITE PLAN –
ALPINE STABLES

SCALE: 1:500

- NOTES:**
1. GAS CONNECTION TO BE BROUGHT TO BUILDINGS BY CHIEF MOUNTAIN GAS AND COORDINATED WITH CONTRACTOR.
 2. EXISTING SITE SHOULD BE PROTECTED.
 3. EXISTING BUTTERFLY HABITAT IS NOT TO BE DISTURBED.
 4. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

- LEGEND**
- FIP
 - CONTROL POINT
 - U/G GAS LINE
 - U/G TELUS LINE
 - EXISTING WATER TAP
 - EXISTING WATER WELL
 - POST
 - EDGE OF EXISTING GRAVEL ROAD
 - EDGE OF EXISTING PAVED ROAD
 - BUTTERFLY HABITAT
 - EXISTING ROAD SHOULDER
 - EXISTING ROAD C/L
 - TOE OF EXISTING DITCH
 - SIGN
 - FENCE
 - BURNED FENCE
 - EXISTING GATE
 - EXISTING SEPTIC TANK
 - TREED AREA
 - EXISTING BUILDING
 - CONCRETE SIDEWALK
 - DECIDUOUS TREE
 - CONIFEROUS TREE
 - MATCH LINE
 - LIMIT OF DISTURBANCE



KEY PLAN

SCALE: 1:7500



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KGS GROUP CONSULTING ENGINEERS

Proj #: 18-0109-009

Client

PWGSC/TPSGC

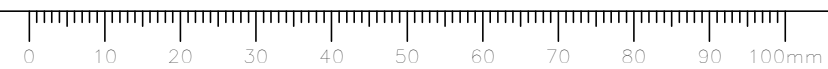
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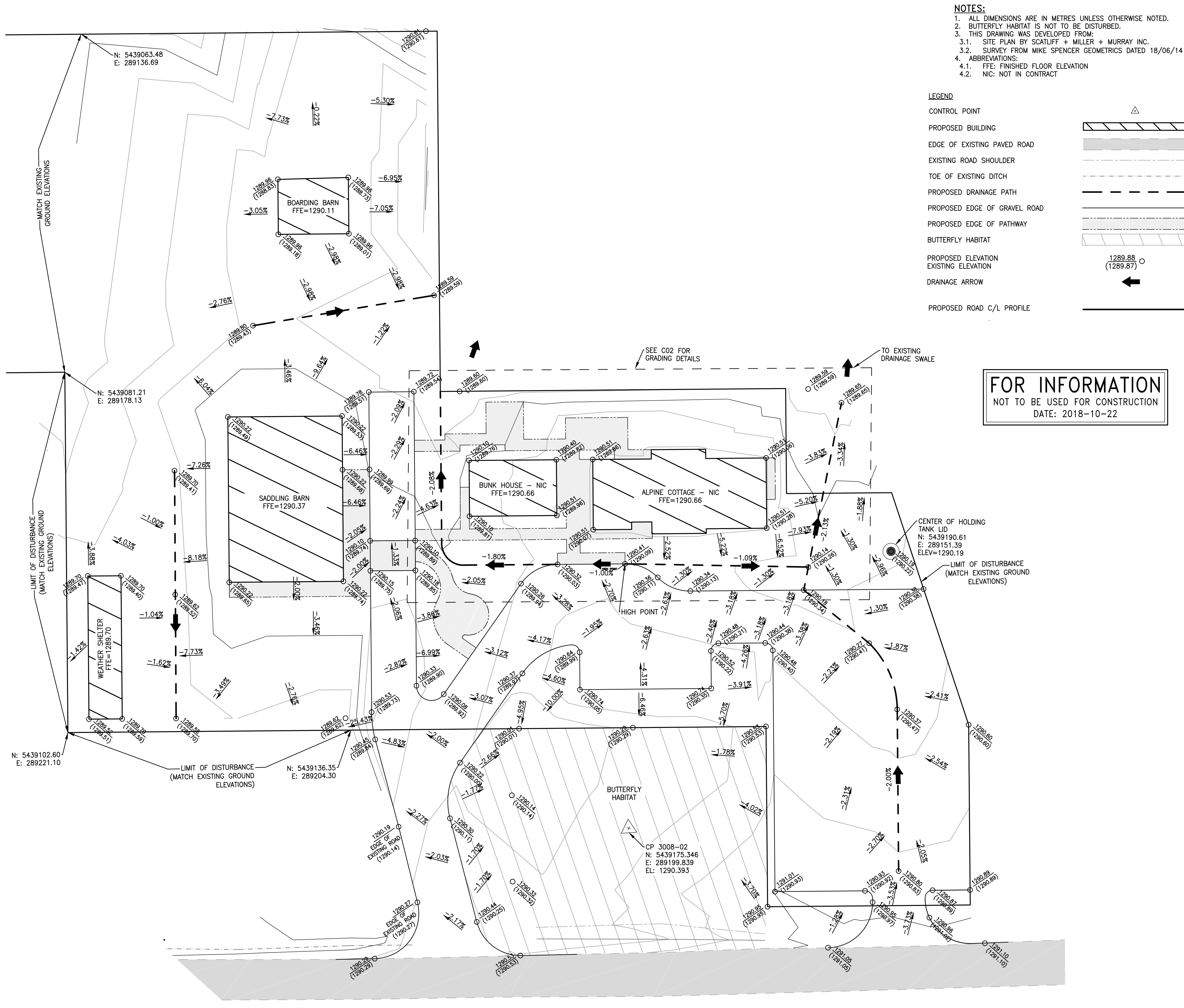
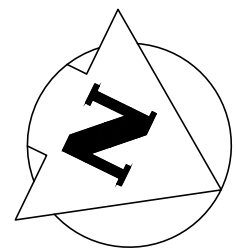
Project title

SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTAWLNP ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGEDesigned by
RKFDrawn by
KNSApproved by
RMPWGSC Project Manager
MICHAEL LYZANIWSKI

Drawing title

EXISTING SITE PLAN






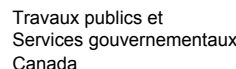
- NOTES:**
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
 2. BUTTERFLY HABITAT IS NOT TO BE DISTURBED.
 3. THIS DRAWING WAS DEVELOPED FROM:
 - 3.1. SITE PLAN BY SCATLIFF + MILLER + MURRAY INC.
 - 3.2. SURVEY FROM MIKE SPENCER GEOMETRICS DATED 18/06/14
 4. ABBREVIATIONS:
 - 4.1. FFE: FINISHED FLOOR ELEVATION
 - 4.2. NIC: NOT IN CONTRACT

- LEGEND**
- CONTROL POINT
 - PROPOSED BUILDING
 - EDGE OF EXISTING PAVED ROAD
 - EXISTING ROAD SHOULDER
 - TOE OF EXISTING DITCH
 - PROPOSED DRAINAGE PATH
 - PROPOSED EDGE OF GRAVEL ROAD
 - PROPOSED EDGE OF PATHWAY
 - BUTTERFLY HABITAT
 - PROPOSED ELEVATION
 - EXISTING ELEVATION
 - DRAINAGE ARROW
 - PROPOSED ROAD C/L PROFILE

FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION
DATE: 2018-10-22




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Proj #: 18-0109-009
Package #2

Revision	Description	Date
2	Issued for Construction	2018 09 12
1	99% Construction Documents Submission	2018 08 21
0	60% Construction Documents Submission	2018 07 26

Client

PWGSC/TPSGC

ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

Project title

**SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA**

**WLNP ALPINE STABLES RECONSTRUCTION
SADDLING BARN, BOARDING BARN,
WEATHER SHELTER AND LANDSCAPE**

Designed by
AH

Drawn by
KNS

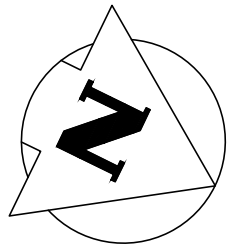
Approved by
RM

PWGSC Project Manager
MICHAEL LYZANIWSKI

Drawing title

GRADING PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C01 OF 3	0



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LEGEND

CONTROL POINT

PROPOSED BUILDING

EDGE OF EXISTING PAVED ROAD

EXISTING ROAD SHOULDER

TOE OF EXISTING DITCH

PROPOSED DRAINAGE PATH

PROPOSED EDGE OF GRAVEL ROAD

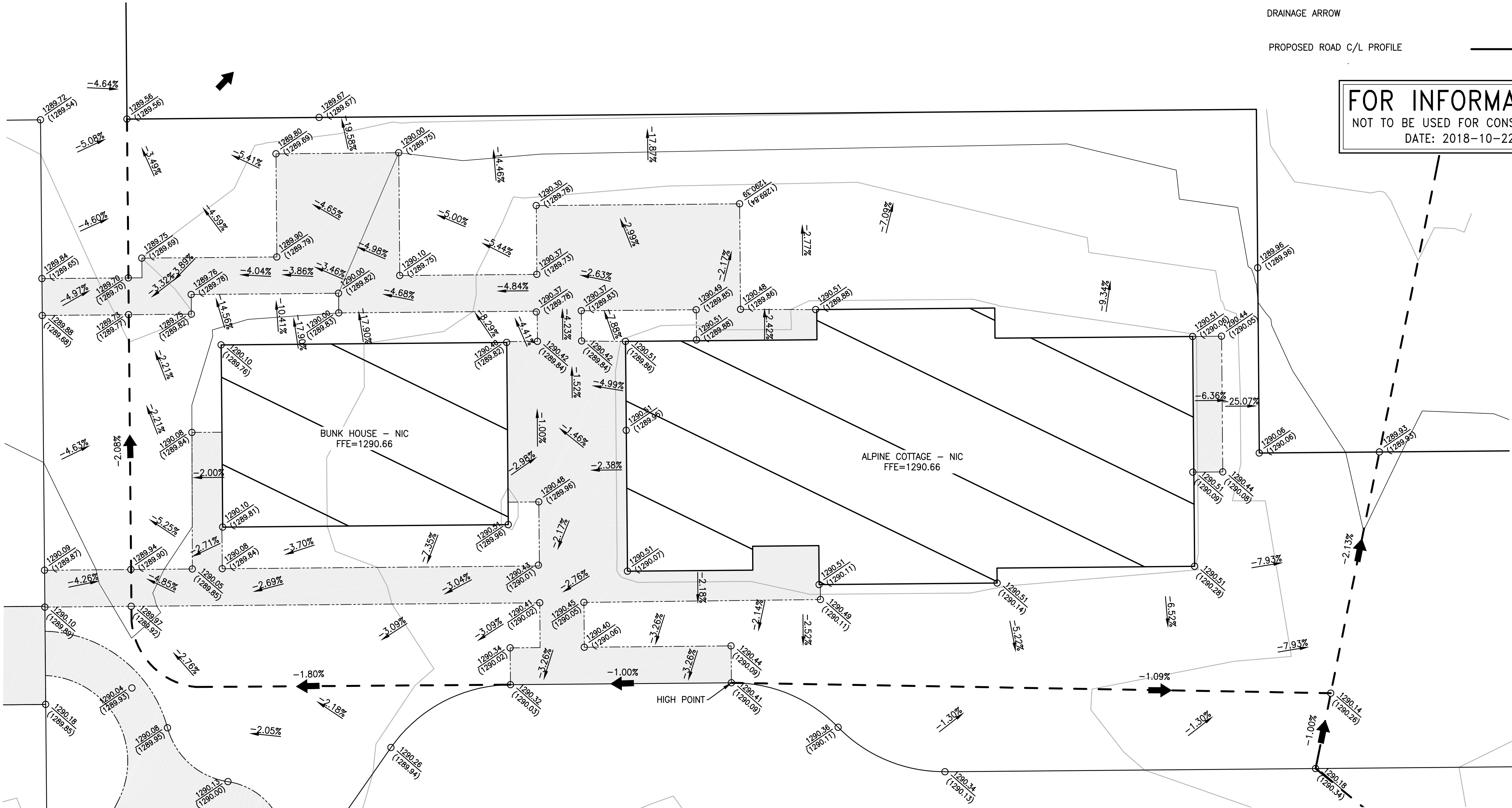
PROPOSED EDGE OF PATHWAY

BUTTERFLY HABITAT

PROPOSED ELEVATION
EXISTING ELEVATION

DRAINAGE ARROW

PROPOSED ROAD C/L PROFILE



FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION
DATE: 2018-10-22

1 GRADING PLAN
C02 SCALE: 1:100

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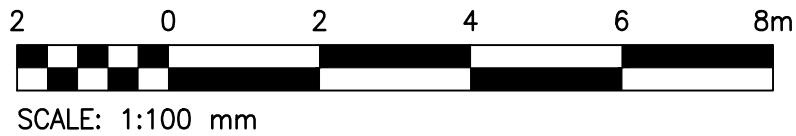
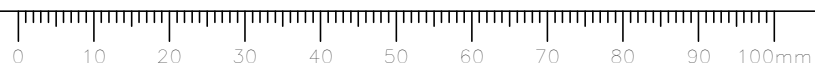
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SADDLING BARN, BOARDING BARN,
WEATHER SHELTER AND LANDSCAPE

Designed by
AH
Drawn by
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Approved by
RM
PWGSC Project Manager
MICHAEL LYZANIWSKI
Drawing title
GRADING PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C02 OF 3	0





Parks Canada EIA Requirement Checklist

This template documents the initial analysis of the requirement for an EIA and is designed to be used with the EIA decision framework and a completed project description. Additional information (such as correspondence with local Parks Canada or other experts) can be appended as required. If you have any questions, please contact Jennifer.Carpenter@pc.gc.ca

Project Title: Alpine Stables Reconstruction

Project Location: Waterton Lakes National Park

Project File #: WLNP-2017-052

Proponent Contact Information: Don Sears

Date of Request: 2018-09-05

Section A: No EIA Required

The project is exempted from EIA requirements under CEAA 2012 S. 70: (check the appropriate box)

- ☐ the project relates to matters of national security;
- ☐ the project is being carried out in response to a national emergency for which special temporary measures are being taken under the Emergencies Act; or
- ☐ the project is to be carried out in response to an emergency, and in the interest of preventing damage to property or the environment or in the interest of public health or safety.

The project is exempted from EIA requirements as the same project was previously assessed: (both boxes must be checked to apply this option)

- ☐ the previous EIA is adequate
- ☐ there is no change in information that would alter the results of the analysis.

The project is exempted from EIA requirements because an initial analysis has determined:

- ☐ there is NO potential for adverse effects to natural and cultural resources, including:
 - natural resources targeted in management objectives and ecological integrity monitoring indicators; listed species at risk, their residence or critical habitat. Additionally, the activity is not prohibited in a protection order under the Species at Risk Act.
 - cultural resources targeted in management objectives and identified in a Parks Canada cultural resource management document, or any structure, site or thing of historical, archaeological, paleontological or architectural significance.

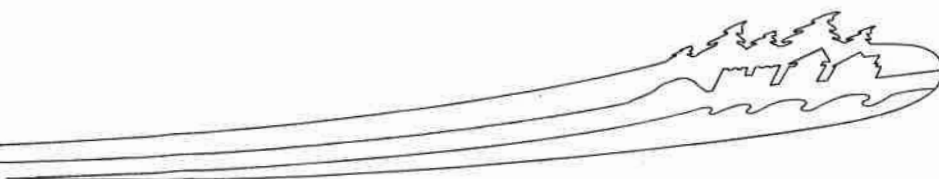
OR

- ☐ potential adverse effects of the project are exclusive to cultural resources (including potential archaeological resources), and the Cultural Resource Impact Analysis (CRIA) will be used to assess impacts and determine appropriate mitigation measures.

Provide a concise explanation to justify the decision.

Click here to enter text.

If you have exempted the project from an EIA requirement by selecting one of the three options above, **Proceed to Section D.**





Section B: EIA Pathway Decision

The EIA pathway to be applied to the proposed project is:

- ☐ an approved alternate process (must be approved by VP PAEC)
- ☒ one or more approved Best Management Practices (BMPs)
- ☐ a Basic Impact Analysis (indicate if one or more BMPs are also being used)
- ☐ a Detailed Impact Analysis (indicate if one or more BMPs are also being used)

Insert the name of the approved alternate process and/or applicable BMPs and Continue to Section C.

Click here to enter text.

Section C: Permitting Requirements

Indicate the types of permits that may be required:

- ☒ Development/Building ☒ Lease/License of Occupation ☐ Water Withdrawal ☒ Business License
- ☐ Add others as required (Fisheries Act, Navigation Protection Act, SARA authorization, etc.)

Section D: Cultural Resource Requirements

Indicate the types of Cultural Resource Impact Assessment that may be required:

- ☐ A separate request for Cultural Resource Impact Assessment must be submitted.
- ☐ No additional assessment is required. The accidental finds mitigation applies to all project activities.
- ☐ Cultural Resources (including archaeology) will be included as a Valued Component of the BIA or DIA.
- ☐ Archaeological Overview or Impact Assessment is required.
- ☒ Additional mitigations related to Cultural Resources are indicated in section F below.

Section E: Recommendation and Approval

Prepared by (IAO name/position): Eri Hiraga, Environmental Assessment Officer

Date:

Sept. 7, 2018

Reviewed by: Edwin Knox, Cultural Resources Management Officer

Date:

Sept 11/18

Reviewed by: Dennis Madsen, Resource Conservation Manager

Date:

Sept 11/18

Recommended by (Project Manager name/position): Don Sears

Date:

Sept 11/18

Approved by (name of FUS, Director of a Waterway, or delegate):

Date:

Ilan Thomas

Sept 12, 2018

Signature (FUS, Director of a Waterway, or delegate):

(Note that EIA decisions regarding highway and waterway projects identified in Parks Canada's Investment Program may require joint approval with Associate VP, Asset Management and Project Delivery; however, the FUS/Dir. of a Waterway is responsible for issuing permits and authorizations for those projects).

**Section F: Additional Comments**

The scope of this project includes:

- General construction of building foundations, underground civil work, and associated mechanical and electrical work, located at the Alpine Stables site in Waterton Lakes National Park.
- Work includes the installation of a Waterline connecting the Alpine Stables to the line feeding the Waterton Lakes Golf Course.

At the time of Assessment, the building and landscaping design has not yet been completed. An amendment will be submitted for this project once these designs are finalized and have been reviewed by the Impact Assessment Officer. The components include:

- Alpine Cottage and bunkhouse will be built off-site and moved on to foundations.
- Saddling barn, boarding barn, and site work including weather shelter, fences and corrals, landscaping, and parking lot.

Adherence to mitigation measures outlined in the attached BMP is a condition of project approvals.

Archaeological Review:

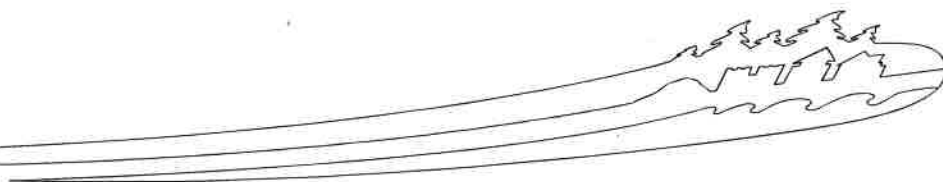
The original Archaeological Overview Assessment completed for the Alpine Stables Waterline Project was based on a scope of work that included directional drilling the majority of the line with minimal excavation (Langemann 2016). The new scope which included the installation of the waterline via trenching was reviewed in 2018 and no additional mitigation measures were recommended.

Notify Parks Canada Archaeologist of the scheduling for excavation activities, including the waterline trenching to facilitate archaeological monitoring of the site during excavation activities. Chance finds clause applies.

Further archaeological review may be required if the route or footprint changes and/or disturbance extends outside of previously disturbed areas.

Section G: Attachments

- Project Description
- Project Design Drawings (Foundations Package)
- WLNP General Projects Best Management Practices
- Archaeological Overview for Waterline and Alpine Stables





Use this template to prepare a comprehensive description of a proposed project. Provide clear concise information as it will help determine the need for an environmental impact analysis (EIA). A well prepared project description will help move the project proposal forward efficiently. The level of detail should match the complexity of the proposed project and its potential to generate impacts of concern. Please include available designs and site photos.

If you have questions or need help contact the Impact Assessment Officer at the site where you are proposing work.

Project Title: Alpine Stables Reconstruction

Project Contacts:

Don Sears

Date of Request: 2018-09-04 **Proposed Project Start:** 2018-11-01

PROJECT DESCRIPTION *(to be completed by proponent)*

Project objective: *Provide a brief description of the project elements & related activities or developments needed to support the project (e.g. construction of a yurt, vegetation clearing, new outhouses, trenching for utilities).*

Rebuild Alpine Stables lost during the Kenow WildFire.

Project rationale (optional):

Support visitor experience objectives.

Project location: *describe site location & size, include locations of any off-site requirements (e.g. for staging materials, excavating a borrow pit, etc.)*

Primary Location: Alpine Stables

Footprint size: Refer to WLNP Alpine Stables Reconstruction Foundations Package

Off-site Location(s): n/a

Footprint size: n/a

Project phases and activities: *i.e. "how the project will be completed" – through the site preparation, construction, operation and decommissioning phases. The [Project Phases & Activities Table](#) on the next page can help organize the information. Include:*

1. *Site preparation/access activities :* **replacement of existing utilities, replacement of existing foundations, and gravel roads and parking areas**
2. *Dimensions of structures, size of excavation, area of disturbance, fill requirements*
Replacement of previously existing buildings with buildings of almost the identical size (refer to drawings and specifications)
3. *Construction activities, methods, materials, equipment to be used*





Foundations to be built on site, saddling barn to be built on site, cottage, and bunkhouse to be built offsite and transported to site for placement on foundation. Normal foundation, and 'stick build' construction equipment will be used. Refer to drawing and specifications for construction methods and materials used.

4. *Associated project work (e.g., paving, vegetation removal, excavation, etc.)*

Refer to drawing and specifications

5. *Changes to utilities, capacity or demand, new lines (i.e. water, electric, natural gas, wastewater)*

Refer to drawing and specifications. New waterline will be added.

6. *Toxic or hazardous materials (e.g. cast in place concrete, chemicals, fuels, paints, solvents, explosives)*

Refer to drawing and specifications. Cast in place concrete foundations will replace the previously existing cast in place foundations.

7. *Operational requirements: (materials, maintenance procedures, monitoring, waste & wastewater management requirements)*

The replacement facilities will continue with the same operational procedures that were in place for the previously existing facilities (e.g. horse operations, building and yard maintenance, waste and wastewater management)

8. *Site modifications, structure removals, site reclamation activities*

Refer to drawing and specifications. There is no modification to the previously existing site.

9. *Plans & drawings attached. yes*

Project Environment

Other facilities that may be affected: n/a

Site history (previous use, contamination, buried tanks, lines, cables): The Staff Residence, Horse Barn, Livery Barn and Bunk House were all lost in the Kenow Fire. The sites have been remediated following the fire.

Known cultural resources (e.g. buildings, engineering works, landscapes and landscape features, historical and archaeological objects): Refer to Archaeological Overview Assessment.

Distance to nearest water body, water crossings, shoreline work: approximately 500 m east of Driftwood beach.

Fish & fish habitat: n/a

Species at risk, critical habitat, and residence of individuals (if any): within critical habitat polygon of half-moon hairstreak. No attributes of critical habitat will be impacted provided that the construction footprint remains within the existing disturbance.

Other species & habitat: n/a

Site photos or map attached: WLNP Alpine Stables Reconstruction Foundations Package attached.

Red flags/ issues: n/a

Project timing: details on proposed project schedule (Terms of Reference, contract package, construction phases & scheduling, in-service targets, reclamation activities).

In-service target, post-construction activities May to June 2019

Additional details (as required):

Potential for project to affect use of lands or resources by aboriginal persons (as relevant): N/A

Other jurisdictions or departments involved in project development, review & approval (as relevant): N/A



Project Description Template



Project Phases and Activities Table				
Use this table to help identify phases of your project and associated activities.				
Phases	Examples of Associated Activities	Y / N	Details	
Project Components	Construction / Site Preparation	Supply and storage of materials	Y	
		Burning	N	
		Clearing	Y	
		Demolition	Y	
		Disposal of waste	Y	
		Blasting/ Drilling	Y	Directional drilling of utility lines
		Dredging	N	
		Drainage	N	
		Excavation	Y	Foundation, utilities
		Grading	Y	
		Backfilling	Y	
		Use of machinery	Y	
		Transport of materials/ equipment	Y	
		Building of fire breaks	N	
		Use of Chemicals	N	
		Set up of temporary facilities	N	
		Other...		
	Operation/Implementation Decommissioning	Waste disposal	Y	
		Wastewater disposal	Y	Disposal of septic tank
		Maintenance	Y	
		Use	Y	
		Use/Removal of temporary facilities	Y	Removal of temporary structures on site
		Use of Chemicals	N	
		Active fire stage	N	
		Clean-up of prescribed burn	N	
		Planting	Y	Landscaping – requires ongoing maintenance
Culling		N		
Vehicle Traffic		Y		
Other...				





Parks
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Parcs
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Parks Canada Waterton Lakes National Park General Project Best Management Practices

May 2017

Version 2.0

Canada





Parks Canada Waterton Lakes National Park General Project Best Management Practices

Recommendation & Approval – Version 2.0

Compiled and authored by: Eri Hiraga Environmental Assessment Officer, Waterton Lakes National Park, Parks Canada Agency	Date:
Recommended by: Jennifer Carpenter Environmental Assessment Coordinator, Waterton Lakes National Park, Parks Canada Agency	Date:
Recommended by: Dennis Madsen Resource Conservation Manager, Waterton Lakes National Park, Parks Canada Agency	
Approved by: <ORIGINAL SIGNED> Ifan Thomas, Superintendent, Waterton Lakes National Park / Bar U Ranch National Historic Site, Parks Canada Agency	Date:





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<i>Project Inspector</i>	<i>3</i>
<i>Project Leader</i>	<i>3</i>
<i>Impact Assessment Officer (IAO).....</i>	<i>3</i>
<i>Surveillance Officer (SO)</i>	<i>4</i>
<i>Consultants.....</i>	<i>4</i>
<i>Environmental Consultants</i>	<i>4</i>
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Definitions

Sensitive Features are any areas designated by the IAO or through the EIA process as locations that require additional care and consideration for project activities. Sensitive features are defined in the supplemental mitigations section. Examples of sensitive features include but are not limited to nests, dens and roosts, locations of cultural resources, critical habitat or residences for SAR, riparian areas, fescue grasslands, wildlife corridors, rare ecotypes, areas of management concern, etc.

Abbreviations

AIA	Archaeological Impact Assessment
AOA	Archaeological Overview Assessment
BIA	Basic Impact Analysis
BMP	Best Management Practices
CABIN	Canadian Aquatic Biomonitoring Network
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRZ	Critical Root Zone
DBH	Diameter at Breast Height
DFO	Department of Fisheries and Oceans
DIA	Detailed Impact Analysis
EAS	Environmental Alignment Sheets
EI	Ecological Integrity
EIA	Environmental Impact Analysis
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
GBSA	Grizzly Bear Secure Areas
HDD	Horizontal Directional Drill
IAO	Impact Assessment Officer
IDA	International Dark-Sky Association
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
PCA	Parks Canada Agency
PM	Project Manager / Functional Manager of Project
RAP	Restricted Activity Permit
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SO	Surveillance Officer
TPZ	Tree Protection Zone
UNESCO	United Nations Educational, Scientific and Cultural Organization
UV	Ultra-violet
VC	Valued Component
WLNP	Waterton Lakes National Park





Introduction

The *Waterton Lakes National Park General Project Best Management Practices* will allow an identified suite of project activities to be undertaken in such a manner that there will not be resulting significant adverse environmental effects.

The Best Management Practice (BMP) pathway is applied when there is a suite of routine, repetitive projects or activities, with well understood and predictable effects. This fulfils Parks Canada's obligations under the *Canadian Environmental Assessment Act 2012* as a manager of federal land, see the [Guide to the Parks Canada EIA Process](#). The BMP maximizes efficiency through creation of a pre-approved impact assessment for the defined suite of projects, to which standard mitigation and environmental management measures can be applied.

The *Waterton Lakes General Project Best Management Practices* can be applied in the following ways:

- Direct application: Use as is when the proposed project falls within the scope of the BMP(s) and its application will ensure there are no significant residual adverse effects.
- Application along with supplemental mitigations: Additional mitigations or slight modifications are required to ensure all potential impacts are mitigated and to provide project-specific clarifications (e.g., critical timing windows, contact information, SAR or cultural resources considerations). Supplemental mitigations are outlined in the supplemental mitigations section or by filling in check boxes in the appropriate sections of the BMP.
- Application as part of a Basic Impact Analysis (BIA) or Detailed Impact Analysis (DIA): where one or more BMPs may not address all the potential adverse effects of a proposed project, Field Units can apply the BMP(s) as part of a BIA or DIA.

The impact assessment officer (IAO) will review a proposed project and advise the functional manager of the project if and how this BMP should be applied. The IAO's advice will be based on whether the project falls within the scope of the BMP, and whether application of the mitigation measures in the BMP will adequately address potential adverse effects of the project. The IAO will also be responsible for adding any required supplemental mitigations to ensure site specific considerations are addressed.

Project Managers are responsible for ensuring all mitigation measures applicable to the project are added to the terms and conditions of any permits or contracts issued for the project.

The IAO must ensure the project, IA pathway applied and determination are recorded in the Parks Canada National Impact Assessment [Tracking System](#).

Project Managers are responsible to ensure all mitigation measures applicable to the project are added to the terms and conditions of any permits or contracts issued for the project.

These BMPs have been compiled from a number of available documents, as listed at the end of this document, and have been adapted to address the predictable effects of routine, repetitive project or activities within the Waterton Lakes Field Unit.



Scope of Application

This BMP outlines the impact analysis of repetitive and routine projects¹. Site security, worker safety and visitor safety are not included in the scope of this document. If a project involves some or all of below activities, and the initial assessment of site and project indicate “the project is unlikely to result in significant adverse environmental effects” the BMP can be applied.

Projects that this BMP would likely be applied to include:

- The proposed maintenance, repair or upgrade of an **existing** development.
- **New** projects with restricted footprints that do not include sensitive habitats.
- Proposed restoration of **new** and **existing** developments.

For projects where further EIA is warranted, this BMP may be utilized as part of the mitigation package for the analysis. Therefore, this document also presents a minimum standard to provide consultants and contractors for environmental protection measures on work sites. In these cases, additional protection measures and mitigations may be required.

Exceptions

Supplemental analysis and/or mitigations are required for the following project activities:

- New projects or developments in natural areas;
- Projects adjacent to sensitive features;
- Work that may impact aquatic or terrestrial wildlife habitat connectivity, such as new fences or culverts;
- Physical works immediately adjacent to the international boundary;
- Elongation of culverts; realigning water courses; dredging; or work below the high water mark of a fish bearing water body;
- Bridge projects needing work to occur below the High-Water Mark², with permanent alteration to the water course, such as replacement of piers/abutments or permanent installation of structures on the bed of a water body;
- Greater than 5% increase in land use footprint (e.g. project expansion); and,
- Work which might adversely impact any potential or established Aboriginal and Treaty rights or traditional use³.

¹ For repetitive and routine projects on roadways, highways and parkways, refer to the Parks Canada National Best Management Practices - Roadway, Highway, Parkway and Related Infrastructure.

² High-water Mark is the usual or average level to which a body of water rises at its highest point and remains for a sufficient time so as to leave a mark on the land. (Fisheries and Oceans, 2015).

³ Parks Canada must engage in additional and separate consultations with Aboriginal groups if there is a possibility of a project adversely affecting established or potential Aboriginal or Treaty rights. This is required to fulfil federal government responsibilities in upholding the honour of the crown. If there is uncertainty regarding the need for Aboriginal consultation with respect to a project, refer the matter to Parks Canada Legal Services for advice. Guidance on consultation may be sought from the **Aboriginal Affairs Secretariat** and from the guidance document “**A Handbook for Parks Canada Employees on Consultation with Aboriginal Peoples**”.



If the project has the potential to have an adverse effect on the critical habitat of a species at risk (with endangered, threatened, or extirpated status) the project will require a separate environmental impact analysis.

If the project has the potential for residual adverse effects on a listed species at risk (including effects to individuals and residence of the individuals) the project will require a separate environmental impact analysis.

Note: If there is any uncertainty regarding potential adverse effects to species at risk, consult a member of the **National Office Species Conservation team**.

Approved Geographic Area of Application

This BMP is intended for use on projects completed in Waterton Lakes National Park (WLNP).

Roles and Responsibilities during Construction

The following is a select list of key roles that will be in place during the construction program⁴. The responsibilities of the key roles are not limited to those that are stated below, as this is a select list of roles most relevant to compliance with environmental commitments and regulations for projects where the proponent is the Parks Canada Agency (PCA).

Project Manager (PM)

The Project Manager is accountable to deliver the project and is responsible for managing risk, scope, time and budget. The Project manager is the Technical Authority and is the contractor's unique point of contact. The Project manager reviews and develops contract change order and supporting documents and conducts pre-construction meetings and chairs project team meetings. Note that where the proponent of a project is external to Parks Canada, a functional manager of the project within the Agency is designated.

Project Inspector

The Project Inspector reviews plans for compliance to building codes and development guidelines. The Project Inspector performs inspections on behalf of the Project manager and monitors contract compliance in consultation with procurement office. The Project Inspector is responsible for keeping daily logs.

Project Leader

The Project Leader is accountable for the overall success of the project. The Project Leader recommends approval to proceed to the construction phase and approves changes in scope, budget or schedule in consultation with Procurement Officer.

Impact Assessment Officer (IAO)

The Impact Assessment Officer is responsible for drafting and/or reviewing the EIA and ensuring that the scope of work of the environmental analysis complies with Parks Canada's responsibilities under the *Canadian Environmental Assessment Act 2012* as well as all other

⁴ The list of roles and key responsibilities have been modified from the PCA document *Construction Site Roles and Responsibilities*.



relevant regulations and guidelines. The IAO may also function as the SO for project construction.

Surveillance Officer (SO)

The Surveillance Officer is responsible for on-site surveillance of the work in accordance with the Parks Canada EIA and environmental regulations and guidelines. The SO will provide direction regarding environmental assessment / environmental infractions or emergencies through the Project Manager unless necessary. As the Parks Canada representative for environmental concerns, the SO may consult with relevant specialists to determine appropriate implementation for mitigation measures. The SO has the authority to stop work for National Parks Act violations, however, during normal operations does not give direction to the Contractor.

Consultants

Consultants recommend contract amendments, reviews and approves shop drawings and provides advice on project compliance. Consultants perform inspections on behalf of the Project Manager.

Environmental Consultants

Under the direction of the IAO, environmental consultants are responsible for producing deliverables as required for the Project, including, but not limited to: Environmental Impact Assessment, site-specific mitigation strategies, Environmental Alignment Sheets (EAS), Environmental Management Plan.

Prime Contractor

The Prime Contractor is responsible for developing a site-specific Occupational Safety and Health Management Plan. The Prime Contractor is responsible for guarding the health and safety of those working on and visiting the site through implementing occupational safety and health induction training. The Prime contractor also obtains materials and labour necessary to successfully complete the project. The Prime contractor will engage and plan the work of sub-contractors and acquire all necessary licenses and permits, provide any required EIA construction planning documents for review (see Submissions Section) and record minutes of site meetings.

Banff Dispatch 1-888-WARDENS

911 provides 24-hour emergency dispatch services and will connect callers with emergency or other Parks Canada services as required (e.g., Warden/Law Enforcement Services, Duty Officers). Banff dispatch at 1-888-WARDENS can be used for 24 hour notification to Parks Canada in non-emergency situations. When calling, if unsure what services you require, request a Waterton Duty Officer.

Environmental Overview

Environmental Setting

Waterton Lakes National Park (WLNP) occupies approximately 505 km² in the southwest corner of Alberta in the southern Rocky Mountains. WLNP forms part of the Waterton-Glacier International Peace Park, and is a designated UNESCO World Heritage Site due to its significant ecological, scenic and cultural values. The park is rich in biodiversity, which includes 1001



vascular plant species, 23 fish species, 6 amphibian species, 4 reptile species, 62 mammal species and over 250 bird species.

As part of the Crown of the Continent ecosystem, WLNP makes up part of a north-south wildlife corridor including migratory bird and bat flight pathways (Lausen 2012). Five ecoregions - foothills parkland, montane, lower subalpine, upper subalpine and alpine - are represented within WLNP boundaries.

Ecological Integrity

Ecological Integrity (EI) is defined in the Canada National Parks Act as “a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes”.

The indicators used to assess EI in WLNP include: Forest, Freshwater, and Grasslands. Measures of these indicators are summarized and include: Terrestrial Birds, 5-Needled Pine – Health Transects, Area Forest Area Disturbed by Fire, Sensitive Species Secure Habitat, Multi-species Mammal Occupancy, Stream Biotic Health (CABIN), Lake Fish Index, Water Quality, Amphibian Occupancy, Stream Fish Community Index, Grassland Birds, Non-Native and Native Plants, Grassland Extent, Elk, and Grassland Area Disturbed by Fire.

Species at Risk

WLNP is host to a number of species that are Endangered, Threatened and Special Concern under Schedule 1 of the *Species at Risk Act* (SARA). Species listed as Endangered, Threatened and Special concern under COSEWIC, as well as the Alberta *Wildlife Act* are also considered in managing species at risk within WLNP. A list of species at risk and defined and proposed critical habitat within WLNP is found in the appendices.

Components of the environment that may be affected

Potential effects from projects occurring within WLNP are well understood and predictable. They include:

Water Resources:

- Adverse modifications to surface drainage patterns
- Reduced water quality due to increased erosion, sedimentation, transportation of debris and contamination (i.e. from leaks and accidental spills, etc.)
- Physical alteration of aquatic habitat

Soil/Land Resources:

- Change in slopes, landforms and landscape
- Soil compaction and rutting
- Slope instability due to increased soil exposure and improper excavation and storage
- Soil contamination

Air quality:

- Decreased ambient air quality (i.e. from dust, equipment emissions, etc.)
- Increased ambient noise levels
- Temporary increased levels of CO₂ and other pollutants
- Temporary increased localized temperatures from paving and equipment operation



Vegetation:

- Damage to and/or removal of vegetation in immediate or adjacent areas
- Introduction of non-native species populations, or expansion of existing populations

Wildlife:

- Introduction of non-native species populations, or expansion of existing populations
- Wildlife sensory disturbance causing displacement/preferred habitat avoidance
- Wildlife habituation/attraction to artificial food sources
- Impeded/altered wildlife movement
- Damage to nests/disruption of nesting animals
- Mortality from project activities
- Damage to the quality of nesting / spawning / roosting habitats

Cultural Resources:

- Adverse effects on the heritage value or character-defining elements of a cultural resource
- Impacts to archaeological resources (known or potential)

Visitor Experience / Safety

- Decreased quality of visitor experience due to temporary area closures, operation of equipment, sensory disturbance
- Potential impacts to visitor safety due to construction activities



Mitigation Measures

To use the document efficiently, keep the activity mitigation lists that apply to the project expanded and collapse the other activities by clicking on the section titles, print this as a pdf or paper document and include this section with the EIA determination record. This will reduce the overall size and scope of the mitigations to present to contractors and project managers. Supplementary mitigations specific to the project can be defined at the beginning of the mitigations section.

Choose all that apply to project. Each title is hyperlinked to the related section.

Modules

1. [SUPPLEMENTARY MITIGATIONS](#)
2. [ENVIRONMENTAL SURVEILLANCE](#)
3. [PROJECT PLANNING / DESIGN](#)
4. [SUBMISSIONS](#)
5. [EROSION AND SEDIMENT CONTROL PLAN](#)
6. [EMERGENCY RESPONSE PLAN MODULE](#)
7. [GENERAL ACTIVITIES MITIGATIONS MODULE](#)
8. [VEGETATION REMOVAL MITIGATIONS MODULE](#)
9. [SOIL HANDLING MITIGATIONS MODULE](#)
10. [SOIL AND VEGETATION RESTORATION MITIGATIONS MODULE](#)
11. [ASPHALT PRODUCTION AND HANDLING MITIGATIONS MODULE](#)
12. [CONCRETE HANDLING MITIGATIONS MODULE](#)
13. [PAVING, RESURFACING, GRADING MITIGATIONS MODULE](#)
14. [DRAINAGE STRUCTURES MITIGATIONS MODULE](#)
15. [WATER WITHDRAWAL AND DEWATERING MITIGATIONS MODULE](#)
16. [BUILDINGS & STRUCTURES](#)
17. [SERVICE LINE HDD](#)



Mitigation Package

Parks Canada Waterton Lakes National Park General Project Best Management Practices

Recommendation & Approval – Version 1.5

Modified for: WLNP-2017-052: Alpine Stables Reconstruction

Contact Information

Project Manager:

Sacha Osolo: 604-789-7991

Impact Assessment Office: 403-859-5185

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Parks Canada Emergency Dispatch:

Banff Dispatch: 403-762-1473

First Contact Authority (for SPILLS):

First Contact Authority: 780-422-4505

OR 1-800-222-6514

24-hour Emergency Dispatch*:

Police, Fire, Ambulance: 9-1-1

* In an Emergency, 9-1-1 operators can also notify Banff Dispatch.



1. Supplementary Mitigations

Include any supplemental, or site-specific mitigations

1. The Alpine Stables site is within the polygon of the Half-moon Hairstreak Critical Habitat (See map in Appendix). As there are no attributes of critical habitat at the Alpine Stables site, no further assessment is required (Sissons pers. comm.).
 - a. No equipment will be permitted to be off hardened surfaces (gravel) at the Alpine Stables site.
 - b. Use or entry of the grassland habitat east of the Alpine Stables road is a violation of the *Canada National Parks Act* and the *Species at Risk Act*. The maximum penalty under the *Canada National Parks Act* is \$300,000 for an individual, \$2 million for small corporations, and \$4 million for large corporations.
2. The fire has removed vegetative ground cover throughout the park. As such, the soils are particularly sensitive to erosion. Avoid travelling on burnt soils and work from hardened surfaces to the extent possible.
3. Notify Parks Canada Archaeologist of the scheduling for excavation activities, including the waterline trenching to facilitate archaeological monitoring of the site during excavation activities. Chance finds clause applies.



2. Environmental Surveillance

- 2.1. All projects are subject to environmental surveillance by the SO to ensure that mitigation measures as outlined through the EIA process are implemented during all phases of construction, including clearing, grading, construction, cleanup, and restoration.
- 2.2. The SO will report deficiencies to the PM and summarize site visit observations in a surveillance report. The surveillance report will be filed into a database to supplement information for restoration activities in the future.
- 2.3. The Prime Contractor is responsible for keeping the SO informed of project activities and will notify the SO prior to the following activities:
 - Vegetation clearing and soil stripping < 30 m from sensitive features;
 - Activities in and < 30 m from water;
 - Species at risk mitigation measures;
 - Rare plant mitigation measures; and
 - As otherwise outlined in the project EIA.

3. Project Planning / Design

Project planning and engineering design for new projects or upgrades to existing infrastructure will incorporate consideration of environmental impacts of long term operation and the potential for Conservation Gains through improved design.

Lighting / Dark Sky Compliance

- 3.1. The replacement or installation of new lighting must be dark sky compliant and follow the Parks Canada Guidelines and Specifications for Outdoor Lighting. Outdoor fixtures must be shielded, full cut off low intensity dark sky compliant lights. Interior lighting must be designed to reduce light trespass. The colour temperature of any new luminaires should be under 3000K, with amber LED or converted amber LED preferred.

Wildlife Collisions & Direct Mortality

Buildings and structures may include features that attract or result in direct mortality of wildlife. For example, reflective or transparent surfaces and lights left on after dark can attract or confuse resident and migratory birds leading to an increase in collisions.

- 3.2. Incorporate lights that shut-off automatically to promote energy efficiency and reduce night time bird collisions.
- 3.3. Minimize use of unnecessary reflective or transparent materials in building design.
- 3.4. For windows, complete risk assessment for collisions and consider technologies that effectively make windows visible to birds (e.g., UV visible coatings, closely spaced marker dots).
- 3.5. Appropriately screen chimney and ventilation shafts to avoid attracting cavity roosting birds or bats to risky locations.
- 3.6. Appropriately screen all water intakes to prevent amphibian and fish mortality.



Wildlife Habitat & Movements

- 3.7. Do not constrict wildlife movement corridors and wildlife trails with physical barriers or sensory disturbance (e.g., lighting, fences, generator noise, and increased human use).
- 3.8. In the Waterton community or areas with high visitation, do not create wildlife barriers where animals may become trapped or difficult for Wildlife Conflict Specialists to manage (e.g., fences, corners, spaces under decks).
- 3.9. Enclose all areas such as under porches, to prevent access by wildlife (e.g., prevent cougars from using these areas for hunting, caching and resting).
- 3.10. For gated/fenced areas, provide escape routes such as leaving 45 cm clearance under gates.
- 3.11. Improve landscape connectivity for terrestrial and aquatic wildlife:
 - Remove anthropogenic constrictions from wildlife movement corridors;
 - Increase the span length of bridges during replacements to allow for terrestrial wildlife passage underneath; and
 - Convert smaller culverts to larger culverts or clear span bridges to allow for better fish passage and less restricted flows (see [culvert section](#)).

Human Use

- 3.12. Incorporate human behaviour into design to minimize human use impacts on the surrounding lands. Some examples include:
 - Block social trails and provide clear wayfinding signage to encourage use of designated trails;
 - Formalize a single trail to remove multiple social/unwanted trails;
 - Prevent vehicle parking outside designated areas; and
 - Manage wildlife attractants and litter through garbage facilities.

Efficiency

- 3.13. Design includes materials and technologies that minimize environmental impacts through the lifecycle of the material.
- 3.14. Design incorporates energy efficiency, reduction of greenhouse gases and environmental design best management practices (e.g., LEED criteria).
- 3.15. Minimize water use and incorporate water meters in buildings over 1000 m².

Project Footprint & Siting

- 3.16. Avoid sensitive features and apply appropriate setbacks.
- 3.17. The Project Footprint and construction methods use existing disturbances and development footprints as much as possible in order to minimize project impacts on native vegetation.
- 3.18. Minimize visual impact of site layout, access routes and construction activities.
- 3.19. Locations are compatible with any zoning requirements (e.g., avalanche paths, wilderness zone).
- 3.20. Design minimizes the area and/or impact of disturbance.
- 3.21. Design and plan activities and works near watercourses and waterbodies to minimize disturbance to aquatic habitat and avoid sensitive spawning habitats.



- 3.22. Design and construct approaches to a watercourse perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- 3.23. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or the built structures.

Aquatic Habitat / Water Quality

- 3.24. Minimize runoff into water bodies; direct runoff and storm water into vegetated areas rather than directly into surface waters.
- 3.25. Avoid designs and construction practices that result in long, smooth, uniform slopes and may contribute to erosion or sediment transfer.
- 3.26. Apply appropriate standards for all septic field, pit privy, and other waste water management at facilities.
- 3.27. Projects < 100 m from sensitive aquatic features including wetlands, drainages, streams, lakes and other surface water requires additional EIA to determine appropriate setbacks, mitigations and other design considerations related to aquatic habitats.

Fire

- 3.28. Design considers location and materials appropriate for risk of fire, following FireSmart Canada guidelines where feasible to reduce risk of fire in the wildland-human interface.

Restoration Funding / Plan

- 3.29. Project planning and design minimize the disturbance to surrounding vegetation as much as is feasible.
- 3.30. Project planning incorporates opportunities to restore or use existing disturbed areas.
- 3.31. Project planning includes restoration of the site following construction. Short term revegetation must establish native vegetation cover to reduce potential for erosion, topsoil loss, and weed infiltration and spread. Long term restoration will establish native vegetation communities similar to existing communities prior to disturbance, or comparable to adjacent areas (see Restoration Section).
- 3.32. A Landscape Restoration Plan shall be developed prior to construction as part of a landscape drawing construction package. The Landscape Restoration Plan shall consider the following:
 - Site objective and intended use;
 - Site design and implementation to be detailed in the plan. The implementation may be executed in stages;
 - Amount and Type of human use within and movement through the site;
 - Site-specific soil, wind, vegetation and/or wildlife concerns;
 - Site hydrology, including flood potential and/or drainage concerns;
 - Identification of potential contamination issues and methods for resolution;
 - Erosion and sediment control requirements for locations near waterbodies or along slopes. Site to be monitored to determine requirements for short- or long-term measures; and
 - Maintenance and monitoring requirements.



Pre-Construction Surveys

- 3.33. Prior to the commencement of project activities, the IAO may determine that field surveys are required to determine the applicability of this BMP, requirements for additional impact analysis, identify sensitive features, and determine mitigations.
- 3.34. All ground disturbance activities must be compared to local archaeological resource inventories and the IAO will consult with the Terrestrial Archaeology section. An Archaeological Overview Assessment (AOA) may be required to determine the archaeological potential of the work area. Based on the results from the AOA, an Archaeological Impact Assessment (AIA) might be required.

Survey	Required	Details
Phase I Environmental Site Assessment	<input type="checkbox"/>	
Hazardous Materials Survey	<input type="checkbox"/>	
Reconnaissance Site Visit	<input type="checkbox"/>	
Rare Plant Survey	<input type="checkbox"/>	
Wetland Survey	<input type="checkbox"/>	
Wildlife Survey (list types)	<input type="checkbox"/>	
Fish Assessment	<input type="checkbox"/>	
Soils / Geotechnical	<input type="checkbox"/>	
Cultural Resources (list type)	<input type="checkbox"/>	
AOA / AIA	<input type="checkbox"/>	
Water/Air Quality	<input type="checkbox"/>	
Visitor Experience	<input type="checkbox"/>	
Weed Survey	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

4. Submissions

- 4.1. Check box of attachments / plans required prior to the start of construction.

Attachments / Plans	Required	Responsible Party	Reviewer and Submission Deadline
Environmental Alignment Sheets	<input type="checkbox"/>		
Erosion and Sediment Control Plan	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications
ERP (Emergency Response Plan)	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications
Spill Response Plan	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications
Fire Contingency Plan	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications
Avalanche Safety Plan	<input type="checkbox"/>		
Site-specific Mitigation Details	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications
Restoration Plan	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications
HDD or Geotechnical Drill Plan	<input checked="" type="checkbox"/>	Contractor	PCA IAO; As per specifications



5. Erosion and Sediment Control Plan

- 5.1. An Erosion and Sediment Control Plan (ESCP) will be prepared that covers all construction and restoration periods.
- 5.2. The requirements for an erosion and sediment control plan can be scaled to the scope and associated risks of the project, as determined by the IAO or SO.
- 5.3. The Erosion and Sediment Management Plan will be developed by a qualified professional and is subject to approval of the IAO.

Timing of Works

- 5.4. Schedule work to avoid extreme wet, windy and rainy periods that may increase erosion and sedimentation.
- 5.5. Avoid soil disturbing activities during periods with saturated soils, periods of runoff, high rainfall intensity, high winds, or wet snow. Temporarily stop work when wet ground conditions contribute to erosion and sediment transport.

General Mitigations

- 5.6. Erosion control measures that prevent sediment transport into any waterway, water body or wetland shall be implemented by the contractor.
- 5.7. Identify high risk areas or components of the project including areas with fine-grained soils, sandy deposits, slopes, shallow soils, or adjacent to sensitive features (e.g., riparian areas).
- 5.8. Identify sources of potential runoff (e.g., ditches, slopes) from within the construction site or from upslope areas. Construct and maintain structures to deflect sources of runoff from entering areas of exposed soils (e.g., diversion ditches, vegetative filter strips).
- 5.9. Acquire necessary erosion and sediment control equipment (i.e., landscaping fabric, sediment fences, coir rolls etc.) and install prior to risk of sediment transport.
- 5.10. Minimize slope lengths and angles, promote surface roughness on slopes, and avoid designs and construction practices that result in smooth, uniform slopes. Incorporate texture and organics into the cover of slopes to reduce soil erodibility.
- 5.11. Plan project activities to minimize soil handling.
- 5.12. Limit equipment movement over exposed soils.
- 5.13. Avoid activities that contribute to soil compaction and use practices that roughen and decompact soils to promote infiltration.
- 5.14. Ensure all activities are conducted at least 30 m from waterbodies wherever possible.
- 5.15. Minimize extent of vegetation cover removal and grubbing. Clearly mark construction boundaries to prevent accidental damage to vegetation.
- 5.16. Where vegetation cannot be retained, apply soil covers to erodible areas (granular materials, mulches, tackifier, tarps). Note that tarp covers may not be suitable at most locations in WLNP where high winds are common.
- 5.17. Minimize the length of time soils are exposed and complete work in one area before commencing work in another area.
- 5.18. If vegetation clearing is scheduled early due to timing windows, grubbing should be delayed until just prior to construction activities, in order to maintain soil stability.
- 5.19. Initiate replanting of disturbed areas immediately after construction is completed.



- 5.20. Ensure all erosion and sediment control devices are weed free. Straw and hay based erosion control is not permitted.
- 5.21. Avoid use of coconut matting due to ungulate hoof entrapment.
- 5.22. Maintain and repair all erosion and sediment control structures in a timely manner. If the design of the control measures is not functioning effectively they are to be repaired.
- 5.23. The site will be secured against erosion during any periods of construction inactivity or shutdown.
- 5.24. Install all erosion and sediment control devices according to Typical Drawings included in ESCP. Typical Drawings must be on site and available at the request of the SO.

Minimum Requirements

- 5.25. The minimum requirements of an erosion and sediment control plan include consideration of:
 - Project design and spatial concept of environmental sensitivities (e.g. watercourses, wetlands, steep slopes etc.);
 - Erosion prevention procedures (e.g., project schedule, minimization of work area, site management, ground cover measures);
 - Sediment control measures (e.g. sediment fences, check dams, sediment traps, etc.) including specifications and Typical Drawings of sediment control structures;
 - Detailed plans for instream works including site isolation measures and project timelines;
 - Water management plans including site control, equipment necessary and proposed dewatering locations;
 - Locations of erosion and sediment control measure application;
 - Monitoring of prevention and control measures and corrective actions (e.g., repairs).
 - Removal of non-biodegradable materials once site is stabilized.

6. Emergency Response Plan Module

- 6.1. The general emergency contact for WLNP is 9-1-1.

Spill Response Plan

- 6.2. The Prime Contractor is responsible for ensuring that a Spill Response Plan is developed prior to start of work and the plan is subject to approval of the IAO.
- 6.3. The Prime Contractor is responsible for ensuring that spill kits sufficient to contain and clean up 110% of the site's largest possible fuel / chemical spill must be retained on site at each location of potential spills (sites where equipment is working).
- 6.4. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on site receive a briefing about the Spill Response Plan and are aware of the location and use of spill kits and containment devices.

General Mitigations

- 6.5. Avoid work in high risk areas, particularly in areas of high water table, steep slopes or in close proximity to streams.



- 6.6. Have spill containment equipment on-hand and ensure that all personnel are aware of their location and trained in their use.
- 6.7. Absorbent booms must be immediately available on site during works in and near water.
- 6.8. Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels. See General Activities module for the requirements for equipment inspection by the SO prior to entry to WLNP.
- 6.9. The crossing of any waterbody (including wetlands) by construction equipment, or the use of such equipment within waterbodies is strictly prohibited unless prior approval has been confirmed from the SO.
- 6.10. Designate refuelling areas at least 100 m away from any water body. Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways (including storm sewers).
- 6.11. Hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- 6.12. Equipment will be fuelled on hardened surfaces wherever possible.
- 6.13. Spill kits shall be provided at re-fuelling, lubrication, and repair locations.
- 6.14. Dispose of contaminated materials at provincially certified disposal sites outside of WLNP. No treatment of contaminated soils (e.g., bioremediation) is allowed in WLNP. All applicable documentation demonstrating proper disposal will be provided to Parks Canada.
- 6.15. If potentially hazardous materials (e.g. cement-based products, sealants or paints) are used on site ensure raw material, mixed compounds and wash water are not released to any watercourse or soils. Secondary containment measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double-lined fuel tanks are required.
- 6.16. All gas generators and water pumps require secondary containment. Electric pumps are preferred.
- 6.17. Follow all applicable regulations and codes for the management and handling of hazardous waste.
- 6.18. The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Prime Contractor. The site will be inspected by the SO to ensure completion to the expected standard and to the satisfaction of Parks Canada.
- 6.19. Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- 6.20. The SO shall be notified immediately of any spill. In the event of a major spill, Banff Dispatch (403-762-1473) shall be notified immediately along with the First Contact Authority (1-800-222-6514).

A major spill is defined below:

Material	Immediate Notification Requirements	Written Spill Report Requirements
Any deleterious substance that enters a water body of any type (e.g., stream, lake, wetland, drainage, sewer)	Any Quantity, notify the SO and Banff Dispatch.	Required; Major Spill



or poses a threat to human safety (e.g., slippery road, explosive hazard, poisonous gas).		
Any substance that is hazardous or toxic to the environment including but not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, paint, solvents and hydrocarbons (e.g., fuel, grease, hydraulic fluid).	<100 L, immediately notify the SO. > 100 L, immediately notify the SO and Banff Dispatch.	At the discretion of the SO. Major Spill if not contained. Required; Major Spill

Minimum Requirements

6.21. The Spill Response Plan must at minimum, include the following information:

- List of products and materials that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, paint, solvents and hydrocarbons.
- required equipment on site and location of spill kits;
- spill prevention procedures (i.e., containment and storage of materials, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation);
- fuelling procedures, fuel storage;
- spill response (i.e., containment, clean-up, disposal of contaminated materials, etc.);
- spill reporting procedure; and
- up-to-date emergency response contact list including contact information for reporting spills.

Spill Reporting Requirements

6.22. Immediate spill reports are verbal notifications and must include all available information. Follow-up written spill reports must include the following:

- Prime Contractor Name
- Name and Contact Number
- Location and time the spill occurred
- Type and quantity of the substance spilled
- Cause of the spill
- Size of area the spill spread to
- Was the spill in water or on land
- Does the spill have potential to enter a water body
- Detail of immediate action taken to control the spill
- Additional actions required or ongoing to control the spill
- Any restoration required at the spill site
- Names of PCA representatives that were present at the spill site

Fire Contingency Plan

6.23. An emergency fire contingency plan is required for projects where risk of fire exists (e.g. for operations on dry grassland habitats) as requested by the IAO in consultation with the Fire Management Officer.

6.24. Fires or burning of waste materials is not permitted.



- 6.25. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on site receive a briefing about the Fire Contingency Plan and are aware of the location of emergency equipment, such as fire extinguishers.
- 6.26. Where an emergency fire contingency plan has been requested, the prime contractor should provide, at minimum the required equipment as defined in the Schedule of the *Alberta Forest and Prairie Protection (Ministerial) Regulation*.
- 6.27. The fire contingency plan must at minimum contain the following information:
 - required equipment on site;
 - fire prevention procedures;
 - initial response;
 - fire reporting procedure; and
 - up-to-date emergency response contact list.

Table 1 Adapted Alberta Forest and Prairie Fire Protection (Ministerial) Regulations AR 65/2017, Schedule

Required Equipment for Fire Control	People Employed at the Site of Operations									
	1	2	3	4	5	6-10	11-20	21-30	31-40	41+
Shovels	1	1	2	2	3	5	10	15	20	Same as 31-40 plus increase as required by SO in consultation with the Parks Canada Fire Management Officer.
Back pack with pump	1	1	1	2	3	5	10	15	20	
Axe or Pulaski	1	1	1	1	2	5	10	15	20	
Fire pump	0	0	0	0	0	0	0	1	1	
Fire hose (metres)	0	0	0	0	0	0	0	450 m	450 m	
Power saw	0	0	0	0	0	0	0	1	1	

7. General Activities Mitigations Module

Construction activities involve the use of laydown/staging areas, equipment operations, storage and handling of hazardous materials. Potential adverse effects include: alteration of vegetation, erosion and sedimentation, constriction for wildlife movements and introduction/spread of non-native vegetation.

- 7.1. All employees must attend an environmental briefing with a SO before beginning work at the site to review and explain the mitigations that are conditions of the project approvals. Employees must attend this briefing before beginning their work at this site.
- 7.2. All equipment and vehicles will be made available for inspection by the SO on arrival to WLNP. The Prime Contractor will give 48 hours' notice and schedule equipment inspection with the SO. Water trucks require a written restricted activity permit from the SO to enter the Park. The permit is received at initial inspection.

Construction Timing / Visitor Experience

- 7.3. Confine construction activities to hours set below, and if possible to periods of low visitation in order to reduce sensory disturbance to wildlife and visitors.



- 7.4. Time activities to minimize vehicle conflicts on access roads (i.e., where possible, schedule activities so that equipment operations does not disrupt traffic flow; result in wildlife collisions).
- 7.5. All Parks Canada designated speed limits apply to construction vehicles. Additional speed restrictions may be required to protect wildlife and visitor safety.

	Required	Location(s)	Notes
Additional Speed Limits	<input type="checkbox"/>		
Work Hour Restriction	<input type="checkbox"/>		
Designated Truck Routes	<input type="checkbox"/>		

Timing Windows

- 7.6. Timing windows to reduce erosion, maintain compliance with the *Migratory Birds Convention Act*, *Fisheries Act*, *Species at Risk Act* and may be part of best practices to reduce erosion and environmental effects. See detailed mitigations for timing windows under **Erosion and Sediment Control**, **Vegetation Removal** and **Buildings** modules where these activities are part of project works. A summary of these restrictions is made below.

Consideration	Applicable	Restricted Window	Notes
Migratory Bird General Breeding Period	<input checked="" type="checkbox"/>	April 1 to August 31	Vegetation clearing must be completed outside of the restricted window.
Bat Maternity Roost Activity Period	<input type="checkbox"/>	April 1 to August 31	
Bat General Activity Period	<input type="checkbox"/>	April 1 to October 31	
Amphibian Calling Window	<input type="checkbox"/>	April 15 to June 15	
Bull Trout Restricted Work Periods	<input type="checkbox"/>	August 31 to August 15	
Other Fish Species Restricted Work Periods	<input type="checkbox"/>	Consult IAO	
Grassland Dormancy	<input type="checkbox"/>	October 1 to February 28	
Additional Timing Considerations (e.g., weed seed set, soil protection)	<input type="checkbox"/>	Dry late summer and fall conditions	

Work Site Conditions/Staging/Laydown

- 7.7. Minimize vegetation-clearing activities and ground disturbance by staging on existing hardened areas wherever possible.
- 7.8. Delineate the work zone; clearly mark the limits to active construction, sensitive features and the access and egress locations.
- 7.9. The Prime Contractor is responsible for security and safety of the work site.
- 7.10. Strong winds are a regular occurrence in WLNP. Prevent materials from blowing off of work site.
- 7.11. If contamination is found, cease work immediately and if necessary, implement Emergency Response Plan.



Wildlife Observations and Encounters

- 7.12. Notify the SO immediately of any dens, litters, nests, carcasses (road kills or other), wildlife encounters, or carnivore (bears, wolves or cougars) observations on or around the worksite.
- 7.13. If wildlife is observed at or near the work site, allow the animal(s) the opportunity to leave the work area to the surrounding habitat and away from areas of potential conflict.
- 7.14. If potentially dangerous wildlife (e.g., bear, cougar, wolf, deer, sheep) persistently enter the work area or display aggressive behaviour, the contractor will immediately stop work, notify 9-1-1 or Banff Dispatch (403-762-1473), and safely evacuate the area.
- 7.15. Contractor will make bear spray, bear spray training, and wildlife awareness training mandatory to all workers on site.
- 7.16. Secure all materials that might attract wildlife (e.g. petroleum products, human food, recyclable food and drink containers and garbage).
- 7.17. No feeding, baiting or luring of any wildlife (including bears, small mammals, birds); do not approach or harass wildlife in any way. Notify the SO immediately if wildlife obtain garbage or human food. If wildlife get into attractants that have been intentionally or accidentally left out, individuals or the contractor could be charged under the *Canada National Parks Act Regulations*.

Equipment Operations & Fuelling

- 7.18. Equipment movements and workers' private vehicles shall be restricted to the designated footprint of the construction area.
- 7.19. Protective measures, including using appropriately sized equipment, or protective access matting must be employed if entry into wet areas is required.
- 7.20. Due to the importance of fescue grassland within WLNP, vehicles must not be driven onto any open grassland areas unless it has been designated by the SO as a parking area prior to construction activities.
- 7.21. Machinery must arrive on site in a clean and dry condition and be maintained free of fluid leaks, vegetative material (i.e., invasive species, noxious weeds) and soils from off-site. All construction equipment from outside WLNP will be washed prior to arrival to minimize the risk of introducing weeds or aquatic invasive species. Additional weed-cleaning stations may be designated by the SO depending on project activities and locations (see table below).

	Required	Location(s)	Notes
Are additional weed cleaning stations required?	<input type="checkbox"/>		

- 7.22. Inspect equipment daily for fluid/fuel leaks and maintain equipment in good working order.
- 7.23. Equipment fuelling and maintenance sites will be identified by the Contractor and approved by the SO. Fuelling should occur on hardened areas > 100 m from streams, wetlands, waterbodies or watercourses. Fuelling personnel shall maintain presence at and provide immediate attention to the fuelling operation.



- 7.24. Mobile fuel containers (e.g., slip tanks) shall remain in the service vehicle at all times.
- 7.25. Operate machinery on land above the high water mark, on ice, or in another manner that minimizes disturbance to the banks and bed of any water body.
- 7.26. Limit machinery crossing (fording) a stream or watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure in compliance with the *Fisheries Act*.
- 7.27. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
- 7.28. Use temporary crossing structures or other practices to cross streams or water bodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds.
- 7.29. Equipment that will work adjacent to or within a stream or watercourse should be free of external grease, oil or other fluids, excessive mud, dirt and vegetation before entering the work area.

Small Equipment

- 7.30. All small equipment (e.g., chainsaws, mowers, etc.) should be kept in good working condition and free of oil and fuel leaks.
- 7.31. Where possible, chain oil should be vegetable-based.
- 7.32. Fuelling of chainsaws will take place outside of riparian areas and sensitive features.

Site Clean Up/Waste Disposal

- 7.33. Clean tools and equipment at an appropriate off-site facility to prevent the release of wash water that may contain deleterious substances.
- 7.34. Sweep up loose material or debris. Any material that may pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site.
- 7.35. No construction waste (sawdust, soil, vegetation, debris, pumped water, hydrocarbon, chemicals, cement, asphalt, etc.) shall be allowed to enter an aquatic habitat or be deposited on undisturbed lands unless the said lands are part of the project works and approved for temporary waste storage.
- 7.36. Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in WLNP. These wastes shall be contained and removed in a timely and approved manner and disposed at an appropriate waste landfill site located outside WLNP.
- 7.37. Construction waste storage containers, shall be emptied when 90% full. Waste containers will have lids, be wildlife proof if containing attractants, and waste loads shall be covered while being transported.
- 7.38. Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition. Sanitary facilities must be in good condition, and located away from sensitive resources including water bodies.
- 7.39. Camping and other recreational activities at the work site by contractors is not permitted without prior approval from the IAO and the Project Manager. These activities, if deemed appropriate, are conditional upon specific mitigations that address risks to wildlife, safety and any other additional environmental effects.



Air Quality Mitigations

- 7.40. Diesel equipment used on the project shall be fuelled with low sulfur diesel fuels and shall conform to local emission requirements.
- 7.41. Minimize idling of engines at all times.
- 7.42. Schedule dust generating activities during periods with lower wind speeds.
- 7.43. Ensure fine materials being transported are covered and protected.

Cultural Resources

- 7.44. All work in WLNP is subject to the accidental finds clause whereby on finding any unexpected Cultural Resources, workers shall stop work in the immediate area and notify the SO. Parks Canada's Terrestrial Archaeology section will provide advice and assessment of significance and determine requirements to mitigate the chance find. Examples of archaeological artefacts encountered in WLNP include buried bison bones, stone tools, and above ground cairns.
- 7.45. Where deep excavation is planned within the townsite, notify the Parks Canada Terrestrial Archaeology section to coordinate a site visit to look at the subsurface deposits with buried soils whenever possible.
- 7.46. If applicable, follow additional mitigations outlined in the Cultural Resources Impact Assessment.

	Required	Location(s)	Notes
Are additional mitigations for cultural resources required?	<input checked="" type="checkbox"/>		Refer to Archaeological Overview Assessment for additional mitigation measures.

8. Vegetation Removal Mitigations Module

Project activities that may alter or remove vegetation include mowing, brushing, and landscape maintenance activities, non-native species management, fire hazard reduction and prescribed burn operations and pre-construction site clearing. Grubbing (stump and root removal) may be required to prepare the ground surface for other activities.

Wildlife Timing Windows

All vegetation, including grassland, has the potential to provide habitat for wildlife. Applicable timing windows for individual project vegetation removal is listed under the **General Activities Mitigations Module**.

- 8.1. The regional bird/songbird nesting period in WLNP is **April 1 to August 31**. Avoid all vegetation removal during this time. If vegetation removal is scheduled to occur within this period, the SO may complete pre-work surveys for nesting migratory birds. See **appendices** for regulatory guidance and detail on the MBCA and SARA.
 - Nesting surveys must be completed within 7 days of project activities.
 - There is a **risk of delays** to project activities due to the presence of nesting migratory birds.
 - If a nest is found during the pre-work surveys, the vegetated area will be left intact with a suitable sized protected buffer until the young have left the nest and vicinity.



Size of buffer is species dependent, to be determined by the SO in consultation with federal regulatory guidance.

- 8.2. Vegetation clearing can negatively impact bats in spring and summer. The timing windows for avoidance of vegetation removal activities in WLNP is April 1 to August 31 for vegetation likely to support roosting bats. If vegetation removal is scheduled to occur within this period, the SO may complete pre-work surveys for bat roosts.
- Roosting surveys must be completed within 7 days of project activities.
 - There is a **risk of delays** to project activities due to the presence of bat roosts.
 - If a potential bat roost is located, a site-specific mitigation strategy must be developed dependent on the type of roost and species present, to be determined by the SO in consultation with federal regulatory guidance.
- 8.3. Vegetation removal can negatively impact amphibians and reptiles, especially during breeding, transformation and important movement periods within and close to wetlands.
- If vegetation removal is to occur within 300 m from a confirmed or potential amphibian breeding wetland, or within 500 m from a confirmed SAR amphibian breeding wetland, additional impact analysis may be required and site-specific mitigations developed.
 - If vegetation removal is scheduled to occur during non-frozen conditions, the SO may complete an amphibian and reptile ground search immediately prior to equipment activities.
 - If ground disturbance activities are scheduled to occur in frozen conditions, amphibian exclusion fencing may be required in the preceding fall season at the discretion of the SO.

Other Timing Considerations

- 8.4. Where ground disturbance accompanies vegetation removal, time activities to minimize soil handling, soil compaction, and erosion potential. Avoid extreme dry windy and wet conditions.
- 8.5. In areas with weed infestations, reduce weed spread through vegetation removal prior to seed set.

Vegetation Removal Mitigations

- 8.6. If previously unidentified sensitive features are found during construction, immediately stop work and notify the SO (e.g., raptor nest).
- 8.7. Vegetation removal should be limited to the minimum area required for safe operations during construction or to meet the objectives of the clearing activities (i.e., fire breaks, sight lines etc.).
- 8.8. Minimize full removal and retain vegetation when possible to reduce erosion.
- 8.9. Retain 30 metre vegetated buffer around sensitive features; where disturbance is unavoidable < 30 metres, a restoration plan is required and the SO must be on site during disturbance activities.
- 8.10. Do not deposit debris in water bodies.



- 8.11. Limbing must be completed using the appropriate equipment to minimize damage to the tree (i.e., using a hoe bucket to limb trees is not appropriate as it can cause the bark to tear and can make the remaining tree vulnerable to diseases and rot).

Tree removal

- 8.12. Safety of workers and the public is the first priority for all tree removal operations. In consultation with the SO, felling of snags or hazard trees outside the designated work area may be permitted, where required for safety of fellers.
- 8.13. Unless approved by the SO due to site-specific limitations be felled away from sensitive features, such as watercourses, wetlands, riparian zones, or ecological features.
- 8.14. Ensure tree limbs/stumps are flush cut as close to the ground or stem as possible.
- 8.15. Fallers should assess each tree individually for critical wildlife features such as nests or cavities. Notify the SO if unexpected features are identified.
- 8.16. Mechanical falling can be used where it is determined that machines will cause minimal site degradation, due to suitable soil conditions, or on a site that is to be developed for future access or facilities.
- 8.17. Mechanical falling may be preferable on sites with numerous hazard trees to be retained for their habitat values, or where mechanical falling equipment can be used to minimise soil disturbance and better direct fallen trees away from environmentally sensitive areas.
- 8.18. Logs and other salvage materials are to be conveyed to and placed at a storage site without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways or water bodies.
- 8.19. During the grubbing component, stumps, roots, imbedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before transport.
- 8.20. Where possible, preserve identified wildlife trees by limbing or topping if they are not assessed as hazard trees.

Disposal of Vegetation Debris

- 8.21. Where practicable, as much of the coarse woody debris and organic matter from the tree removal should remain on the site and used in restoration. The quantity and distribution of slash remaining must not impede wildlife movement, choke out native vegetation, create a significant fire hazard or cause an excessive nutrient flush.
- 8.22. All debris that is not being disposed of on-site must be removed as soon as possible from the project footprint, by transporting off-site for disposal.
- 8.23. If temporary storage is required, store debris on already disturbed areas to minimize footprint of disturbance.
- 8.24. All vegetation containing non-native species will be bagged and removed off site to disposal facility.
- 8.25. On approval of the SO, vegetation debris may be taken to the WLNP burn pile at the upper government compound provided all materials are transported, placed and sorted according to current WLNP requirements.
- 8.26. If removal is not feasible a chipper may be used for less than 50 boles per hectare. Chip depth is to be a maximum of 5 cm (2 inches), spread over area no greater of 5m x 5m per hectare so as to not cover underlying vegetation, prevent new native seedlings



from sprouting, and cause soil/seed bank sterilization. Spreading of chips may extend beyond these parameters with approval by the SO.

- 8.27. Firewood must be salvaged and bucked and stacked at the government compound.
- Firewood Tree: one that has a minimum diameter off 15 cm outside bark at stump height (30 cm) and a usable length of 4.88 m to a 10 cm diameter (inside bark).
 - Fire Piece: One that is 2.44 m (plus 5 cm trim allowance) or longer, with a 10 cm (inside bark) small end, where rot content or form does not render it unusable.

Herbicide Use

- 8.28. A Field Unit Integrated Pest Management Plan (IPMP) must be completed and approved prior to the use of herbicides to ensure the most effective and least harmful substances are properly used.

9. Soil Handling Mitigations Module

To successfully complete restoration of disturbed areas, and protect areas from erosion, proper soil handling and backfilling procedures must be followed. Post excavation and stripping soil and vegetation restoration mitigations should be applied. See Section 10 of this BMP for Soil and Vegetation Restoration.

- 9.1. All soil handling activities require consideration of erosion and sediment control.
See ESCP Section.

Soil Stripping

- 9.2. No stripping shall occur outside of the delineated work area or within 1 metre of the drip line of existing forest.
- 9.3. Stripping close to any watercourse, water body or wetland shall employ methods to ensure materials are not pushed, do not fall or erode into the water or wetlands.
- 9.4. Soil must be stripped in accordance with the ESCP. Key components for soil stripping are:
- Minimize soil movement and handling at all times.
 - Strip topsoil under dry conditions, whenever possible.
 - In the event of a work program shutdown during inclement weather (e.g. winter conditions unfavourable for construction, heavy rain events, construction delays, etc.) contingency planning for bared soils or excavated material stockpiles is required.

Topsoil Salvage

- 9.5. Salvage topsoil at all excavation sites for restoration purposes.
- 9.6. Prevent loss of topsoil through wind or water erosion.
- 9.7. Usually the upper 15 cm of soil, below the sod layer if present, is considered topsoil, where topsoil depths exceed 15 cm then salvage the entire depth of topsoil.
- 9.8. Where depths exceed 15 cm, salvage the upper 15 cm of topsoil separately from the remaining, where the seedbank is filled with desirable native seed material.
- 9.9. The SO may designate separate storage of topsoil zones whereby forest soils are stored separately from grassland soils and weed contaminated soils are separated from clean topsoil.



Excavation

- 9.10. All trenches or ditches left unattended overnight must be fenced or covered to prevent wildlife entrapment or provide appropriate egress for wildlife.
- 9.11. Workers must inspect trench for trapped wildlife prior to backfilling. If trench has been left open for > 24 hours, SO must be notified and time allowed for the SO to complete additional inspection for trapped wildlife such as salamanders.
- 9.12. Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation.
- 9.13. Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels.
- 9.14. Minimize changes to the ground surface that affects its infiltration and runoff characteristics and maintain/re-establish effective surface drainage on completion of the project.
- 9.15. Backfill and compact excavations as soon as possible. Optimize degree of compaction to minimize erosion and allow for re-vegetation.
- 9.16. To limit over compaction, use equipment which minimizes surface disturbance including low ground pressure tracks/tires, blade shoes and brush rake attachments.
- 9.17. All excavations will remain free of water (see dewatering mitigations).

Excavated Material Storage

- 9.18. Allow space for separate storage of topsoil and spoil; where space is available, separate stored topsoil from spoil by at least 1 m. Use appropriate material (e.g., geo-textile) to separate soil components where space is limited.
- 9.19. Topsoil from separate ecotypes or areas of the project may not be mixed without approval of the SO (i.e., grassland soils must be kept separate from forested soils).
- 9.20. Topsoil may be stored on hardened surfaces, geo-textile material, in topsoil storage containers or directly on undisturbed vegetation. If storage occurs on vegetation, material recovery by hand may be required.
- 9.21. Topsoil should be stockpiled on the uphill side of the disturbance on sloped terrain and away from any grades, subsoils, spoil material, construction activity and day to day operations.
- 9.22. Construct barricades to prevent losses on steep terrain (>18°, 3:1).

Excess Materials and Waste (Overburden Removal)

- 9.23. Remove excess excavated material from site where it cannot be used for the final grading of the area. Site specific arrangements must be made for disposal locations and procedures of overburden.
- 9.24. Surplus excavated material may be used to fill depressions around the project site providing topsoil is stripped before filling, with approval from SO.

10. Soil and Vegetation Restoration Mitigations Module

Almost all projects activities included in this BMP will require some ecological restoration- *the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed*. The restoration plan can be a simple application of the following mitigations and can be at the site or both at the site and in concert with another site designated to offset the



permanent impact of a project. A restoration plan is required for all projects but the scale and scope can be adapted to that required by the project (i.e., BMPs, site restoration plan, etc.). Restoration works can often be considered projects in and of themselves. Soil and vegetation restoration must apply the principles of effective, efficient and engaging solutions.

Restoration Plan

- 10.1. Develop restoration plan as part of the project scoping and specifications prior to project approvals.
- 10.2. Ensure that the appropriate restoration materials are available as needed immediately following construction activities.
- 10.3. The restoration plan will be subject to the approval of the LAO, who will be responsible for consulting with the Park Vegetation Ecologist.
- 10.4. The restoration plan should the following minimum information
 - Site description;
 - Site-specific restoration goals and objectives;
 - Schedule of clean-up activities;
 - Timing of restoration activities;
 - Restoration Standards; and
 - Follow-up Protocols (i.e., supplemental seeding, native transplants, weed control, etc.)

Timing Windows

- 10.5. Complete initial seeding as soon as possible.
- 10.6. Supplemental planting should be timed for the species and location. Seeding in the fall allows for full scarification of the seed over the winter. Consider using seed that requires shorter scarification times for spring and summer applications. Transplants may do best in the spring and summer and can require watering or other maintenance.
- 10.7. Time weed control measures to prevent seed propagation.

Topsoil Replacement

- 10.8. Implement restoration plan for the disturbed area immediately following completion of construction.
- 10.9. Minimize soil movement and handling to protect existing native seed bank.
- 10.10. Replace topsoil to all areas immediately following fine grading.
- 10.11. Do not compact topsoil.
- 10.12. Backfilling should allow settling to prevent depressions however, long term roach piles on linear disturbances should be minimal.
- 10.13. Where insufficient topsoil is available, the SO may approve moving soil from different projects or areas of WLNP. Imported soil may be used as a last resort and must be from a supplier that has been inspected and approved by the Park Vegetation Ecologist. Methods of improving vegetation succession using locally sourced, weed and contaminant free materials are preferred.
- 10.14. Slopes to be seeded should be no steeper than 2 horizontal to 1 vertical (2:1) and covered with a minimum of 5 cm (2 inch) of topsoil. Finish grading should always follow top soil placement. Maintain structure (i.e., rocks, roots, woody debris) in topsoil.



- 10.15. Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or other erosion control is required.
- 10.16. Methods of bioengineering such as terracing, willow staking, live pole drain systems should be assessed as solutions where soils are steeper or remain unstable.

Soil Amendments

Fertilizer Application

- 10.17. Avoid use of fertilizer to limit non-native vegetation growth and allow for local species to use available nutrients.
- 10.18. If needed use locally sourced mycorrhizae compost teas to improve vegetative success, as approved by WLNP vegetation ecologist.

Topsoil substitute

- 10.19. Apply an organic cellulose only amendment as a soil substitute if restoration standards are not being met within the defined time frame.
- 10.20. Determine the type of organic amendment based on the site-specific requirements (e.g., peat moss, compost) at the discretion of WLNP vegetation ecologist.

Seedbed Preparation

- 10.21. The seedbed will be scarified by hand or, with the approval of the SO, by machine on large areas (i.e., roadbeds) where it is accessible and appropriate.
- 10.22. The seedbed will be scarified if seeding takes place more than 7 days after final grading or if there has been a rainfall between final grading and the seeding date.
- 10.23. The cleats of a tracked vehicle or a harrow device will be used, where possible, to prepare an adequate seedbed with seedling safe-sites (microsites) substantially free of soil crusts.
- 10.24. Align cleat marks at right angles on slopes to trap seed and sediment and reduce erosion.

Species Selection

- 10.25. When selecting species and varieties:
 - Use species of local native plant communities.
 - Avoid use of cultivars.
 - Species viability in proposed environment and climatic conditions.
 - Capability to effectively control erosion, where required.
 - Adaptation to the variable site conditions of undulating topography.
 - Consider palatability of some species to herbivores and avoid growing attractants in areas of increased risk to wildlife and visitors.
 - Variable life expectancy to produce variable, delayed die-out of seeded species and replacement with indigenous native plants.

Seed Mix Selection

- 10.26. A prescriptive seed mix appropriate for the project area will be provided by Parks Canada. If an appropriate seed mix is not available, the SO will contact the Park Vegetation Ecologist to determine an appropriate mix for the Project.
- 10.27. Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in



limited quantities commercially have been included in the seed mixes. These seed mixes are to be used conditional on availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.

- 10.28. Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.
- Do **NOT** purchase seed until written approval is obtained.
 - Certificates of Analysis must include both the common and include the scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.
- 10.29. All seed is subject to testing by PCA prior to use.

Seeding

- 10.30. Use only seed purchased after written approval is obtained.
- 10.31. Seed and stabilize (e.g. mulch/tackifier) bare areas as soon as possible after disturbance, preferably as soon as a significant area is graded and finished and before the next rain event. If there is a risk of seedling mortality as a result of fall frost stabilize until appropriate growing conditions exist.
- 10.32. In previously disturbed lawn areas of the Waterton Community, consider using sod in high traffic areas or places that need extra erosion control.
- 10.33. Use temporary seeding when outside the seeding dates for permanent vegetation.
- 10.34. Apply a seed mixture which is appropriate for the climate, soil, and drainage conditions of the site.
- 10.35. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions.
- 10.36. Conduct broadcast seeding under calm wind conditions. Hydro-seeding is acceptable where access is available.
- 10.37. Do not increase the seeding rate to compensate for poor seedbed conditions.
- 10.38. Monitor temporary erosion control measures to prevent seed loss.
- 10.39. Supplemental seeding may be required in subsequent years.

Alternatives to Seeding

- 10.40. Use topsoil seed bank in small areas when there is no risk of erosion or competition from invasive species (i.e., natural regeneration).
- 10.41. Use native transplants in areas where conventional seeding applications are not applicable or where slope stability is an issue.
- 10.42. Use native transplants to provide additional diversity and structure to supplement seeding.
- 10.43. Use conventional forestry planting methods for container grown transplants, see [website](#) for guidance.



11. Asphalt Production and Handling Mitigations Module

Asphalt is a common building material for transportation infrastructure. Its production requires the use of gravel, water, and petroleum products, and associated project activities include transportation, storage and handling of these materials. Installation of asphalt plants is common within the larger parks where gravel extraction is undertaken.

Timing of Works

- 11.1. Asphalt works are preferably undertaken during periods of dry weather as this allows easier control of contaminated runoff and sediment.
- 11.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Gravel Crushing and Washing

- 11.3. Where possible within engineering constraints, asphalt materials should be recycled to reduce the need for new gravel.
- 11.4. Gravel will be obtained from an approved operational borrow pit only. For gravel obtained from a borrow pit within a protected heritage place or borrow pit, gravel extraction within the footprint of the disturbed area of the approved operational borrow pit is permitted.
- 11.5. Gravel will not be crushed within 30 meters of any water body.
- 11.6. If water for cleaning is extracted from a watercourse, refer to [water withdrawal section](#) of this BMP.
- 11.7. If gravel requires washing, the water used will not be returned directly to any watercourse.
- 11.8. Water free from chemical contaminants will be discharged into ground where further erosion and runoff into surface water is prevented. Discharging into well vegetated ground surface, at a rate which prevents erosion can often provide increased absorption and reduction of sediment load.
- 11.9. Contaminated water must be treated to meet CCME guidelines or transported outside of WLNP for disposal at an approved facility.
- 11.10. For waste removed from WLNP a detailed receipt of delivery to an approved facility will be provided to the SO.

Oiling of Truck Boxes

Trucks for hauling asphalt mixture shall have tight, clean, smooth metal beds that have been sprayed with a minimum amount of thin fuel oil to prevent the mixture from adhering and causing waste asphalt.

- 11.11. Truck boxes may be oiled only when absolutely necessary.
- 11.12. Oiling will take place in a bermed area, consisting of a plastic underlay with 15 centimetres overlay of clean gravel. Oil contaminated gravel will be hand collected (so as to prevent tearing of the plastic) from the bermed area daily, and put through the asphalt plant.
- 11.13. Vehicle covers shall be securely fastened.



Disposal and Clean Up of Other Waste Products

- 11.14. To ensure regular clean-up of waste asphalt and petroleum spills, a defined clean up schedule will be established during the preconstruction meeting.
- 11.15. Leaks will be collected in drip-trays, the collected material will either be removed from WLNP, or recycled back through the Asphalt Plant. For any material removed outside WLNP to an approved facility, a detailed receipt will be provided to the ESO.
- 11.16. Used oil, filters, grease cartridges, oil cans and other waste products of plant servicing will be collected and disposed of at the nearest industrial waste facility.

12. Concrete Handling Mitigations Module

Concrete is a common construction material. Its use ensures longevity of the infrastructure and safety for public use. One litre of concrete wash water or leachate in 1000L of water will kill fish. Cement-based products including grouts and concrete are lethal to fish and many other aquatic organisms. Raw product or leachate entering a watercourse will alter water chemistry, making it more basic or alkaline.

Onsite Temporary Concrete Washout Facility

- 12.1. Temporary concrete washout facilities shall be located a minimum of 100 m from storm drain inlets, open drainage facilities, and watercourses.
- 12.2. Temporary concrete washout facilities shall be temporary pit or bermed areas constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- 12.3. Wood stakes, and sandbag materials can be used to construct temporary containment walls or “barriers”.
- 12.4. Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.
- 12.5. The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.
- 12.6. Washout of concrete mixer trucks is not permitted in WLNP.
- 12.7. Wash concrete from mixer truck chutes/pumps into approved concrete washout facility or collect in an impermeable bag for disposal.
- 12.8. Pump excess concrete in concrete pump bin back into concrete mixer truck.
- 12.9. Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
- 12.10. Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per federal and provincial regulations.

Maintenance and Inspection of Temporary Concrete Washout Facilities

- 12.11. Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm (4 inches) for above grade facilities and 300 mm (12 inches) for below grade facilities.
- 12.12. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition.



- 12.13. Existing facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- 12.14. Temporary concrete washout facilities shall be inspected for damage (i.e. tears in PVC liner, missing sand bags, etc.).
- 12.15. Onsite concrete waste storage and disposal procedures should be monitored at least weekly or as directed by the SO.

Removal of Temporary Concrete Washout Facilities

- 12.16. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled and restored.

Onsite Concrete Management

- 12.17. Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in a right-of-way as directed by the SO in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be returned to the batching yard.
- 12.18. Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
- 12.19. The concrete batching plant must be operated pursuant to applicable dust, air emission, and water quality control regulations.
- 12.20. Waste, solidified concrete from rolling concrete mixers in amounts less than 1 cubic meter and waste solidified concrete from construction pour shall be buried in the grade within 48 hours of the pour, or removed from the site subject to approval and direction from the SO.

13. Paving, Resurfacing, Grading Mitigations Module

Surface management activities are undertaken to ensure public safety on PCA surfaces by maintaining clean, level, and unbroken road surface conditions through activities such as pavement cleaning, patching, application of surface treatments, and pavement crack sealing. Grading is used to address drainage issues, vegetation encroachment, potholes and rough surfaces.

Timing of Works

- 13.1. Works are preferably undertaken during periods of dry weather (e.g., summer) as this allows easier control of contaminated runoff and sediment.
- 13.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Grading

- 13.3. During grade construction conducted close to any watercourse, water body or wetland ensure materials are not pushed, fall or are eroded into the water or wetlands.
- 13.4. No grade building shall occur outside of the delineated work area or within 1 metre of the drip line of existing forest. Any material inadvertently falling outside the work



- limits will be removed promptly in a manner that does not damage trees or vegetation.
- 13.5. Materials shall be placed at storage sites or on the grade without spillage outside the work limits. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage trees or vegetation.
 - 13.6. Retain a 30 metre vegetated buffer around water bodies or install runoff management structures.
 - 13.7. If possible, grade roads early in the spring before vegetation develops seed heads or late in season after vegetation has set seed and is dormant to minimize non-native vegetation propagation.
 - 13.8. Ensure gravel or road bed material is free of weeds and comes from an approved operational gravel source free of other contaminants.

Paving and Resurfacing

- 13.9. Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface waters.
- 13.10. Minimize application of seal coats in wet conditions. Attempt to apply only to dry surfaces and not prior to (within 24 hrs.) or during rainfall. If unforeseen rain arrives ensure runoff from recently seal coated surfaces are prevented from entering surface waters.
- 13.11. For asphalt handling and management see the Asphalt Mitigation Module of the BMP.

Pavement Marking and Barrier and Guardrail Reinstatement

- 13.12. Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface water. Pavement marking shall be undertaken pursuant to standard methods applied in National Parks for control of paint products, both in transport and handling. The Contractor shall present a description of methods to be employed for transporting and controlling paint and hazardous products, application of paint, cleaning of equipment, containment and disposal of waste paint and cleaning products, etc. to the satisfaction of the SO.
- 13.13. Where concrete barriers or guard rails are temporarily removed, for highway improvements, temporary glow posts shall be installed, at 20.0 m intervals on straight sections and at 10.0 m intervals on curves and shall remain in place until permanent barrier system has been installed.

14. Drainage Structures Mitigations Module

Drainage structures on roadway, highway and parkways are structures such as culverts, ditches and drains. Drainage structure management activities are undertaken to ensure that surfaces are safe and efficiently drained, water is efficiently channeled to ditches and watercourses, and erosion of highways and adjacent properties is prevented. These mitigations include the cleaning and maintenance of drainage structures and related hardware, as well as the repair or replacement of existing and installation of new drainage structures.

- 14.1. All workers shall be familiar with the Spill Response Section of this document.



Timing of Works

- 14.2. Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. Contact your local aquatics specialists and DFO offices for further information on timing windows in your region.
- 14.3. Conduct in-stream work during periods of low flow, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
- 14.4. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

Drainage Structures

- 14.5. Isolate your work area from any flowing water that may be present. Ensure any flows are temporarily diverted around the portion of the ditch or watercourse where you are working.
- 14.6. Select appropriate equipment and work access routes to reduce damage to riparian vegetation and watercourse banks when using earth-moving equipment.
- 14.7. For smaller scale debris and sediment removal activities, remove materials by hand.
- 14.8. To assist with bank stability and invasive plant prevention, leave topsoil and root systems intact on channel banks surrounding your work area.
- 14.9. Ensure any works to repair damaged structures retain the pre-repair channel conditions (e.g., streambed profile, substrate, channel cross section) and do not constrict the stream width.
- 14.10. Maintain effective sediment and erosion control measures until complete re-vegetation of disturbed areas is achieved.

Culverts

Culvert Design and Alternatives

- 14.11. The culvert, inlet(s) and outlet(s) should be adequately protected with rip-rap to prevent erosion and scour around the culvert during high runoff events. The following measures should be incorporated when using replacement rock to stabilize the culvert:
 - Place appropriately-sized, clean rocks into the eroding bank area by hand or machinery operating outside the water course.
 - Do not obtain rocks from below the ordinary high water mark of any water body.
 - Where possible, install rock at a slope similar to the stream bank to maintain a uniform stream profile and natural stream alignment. Otherwise, install the rock at the closest slope required to ensure it is stable.
 - Ensure rock does not interfere with fish passage or constrict the channel width.
- 14.12. Ensure designs locate culvert structures in areas that minimize impacts to riparian vegetation and associated wildlife.

Culvert Installation

- 14.13. Maintain effective sediment and erosion control measures until complete re-vegetation of disturbed areas is achieved.



- 14.14. Remove any old structures to a suitable upland disposal facility away from the riparian area and floodplain to avoid waste material from re-entering the watercourse

Wildlife Considerations for Culverts

- 14.15. At times, culverts are placed along portions of highways that bisect wetlands or specific habitats that support an abundance of wildlife. Consider building natural rock ledges through culverts to allow for small and medium-sized animals to walk on during periods of high flow.

15. Water Withdrawal and Dewatering Mitigations Module

Construction often requires the use of water; many common methods of excavation and site isolation require dewatering. Temporary, short term water withdrawal provides an efficient uncontaminated water source for local project sites. Dewatering can allow sites to be effectively dry during construction, reducing the impact of sediment laden water entering fish bearing waters.

Additional Permits

- 15.1. All water withdrawal requires a Restricted Activity Permit issued by the IAO.

Equipment Cleaning

- 15.2. All hoses, pumps, intake hoses, or equipment from outside of WLNP must be clean and dry on arrival and require approval and inspection by the SO prior to use in WLNP (see **General Activities Section**).
- 15.3. Do not bring equipment into WLNP from areas that have known infestations of aquatic invasives (e.g., USA, east of Saskatchewan).
- 15.4. Thoroughly clean water trucks, hoses, pumps and intake hoses using clean HOT WATER with as much pressure as possible.
- 15.5. If last use of equipment was out of province, allow hoses, pumps and intake hoses to dry completely and then remain dry (ideally for >20 days).

Timing Windows

- 15.6. As a general guide to prevent taking more water than aquatic system can support, limit total take of water to less than 5 successive days and less than 10 days in any period of 30 days.
- 15.7. Do not withdraw water from waterbodies that support breeding amphibians.

Water Withdrawal

- 15.8. Water should not be withdrawn from a wetland or stream less than 2 metres wide at the surface or a lake less than one hectare in area.
- 15.9. Water withdrawal should follow the 10/90 rule which allows for up to 10% of the stream flow to be withdrawn, as long as the stream flow does not fall below the 90% exceedence flow (eg. 1 in 10 chance in a given year).
- 15.10. No permanent or semi-permanent works for water withdrawal should be placed in the stream channel.
- 15.11. Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish, amphibians and/or reptiles. Entrainment occurs when a fish or amphibian is drawn into a water intake and cannot escape. Impingement occurs when an



entrapped fish, reptile or amphibian is held in contact with the intake screen and is unable to free itself.

Dewatering

- 15.12. A site specific dewatering plan is required be provided before commencing a pump-out sump to dewater excavation sites with specific details on how and where the water will be discharge.
- 15.13. Site specific mitigations may be required depending on the conditions of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond restoration.
- 15.14. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the SO.
- 15.15. Soil and vegetation erosion protection is required for water pumped on to land.

16. Buildings & Structures

These mitigations are currently in development. Consult with the IA Office for more information.

General Activities

- 16.1. As appropriate for project activities, a Phase I Environmental Site Assessment and/or hazardous material survey must be completed by qualified personnel. Mitigations to safely and effectively manage any impacts of hazardous materials on people or the environment will require additional project planning (e.g., asbestos, ground contamination).
- 16.2. If building systems will incorporate glycol or antifreeze, ensure design includes containment and spill response plan. If risk to aquatic habitat cannot be mitigated, use alternative system.
- 16.3. Refer to **Section 2, Project Planning and Design** for addition mitigations related to building design.
- 16.4. Be aware that high winds are common in WLNP and all materials need to be secured to prevent materials from blowing off site, particularly during high risk activities such as roofing.

Wildlife & Structures - Bats

Resident bats in southwest Alberta include Little Brown Myotis (*Myotis lucifugus*), an Endangered species on Schedule 1 of the *Species at Risk Act* (SARA) that is often associated with buildings. Project proposals that include building renovation, refurbishment, relocation, and demolition have the potential for adverse effects on this listed species of risk.

- 16.5. Buildings require a Bat Building Evaluation to determine the potential use at the building (i.e., none, day roost, night roost, maternity roost, or hibernacula). Results of the evaluations are used to determine the appropriate site-specific mitigations and prevent any residual effects of Project activities on Little Brown Myotis or other bat species.
- 16.6. Identify adjacent natural or artificial roosts that can be avoided or maintained during the Project.



- 16.7. Reduce light trespass from buildings and in natural areas or corridors bats may use to travel from roosts to water (see [Section 2, Project Planning and Design](#)).
- 16.8. Maintain the properties and characteristics of a structure that make it attractive to bats and where feasible, allow them to continue roosting at the structure. Where not feasible, a site specific mitigation plan is required.
- 16.9. Structures and buildings provide nesting and roosting habitat for wildlife including Cliff Swallows and Little Brown Bats. See timing windows under the [General Activities Mitigations Module](#). If work must occur in the restricted timing window, the SO may complete preconstruction surveys to determine if activities may proceed.
 - There is risk of **DELAY** to project activities if work is scheduled within restricted windows.

Sandblasting, Painting, Stripping

- 16.10. Minimize sandblasting to only remove loose paint and provide a clean surface for new paint to adhere to.
- 16.11. Confine activity to days with little or no wind and use physical barriers to contain dust.
- 16.12. See the section on [Spill Response](#) for spill response.

Ground Thawing

- 16.13. If ground must be thawed to allow excavation, activities related to generators, fuel stations, and antifreeze/glycol must be included in Spill Response Plans.

Foundation

- 16.14. See Section 13, [Concrete Handling](#).

17. Service Line HDD

- 17.1. For directional drilling operations, a drilling plan will be developed by the contractor, addressing mud systems and handling, and contingency measures for circulation losses or dewatering of excavations.
- 17.2. Excavation in sensitive features to recover equipment is not permitted.
- 17.3. All mud containment structures must be situated outside of sensitive features.
- 17.4. All drill mud must be disposed of appropriately off site.
- 17.5. Use of methanol or ethylene glycol is not permitted. Propylene glycol may be permitted with review of the drill operation and drill plan by the SO. Consistent with spill plan requirements, all containers must have original labels.
- 17.6. Schedule drilling operations outside repeated days of cold weather (below -20°C).
- 17.7. Drill mud containment and frac-out response materials and equipment must be immediately available on site during operations (e.g., vacuum truck, sandbags, shovels, spill response equipment). Drill mud containment (e.g., sandbag berm) around the drill stem will be in place prior to project activities.
- 17.8. Drill mud must not contaminate topsoil. If necessary, topsoil should be removed from drill entry and restored at the end of project activities. Where possible, position equipment on existing disturbed areas.



- 17.9. A vacuum truck must be immediately available on site during all service line HDD operations within WLNP.
- 17.10. The Prime Contractor will monitor, by visual and electronic means:
 - Regular and scheduled visual checks for frac-outs (*i.e.* frac walks). The SO shall be notified immediately of any frac-out;
 - The return flow of drilling fluid from the borehole. A reduction in return flow shall be taken as indicating a possible seepage of drilling fluid;
 - The tank and pit volumes;
 - Any unplanned losses or gains.
- 17.11. The above monitoring techniques will assist in the detection of any potential environmental concerns and / or frac-outs during drilling activities. At the first indication of any concerns, the following is to occur:
 - Stop drilling operations and shut of the drilling fluid pumps;
 - Conduct a survey of the ground and surface water body for evidence/confirmation of seepage of drilling fluid to the surface;
 - Contain any seepages;
 - Notify the SO;
 - Assemble measurement data and observations with the SO;
 - Develop and implement a recovery clean-up plan, if necessary; and
 - Develop a drill continuance plan in consultation with the SO.



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Appendix 1 Regulatory Guidance

Jurisdictions

While all projects on lands managed by Parks Canada must adhere to Federal law and regulation, it is considered best practice to refer to local community, regional, provincial regulation and best practices where federal guidance is silent and/or attempt to meet those targets if it can reduce the overall impact of the project.

Some of the project activities reviewed have potential environmental impacts that are addressed by various provincial, federal and territorial acts and regulations. All activities must meet current environmental law and regulations in their design and construction. The following is a brief description of some of the key federal acts and regulations. Further review, understanding and application of other federal, provincial and territorial environmental laws are part of a rigorous approach to project planning and execution.

Canada National Parks Act and Regulations-Parks Canada

All work inside National Parks and Protected Areas must be performed in accordance with the laws and regulations set out in the *Canada National Parks Act* and Regulations. This includes the requirement for most activities described to only be done under a permit such as: business licence for contractor, disturbance of natural objects, travel in restricted areas, special events or use of disposal sites.

Fisheries Act - Fisheries and Oceans Canada

If a project is to be conducted near water, it is the proponent's responsibility to ensure they avoid causing serious harm to fish in compliance with the *Fisheries Act*. The advice in on the Fisheries and Oceans website will help a proponent avoid causing harm and comply with the Act.

If the water body in the project area has fish or is connected to waters at any time that have fish the project must meet the self-assessment criteria on the Fisheries and Oceans website, if not a project review can be made by Fisheries and Oceans Canada to assess whether the project requires authorization or authorization can be requested directly. Given the level of detail required for a review and/or authorization request the EIA officer may need to consider a more involved EIA pathway in those circumstances.

Migratory Bird Convention Act – Environment Canada

The purpose of this Act is to implement the Convention by protecting and conserving migratory birds - as populations and individual birds - and their nests. Section 6 - prohibits the disturbance, destruction, or taking of a nest, egg, or nest shelter of a migratory bird.

In Canada, the general nesting period may start as early as mid-March and may extend until end of August. This is a general nesting period that covers most federally protected migratory bird species. This period varies regionally across Canada mainly due to differences in species assemblages, climate, elevation and habitat type. Generally, the nesting period is delayed in more northerly latitudes, corresponding to vegetation development and food availability. (Environment Canada, 2014). To help with determining regionally relevant periods where nesting is likely to occur, Environment Canada is publishing estimated regional nesting periods within large geographical areas across Canada referred as "nesting zones". These periods are



estimated for each zone and consider the time of first egg-laying until the young have naturally left the vicinity of the nest. Field Units may wish to refine this section and add their known local nesting periods.

Species at Risk Act

If a species listed under the *Species at Risk Act* (SARA) is found within the project area, any potential adverse effects from the proposed project to the individuals of the species, their residences and/or their critical habitat must be understood. Species at risk considerations require specific expertise, due to additional legal requirements under the SARA and CEAA 2012. If the projects or activities to be addressed by the BMP could affect a listed species or its critical habitat, the EIA officer may need to consider a more involved EIA pathway in those circumstances.



Appendix 2 Species at Risk and Critical Habitat

Table 2 Species at Risk Occurring in Waterton Lakes National Park

Species	SARA status	COSEWIC	Provincial Status
Vascular Plants			
Bolander's Quillwort	Threatened	--	--
Limber Pine	--	Endangered	Endangered
Whitebark Pine*	Endangered	--	Endangered
Arthropods			
Half-moon Hairstreak*	Endangered	--	--
Western Bumble Bee	--	Threatened (southern subspecies)	--
Amphibians			
Long-toed Salamander	--	Not at risk	Special Concern
Northern Leopard Frog	Special Concern (Western Boreal/Prairie Populations)		Threatened
Western Tiger Salamander	--	Special Concern (Prairie/Boreal Population)	--
Western Toad	Special Concern (Calling and/or Non-calling populations)	--	--
Reptiles			
Western painted turtle (note that status depends on population definition)	Special Concern	--	--
Birds			
Band-tailed Pigeon	Special Concern	--	--
Bank Swallow	--	Threatened	--
Barn Swallow	--	Threatened	--
Barred Owl	--	Not assessed	Special Concern
Black Swift	--	Endangered	--
Bobolink	--	Threatened	--
Canada Warbler*	Threatened	--	--
Chestnut-collared Longspur*	Threatened	--	--
Common Nighthawk*	Threatened	--	--
Ferruginous Hawk*	Threatened	--	Endangered
Harlequin Duck	--	Not assessed (western population)	Special Concern
Horned Grebe	--	Special Concern	--
Lewis's Woodpecker*	Threatened	--	--
Loggerhead Shrike	Threatened	--	Special Concern
Long-billed Curlew	Special Concern	--	Special Concern
Olive-sided Flycatcher*	Threatened	--	--
Peregrine Falcon	Special Concern	--	Threatened
Prairie Falcon	--	Not assessed	Special Concern
Red-headed Woodpecker*	Threatened	--	--
Rusty Blackbird	Special Concern	--	--
Short-eared Owl	Special Concern	--	--
Sprague's Pipit	Threatened	--	Special Concern
Trumpeter Swan	--	Not at Risk	Special Concern
Western Grebe	--	Special Concern	Threatened
Western Screech-Owl*	Endangered	--	--
White-winged Scoter	--	Not assessed	Special Concern
Whooping Crane.	Endangered	--	--
Fish			
Westslope Cutthroat Trout	Threatened	--	Threatened



WLNP General Project Best Management Practices
Appendix 2 Species at Risk and Critical Habitat

Species	SARA status	COSEWIC	Provincial Status
Bull Trout	--	Threatened (Saskatchewan-Nelson Population)	Threatened
Pygmy Whitefish	--	Special Concern (Waterton Population)	Threatened
Mammals			
American Badger	--	Special Concern	Data Deficient
Grizzly Bear	--	Special Concern (Western Population)	Threatened
Little Brown Myotis*	Endangered	--	Data Deficient
Plains Bison	--	Threatened	--
Western Small-footed Myotis	--	Not assessed	Special Concern
Wolverine	--	Special Concern (Western Population)	Data Deficient

*species with no published recovery strategy

Defined critical habitat exists for Bolander's Quillwort and Half-moon Hairstreak.

Contact the Impact Assessment Office for more information, including information regarding other habitats important for species at risk, as well as species at risk without defined critical habitat maps to date.

Additional information on Species at Risk is included in the Multi-species Action Plan.

Parks Canada Agency. 2017. Multi-species Action Plan for Waterton Lakes National Park of Canada and Bar U Ranch National Historic Site of Canada [Proposed]. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. iv + 30 pp. [G:\Resource Conservation\Species at risk\Action Planning 2013-2016\WLNP BURNHS Action Plan](#)



Figure 1 Waterton Lakes National Park Half-moon Hairstreak (*Satyrrium semiluna*) Critical Habitat



Appendix 3 Recommended Seed Mixes for WLNP

All commercial seed lots will have Certificates of Analysis for weed and undesirable species content and germination tests for each lot of each species in the mix.

Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.

Do NOT purchase seed until written approval for individual lots is obtained.

Certificates of Analysis must include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.

Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in limited quantities commercially have been included in the seed mixes. These seed mixes are to be used as possible conditional on availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.

Native seed mixes will be seeded within the appropriate areas of WLNP (i.e., open fescue prairie, open deciduous forests with or without a mesic area modifier, etc.).

Inclusion of a clean cover crop (e.g., awned wheatgrass), to combat invasive plant problems may be considered.

Below is an **example** seed mix. Consult with Vegetation Ecologist for ALL projects, regardless of size, for a site specific and project appropriate mix.

Seed Mix	Species	Species % by Seed Weight
Open Fescue Grassland Mix Rate = 40 kg/ha	Foothills rough fescue (<i>Festuca campestris</i>)	40
	Idaho fescue (<i>Festuca idahoensis</i>)	20
	Parry Oatgrass (<i>Danthonia parryi</i>)	10
	Bluebunch wheatgrass (<i>Agropyron spicatum</i>)	10
	June grass (<i>Koeleria macrantha</i>)	7
	Alkaline bluegrass (<i>Poa juncifolia</i>)	3
	Rocky Mountain fescue (<i>Festuca saximontana</i>)	3
	Sticky Purple Geranium (<i>Geranium viscosissimum</i>)	3
	Early Yellow Locoweed (<i>Oxytropis sericea</i>)	3
	Yarrow (<i>Achillea millefolium</i>)	1
Aspen / Shrub Community Mix Rate = 40 kg/ha	Smooth wild rye (<i>Elymus glaucus</i>) ¹	25
	Bluebunch wheatgrass (<i>Agropyron spicatum</i>) ¹	20
	Foothills rough fescue (<i>Festuca campestris</i>) ¹	20
	Idaho fescue (<i>Festuca idahoensis</i>) ¹	15
	Mountain Brome (<i>Bromus carinatus</i>) ^{1&2}	10
	Marsh Reed Grass (<i>Calamagrostis canadensis</i>)	40
	Tufted hair grass (<i>Deschampsia caespitosa</i>) ²	40



WLNP General Project Best Management Practices
Appendix 3 Recommended Seed Mixes for WLNP

Seed Mix	Species	Species % by Seed Weight
¹ species for dry open stands	Sticky Purple Geranium (<i>Geranium viscosissimum</i>)	2
	Northern bedstraw (<i>Galium boreale</i>)	2
² species for wet or closed stands	Meadow Rue (<i>Thalictrum occidentale</i>)	2
	American vetch (<i>Vicia americana</i>)	2
	wild strawberry (<i>Fragaria virginiana</i>)	2



Appendix 4 Waterton Townsite Tree Protection and Succession Implementation Plan

The following Implementation Guideline has been created to function as a standalone document from the Waterton Townsite Grounds Vegetation Plan with content derived from the Waterton Townsite Grounds Vegetation Plan. This Appendix will function as a general guideline for proper construction practices while working in and around trees.

PROPER TREE PROTECTION PRACTICE

When constructing within approximately 6 m of an existing tree, it will be necessary to have Proper Tree Protection Practices in place. The following recommendations will assist in the prevention of unintentional tree damage.

Tree protection measures should be required for any retained public trees within the proposed limits of disturbance and within the 6 m setback from the limits of disturbance. Trees identified for retention and incorporation into the landscape plan should not be removed, damaged, or destroyed without prior written authorization from Parks Canada. Of note, the term “tree” refers to all parts of the tree including the roots.

The site specific specifications for tree protection should be outlined in the recommended Landscape Restoration Plan.

Tree Protection Measures

In order to mitigate potential damages and stress to existing publicly owned trees, tree protection measures should be in effect prior to the commencement of construction activities and should remain in effect until construction is completed. Protective barrier fencing should be installed to protect publicly owned trees located within 6 m of the limits of disturbance and for all publicly owned trees that are to be retained within the limits of disturbance. The area contained within the barrier fencing should be considered the Tree Protection Zone (TPZ).

Tree Protection Zone (TPZ)

Tree Protection Zones are limited to the Waterton Townsite and should include a 4.0 m distance from the trunk (where possible) and to a height of 1.2 m. The protective barrier fencing should be constructed of steel construction fencing or 2 x 4 wood framing skirted with fencing. The TPZ distance is to be measured from the base of the tree trunk outward beyond the drip line and Critical Root Zone (CRZ) where possible. The CRZ is the portion of tree roots requiring protection from damage in order to maintain the health and stability of a tree. One method of calculating the CRZ is that every 2.5 cm of DBH is 30 cm of CRZ radius. All supports and bracing for the protective barrier fencing should be located outside the TPZ. All supports and bracing should be placed to reduce damage to roots. The protective barrier fencing should remain standing and in good condition until construction of the project is completed. Signs identifying the TPZ should be located on the protective barrier fencing.



Appendix 4 WLNP General Project Best Management Practices Waterton Townsite Tree Protection and Succession Implementation Plan

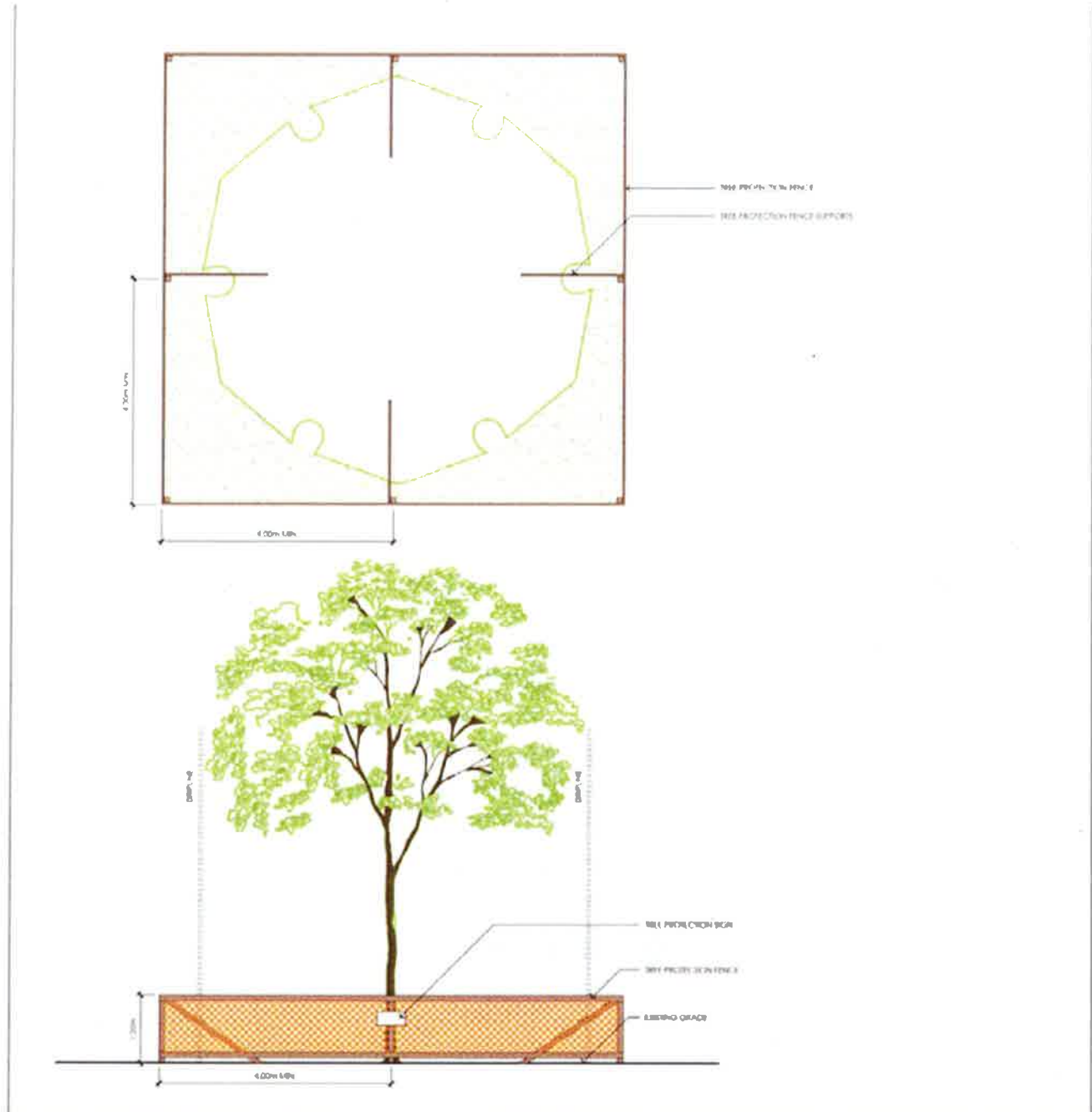


Figure 2 Construction Tree Protection Detail

Notes

1. General Note: This drawing is an artistic representation of the proposed construction and is not intended to be used for construction purposes. It is subject to change without notice.
2. Copyright Reserved.

The City of Waterton assumes no responsibility for any errors or omissions in this drawing. The City of Waterton assumes no responsibility for any errors or omissions in this drawing. The City of Waterton assumes no responsibility for any errors or omissions in this drawing.

0 300 600
meters
1:50,000 (not to scale)



Project Location
Waterton, AB

Client/Project
Parks Canada
Townsite Grounds Vegetation
Management Plan

Figure No.
5.0

Tree Protection Detail



The following should be adhered to during the construction process:

- No alteration or disturbance of the grade should occur within the TPZ;
- No equipment or construction materials should be stored within the TPZ;
- No soil, construction waste, or debris should be stored within the TPZ;
- No disposal of liquids should occur within the TPZ; and
- No vehicle, equipment, or pedestrian access through the TPZ, unless expressly permitted for the maintenance of the trees within the area.

The condition of trees within TPZs should be monitored throughout construction. A scheduled watering and monitoring program should be implemented for all trees within TPZ. Regular monitoring of the trees should occur during construction to reduce the potential that the trees are damaged by construction practices and to detect any signs of decline. Any damage or suspected damage to the trees should be rehabilitated or restored in accordance with acceptable industry standards. Trees within the TPZ should be maintained for a period of one year after construction completion. Monitoring should continue during this period to check on the continued health of the trees.

Where excavation is required within the root zone, root pruning should be completed by qualified personnel and should ensure clean cuts to facilitate wound closure. The roots should be covered with topsoil after the pruning cut has been made.

TREE REMOVAL

Throughout the Townsite, there may be trees that require removal. Reasons for tree removal may include:

- Trees restricting with desired development plan;
- Trees causing a risk or hazard post construction; and/or
- Trees causing a risk due to health and potential to cause damage.

In the event that a tree requires removal, a Succession Plan has been created to assist Landscape Architects or Designers with a planting scheme to replace the tree with appropriate vegetation.

SUCCESSION PLAN FOR TREE REPLACEMENT

The principals for the Succession Plan include replacing all non-native tree species with a 3:1 replacement ratio based on canopy cover. The replacement of trees includes using native trees of different sizes (Table 3 [H-1]). Over time, this will allow the public and green areas within the Townsite to be composed of trees of different size, age and species diversity, reflecting the natural surroundings.

The strategy recommended for this Succession Plan is to use trees of different sizes. Available sizes and appropriate tree species are outlined in Table 3 (H-1). The ratio of basket trees and potted trees was determined by estimating the amount of canopy cover needed to replace what is removed. The ratio of choosing deciduous trees or coniferous trees should be approximately 1:2 to 1:2.5 ratios as it will better emanate the surrounding landscape. The combinations of deciduous to coniferous species may vary from what is displayed in Figure H-1. The following combinations of trees should be used to guide planting for succession. Any removed trees should be replaced using the following combinations:



Appendix 4 WLNP General Project Best Management Practices Waterton Townsite Tree Protection and Succession Implementation Plan

- Combination #1 one tree removed and replaced with three basket trees of different sizes;
- Combination #2 one tree removed and replaced with two basket trees of different sizes and three potted trees of different sizes; or
- Combination #3 one tree removed and replaced with one basket tree and eight potted trees using as much variety in size as available.

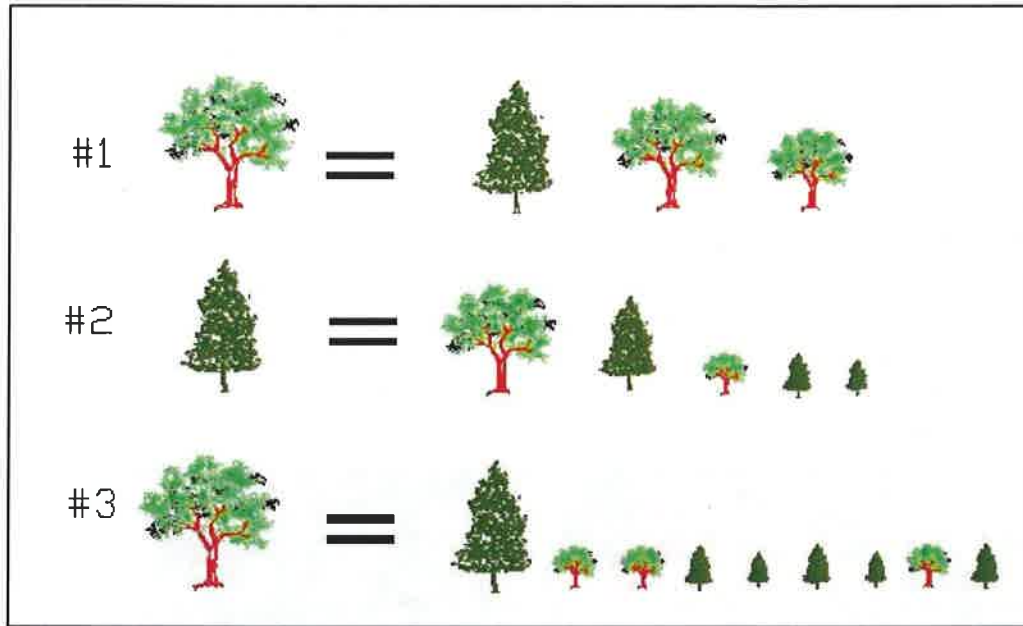


Figure 3 Three Tree Replacement Combinations

* Deciduous and coniferous species are subject to change within the above combination schemes.

Table 3 Tree Replacement Options and Sizes Available

Common Name	Scientific Name	Available size options in baskets	Available size options in pots	Fire resistant/ low palatability	Appropriate Townsite landscape zones
white spruce	<i>Picea glauca</i>	125cm, 150cm, 200cm, 250cm, 300cm, 350cm, 400cm, 450cm,	#1, #5	Low palatability	Zone 1, 2, 3
Douglas fir	<i>Pseudotsuga menziesii</i>	125cm, 150cm, 200cm, 250cm,	#1, #5	Fire resistant	Zone 1, 3
trembling aspen	<i>Populus tremuloides</i>	40mm, 50mm, 60mm, 70mm, 80mm, 90mm, 100mm	#5, #7, #10, #15	Fire resistant	Zone 1, 2, 3, 4, 5
balsam poplar	<i>Populus balsamifera</i>	50mm, 60mm, 70mm, 80mm	#7	Fire resistant and low palatability	Zone 1, 2, 3, 4, 5



Common Name	Scientific Name	Available size options in baskets	Available size options in pots	Fire resistant/low palatability	Appropriate Townsite landscape zones
<p>NOTE:</p> <p>Zone 5 is located along Cameron Creek (in the Townsite), following the creek south to the shoreline and north along the shoreline; it then curves around the Marina stopping at the tip of Emerald Bay. When replacement planting within Zone 5 between Waterton Avenue and the shoreline special consideration for planting choices will be needed. The shoreline area has a high flooding risk requiring more flood-resistant species selection. When planting in the flood plain species such as willows and river birch should be used. An Erosion and Sediment Control Plan should also be considered before planting in these locations to ensure the long-term sustainability of the plantings.</p>					

Tree Replacement Locations

Within the Waterton Townsite there are multiple locations that are suitable for tree replacement in accordance with the Successional Plan. It is recommended to plant new trees in any green space that will sustain healthy trees. Contractors are recommended to begin planting within Lot A, B, C, D and the Waterton Campground. Below is a map that shows the locations of the Lots that will be refurbished over time (Figure 6).



Figure 4 Waterton Townsite showing lot locations for potential tree planting



Appendix 5 Trees and Shrubs Recommended for Waterton Park Townsite

The following is a condensed list of native tree and shrub species which are recommended for planting in the Waterton Townsite area. Species of trees and shrubs native to the Waterton area are the preferred species to be used when planting and should be sourced locally to prevent the introduction of non-native varieties. Where possible species have been selected to minimize the attraction to wildlife (bears, deer, elk) and have reduced fire risk potential. Species not found on this list must be approved by the Park Ecologist (Vegetation) or representative prior to planting.

TREES

Coniferous

Douglas fir (*Pseudotsuga menziesii*) – medium browse; medium fire

- Growing to 10 metres or more with a massive trunk and dense, spreading branches. Occurs at low elevations on dry exposed slopes and ridges.
- A primary species on disturbed sites, it occupies a variety of habitats from moist to very dry soils
- Adaptable to most sites; therefore good survival rate
- Good windthrow resistance; good shade tree
- Plant well away from eaves troughs (high needle cast)

White Spruce (*Picea glauca*) – Low browse; high fire

- Often somewhat bluish-green with a dense crown, up to 15 metres in height.
- Best on a moist site; needs a great deal of water, especially after transplanting
- Good shade tree; wind and shade tolerant.
- Colorado Spruce is not a desirable alternative; it's non-native

Lodgepole Pine (*Pinus contorta*) – low browse; high fire

- Occurs on a wide variety of soils, at low to middle elevations
- Young trees are intolerant of shade and grow best on dry exposed sites

Deciduous:

Trembling aspen (*Populus tremuloides*) – high browse; very low fire

- Rather small and more or less rounded leaves
- Mature trees form groves from root suckers.
- Require a moderately moist site
- NOTE – lots of hybrid and cultivar species available – these must not be used.

Balsam Poplar (*Populus balsamifera*) – high browse; very low fire

- Tall tree growing best along creek-beds and lakeshores (requires a moist site)
 - Long, wide leaf-blades
 - Sticky seed scales can be a nuisance; roots can surface

Paper Birch (*Betula papyrifera*) – low browse; very low fire



- A slender, long-branched tree – 10-25 m tall, mature bark mostly white; peeling
- Moist upland sites; shade intolerant
- Can withstand moderate drought once established

Water Birch (*Betula occidentalis*) – low browse; very low fire

- Smaller tree - <10m; dark-reddish brown bark that does not peel.
- Good early successional species in moist areas

SHRUBS:

Mountain Maple (*Acer glabrum*) – medium browse; very-low fire

- A red-stemmed shrub growing to a few metres tall. Typical "maple leaf" shaped leaf blades
- Will grow on rocky sites

Shrubby Cinquefoil (*Potentilla fruticosa*) – low browse; low fire

- A coarse shrub of grasslands and open places, decorated June to September with numerous small, yellow, rose-like flowers.
- NOTE – lots of hybrid and cultivar species available – these must not be used.

Red Osier Dogwood (*Cornus stolonifera*) - high browse; low fire

- Willow-like shrub with distinct red bark and small greenish-white flowers; 1 to 3 metres tall
- grows best in damp, somewhat sheltered places

Wolf Willow (*Elaeagnus commutata*) – medium browse; low fire

- Leaves silvery in colour; exhibits small yellow aromatic flowers in June/July
- Forms small groves in seepage areas
- NOTE – lots of hybrid and cultivar species available – these must not be used.

Snowberry (*Symphoricarpos albus*) – medium browse; low fire

- Common in a variety of habitats
- Small bell-shaped flowers June to August

Buffalo-berry (*Shepherdia canadensis*) – medium browse; low fire

- PLANT MALE SHRUBS ONLY
- Spreading shrub to 3m tall

Common Wild Rose (*Rosa woodsii*) – medium browse; low fire

- Exhibits bright pink flowers in June and July
- Open woods and thickets, some tolerance to sandy areas

Prickly Rose (*Rosa accicularis*) – high browse; low fire

- Branching shrub, up to 1.5 metres high
- Open woods and moist thickets

Tree Standards:



Appendix 5 WLNP General Project Best Management Practices
Trees and Shrubs Recommended for Waterton Park Townsite

- In cases of tree replacement, the three replacement trees should be as large as available, with a 15 gallon root size and at least 3/4" trunk size. If 15 gallon native trees are not available, on approval of the Parks Canada Surveillance Officer (SO), four 10 gallon trees may be planted instead.
- All trees must be guaranteed for one year (one growing season).
- Trees shall be inspected immediately after initial planting and during the growing season by a designated Parks Canada SO. After the growing season, the SO will determine final acceptance of the tree.
- Any planted tree that is dead or, in the opinion of the SO, is in an unhealthy or unsightly condition, and/or has lost its natural shape due to dead branches, excessive pruning, inadequate or improper maintenance, or other causes prior to final acceptance, shall be replaced in the next planting season. There shall be a growing season guarantee on trees commencing after the final inspection of the permitted planting.
- Where dead trees are identified, the dead material shall be removed within four (4) weeks of notification. When necessary, approved soil and grass seed shall be added to the pit to reclaim the site and eliminate potential tripping hazards at the time of removal.

General Tips:

- Select the right tree for the site. It is important to match your planting site and its conditions with a tree species' shade, moisture, and soil preferences.
- Plants should be put in the ground in autumn or spring and fenced immediately to prevent animal damage.
- Frequent watering is necessary for the weeks following transplantation or first growing season, and if possible up to the first frost.
- It is advisable to screen young plants from wind over the winter.
- Avoid planting dense clusters of shrubs; this helps limit cover for large animals such as cougars and reduces fire hazards.
- Even "fire resistant" vegetation will burn if the plant's moisture content is low.
- To prevent the spread of non-native species and reduce the appeal of the townsite for animals such as deer and bear, please avoid planting the following:
 - Saskatoon (*Amelanchier alnifolia*) - berries attract bears
 - Chokecherry (*Prunus virginiana*) - cherries can attract bears
 - Pincherry (*Prunus pennsylvanica*) - cherries can attract bears



Appendix 6 List of Non-Native Species of Local Concern

Contact the Impact Assessment Office for more information about potential site specific non-native species of concern.

Table 4 Non-native Species Listed by the Alberta Weed Control Act

Common Name	Scientific Name
Prohibited Noxious	
autumn olive	<i>Elaeagnus umbellata</i> Thunb.
balsam, Himalayan	<i>Impatiens glandulifera</i> Royle
barberry, common	<i>Berberis vulgaris</i> L.
bartsia, red	<i>Odontites vernus</i> (Bellardi) Dumort
buckthorn, common	<i>Rhamnus cathartica</i> L.
cinquefoil, sulphur	<i>Potentilla recta</i> L.
crupina, common	<i>Crupina vulgaris</i> Pers. ex Cass.
dyer's woad	<i>Isatis tinctoria</i> L.
Eurasian water milfoil	<i>Myriophyllum spicatum</i> L.
flowering rush	<i>Butomus umbellatus</i> L.
garlic mustard	<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande
goatgrass, jointed	<i>Aegilops cylindrica</i> Host
hawkweed, meadow	<i>Hieracium caespitosum</i> Dumort.
hawkweed, mouse-ear	<i>Hieracium pilosella</i> L.
hawkweed, orange	<i>Hieracium aurantiacum</i> L.
hoary alyssum	<i>Berteroa incana</i> (L.) DC.
hogweed, giant	<i>Heracleum mantegazzianum</i> Sommier & Levier
iris, pale yellow	<i>Iris pseudacorus</i> L.
knapweed, bighead	<i>Centaurea macrocephala</i> Puschk. ex Willd.
knapweed, black	<i>Centaurea nigra</i> L.
knapweed, brown	<i>Centaurea jacea</i> L.
knapweed, diffuse	<i>Centaurea diffusa</i> Lam.
knapweed, hybrid	<i>Centaurea</i> × <i>psammogena</i> Gáyer
knapweed, meadow	<i>Centaurea</i> × <i>moncktonii</i> C. E. Britton
knapweed, Russian	<i>Rhaponticum repens</i> (L.) Hidalgo
knapweed, spotted	<i>Centaurea stoebe</i> L. ssp. <i>Micranthos</i> (Gugler) Hayek
knapweed, squarrose	<i>Centaurea virgata</i> Lam. ssp. <i>squarrosa</i> (Willd.) Gugler
knotweed, giant	<i>Fallopia sachalinensis</i> (F. Schmidt Petrop.) Ronse Decr.
knotweed, hybrid Japanese	<i>Fallopia</i> × <i>bohémica</i> (Chrtek & Chrtková) J. P. Bailey
knotweed, Japanese	<i>Fallopia japonica</i> (Houtt.) Ronse Decr.
loosestrife, purple	<i>Lythrum salicaria</i> L.
medusahead	<i>Taeniatherum caput-medusae</i> (L.) Nevski
nutsedge, yellow	<i>Cyperus esculentus</i> L.
puncturevine	<i>Tribulus terrestris</i> L.
ragwort, tansy	<i>Jacobaea vulgaris</i> Gaertn.
rush skeletonweed	<i>Chondrilla juncea</i> L.
saltcedar	<i>Tamarix ramosissima</i> Ledeb.
saltlover	<i>Halogeton glomeratus</i> (M. Bieb.) C.A. Mey.
St John's-wort, common	<i>Hypericum perforatum</i> L.
starthistle, yellow	<i>Centaurea solstitialis</i> L.
tamarisk, Chinese	<i>Tamarix chinensis</i> Lour.
tamarisk, smallflower	<i>Tamarix parviflora</i> DC.



WLNP General Project Best Management Practices
Appendix 6 List of Non-Native Species of Local Concern

Common Name	Scientific Name
thistle, marsh	<i>Cirsium palustre</i> (L.) Scop.
thistle, nodding	<i>Carduus nutans</i> L.
thistle, plumeless	<i>Carduus acanthoides</i> L.
Noxious	
baby's-breath, common	<i>Gypsophila paniculata</i> L.
bellflower, creeping	<i>Campanula rapunculoides</i> L.
bindweed, field	<i>Convolvulus arvensis</i> L.
blueweed	<i>Echium vulgare</i> L.
brome, downy	<i>Bromus tectorum</i> L.
brome, Japanese	<i>Bromus japonicus</i> Thunb.
burdock, great	<i>Arctium lappa</i> L.
burdock, lesser	<i>Arctium minus</i> (Hill) Bernh.
burdock, woolly	<i>Arctium tomentosum</i> Mill.
buttercup, tall	<i>Ranunculus acris</i> L.
chamomile, scentless	<i>Tripleurospermum inodorum</i> (L.) Sch. Bip.
clematis, yellow	<i>Clematis tangutica</i> (Maxim.) Korsh.
cockle, white	<i>Silene latifolia</i> Poir. ssp. <i>alba</i> (Miller) Greuter & Burdet
daisy, oxeye	<i>Leucanthemum vulgare</i> Lam.
dame's rocket	<i>Hesperis matronalis</i> L.
henbane, black	<i>Hyoscyamus niger</i> L.
hoary cress, globe-podded	<i>Lepidium appelianum</i> Al-Shehbaz
hoary cress, heart-podded	<i>Lepidium draba</i> L.
hoary cress, lens-podded	<i>Lepidium chalepense</i> L.
hound's-tongue	<i>Cynoglossum officinale</i> L.
mullein, common	<i>Verbascum thapsus</i> L.
pepper-grass, broad-leaved	<i>Lepidium latifolium</i> L.
scabious, field	<i>Knautia arvensis</i> (L.) Coult.
sow thistle, perennial	<i>Sonchus arvensis</i> L.
spurge, leafy	<i>Euphorbia esula</i> L.
tansy, common	<i>Tanacetum vulgare</i> L.
thistle, Canada	<i>Cirsium arvense</i> (L.) Scop.
toadflax, Dalmatian	<i>Linaria dalmatica</i> (L.) Mill.
toadflax, yellow	<i>Linaria vulgaris</i> Mill.

Table 5 List of non-native species of local concern considered invasive in natural habitats.

Common Name	Scientific Name



Appendix 7 Zoning & Planning Areas

Several zoning and area designations are useful in planning, understanding potential project effects and for developing and choosing appropriate mitigations. Five zones plus an Environmentally Sensitive Site (ESS) are outlined in the [Park Management Plan](#).

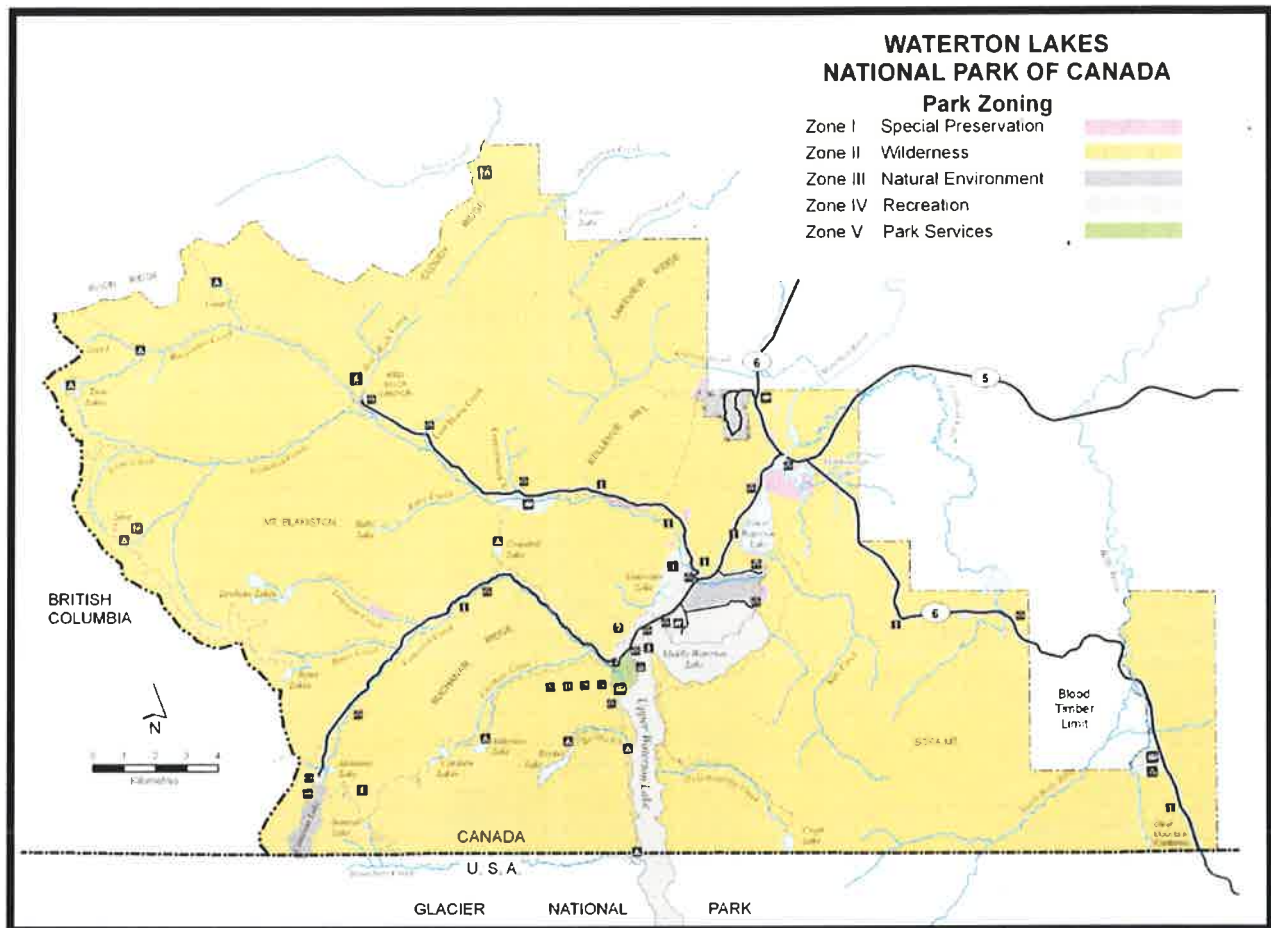


Figure 5 Waterton Lakes National Park of Canada Park Zoning Map

Zone I: Special Preservation

- Resource sensitivity is the key consideration in designating Zone I areas.
- The Maskinonge wetlands contain some of the few remaining wetlands in southwestern Alberta. This area is an important waterfowl staging and nesting area. Several rare bird species such as Trumpeter swans, Hooded mergansers and Red-necked grebes frequent the area. Two significant archaeological sites on the shores of Maskinonge Lake have been included in the Zone I designation.
- The Historic Sites and Monuments Board of Canada recommended the Lineham Discovery Well, the first oil well in Western Canada, as a national historic site on May 17, 1965. The site is marked with a plaque which commemorates the “First Oil Well in Western Canada.”



- There are approximately 250 known archaeological sites in Waterton Lakes National Park, dating back almost 11,000 years. Zone I designation is applied to the most significant of these sites.

Zone II: Declared Wilderness Area

- Only those activities are allowed which are required for: park administration; public safety; provision of basic user facilities including trails and rudimentary campsites; the carrying on of traditional resource harvesting activities where authorized; and in exceptional circumstances, access by air.
- For more information on DWA consult G:\Common\Planning\Declared Wilderness Areas

Zone III: Natural Environment

- Applies to areas where visitor use requires facilities that exceed the acceptable standards for Zone II.
- Motorized access is limited and controlled.
- Rigorous protection is required because of the area's ecological and aesthetic importance.

Zone IV: Recreation

- Zone IV also includes the Upper and Middle Waterton Lakes to accommodate motorized access. Note that trailer launched and motorized watercraft are no longer permitted in Upper and Middle Waterton Lakes.

Zone V: Park Services

- The Community Plan outlines the **Land Use Districts** in the Waterton Community (Environmental Reserve, Recreational Reserve, Commercial Retail, Commercial Accommodation, Institutional, Campground, Parking, Cottage)

Environmentally Sensitive Sites (ESS)

- The Park Management Plan recognizes the foothills rough fescue grasslands as an ESS in Waterton Lakes National Park. The foothills rough fescue grasslands form a narrow band that stretches along the plains and foothills from southern Alberta into Montana. The ESS is not spatially defined, however, a figure that outlines the grassland portions of WLNP is included below.

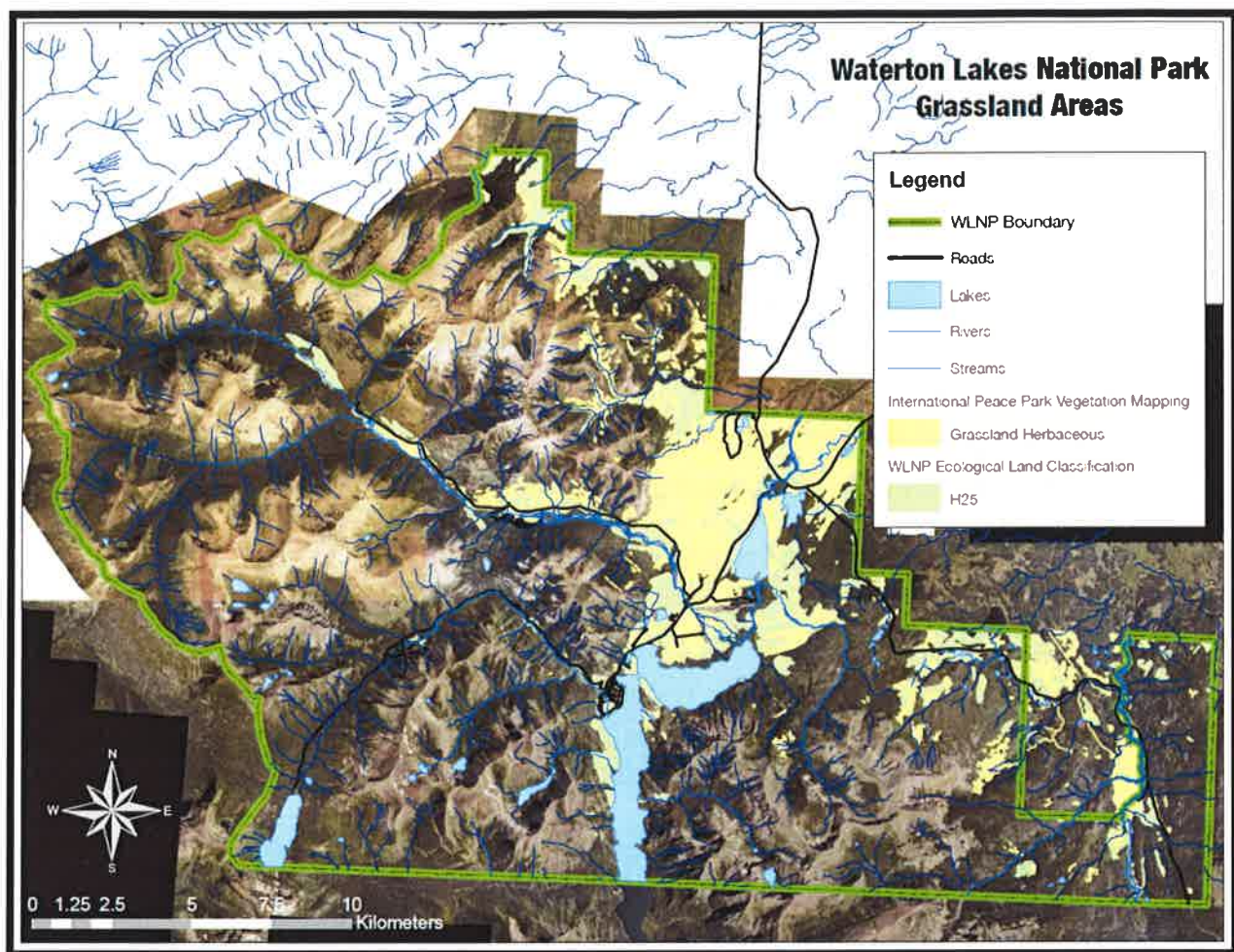


Figure 6 Grassland Areas in Waterton Lakes National Park.

Planning Areas

In addition to formal zoning, the park management plan identifies several Planning Areas that may be useful in in planning, understanding potential project effects and for developing and choosing appropriate mitigations. Some of the key ecological factors, seasonal closures and other considerations that may be relevant to impact analysis in each planning area is included below. (Note that information additional to the Management Plan is included.)

Survey	Notes
Waterton Valley	Seasonal closure of the fan reduces disturbance of elk during rut. Area contains critical habitat for half-moon hairstreak butterfly. Dynamic natural processes occur on the alluvial Blakiston Fan. Invasive plant control is a management priority. Location of northern leopard frog re-introduction. Contains known salamander migration areas. Contains fescue grassland ESS.
Waterton Community	Efforts to include natural areas and a natural aesthetic are important goals of the Community Plan. Need to maintain and monitor wildlife corridors in and around the community.



WLNP General Project Best Management Practices Appendix 7 Zoning & Planning Areas

Survey	Notes
	Community planning involves working to reduce human-wildlife conflict. Dark sky compliance and upgrading is on-going work. There is an important archaeological site at Emerald Bay that likely extends into the yard of the superintendent.
Blakiston Valley	Winter road closure reduces disturbance of ungulates in their winter range. Prescribed fire is an important management tool.
Belly River	Park Management Plan outlines that no new trails will be developed in Belly River Area to maintain secure habitat and a wilderness experience for visitors. Grizzly Bear secure habitat thresholds are used as part of the Ecological Integrity indicators for WLNP. Human use (e.g., trailheads, trails) can move habitat from "secure" to "unsuitable due to human use". (See figure of secure habitat). The highway is not actively maintained in winter which functions to reduce human use in this planning area.
Cameron Valley	Contains critical habitat for Bolander's quillwort. Parking congestion along the parkway has resulted in people parking in ditches and non-hardened areas and the refurbishment of trailheads and Cameron Lake DUA is in progress. The First Oil Well National Historic Site and several cultural resources are adjacent to the Akamina Parkway (Zone I).
Foothills	Contains foothills rough fescue environmentally sensitive site. Includes wilderness and equestrian opportunities.
*Park Waterbodies	Public use of motorboats and trailer-launched boats is no longer permitted due to risk of aquatic invasive species. An educational self-inspection of human-powered watercraft is required.



Appendix 8 Lighting / Dark Sky Compliance Guidelines

Outdoor lighting is required for a variety of reasons, including safety and visitor experience. Best Practices are that any required lighting be used wisely. To minimize the harmful effects of light pollution, the [International Dark-Sky Association](http://www.darksky.org) (IDA) promotes that lighting should:

- Only be on when needed,
- Only light the area that needs it,
- Be no brighter than necessary,
- Minimize blue light emissions,
- Be fully shielded (pointing downward).

The IDA provides an easy visual guide to understand the differences between unacceptable, unshielded light fixtures and those fully shielded fixtures that minimize skyglow, glare and light trespass. Additional information on types of light, colour temperature, and sourcing compliant lights is available on the IDA website darksky.org.

Resources to assist the IAO are available at: G:\Electronic Bookshelf\Park Management\Dark Sky

Dick, Robert. 2014. Report on Current Lighting within Waterton Lakes National Park, Specifically the Town Site of Waterton. Report presented to Parks Canada.

Dick, Robert. 2013. [Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.]

Guidelines for Outdoor Lighting in Dark Sky Preserves. Royal Astronomical Society of Canada, March 2008 (Revised: Summer 2013)
http://rasc.ca/sites/default/files/RASC%20DSP%20GOL%20-%20Summer%202013_0.pdf

Parks Canada. 2008. Guidelines and Specifications for Outdoor Lighting at Parks Canada, March 2008 (Revised: February 2016).

http://intranet2/media/2685129/guidelines_and_specifications_for_outdoor_lighting_2016.pdf

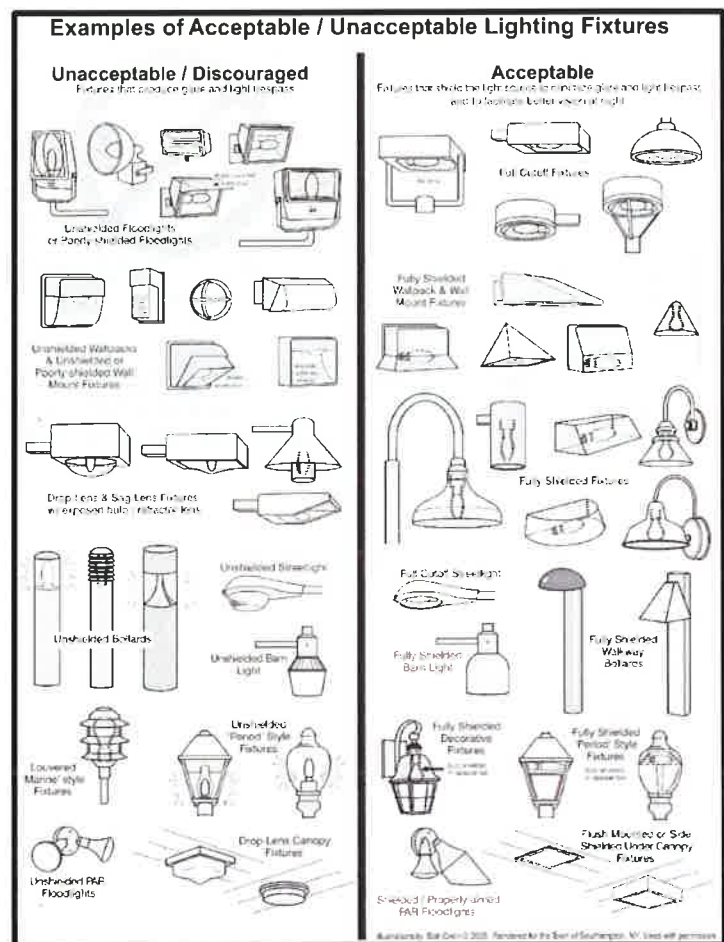


Figure 7 Examples of Acceptable / Unacceptable Lighting Fixtures.



Appendix 9 Details on Timing Windows and Setbacks

Timing Windows

Several seasonal timing restrictions and area setbacks are regularly applied in WLNP. These are most commonly applied for activities that can disrupt plants and animals such as vegetation removal, but may be applicable for other activities. For individual projects, the relevant timing windows are summarized in the General Mitigations section. As a best practice, activities should be planned to avoid the restricted window. When activities occur within a timing window, additional mitigations or setbacks may apply.

- Migratory Bird General Breeding Period – April 1 to August 31
 - Bat Maternity Roost Activity Period – April 1 to August 31
 - Bat General Activity Period – April 1 to October 31
 - Amphibian Calling Window – April 15 to June 15
 - Bull Trout Restricted Work Periods – August 31 to August 15
 - Other Fish Species Restricted Work Periods – Consult IAO for location specific advice
 - Grassland Dormancy – October 1 to February 28
 - Additional Timing Considerations (e.g., weed seed set, soil protection) – Dry late summer and fall conditions, avoidance of wet spring
 - Wolf Natal Den – May 1 to July 15
 - Sharp-tailed Grouse Lek – March 15 to June 15
 - Critical Ungulate Winter Range* – December 1 to May 15
- *Consistent with Glacier National Park, Montana

Setback Guidance

Several jurisdictions provide setback and timing guidelines that may assist the IAO in determining the appropriate setback for an activity.

- Stepping Back from the Water Guidelines A BMP guide for new development near water bodies in Alberta's Settled Region.
- Saskatchewan Activity Restriction Guidelines for Sensitive Species.
- Petroleum Industry Activity Guidelines for Wildlife Species at Risk in the Prairie and Northern Region.
- Alberta Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta.

Environment Canada (Gregoire 2015) provided WLNP additional setback advice for Species at Risk. Note that these setbacks are provided as general feedback and do not present site or project specific guidance.

- Baird's Sparrow (Special Concern COSEWIC) May 15 to August 31. 200m setbacks from nests.
- Barn Swallow (Threatened COSEWIC). May 1 to August 31. 100m setback from active nests.



WLNP General Project Best Management Practices
Appendix 9 Details on Timing Windows and Setbacks

- Bobolink (Threatened COSEWIC). May 1 to August 31. 200m setback from active nests.
- Canada Warbler (Threatened SARA). May 1 to July 31 300m (high disturbance) 150m (medium) 0-50m (low)
- Chestnut-collared Longspur (Threatened COSEWIC). May 1 to August 31. 200m setback from active nests.
- Chimney swift (Threatened SARA). April 1 to August 31. 100m setback from active nests.
- Common Nighthawk (Special Concern SARA) May 1 to August 31 200m (high disturbance) 100m (medium) 0-50m (low)
- Horned Grebe (Special Concern COSEWIC). April 1 to August 31. 100m setback from the high water mark of the wetland or waterbody containing a nest.
- Olive-sided Flycatcher (Threatened SARA) May 1 to August 31 300m (high disturbance) 150m (medium) 0-50m (low)
- Rusty Blackbird (Special Concern SARA) May 1 to July 31 300m (high disturbance) 150m (medium) 0-50m (low)
- American Badger (Special Concern COSEWIC) 200m from natal den.
- Monarch Butterfly (Special Concern SARA). June 1 to September 30. 30m setback from occupied host plants.



Re: CRM Preliminary Comments Alpine Stable Complex

Bill Perry to: Eri Hiraga

Cc: Gwenaelle Le Parlouer

26/07/2018 04:35 PM

Gwenaelle Le Parlouer	CRM Preliminary Comments Alpine Stable Complex
Eri Hiraga	<i>Hi Gwenaelle, Just noticed that the circled Alpine Stables Location is v</i>
Gwenaelle Le Parlouer	<i>Dam :-(((((((Thanks Eri for this. I am going to change the visual</i>
Eri Hiraga	<i>Here is a KMZ. -----</i>
Eri Hiraga	<i>Hi Bill, Just an update on the Alpine Stables Project. Here is the 90% c</i>

Hi Eri, just had a look at the revised plans. Previously, the AOA for the waterline recommended Chance Finds protocol. I'm still happy with that for that segment of the work.

For the larger footprint of the stables etc I'd like to be informed when the foundation and trenching activities take place, including the scheduling of the waterline trenching so that we can do archaeological monitoring as required. Otherwise, chance finds will apply. I'll modify the original AOA for the waterline to now include the entire Alpine Stables project.

best to you and sorry this is late. Been crazier than usual lately :)

Bill

Bill Perry

Archaeologist

Direction de l'archéologie et de l'histoire | Archaeology and History Branch

Direction générale des affaires autochtones et du patrimoine culturel/Indigenous Affairs and Cultural

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Eri Hiraga

Hi Bill, Just an update on the Alpine Stables Pro...

19/07/2018 08:57:51 AM

From: Eri Hiraga/NOTES/PC/CA
To: Bill Perry/NOTES/PC/CA@PC
Cc: Shelley Bruce/NOTES/PC/CA@PC, Gwenaelle Le Parlouer/NOTES/PC/CA@PC
Date: 19/07/2018 08:57 AM
Subject: Re: CRM Preliminary Comments Alpine Stable Complex

Hi Bill,

Just an update on the Alpine Stables Project. Here is the 90% drawing for the foundations and utilities that we received this week, which should give you a better idea at the extent of ground disturbance.
[attachment "323 WLNP ALPINE STABLES 90% Foundation Package.pdf" deleted by Bill Perry/NOTES/PC/CA]

The waterline install is part of the Alpine Stables Project. This is the previous AOA that we had for that project. There is a change in project scope and the project will no longer be directionally drilled. It will be trenched in, which may impact the previous recommendations.
[attachment "AOA Alpine stables waterline, WLNP 2016.pdf" deleted by Bill Perry/NOTES/PC/CA]

Please give me a call if you have any questions.

Thanks,

Eri

Eri Hiraga, P.Biol.

Environmental Assessment Officer, Waterton Lakes National Park / Bar U Ranch National Historic Site
Parks Canada / Government of Canada
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eri.hiraga@pc.gc.ca / Cel.: 403-632-6071

Agente, Évaluations environnementales, Parc National des Lacs-Waterton / Lieu historique national du Ranch-Bar U
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Box 200, Waterton Park AB, Canada T0K 2M0
eri.hiraga@pc.gc.ca / Tél. cell.: 403-632-6071

Parks Canada - 450 000 km² of memories / Parcs Canada - 450 000 km² de souvenirs

Gwenaelle Le Parlouer Hi Bill, Shelley and I have reviewed this proj... 18/07/2018 01:55:37 PM

From: Gwenaelle Le Parlouer/NOTES/PC/CA
To: Bill Perry/NOTES/PC/CA@PC
Cc: Shelley Bruce/NOTES/PC/CA@PC, Eri Hiraga/NOTES/PC/CA@PC
Date: 18/07/2018 01:55 PM
Subject: CRM Preliminary Comments Alpine Stable Complex

Hi Bill,

Shelley and I have reviewed this project. Based on the drawings, it seems that the size of the buildings would be larger. I don't know whether this is a concern for you.

Hoping you are well and not too swamped with field work :-)

Cheers,

[attachment "CRM Preliminary comments_Alpine Stable Reconstruction_final.docx" deleted by Eri Hiraga/NOTES/PC/CA]

Gwénaëlle Le Parlouër

Policy Advisor, Cultural Resources Management | Conseillère de la gestion des ressources culturelles
Indigenous Affairs and Cultural Heritage Directorate (IACH) | Direction générale des affaires autochtones et du patrimoine culturel (AAPC)

Parcs Canada / Parks Canada

Politiques du patrimoine culturel | Cultural Heritage Policies

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**Archaeological Overview Assessment
Post fire Contaminated Site Clean-up,
Waterton Lakes National Park of Canada.**

*Prepared by Bill Perry, Archaeologist, IACHD, Parks Canada
September 27, 2017*

Disclaimer

This document contains sensitive information about archaeological and cultural resources that are protected under provisions of the *Canada National Parks Act*, and the Parks Canada Agency *Cultural Resource Management Policy* and *Parks Canada Guidelines for the Management of Archaeological Resources*. This information is to be used to assist in planning the proposed project only, and should be used in consultation with Parks Canada Archaeologists. It is not to be disseminated, and no copies of this document are to be made without the written permission of the Archaeology and History Branch, Parks Canada.

Purpose and Background

The objective of the project is to identify archaeological concerns for various locations where areas of contamination have been identified after the recent wildfire in Waterton Lakes National Park. The project was outlined to the author by Brent O'Rae, Environmental Program Advisor, Environmental Management and Security, Parks Canada (pers. Comm. dated Sept 22, 2017) who is conducting the contaminated site analysis on behalf of Waterton Lakes National Park. Thirty six contaminated sites were examined for conflict with archaeological resources. A list of these sites and a Google Earth map layer were provided to help determine the impacts to the archaeology of the park.

Observations

This assessment is based on my knowledge of the cultural resources in Waterton Lakes National Park, gained through reviews of the archaeological records and my own extensive field work in the mountain parks. Based on this knowledge I am able to provide the following observations.

- In general, most of the sites occur within previously disturbed areas. This does not totally discount the presence of archaeology however, as past disturbance may not have completely erased the archaeology and if the past historic use is old enough, may be part of the archaeology. In these areas the "chance finds" protocol outlined later in this document was recommended.
- The project areas include buildings or structures that may hold historic value. This document only comments on archaeological resource management. These structures have therefore been recommended for assessment by both parks and national office historic structures experts.
- Some areas that will be remediated have been recommended for review by Terrestrial Archaeology due to either the archaeological potential of the site or landform or the significance of adjacent archaeological sites. Recommendations therefore include all subsurface disturbances related to remediation that exceed the building/utility etc footprints. Chance finds protocol will suffice for finds within the disturbed footprints.
- Detailed observations and recommendations can be found in Table 1 below.



Management Concerns and Project Recommendations

The following interventions are **required**:

WLNP

Kenow Wildfire 2017

Structural Impact - Contaminated Sites

Structure	Location	Latitude	Longitude	Archaeological Requirements
Generator House	Crandell Campground	49.098951	-113.945626	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended.
Wood Shed	Crandell Campground	49.098909	-113.946556	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended.
Loop B - Washroom	Crandell Campground	49.098901	-113.949499	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended.
Loop B - Shelter	Crandell Campground	49.098901	-113.950099	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended. If the shelter is over 40 years, it should be reviewed for historical significance.
Loop G - washroom	Crandell Campground	49.099192	-113.953793	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended.
Loop G - Cook Shelter	Crandell Campground	49.099201	-113.953699	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended. If the shelter is over 40 years, it should be reviewed for historical significance.
Loop L - Shelter	Crandell Campground	49.100101	-113.959799	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended. If the shelter is over 40 years, it should be reviewed for historical significance.
Interpretive Theatre	Crandell Campground	49.097301	-113.954399	Precontact era archaeology nearby but landform has limited potential. Chance finds protocol is recommended.
Jet Fuel EnviroShed	Helipad	49.070141	-113.897939	No immediate concerns at this location – well within the compound. Historic structural remains however are located adjacent to the entrance highway and any potential fuel leaks associated with the enviroshed destruction may creep downslope into the historic zone. If this is detected, additional review will be required.



VRC	Highway 5 at Bears Hump Trail Head	49.060271	-113.908399	The landform has limited archaeological potential. The surrounding areas however, have high potential and known significant sites are located nearby. Terrestrial Archaeology therefore requires a review of any ground disturbance related to the post fire cleanup of this structure and utilities that go beyond its original footprint.
Horse Corral	Upper compound	49.069668	-113.899227	No immediate concerns. The landform does have archaeological potential however, so chance finds protocol is recommended.
Chip pile	Upper compound	49.069317		No concerns. Nearby cairn on hill to southeast (584R) 1.7km away. Chance finds protocol is recommended.
Sewage Lines	Sewage Pond	49.071736	-113.897976	Site 577R located 200m north on edge of Lonesome Lake. Site is noted as destroyed. Chance finds protocol is recommended as the landform has archaeological potential.
Gate House	Park Entrance	49.115031	-113.842989	No archaeology nearby but landform has some potential. Any remedial work that goes beyond the present disturbed footprint needs to be reviewed by Terrestrial Archaeology.
Heavy Equipment	Park Entrance	49.115031	-113.842989	Same location as previous. No archaeology nearby but landform has some potential. Any remedial work that goes beyond the present disturbed footprint needs to be reviewed by Terrestrial Archaeology.
sleep shelters	Canyon Church Camp	49.100356	-113.963125	Site 1486R is the historic Canyon Church Camp. The landform has some potential (adjacent nearby precontact campsite 656R) but mostly the buildings need to be reviewed for historic significance. Any remedial activities involving ground disturbance will require archaeological review.
hospital	Canyon Church Camp	49.100429	-113.96274	Site 1486R is the historic Canyon Church Camp. The landform has some potential (adjacent nearby precontact campsite 656R) but mostly the buildings need to be reviewed for historic significance. Any remedial activities involving ground disturbance will require archaeological review.
utility building	Canyon Church Camp	49.100429	-113.96274	Site 1486R is the historic Canyon Church Camp. The landform has some potential (adjacent nearby precontact campsite 656R) but mostly the buildings need to be reviewed for historic significance. Any remedial activities involving ground disturbance will require archaeological review.
Must be the propane tank?	Canyon Church Camp	49.100429	-113.96274	Site 1486R is the historic Canyon Church Camp. The landform has some potential (adjacent nearby precontact campsite 656R) but mostly the buildings need to be reviewed for historic significance. Any remedial activities involving ground disturbance will require archaeological review.
PoW Maintenance Shed	Prince of Wales Hill (north of water tower)	49.059477	-113.906422	Site 1118R is the Prince Of Wales Hotel, national historic site. The maintenance shed was part of this designation and clean up should be respectful of this designation. Referral to the CRIA process is recommended so that historic structure experts can give recommendations as well. Any remedial activities related to the building removal and area clean up involving subsurface disturbance requires archaeological review. Nearby sites 580R and 697R argue for the precontact potential of this landform. Remedial activities associated with the cleanup of this building needs to be reviewed by Terrestrial Archaeology.



Maintenance Building	Golf Course	49.074746	-113.884881	There are no known sites at this location. The landform however, argues for archaeological potential so that remedial and rebuilding activities related to the removal and rebuilding of this structure beyond its current footprint of disturbance will require archaeological review.
Washroom	McNeally's	49.078658	-113.967721	Site 1682R is the historic McNeally's workcamp. Work conducted on site cleanup and replacement of structures and utilities will require archaeological review. Review through the CRIA process is required to determine the historic significance of the former picnic structure at this location. The washroom building itself is modern and will not need a review.
Shelter	McNeally's	49.078503	-113.967517	1682R is the historic McNeally's workcamp. Work conducted on site cleanup and replacement of structures and utilities will require archaeological review. Review through the CRIA process is required to determine the historic significance of the former picnic structure at this location.
Washroom	Little Prairie	49.040678	-114.03277	No known sites at this location. Chance finds protocol is recommended.
Solar Panel Box/Traffic Counter	approx. Dipper Trail	49.059493	-114.009434	No known sites at this location. Chance finds protocol is recommended.
Speed Sign	Little Prairie Gate	49.040593	-114.033844	No known sites at this location. Chance finds protocol is recommended.
Stables	Alpine Stables	49.068741	-113.886769	No known sites at this location. Since the area is known to have historic remains scattered throughout the general area, review by Terrestrial Archaeology is required of any ground disturbance related activities beyond the existing disturbed footprint of the burnt stables and outbuildings.
Bunk House	Alpine Stables	49.069002	-113.886514	No known sites at this location. Since the area is known to have historic remains scattered throughout the general area, review by Terrestrial Archaeology is required of any ground disturbance related activities beyond the existing disturbed footprint of the burnt stables and outbuildings.
Residence	Alpine Stables	49.069201	-113.886659	No known sites at this location. Since the area is known to have historic remains scattered throughout the general area, review by Terrestrial Archaeology is required of any ground disturbance related activities beyond the existing disturbed footprint of the burnt stables and outbuildings.
Washroom	Coppermine Creek	49.121423	-114.003119	The mining works (1503R) is located 450m upslope from this location. 695R, 658R and 1498R are precontact sites located on the hills nearby showing that the landforms and proximity to the creek affords the location archaeological potential so that any remedial activities involving subsurface disturbance will require review. The shelter may be historic and needs review through the CRIA process. The washroom is modern.
Shelter	Coppermine Creek	49.104501	-113.959399	The mining works (1503R) are located 450m upslope from this location. 695R, 658R and 1498R are precontact sites located on the hills nearby showing that the landforms and proximity to the creek affords the location archaeological potential so that any remedial activities involving subsurface disturbance



				will require review. The shelter may be historic and needs review through the CRIA process. The washroom is modern.
Shelter	Lost Horse Creek	49.120701	-113.999659	The picnic shelter may be historic and requires review for significance. Proximity to the creek affords the landform some archaeological potential requiring review of any subsurface disturbance related to remedial post burn work.
boardwalk	Blakiston Falls	49.126791	-114.03516	No known sites. Chance finds protocol is recommended.
Shed	Operations Compound	49.065735	-113.904618	Review through CRIA is recommended as we don't know anything about this shed in terms of age or history of use. No further archaeological response is warranted as the operations compound is a heavily disturbed landscape. Chance finds protocol is recommended.
Retardant spill site	Operations Compound	49.065683	-113.90437	No further archaeological response is warranted as the operations compound is a heavily disturbed landscape. If the retardant spill extends outside of the disturbed compound area or towards the lower reaches of the compound adjacent to the highway, there are known historic residences and structures that could be impacted. Review by Terrestrial Archaeology would be required.
Salamander corridor	Hwy 5	49.063736	-113.904398	The salamander corridor is located predominantly on side slopes but does traverse landforms near areas of archaeological interest. The hill immediately south of the operations compound contains a precontact archaeological site (576R) as does the landform to the east surrounding the Linnet Lake DUA (646R) where a 10,000 year old campsite lies. It is therefore recommended that remedial work involving subsurface disturbance related to the removal of past salamander structures be reviewed by Terrestrial Archaeology. This also applies to new structures being put in place at a future time.

Accidental Finds

As archaeological testing is by nature sampling (not 100 percent coverage) there could be a chance, however low, that features or artifact concentrations are encountered in the course of work. If significant features (i.e., structural remains and/or high artifact concentrations) are encountered when a professional archaeologist is not onsite, work should stop in the immediate area, photographs and a GIS reading should be taken, 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 Cited:

Verbal request and emails dated September 22, 2017

Excel file and Google Earth file provided by Brent O'Rae on September 22, 2017.

Contacts

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Tel 403-292-4692

Archaeological Overview Assessment
Alpine Stables Waterline Installation, Waterton Lakes National Park
Prepared by Gwyn Langemann, Archaeologist, IACHD
June 27, 2016

Purpose

To conduct an initial overview assessment for the waterline installation project at the Alpine Stables, Waterton Lakes National Park. This overview will identify possible impacts to archaeological and cultural resources, and provide recommendations to mitigate these impacts.

Background

Installation of a waterline is proposed, to run from the Alpine Stables up to Highway 5, along the north side of the road to the golf course access road, and then to follow the access road up hill to a point on top of the terrace near the club house. Most of the route is in the ditch of existing roads, and the waterline will be installed using directional drilling. Four boreholes will be needed at junction points, where the contractor will excavate or hydro vac.

Observations

This assessment is based on my knowledge of the cultural resources in the area, gained through a review of the archaeological records and my own extensive experience in the park. Based on this knowledge I am able to provide the following observations:

- We have no archaeological sites recorded in the immediate area of the route
- The immediate project area is already disturbed by road construction
- The area on both sides of Highway 5 has been surveyed several times in the past; for example, during impact assessments for the Chief Mountain Gas line (Reeves 1985), an AGT line (Perry and Sumpter 1988), and the Kootenay Brown bicycle trail (Langemann 2011)
- Waterline work at the golf course has been monitored, and no resources found; for example in 1998 and 1999 (Langemann and Perry 2007)
- Several finds of isolated bison bones were made as the Kootenay Brown trail was grubbed through the aspen forest west of the Alpine Stables access road, but none of these showed signs of butchering, and no artefacts were found
- The pre-contact sites nearest the route (Fig. 1) are all small finds of isolated bison bone, or burnt bone fragments (588R, 589R, 752R)
- The major known pre-contact campsites are considerably west of the project area, at Linnet Lake and at the Narrows between Upper and Middle Waterton Lakes
- The historic sites nearby are the location of an 1874 Boundary Commission surveyor's camp (also at 752R), and an historic dump site with material from the early 1900s (1540R), possibly related to the summer camps on the shore of Middle Waterton Lake

Recommendations

I do not recommend any further archaeological assessment of this project. There are no archaeological concerns.

Accidental Finds

As archaeological testing is by nature sampling (not 100 percent coverage) there could be a chance, however low, that features or artifact concentrations are encountered in the course of work on the waterline. There are known sites in the area, and workers might be expected to encounter historic objects. Isolated historic objects such as bottles or tin cans may well be found, and these are not a reason to stop work. If significant features (i.e., structural remains and/or high artifact concentrations) are encountered, development work should stop in the immediate area, photographs and a GIS reading should be taken, 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.

In this area, significant remains could include structural depressions and cellars, or artefact dumps related to early historic settlement and summer camp use. Pre-contact materials could include stone tools, hearth features, or butchered bison bone.

It is quite possible that isolated bison bones will be found in the course of the project, as they have been widely found in this general area of the Blakiston Creek fan. These should be kept aside, for the Parks Canada archaeologist to look at next time they are in the park. Unless there is a large concentration of them, however, or they are found in conjunction with stone tools or a hearth, there is no need to stop work.

References

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Perry, William, and Ian D. Sumpter

1988 *Archaeological Resource Survey, Impact Assessment and Monitoring Program, A.G.T. Underground Communication Cable, Job 910933, Waterton Lakes National Park, Alberta.* Microfiche Reports Series no. 405, Environment Canada, Parks, Ottawa.

Reeves, Brian

1985 *Heritage Resources Site Survey and Impact Assessment Waterton Lakes National Park Natural Gas Transmission Line and Highway Improvements.* Microfiche Report Series No. 183, Parks Canada, Ottawa.

Contacts

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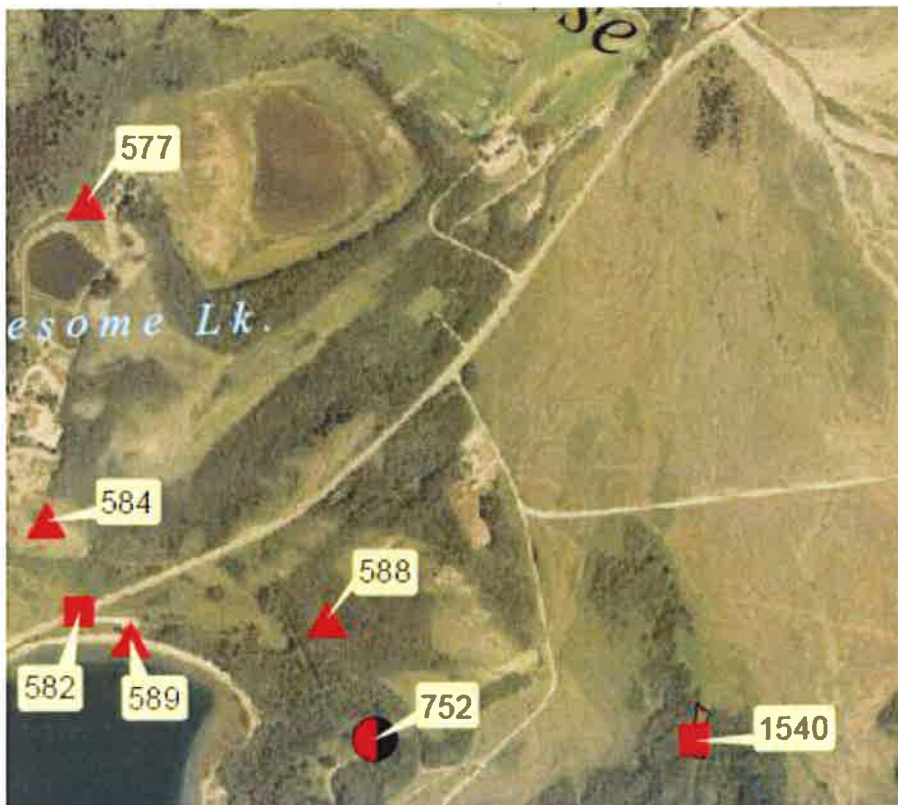
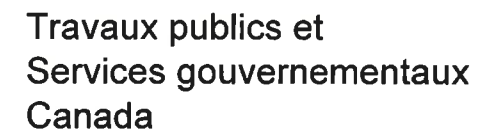


Figure 1. Known archaeological sites in the vicinity of the Alpine Stables waterline project. Red triangles are pre-contact sites, red squares historic sites, and divided circles are sites with both historic and pre-contact components.




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WATERTON LAKES NATIONAL PARK ALPINE STABLES RECONSTRUCTION FOUNDATION PACKAGE

**SECTION 25, NE CORNER
TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH**

WATERTON, ALBERTA

DATE: August 30, 2018
ISSUED FOR 100% CONSTRUCTION DOCUMENTS

 <p>Public Works and Government Services Canada</p>	<p>Trouver publicis et services gouvernementaux Canada</p>	<p>REAL PROPERTY SERVICES Western Region SERVICES IMMOBILIERS Région de l'ouest</p>																																																			
<p>REPUBLIC ARCHITECTURE INC</p>	<p>365 St. Mary Avenue Wetumpka, AB T5C 0N1 T 204 688 0102 F 204 989 0094 www.republicarchitecture.com</p>																																																				
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2. INFORMATION CONCERNING THIS CONSTRUCTION WAS TAKEN FROM ORIGINAL DRAWINGS AND IS ASSUMED CORRECT.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF SIZE MEASUREMENTS AND QUANTITIES OF MATERIALS REQUIRED.
4. PERFORM WORK IN STRICT ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA, AND ANY OTHER CODE OF PRACTICE.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE EXISTING AND THE LATEST EDITIONS OF THE CANADIAN CODES.
6. DRAWINGS MUST NOT BE SCALED.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXISTING AND THE NATIONAL BUILDING CODE IS ALTERED, PATCH, REPAIR AND MAKE GOOD TO MATCH EXISTING. CONTACT DEPARTMENTAL REPRESENTATIVE FOR CLARIFICATION AS REQUIRED.
8. ALL FINISHES AND MATERIALS TO REMAIN ARE TO BE PROTECTED IN THEIR EXISTING CONDITION EXCEPT AS NOTED. ANY DAMAGE TO EXISTING MATERIALS OR FINISHES DURING THE COURSE OF CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR.
9. IN CASE OF DOUBT, CONFLICT OR DISCREPANCIES ON THE DRAWINGS, SPECIFICATIONS, MATERIALS OR METHOD OF CONSTRUCTION, THE CONTRACTOR SHALL CONSULT WITH THE ARCHITECT IMMEDIATELY BEFORE PROCEEDING.
10. DIMENSIONS TO FACE OF FINISHED OR UNLESS OTHERWISE INDICATED.
11. ALL CONSTRUCTION SHALL BE COMPLETED WITHIN THE TIME FRAME TO BE STATED IN THE TENDERS.
12. TURN OVER EXISTING ITEMS ON SITES TO THE DESIGNATED DEPARTMENTAL REPRESENTATIVE FOR FIRST RIGHT OF REFURNAL.
13. ALL CONSTRUCTION MATERIAL, RECYCLING & WASTE TO BE TAKEN OFF SITE BY CONTRACTOR

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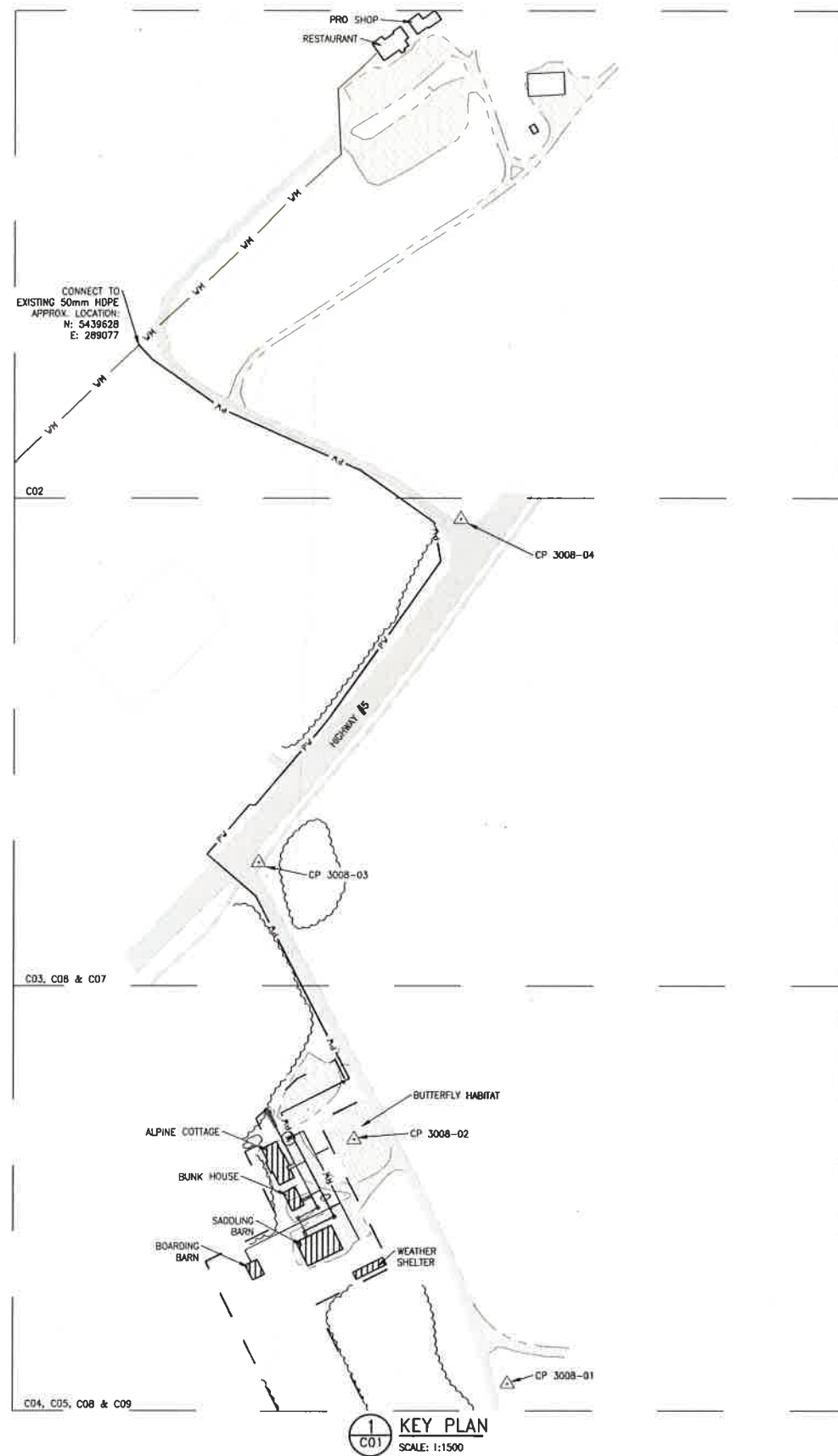
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SMS
770 BRADFORD ST,
WINNIPEG, MANITOBA R3H 0N3

[illegible]



NOTES:

- EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.
- EXISTING BUTTERFLY HABITAT IS NOT TO BE DISTURBED.

CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439636.244	289287.444	1269.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

LEGEND

CONTROL POINT	
LIMIT OF DISTURBANCE	
PROPOSED POTABLE WATER MAIN	
PROPOSED WELL WATER SERVICE	
EXISTING WATER WELL	
EXISTING WATER MAIN	
PROPOSED DOMESTIC SERVICE	
PROPOSED SEWAGE HOLDING TANK	
PROPOSED BUILDING	
EDGE OF EXISTING GRAVEL ROAD	
EDGE OF EXISTING PAVED ROAD	
BUTTERFLY HABITAT	

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1	Issued for Construction	2018 08 28
2	Issued for Construction	2018 08 28
3	Issued for Construction	2018 08 28
4	10% Construction Documents Submittal	2018 07 12

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ATB Place North Tower
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Project Site
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

**WLN ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE**

Designed by
RVP
Drawn by
KNS
Approved by
RMS
PWGSC Project Manager
MICHAEL LYZARWYSKI

Drawing Title
KEY PLAN

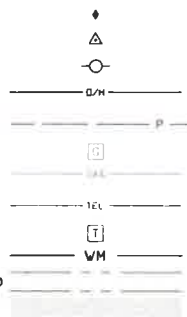
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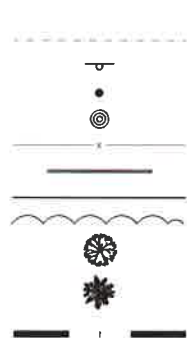
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LEGEND

FIP
CONTROL POINT
POWER POLE
O/H POWER LINE
U/G POWER LINE
GAS METER
U/G GAS LINE
U/G TELUS LINE
TELUS BOX
EXISTING WATER MAIN
EDGE OF EXISTING GRAVEL ROAD
EDGE OF EXISTING PAVED ROAD
EXISTING ROAD SHOULDER



EXISTING ROAD C/L
TOE OF EXISTING DITCH
SIGN
POST
SANITARY CLEANOUT
EXISTING FENCE
EXISTING GATE
EXISTING BUILDING
TREED AREA
DECIDUOUS TREE
CONIFEROUS TREE
MATCH LINE



NOTES:

1. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

CONTROL POINTS			
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CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

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Rev	Description	Date
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2	Issued for Construction	2018 08 18
3	Issued for Construction	2018 07 18
4	MPL Construction Documents Submittal	2018 07 13

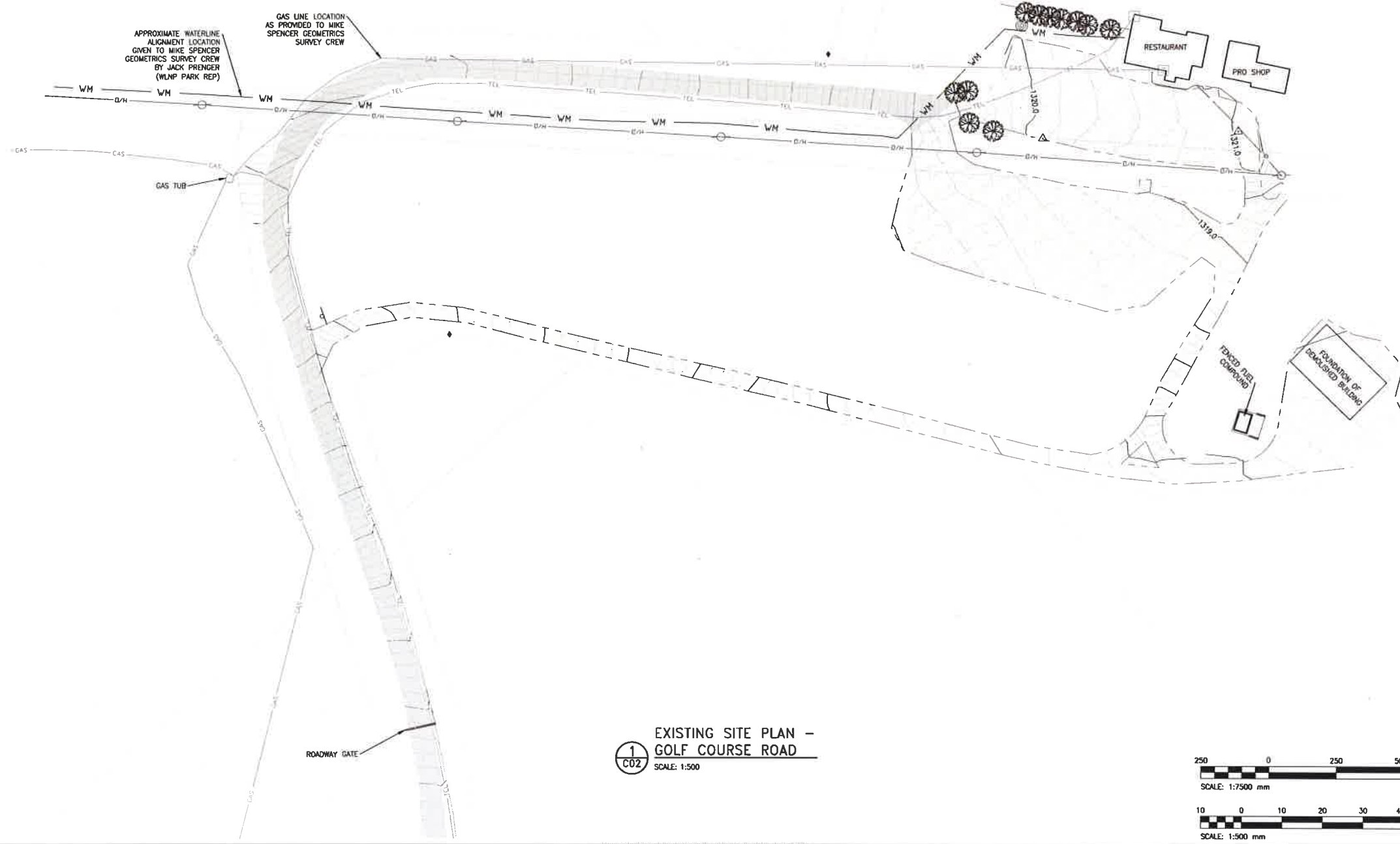
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ATB Place North Tower
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Edmonton, Alberta T5J 1S6

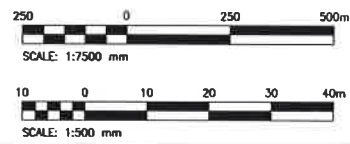
Project title
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA
WLNK ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE

Designed by
RUC
Drawn by
RUC
Approved by
RUC
PWGSC Project Manager
MICHAEL LYZAKWYSHO
Drawing title
EXISTING SITE PLAN

Project no. R.096286.001	Drawing no. C02 OF 11	Revision no. 3
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EXISTING SITE PLAN -
GOLF COURSE ROAD
SCALE: 1:500



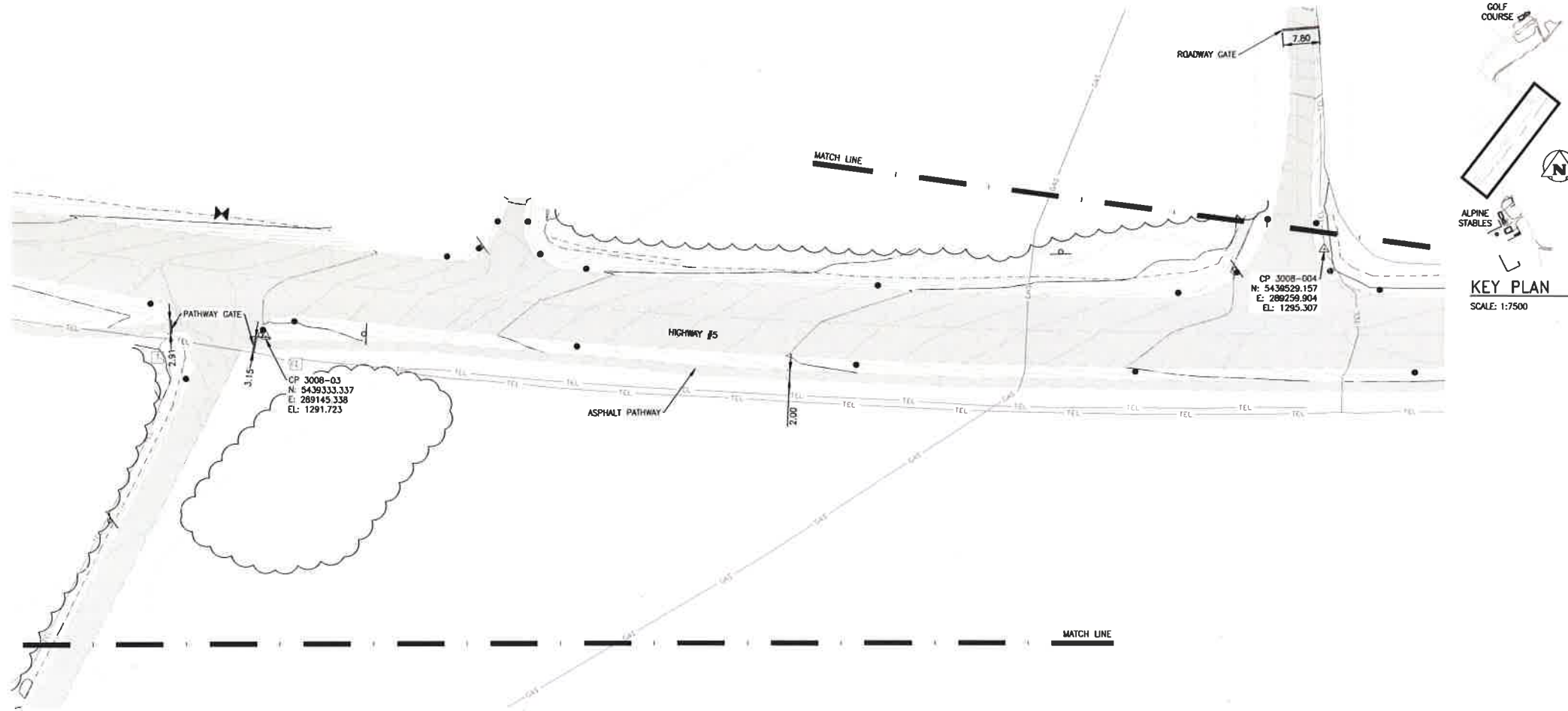


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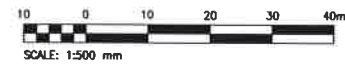
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LEGEND

PIP	
CONTROL POINT	
U/G GAS LINE	
U/G TELUS LINE	
TELUS BOX	
EDGE OF EXISTING GRAVEL ROAD	
EDGE OF EXISTING PAVED ROAD	
EXISTING ROAD SHOULDER	
EXISTING ROAD C/L	
TOE OF EXISTING DITCH	
SIGN	
POST	
EXISTING GATE	
TREED AREA	
MATCH LINE	



EXISTING SITE PLAN -
HIGHWAY 5
SCALE: 1:500



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Is used for Construction	2019 01 28	
Is used for Construction	2019 01 16	
Is used for Construction	2019 01 28	
SPS Construction Document Submittal	2019 01 11	
Revision	Description	Date
Client		
PWGSC/TPSGC		
ATB Place North Tower 10025 Jasper Ave, 8th Floor Edmonton, Alberta T5J 1S6		
Project title		
SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA		
WLNK ALPINE STABLES RECONSTRUCTION FOUNDATION PACKAGE		
Designed by R/KP		
Drawn by K/S		
Approved by R/S		
PWGSC Project Manager MICHAEL LYZAHWIK		
Drawing title		
EXISTING SITE PLAN		
Project no.	Drawing no.	Revision no.
R.098286.001	C03 OF 11	3

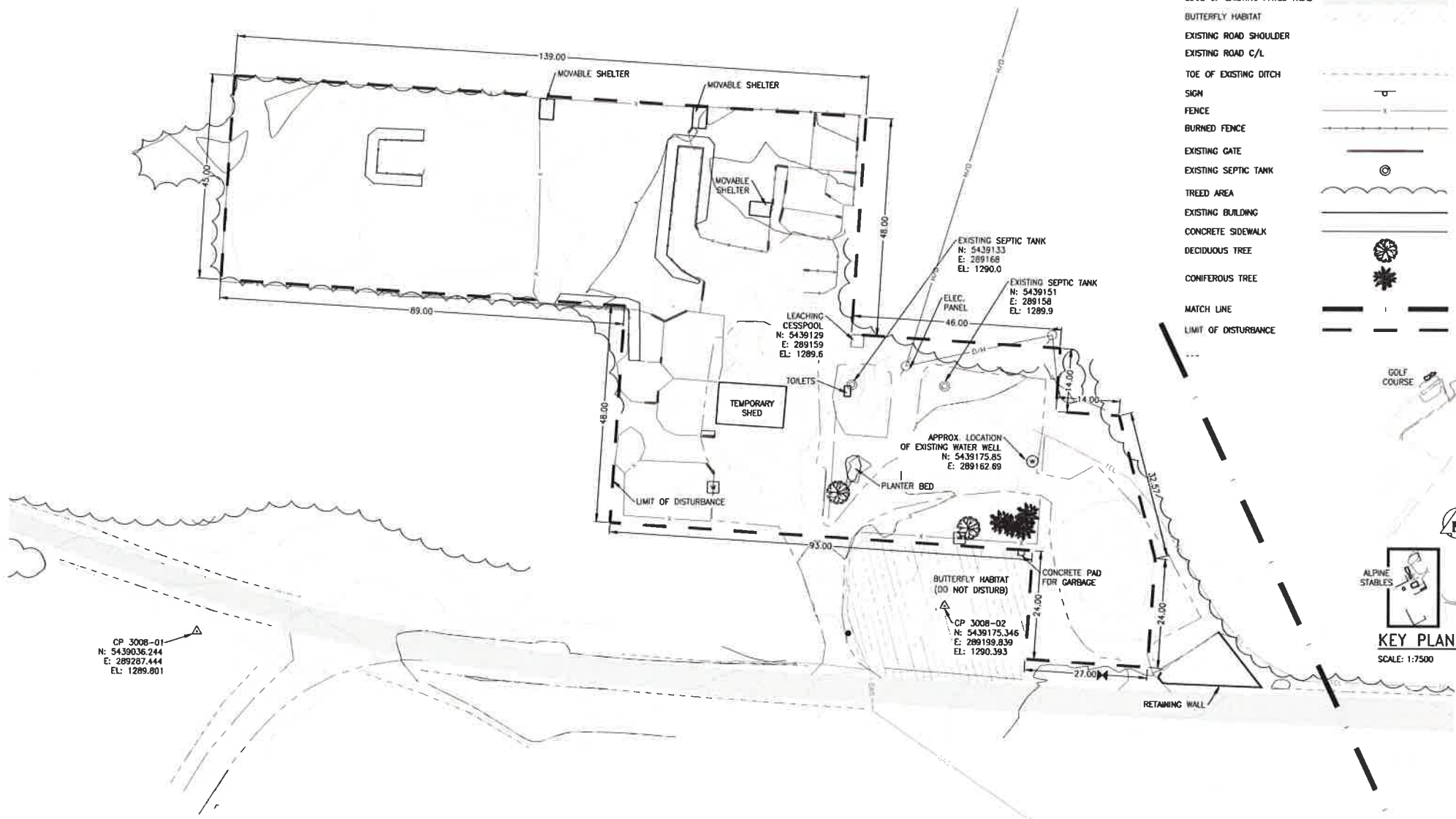


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CP 3008-02	5439175.346	289199.839	1290.393
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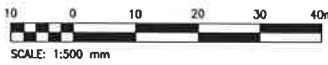
- NOTES:**
1. GAS CONNECTION TO BE BROUGHT TO BUILDINGS BY CHIEF MOUNTAIN GAS AND COORDINATED WITH CONTRACTOR.
 2. EXISTING SITE SHOULD BE PROTECTED.
 3. EXISTING BUTTERFLY HABITAT IS NOT TO BE DISTURBED.
 4. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

LEGEND

RP	
CONTROL POINT	
U/G GAS LINE	
U/G TELUS LINE	
EXISTING WATER TAP	
EXISTING WATER WELL	
POST	
EDGE OF EXISTING GRAVEL ROAD	
EDGE OF EXISTING PAVED ROAD	
BUTTERFLY HABITAT	
EXISTING ROAD SHOULDER	
EXISTING ROAD C/L	
TOE OF EXISTING DITCH	
SIGN	
FENCE	
BURNED FENCE	
EXISTING GATE	
EXISTING SEPTIC TANK	
TREED AREA	
EXISTING BUILDING	
CONCRETE SIDEWALK	
DECIDUOUS TREE	
CONIFEROUS TREE	
MATCH LINE	
LIMIT OF DISTURBANCE	



EXISTING SITE PLAN - ALPINE STABLES
SCALE: 1:500



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Proj #: 18-0109-009

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2	Issued for Construction	2019 06 18		
3	Issued for Construction	2019 07 18		
4	80% Construction Completion Submittal	2019 07 12		
Revised	Description	Date		
Client	PWGSC/TPSGC			
ATB Place North Tower 10025 Jasper Ave, 5th Floor Edmonton, Alberta T5J 1S6				
Project title SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA WLNP ALPINE STABLES RECONSTRUCTION FOUNDATION PACKAGE				
Designed by RKF				
Drawn by KHS				
Approved by RBF				
PWGSC Project Manager MICHAEL LYZANWISKI				
Drawing title EXISTING SITE PLAN				
Project no. R.096286.001	Drawing no. C04 OF 11	Revised no. 3		



CONTROL POINTS			
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 4. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

- LEGEND
- FIP
- CONTROL POINT
- UNIT OF DISTURBANCE
- PROPOSED BUILDING
- PROPOSED SANITARY SERVICE
- PROPOSED 50mm POTABLE WATER MAIN
- PROPOSED 25mm POTABLE WATER SERVICE
- PROPOSED 25mm WATER SERVICE FROM WELL
- PROPOSED SEWAGE HOLDING TANK
- PROPOSED MANHOLE
- PROPOSED PARK OUTDOOR FAUCET
- EXISTING WATER TAP
- EXISTING WATER WELL
- EXISTING SEPTIC TANK
- U/G GAS LINE
- U/G TELUS LINE
- EDGE OF EXISTING GRAVEL ROAD
- EDGE OF EXISTING PAVED ROAD
- BUTTERFLY HABITAT
- EXISTING ROAD SHOULDER
- EXISTING ROAD C/L
- PROPOSED ROAD AND PARKING AREAS
- TOE OF EXISTING DITCH
- SIGN
- POST
- FENCE
- EXISTING GATE
- TREED AREA
- CONCRETE SIDEWALK
- DECIDUOUS TREE
- CONIFEROUS TREE
- MATCH LINE

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GROUP
CONSULTING
ENGINEERS

Proj #: 18-0109-009

PROFESSIONAL ENGINEER ALBERTA

Alberta Engineering
KGS GROUP
P.Eng.

1	Issued for Construction	2018 02 28
2	Issued for Construction	2018 08 16
3	Issued for Construction	2018 07 28
4	WPA Construction Document Submittal	2018 07 12
Revised	Drawings	2018

PWGSC/TPSGC

ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

Project Site
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

WLNPP ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE

Designed by
RDKF

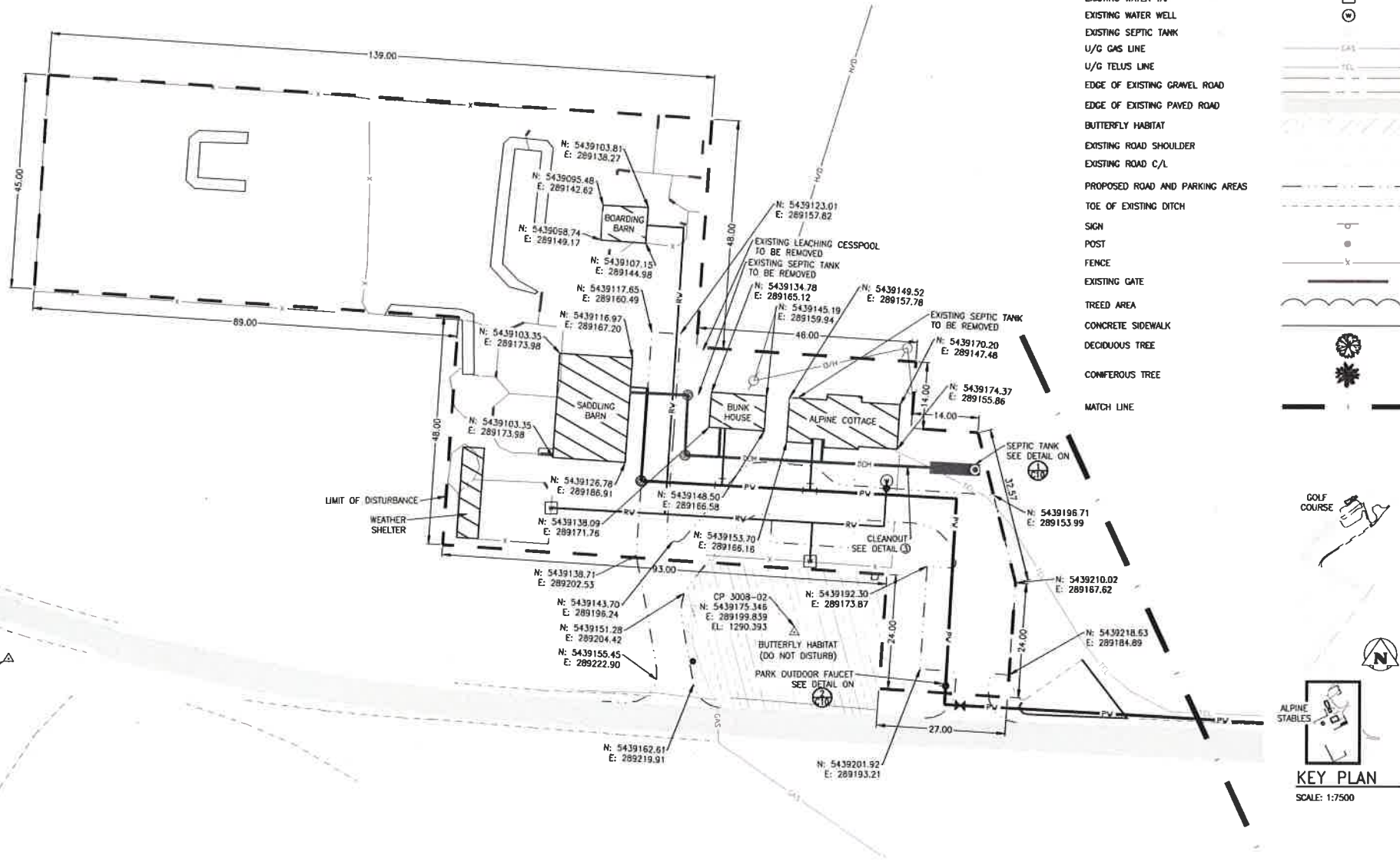
Drawn by
KNS

Approved by
RDK

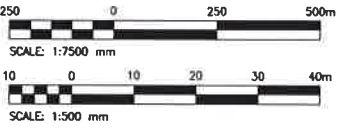
PWGSC Project Manager
MICHAEL LYZANOWSKI

Drawing title
PROPOSED SITE PLAN

Project no. R.098286.001	Drawing no. C05 OF 11	Revision no. 3
-----------------------------	-----------------------------	-------------------



PROPOSED SITE PLAN -
ALPINE STABLES
SCALE: 1:500



CP 3008-01
N: 5439036.244
E: 289287.444
EL: 1289.801



CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

- NOTES:
1. WATER MAIN WILL BE 50mm HDPE AND WILL BE BURIED AT A MINIMUM DEPTH OF 2.8m.
 2. EXISTING SITE SHOULD BE PROTECTED.
 3. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

LEGEND

- FIP
CONTROL POINT
PROPOSED 50mm POTABLE WATER MAIN
PROPOSED VALVE
EXISTING WATER MAIN
POWER POLE
O/H POWER LINE
U/G POWER LINE
U/G GAS LINE
U/G TELUS LINE
TELUS BOX
EDGE OF EXISTING GRAVEL ROAD
EDGE OF EXISTING PAVED ROAD
EXISTING ROAD SHOULDER
EXISTING ROAD C/L
TOE OF EXISTING DITCH
SIGN
POST
EXISTING FENCE
EXISTING GATE
TREED AREA
DECIDUOUS TREE
CONIFEROUS TREE
MATCH LINE

Public Works and
Government Services
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Travaux publics et
Services gouvernementaux
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ENGINEERS

Proj #: 18-0109-009

PROFESSIONAL ENGINEER
ALBERTA
A. McGOVERN
1988

Permit to Practice
KGS GROUP
P.0103

1	Issued for Construction	2018 08 30
2	Issued for Construction	2018 08 30
3	Issued for Construction	2018 07 30
4	MP's Construction Document Submission	2018 07 18
5	Drawn/checked	2018 07 18

Client

PWGSC/TPSGC

ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

Project title

SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

WLNIP ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE

Designed by
RDKP

Drawn by
KNS

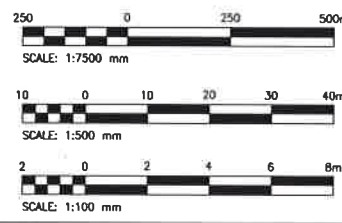
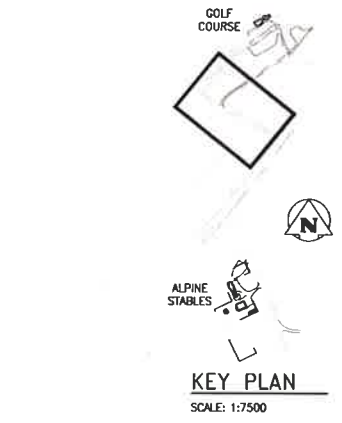
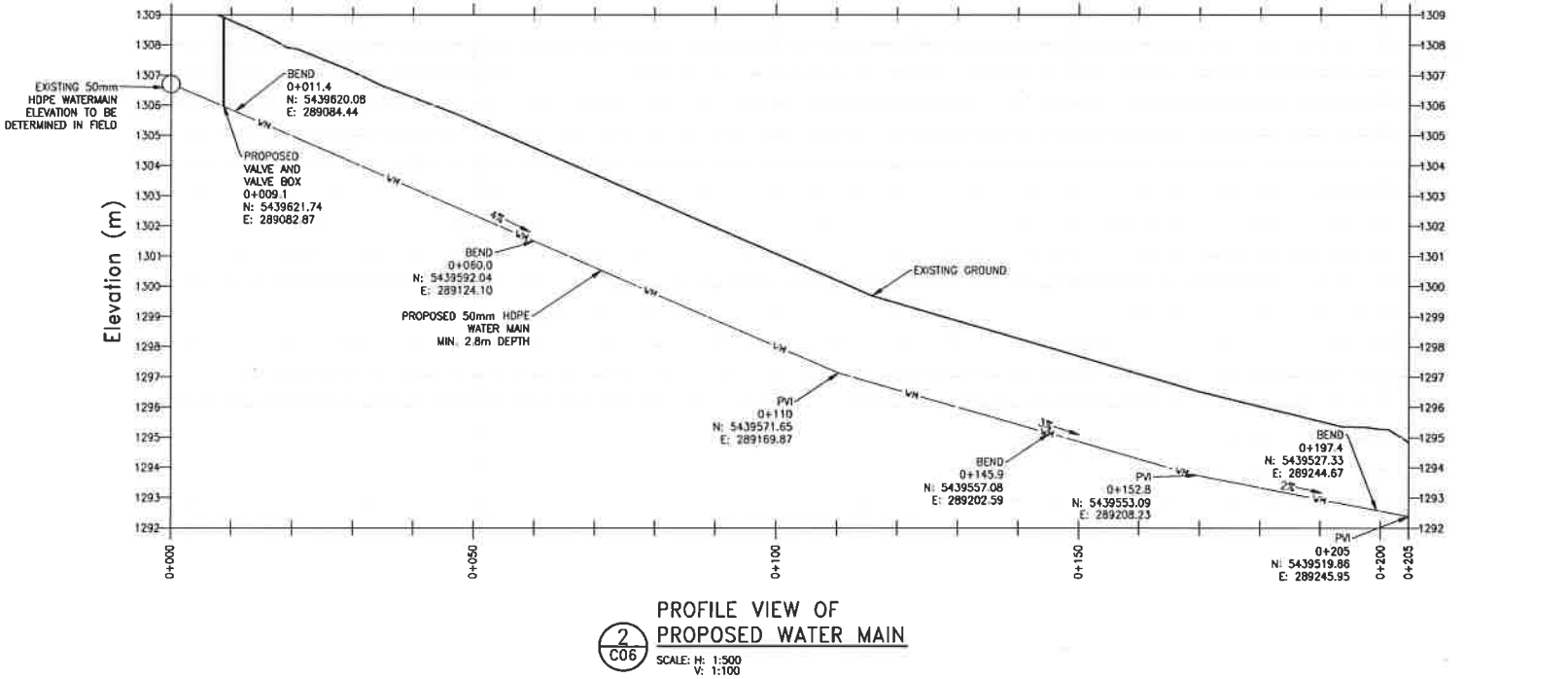
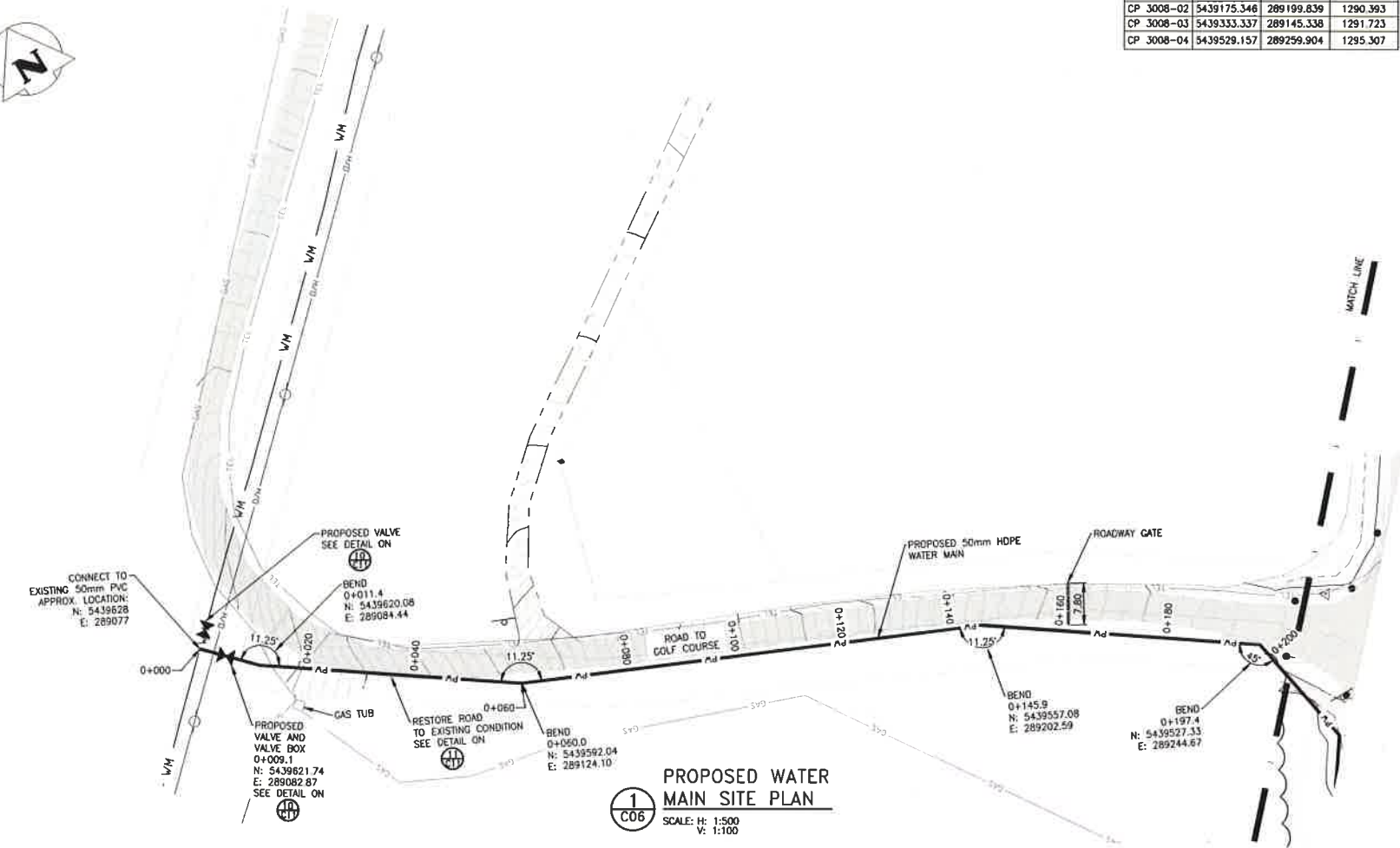
Approved by
RM

TPSGC Project Manager
MICHAEL LYZAMWINSKI

Drawing title

PROPOSED WATER SERVICE

Project no.	Drawing no.	Revision no.
R.096286.001	C06	3
	OF 11	





LEGEND

FIP		EDGE OF EXISTING PAVED ROAD	
CONTROL POINT		EXISTING ROAD SHOULDER	
PROPOSED WATER SERVICE		EXISTING ROAD C/L	
PROPOSED VALVE		TOE OF EXISTING DITCH	
U/G GAS LINE		SKIN	
U/G TELUS LINE		EXISTING FENCE	
TELUS BOX		EXISTING GATE	
POST		TREED AREA	
EDGE OF EXISTING GRAVEL ROAD		MATCH LINE	

NOTES:

1. WATER MAIN WILL BE 50mm HDPE AND WILL BE BURIED AT A MINIMUM DEPTH OF 2.8m.
2. EXISTING SITE SHOULD BE PROTECTED.
3. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

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Proj #: 18-0109-009



NO.	DESCRIPTION	DATE
1	Issued For Construction	2018 08 30
2	Issued For Construction	2018 08 14
3	Issued For Construction	2018 07 16
4	As-Built Construction Documents Submittal	2018 07 17
5	Revised	2018

PWGSC/TPSGC

ATB Place North Tower
10025 Jasper Ave, 8th Floor
Edmonton, Alberta T5J 1S6

Project title
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

WLN ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE

Designed by
RSCF
Drawn by
KNS
Approved by
RSC

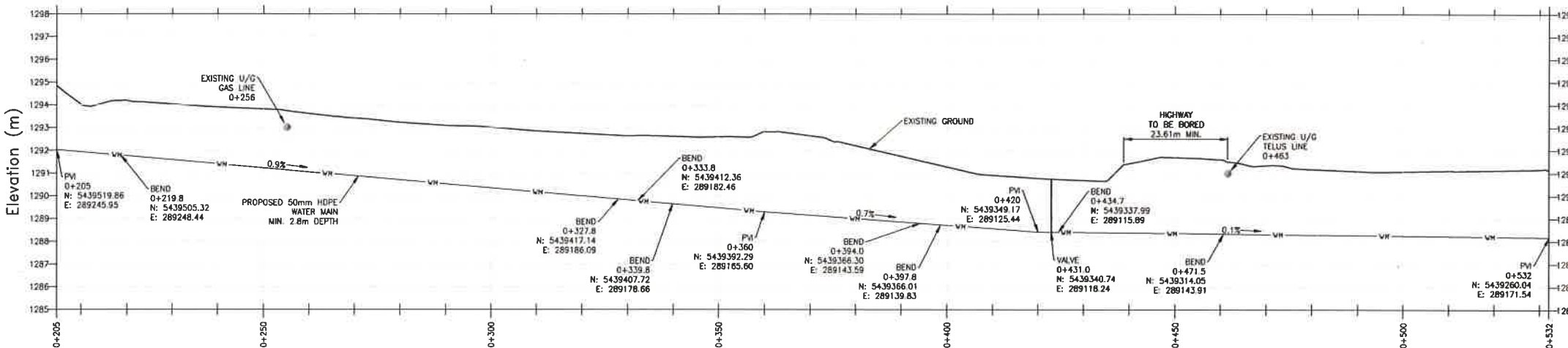
PWGSC Project Manager
MICHAEL LYZANIN

Proposed Water Service

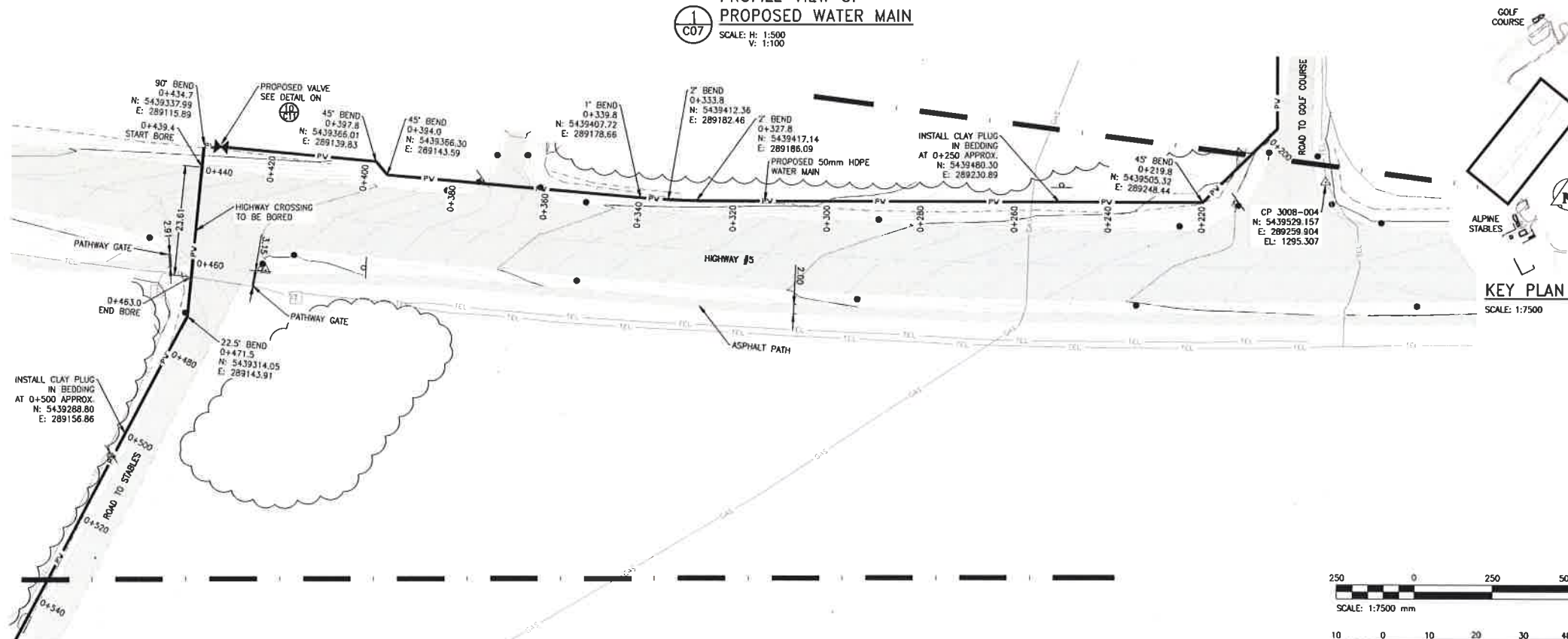
Project no.
R.096286.001

Drawing no.
C07
OF 11

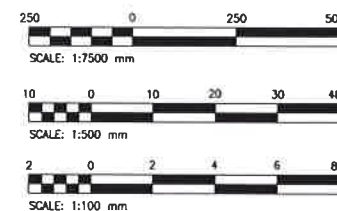
Revision no.
3



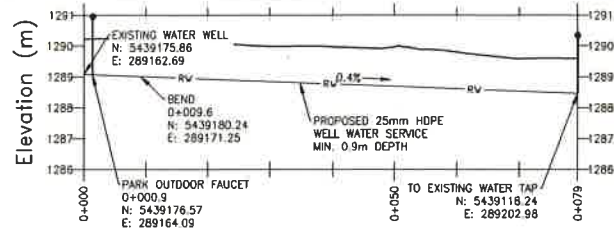
PROFILE VIEW OF
PROPOSED WATER MAIN
SCALE: H: 1:500
V: 1:100



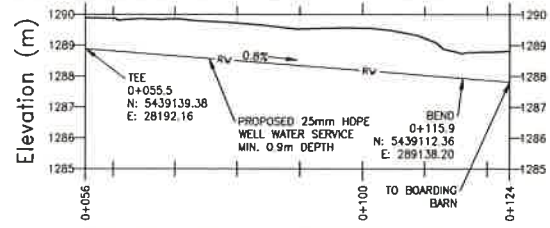
PROPOSED WATER
MAIN SITE PLAN
SCALE: H: 1:500
V: 1:100



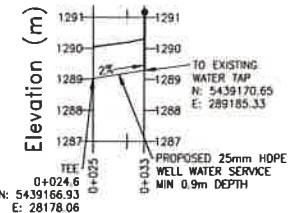
CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307



1
C08
PROFILE VIEW OF PROPOSED RAW WATER SERVICE TO EXISTING WATER TAP
SCALE: H: 1:500
V: 1:100



2
C08
PROFILE VIEW OF PROPOSED RAW WATER MAIN TO BOARDING BARN
SCALE: H: 1:500
V: 1:100

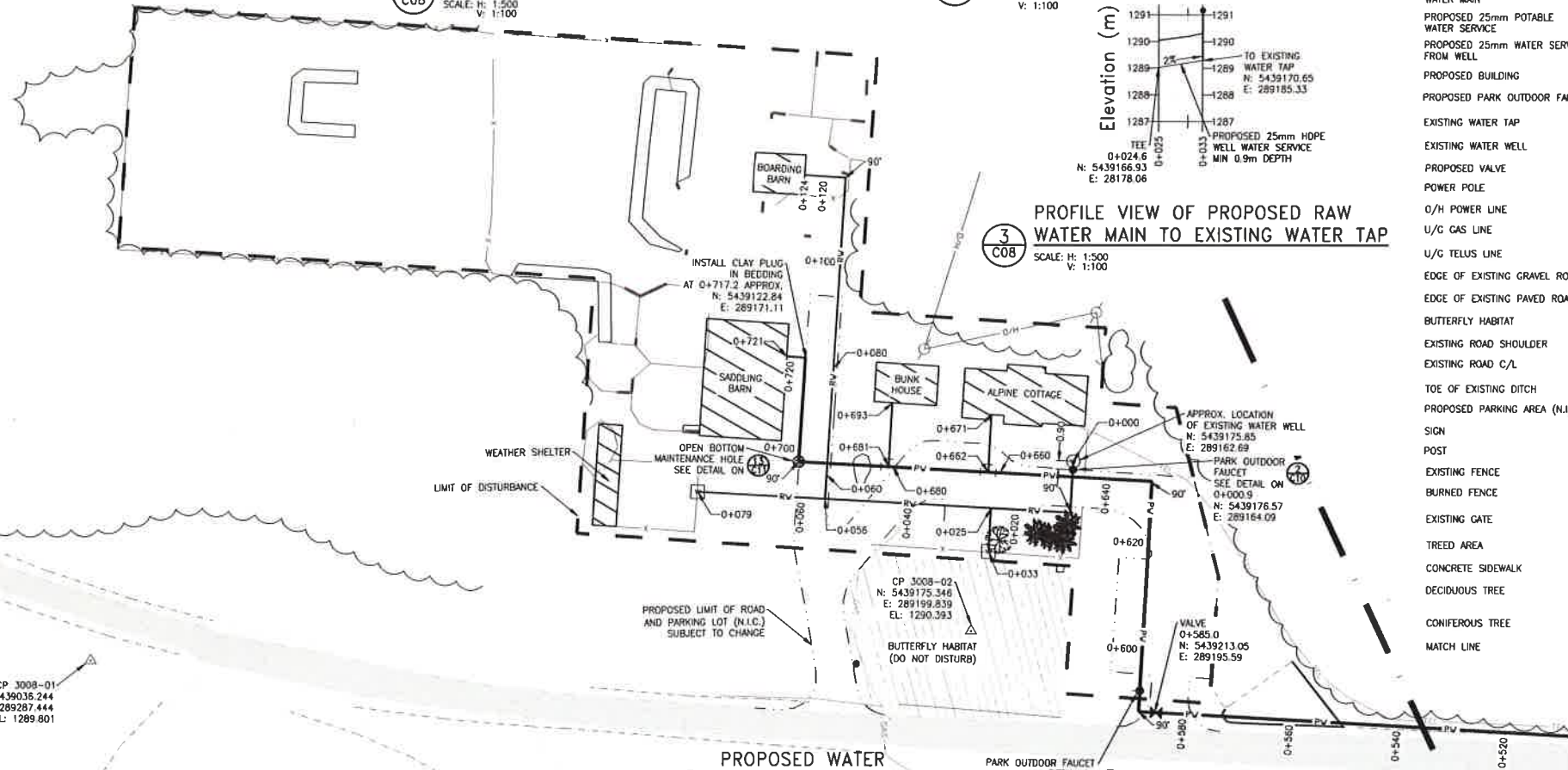


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C08
PROFILE VIEW OF PROPOSED RAW WATER MAIN TO EXISTING WATER TAP
SCALE: H: 1:500
V: 1:100

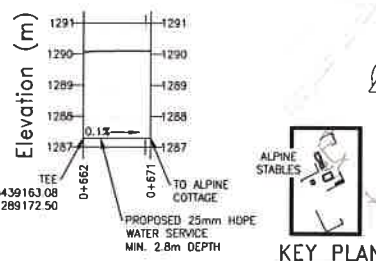
- NOTES:
- PROPOSED WATER MAIN WILL BE 50mm HDPE AND WILL BE BURIED AT A MINIMUM DEPTH OF 2.8m
 - PROPOSED WATER SERVICES WILL BE 25mm HDPE AND WILL BE BURIED AT A MINIMUM DEPTH OF 2.8m
 - PROPOSED WATER SERVICES FROM EXISTING WELL WILL BE 25mm HDPE AND WILL BE BURIED AT A MINIMUM DEPTH OF 0.9m
 - EXISTING SITE SHOULD BE PROTECTED
 - EXISTING BUTTERFLY HABITAT IS NOT TO BE DISTURBED
 - GAS CONNECTION TO BE BROUGHT TO BUILDINGS BY CHIEF MOUNTAIN GAS AND COORDINATED WITH CONTRACTOR
 - EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION

LEGEND

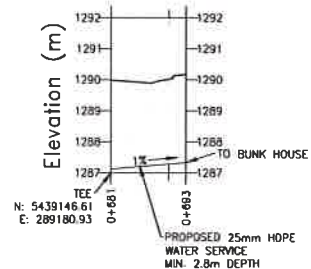
- CONTROL POINT
- PROPOSED 50mm POTABLE WATER MAIN
- PROPOSED 25mm POTABLE WATER SERVICE
- PROPOSED 25mm WATER SERVICE FROM WELL
- PROPOSED BUILDING
- PROPOSED PARK OUTDOOR FAUCET
- EXISTING WATER TAP
- EXISTING WATER WELL
- PROPOSED VALVE
- POWER POLE
- O/H POWER LINE
- U/G GAS LINE
- U/G TELUS LINE
- EDGE OF EXISTING GRAVEL ROAD
- EDGE OF EXISTING PAVED ROAD
- BUTTERFLY HABITAT
- EXISTING ROAD SHOULDER
- EXISTING ROAD C/L
- TOE OF EXISTING DITCH
- PROPOSED PARKING AREA (N.I.C.)
- SIGN
- POST
- EXISTING FENCE
- BURNED FENCE
- EXISTING GATE
- TREED AREA
- CONCRETE SIDEWALK
- DECIDUOUS TREE
- CONIFEROUS TREE
- MATCH LINE



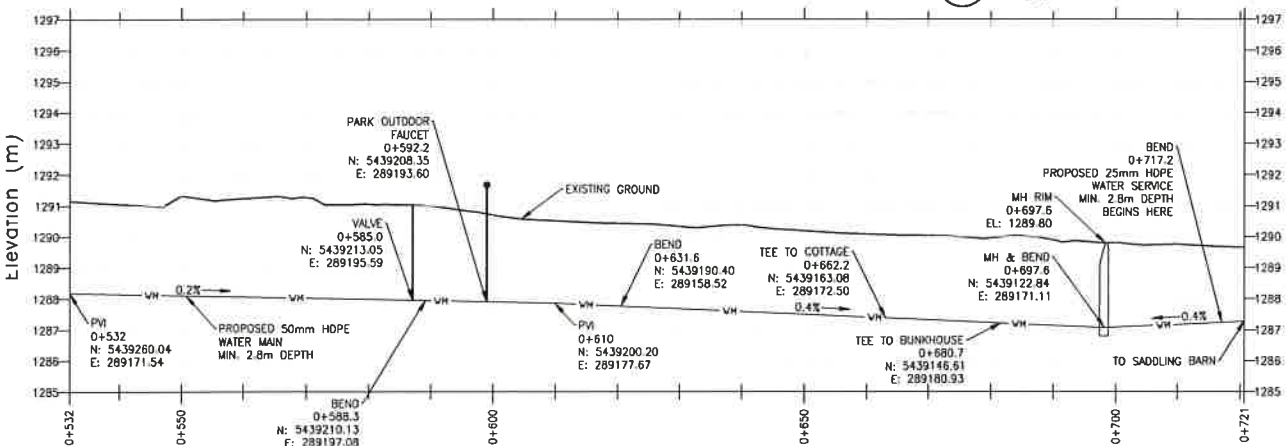
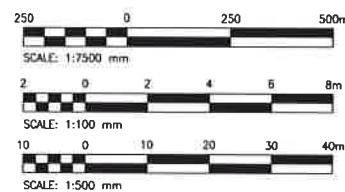
4
C08
PROPOSED WATER MAIN SITE PLAN
SCALE: 1:500



7
C08
PROFILE VIEW OF PROPOSED WATER SERVICE TO ALPINE COTTAGE
SCALE: H: 1:500
V: 1:100



6
C08
PROFILE VIEW OF PROPOSED WATER SERVICE TO BUNK HOUSE
SCALE: H: 1:500
V: 1:100



5
C08
PROFILE VIEW OF PROPOSED WATER MAIN TO SADDLELING BARN
SCALE: H: 1:500
V: 1:100

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Proj #: 18-0109-009

1	Issued for Construction	2018 08 16
2	Issued for Construction	2018 08 16
3	Issued for Construction	2018 07 18
4	W's Construction Documents Bulletin	2018 07 13

Client: PWGSC/TPSGC

ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

Project Title:
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

WLNP ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE

Designed by:
RKP

Drawn by:
HNS

Approved by:
RPM

PWGSC Project Manager:
MICHAEL LYNNANWIKI

Drawing title:
PROPOSED WATER SERVICE

Project no. R.096286.001	Drawing no. C08 OF 11	Revision no. 3
-----------------------------	-----------------------------	-------------------



CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

- NOTES:
- EXISTING SANITARY INFRASTRUCTURE (2 SEPTIC TANKS AND LEACHING CESSPOOL) TO BE DECOMMISSIONED.
 - PROPOSED SEPTIC TANK TO BE BURIED 3.0m DEEP.
 - EXISTING SITE SHOULD BE PROTECTED.
 - EXISTING BUTTERFLY HABITAT IS BOUNDED BY EXISTING ROAD AND NOT TO BE DISTURBED.
 - GAS CONNECTION TO BE BROUGHT TO BUILDINGS BY CHIEF MOUNTAIN GAS AND COORDINATED WITH CONTRACTOR.
 - EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

LEGEND

- FIP
- CONTROL POINT
- PROPOSED DOMESTIC SERVICE
- PROPOSED MANHOLE
- PROPOSED SEWAGE HOLDING TANK
- PROPOSED BUILDING
- POWER POLE
- O/H POWER LINE
- U/G GAS LINE
- U/G TELUS LINE
- EDGE OF EXISTING GRAVEL ROAD
- EDGE OF EXISTING PAVED ROAD
- BUTTERFLY HABITAT
- EXISTING ROAD SHOULDER
- EXISTING ROAD C/L
- TOE OF EXISTING DITCH
- PROPOSED PARKING AREA (N.I.C.)
- SGN
- POST
- FENCE
- EXISTING GATE
- TREED AREA
- CONCRETE SIDEWALK
- DECIDUOUS TREE
- CONIFEROUS TREE
- MATCH LINE

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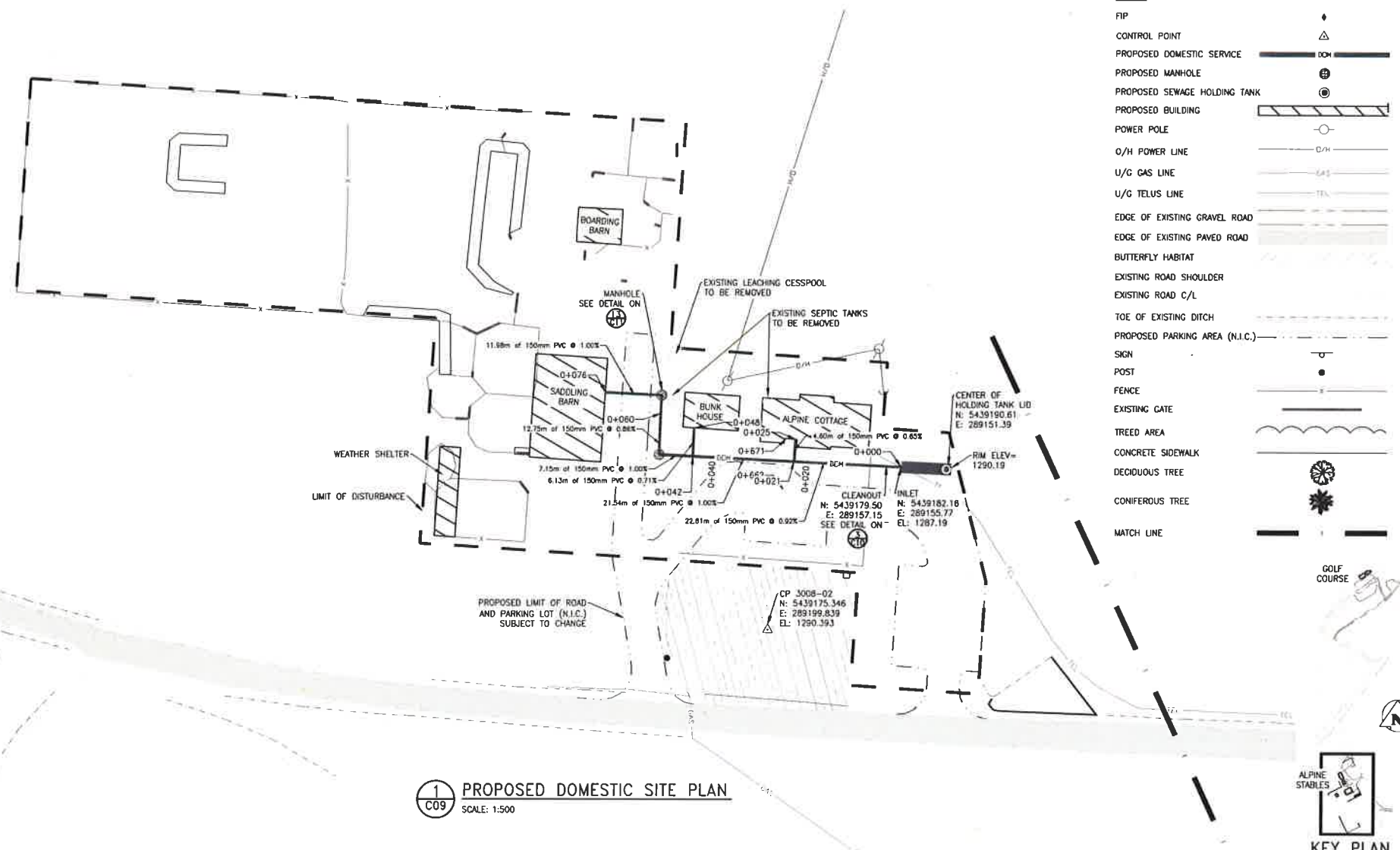
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KGS
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ENGINEERS

Proj #: 18-0109-009

PROFESSIONAL ENGINEER
ALBERTA

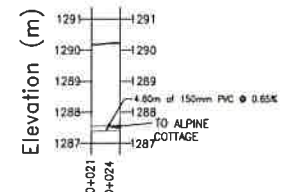
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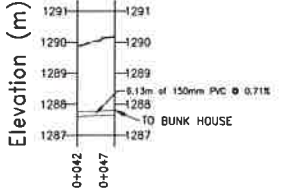
1 PROPOSED DOMESTIC SITE PLAN
SCALE: 1:500



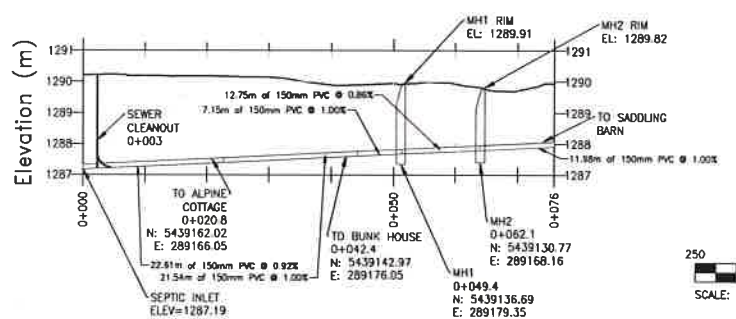
KEY PLAN
SCALE: 1:7500



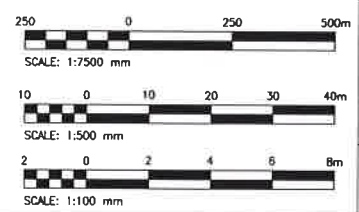
2 PROFILE VIEW OF PROPOSED DOMESTIC SERVICE TO ALPINE COTTAGE
SCALE: H: 1:500
V: 1:100



3 PROFILE VIEW OF PROPOSED DOMESTIC SERVICE TO BUNK HOUSE
SCALE: H: 1:500
V: 1:100



4 PROFILE VIEW OF PROPOSED DOMESTIC SERVICE TO SADDLING BARN
SCALE: H: 1:500
V: 1:100



PWGSC/TPSGC

ATB Place North Tower
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Edmonton, Alberta T5J 1S6

Project Use
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

WLNIP ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE

Designed by
RKF

Drawn by
JHS

Approved by
RBL

PWGSC Project Manager
MICHAEL LYZANSKI

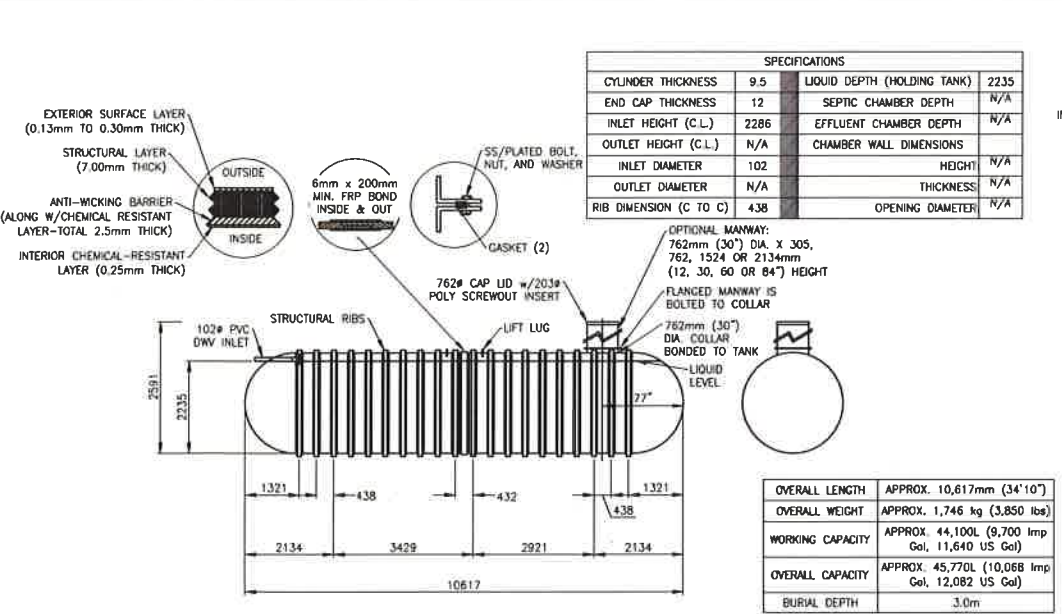
Drawing title
PROPOSED DOMESTIC SERVICE

Project no.
R.096286.001

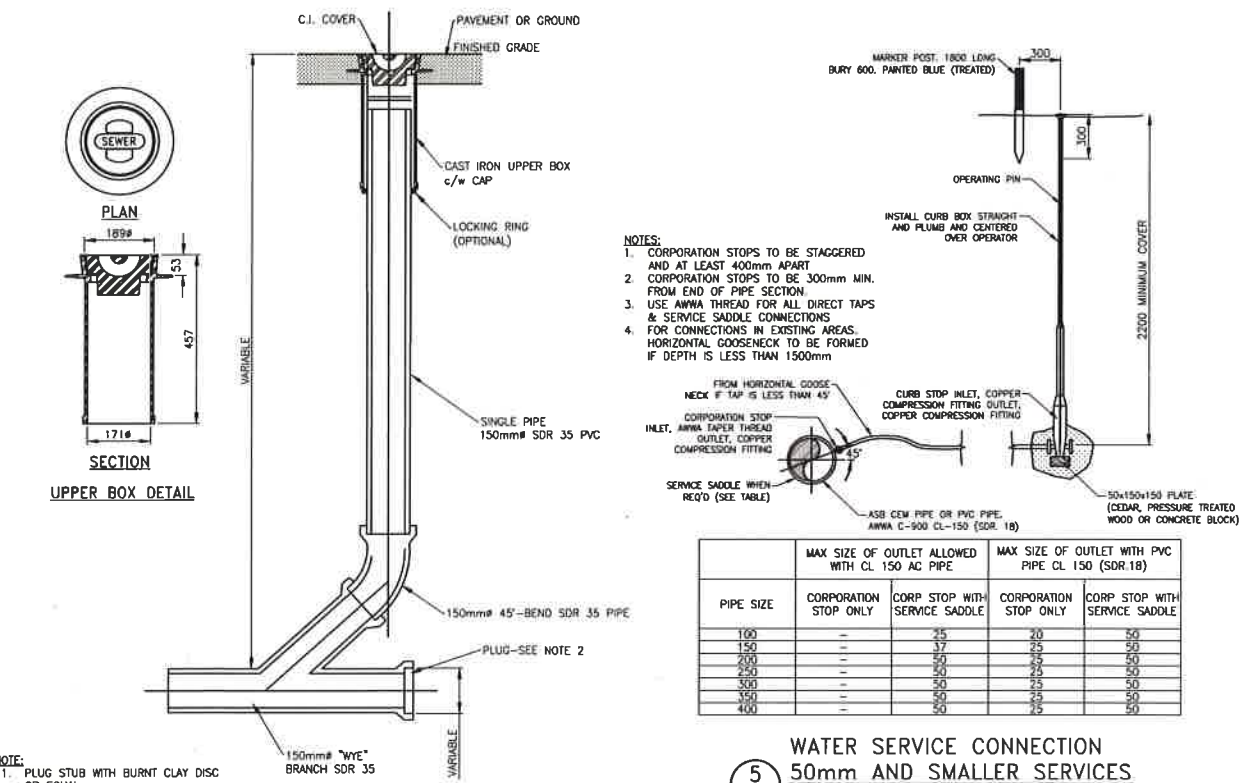
Drawing no.
C09

Revision no.
3

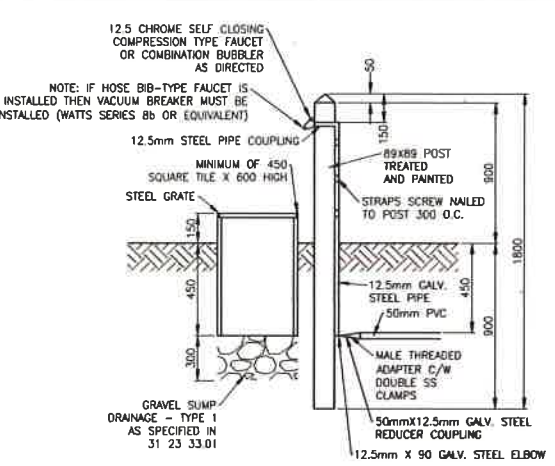
OP 11



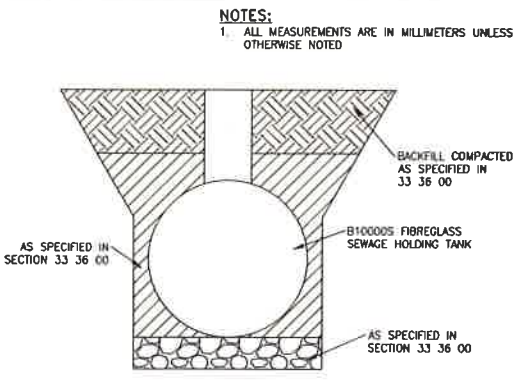
1 B10000S FIBREGLASS SEWAGE HOLDING TANK
SCALE: NTS



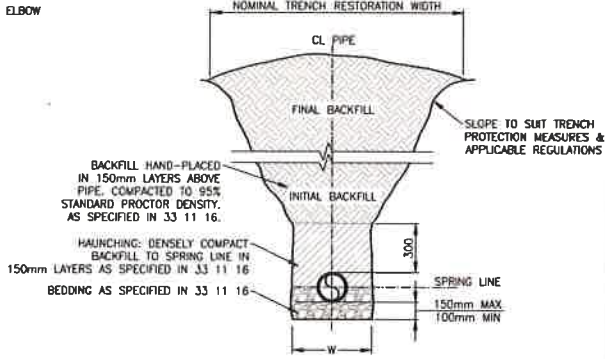
5 WATER SERVICE CONNECTION 50mm AND SMALLER SERVICES
SCALE: NTS



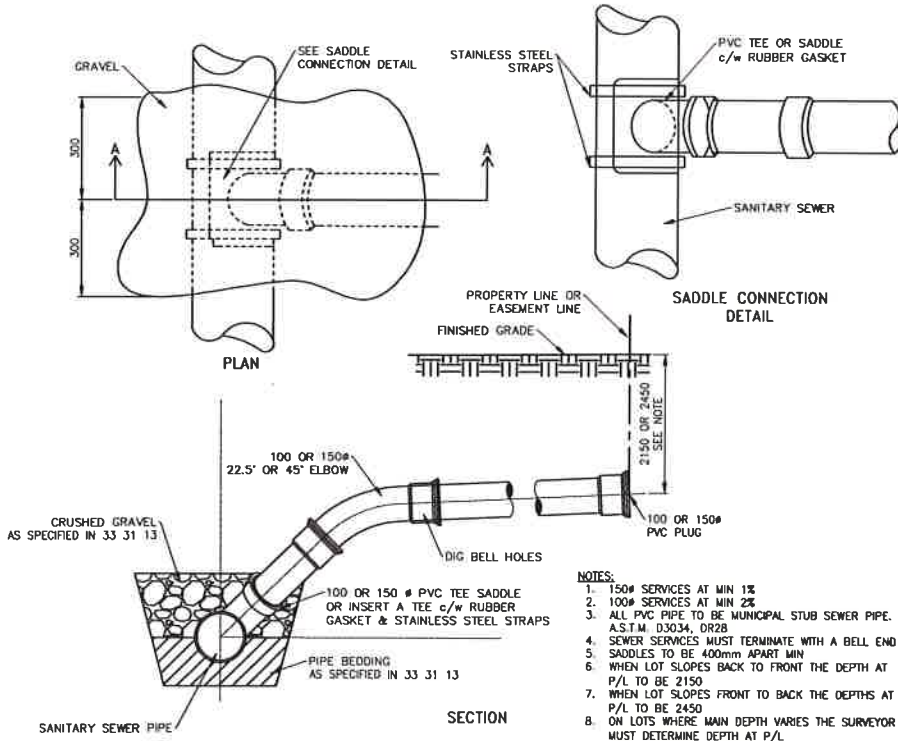
2 PARK OUTDOOR FAUCET
SCALE: NTS



4 SEWAGE HOLDING TANK CROSS SECTION
SCALE: NTS



6 TYPICAL HDPE TRENCH DETAIL
SCALE: NTS



7 TYPICAL SERVICE CONNECTION FOR MAINS LESS THAN 3.7m DEEP
SCALE: NTS

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CONSULTING ENGINEERS
Proj #: 18-0109-009

PROFESSIONAL ENGINEER ALBERTA
McDonald

Permit to Practice
KGS GROUP
P07205

Rev	Description	Date
1	Issued For Construction	2018 08 28
2	Issued For Construction	2018 08 16
1	Issued For Construction	2018 07 16
1	WPA Construction Documents Submission	2018 07 11

PWGSC/TPSGC

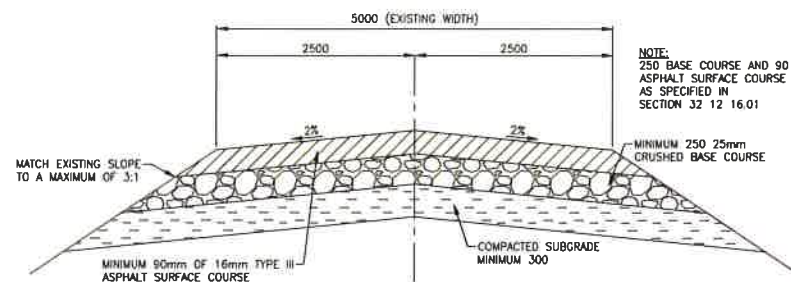
ATB Place North Tower
10025 Jasper Ave, 8th Floor
Edmonton, Alberta T5J 1S6

SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA

WLNP ALPINE STABLES RECONSTRUCTION FOUNDATION PACKAGE

Designed by: RCF
Drawn by: KHS
Approved by: RM
PWGSC Project Manager: MICHAEL LYZAHWYSKI
Drawing title: DETAILS

Project no: R.098286.001
Drawing no: C10
Revision no: 3
OF 11



VALVE SIZE (mm)	REQUIRED AREA - S_v $\frac{M \times 1000}{\gamma_v \times 1000} = \text{AREA}$
100	0.09
150	0.18
200	0.31
250	0.47
300	0.67
350	0.97
400	1.25
450	1.56
500	1.93
600	2.73
750	4.20
900	6.03

- NOTES:
1. DIMENSIONS OF BLOCK AND REQUIRED BEARING AREA BE BASED UPON A MAXIMUM TEST/OPERATING PRESSURE OF 589 kPa (100 psi) MINIMUM FOR ANY CONDITION WHICH VARIES FROM THESE CONFIRM REQUIRED AREA WITH THE ENGINEER
 2. REFER TO 03-33-00 FOR CONCRETE REQUIREMENTS
 3. ANY VALVE WHICH HAS EITHER 'TYTON' OR MJ STYLE END CONNECTIONS MUST BE ANCHORED AS SHOWN. THIS INCLUDES GATE VALVES AND BUTTERFLY VALVES

12 VALVE ANCHORING
C06,C08 SCALE: NTS

PIPE DIAMETER (mm)	90° BEND		45° BEND		TEE, ELBOWS, WYES		22.5 & 11.25 BENDS	
	A	B C AREA	A	B C AREA	A	B C AREA	A	B C AREA
(mm)	(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(mm)(sq mm)	(mm)(mm)(mm)(mm)(sq mm)
100	170 200 0.16	160 110 0.09	190 140 0.11	110 60 0.04				
150	250 300 0.33	240 160 0.18	270 190 0.23	160 90 0.08				
200	320 350 0.56	310 210 0.30	350 250 0.40	210 110 0.14				
250	390 460 0.85	380 250 0.46	430 310 0.60	260 140 0.22				
300	460 450 1.20	450 300 0.65	520 370 0.90	310 160 0.30				
350	530 550 1.61	520 350 0.87	600 420 1.14	340 170 0.38				
400	610 550 2.08	600 400 1.13	680 480 1.47	390 190 0.49				
450	680 600 2.62	670 440 1.42	760 540 1.85	440 220 0.62				
500	750 650 3.21	740 490 1.75	840 590 2.27	490 240 0.77				
600	950 950 4.95	880 580 2.49	1010 710 3.24	590 290 1.22				
750	1200 704 10.90	1090 720 3.81	1270 820 5.10	780 410 1.79				
900	1330 1009 11.30	1130 860 5.46	1490 1040 7.14	930 480 2.29				

INSTALL 42x89x1000 LONG WOODEN MARKER POST AT 150 FROM VALVE BOX. EMBED HALF IN GROUND. EXPOSED HALF TO BE PAINTED BRIGHT RED

SET UPPER VALVE BOX SECTION AT FINISHED GRADE AND SUPPORT SECURELY

C.I. COVER

CAST IRON UPPER BOX SECTION. SEE NOTE 1

MIN. 150 INSERTION

2400

150

11mm W.T. MIN.

6mm W.T. MIN.

127

PVC LOWER VALVE BOX SECTION. INSTALL STRAIGHT AND PLUMB AND CENTERED OVER VALVE

50 SQUARE VALVE OPERATING SECTION

FLARED SECTION 194 I.D. MINIMUM 6 WALL THICKNESS

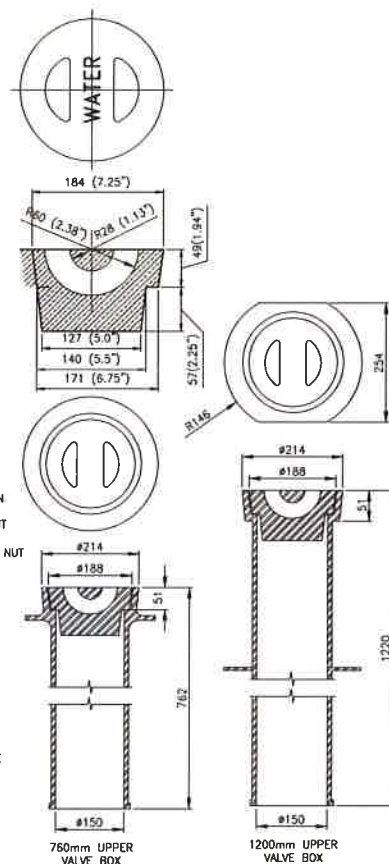
GATE VALVE

VALVE ANCHOR BLOCK SEE DETAIL 1.3

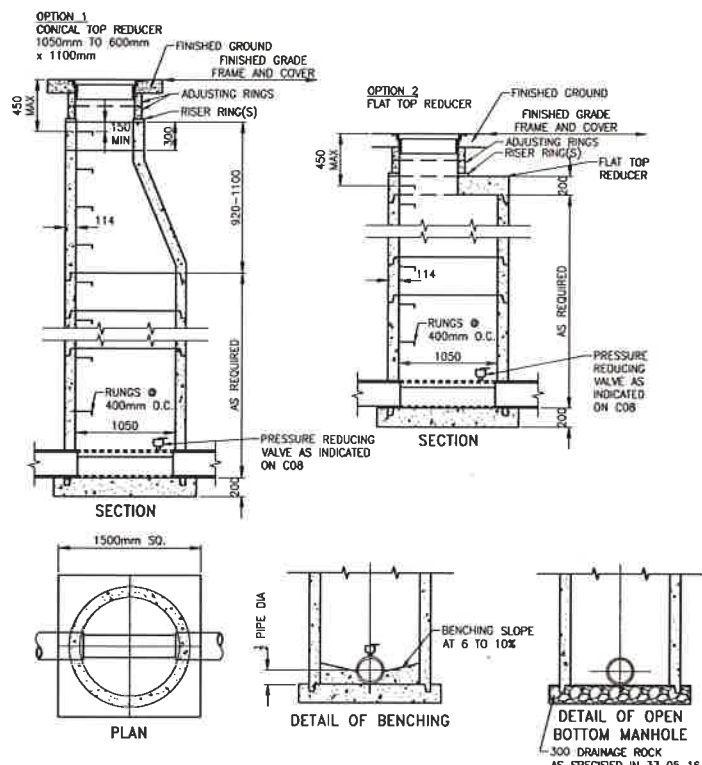
NOTES:

1. WHERE THE LOCATION OF THE VALVE

- NOTES:
1. WHERE THE LOCATION OF THE VALVE IS UNDER A ROADWAY USE A 1200 LONG UPPER VALVE BOX SECTION. WHERE THE VALVE LOCATION IS NOT UNDER A ROADWAY USE A 750 LONG UPPER VALVE BOX SECTION
 2. LOCKING RING (OPTIONAL)

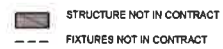


10 VALVE BOX INSTALLATION
C06,C08 SCALE: NTS



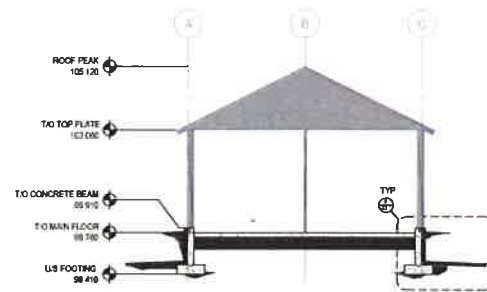
13 PRECAST MANHOLE 1050mm DIA.
C09 SCALE: NTS

9 22-1/2" ELBOW
C06,C07 SCALE: NTS

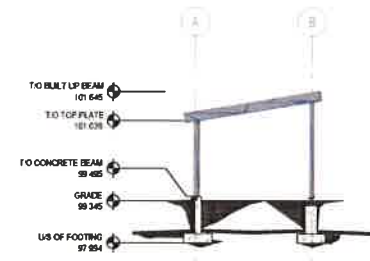


GENERAL BARN NOTES:

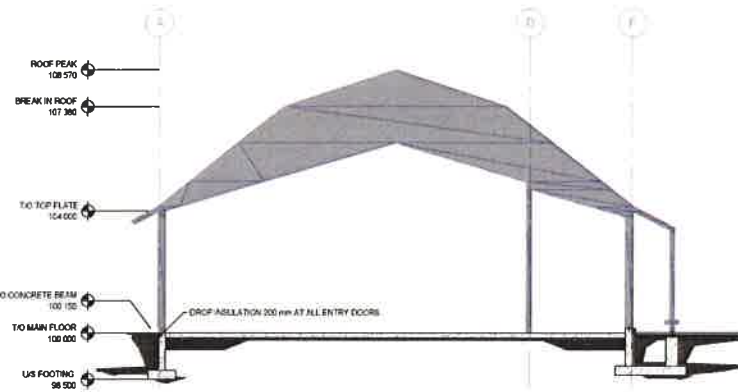
- 1) SECTION DRAWINGS ARE FOR REFERENCE ONLY
- 2) ALL FOUNDATION WALLS TO RECEIVE 100 mm XPS CONCRETE FACED RIGID INSULATION ON THE EXTERIOR FACE
- 3) DROP EXTERIOR RIGID INSULATION 200 mm AT ENTRY DOORS



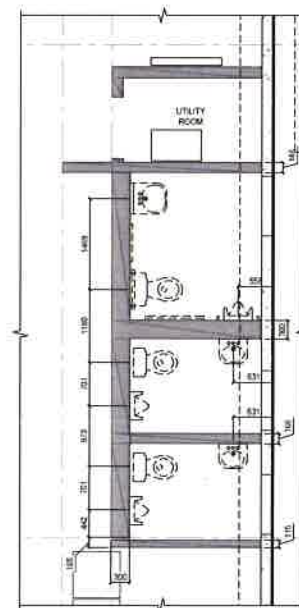
2 BOARDING BARN SECTION

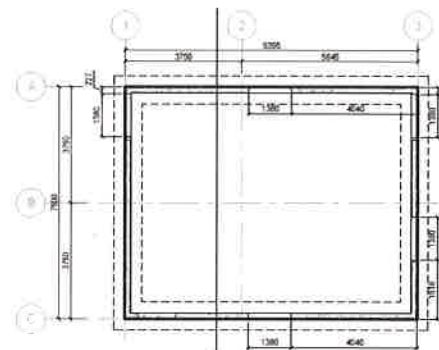


3 WEATHER SHELTER SECTION
A7.1 1:100

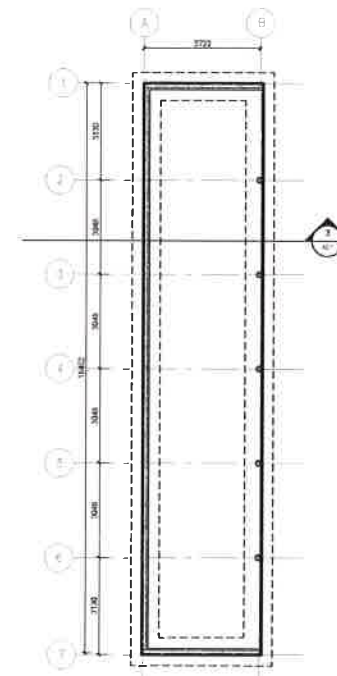


1 SADDLING BARN BUILDING SECTION
A2.1 1 100

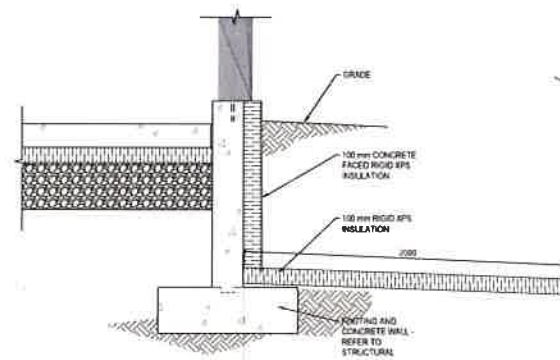


W/C ROUGH INS
A21 150

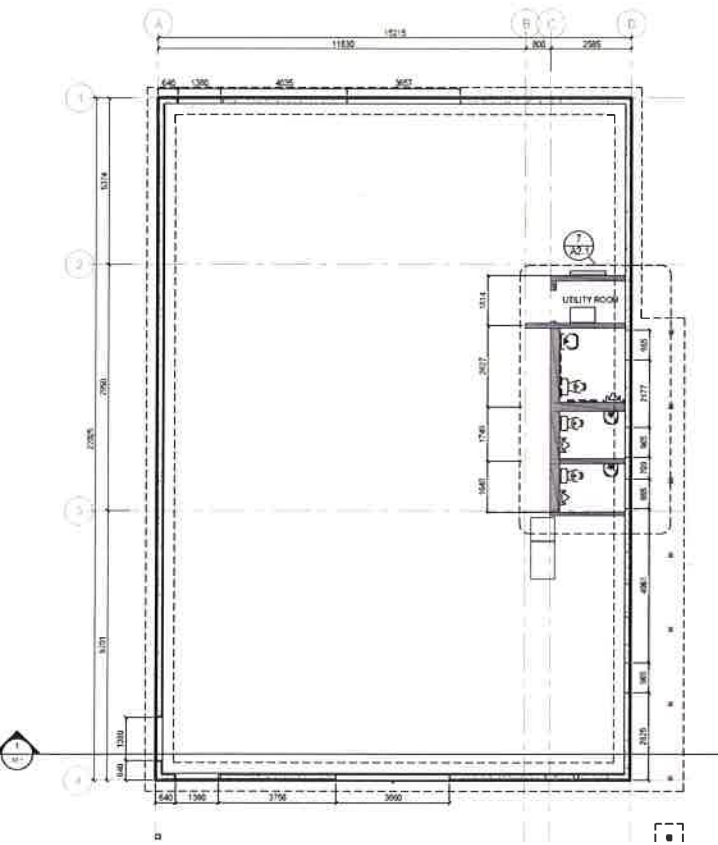
5 BOARDING BARN FLOOR PLAN




6 WEATHER SHELTER FLOOR PLAN
A2.1 1/100



8 TYPICAL BARN FOUNDATION INSULATION



 **4 SADDLING BARN FLOOR PLAN**
A2.1 1:100



X	ISSUES FOR CONSTRUCTION	1016 07 20
8	801 Construction Documents Submittal	1016 07 20
Work on	Exception	Final

PWGSC / TPSGC

**ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6**

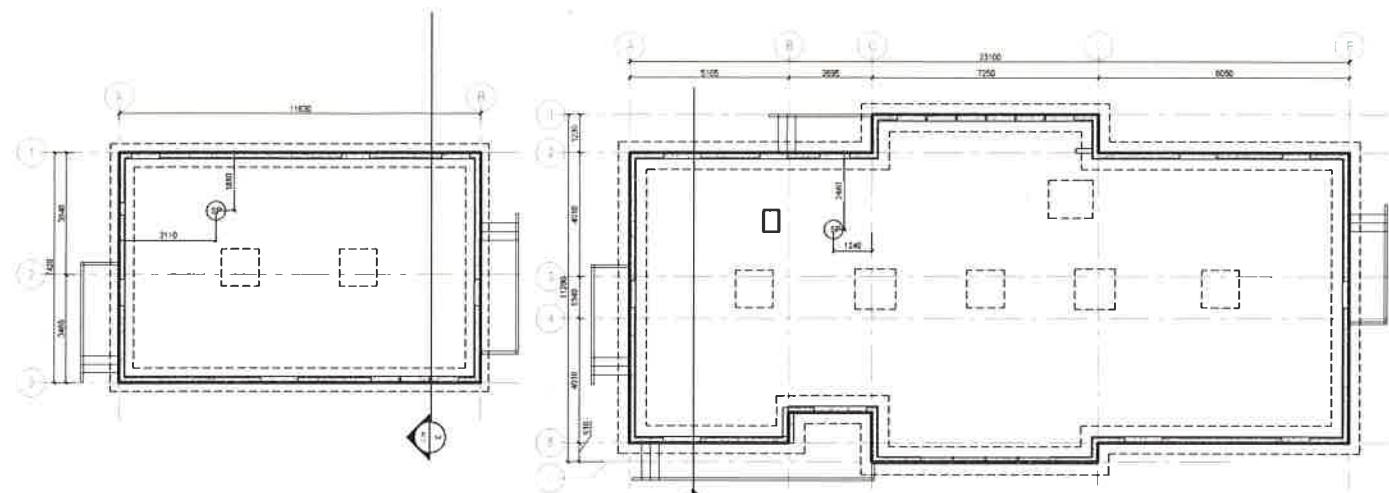
**SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA**

**WLNP ALPINE STABLES
RECONSTRUCTION
FOUNDATION PACKAGE**

Cooperator by MS
Owner by RA
Appointed by JR
PRCOSC Project Manager MICHAEL LYZANWICK

SADDLING BARN, BOARDING BARN & WEATHER SHELTER PLANS AND SECTIONS

Number to R.096286.001	Country to A2.1 OF	Date sent to 0
----------------------------------	---------------------------------	--------------------------

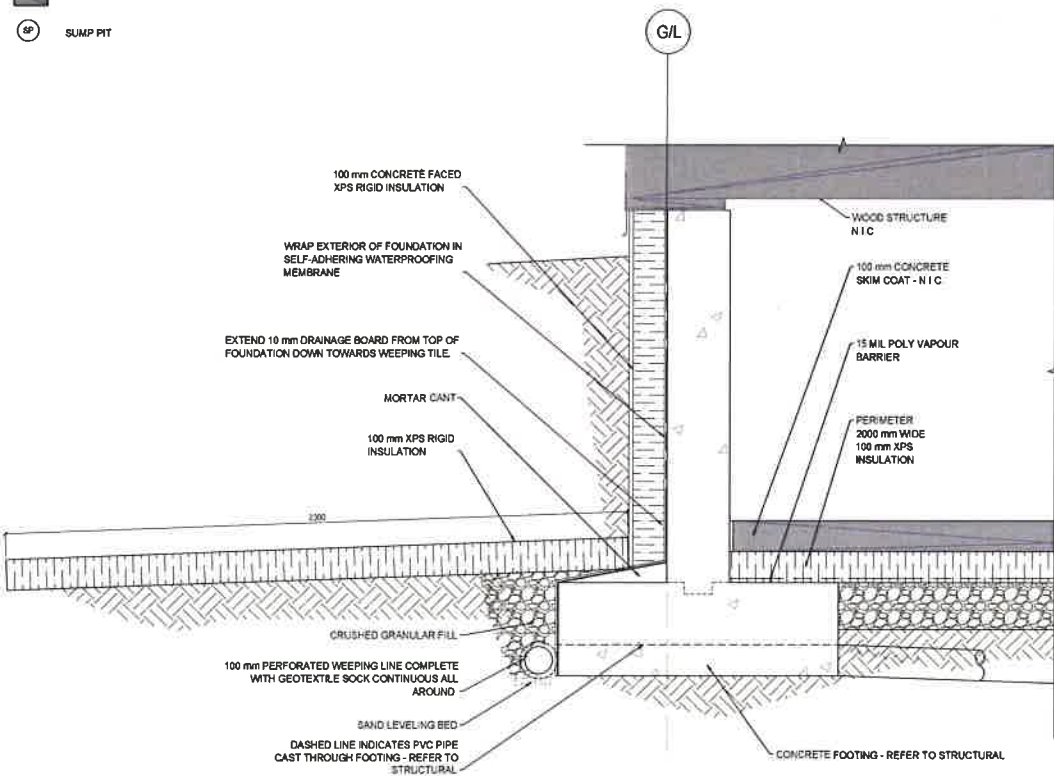


1 BUNKHOUSE FLOOR PLAN
A2.2 1:100

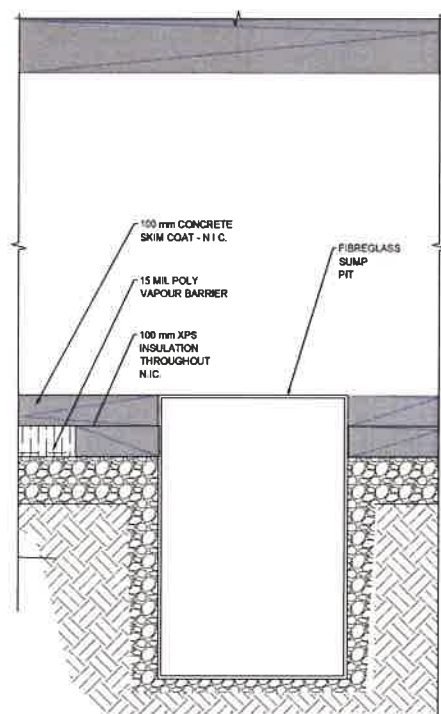
2 ALPINE COTTAGE
A2.1 1:100

LEGEND

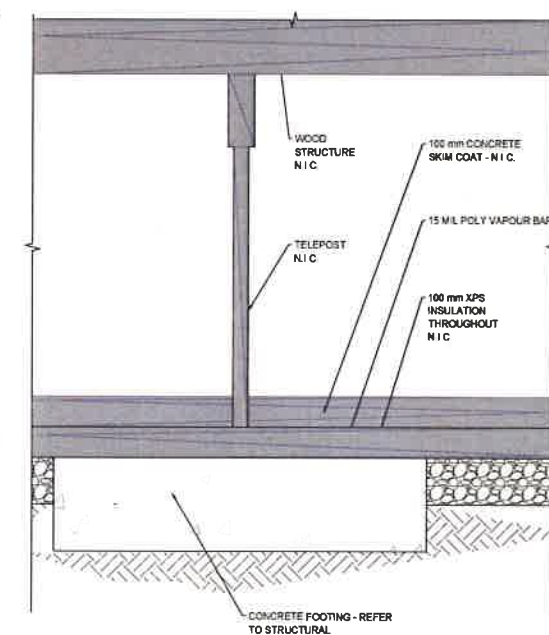
- NOT IN CONTRACT
- SUMP PIT



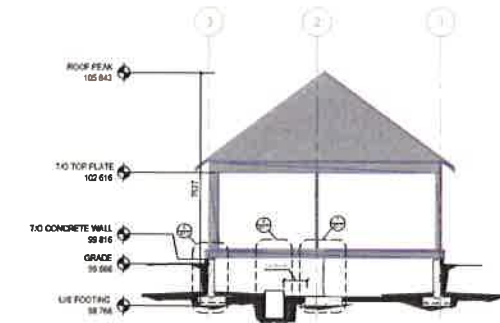
5 FOUNDATION INSULATION AND DRAINAGE
A2.2 1:10



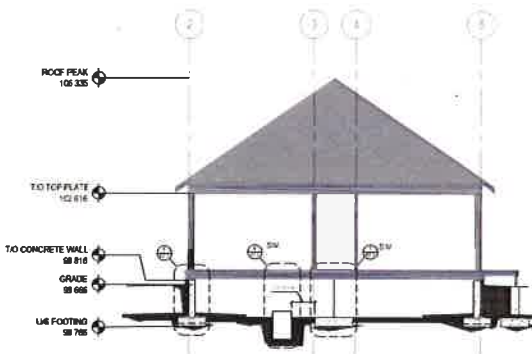
6 SEPTIC TANK DETAIL
A2.2 1:10



7 FOOTING DETAIL
A2.2 1:10



3 BUNKHOUSE SECTION
A2.2 1:100



4 ALPINE COTTAGE SECTION
A2.2 1:100

REPUBLIC ARCHITECTURE INC.
PERMIT NO. AC 13527
ISSUED PURSUANT TO THE
ARCHITECT ACT OF ALBERTA



1	ISSUED FOR CONSTRUCTION	2018 02 28
2	SPR. Construction Occupancy Inspection	2018 07 18
3	Client	2018 07 18
PSPC/SPAC		
ATB Place North Tower 10025 Jasper Ave, 5th Floor Edmonton, Alberta T5J 1S6		
Prepared by: SECTION 26, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA		
WLNK ALPINE STABLES RECONSTRUCTION FOUNDATION PACKAGE		
Designed by: MKS		
Checked by: RA		
Approved by: JR		
PSPC Project Manager: MICHAEL LYZAMA		
Drawing title: ALPINE COTTAGE AND BUNKHOUSE PLANS, SECTIONS & DETAILS		
Project no: R.096286.001	Drawing no: A2.2 OF	Rev. no. no: 0




AB	AT (SPACING)	GA	GAUGE
AB	ANCHOR BOLT	GA	GALVANIZED
ADJ	ADJUSTABLE	GEN	GENERAL
AF	ABOVE FINISHED FLOOR	GR	GRADE
ALT	ALTERNATE	GRM	GRANULAR
ARCH	ARCHITECT, ARCHITECTURAL	H	HIGH
B	BOTTOM	H	HORIZONTAL FORCE (UNFACT)
B PL	BASE PLATE	HC	HOLLOW CORE
B	BOTTOM FLOOR	HCH	HATCH
BO	BOARD	HORZ	HORIZONTAL
BW	BETWEEN	H	HORIZONTAL FORCE (FACTORED)
BLDG	BUILDING	HM	HOLLOW METAL
BULK	BULK	HP	HIGH POINT
BLL	BOTTOM LOWER LAYER	HT	HEIGHT
BM	BEAM	C	IN CENTRE
BRG	BENDING	D	INSIDE DIAMETER
BRG	BEARING	I/T	INSIDE OF
BRG PL	BEARING PLATE	INSUL	INSULATION
B	BOTH SIDES	INT	INTERIOR
BSMT	BASEMENT	JT	JOINT
BUL	BOTTOM UPPER LAYER	K	KILOGRAM
C	COMPRESSION (UNFACTORED)	KIP, K	1000 LB
C/C	CENTRE TO CENTRE	KLF	KILOHOUR PER LINEAL FOOT
CW	COMPLETE WITH	KLD	KILODYNE
CNT	CENTRE LINE	KO	KNOCKOUT
CAP	CAPACITY	KPa	KILOPASCAL
CEM	CEMENT	KSF	KIP(S) PER SQUARE FOOT
C	COMPRESSIVE FORCE (FACTORED)	KSI	KIP(S) PER SQUARE INCH
CH	CHANNEL	L	LOW
CH	CAST IRON	L LB	POUNDS(S)
CL	CAST IN PLACE	LG	LONG
CP	CONTROL JOINT	LL	LONG LEAD
CLR	CLEAR	LL	LOWER LAYER
CMU	CONCRETE MASONRY UNIT	LLV	LONG LEG VERTICAL
COL	COLUMN	LLH	LONG LEG HORIZONTAL
COMP	COMPOSITE	LONG	LONGITUDINAL
CONC	CONCRETE	LP	LOW POINT
CONN	CONNECT, CONNECTION	m	METRE
CONSTR	CONSTRUCTION	mm	MILLIMETRE
CONT	CONTROLS	MAS	MASONRY
CORR	CORRIDOR	MAX	MAXIMUM
DBL	DOUBLE	MECH	MECHANICAL
DEFL	DEFLECTION	MEZZ	MEZZANINE
DEMO	DEMOLITION	M	MOMENT
DEPR	DEPRESSION	MISC	MISCELLANEOUS
DET	DETAIL	MK	MARK
DEV	DEVELOP, DEVELOPMENT	M	MASONRY OPENING
DN	DIMETER	MOM	MOMENT
DN	DIMENSION	MPS	MEGAPASCAL
DIR	DIRECTION	NIC	NOT IN CONTRACT
DL	DEAD LOAD	NF	NEAR FACE
DN	DOWN	N	NUMBER
DR	DEEP	NO	NOMINAL
DR	DOOR	NIS	NOT TO SCALE
DR	DOWELS FIR	N-S	NORTH-SOUTH
DWG	DRAWINGS(S)	NS	NELSON STUDIO
DWL	DOWEL(S)	O/C	ON CENTRE
EA	EACH	OD	OUTSIDE DIAMETER
EA	EACH END	O/D	OUT TO OUT
EF	EACH FACE	O/F	OUTSIDE FACE
EJ	EXPANSION JOINT	O/H	OVERHEAD
EL	ELEVATION	OPNG	OPENING
ELEV	ELEVATION	OWSJ	OVER WEB STEEL JOIST
ELEC	ELECTRICAL	P	PASCAL
ENG	ENGINEER	PC	PRECAST
EQ	EQUAL	PERP	PERPENDICULAR
EQUIP	EQUIPMENT	PL	PLATE
E-S	EAST - WEST	PL	POUNDS PER LINEAL FOOT
E-W	EACH WAY	PLYMD	PLYWOOD
EXT	EXISTING	PRETAB	PREFABRICATED
EXT	EXTERIOR	PROJ	PROJECTION
FDN	FOUNDATION	PSF	POUNDS PER SQUARE FOOT
FIN	FINISHED	PSI	POUNDS PER SQUARE INCH
FL	FLOOR	PT	PRESSURE TREATED
FS	FACE SIDE	R	RADIUS, REACTION
FT	FOOT/FEET	REF	REFERENCE
FTG	FOOTING	REINF	REINFORCE, REINFORCEMENT
		REQ	REQUIRED

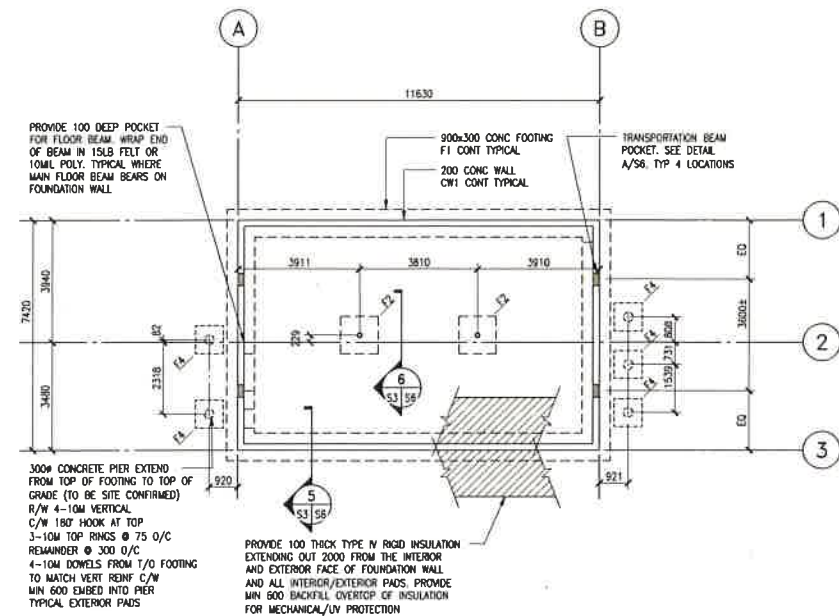
REV	REVISION, REVISED
R/O	ROUGH OPENING
R/M	REINFORCE WITH
SCHED	SCHEDULE
SECT	SECTION
SIM	SIMILAR
SJ	STRUT JOIST
SLE	STRUT ONE END
SL	SLAB
SOC	SLAB ON GRADE
SPEC	SPECIFICATIONS
SF	SPRACE-PINE-FIR
SO	SQUARE
STD	STANDARD
STR	STAIR
STIFF	STIFFENER
STR	STRIPUP
STL	STEEL
STRUCT	STRUCTURAL
STM	SYMMETRICAL
T	TENSION (UNFACTORED)
T	TOP
T/O	TOP OF
TAB	TOP & BOTTOM
TEMP	TEMPORARY
TH	TENSION FORCE (FACTORED)
THRU	THROUGH
TJ	TE JOIST
TLL	TOP LOWER LAYER
TRANS	TRANSVERSE
TS	TEMPERATURE STEEL
TUL	TOP UPPER LAYER
TYP	TYPICAL
UHMW	ULTRA HIGH MOLECULAR WEIGHT
UL	UPPER LAYER
U/N	UNLESS OTHERWISE NOTED
U/S	UNDERSIDE
V	VERTICAL SHEAR (UNFACTORED)
VERT	VERTICAL
VI	VERTICAL SHEAR (FACTORED)
W	WIDE, WIDTH
W/	WITH
W/O	WITHOUT
WO	WOOD
WP	WORK POINT
WT	WEIGHT
WWS	WELDED WIRE MESH
X-BRACE	CROSS BRACING

MARK	DESCRIPTION	REINFORCING
S1	150 CONCRETE SLAB ON 100 H-DENSITY RIGID INSULATION ON MIN 300 LEVELLING COURSE OF COMPACTED GRANULAR (REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS)	10M @ 300 O/C EACH WAY TOP

MARK	DESCRIPTION	REINFORCING
CW1	200 x 1200 CONCRETE WALL	1-20M CONT HORIZ TOP & BOTTOM INSIDE FACE 1-15M CONT HORIZ MID HEIGHT INSIDE FACE 10M VERT @ 300 O/C INSIDE FACE

MARK	DESCRIPTION	REINFORCING
F1	900 WIDE x 300 DEEP CONTINUOUS CONCRETE FOOTING	3-20M CONTINUOUS HORIZONTAL BOTTOM BARS 2-20M BOTTOM TRANSVERSE @ 600 O/C PROVIDE 10M DOWELS @ 300 O/C MAX TO MATCH VERTICAL REINFORCING OF WALL ABOVE
F2	1200x1200 x 300 DEEP CONCRETE PAD	4-20M EACH WAY BOTTOM
F3	1300x1300 x 300 DEEP CONCRETE PAD	5-20M EACH WAY BOTTOM
F4	900x900 x 300 DEEP CONCRETE PAD	3-20M EACH WAY BOTTOM

 Public Works and Government Services Canada		Travaux publics et Services gouvernementaux Canada					
REAL PROPERTY SERVICES Western Region SERVICES IMMOBILIERS Région de l'ouest							
REPUBLIC ARCHITECTURE INC		185 St. Mary Avenue Winnipeg, MB R3C 0K1 T 204 589 0102 F 204 589 0094 www.rpublicarchitecture.ca					
240-212 Carlton Street Winnipeg, Manitoba R3C 1S6 T 204 582 7503 F 204 542 7519 2019-02-25							
Crosier Kilgour & Partners Ltd. CONSULTING STRUCTURAL ENGINEERS							
							
<table border="1"> <tr> <td colspan="2"> PWGSC/TPSPGC </td> </tr> <tr> <td colspan="2"> ATB Place North Tower 10025 Jasper Ave, 5th Floor Edmonton, Alberta T5J 1S6 </td> </tr> </table>				PWGSC/TPSPGC		ATB Place North Tower 10025 Jasper Ave, 5th Floor Edmonton, Alberta T5J 1S6	
PWGSC/TPSPGC							
ATB Place North Tower 10025 Jasper Ave, 5th Floor Edmonton, Alberta T5J 1S6							
Project Title SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA WATERTON LAKES NATIONAL PARK - ALPINE STABLES RECONSTRUCTION							
Designed by AJD							
Drawn by AJD							
Approved by _____							
PWGSC Project Manager MICHAEL LYZHANSKI							
Drawing title FOUNDATIONS AND UNDERGROUND CIVIL WORK SCHEDULES AND ABBREVIATIONS							
Project no R.096286.001	Drawing no S1 OF	Revision no 0					

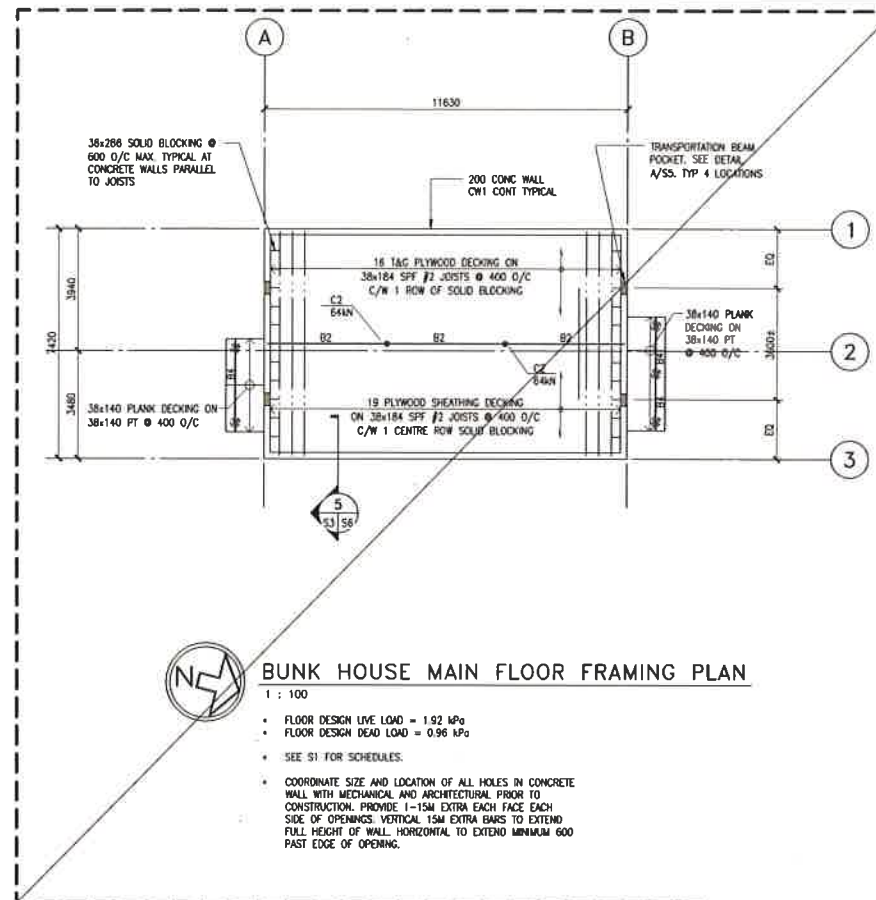


SUBGRADE BEARING SURFACE PREP NOTES:

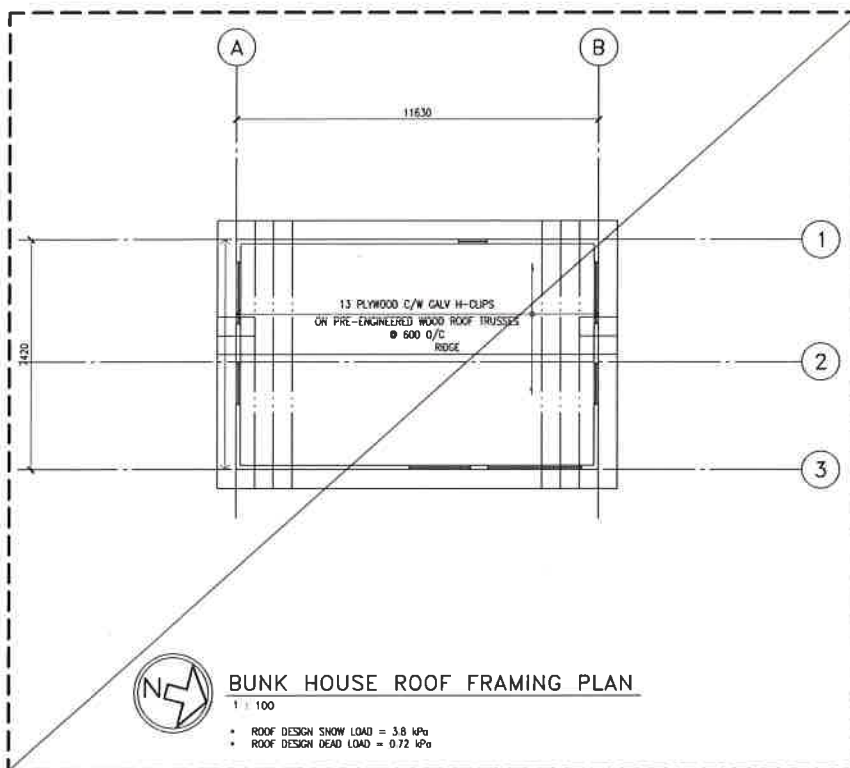
- FOOTING TO BE FOUNDED ON MIN 150 LEVELLING COURSE OF COMPACTED GRANULAR ON COMPACT TO DENSE GRAVEL LAYER AT A DEPTH OF 1.5M± BELOW EXISTING GRADE.
- SUBGRADE BEARING SURFACE TO BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO STARTING FOOTING FORM WORK.

FOUNDATION BACKFILL NOTES:

- FOLLOWING INSTALLATION OF ALL UNDERGROUND RIGID INSULATION, BACKFILL FOUNDATION ON INTERIOR/EXTERIOR C/W 600 DEPTH OF GENERAL ENGINEERED FILL OVERTOP OF RIGID INSULATION.
- ON EXTERIOR ONLY, BACKFILL IN MAX 150 LIFTS COMPACTED TO 98% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (CORRECTED IF REQUIRED) IN 22% OF THE OPTIMAL MOISTURE CONTENT.
- PLACE BACKFILL EVENLY FROM INTERIOR/EXTERIOR TO MINIMIZE UNEQUAL SOIL PRESSURES.
- DO NOT COMPACT BACKFILL ON INTERIOR FINAL BACKFILL OF FOUNDATION & FINISHING OF CRANKSPACE TO OCCUR FOLLOWING INSTALLATION OF SUPERSTRUCTURE.
- (BY OTHERS N.I.C.)

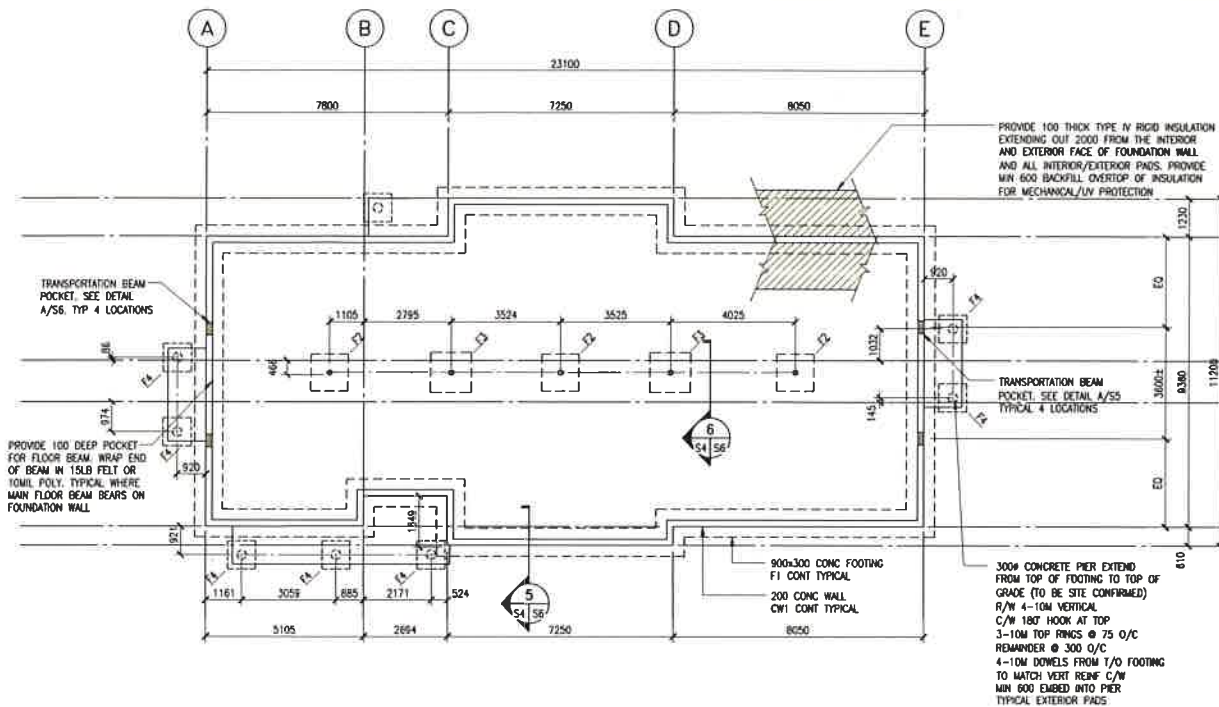


PRELIMINARY MAIN FLOOR FRAMING AND RELATED DETAILS N.I.C. SHOWN FOR REFERENCE ONLY



PRELIMINARY ROOF FRAMING N.I.C. SHOWN FOR REFERENCE ONLY

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REAL PROPERTY SERVICES Western Region SERVICES IMMOBILIERS Région de l'ouest			
REPUBLIC ARCHITECTURE INC		385 St. Mary Avenue Winnipeg, MB R2C 0N1 T 204 589 0102 F 204 589 0104 www.republicarchitecture.ca	
241-275 (office) 241-276 (residential) 241-277 (cell) 241-278 (cell) 241-279 (cell)			
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SUBGRADE BEARING SURFACE PREP NOTES:

- FOOTING TO BE FOUNDED ON MIN 150 LEVELLING COURSE OF COMPACTED GRAVEL/CLAY ON COMPACT TO DENSE GRAVEL LAYER AT A DEPTH OF 150mm BELOW EXISTING GRADE.
- SUBGRADE BEARING SURFACE TO BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO STARTING FOOTING FORM WORK.

FOUNDATION BACKFILL NOTES:

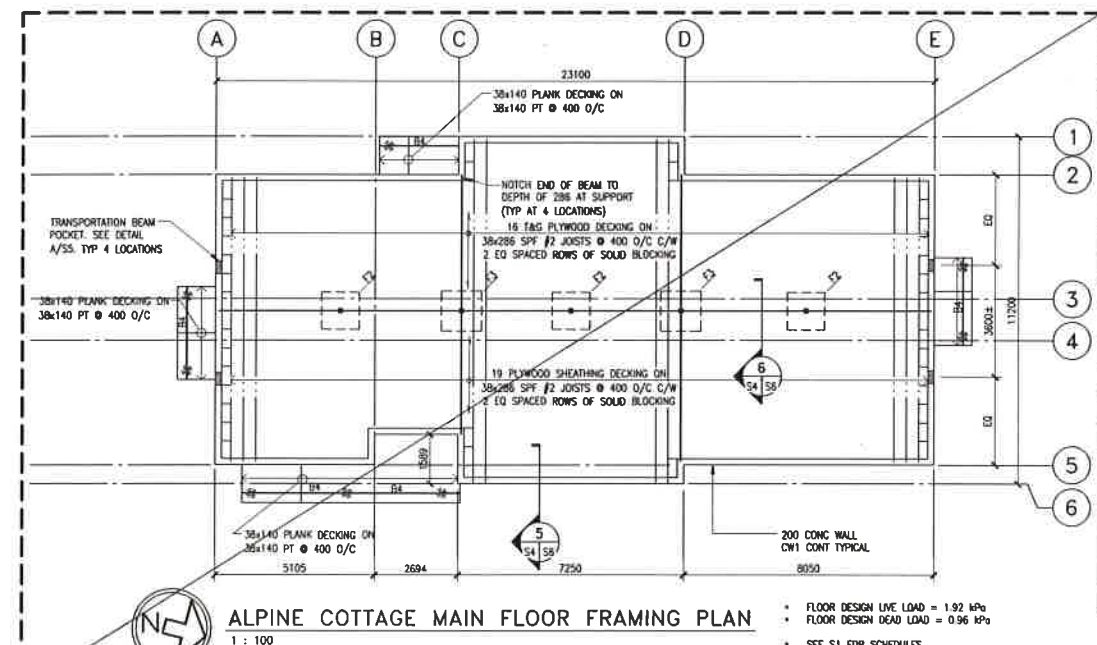
- FOLLOWING INSTALLATION OF ALL UNDERGROUND RIGID INSULATION, BACKFILL FOUNDATION ON INTERIOR/EXTERIOR C/W 600 DEPTH OF GENERAL ENGINEERED FILL OVERTOP OF RIGID INSULATION.
- ON EXTERIOR ONLY, BACKFILL IN MAX 150 LIFTS COMPACTED TO 98% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (CORRECTED IF REQUIRED) IN 32% OF THE OPTIMAL MOISTURE CONTENT.
- PLACE BACKFILL EVENLY FROM INTERIOR/EXTERIOR TO MINIMIZE UNEQUAL SOIL PRESSURES.
- DO NOT COMPACT BACKFILL ON INTERIOR.
- FINAL BACKFILL OF FOUNDATION & FINISHING OF CRAMSPACE TO OCCUR FOLLOWING INSTALLATION OF SUPERSTRUCTURE (BY OTHERS N.I.C.).



ALPINE COTTAGE FOUNDATION PLAN

1 : 100

- DESIGN BEARING PRESSURE ULS = 250 kPa (B=0.5)
- SEE S1 FOR SCHEDULES.
- COORDINATE SIZE AND LOCATION OF ALL HOLES IN CONCRETE WALL WITH MECHANICAL AND ARCHITECTURAL PRIOR TO CONSTRUCTION. PROVIDE 1-15M EXTRA EACH FACE EACH SIDE OF OPENINGS. VERTICAL 15M EXTRA BARS TO EXTEND FULL HEIGHT OF WALL. HORIZONTAL TO EXTEND MINIMUM 600 PAST EDGE OF OPENING.
- EXTERIOR UNDERGROUND RIGID INSULATION SHALL BE SANDWICHED BETWEEN 2 LAYERS OF 75mm BEDDING SAND AND SLOPED AWAY FROM STRUCTURE 1%.

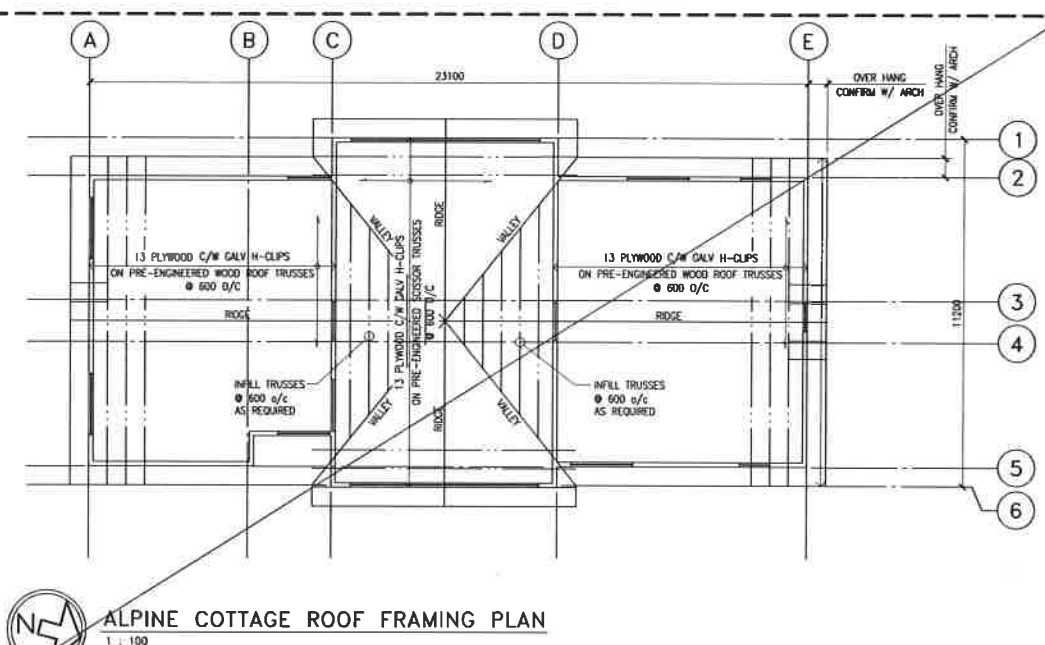


ALPINE COTTAGE MAIN FLOOR FRAMING PLAN

1 : 100

- FLOOR DESIGN LIVE LOAD = 1.92 kPa
- FLOOR DESIGN DEAD LOAD = 0.96 kPa
- SEE S1 FOR SCHEDULES.
- COORDINATE SIZE AND LOCATION OF ALL HOLES IN CONCRETE WALL WITH MECHANICAL AND ARCHITECTURAL PRIOR TO CONSTRUCTION. PROVIDE 1-15M EXTRA EACH FACE EACH SIDE OF OPENINGS. VERTICAL 15M EXTRA BARS TO EXTEND FULL HEIGHT OF WALL. HORIZONTAL TO EXTEND MINIMUM 600 PAST EDGE OF OPENING.

PRELIMINARY MAIN FLOOR FRAMING AND RELATED DETAILS N.I.C. SHOWN FOR REFERENCE ONLY



ALPINE COTTAGE ROOF FRAMING PLAN

1 : 100

- ROOF DESIGN SNOW LOAD = 3.8 kPa
- ROOF DESIGN DEAD LOAD = 0.72 kPa

PRELIMINARY ROOF FRAMING N.I.C. SHOWN FOR REFERENCE ONLY

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Crosier Kilgour
& Partners Ltd.
CONSULTING STRUCTURAL ENGINEERS

REVISIONS		Date
1	ISSUED FOR CONSTRUCTION FOUNDATION ONLY	Aug 26, 2015

PWGSC/TPSGC

ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

Project title
SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA

WATERTON LAKES
NATIONAL PARK - ALPINE
STABLES RECONSTRUCTION

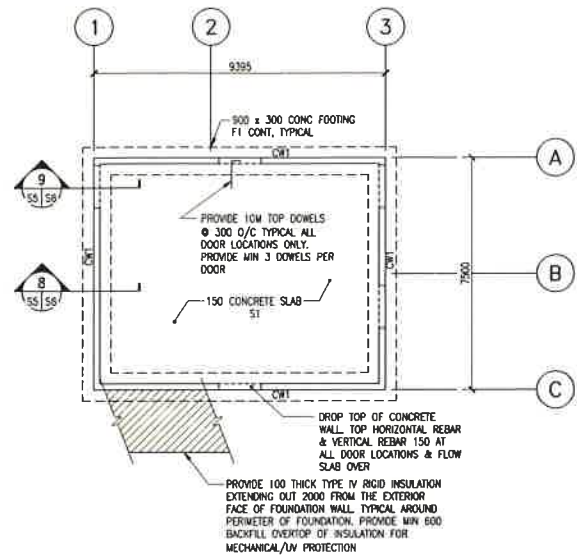
Designed by
AJD

Drawn by
JLP

Approved by
MICHAEL LYZARHYSKI

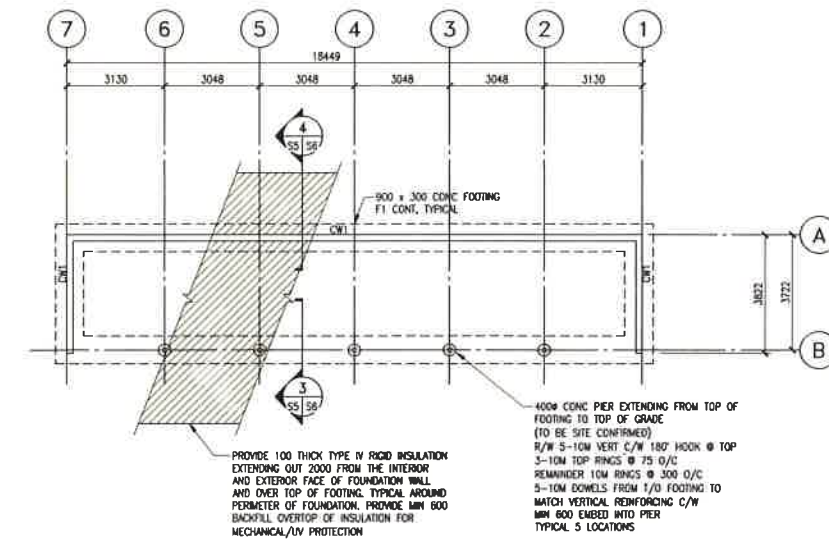
Drawing title
FOUNDATIONS AND
UNDERGROUND CIVIL WORK
ALPINE COTTAGE
FRAMING PLANS

Project no	Drawing no	Revision no
R.096286.001	S4 OF	0



**BOARDING BARN
FOUNDATION/MAIN FLOOR FRAMING PLAN**

- 1 : 100
- FLOOR DESIGN LIVE LOAD = 4.8 kPa
 - FLOOR DESIGN DEAD LOAD = 3.6 kPa
 - DESIGN BEARING PRESSURE = 250 kPa ($\phi=0.5$)
 - TOP OF CONCRETE BEAM CB1 TO BE MIN 150 ABOVE FLOOR/EXTERIOR GRADE U/N.
 - SEE S1 FOR SCHEDULES.
 - EXTERIOR UNDERGROUND RIGID INSULATION SHALL BE SANDWICHED BETWEEN 2 LAYERS OF 75mm BEDDING SAND AND SLOPED AWAY FROM STRUCTURE 1%.



**WEATHER SHELTER
FOUNDATION/MAIN FLOOR FRAMING PLAN**

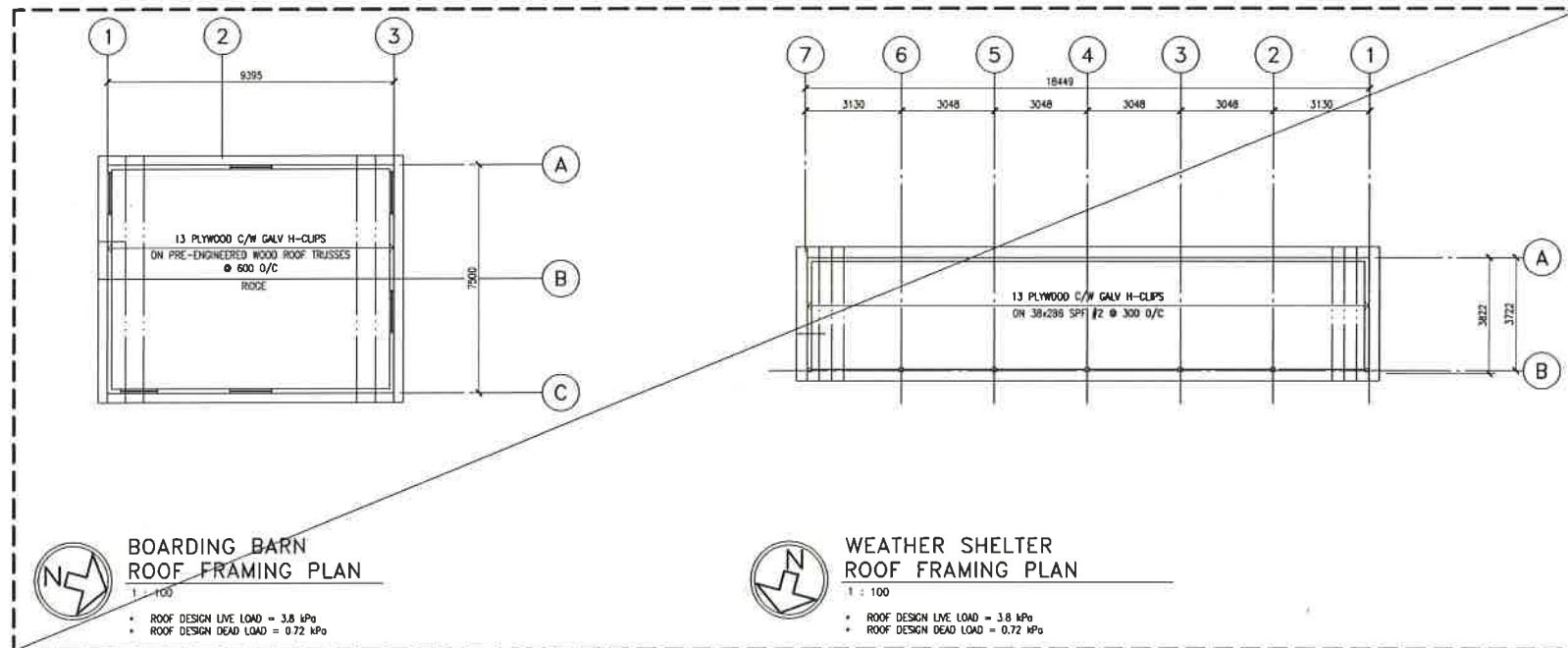
- 1 : 100
- FLOOR DESIGN LIVE LOAD = 4.8 kPa
 - FLOOR DESIGN DEAD LOAD = 3.6 kPa
 - DESIGN BEARING PRESSURE = 250 kPa ($\phi=0.5$)
 - NO CONCRETE SLAB REQUIRED, REFER TO ARCH FOR FLOOR FINISH
 - TOP OF CONCRETE BEAM CB1 TO BE MIN 150 ABOVE FLOOR/EXTERIOR GRADE
 - SEE S1 FOR SCHEDULES.
 - EXTERIOR UNDERGROUND RIGID INSULATION SHALL BE SANDWICHED BETWEEN 2 LAYERS OF 75mm BEDDING SAND AND SLOPED AWAY FROM STRUCTURE 1%.

SUBGRADE BEARING SURFACE PREP NOTES:

- FOOTING TO BE FOUNDED ON MIN 150 LEVELLING COURSE OF COMPACTED GRANULAR ON COMPACT TO DENSE GRAVEL LAYER AT A DEPTH OF 1.5M± BELOW EXISTING GRADE.
- SUBGRADE BEARING SURFACE TO BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO STARTING FOOTING FORM WORK.

FOUNDATION BACKFILL NOTES:

- FOLLOWING INSTALLATION OF ALL UNDERGROUND RIGID INSULATION, BACKFILL FOUNDATION ON INTERIOR/EXTERIOR C/W GENERAL ENGINEERED FILL PLACED IN MAX 150 LIFTS, COMPACTED TO 98% STANDARD PROCTOR MAXIMUM DRY DENSITY (CORRECTED IF REQUIRED) WITHIN ±2% OF THE OPTIMAL MOISTURE CONTENT.
- PLACE BACKFILL EVENLY FROM INTERIOR/EXTERIOR TO MINIMIZE UNEQUAL SOIL PRESSURES
- FOR BOARDING BARN ONLY, BACKFILL ON INTERIOR UP TO 550± BELOW TOP OF MAIN FLOOR SLAB ELEVATION TO ALLOW FOR ALL UNDERSLAB PREP TO BE COMPLETED AS PER THE SCHEDULE/SPEC.



**BOARDING BARN
ROOF FRAMING PLAN**

- 1 : 100
- ROOF DESIGN LIVE LOAD = 3.8 kPa
 - ROOF DESIGN DEAD LOAD = 0.72 kPa

**WEATHER SHELTER
ROOF FRAMING PLAN**

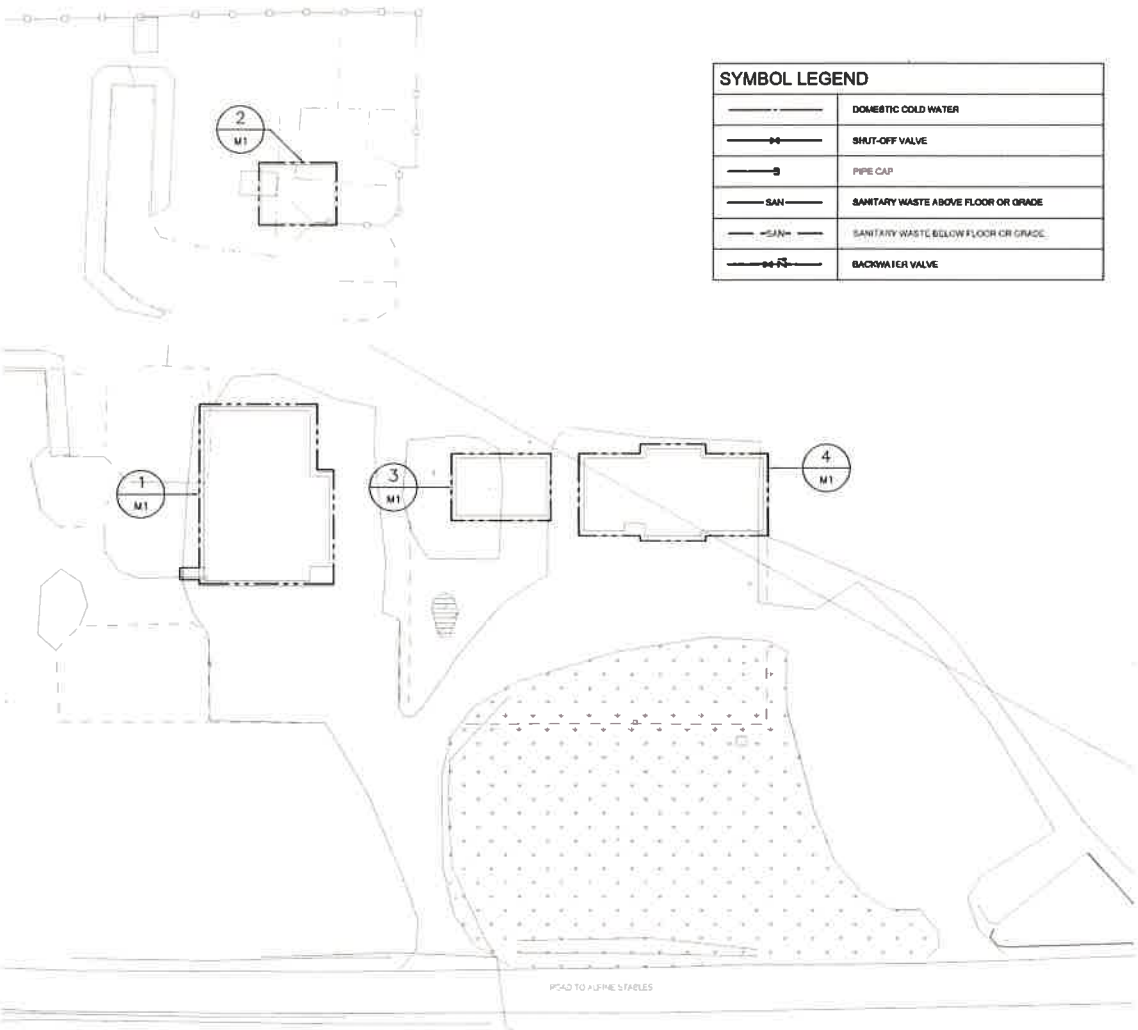
- 1 : 100
- ROOF DESIGN LIVE LOAD = 3.8 kPa
 - ROOF DESIGN DEAD LOAD = 0.72 kPa

PRELIMINARY ROOF FRAMING
N.I.C. SHOWN FOR REFERENCE
ONLY

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141-215 Carlton Street Winnipeg, Manitoba R2C 1P6 1 204 543 1213 F 204 543 1207 www.crosierkgilgour.com		Crosier Kilgour & Partners Ltd. REGISTERED STRUCTURAL ENGINEERS							
<table border="1"> <tr> <th>Project No.</th> <th>Description</th> <th>Date</th> </tr> <tr> <td>1</td> <td>REVIEW FOR CONSTRUCTION FOUNDATION ONLY</td> <td>Aug 24, 2011</td> </tr> </table>				Project No.	Description	Date	1	REVIEW FOR CONSTRUCTION FOUNDATION ONLY	Aug 24, 2011
Project No.	Description	Date							
1	REVIEW FOR CONSTRUCTION FOUNDATION ONLY	Aug 24, 2011							
PWGSC/TPSGC									
ATB Place North Tower 10025 Jasper Ave, 5th Floor Edmonton, Alberta T5J 1S6									
Project title SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA WATERTON LAKES NATIONAL PARK - ALPINE STABLES RECONSTRUCTION									
Designed by AJO									
Drawn by JLP									
Approved by 									
PWGSC Project Manager MICHAEL LYZHANSKI									
Project title FOUNDATION AND UNDERGROUND CIVIL WORK BOARDING BARN & WEATHER SHELTER FRAMING PLANS									
Project No.	Drawing No.	Sheet No.							
R.096286.001	S5 OF	0							

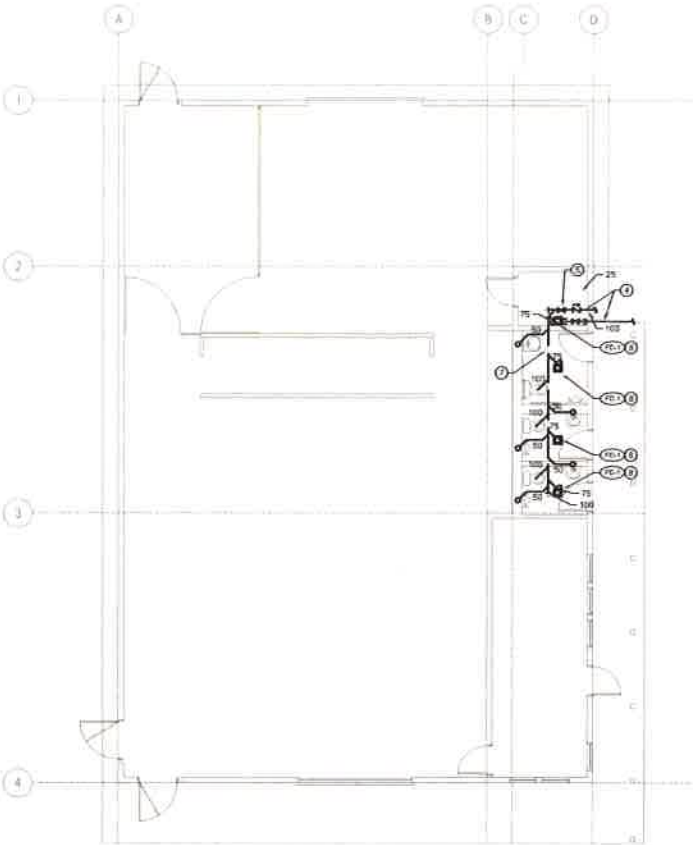


Project no R.096286.001	Drawing no S6 OF	Revision no 0
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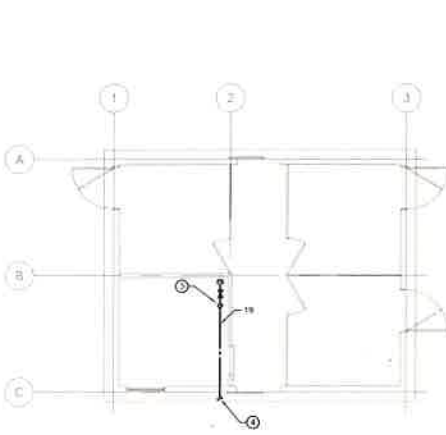


SITE PLAN
SCALE: 1:100

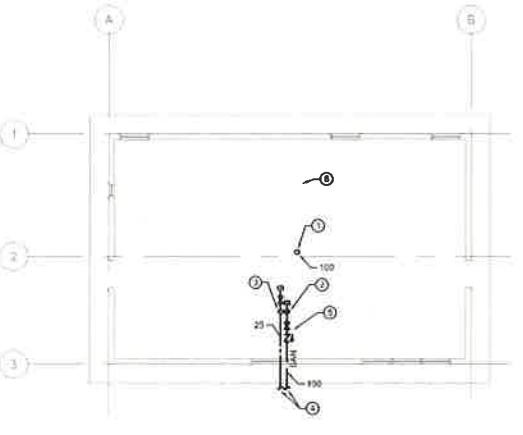
SYMBOL LEGEND	
	DOMESTIC COLD WATER
	SHUT-OFF VALVE
	PIPE CAP
	SANITARY WASTE ABOVE FLOOR OR GRADE
	SANITARY WASTE BELOW FLOOR OR GRADE
	BACKWATER VALVE



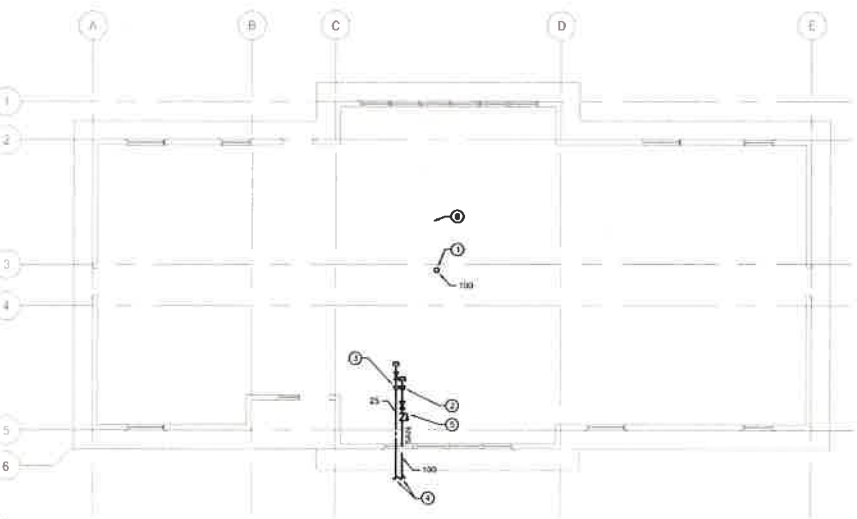
1 SADDLING BARN FLOOR PLAN - MECHANICAL
SCALE: 1:100



2 BOARDING BARN FLOOR PLAN - MECHANICAL
SCALE: 1:100



3 BUNK HOUSE CRAWLSPACE FLOOR PLAN - MECHANICAL
SCALE: 1:100



4 ALPINE COTTAGE CRAWLSPACE FLOOR PLAN - MECHANICAL
SCALE: 1:100

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GENERAL NOTES

A. DRAWINGS ARE SCHEMATIC, DO NOT SCALE.
B. COORDINATE EXACT LOCATIONS FOR LOCATION OF PIPING WITH BUILDING PACKAGE CONTRACTOR.

KEY NOTES

- PROVIDE ROUGH-IN FOR RADON GAS SUB FLOOR DEPRESSURIZATION SYSTEM AS PER ALBERTA BUILDING CODE REQUIREMENTS. PIPE TO BE SEALED AIRTIGHT ABOVE FLOOR FOR FUTURE USE.
- EXTEND SANITARY PIPE ABOVE CRAWLSPACE SLAB AND CAP OFF FOR FUTURE CONNECTION.
- EXTEND DOMESTIC WATER PIPE ABOVE CRAWLSPACE SLAB. PROVIDE SHUT OFF VALVE AND CAP OFF FOR FUTURE CONNECTION.
- REFER TO CIVIL DRAWING FOR CONTINUATION.
- PROVIDE BACKWATER VALVE.
- COORDINATE SUMP PIT LOCATION WITH ARCHITECTURAL DRAWINGS.
- PROVIDE UNDERGROUND DRAINAGE FOR FUTURE PLUMBING FIXTURES. CAP OFF PIPING ABOVE SLAB.
- ROUGH IN PIPING FOR FLOOR DRAIN TRAP PRIMING SYSTEM. CONNECTION TO SYSTEM SHALL BE LOCATED IN UTILITY ROOM.

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18-123-01

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Issued for Construction	2019 03 20
Issued for 100% Construction Document Submittal	2019 03 20
100% Construction Document Submittal	2019 03 20
Revised	Issued

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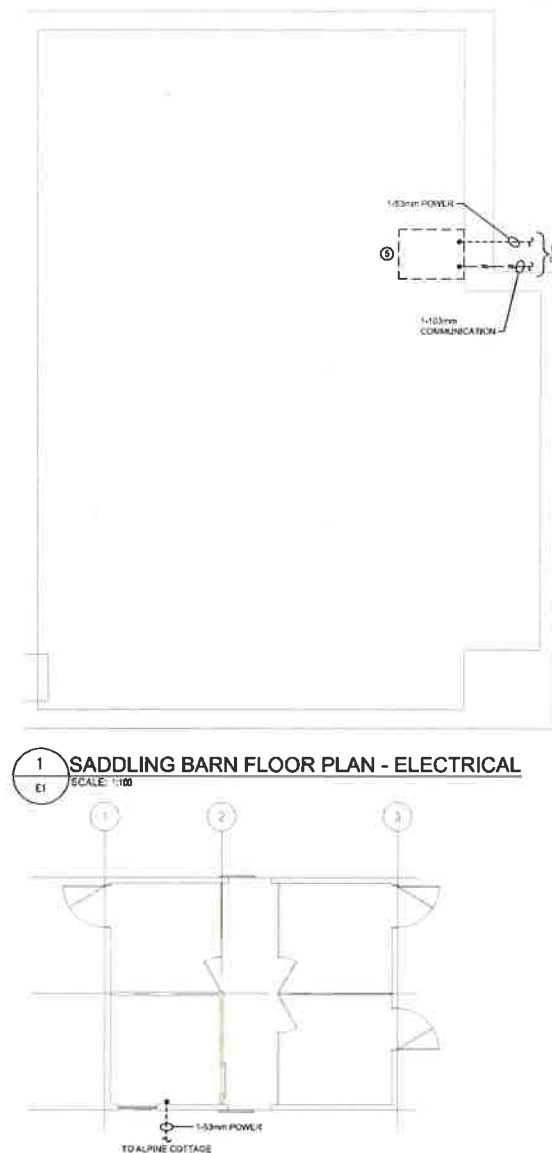
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10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

Project site
SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA

WATERTON LAKES NATIONAL PARK - ALPINE STABLES RECONSTRUCTION

Designed by
JMS
Drawn by
BC
Approved by
JMS
PWGSC Project Manager
MICHAEL LYCANBROOK
Drawing title
**FOUNDATION PACKAGE
MECHANICAL
NEW CONSTRUCTION**

Project no. R.098286.001	Drawing no. M1 OF 1	Revision no. 2
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GENERAL NOTES

- E. DUCT LAYOUTS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR TO PROVIDE AND COORDINATE EXACT DUCT LAYOUTS AND ROUTES WITH ALL TRADES AND DEPARTMENTAL REPRESENTATIVES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUCTS STUB UP AND CAP DUCTS AS SHOWN.
- F. THE CONTRACTOR TO BURY DUCTS BELOW GRADE AND PROVIDE MARKED UP DRAWINGS INDICATING DUCT ROUTES, DRAWINGS TO BE PROVIDED TO THE CONTRACTOR FOR INFORMATION. ROUTING, ROUTING, GPS COORDINATES, DEPTH BELOW GRADE AND STUB UP LOCATIONS.
- G. FOR ALL BURRED DUCTS THE CONTRACTOR SHALL REFER TO CIG TO OBTAIN MINIMUM COVER REQUIREMENTS FOR DIRECT BURIED RACEWAYS. CONTRACTOR TO PROVIDE A SEPARATE DRAWING INDICATING WHERE DUCTS ARE BURIED LOWER THAN REQUIRED DEPTH THAN THE MINIMUM COVER REQUIREMENTS AS STATIONED CIG FILES. THIS DRAWING SHALL INDICATE THE DEPTH OF THE DUCT, THE LENGTH OF THE RUN THAT IS DEEPER THAN THE MINIMUM COVERAGE AS WELL AS DUCT TYPE AND THE REQUIRED DEPTH.
- H. INSTALLATION ROUTE SHOWN IS TYPICAL. ROUTE IS TO BE COORDINATED WITH ALL OTHER UNDERSLAB SERVICES. IDENTIFY ANY INTERFERENCE ON A DRAWING AND SUBMIT TO DEPARTMENTAL REPRESENTATIVE PRIOR TO INSTALL.
- I. PROVIDE GPS COORDINATES FOR ALL DUCTS SHOWN ON CHART. PROVIDE COORDINATE EACH DUCT TO LABELED FIELD TO AND FIELD FROM.
- J. CONTRACTOR IS TO LABEL CONDUITS "POWER" OR "COMMUNICATIONS" AS APPLICABLE.
- K. USE SLOW BURIED AND ENSURE THAT FINAL INSTALLATION ALLOWS POWER AND DATA CABLES TO BE PULLED INTO CONDUIT WITHOUT THE USE OF ELECTRICITY.
- L. ALL DUCTS SHOWN TO BE STUBBED UP OR UP. SHALL BE STUBBED UP A MINIMUM OF 31 INCHES ABOVE SLAB OR GRADE AND CAPPED OFF AND PROTECTED.
- M. REFER TO AIRSIST/750 CIGS COMEOWNED OUTSIDE PLANT TELECOMMUNICATIONS INFRASTRUCTURE SITE STANDARD FOR INFORMATION DETAILS.
- N. TELECOMMUNICATION MAINTENANCE HANDLES TO BE PLACED WHEN THE CONDUIT OR DUCT SECTION LENGTH EXCEEDS 180'.N.
- O. TELECOMMUNICATION HANDLES MAY BE PLACED WHEN THE BINDER EITHER TWO 90-DEGREE BENDS OR A TOTAL OF FOUR 45-DEGREE BENDS. CONTRACTOR TO PROVIDE THE REQUIRED A PULL POINT FOR EASE OF CABLE INSTALLATION.
- P. NO SECTION OF TELECOMMUNICATION DUCT SHALL CONTAIN MORE THAN TWO 90 DEGREE BENDS. CIG EQUIVALENT; FOR DUCTS WITH AN INTERNAL DIAMETER OF 50mm OR LESS, THE CONTRACTOR TO PROVIDE A BENDER OR BENDERS TO PROVIDE THE INTERNAL DIAMETER. BENDS IN THE DUCT SHALL NOT EXCEED 180 DEGREE BENDS. CONTRACTOR TO PROVIDE A DIRECTIONAL EFFECT ON THE CABLE SHEATH DURING CABLE PULLING CREATIONS.
- Q. TELECOMMUNICATION WARRIORS PULL DUCTS CABLE FOR WIRE (OPTIC) CABLES SHOULD BE BURIED AT LEAST 500mm ABOVE THE GRADE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUCTS OUTSIDE EDGE OF THE FACILITY.
- R. WHEN A JOINT TRENCH THE METHOD IS USED TO VIEW THE VERTICAL OR HORIZONTAL SEPARATION FROM TELECOMMUNICATION DUCT TO OTHER CONDUIT OR CABLES.
 - POWER OR OTHER FOREIGN CONDUIT: 75mm OF CONCRETE.
 - 100MM OF MASSIVE 150mm OF WELL-TAMPED EARTH
 - 100MM OF GULF, OR WATER. 150MM WHEN CROSSING 300mm WHEN PARALLEL.
- S. ENSURE TRIDERS ARE DRY AND PROPERLY COMPACTED AND PREPARED. SADDLE/AROUND DUCTS WITH UNBURRED CONDUIT AND SADDLE OF DUCTS TO BE BURIED.
- T. USE EXPRESSION SLIP JOINT FITTINGS WHERE DUCTS EXIT GROUND TO ALLOW FOR DIFFERENTIAL GROUND MOVEMENT.
- U. DUCTS TO PASS BENEATH FOUNDATION WHERE POSSIBLE. WHERE NOT POSSIBLE, PROVIDE UNDERSLAB AROUND DUCTS.

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KEY NOTES

1. APPROXIMATE LOCATION OF EXISTING UTILITY (FORTH ALBERTA) POWER POLE.
2. CONTRACTOR TO SUPPLY AND INSTALL 2-10MM² (4) RIBBON CONDUCTOR, COORDINATE ALL WORK WITH FORTIS ALBERTA INSTALLATION TO BE INSTALLED TO FORTH ALBERTA SERVICE AND METERING GUIDE.
3. APPROXIMATE LOCATION OF EXISTING COMMUNICATION UTILITY DUCT.
4. CONTRACTOR TO EXTEND COMMUNICATION UTILITY (FIBER DUCT) TO ELECTRICAL ROOM.
5. ELECTRIC TO STRIP UP LOCATION OF FUTURE UTILITY (ELECTRICAL ROOM) AND CARRIED UP FUTURE UTILITY EXTENSION INTO ELECTRICAL EQUIPMENT. STRIP UP LOCATION TO BE COORDINATED WITH ALL TRAVELERS ON SITE PRIOR TO ROUGH-IN.
6. SITE LIGHTING PATH LIGHTING AND PARKING POWER TO BE DEVELOPED IN FUTURE PLANS.
7. INITIAL PER CEC DIAGRAM D1, DETAIL 2, WIRE SIZED PER TABLE 16.1 (A).
8. INITIAL PER CEC DIAGRAM D1, DETAIL 1, B, WIRE SIZED PER TABLE 2.
9. OTHER ALPINE COT TAGE LOADS (QUANTITY IS TYPICAL).
10. 53mm SLEEVE FOR GROUNDING CONDUCTOR, GROUND CONDUCTOR CRIP IN FUTURE PHASES.

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8	Invent for Construction	2010 09 30
8	Invent for 100% Construction Investment Subsidies	2010 08 30
8	100% Construction Investment Subsidies	2010 07 13
8	Investment	Investment
8	Investment	Investment

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**SECTION 25, NE CORNER, TOWNSHIP ONE,
RANGE 30, WEST OF THE 4TH
WATERTON, ALBERTA**

**WATERTON LAKES
NATIONAL PARK - ALPINE
STABLES RECONSTRUCTION**

Designed by	33
Drawn by	WFO
Approved by	TM

PAUSC Project Manager
MICHAEL LYZANIEWSKI

**FOUNDATION PACKAGE
ELECTRICAL
NEW CONSTRUCTION**

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R.096286.001	E1 OF 1	0

