

Part 1 General

- .1 This addendum consists of six (6) pages plus the specifications and following list of drawings:

No.	Drawing Title	Issue Date
C01	Key Plan	25 October 2018
C02	Existing Site Plan	25 October 2018
C03	Existing Site Plan	25 October 2018
C04	Existing Site Plan	25 October 2018
C05	Grading Plan	25 October 2018
C06	Grading Plan	25 October 2018
C07	Proposed Site Coordinates	25 October 2018
RL1	Existing and Removal Plan	24 October 2018
RL2	Overall Site Plan	24 October 2018
RL3	Detailed Landscape Plan	24 October 2018
RL4	Landscape Layout Plan	24 October 2018
RL5	Planting Plan	24 October 2018
RL11	Landscape Details - Signage	24 October 2018
E1	Site Plan and Single Line Diagram	22 October 2018
E2	Saddling Barn and Boarding Barn Floor Plans – Lighting, Power, and Systems	22 October 2018

1.2 CHANGES TO THE PROJECT MANUAL

- .1 SECTION 00 01 10 – TABLE OF CONTENTS
 - .1 **Replace** with attached.
- .2 SECTION 01 22 10 – CONTRACT UNIT PRICES
 - .1 **Revise** Item 1.5.1. as follows:
 Site Road and Parking lot subgrade...
 - .1 1.5.1.1 to read "...for expanded surface area and all other works incidental to these works."
 - .2 **Revise** Item 1.5.2. as follows:
 Site Road and Parking lot subgrade...
 - .1 1.5.2.1 to read "...elevations, and slopes as indicated and all other works incidental to these works."
 - .3 **Replace** Item 1.5.3 as follows:
 Asphalt Surfacing Sections 31 05 10, 31 05 16, and 32 12 16.01.
 - .1 Description: supply and install hot mix asphalt pavement to a thickness of 100 mm and such that final elevations match or improve upon existing grades, including tack and/or prime coat as required. Work includes loading and hauling, asphalt mix design, surface preparation, supply and placement of tack coat and/or prime coat and hot mix asphalt to required thickness, compaction and rolling, testing as

- specified in the related sections and all other works incidental to these works.
- .2 Measurement: Area will be measured at the edge of asphalt surface placed.
 - .3 Payment: per field measured square metre of hot mix asphalt installed, pending approval of compaction and materials testing results and adherence to specification requirements.
- .4 **Add** Item 1.5.4 as follows:
Failure Repair – Sections 31 05 10, 31 05 16, 31 22 13, 32 11 17, and 32 11 23
- .1 Description: Failure repair to include proof rolling entire road length to identify areas of insufficient bearing strength and, in areas to be indicated by Departmental Representative, remove existing surface material to depth of bearing surface or 400 mm below existing asphalt surface, stockpile unsuitable material at Upper Compound, prepare subgrade, supply and install 300 mm Granular Base material (at least two lifts), compact, and prepare surface suitable for accepting asphaltic prime coat. Work includes loading and hauling, means and methods as appropriate for surface removal and disposal of material, supply and placement of materials, compaction and rolling, testing as specified in the related sections and all other works incidental to these works.
 - .2 Measurement: Area will be measured at the edge of material removed and the width of the final road surface placed.
 - .3 Payment: per field measured square metre of failure repair completed, pending approval of compaction and materials testing results and adherence to specification requirements.
- .5 **Add** Item 1.5.5 as follows:
Removal of Asphalt Surface
- .1 Description: Removal of asphalt surface including: all materials, labour and equipment required for removing all asphalt within the limits shown on the drawings, including: saw cutting as required, removal of entire thickness of asphalt surface, crushing or milling removed asphalt to 25mm minus, loading, hauling and stockpiling at Upper Compound, associated cleaning and all other work incidental to performance of this work.
 - .2 Measurement: Removal of asphalt surface to be measured by length and average width to produce as area in square meters.
 - .3 Payment: per field measured square metre of removal.
- .6 **Add** Item 1.5.6 as follows:
Reconstruction top of road base – Section 31 05 10, 31 05 16, 31 22 13, 31 24 13, 32 11 17, and 32 11 23
- .1 Description: Reconstruction of top of base material to consist of all materials, labour and equipment required for removal of material to depth 200mm below existing asphalt surface, loading, hauling and stockpiling material at Upper Compound, preparation of resulting surface including proof rolling and compaction, supply and install 100mm granular base material, preparation for accepting prime coat, associated cleaning and all other work incidental to performance of this work.

- .2 Measurement: Area will be measured at the edge of final road surface placed.
- .3 Payment: per field measured square metre of resurfacing completed, pending approval of compaction and materials testing results and adherence to specification requirements.
- .3 SECTION 01 78 00 – CLOSEOUT SUBMITTALS
 - .1 **Delete** Items 1.5.6.6 ESA certification and 1.5.6.7 TSSA certification.
- .4 SECTION 03 10 00 – CONCRETE FORMING AND ACCESSORIES
 - .1 **Replace** with attached.
- .5 SECTION 06 10 00 – ROUGH CARPENTRY
 - .1 **Revise** Item 3.4.1 to “Comply with requirements of NBC 2015 Part 9 supplemented by following paragraphs.”
- .6 SECTION 06 20 01 – EXTERIOR FINISH CARPENTRY
 - .1 **Replace** with attached.
- .7 SECTION 31 05 10– CORRECTED MAX DRY DENSITY - CIVIL
 - .1 **Add** attached specification.
- .8 SECTION 31 05 10.05 – CORRECTED MAX DRY DENSITY - LANDSCAPE
 - .1 **Replace** with attached.
- .9 SECTION 31 05 16– AGGREGATE MATERIALS - CIVIL
 - .1 **Add** attached specification.
- .10 SECTION 31 05 16.05 – AGGREGATE MATERIALS - LANDSCAPE
 - .1 **Replace** with attached.
- .11 SECTION 31 22 13 – ROUGH GRADING - CIVIL
 - .1 **Add** attached specification
- .12 SECTION 31 22 13.05 – ROUGH GRADING - LANDSCAPE
 - .1 **Replace** with attached.
- .13 SECTION 31 23 10 – EXCAVATION, TRENCHING AND BACKFILL
 - .1 **Replace** with attached.
- .14 SECTION 31 23 33.01 – EXCAVATION, TRENCHING AND BACKFILLING
 - .1 **Add** attached specification.
- .15 SECTION 31 24 13 – ROADWAY EMBANKMENTS
 - .1 **Add** attached specification.
- .16 SECTION 31 37 00 – RIP RAP BOULDERS
 - .1 **Replace** with attached.
- .17 SECTION 32 01 91 – TREE AND NATURAL AREA PRESERVATION
 - .1 **Replace** with attached.
- .18 SECTION 32 11 17 – RESHAPING GRNAULAR ROADBED
 - .1 **Add** attached specification.
- .19 SECTION 32 11 23 – AGGREGATE BASE COURSE - CIVIL
 - .1 **Add** attached specification.
- .20 SECTION 32 11 23.05 – AGGREGATE BASE COURSE - LANDSCAPE

- .1 **Replace** with attached.
- .21 SECTION 32 12 16.01 – ASPHALT PAVING
 - .1 **Add** attached specification.
- .22 SECTION 32 14 13 – PRECAST CONCRETE UNIT PAVERS
 - .1 **Replace** with attached.
- .23 SECTION 32 15 40 – CRUSHED GRANULAR SURFACING
 - .1 **Replace** with attached.
- .24 SECTION 32 31 13 – FENCES AND GATES
 - .1 **Replace** with attached.
- .25 SECTION 32 37 00 – EXTERIOR SITE FURNISHINGS
 - .1 **Replace** with attached.
- .26 SECTION 32 91 21 – TOPSOIL PLACEMENT AND GRADING
 - .1 **Replace** with attached.
- .27 SECTION 32 92 23 – SODDING
 - .1 **Replace** with attached.
- .28 SECTION 32 93 10 – TREE SHRUB AND GROUND COVER PLANTING
 - .1 **Replace** with attached.

1.3

CHANGES TO DRAWINGS

- .1 DRAWING C01 – KEY PLAN
 - .1 **Replace** with attached.
- .2 DRAWING C02 – EXISTING SITE PLAN
 - .1 **Replace** with attached.
- .3 DRAWING C03 – EXISTING SITE PLAN
 - .1 **Replace** with attached.
- .4 DRAWING C04 – EXISTING SITE PLAN
 - .1 **Add** attached drawing.
- .5 DRAWING C05 – GRADING PLAN
 - .1 **Add** attached drawing.
- .6 DRAWING C06 – GRADING PLAN
 - .1 **Add** attached drawing.
- .7 DRAWING C07 – PROPOSED SITE COORDINATES
 - .1 **Add** attached drawing.
- .8 DRAWING L1 – EXISTING AND REMOVAL PLAN
 - .1 **Add** Existing Septic System to be removed by others
 - .2 **Revise** excavation location for vehicular access
 - .3 **Add** Remove and Stockpile additional existing boulders
 - .4 **Add** Note #15 regarding salvage and stockpile materials to Notes

- .9 DRAWING L2 – OVERALL SITE PLAN
 - .1 **Remove** Native Seed Repair along Peripheral Area from Contract. Seed Repair will be completed by Parks Canada
 - .2 **Revise** Park Outdoor Faucet and Valve location (as per information provided by Civil from Alpine Stables Reconstruction - Foundation Package)
 - .3 **Revise** Extent of Existing Boulders to remain
 - .4 **Revise** Layout of Dark Rundle Rock Paving Pathway to accommodate updated proposed Manhole locations
 - .5 **Revise** location of Vehicular Unit Paving at Crossing
 - .6 **Remove** Interpretive Sign for Butterfly Garden from Contract
 - .7 **Add** Proposed Manhole to Legend
 - .8 **Revise** Quantity of Dark Rundle Rock Paving
 - .9 **Revise** Quantity of Sod Area
 - .10 **Remove** Native Seed Area
- .10 DRAWING L3 – DETAILED LANDSCAPE PLAN
 - .1 **Revise** Park Outdoor Faucet and Valve location (as per information provided by Civil from Alpine Stables Reconstruction - Foundation Package)
 - .2 **Revise** Extent of Existing Boulders to remain
 - .3 **Revise** Layout of Dark Rundle Rock Paving Pathway to accommodate updated proposed Manhole locations
 - .4 **Revise** location of Vehicular Unit Paving at Crossing
 - .5 **Add** Proposed Manhole to Legend
 - .6 **Remove** Interpretive Sign for Butterfly Garden from Contract
- .11 DRAWING L4 – LANDSCAPE LAYOUT PLAN
 - .1 **Revise** Coordination and Curve Table associated with Dark Rundle Rock Paving Pathway
 - .2 **Add** Proposed Manhole to Legend
 - .3 **Revise** Park Outdoor Faucet and Valve location (as per information provided by Civil from Alpine Stables Reconstruction - Foundation Package)
 - .4 **Revise** Extent of Existing Boulders to remain
- .12 DRAWING L5 – PLANTING PLAN
 - .1 **Revise** Proposed Planting Layout related to proposed Manholes location and revised Dark Rundle Rock Paving Pathway
 - .2 **Add** Proposed Manhole to Legend
 - .3 **Revise** Park Outdoor Faucet and Valve location (as per information provided by Civil from Alpine Stables Reconstruction - Foundation Package)
 - .4 **Revise** Extent of Existing Boulders to remain

- .13 DRAWING L11 – LANDSCAPE DETAILS – SIGNAGE
 - .1 **Delete** Butterfly Garden Interpretive Sign from Contract.
- .14 DRAWING E1 – SITE PLAN AND SINGLE LINE DIAGRAM
 - .1 Refer to revised Drawing E1 as attached. Revisions are indicated in revision clouds.
- .15 DRAWING E2 – SADDLING BARN AND BOARDING BARN FLOOR PLANS – LIGHTING, POWER, AND SYSTEMS
 - .1 Refer to revised Drawing E2 as attached. Revisions are indicated in revision clouds.

END OF ADDENDUM NUMBER NO. 1

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Part 1 General

1.1 WORK INCLUDED

- .1 This Specification shall cover the requirements for forming of cast in place concrete as specified herein and shown on the Drawings. The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

1.2 REFERENCES

- .1 All concrete formwork is to be done in accordance with CAN/CSA-A23.1 and CAN/CSA-A23.2.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Formwork materials shall conform to CSA Standard CAN3-A23.1-M77 and American Concrete Publication SP-4 "Formwork for Concrete".
- .2 Formwork lumber:
 - .1 Plywood and wood formwork materials conform to CAN-086.
- .3 Form ties:
 - .1 Removal or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25mm diameter in concrete surface.
- .4 Form liner:
 - .1 Plywood: Douglas Fir to CSA 0121, concrete form grade, square edge, 19mm thick.
- .5 Formwork release agent:
 - .1 Chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

Part 3 Execution

3.1 FABRICATION AND ERECTION

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

- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 If requested, prepare and submit for approval to Departmental Representative, diagram showing proposed location and details of all construction joints.
- .5 Formwork shall be constructed to permit easy dismantling and stripping and such that removal will not damage the concrete. Provision shall be made in the formwork for shores to remain undisturbed during stripping where required.
- .6 Forms shall be constructed and maintained so that the completed work is within minus 3 mm or plus 6 mm of the dimensions shown on the Drawings.
- .7 Align form joints and make watertight. Keep form joints to minimum.
- .8 Clean formwork in accordance with CAN/CSA-A23:1. Only permitted if in good condition.
- .9 Where prefabricated panels are used, care shall be taken to ensure that adjacent panels remain flush. Where metal forms are used, all bolts and rivets shall be countersunk and well ground to provide a smooth, plane surface.
- .10 All form lumber, studding, etc. becomes the property of the Contractor when the work is finished, and it shall be removed from the concrete and the site by the Contractor after the concrete is set, free of extra charge, and the entire site left in a neat and clean condition.
- .11 It shall be permissible to use the forms over again where possible, provided they are thoroughly cleaned and in good condition after being removed from the former portions of the Work. The Departmental Representative shall be the sole judge of their condition and his decision shall be final regarding the use of them again.

3.2 FORM REMOVAL

- .1 The Departmental Representative must be notified at least 24 hours prior to form removal and give approval prior to beginning work.

3.3 PATCHING OF FORMED SURFACES

- .1 Immediately after forms have been removed, but before any repairing or surface finish is started, the concrete surface shall be inspected by the Departmental Representative. Any repair or surface finishing started before this inspection may be rejected and required to be removed.
- .2 All formed concrete surfaces shall have bolts, ties, struts and all other timber or metal parts not specifically required for construction purposes cut back twenty-five (25) mm from the surface before patching.

- .3 Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter and voids left by strutting and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement, shall be well brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar, it shall be touched up until it is satisfactory to the Departmental Representative.
- .4 All objectionable fins, projections, offsets, streaks or other surface imperfections shall be removed by approved means to the Departmental Representative's satisfaction. Cement washes of any kind shall not be used.
- .5 Wherever "Concrete Surface Coating" is to be applied, patching of minor surface defects shall be done by the Thoroseal applicator using Thorite. Payment for same is considered incidental to the works of this Specification. Patching of snap tie holes to defects larger than 15 mm in diameter shall be done under this Specification.

3.4 FINISHING OF FORMED SURFACES

- .1 Concrete shall be cast against forms which will produce plane surfaces with no bulges, indentation or swelling other than those shown on the Drawing. The arrangement of panel joints shall be kept to a minimum. Panels containing worn edges, patches or other defects which will impair the texture of concrete surfaces shall not be used. All fins on the concrete surfaces shall be removed.

3.5 QUALITY CONTROL

- .1 Inspection
 - .1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Departmental Representative including all operations from the selection and production of materials through to final acceptance of the specified work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Departmental Representative reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

3.6 ACCESS

- .1 The Departmental Representative shall be afforded full access for the inspection of form work and constituent materials.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This specification shall cover the supply and installation of exterior wood information signs. The Contractor shall furnish all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as shown on the Drawings and as specified herein.

1.2 REFERENCES

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - .1 AWMAC Quality Standards for Architectural Woodwork -1994.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A247-M86(R1996), Insulating Fibreboard.
 - .2 CSA B111-74(R1998), Wire Nails, Spikes and Staples.
 - .3 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CSA O115-M82(R2001), Hardwood and Decorative Plywood.
 - .5 CSA O121-M78(R1998), Douglas Fir Plywood.
 - .6 CAN/CSA O141-91(R1999), Softwood Lumber.
 - .7 CSA O151-M78 (R1998), Canadian Softwood Plywood.
 - .8 CSA O153-M80 (R1998), Poplar Plywood.
 - .9 CSA Z760-94, Life Cycle Assessment.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2000.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate details of construction, profiles, jointing, fastening and other related details.
- .3 Indicate materials, thicknesses, finishes and hardware.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Protect materials against dampness during and after delivery.
- .2 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Set aside damaged wood for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-joining, or ties). Store separated reusable wood waste convenient to cutting station and area of work.
- .2 Do not burn scrap at project site.
- .3 Fold up metal banding, flatten, and place in designated area for recycling.

Part 2 Products

2.1 LUMBER MATERIAL

- .1 General: All material and installation shall be shown on the drawing.
- .2 Timber: Shall be hand selected and free of waness, splits and cracks

2.2 ACCESSORIES

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work.
- .2 Wood screws: galvanized type and size to suit application.
- .3 Adhesive: recommended by manufacturer.
- .4 Use least toxic sealants, adhesives, sealers, and finishes necessary to comply with requirements of this section.

Part 3 Execution

3.1 WORKMANSHIP AND MATERIALS

- .1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Departmental Representative including all operations from the selection and production of materials through to final acceptance of the specified work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Departmental Representative reserves the right to reject any materials or works which are not in accordance with the requirements of this specification, the drawings, and accepted standards of good construction practices.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .2 ASTM D1557-02e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - .3 ASTM D4253-00, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.2 DEFINITIONS

- .1 Corrected maximum dry density is defined as:
 - .1 $D = (F1 \times D1) + (0.9 \times D2 \times F2)$
 - .2 Where: D = corrected maximum dry density kg/m³.
 - .1 F1 = fraction (decimal) of total field sample passing ASTM 4.75 mm sieve
 - .2 F2 = fraction (decimal) of total field sample retained on ASTM 4.75 mm sieve (equal to 1.00 - F1)
 - .3 D1 = maximum dry density, kg/m³ of material passing ASTM 4.75 mm sieve determined in accordance with Method A of ASTM D 1557-91 (regardless of % oversize fraction F2) for granular base, subbase and backfill materials and to ASTM D 698-00a for clay subgrades and backfill materials.
 - .4 D2 = bulk density, kg/m³, of material retained on ASTM 4.75 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127-88 (1993)e1.
 - .3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 dry method when directed by Departmental Representative.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .2 ASTM D1557-02e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - .3 ASTM D4253-00, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.2 DEFINITIONS

- .1 Corrected maximum dry density is defined as:
 - .1 $D = (F1 \times D1) + (0.9 \times D2 \times F2)$
 - .2 Where: D = corrected maximum dry density kg/m³.
 - .1 F1 = fraction (decimal) of total field sample passing ASTM 4.75 mm sieve
 - .2 F2 = fraction (decimal) of total field sample retained on ASTM 4.75 mm sieve (equal to 1.00 - F1)
 - .3 D1 = maximum dry density, kg/m³ of material passing ASTM 4.75 mm sieve determined in accordance with Method A of ASTM D 1557-91 (regardless of % oversize fraction F2) for granular base, subbase and backfill materials and to ASTM D 698-00a for clay subgrades and backfill materials.
 - .4 D2 = bulk density, kg/m³, of material retained on ASTM 4.75 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127-88 (1993)e1.
 - .3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 dry method when directed by Departmental Representative.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

Part 2 Products

2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
 - .1 Greatest dimension to exceed 5 times least dimension.
- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
 - .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
 - .2 Reclaimed asphalt pavement.
 - .3 Reclaimed concrete material.

- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
 - .1 Crushed rock.
 - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
 - .3 Reclaimed asphalt pavement.
 - .4 Reclaimed concrete material.

2.2 SOURCE QUALITY CONTROL

- .1 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .2 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

2.3 TESTING

- .1 Inspection and testing of aggregate materials will be carried out by testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.
- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.
- .3 For each material specified in the following sections, one test for each material property specified will be required for every 500 tonnes of material unless otherwise specified in the relevant section.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with topsoil stripping only after unacceptable conditions have been remedied.

3.2 PREPARATION

- .1 Topsoil stripping:
 - .1 Stockpile within 50 m of stripped area where possible as directed by Departmental Representative. Stockpile height not to exceed 2m.
- .2 Aggregate source preparation:

- .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.
 - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
 - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
 - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
 - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .3 Processing:
- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
- .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .5 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .6 Stockpiling:
- .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Departmental Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials within 48 hours of rejection.
 - .7 Stockpile materials in uniform layers of thickness as follows:

- .1 Maximum 1.5 m for coarse aggregate and base course materials.
- .2 Maximum 1.5 m for fine aggregate and sub-base materials.
- .3 Maximum 1.5 m for other materials.
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles or spill material over edges of piles.
- .10 Do not use conveying stackers.
- .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by Department Representative .
- .5 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.
- .6 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to Departmental Representative.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

Part 2 Products

2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
 - .1 Greatest dimension to exceed 5 times least dimension.
- .3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
 - .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
 - .2 Reclaimed asphalt pavement.
 - .3 Reclaimed concrete material.

- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
 - .1 Crushed rock.
 - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
 - .3 Reclaimed asphalt pavement.
 - .4 Reclaimed concrete material.

2.2 SOURCE QUALITY CONTROL

- .1 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .2 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

2.3 TESTING

- .1 Inspection and testing of aggregate materials will be carried out by testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.
- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.
- .3 For each material specified in the following sections, one test will be required for every 500 tonnes of material unless otherwise specified in the relevant section.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with topsoil stripping only after unacceptable conditions have been remedied.

3.2 PREPARATION

- .1 Topsoil stripping:
 - .1 Stockpile within 50 m of stripped area where possible as directed by Departmental Representative. Stockpile height not to exceed 2m.
- .2 Aggregate source preparation:

- .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.
 - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
 - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
 - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
 - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .3 Processing:
- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
- .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .5 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .6 Stockpiling:
- .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Departmental Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials within 48 hours of rejection.
 - .7 Stockpile materials in uniform layers of thickness as follows:

- .1 Maximum 1.5 m for coarse aggregate and base course materials.
- .2 Maximum 1.5 m for fine aggregate and sub-base materials.
- .3 Maximum 1.5 m for other materials.
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles or spill material over edges of piles.
- .10 Do not use conveying stackers.
- .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by Department Representative .
- .5 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.
- .6 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to Departmental Representative.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

1.2 EXISTING CONDITIONS

- .1 Known underground and surface utility lines and buried objects are as indicated on site plan.
- .2 Refer to dewatering in Section 31 23 33.01- Excavating, Trenching and Backfilling.

Part 2 Products

2.1 MATERIALS

- .1 Fill material: Type 3 to Section 31 23 33.01- Excavating, Trenching and Backfilling
- .2 Excavated or graded material existing on site suitable to use as fill for grading work if material meets requirements of Type 3 to Section 31 23 33.01- Excavating, Trenching and Backfilling.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 STRIPPING OF TOPSOIL

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Departmental Representative.
- .2 Commence topsoil stripping of areas as indicated or as directed by Departmental Representative.

- .3 Strip topsoil to depths as indicated. Avoid mixing topsoil with subsoil.
- .4 Stockpile in off-site location southwest of lagoons. Stockpile height not to exceed 2 m and should be protected from erosion.
- .5 Dispose of unused topsoil as directed by Departmental Representative.

3.3 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Rough grade to depths below finish grades as indicated on drawings.
- .3 Slope rough grade away from building 2% minimum.
- .4 Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum before placing fill over existing ground. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .5 Compact filled and disturbed areas to corrected maximum dry density according to Section 31 05 10 Corrected Maximum Dry Density as follows:
 - .1 90% under landscaped areas.
 - .2 95% under paved and walk areas.
- .6 Do not disturb soil within branch spread of trees or shrubs to remain.

3.4 TESTING

- .1 Inspection and testing of soil compaction will be carried out by certified testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.
- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.
- .3 One test for each material property specified is required for every 500 sqm of area graded and one test for every 500 sqm of each 150 mm lift of material placed.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.6 PROTECTION

- .1 Protect existing trees, natural features, bench marks, buildings, surface or underground utility lines which are to remain. If damaged, restore to original or better condition unless directed otherwise.

- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

1.2 EXISTING CONDITIONS

- .1 Known underground and surface utility lines and buried objects are as indicated on site plan.
- .2 Refer to dewatering in Section 31 23 33.01- Excavating, Trenching and Backfilling.

Part 2 Products

2.1 MATERIALS

- .1 Fill material: Type 3 to Section 31 23 33.01- Excavating, Trenching and Backfilling
- .2 Excavated or graded material existing on site suitable to use as fill for grading work if material meets requirements of Type 3 to Section 31 23 33.01- Excavating, Trenching and Backfilling.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 STRIPPING OF TOPSOIL

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Departmental Representative.
- .2 Commence topsoil stripping of areas as indicated or as directed by Departmental Representative.

- .3 Strip topsoil to depths as indicated. Avoid mixing topsoil with subsoil.
- .4 Stockpile in off-site location southwest of lagoons. Stockpile height not to exceed 2 m and should be protected from erosion.
- .5 Dispose of unused topsoil as directed by Departmental Representative.

3.3 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Rough grade to depths below finish grades as indicated on drawings.
- .3 Slope rough grade away from building 2% minimum.
- .4 Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum before placing fill over existing ground. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .5 Compact filled and disturbed areas to corrected maximum dry density according to Section 31 05 10 Corrected Maximum Dry Density as follows:
 - .1 90% under landscaped areas.
 - .2 95% under paved and walk areas.
- .6 Do not disturb soil within branch spread of trees or shrubs to remain.

3.4 TESTING

- .1 Inspection and testing of soil compaction will be carried out by testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.
- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.6 PROTECTION

- .1 Protect existing trees, natural features, bench marks, buildings, surface or underground utility lines which are to remain. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

1. This Specification shall cover the excavation, trenching and backfill work as specified herein and shown on the Drawings. The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

1.2 PROTECTION OF EXISTING FEATURES

1. Existing buried utilities and structures:
 - .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .2 Prior to commencing excavation work, notify Departmental Representative or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Departmental Representative or authorities having jurisdiction to clearly mark such locations to prevent disturbance during work.
 - .3 Confirm locations of buried utilities by careful test excavations.
 - .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .5 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative.
 - .6 Record location of maintained, re-routed and abandoned underground lines.
- .2 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative condition survey of existing buildings, trees and other plants, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by work.
 - .2 Protect existing buildings and surface features from damage while work is in progress. In event of damage, immediately make repair to approval of Departmental Representative.

Part 2 Products

2.1 Granular Base

- .1 Granular base shall be provided as specified in Section 32 11 23, part 2.1 Materials.

Part 3 Execution

3.1 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 STOCKPILING

- .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

3.3 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as shown on the drawings.
- .2 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .3 Dispose of surplus and unsuitable excavated material off site.
- .4 Do not obstruct flow of surface drainage or natural watercourses.
- .5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .6 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.4 BACKFILLING

- .1 Do not proceed with backfilling operations until Departmental Representative has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Place unshrinkable fill in areas as indicated. Consolidate and level unshrinkable fill with internal vibrators.
- .6 Place bedding and surround material as specified elsewhere.
- .7 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

3.5 RESTORATION

- .1 Upon completion of work, remove waste materials and debris, trim slopes, and correct defects.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).
 - .5 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
 - .2 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

1.2 DEFINITIONS

- .1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

- .6 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM C136 or ASTM D422: Sieve sizes to CAN/CGSB-8.2.
 - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 – 100
0.02 mm	10 – 80
0.005 mm	0 – 45
 - .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.
- .7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Quality Control:
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
 - .2 Submit for review by Departmental Representative proposed dewatering methods as described in PART 3 of this Section.
 - .3 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
 - .4 Submit to written notice when bottom of excavation is reached.
 - .5 Submit to Departmental Representative testing results report as described in PART 3 of this Section.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground utility locates, indicating: location plan of relocated and abandoned services, as required, location plan of existing utilities as found in field and clearance record from utility authority.
- .4 Samples:
 - .1 Submit samples in accordance with Section 01 33 00- Submittal Procedures.
 - .2 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

- .3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
- .4 Ship samples prepaid to approved testing laboratory, in tightly closed containers to prevent contamination and exposure to elements.

1.4 QUALITY ASSURANCE

- .1 Submit design and supporting data at least 2 weeks prior to beginning Work.
- .2 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Alberta, Canada.
- .3 Keep design and supporting data on site.
- .4 Engage services of qualified professional Engineer who is registered or licensed in Alberta, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .5 Do not use soil material until written report of soil test results are approved by Departmental Representative.

1.5 EXISTING CONDITIONS

- .1 Examine soil report available from Departmental Representative.
- .2 Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services within 2 m of foundations including existing holding tank and well water lines: cap cut-offs.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

Part 2 Products

2.1 MATERIALS

- .1 Type 1 and Type 2 fill: properties to Section 31 05 16- Aggregate Materials and the following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C117 and ASTM C136. Sieve sizes to CAN/CGSB-8.2.

.3 Table:

Sieve Designation	% Passing	
	Type 1	Type 2
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
0.075 mm	3-8	0-10

.2 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Unshrinkable fill: proportioned and mixed to provide:

- .1 Maximum compressive strength of 0.4 MPa at 28 days.
- .2 Maximum cement content of 25 kg/m³ fly ash replacement: to CSA-A3001, Type GU.
- .3 Minimum strength of 0.07 MPa at 24 h.
- .4 Concrete aggregates: to CSA-A23.1/A23.2.
- .5 Cement: Type GU.
- .6 Slump: 160 to 200 mm.

.4 Fracture face: any

.5 Liquid Limit ASTM D4318, maximum 30

.6 Plasticity Index: maximum 10

.7 LA Abrasion: ASTM C131, maximum % loss by weight 100

.8 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

2.2 TESTING

.1 Inspection and testing of materials will be carried out by certified testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.

.2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.

.3 For each material used, one test will be required for every 500 tonnes of material placed.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.3 PREPARATION/PROTECTION

- .1 Keep excavations clean, free of standing water, and loose soil. Protect excavations from freezing.
- .2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .4 Protect buried services that are required to remain undisturbed.

3.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative.
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Health and Safety Act for the Province of Alberta.
 - .1 Where conditions are unstable, Departmental Representative to verify and advise methods.
- .2 Obtain permit from authority having jurisdiction for temporary diversion of water course.

- .3 Construct temporary Works to depths, heights and locations as indicated.
- .4 During backfill operation:
 - .1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.
 - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
 - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.
- .5 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .6 Upon completion of substructure construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore watercourses as indicated.

3.6 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for approval details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in collection or runoff areas and in a manner not detrimental to public and private property, or portion of Work completed or under construction.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.7 EXCAVATION

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 120 m of trench in advance

- of installation operations and do not leave open more than 15 m at end of day's operation.
- .6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
 - .7 Restrict vehicle operations directly adjacent to open trenches.
 - .8 Dispose of surplus and unsuitable excavated material in approved location on site.
 - .9 Do not obstruct flow of surface drainage or natural watercourses.
 - .10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter, or frozen ground.
 - .1 Any subgrade rejected as a result of these will be removed and replaced with unfrozen 25 mm gravel (Type 1), placed and compacted to 98% corrected maximum dry density in accordance with Section 31 05 10 Corrected Maximum Dry Density. Repair shall be at no extra cost.
 - .11 Notify Departmental Representative when bottom of excavation is reached.
 - .12 Obtain Departmental Representative approval of completed excavation.
 - .13 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
 - .14 Dispose of surplus and unsuitable material by stockpiling in the Upper Compound.
 - .15 Correct unauthorized over-excavation, at no extra cost to the contract, as follows:
 - .1 Fill under bearing surfaces and footings with concrete specified for footings.
 - .2 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected maximum dry density in accordance with Section 31 05 10 Corrected Maximum Dry Density.
 - .16 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
 - .2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

3.8 FILL TYPES AND COMPACTION

- .1 Compaction densities are corrected maximum dry obtained from ASTM D698 and specified in Section 31 05 10.

3.9 TESTING

- .1 Inspection and testing of soil compaction will be carried out by certified testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.

- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.
- .3 Testing frequency will be one test for every 500 m² and one test every 500 m² of 150 mm lift of fill material placed.

3.10 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
 - .2 Departmental Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of concrete formwork.
 - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
- .6 Place recycled fill in areas as indicated.

3.11 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Replace topsoil as indicated or as directed by Departmental Representative.
- .3 Clean and reinstate areas affected by Work as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Common Excavation: excavation of materials that are not Rock Excavation or Stripping.
- .2 Free Haul: distance that excavated material is hauled without compensation. Free haul distance to be 0.5 km or less.
- .3 Stripping: excavation of organic material covering original ground.
- .4 Over Haul: authorized hauling in excess of free haul distance that excavated material is moved.
- .5 Embankment: material derived from usable excavation and placed above original ground or stripped surface up to top of subgrade.
- .6 Waste Material: material unsuitable for embankment, embankment foundation or material surplus to requirements.
- .7 Borrow Material: material obtained from areas outside right-of-way and required for construction of embankments or for other portions of work.
- .8 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.

1.3 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Adhere to regulations of authority having jurisdiction when blasting is required.

Part 2 Products

2.1 MATERIALS

- .1 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.
- .2 Borrow material:
 - .1 Obtain from sources such as quarry, or borrow pit as approved by Departmental Representative.
 - .1 Earth Embankment materials to consist of acceptable earth material and processed rock material free from objectionable quantities of organic matter, frozen soil, stumps, trees, moss, and other unsuitable materials.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that condition of substrate is acceptable for roadway embankment Work:
 - .1 Visually inspect substrate in presence Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 COMPACTION EQUIPMENT

- .1 Compaction equipment: vibratory rollers or vibrating plate compactors capable of obtaining required density in materials on project.
 - .1 Demonstrate compaction equipment effectiveness on specified material and lift thickness by documented performance of test-strip before start of Work.
 - .2 Replace or supplement equipment that does not achieve specified densities.
- .2 Operate compaction equipment continuously in each embankment when placing material.

3.3 WATER DISTRIBUTORS

- .1 Apply water with equipment capable of uniform distribution.

3.4 STRIPPING (OF TOPSOIL)

- .1 Strip topsoil as follows:
 - .1 Ensure that procedures are conducted in accordance with applicable requirements.
 - .2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
 - .3 Handle topsoil only when it is dry and warm.
 - .4 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation.
 - .5 Remove brush from targeted area by non-chemical means and dispose of through mulching.
- .2 Commence topsoil stripping of areas as indicated after weeds, grasses, and brush have been removed from these areas.
- .3 Strip topsoil to depths as indicated. Do not mix topsoil with subsoil.
- .4 Stockpile in nearby materials yard southwest of lagoons.

- .1 Stockpile height: not to exceed 2m.
- .5 Remove clearing and grubbing debris from stripping.
- .6 Spread organic stripping, on completion of excavation and embankment construction, on slopes and trim or remove from site if quantity exceeds ability to grade on site.

3.5 EXCAVATING

- .1 General:
 - .1 Notify Departmental Representative when waste materials are encountered and remove to depth and extent directed.
 - .2 Treat ground slopes, where subgrade is on transition from excavation to embankment, at grade points as directed by Departmental Representative.
 - .3 Treat ground slopes, where subgrade is on transition from excavation to embankment, at grade points as indicated.
- .2 Drainage:
 - .1 Maintain profiles, crowns and cross slopes to provide good surface drainage.
 - .2 Provide ditches as work progresses to provide drainage.
 - .3 Construct interceptor ditches as indicated or as directed before excavating or placing embankment in adjacent area.
- .3 Borrow Excavation:
 - .1 Completely use in embankments, suitable materials removed from right-of-way excavations before taking material from borrow areas.
 - .2 Obtain embankment materials, in excess of what is available from cut areas, from designated borrow areas.
 - .1 Departmental Representative to designate extent of borrow areas and allowable depth of excavation.
 - .2 Remove waste and stripping material from borrow pits to designated locations.
 - .3 Slope edges of borrow areas to minimum 3:1 and provide drainage as directed.
 - .4 Trim and leave borrow pits in condition to permit accurate measurement of material removed.

3.6 EMBANKMENTS

- .1 Scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces.
 - .1 Method used to be pre-approved in writing by Departmental Representative.
- .2 Break up or scarify existing road surface prior to placing embankment material.

- .3 Do not place material which is frozen nor place material on frozen surfaces except in areas authorized by Departmental Representative.
- .4 Maintain crowned surface during construction to ensure ready run-off of surface water.
- .5 Drain low areas before placing materials.
 - .1 Place and compact to full width in layers not exceeding 200mm loose thickness. Departmental Representative may authorize thicker lifts if specified compaction can be achieved and if material contains more than 25% by volume stone and rock fragments larger than 100 mm.
- .6 Where material consists of rock:
 - .1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 1m.
 - .2 Distribute rock material to fill voids with smaller fragments to form compact mass.
 - .3 Fill surface voids at subgrade level with rock spalls or selected material to form earth-tight surface.
 - .4 Do not place boulders and rock fragments with dimensions exceeding 150mm within 300mm of subgrade elevation.
- .7 Deductions from excavation will be made for overbuild of embankments.

3.7 COMPACTION

- .1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.
- .2 Deposit, spread, and level, embankment material in layers 200 mm maximum thickness before compaction.
 - .1 Compact each layer of embankment until compaction equipment achieves no further significant consolidation.
 - .2 Ensure required compaction for each layer before placing any material for next layer.
- .3 Use specialized compaction equipment supplemented by routing, hauling, and leveling equipment over each layer of fill.
- .4 Obtain written approval from Departmental Representative before using specialized compaction equipment such as tamping rollers, vibratory rollers, or other alternate compaction equipment that produces the required results
 - .1 For tamping rollers, use equipment that exerts 1000 kPa minimum of pressure on tamping surface of each tamping foot in transverse row.
- .5 Compact each layer to minimum 95% corrected maximum dry density: ASTM D698 and Section 31 05 10 Corrected Maximum Dry Density except top 150 mm of subgrade.
 - .1 Compact top 150 mm to 100% maximum dry density according to Section 31 05 10 Corrected Maximum Dry Density.

- .6 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.

3.8 FINISHING

- .1 Shape entire roadbed to within 25 mm of design elevations.
- .2 Finish slopes, ditch bottoms and borrow pits true to lines, grades and drawings where applicable.
- .3 Remove rocks over 150 mm in dimension from slopes and ditch bottoms.
- .4 Hand finish slopes that cannot be finished satisfactorily by machine.
- .5 Round top of backslope 1.5 m both sides of top of slope.
- .6 Run tractor tracks over slopes exceeding 3 m in height to leave tracks parallel to centreline of highway.
- .7 Trim between constructed slopes and edge of clearing to provide drainage and free of humps, sags and ruts.
- .8 Place top soil as follows:
 - .1 Place topsoil only after Departmental Representative has accepted subgrade.
 - .2 Spread topsoil during dry conditions in uniform layers not exceeding 200 mm, over unfrozen subgrade free of standing water.
 - .3 Establish traffic patterns for equipment to prevent driving on topsoil after it has been spread to avoid compaction.
 - .1 Cultivate soil following spreading procedures.

3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.10 PROTECTION

- .1 Provide silt fences and erosion protection as required to mitigate and prevent impacts to adjacent properties.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

- .1 This Specification shall cover the complete supply, and installation of Rundle landscape boulders as indicated on the Drawings. The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

1.2 SAMPLES

- .1 Submit to Departmental Representative photographic inventory of boulders to be used, including source location.. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .3 Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals.

Part 2 Products

2.1 BOULDERS

- .1 Boulders shall be Rundle hard, durable stone, free from seams, cracks or other structural defects, to meet following size distribution (5% +/- deviation is acceptable):

Size (Dia. mm)	Distribution %
350 – 450	30%
475 - 650	50%
750 - 900	20%

2.2 GEOTEXTILE FABRIC

- .1 Geotextile Fabric shall be non-woven, supplied as per the Table below:

Physical Property	Standard	Test Method
Grab Tensile Strength	900 N – minimum	ASTM D4632
CBR Puncture	2200 N - minimum	ASTM D 6241
Trapezoid Tear	350 N - minimum	ASTM D4533
Apparent Opening Size	0.18mm – maximum	ASTM D4751
Permittivity	1.4 sec-1 – minimum	ASTM D4491
Flow Rate	4000 l/min/m ² – minimum	ASTM D4491
U.V. Resistance	70% per 500 hrs - minimum	ASTM D4355
Puncture Strength	575 N – minimum	ASTM D4833
Mullen Burst	2000 kPa – minimum	ASTM D3786

Part 3 Execution

3.1 GEOTEXTILE

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with pins.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .5 Pin successive strips of geotextile with securing pins at 600 mm intervals.
- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 After installation - cover with overlying layer within 4 hours of placement.
- .8 No vehicles permitted directly on geotextile.
- .9 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

3.2 PLACING

- .1 Fine grade area to receive boulders to uniform even surface. Fill depressions with suitable material and compact to provide firm bed.
- .2 Place geotextile on prepared surface in accordance with Drawings.
- .3 Place boulders to the extents shown on the drawings.
- .4 Place boulders in manner approved by Departmental Representative to create a stable mass.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This Specification covers the protection of all existing trees and natural areas. The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.

1.2 DEFINITIONS

The following definitions shall apply:

- .1 **TREE PROTECTION AREA:** Generally, a tree protection area should consist of the ground encompassing from 1.0 (minimum) to 1.5 times the distance between the trunk and dripline, or as shown in the table below, whichever is greater. Areas of ground covered by pavement, buildings, or other permanent structures where the presence of roots is minimal or negligible may be excluded at the discretion of the Departmental Representative.

Trunk Diameter	Min. Protection Radius
< 100 mm	1.8 m
110–400 mm	2.4 m
410– 500 mm	3.0 m
510– 600 mm	3.6 m
610–700 mm	4.2 m
710–800 mm	4.8 m
810–900 mm	5.4 m
910–1000 mm	6.0 m

With groups of trees or where an array effect is present, there may be discontinuous (non-overlapping) perimeters of tree protection areas, which result in difficult to maintain or ineffective tree protection fencing. In these cases, even though tree protection areas do not overlap, they should be treated as though they do if the distance between the perimeters of such areas is less than 10M. In effect, this will artificially enlarge the area of tree protection, but will result in a more clearly defined, manageable area.

- .2 **DRIPLINE:** The outermost edge of the tree's canopy or branch spread. The area within a tree's dripline is all the ground under the total branch spread.
- .3 **CRITICAL ROOT ZONE:** Generally, all of the ground area included in the dripline.

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- .4 **DIAMETER (CALIPER):** The size (millimeters) of a tree's trunk is measured at:
- 150mm above grade for trunk diameters up to and including 100mm;
 - 600mm above grade for trunk diameters from 100mm up to and including 200mm; and
 - 1.2M above grade for trunk diameters greater than 200mm.
- .5 **ARBORIST:** An individual who has obtained accreditation from the Ontario Arborists Training and Examination Program or the International Society of Arboriculture Arborist Certification Program (ISA) and possesses a valid Alberta Arborists License.

Part 2 Execution**2.1 TREE PROTECTION AREA**

- .1 Existing trees and planted areas shall be protected and preserved as noted on the drawings. The Protection Area shall be as described above, unless otherwise approved by the Departmental Representative.
- .2 Motorized equipment and trailers, including tractors, bobcats, bulldozers, trackhoes, trucks, cars, and carts shall not be allowed access within tree protection areas. Should access be necessary within designated tree protection areas, the existing grade shall be covered with 150 -200mm of wood mulch to help distribute the weight of equipment and to minimize soil compaction and rutting. Plywood and/or mulch is not acceptable bridging material for driving over exposed tree roots. Exposed tree roots shall not be driven over. The Departmental Representative must approve the access and driving surface prior to its use.
- .3 Materials and supplies shall not be stockpiled or stored within the tree protection area. Should temporary storage be necessary within designated tree protection areas, the existing grade shall be covered with double, overlapping sheets of ¾ inch thick plywood, or 150 -200mm of wood mulch to help distribute the weight of materials or supplies and to minimize soil compaction.
- .4 No objects or materials may be leaned against or supported by a tree's trunk, branches, or exposed roots. The attachment or installation to trees of any sign, cable, wire, nail, swing, or any other material that is not needed to help support the natural structure of the tree is prohibited. Standard arboricultural techniques such as bracing or cabling that are performed by professional arborists are acceptable upon approval by the Departmental Representative.
- .5 Appropriate tree pruning and/or removal permits must be secured prior to beginning work.

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2.2 TREE PROTECTION

- .1 Further to item 2.1.1, all trees within or immediately adjacent to the proposed construction area will have a 1.0m (minimum) radius protective zone calculated from the circumference at the base of the trunk which will remain free of digging, trenching, grade changes, stock piling of materials and soil compaction throughout the duration of the Contract.

2.3 OVERHEAD BRANCH AND LIMB PROTECTION

- .1 Further to 2.1.1, tree limbs and branches overhanging the construction area shall not be damaged. The Contractor shall be responsible for ensuring that the above ground portions of trees are not damaged during Work.
- .2 Should pruning be required, the Contractor shall contact the Departmental Representative for approval. Pruning work must be using proper pruning techniques by a licensed Arborist.

2.4 EXCAVATION

- .1 During all excavation a representative of the Departmental Representative shall be present at all times unless otherwise agreed upon.
- .2 The CA shall be notified prior to any trenching or excavation known or suspected to involve cutting of more than:
 - .1 Two (2) roots, 75mm or more in diameter; and/or
 - .2 Four (4) roots between 50mm & 75mm diameter. The Departmental Representative shall be notified immediately in the event that roots in excess of that described above are cut, torn, ripped, or otherwise injured.
 - .3 Should root pruning be required the Contractor must ensure proper root pruning techniques are employed by a licensed Arborist.
- .3 Prior to any excavation, removal of sidewalk, or other activity that will result in removal of soil and tree roots, all tree roots within work area will be pruned to a depth of 350mm. Pruning shall occur with a purpose designed Root Pruner, or equivalent, in accessible areas, and by hand in areas inaccessible to the root pruning machine. Proper root pruning techniques must be used and employed by a licensed Arborist.
- .4 All work under the Dripline of any tree shall be done by hand or by other methods which will prevent breakage or other injury to branches and roots.
- .5 Where it is necessary to excavate within the critical root zone of existing trees, contractor shall use all possible care to avoid injury to trees and tree roots. Excavation, in areas where 50mm diameter and larger roots occur, shall be done by hand with approved hand tools. Where possible, tree roots 50mm inches or larger in diameter shall be tunnelled or bored under and shall be covered with moistened burlap to prevent excessive drying.

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- .6 Wherever roots are exposed smaller than two 50mm in diameter, such roots extending through the excavation shall be hand pruned. All excavated areas within critical root zones shall be closed within twelve (12) hours - if this is not possible, the excavation walls shall be covered with burlap and kept moistened.
- .7 Horizontal directional boring (auger tunnelling), rather than open trenching, shall be used for utility installation within 150mm linear distance from the trunk base for every 25mm of trunk diameter, if root disruption or utility installation occurs on no more than one side of the tree. If trenching or utility installation will occur on two or more sides of a tree trunk (e.g. N,S,E, or W), then horizontal directional boring shall be used if line installation is within 600mm linear distance from the trunk base for every inch of trunk diameter.

2.5 NOTIFICATION

- .1 Special care is required during excavation to ensure existing tree root structure is not damaged. Should root pruning be required the Contractor must ensure proper root pruning techniques are employed by a licensed Arborist.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C117-03, Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-03, Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-01, Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-00a, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m³).
 - .5 ASTM D4318-00, Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series
 - .2 CAN/CGSB-8.2-M88, Sieves Testing, Woven Wire, Metric.

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Excess materials are to be diverted from landfill to site approved by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Granular base material: to Section 31 05 16- Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material and other deleterious materials.
 - .2 Graduations within limits specified when tested to ASTM C117 and ASTM C136. Sieve sizes to CAN/CGSB-8.1.
 - .3 Gradation to Type 32 as specified in Section 32 11 23 – Aggregate Base Courses.
 - .4 Other properties as follows:
 - .1 Liquid limit: ASTM D4318, maximum 25.
 - .2 Plasticity index: ASTM D4318, maximum 6.
 - .3 Los Angeles Degradation: ASTM C131, maximum % loss by weight 45.

- .4 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

Passing		Retained on
50mm	to	25mm
25mm	to	19.0mm
19.0mm	to	4.75mm

Part 3 Execution

3.1 SEQUENCE OF OPERATION

- .1 Scarifying and reshaping:
- .1 Scarify roadbed to width as indicated unless directed otherwise by Departmental Representative and to minimum depth of 300 mm.
 - .2 Pulverize and break down scarified material.
 - .3 Blade and trim pulverized material to elevation and cross section dimensions as indicated unless directed otherwise by Departmental Representative.
 - .4 Where deficiency of material exists, add and blend in new granular base material as directed by Departmental Representative. Ensure no frozen material is used.
- .2 Compaction equipment:
- .1 Compaction equipment capable of obtaining required material densities.
 - .2 Provide Departmental Representative with proof of equipment efficiency for unspecified equipment.
 - .1 Efficiency of proposed equipment equal to specified equipment.
 - .2 Obtain approval of Departmental Representative before use.
 - .3 Equip with device that records hours of actual work, not motor running hours.
- .3 Compacting:
- .1 Compact to 98% corrected maximum dry density in accordance with ASTM D698 and Section 31 05 10 Corrected Maximum Dry Density.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compaction to obtain specified density.
 - .4 Use mechanical tampers, approved by Departmental Representative to compact areas not accessible to rolling equipment to specified density.
 - .5 Quality control testing to be carried out: one test for each 500 sqm of area.
- .4 Repair of soft areas:

- .1 Correct soft areas by removing defective material to depth and extent directed by Departmental Representative. Replace with material acceptable to Departmental Representative and compact to specified density. Verify compaction with compaction testing for each 100 sqm of soft area repaired.
- .2 Maintain reshaped surface in condition conforming to this section until succeeding material is applied or until acceptance by Departmental Representative.

3.2 SITE TOLERANCES

- .1 Reshaped compacted surface within plus or minus 15 mm of elevation as indicated.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This Specification shall cover the complete supply and installation of granular base course as shown on the Drawings. The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m³).
 - .5 ASTM D1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700kN-m/m³).
 - .6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Stockpile minimum 50% of total aggregate required prior to beginning operation.

- .2 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .3 Replace defective or damaged materials with new.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular material from landfill to local facility as approved by Departmental Representative.

1.6 MEASUREMENT PROCEDURES

- .1 The supply and installation of granular base shall be incidental to the Work. No separate measurement shall be made.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: material in accordance with Section 31 05 16 - Aggregate Materials and the following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C117 and ASTM C136. Sieve sizes to CAN/CGSB-8.2.

- .1 Gradation Method #1 to:

Sieve Designation	% Passing
25 mm	100
20 mm	93-100
12.5 mm	72-93
5 mm	45-77
2 mm	29-56
0.800 mm	17-38
0.400 mm	13-26
0.160 mm	7-16
0.080 mm	6-11

- .2 Material to level surface depressions to meet gradation (2) limits in accordance with Method #1.
- .3 Liquid limit: to ASTM D4318, maximum 25
- .4 Plasticity index: to ASTM D4318, maximum 6.
- .5 Los Angeles degradation: to ASTM C13. Max. % loss by weight: 45
- .6 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

Passing	to	Retained on
50mm		25mm

25mm	to	19.0mm
19.0mm	to	4.75mm

2.2 TESTING

- .1 Inspection and testing of aggregate materials will be carried out by testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.
- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.
- .3 For each material specified, one set of material testing will be required for every 500 tonnes of material unless otherwise specified.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PLACEMENT AND INSTALLATION

- .1 Place granular base after sub-grade surface is inspected and approved in writing by Departmental Representative.
- .2 Placing:
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Place material to full width in uniform layers not exceeding 150mm compacted thickness.
 - .1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
 - .5 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .6 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment:

- .1 Ensure compaction equipment is capable of obtaining required material densities.
- .4 Compacting:
 - .1 Compact to density not less than 100% corrected maximum dry density to ASTM D698 and Section 31 05 10 Corrected Maximum Dry Density.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compacting to obtain specified density.
 - .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.
 - .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.5 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This Specification shall cover the complete supply and installation of granular base course as shown on the Drawings. The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m³).
 - .5 ASTM D1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700kN-m/m³).
 - .6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Stockpile minimum 50% of total aggregate required prior to beginning operation.

- .2 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .3 Replace defective or damaged materials with new.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular material from landfill to local facility as approved by Departmental Representative.

1.6 MEASUREMENT PROCEDURES

- .1 The supply and installation of granular base shall be incidental to the Work. No separate measurement shall be made.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: material in accordance with Section 31 05 16 - Aggregate Materials and the following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C117 and ASTM C136. Sieve sizes to CAN/CGSB-8.2.

- .1 Gradation Method #1 to:

Sieve Designation	% Passing
25 mm	100
20 mm	93-100
12.5 mm	72-93
5 mm	45-77
2 mm	29-56
0.800 mm	17-38
0.400 mm	13-26
0.160 mm	7-16
0.080 mm	6-11

- .2 Material to level surface depressions to meet gradation (2) limits in accordance with Method #1.
- .3 Liquid limit: to ASTM D4318, maximum 25
- .4 Plasticity index: to ASTM D4318, maximum 6.
- .5 Los Angeles degradation: to ASTM C13. Max. % loss by weight: 45

- .6 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

Passing		Retained on
50mm	to	25mm
25mm	to	19.0mm
19.0mm	to	4.75mm

2.2 TESTING

- .1 Inspection and testing of aggregate materials will be carried out by testing laboratory approved by Departmental Representative. Costs of tests will be paid by Contractor.
- .2 Submit testing procedure, frequency of tests, testing laboratory or certified testing personnel to Departmental Representative for approval.
- .3 For each material specified, one set of material testing will be required for every 500 tonnes of material unless otherwise specified.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PLACEMENT AND INSTALLATION

- .1 Place granular base after sub-grade surface is inspected and approved in writing by Departmental Representative.
- .2 Placing:
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Place material to full width in uniform layers not exceeding 150mm compacted thickness.

- .1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
- .5 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .6 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment:
 - .1 Ensure compaction equipment is capable of obtaining required material densities.
- .4 Compacting:
 - .1 Compact to density not less than 100% corrected maximum dry density to ASTM D698 and Section 31 05 10 Corrected Maximum Dry Density.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compacting to obtain specified density.
 - .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.
 - .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.5 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.
 - .2 AASHTO R29-08, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.
 - .3 AASHTO T245-97(2008), Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
- .2 Asphalt Institute (AI)
 - .1 AI MS-2-1994, Mix Design Methods for Asphalt Concrete and Other Hot-Mixes.
- .3 ASTM International
 - .1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb f/ft³(600 kN-m/m³)).
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - [current edition].
 - .1 MPI #32, Traffic Marking Paint, Alkyd.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C 4 weeks prior to beginning Work.
- .3 Samples:
 - .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks prior to beginning Work.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver and stockpile aggregates in accordance with Section 31 05 16- Aggregate Materials. Stockpile minimum 50% of total amount of aggregate required before beginning asphalt mixing operation.
- .3 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .4 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.
- .5 Provide approved storage, heating tanks and pumping facilities for asphalt cement.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: as specified in Section 32 11 23 Aggregate Base Courses
- .2 Prime/Tack coat: Anionic emulsified asphalt: to CAN/CGSB-16.2, grade: SS-1 or MC-30 as approved by the Departmental Representative.
- .3 Asphalt cement:
 - .1 Asphaltic binder shall not foam when heated to 175°C and shall meet the following specifications:

ASTM Characteristics	ASTM Test Method	Specifications	
		MIN	MAX
Flash Point (Cleveland Open Cup) °C	D92	205	
Thin Film Oven Test Weight Loss, max. %	D1754	-	1.0
Penetration @ 25°C of residue, % of orig.	D5	50	-
Ductility: @ 25°C	D113	100	-
Solubility in Trichloroethylene, min. %	D2042	99.5	-

- .4 Asphalt concrete aggregates:
 - .1 Coarse aggregate is aggregate retained on 5.0 mm sieve and fine aggregate is aggregate passing 5.0 mm sieve when tested to ASTM C117.
 - .2 Aggregate material shall be crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps cementation, organic material, frozen material and any other deleterious materials.

- .3 When dryer drum plant or plant without hot screening is used, process fine aggregate through 5.0 mm sieve and stockpile separately from coarse aggregate.
- .4 Do not use aggregates having known polishing characteristics in mixes for surface courses.
- .5 Blended Aggregate: material to Section 31 05 16 - Aggregate Materials and following requirements:

- .1 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

.2 Table:

Sieve Size	Percent Passing	
	Type III	
	Max	Min
25 mm	-	-
20 mm	-	-
16 mm	-	100
12.5 mm	100	90
10 mm	90	75
5 mm	75	60
2.5 mm	60	45
630 µm	45	30
315 µm	36	22
160 µm	27	15
80 µm	10	4

- .1 Sand equivalent: to ASTM D2419, Minimum 45.
 - .2 Crushed particles: at least 80 % of coarse fraction by mass passing 19 mm sieve and retained on 5.00 mm sieve to have at least 2 freshly fractured faces. Material to be divided into ranges using methods of ASTM C136.
 - .3 LA Abrasion to C131: maximum 32
 - .4 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.
 - .5 Flat and Elongated Particles: For coarse fraction (retained on 5.00 mm sieve size) the percentage of flat and elongated particles greater than a 5:1 ratio shall be by mass less than 10%
- .5 Mineral filler for asphalt concrete:
- .1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.
 - .2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed by Departmental Representative to improve mix properties.

2.2 Mix Design

- .1 An asphalt mix design must be prepared and submitted to the Departmental Representative for review and approval at least one week prior to the Work. The Contractor shall use qualified Departmental Representative and testing services licensed to practice in the Province of Alberta.
- .2 The mix design shall follow the Marshall method of mix design as outlined in the latest edition of the Asphalt Institute Manual Series No. 2 (MS-2), and shall include five separate trial values of asphalt content.
- .3 Design of Mix:
 - .1 Mix Type III – 50 Blows on each face of test specimens.
- .4 Include the following data with mix design submission:
 - .1 Aggregate specific gravity and asphalt absorption.
 - .2 Sand equivalent, coarse aggregate fracture, flat and elongated particles, and percent manufactured sand values.
 - .3 Asphalt cement supplier/refinery, specific gravity and mixing and compaction temperatures, based on temperature – viscosity properties of asphalt cement.
 - .4 Job mix formula including aggregate gradation and blending proportions, and design asphalt content.
 - .5 Maximum relative density at each trial asphalt content.
 - .6 Where reclaimed asphalt pavement (RAP) is to be incorporated into the mix supply, RAP gradation, RAP asphalt cement content and design recycle percentage.
 - .7 Data to satisfy the requirements of the following:
 - .8 Table:

Property	Requirements Mix Type III
Marshall Stability (kN)	5.4 min.
Marshall Flow (0.25mm Units)	8 – 14
Air Voids (%)	2.8 – 3.2
Voids in Mineral Aggregate (VMA) (%)	14.0 – 16.0
Voids Filled With Asphalt (VFA) (%)	70 – 80
Film Thickness (□m)	7.0 min.

- .5 Job Mix Formula:
 - .1 Subject to approval by the Departmental Representative, the aggregate proportioning (including RAP), target gradation, asphalt content and air void content from the Mix Design will become the Job Mix Formula for the supply of hot mix asphalt.
 - .2 Once established, no alterations to the Job Mix Formula will be permitted unless the Contractor submits a new Job Mix Formula and approved by the Departmental Representative.

- .3 If the sum of any alterations to the Job Mix Formula is in excess of any one of the following limits, a new Mix Design is required.
 - .1 ± 5% passing the 5.00 mm sieve size
 - .2 ± 1% passing the 80 µm sieve size
 - .3 ± 0.30% asphalt content
- .4 Any alteration to the Job Mix Formula shall not result in properties which do not meet the requirements of this Specification.
- .6 **Production Tolerances**
 - .1 All mixtures shall be supplied to the Job Mix Formula within the range of tolerances specified.
 - .2 Asphalt cement content: +0.30% of JMF value.
 - .3 Temperature: Mix temperature at point of plant discharge shall not vary from that specified in the job mix formula by more than +10°C.
 - .4 Air Voids: + 1.0% of the JMF value.
 - .5 Mixture Properties: Marshall Stability, Marshall Flow, Voids Filled with Asphalt, Voids in Mineral Aggregate and Film Thickness as per requirements identified in Table 2.2.4.8.
 - .6 Moisture in Mix: Maximum permissible moisture, at point of plant discharge, is 0.2% by mass of mix.

2.3 Sampling and Testing

- .1 In accordance with Section 31 05 16 Aggregate Materials and as follows:
- .2 Table

Material	Test Standard	Minimum Frequency
Aggregate Gradation analysis and Fracture Content	ASTM C136 ASTM D5821 ASTM C117 ASTM C126	One for every 500 tonne of each class of material processed or placed
Hot Mix Asphalt Analysis (including Asphalt Content, Aggregate Gradation, Marshall Density and Void Properties)	ASTM D 6307 ASTM C 117 ASTM C 136 ASTM D 3203	One for every 500 tonne of each mix type supplied under this specification.
Hot Mix Asphalt Temperature		At least one
Compaction Monitoring (Core or Nuclear Density) following compaction	ASTM D 2726 ASTM D 2950	At least one

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 FOUNDATIONS

- .1 Foundations for roadways comprise:
 - .1 Existing surface: Asphaltic chip seal on unknown structure. Resurfacing (tack coat and 50 mm Asphalt Surface Course to be placed directly on existing cleaned surface unless directed to perform failure repairs by Departmental Representative.
 - .2 Failure repairs: where directed by Departmental Representative, remove existing road structure to bearing surface or 300 mm depth, whichever is deeper. Stockpile waste material at Upper Compound. Supply and place fill material as necessary. Prepare subgrade to 300 mm below existing surface in accordance with Section 31 22 13. Supply and place 300 mm thick 19 mm (Type 2) Granular Road Base according to Section 32 11 23 Granular Base Courses and article 3.2.2, suitable for receiving prime coat. Complete asphalt surfacing according to Article 3.2.1.1. Supply and place asphalt surface (prime coat and 50 mm Asphalt Surface Course).
 - .3 Roadway Renewal: alternative approach to roadway renewal is to be undertaken only at the direction of the Departmental Representative. Entire area of road surface to be removed to depth of 100 – 150 mm to provide smooth grade and remove existing surface deficiencies. Remove and stockpile waste material at Upper compound Supply and place 100 mm thick 19 mm (Type 2) Granular Road Base according to Section 32 11 23 Granular Base Courses and article 3.2.2, suitable for receiving prime coat. Supply and place asphalt surface (prime coat and 50 mm Asphalt Surface Course).
- .2 Compaction: compact each lift of granular material to 100% corrected maximum dry density in accordance with Section 31 05 10 Corrected Maximum Dry Density. Maximum lift thickness: 150 mm.

3.3 PAVEMENT THICKNESS

- .1 Pavements for roadways: 50 mm of 16 mm Type III Asphalt Surface Course

3.4 PAVEMENT CONSTRUCTION

- .1 Hot Mix Asphalt Placing Temperature
 - .1 No hot mix asphalt shall be dispatched to the field unless the temperature, as issued by Environment Canada, is rising and meets the following minimum temperature requirements:
 - .1 Thickness less than 50mm : 7°C
 - .2 Thickness greater than 50mm : 2°C
 - .2 A tolerance will be permitted for plant start-up.
 - .3 No surface lift asphalt shall be placed regardless of temperature until the road surface is 5 °C or higher.
- .2 Transportation of Hot Mix Asphalt:
 - .1 Trucks shall be equipped with tarpaulins of sufficient weights and size to cover the entire open area of the truck box. Regardless of weather conditions, tarpaulins shall be used.
 - .2 Vehicles used for the transportation of hot mix asphalt from the plant to the site of work shall have tight metal boxes previously cleaned of all foreign matter. The inside surface may be lightly lubricated with a soap solution just before loading. Excess lubrication will not be permitted.
- .3 Spreading:
 - .1 The spreading machine shall be self-propelled and capable of placing a uniform layer of asphalt mix to the depth and grades as shown on the plans or as indicated by the Departmental Representative.
 - .2 The screed shall include a tamping bar or vibratory strike-off device for use when required. The screed shall strike-off the mix to the depth and cross-section specified and produces a finished surface of uniform texture.
 - .3 Control of the screed shall be by automatic sensing devices. Longitudinal control shall be accomplished by a sensor, which follows a string line, ski, or other reference. The grade sensor shall be moveable and mounts provided so that grade control can be established on either side of the paver. A slope control sensor shall also be provided to maintain the proper transverse slope of the screed. Use automatic grade control for paving operations.
- .4 Placing:
 - .1 The asphalt concrete shall be placed to the design thickness as shown on the contract drawings. On new construction where an established reference is lacking, a string-line reference will be required. Adjacent mats on the same lift are to be controlled by use of the grade sensor. No relaxation of the above procedure will be permitted without written approval of the Departmental Representative.
 - .2 The spreader shall be operated in such a manner as to distribute the asphalt concrete mix to proper cross-section, width and thickness without causing segregation of the mix. Segregated areas, which may occur, shall

be corrected immediately. The forward motion of the spreader shall be controlled so that no irregularities in the pavement surface are caused by excessive speed. The rate of placement of the mixture shall be uniform, and shall be co-ordinated with the production rate of the asphalt plant without intermittent operation of the spreader.

- .3 Any failure of the machine or operation to produce a smooth, uniformly dense mat, free from irregularities, shall be corrected immediately to the satisfaction of the Departmental Representative.
- .4 Areas that are inaccessible to the paving machine may be paved by other methods, as approved by the Departmental Representative.
- .5 In small areas or where the use of mechanical equipment is not practical, the mix may be spread and finished by hand. The asphalt mixture shall be dumped on the area and immediately thereafter distributed into place by shovels and spread with lutes in a loose uniform layer of uniform density and correct depth. Material must be handled so as to avoid segregation.
- .5 Compaction: The Contractor shall supply sufficient compaction equipment to:
 - .1 Provide a compaction rate that will equal or exceed the placing rate of the spreader.
 - .2 Ensure the specified compaction is attained before the temperature of the mat falls below 80°C.
- .6 Pavement mat shall be sufficiently cool to resist any deformation or surface scuffing prior to application of any traffic.
- .7 Any damage to existing features to be repaired at no additional cost.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Requirements and procedures for installing precast concrete unit pavers, by hand.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C136-[01], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM C979-[99], Standard Specification for Pigments for Integrally Colored Concrete.
- .2 Canadian Standards Association (CSA International).
 - .1 CSA A23.1/A23.2-[00], Concrete Materials and Methods of Concrete Construction/Method of Test for Concrete.
 - .2 CSA A179-[94], Mortar and Grout for Unit Masonry.
 - .3 CSA-A231.2-[95], Precast Concrete Pavers.
 - .4 CSA A283-[00], Qualification Code for Concrete Testing Laboratories.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details as well as to existing site features.

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit following sampling and testing data:
 - .1 Sieve analysis for gradation of bedding and joint material.
 - .2 Unit paver sampling and testing.
 - .3 Evaluation of cleaning and sealing compound.
- .2 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit full size sample of each type, size pavers.
- .3 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in precast concrete paver installations with 5 years documented experience.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 CONCRETE PAVERS

- .1 Concrete pavers: to CSA-A231.2 and as shown on the drawings
- .2 Manufactured in moulds, with spacers, suitable for installation and delivered to site palettes in protective wrapping.
- .3 Pigment in concrete pavers: to ASTM C979.

2.2 BEDDING AND JOINT MATERIAL

- .1 Joint Sand: Polymeric Sand
- .2 Bedding sand: clean, non-plastic, free from deleterious or foreign matter, natural or manufactured from crushed rock or gravel. Do not use limestone screenings or stone dust.
- .3 Gradation: to CSA-A23.1, Table 4 - Grading Limits for Fine Aggregate, and CSA A179 as follows:

Sieve Designation	% Passing for Bedding Sand	Joint Sand
10 mm	100	
5 mm	95-100	100
2.5 mm	80-100	95-100
1.25 mm	50-90	60-100
630 microns	25-65	
600 microns		35-80
315 microns	10-35	

300 microns		15-20
160 microns	2-10	
150 microns		2-15

2.3 EDGE RESTRAINTS

- .1 Edge restraints shall be aluminum and as indicated on Drawings.

2.4 CLEANING COMPOUND

- .1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.
- .2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 STRUCTURAL SURFACE

- .1 Verify that structural surfaces conform to levels and compaction required for installation of unit pavers. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .2 Verify that top of structural surface (top of base) does not exceed plus or minus 10mm of grade over 3m straightedge.
- .3 Ensure that structural surface is not frozen or standing water is present during installation.

3.3 INSTALLATION OF EDGE RESTRAINTS

- .1 Install restraints true to grade, in accordance with manufacturer's recommendations.

3.4 PLACING OF BEDDING MATERIAL

- .1 Ensure bedding material is not saturated or frozen at all times until installation is complete.
- .2 Spread and screed material on structural surface to achieve 25mm compacted thickness after vibrating pavers in place. Do not use joint sand for bedding sand.
- .3 Do not disturb screeded material. Do not use bedding material to fill depressions in structural surface.

3.5 INSTALLATION OF CONCRETE PAVERS

- .1 Lay pavers to patterns indicated. Joints between pavers: as recommended by manufacturer.
- .2 Use appropriate end, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures. No paver to
- .3 Use a low amplitude, high frequency plate compactor capable of at least 22 kN centrifugal compaction force to vibrate pavers into bedding sand.
- .4 Inspect, remove, and replace chipped, broken and damaged pavers.
- .5 Adjust pattern at pavement edges such that cutting of pavers is minimized. All cut pavers shall be no smaller than one-third of a whole paver.
- .6 Sweep dry joint sand material into joints. Settle sand by vibrating pavers with plate compactor. Continue application of joint material and vibrating of pavers until joints are full. Do not vibrate within 2 m of unrestrained edges of pavers. Sweep off excess joint material and water in to set the polymeric sand.
- .7 Lippage: No greater than 3 mm difference in height between adjacent pavers, adjacent drainage inlets, concrete collars or channels.
- .8 Where pavers abut grade beams or other surfaces and transitions including places of entry into buildings, stairs or ramps, a maximum 1 mm lippage is required.
- .9 Installing 80mm adjacent to 100mm Pavers.
 - .1 Contractor to install 100mm Pavers first, ensuring the proper width for the 80mm Paver strips have been left.
 - .2 Temporary measures to retain edge of pavers may be taken if necessary.
 - .3 After installation of 100mm Pavers, add sufficient granular material to raise base to suit 80mm Pavers and compact to 98% Proctor Density.
 - .4 Add bedding sand to 25mm depth.
 - .5 Complete Installation as per 3.6 of this specification.
- .10 ENSURE CONFORMANCE OF FINAL ELEVATIONS. The final surface tolerance from grade elevations shall not deviate more than 10 mm under a 3 m straightedge.

3.6 CLEANING

- .1 Carry out cleaning at times and conditions recommended by manufacturer of cleaning compound.
- .2 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.

- .3 Apply cleaning compounds appropriate for removal of various contaminants encountered in accordance with manufacturer's recommendations.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers. Final surface to be free of contamination.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 136-96a, Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM C 117-95, Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .3 ASTM E 11-95, Specification for Wire - Cloth Sieves for Testing Purposes.
 - .4 ASTM D 4318-98, Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
 - .5 ASTM D 698-91, Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49-kg) Rammer and 12-in (304.8-mm) Drop.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

Part 2 Products

2.1 GRANULAR BASE:

- .1 As per Section 32 11 23 - Aggregate Base Courses.

2.2 GEOTEXTILE FABRIC

- .1 Geotextile Fabric shall be non-woven, supplied as per the Table below:

Physical Property	Standard	Test Method
Grab Tensile Strength	900 N – minimum	ASTM D4632
CBR Puncture	2200 N - minimum	ASTM D 6241
Trapezoid Tear	350 N - minimum	ASTM D4533
Apparent Opening Size	0.18mm – maximum	ASTM D4751
Permittivity	1.4 sec-1 – minimum	ASTM D4491
Flow Rate	4000 l/min/m2 – minimum	ASTM D4491
U.V. Resistance	70% per 500 hrs - minimum	ASTM D4355
Puncture Strength	575 N – minimum	ASTM D4833

Mullen Burst	2000 kPa – minimum	ASTM D3786
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2.3 TRAFFIC GRAVEL

- .1 The aggregate shall be composed of sound, hard and durable particles of sand, gravel and rock free from injurious quantities of elongated, soft or flaky particles, shale, loam, clay balls and organic or other deleterious material.
- .2 Traffic gravel shall comply with the requirements listed in the table below.

Sieve Designation	Percent by Weight Passing Canadian Metric Sieve Series							
	Type							
	101	102	103	104	105	106	108	109
75.0 mm	100							
50.0 mm	55-85	100						
40.0 mm		63-92						
31.5 mm			100	100				
22.4 mm			63-92	63-92	100	100	100	
18.0 mm					63-92	63-92	63-92	100
5.0 mm	0-40	0-40	0-40	40-70	0-40	0-60	40-70	45-80
2.0 mm	0-25	0-25	0-25	20-45	0-25	0-45	20-45	25-60
400 um				0-20			0-20	0-30
Fractured Face %	50 Minimum							

- .3 A tolerance of 3% in the percent by weight passing the maximum size sieve will be permitted providing 100% of the oversize passes the next highest sieve size.

Part 3 Execution

3.1 SUBGRADE

- .1 Ensure that the subgrade preparation conforms to levels and compaction required to allow for installation of granular base.

3.2 GEOTEXTILE FABRIC

- .1 Commence installation of geotextile fabric after material has been approved by the Departmental Representative.
- .2 Install geotextile fabric to the limits of the sub-grade, or as directed by the Departmental Representative.
- .3 Unroll geotextile fabric as smooth as possible on the prepared sub-grade in the direction of the construction traffic.

- .4 Install geotextile fabric in the longest continuous practical length, free from tension, stress, wrinkles and creases.
- .5 Cut or fold geotextile fabric to conform to curves.
- .6 Install geotextile fabric in accordance with this specification and manufacturer's recommendations.
- .7 Overlap joints a minimum of 600mm.
- .8 Install pins as required to hold geotextile fabric in place.
- .9 Remove and replace geotextile fabric that is improperly installed or damaged as directed by the Departmental Representative.

3.3 GRANULAR BASE

- .1 Granular base material to be as per Section 32 11 23 - Aggregate Base Courses

3.4 TRAFFIC GRAVEL

- .1 Place material to the compacted thickness as indicated on drawings.

3.5 FIELD QUALITY CONTROL

- .1 Inspection and testing of crushed stone surfacing will be carried out by designated testing laboratory as required.
- .2 Costs of tests will be paid by the Contractor if required.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This specification shall cover the supply and installation of metal and wood fences, railings, screens and gates. The Contractor shall furnish all superintendence, overhead, labour, foundations, supports, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as shown on the Drawings and as specified herein.
- .2 All materials supplied under this specification shall be of a type approved by the Departmental Representative.

1.2 SUBMITTALS

- .1 Submit shop drawings and / or manufacturer's cut sheets for all fencing, railings screens and gates. Submittals must clearly show, but not limited to: product sizes, dimensions, materials, fasteners, latches, hinges, couplings, and methods of assembly.

1.3 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A53/A53M-[10], Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A90/A90M-[09], Standard Test Method for Weight [Mass]of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - .3 ASTM A121-[07], Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
 - .4 A653/A653M-[10], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM C618-[08a], Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - .6 ASTM F1664-[08], Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
 - .7 ASTM A123/A123M-[09], Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit shop drawings, manufacturer's instructions, printed product literature, data sheets for concrete mixes, fences, posts and gates,

fasteners, couplings, hinges and latches, including product characteristics, performance criteria, physical size, finish and limitations.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Store and protect fence and gate materials from damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03 30 00 Cast-in-Place Concrete.
 - .1 Nominal coarse aggregate size: 20-5.
 - .2 Compressive strength: 20 MPa minimum at 28 days.
 - .3 Additives: fly ash to CSA A3000.
- .2 Steel posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.
- .3 Steel Gates: to CAN/CGSB-138.4.
- .4 Steel Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 50mm outside diameter pipe for outside frame, 35mm outside diameter pipe for interior bracing.
 - .1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.
 - .2 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.
 - .3 Furnish double gates with chain hook to hold gates open.
- .5 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.
 - .1 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.
 - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
 - .3 Overhang tops to provide waterproof fit.
- .6 Organic zinc rich coating: to CAN/CGSB-1.181 MPI #18.

- .7 Grounding rod for steel fencing: 3 m long.

2.2 WOODEN FENCES AND GATES

- .1 Timber shall be #2 Grade Cedar, hand selected, free from waness, splits and cracks. Sizes and dimensions as indicated on the drawings.

2.3 FINISHES

- .1 Galvanizing:
 - .1 For pipe: 550 g/m² minimum to ASTM A90.
 - .2 For other fittings: to ASTM A123/A123M.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and Departmental Representative.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Grading:
 - .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
 - .1 Provide clearance between bottom of fence and ground surface as shown on the drawings.

3.3 ERECTION OF FENCES

- .1 Erect fence along lines as indicated and to CAN/CGSB-138.3.

- .2 Excavate post holes as directed by Departmental Representative.
- .3 Space line posts as indicated, measured parallel to ground surface.
- .4 Install corner post where change in alignment exceeds 10 degrees.
- .5 Install end posts at end of fence and at buildings.
 - .1 Install gate posts on both sides of gate openings.
- .6 Place concrete in post holes then embed posts into concrete to depths indicated.
 - .1 Extend concrete 50mm above ground level and slope to drain away from posts.
 - .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .7 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.
 - .1 Install braces on both sides of corner and straining posts in similar manner.
- .8 Install overhang tops and caps.
- .9 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .10 Install grounding rods as required by authorities having jurisdiction.

3.4 INSTALLATION OF GATES

- .1 Install gates in locations as indicated and as directed by Departmental Representative.
- .2 Level ground between gate posts and set gate bottom as indicated.
- .3 Install gate stops at all closing locations.

3.5 TOUCH UP

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas.
 - .1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

3.6 CLEANING

- .1 Upon completion remove surplus materials, rubbish, tools and equipment to the satisfaction of the Departmental Representative.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This specification shall cover the supply and installation of the heavy timber information signs, bumper stops, benches, picnic tables, bear-proof garbage and recycling enclosures, edging, and seating. The Contractor shall furnish all superintendence, overhead, labour, foundations, supports, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as shown on the Drawings and as specified herein.
- .2 All materials supplied under this specification shall be of a type approved by the Departmental Representative.

1.2 SUBMITTALS

- .1 Submit shop drawings and / or manufacturer's cut sheets for all furnishings and materials. Submittals must clearly show product sizes, dimensions, materials, fasteners and methods of assembly.
- .2 Samples: "Rundle Stone" to be used for sign bases.

Part 2 Products

2.1 GENERAL

- .1 Smooth all cut edges and ensure that all material is free from burrs, cracks, defects and other imperfections.

2.2 BENCHES AND TABLES

- .1 Outdoor Seating Benches and Chairs
 - .1 Benches and chairs shall be as shown on the drawings and as specified herein.
- .2 Outdoor Picnic Tables
 - .1 Picnic Tables shall be as shown on the drawings and as specified herein.

2.3 BEAR-PROOF GARBAGE AND RECYCLING ENCLOSURES

- .1 Enclosures shall be triple compartment with individual lids for waste, recycling and organic waste material, each with a volume of 740 litres. Enclosures shall include the following requirements
 - .1 Removable plastic bins per / compartment.
 - .2 Side hinged unloading door, complete with prop and hinged bag cage.
 - .3 Self-closing, gravity latching lids, complete with bear-proof riser.
 - .4 Minimum 14 Ga. Galvanized Steel
 - .5 Fasteners, latches and hinges shall be stainless steel.

.6 Powdercoated: colour TBD

2.4 SEATING AND BARRIER STONES

.1 Seating and Barrier Stones shall be salvaged stone slabs, as shown on drawings.

2.5 BUMPER STOPS

.1 Bumper Stops shall be 1.8M long pre-cast concrete bumper stops, or approved equal.

2.6 LUMBER MATERIAL

.1 General: All material and installation shall be shown on the drawing.

.2 Timber: Shall be hand selected and free of waness, splits and cracks

2.7 ACCESSORIES

.1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work.

.2 Wood screws: galvanized type and size to suit application.

.3 Adhesive: recommended by manufacturer.

.4 Use least toxic sealants, adhesives, sealers, and finishes necessary to comply with requirements of this section.

Part 3 Execution

3.1 INSTALLATION

.1 Installation of site furnishings shall be as shown on drawings and as per manufacturer's specifications.

3.2 WORKMANSHIP AND MATERIALS

.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Departmental Representative including all operations from the selection and production of materials through to final acceptance of the specified work. The Departmental Representative reserves the right to reject any materials or works which are not in accordance with the requirements of this specification, the drawings, and accepted standards of good construction practices.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canadian Landscape Standard, First Edition
 - .1 Section 4: Grading and Drainage
 - .2 Section 6: Growing Medium

1.2 MATERIAL SUPPLIED BY CONTRACTOR

- .1 Topsoil source(s) shall be local and must be approved by the Departmental Representative prior to import. No topsoil shall be delivered to the site until written approval is provided by the Departmental Representative. Source locations shall be provide to the Departmental Representative at least 5 working days prior to any topsoil related work.

1.3 QUALITY ASSURANCE

- .1 Contractor: experienced and knowledgeable in landscape work of contract.
- .2 Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and work of contract. Supervisor shall possess a Landscape Journeyman Gardener certification or other similar qualification acceptable to the Departmental Representative.
- .3 Staffing: experienced, competent and trained landscape personnel who will perform all tasks and services in a knowledgeable and professional manner. Workers shall act safely and professionally at all times while working on site. Contractor shall not assign any worker that the Departmental Representative deems incompetent, careless, insubordinate, or otherwise objectionable to work on site.
- .4 Contractor shall be responsible for ensuring that contract specifications are being adhered to. Failure of the Departmental Representative to immediately reject unsatisfactory workmanship or to notify the Contractor of their deviation from the specification shall not relieve the Contractor of their responsibility to repair and/or replace unsatisfactory work.
- .5 Contractor shall obtain approvals as required by contract for suppliers, sub-contractors, and materials.
- .6 Contractor shall advise Departmental Representative, in writing, of any conditions or defects encountered on site before or during construction upon which the work of this section depends and which may adversely affect its performance.
- .7 Do not commence work until adverse conditions or defects have been evaluated by the Departmental Representative and corrective measures taken.
- .8 Commencement of work shall imply acceptance of existing conditions and no claims for damages or extras resulting from such conditions or defects will be accepted later, except where such conditions could not have been known prior to commencing work.

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TOPSOIL PLACEMENT & GRADING
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- .9 Recommendations: provide a report based on the soil and compost analyses, and with reference to the contract documents, prepared by an accredited and approved professional Agrologist.
 - .1 Report suitability of soil for lawn and woody plant growth.
 - .2 State all aspects of the soil analysis that indicate the soil does not conform to referenced standards
 - .3 State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory soil for lawns and other plantings indicated or specified.
 - .4 Take into account and adjust recommendations for soil depths indicated and amendments already specified.

1.4 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with the latest version of the Government of Alberta, Erosion and Sediment Control Manual.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

1.5 SUBMITTALS

- .1 Provide an Erosion and Sediment control plan for the Departmental Representative review and approval prior to commencement of any work.
- .2 Provide submittals and wait for Departmental Representative's and acceptance, prior to placement of any materials on site.
- .3 Original copy of each soil analysis report and Agrologist's recommendations indicating recommended amendments for approval before delivering any topsoil to site.
- .4 Resubmit samples of soil amended as recommended by report for verification of compliance with specified requirements.
- .5 Submit one copy of all new soil reports to Departmental Representative until approval.
- .6 Submit product data for each type of product indicated.
- .7 Submit product certificates for soil amendments and fertilizers, signed by product manufacturer.

Part 2 Products

2.1 TOPSOIL

- .1 Where one type of soil particulate is not found, specify topsoil texture based on local horticultural authority recommendations and availability of required particulate material. Identify soil requirements for special turf and plant material applications.
- .2 Repeat and adjust 2.1.1 if different topsoil mixtures are required for special turfs and planting beds.
- .3 Topsoil for seeded areas: mixture of mineral particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20% to 50% sand and contain 2% to 10% organic matter by weight.
- .4 Fertility: major soil nutrients present in following ratios:
 - .1 Nitrogen (N): 20 to 40 microgram of available N per gram of topsoil.
 - .2 Phosphorus (P): 10 to 20 micrograms of phosphate per gram of topsoil.
 - .3 Potassium (K): 80 to 120 micrograms of potash per gram of topsoil.
 - .4 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to
 - .5 2.3 support germination and/or establishment of intended vegetation.
 - .6 PH value: 6.5 to 8.0.
 - .7 Contain nontoxic elements or growth inhibiting materials.
 - .8 Free from: Debris and stones over 50 mm diameter.
 - .9 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .10 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

- .1 Specify quality of material for required soil amendments. Include additional soil amendments for special turf and plant material requirements.
 - .1 Peat Moss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle minimum size: 5 mm.
 - .2 Sand:
 - .1 Hard, granular sharp coarse sand, washed, and free of gravel and very fine material, free of impurities, chemical or organic matter. Reasonable care in the selection of material in a pit shall be used to produce a uniform product. Sand gradation: uniform (well graded), and within the following limits:

2.5mm	(no. 8)	100%
1.25mm	(no.16)	90-100%
0.8mm	(no.20)	80-90%
0.0315mm	(no.50)	80-60%
0.16mm	(no.100)	2-10%
0.063mm	(no.200)	1% maximum

- .3 Compost: conforming to CCME Guidelines, Category A requirements, including:
 - .1 Trace elements
 - .2 Foreign matter (also conforming to CAN/BNQ 0413-M95, Type A)
 - .3 Pathogenic organism content
- .4 Limestone:
 - .1 Ground agricultural limestone containing minimum calcium carbonate equivalent of 85%.
 - .2 Graduation requirements: percentage passing by weight, 90% passing
 - .3 1.0 mm sieve, 50% passing 0.124 mm sieve.
- .5 Fertilizer:
 - .1 Complete, commercial with 35% soluble nitrogen

Part 3 Execution

3.1 GENERAL

- .1 Minimize creation of dust and disturbance of neighbours during all construction phases that work with topsoil.
- .2 Protect existing work:
 - .1 Exercise caution against injury to, or defacement of, existing conditions. Repair or replace all items and site features damaged from installation operations to original or better condition at Contractor's own expense.
 - .2 Locate utility lines before commencement of work and protect from damage.
- .3 Pre-installation Site Meeting: Conduct Meeting at Project site to address quality of materials, inspection schedule and samples including, but not limited to, the following:
 - .1 Protection of existing trees and facilities.
 - .2 Landscape materials and installation procedures.
 - .3 Layout and stacking of tree trenches and shrub beds prior to excavation.
 - .4 Verification of required subgrade depths to accommodate topsoil depths at sod, shrub beds and tree trench locations prior to installation of topsoil.

3.2 PREPARATION OF SUBGRADE

- .1 All Areas to receive topsoil:
 - .1 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
 - .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
 - .3 Remove debris, roots, branches, stones in excess of 25 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.

3.3 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.
- .3 Place topsoil in dry weather on loose, friable, and graded subgrade surface. Do not spread topsoil when ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the Work, as determined by the Departmental Representative. Fine grade and loosen topsoil. Eliminate rough spots and low areas to ensure positive drainage away from fences and walkways. Prepare a loose friable bed by means of cultivation and subsequent raking. Maintain levels, profiles and contours of subgrade.
- .4 Keep topsoil 25mm below finish grade for sodded areas adjacent to walkways, curbs, edging materials, other hard surfaces and crown of adjacent existing turf. Elsewhere, bring topsoil up to finished grade.
- .5 Do not cover catch basins, valve covers or manholes. Cut smooth falls to catch basin rim, finish flush. Provide smooth transitions at top and bottom of slopes.
- .6 Spread topsoil as indicated to depths shown on drawings
- .7 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.4 SOIL AMENDMENTS

- .1 Incorporate soil amendment well into full depth of topsoil. Rototill (or other approved mechanical incorporation) amendment into soil in perpendicular directions. Rototill entire area numerous times in one direction and then numerous times at right angles to initial direction, ensuring no surface debris, stones in excess of 20mm diameter, soil clods, vegetation, roots, grass or weeds, litter or other foreign debris are present upon completion of disking.

3.5 FINISH GRADING

- .1 Finish grade to be within 25mm of design grades. All costs associated with the survey and surface preparation shall be borne by the Contractor.

- .2 Contractor to remove and dispose of all rocks that exceed 25mm at the finish grade.
- .3 Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.
- .4 Consolidate topsoil to required bulk density using equipment approved by the Departmental Representative. Leave surfaces smooth, uniform and firm against deep foot printing.

3.6 PROTECTION OF GRADED AREAS

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

3.7 CLEAN UP

- .1 Dispose of materials not required where directed by Departmental Representative off site.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by the Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.
- .4 Restore stockpile sites acceptable to Departmental Representative.
- .5 Keep roadway, walkway, and surrounding areas free of soil and debris as a result of work done under this section at the end of each working day or as directed by the Owner.
- .6 Dispose of surplus soil not required for fine grading and landscaping off site.
- .7 Restore stockpile sites on site to "rake clean" condition acceptable to the Owner.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

- .1 The section covers the supply, approval, handling, storage and installation of sod.

1.2 REFERENCES

- .1 Canadian Nursery Landscape Association
 - .1 Canadian Standards for Nursery Stock
- .2 Canadian Landscape Standard, First Edition
 - .1 Section 4: Grading and Drainage
 - .2 Section 6: Growing Medium

1.3 SUBMITTALS

- .1 Submit product data for each type of product indicated.
- .2 Submit planting schedule indicating anticipated planting dates for each type of planting.
- .3 Submit maintenance instructions indicating recommended procedures to be established by Departmental Representative for maintenance of sodded areas following the required maintenance period.

1.4 SCHEDULING

- .1 Schedule sod laying to coincide with preparation of soil surface.
- .2 Schedule sod installation when frost is not present in ground.

Part 2 Products

2.1 SOD

- .1 The grass sod shall be a certified No. 1 cultivated turf grass sod grown from Canada No. 1 seed. It shall be grown and sold in accordance with the classification of the Southern Alberta Turf Grass Association.

2.2 APPROVED SOD TYPES

- .1 Sod
 - .1 Shall be a 100% Fescue Blend, each variety shall be no more than 40% of the total blend.

2.3 SUBSTITUTIONS

- .1 Contractor shall provide documentation from supplier demonstrating that proposed substitution product achieves the same performance bench marks as the blends mixes above.
- .2 Performance Bench Marks:
 - .1 Drought Tolerant
 - .2 Shade Tolerant
 - .3 Salt Tolerant
 - .4 $\geq 50\%$ Reduction in Water Requirements

2.4 APPROVAL OF SOD

- .1 The Contractor shall make the sod available at the source of supply for inspection by the Departmental Representative.
- .2 The sod shall have a strong fibrous root system and shall be free from stones and burned or bare spots.

2.5 HANDLLING AND STORAGE

- .1 The sod shall be cut by approved methods in accordance with recommendations of the Nursery Sod Growers Association of Alberta. The pieces shall be approximately 0.50 square meters in area. The soil shall be a minimum of 12.5 mm and a maximum of 25 mm in depth.
- .2 The sod shall be rolled or folded prior to lifting in such a manner as to prevent tearing or breaking.
- .3 Sod shall be protected during transportation to prevent drying out and shall arrive at the site in a fresh and healthy condition.
- .4 Dried out, damaged, deteriorated and unhealthy sod is not acceptable. Broken or irregular pieces of sod are not acceptable. Promptly remove all unacceptable sod from site.
- .5 Sod shall be installed immediately after arrival. If there is any delay in installation, sod.
- .6 Deliver sod to site within 24 hours of being harvested. Install all sod within 36 hours of being harvested.

Part 3 Execution

3.1 SITE PREPARATION

- .1 Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- .2 Remove weeds and debris.

- .3 The subgrade shall be compacted to 80% of Standard Proctor Density for sodded areas unless otherwise specified and be approved by the Departmental Representative prior to placing the topsoil.
- .4 The topsoil mix shall be a minimum of 135 mm deep and fertilized within 48 hours of laying sod. The topsoil mix shall be compacted to 80% of Maximum Standard Proctor Density for sodded areas unless otherwise specified.
- .5 Keep topsoil 25 mm below finished grade.
- .6 Scarify and/or aerate soil surface to allow for proper subsurface drainage.
- .7 The surface of all areas to be sodded shall be wet immediately prior to sodding.

3.2 FERTILIZING

- .1 Apply fertilizer prior to sodding, after final grade is approved by Owner.
- .2 Apply 12-51-0 or other similar granular starter fertilizer evenly at 3 kg/100 m² using a calibrated mechanical distributor.
- .3 Lightly rake and incorporate fertilizer into topsoil.

3.3 INSTALLATION

- .1 Do not lay sod if dormant.
- .2 Do not perform work during hot and dry conditions, or when ground is frozen, muddy or covered in snow or during times of unfavorable climatic conditions.
- .3 Lay sod smooth and even; butt sod pieces close and tight with no open joints visible. Stagger end joints 30 cm minimum between adjacent rows to avoid continuous seams. Do not stretch or overlap sod pieces.
- .4 Sod shall be laid closely knit together in such a manner that no open joints are visible, or pieces are overlapping.
- .5 Sod shall be laid smooth and flush with adjoining grass areas and hard landscape elements such as paving and curbing unless otherwise specified on the drawings.
- .6 Saturate sod with fine water spray within two hours of planting, until sod and soil in contact with bottom of sod are thoroughly wet.
- .7 When the sod and soil has sufficiently dried to prevent damage, the sod area shall be rolled with a roller to ensure a good bond between the sod and soil, also remove any minor depressions and irregularities.
- .8 All sodded areas shall be posted by the Contractor to warn that the area is freshly sodded. The signs supplied by the Contractor shall be approved by the Departmental Representative.
- .9 During first week, water daily or more frequently as necessary to maintain constantly adequate moisture in soil to a minimum depth of 100 mm (4") below sod.

3.4 LAYING SOD ON SLOPES

- .1 On sloped areas 5:1 and steeper, lay sod perpendicular to slope and secure with wooden pegs. Place 4 to 6 wooden pegs/m², to prevent shifting of sod. Drive pegs flush with sod surface. Initiate sod installation from bottom of slope.
- .2 Prior to placing sod on steep slopes where erosion may occur, place geotextile fabric netting over graded topsoil for reinforcement. Install and securely anchor sod in place over fabric with metal staples in accordance with manufacturer's instructions.

3.5 CLEANUP AND PROTECTION

- .1 Promptly remove soil and debris created by lawn work from paved areas; clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas. Clear soil and rubble from catch basins, manholes, valves and other hard surface features.
- .2 Collect all litter and other debris from site during work of contract.
- .3 Remove and dispose of excess materials, soil, litter, debris, and grass clippings at approved disposal site. Contractor shall be responsible for all disposal costs.
- .4 Erect barricades and warning signs as required to protect newly planted areas from traffic; maintain barricades throughout maintenance period and remove after lawn is established.
- .5 Damaged sod resulting from inadequate protection shall be repaired with topsoil, fertilizer and new sod at Contractor's expense. All damages shall be repaired prior to final acceptance.

3.6 MAINTENANCE OF SODDED AREAS

- .1 Maintenance of turf areas shall be provided by the Contractor and shall include all measures necessary to establish and maintain grass in a healthy and vigorous growing condition.
- .2 Management of the sodded areas will occur in the second growing season to control the establishment and growth of undesirable vegetation such as Canada thistle.
 - .1 Weed Control
 - .1 May use Selective Herbicides or Mechanical Vegetation Control (Mowing). Any chemical herbicides must be applied by a licensed applicator (Alberta).
 - .2 Vegetation to be 90% free of weeds.
 - .2 Watering:
 - .1 Contractor is responsible to increase watering as required during hot / dry periods.
 - .2 Sod must not be allowed to dry and must be kept moist at all times.

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SODDING
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END OF SECTION

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Part 1 General**1.1 SECTION INCLUDES**

- .1 This specification shall cover all Work associated with the supply and installation of plant material. The Contractor shall furnish all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.

1.2 REFERENCES

- .1 Canadian Nursery Landscape Association
 - .1 Canadian Standards for Nursery Stock
 - .2 Pruning Guidelines
- .2 Canadian Landscape Standard, First Edition
 - .1 Section 4: Grading and Drainage
 - .2 Section 6: Growing Medium

1.3 SUBMITTALS

- .1 Submit list of all plant nursery sources. Where applicable, provide "Clean Plants Certification Number" of each Clean Plants certified nursery for approval. Submit information minimum two weeks prior to commencement of work.
 - .1 Provide quality, size, genus, species, and variety of exterior plants indicated, using ANSI Z60.1 terminology and methods of measurement.
- .2 Submit product data for:
 - .1 Fertilizer.
 - .2 Anti-desiccant.
 - .3 Mycorrhizae
 - .4 Guying assembly including clamps, collar, guying wire, anchors and wire tightener.
 - .5 Mulch.
- .3 Submit samples for:
 - .1 Mulch.
- .4 Submit maintenance instructions indicating recommended procedures to be established by Departmental representative for maintenance of plantings after the Contractor's required maintenance period.

1.4 STORAGE AND PROTECTION

- .1 Protect plant material from frost, excessive heat, wind and sun during delivery.

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- .2 Immediately store and protect plant material which will not be installed within 1 hour after arrival at site in storage location.
- .3 Protect plant material from damage during transportation:
 - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
 - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
 - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand and watering to full depth of root zone.
 - .2 For containers, maintain moisture level in containers.
 - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.
- .5 Waste Management and Disposal:
 - .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .2 Place materials defined as hazardous or toxic in designated containers.
 - .3 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
 - .4 Fold up metal and plastic banding, flatten and place in designated area for recycling.
 - .5 Divert discarded plastic plant containers materials from landfill to plastic recycling facility.
 - .6 Dispose of unused fertilizer at official hazardous material collection site.
 - .7 Dispose of unused anti-desiccant at official hazardous material collections site.
 - .8 Divert unused wood and mulch materials from landfill.

1.5 INSPECTIONS

- .1 Observation: Departmental Representative will observe trees and shrubs for compliance with requirements for genus, species, variety, size, and quality as follows:
 - .1 Departmental Representative retains right to review trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work.
 - .2 Remove rejected trees or shrubs immediately from Project site.
 - .3 Notify Departmental Representative of sources of planting materials seven (7) days in advance of delivery to site.

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- .2 The Departmental Representative will review trees and shrubs at the following stages to verify conformance with specified requirements:
 - .1 Installed trees and shrubs before commencement of maintenance period.
 - .2 At end of maintenance period.

1.6 WARRANTY

- .1 End of Warranty inspection conducted by Departmental Representative.
- .2 Departmental Representative reserves the right to extend Contractors warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

Part 2 Products**2.1 PLANT MATERIAL**

- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
 - .1 Source of plant material: grown in Zone 3 in accordance with Plant Hardiness Zones in Canada.
 - .2 Plant material must be planted in zone indicated as appropriate for its species.
 - .3 Plant material in location appropriate for its species.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .3 Trees: with straight trunks, well and characteristically branched for species except where specified otherwise.
- .4 Trees larger than 200 mm in caliper: half root pruned during each of two successive growing seasons, the latter at least one growing season prior to arrival on site.
- .5 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
- .6 Collected Plant Material
 - .1 Maximum 40 mm in caliper, with well-developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.
 - .2 Collected Plants may only be used when approved in writing by the Departmental Representative.
- .7 Plants shall be kept continually moist and shaded until they are planted by covering with wet burlap or by other method approved by the Departmental Representative.
- .8 Plants shall be stored or bundled in original conditions with manufacturer's seals and labels intact.

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- .9 Any plants that have been permitted to dry out, to become overheated, or for any reason, in the judgment of the Departmental Representative, do not clearly show a viable condition shall be rejected for use regardless of previous inspections. The Contractor will remove and replace defective vegetation products at own expense and be responsible for delays and expenses caused by rejection.
- .10 Should any dispute arise as the quality of fitness of vegetation products, decision rests strictly with the Departmental Representative based upon requirements of the Contract Documents.

2.2 WATER

- .1 Free of impurities that would inhibit plant growth.

2.3 STAKES

- .1 T-bar, steel, 40 x 40 x 5 x 2440 mm.

2.4 WIRE TIGHTENER

- .1 Turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm open length.

2.5 COLLAR TIES

- .1 Foam, or similar approved material.

2.6 CLAMPS

- .1 U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.
- .2 Crimp type.

2.7 ANCHORS

- .1 Drive-in type.
 - .1 13 mm diameter x 75 mm long, aluminum.

2.8 TRUNK PROTECTION

- .1 100mm diameter x 600mm length, HDPE corrugated drain pipe.

2.9 MULCH

- .1 Mulch shall be made from recycle and shredded wooden pallets - free of bark, small branches and leaves.

2.10 FERTILIZER

- .1 Synthetic commercial type as recommended by soil test report.

2.11 SOURCE QUALITY CONTROL

- .1 Obtain approval from Departmental Representative of plant material prior to planting.

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- .2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

Part 3 Execution**3.1 PRE-PLANTING OPERATIONS**

- .1 Ensure plant material acceptable to Departmental Representative.
- .2 Remove damaged roots and branches from plant material.
- .3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

3.2 DELIVERY, STORAGE AND PROTECTION

- .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within one (1) hour after arrival at site in storage location approved by Departmental Representative.
- .3 Protect plant material from damage during transportation:
 - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 kph, tie tarpaulins around plants or over vehicle box.
 - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 kph, use enclosed vehicle.
- .4 Protect stored plant material from frost, wind and sun as follows:
 - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil, and watering to full depth or root zone.
 - .2 For pots and containers, maintain moisture level in containers. (Heel-in and fibre pots)
 - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

- .1 For individual planting holes:
 - .1 Stake out location and obtain approval from Departmental Representative prior to excavating.
 - .2 Excavate to depth and width as indicated.
 - .3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will 3.3.1 be used as planting soil for trees and individual shrubs. Dispose of excess material.
 - .4 Scarify sides of planting hole.
 - .5 Remove water which enters excavations prior to planting. Notify Departmental Representative if water source is ground water.

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3.4 TREE AND SHRUB PLANTING

- .1 Planting
 - .1 For bare root stock, place 50 mm backfill soil in bottom of hole. Plant trees and shrubs with roots placed straight out in hole.
 - .2 For jute burlapped root balls, cut away top 1/3 of wrapping and fold down top 1/3 of wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
 - .3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
 - .4 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
 - .5 For all plants located in the bio-swale apply mycorrhizae in the planting hole and in contact with the roots as per the manufacturer's specifications and application chart. For balled and burlap trees, apply on the top 2/3 from the base. It is important to apply the recommended amount per plant evenly to cover the whole circumference of the root ball. Product must be in physical contact to the root ball prior to backfilling.
 - .6 For trees and shrubs:
 - .1 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
 - .2 Form watering saucer as indicated.
 - .7 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.
 - .8 Water plant material at time of planting and as needed.
 - .9 After soil settlement has occurred, fill with soil to finish grade.
 - .10 Dispose of burlap, wire and container material off site.

3.5 TRUNK PROTECTION

- .1 Install trunk protection on deciduous trees as indicated.
- .2 Install trunk protection prior to installation of tree supports used.

3.6 TREE SUPPORTS

- .1 Install tree supports as indicated.
- .2 Use single stake tree support for deciduous trees less than 3 m and evergreens less than 2 m.
 - .1 Stake trees on prevailing wind side and 250 mm from trunk.
 - .2 Drive stake minimum 250 mm into undisturbed soil beneath roots. Ensure stake is secure, vertical and un-split.
 - .3 Install 260 mm long canvas strap 1500 mm above grade.
 - .4 Wrap strap around tree and overlap strap at nailing point. Nail strap to stake.

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- .3 Use three (3) guy wires and anchors for deciduous trees greater than 3 m and evergreens greater than 2 m.
 - .1 Use type 2 guying wire with clamps for trees less than 75 mm in diameter and type 3 guying wire with clamps for trees greater than 75 mm in diameter.
 - .2 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and half height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.
 - .3 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.
 - .4 Install anchors at equal intervals about tree and away from trunk so that guy wire will form 45, 30 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.
 - .5 Attach guy wire to anchors. Tension wire and secure by multi-wraps installing clamps.
 - .6 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.
 - .7 Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by Departmental Representative.
 - .8 Install flagging tape to guys as indicated.
 - .9 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.7 MULCHING

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch to a depth of 100mm loosely packed. Expose bottom of trunk area to ground level 100mm around base.

3.8 PRUNING

- .1 Prune, thin, and shape trees and shrubs according to standard horticultural practice.
- .2 Prune trees to retain required height and spread; do not cut tree leaders; remove only injured or dead branches.
- .3 Prune shrubs and vines to retain natural character; sizes indicated are sizes after pruning.

3.9 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following maintenance operations from time of planting to acceptance by Departmental Representative.
 - .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
 - .1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

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- .2 Remove weeds monthly.
- .3 Replace or re-spread damaged, missing or disturbed mulch.
- .4 For non-mulched areas, cultivate as required to keep top layer of soil friable.
- .5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
- .6 Remove dead or broken branches from plant material.
- .7 Keep trunk protection and guy wires in proper repair and adjustment.
- .8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.10 MAINTENANCE DURING WARRANTY PERIOD

- .1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
 - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
 - .2 Reform damaged watering saucers.
 - .3 Remove weeds monthly.
 - .4 Replace or re-spread damaged, missing or disturbed mulch.
 - .5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.
 - .6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
 - .7 Apply fertilizer in early spring as indicated by soil test.
 - .8 Remove dead, broken or hazardous branches from plant material.
 - .9 Keep trunk protection and tree supports in proper repair and adjustment.
 - .10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
 - .11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

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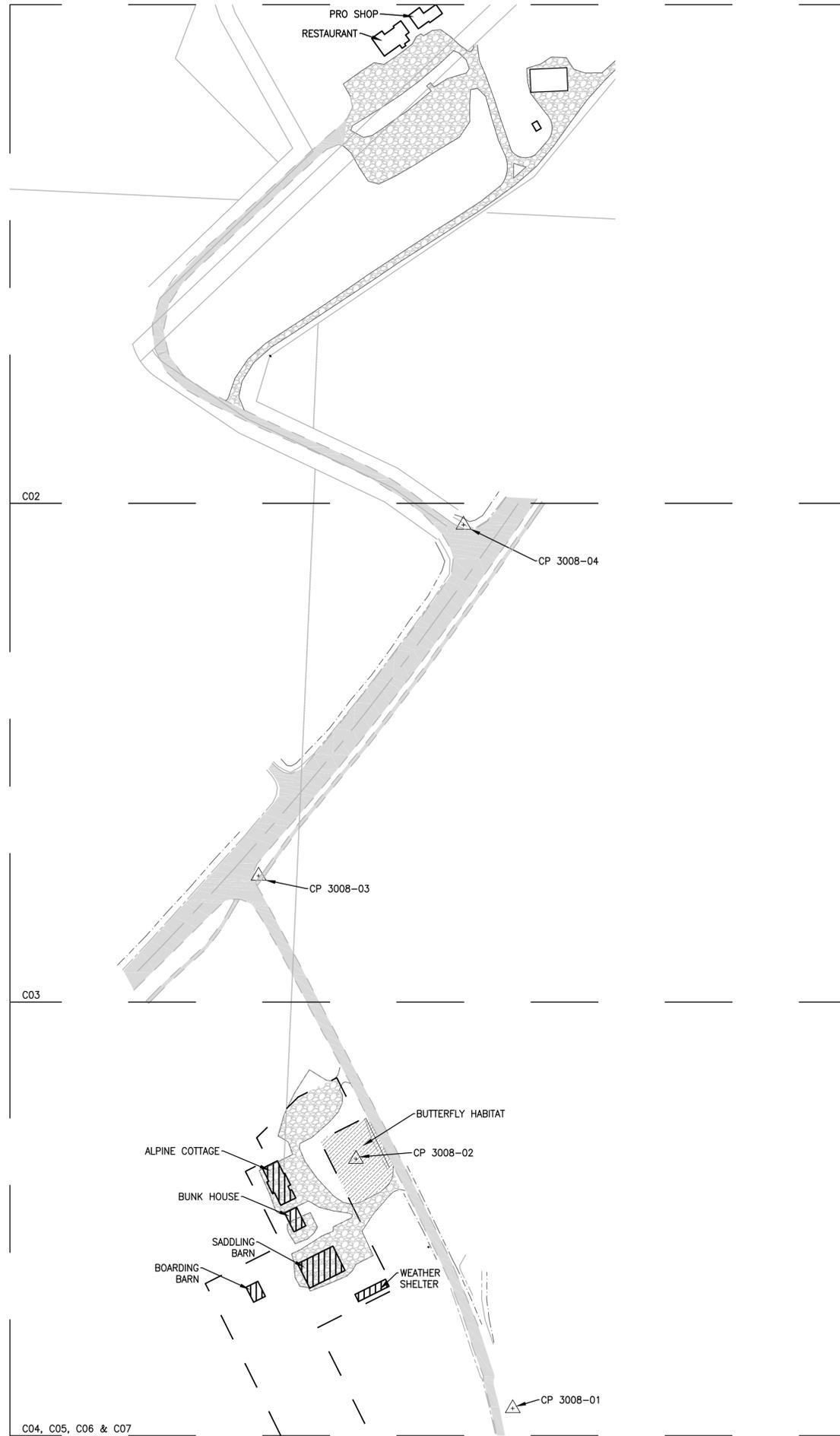
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- .12 Submit monthly written reports to Departmental Representative identifying:
 - .1 Maintenance work carried out.
 - .2 Development and condition of plant material.
 - .3 Preventative or corrective measures required which are outside Contractor's responsibility.

END OF SECTION



1
KEY PLAN
SCALE: 1:1500

NOTES:
 1. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.
 2. EXISTING BUTTERFLY HABITAT IS NOT TO BE DISTURBED.

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

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	

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

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Western Region
SERVICES IMMOBILIERS
Région de l'ouest

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Proj #: 18-0109-009

PROFESSIONAL ENGINEER ALBERTA
K.A. McDONALD
1988

Permit to Practice
KGS GROUP
P07205

Revision	Description	Date
3	Issued for Construction	2018 10 25
2	Issued for Construction	2018 08 16
1	Issued for Construction	2018 07 30
0	90% Construction Documents Submission	2018 07 12

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

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

Designed by
RKF

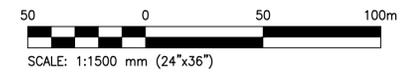
Drawn by
KNS

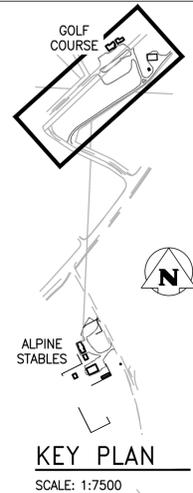
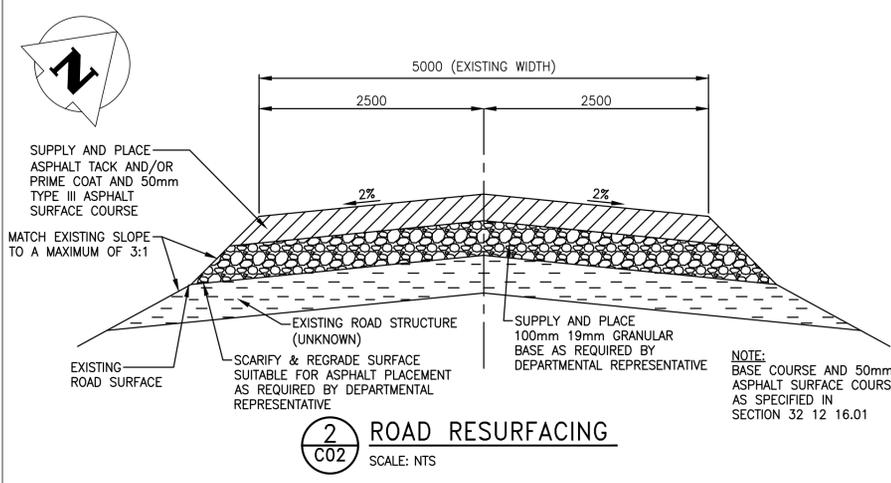
Approved by
RM

PWGSC Project Manager
MICHAEL LYZANIWSKI

Drawing title
KEY PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C01 OF 7	3





- 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
 - EXISTING VALVE
 - 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:

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

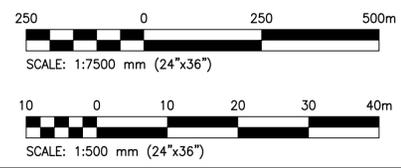
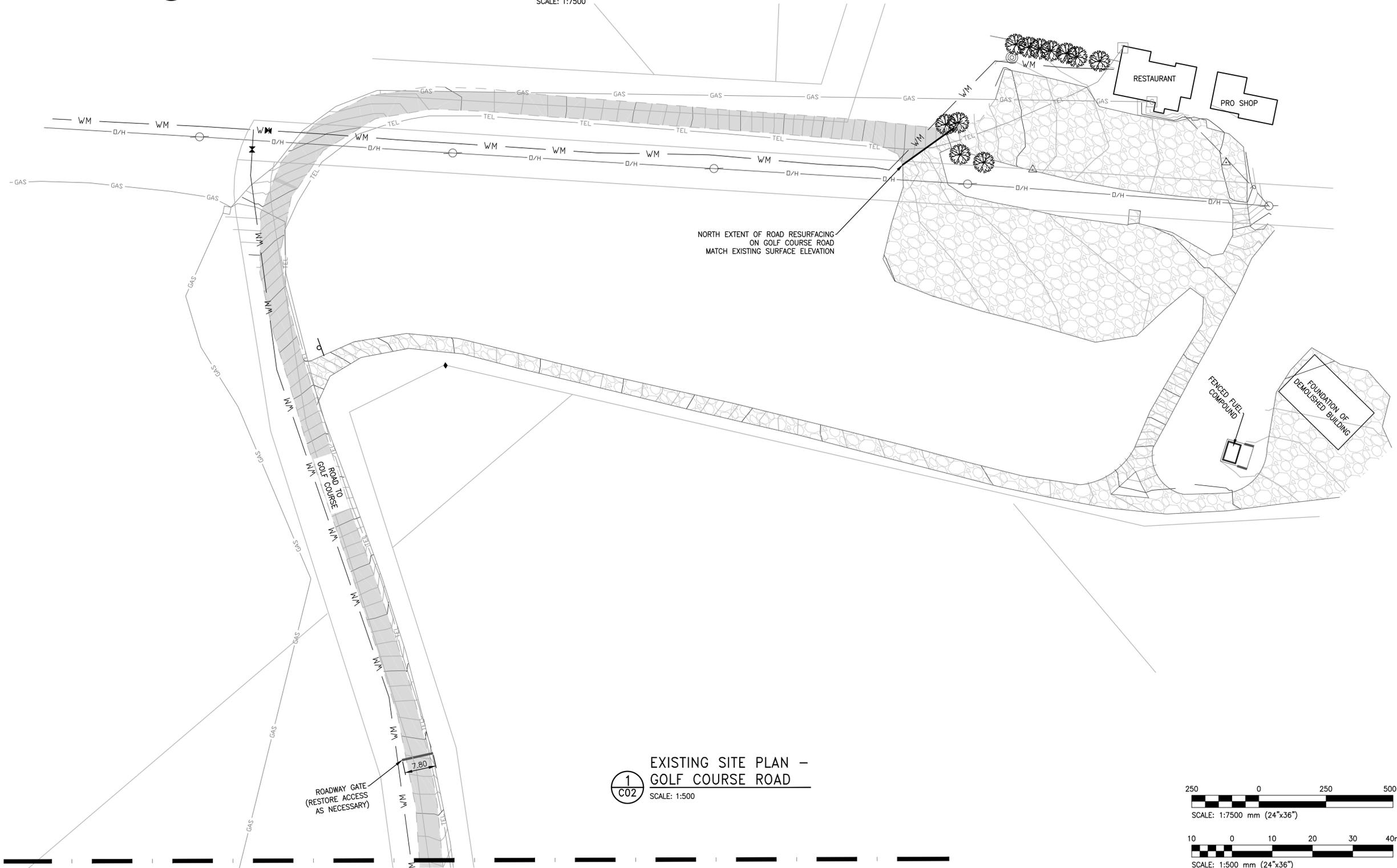
CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

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CONSULTING ENGINEERS
Proj #: 18-0109-009



Revision	Description	Date
3	Issued for Construction	2018 10 25
2	Issued for Construction	2018 08 16
1	Issued for Construction	2018 07 30
0	90% Construction Documents Submission	2018 07 12

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
RKF

Drawn by
KNS

Approved by
RM

PWGSC Project Manager
MICHAEL LYZANIEWSKI

Drawing title
EXISTING SITE PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C02 OF 7	3



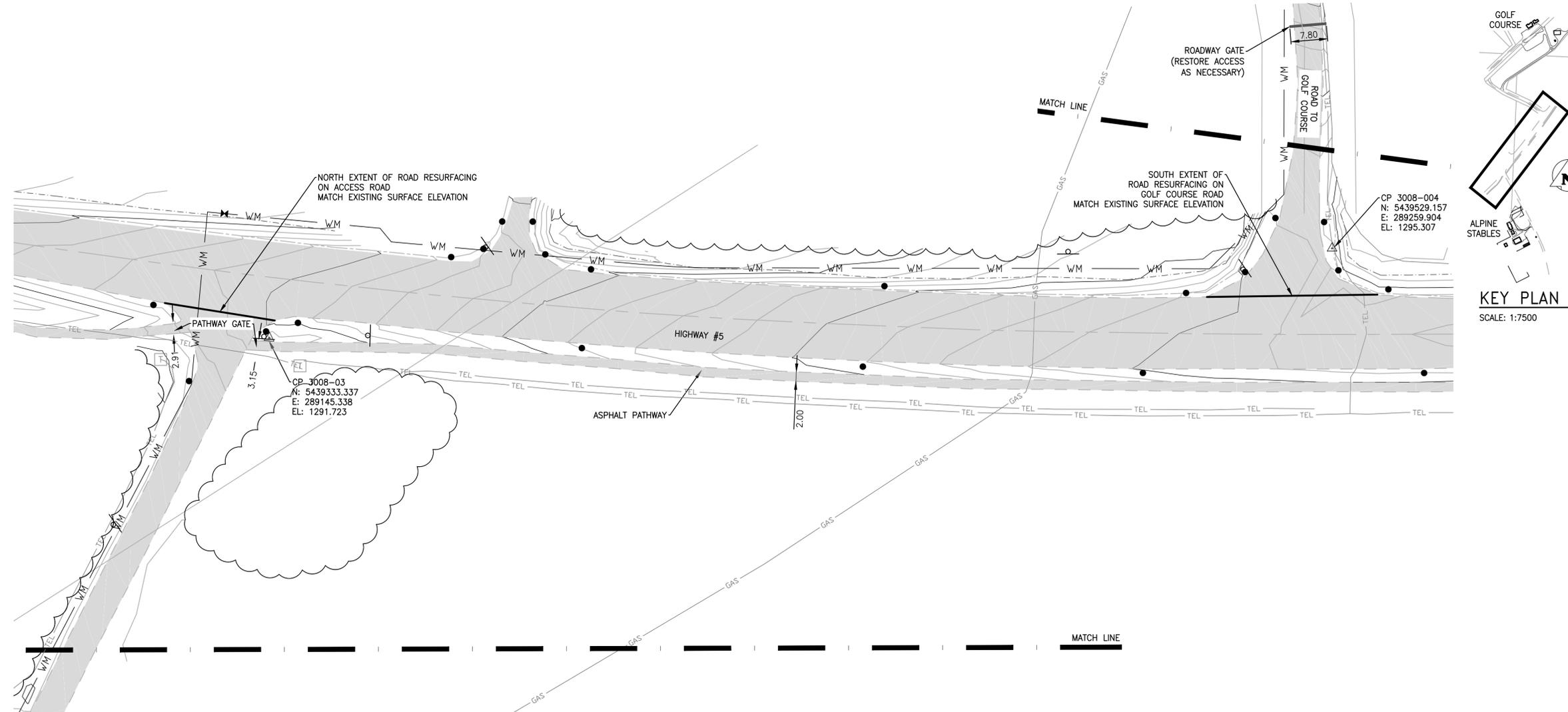
CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

NOTES:

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

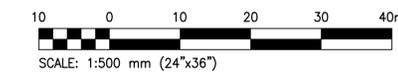
LEGEND

FIP	
CONTROL POINT	
U/G GAS LINE	
U/G TELUS LINE	
TELUS BOX	
EXISTING WATER MAIN	
EXISTING VALVE	
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	



KEY PLAN
SCALE: 1:7500

EXISTING SITE PLAN - HIGHWAY 5
SCALE: 1:500



Revision	Description	Date
3	Issued for Construction	2018 10 25
2	Issued for Construction	2018 08 16
1	Issued for Construction	2018 07 30
0	90% Construction Documents Submission	2018 07 12

Client
PWGSC/TPSGC

ATB Place North Tower
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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
RKF
Drawn by
KNS
Approved by
RM

PWGSC Project Manager
MICHAEL LYZANIEWSKI

Drawing title
EXISTING SITE PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C03 OF 7	3

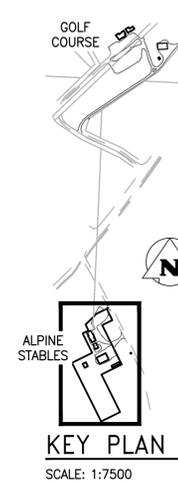
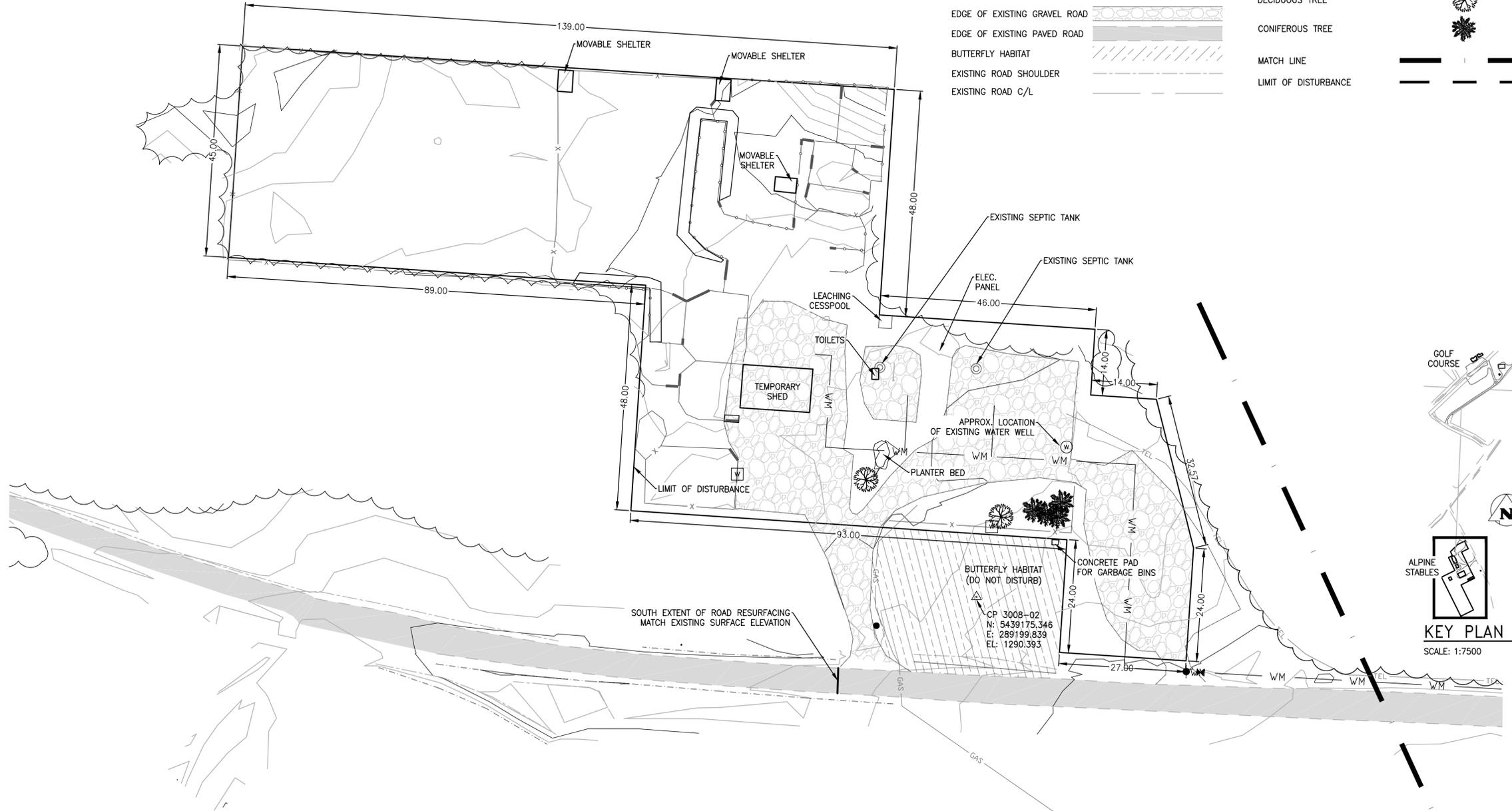


CONTROL POINTS			
NAME	NORTHING	EASTING	ELEVATION
CP 3008-01	5439036.244	289287.444	1289.801
CP 3008-02	5439175.346	289199.839	1290.393
CP 3008-03	5439333.337	289145.338	1291.723
CP 3008-04	5439529.157	289259.904	1295.307

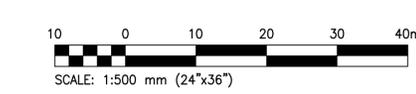
- NOTES:**
1. GAS CONNECTION TO BE BROUGHT TO BUILDINGS BY CHIEF MOUNTAIN GAS AND COORDINATED WITH CONTRACTOR.
 2. EXISTING SITE SHOULD BE PROTECTED.
 3. EXISTING BUTTERFLY HABITAT IS NOT TO BE DISTURBED.
 4. EXISTING INFRASTRUCTURE IS APPROXIMATE AND SHOULD BE LOCATED PRIOR TO CONSTRUCTION.

LEGEND

FIP	◆	TOE OF EXISTING DITCH	---
CONTROL POINT	△	SIGN	⊖
U/G GAS LINE	— GAS —	FENCE	— X —
U/G TELUS LINE	— TEL —	BURNED FENCE	— o —
EXISTING WATER MAIN	— WM —	EXISTING GATE	—
EXISTING VALVE	✕	EXISTING SEPTIC TANK	⊙
EXISTING WATER TAP	⊞	TREED AREA	~~~~~
EXISTING WATER WELL	⊞	EXISTING BUILDING	—
EXISTING PARK OUTDOOR FAUCET	◆	CONCRETE SIDEWALK	—
POST	●	DECIDUOUS TREE	⊙
EDGE OF EXISTING GRAVEL ROAD	—	CONIFEROUS TREE	⊙
EDGE OF EXISTING PAVED ROAD	—	MATCH LINE	— —
BUTTERFLY HABITAT	///	LIMIT OF DISTURBANCE	— - - -
EXISTING ROAD SHOULDER	---		
EXISTING ROAD C/L	---		



1
C04
EXISTING SITE PLAN —
ALPINE STABLES
SCALE: 1:500



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KGS GROUP
CONSULTING ENGINEERS
Proj #: 18-0109-009

PROFESSIONAL ENGINEER ALBERTA
McDONALD
Permit to Practice
KGS GROUP
P07205
APFGA

Revision	Description	Date
3	Issued for Construction	2018 10 25
2	Issued for Construction	2018 08 16
1	Issued for Construction	2018 07 30
0	90% Construction Documents Submission	2018 07 12

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
RKF

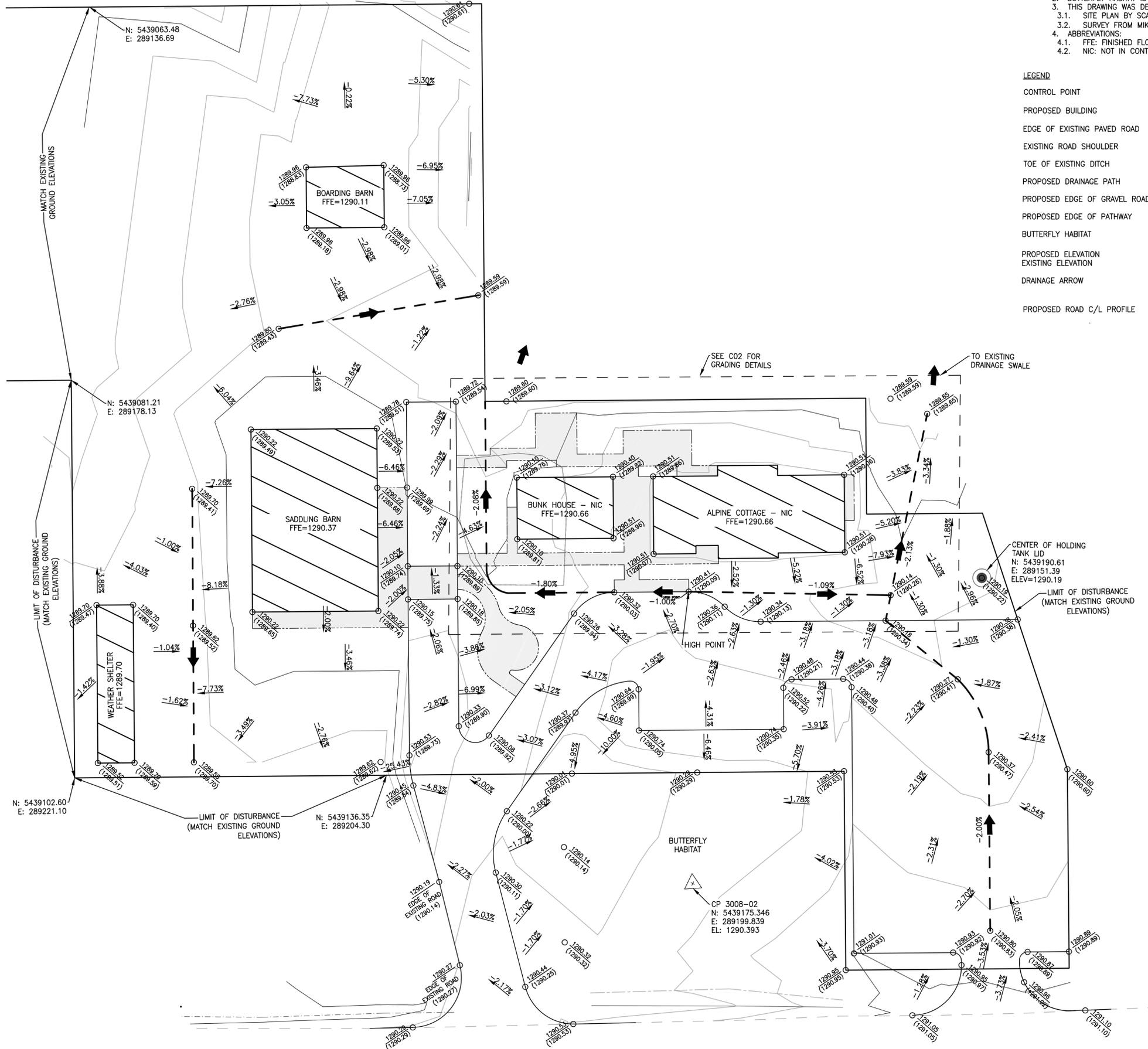
Drawn by
KNS

Approved by
RM

PWGSC Project Manager
MICHAEL LYZANIWSKI

Drawing title
EXISTING SITE PLAN

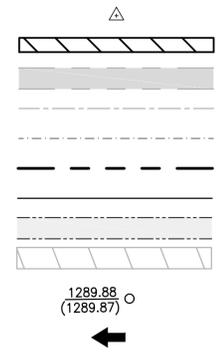
Project no.	Drawing no.	Revision no.
R.096286.001	C04 OF 7	3



- 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



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KGS GROUP
CONSULTING ENGINEERS

Proj #: 18-0109-009
Package #2

PROFESSIONAL ENGINEER ALBERTA
R.A. McDONALD
P. Eng. No. 12345

Permit to Practice
KGS GROUP
P07205

Revision	Description	Date
3	Issued for Construction	2018 10 25
2	Issued for Construction	2018 08 16
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 LYZANOWSKI

Drawing title
GRADING PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C05	3
	OF 7	

1 GRADING PLAN
C05 SCALE: 1:250





- 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

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
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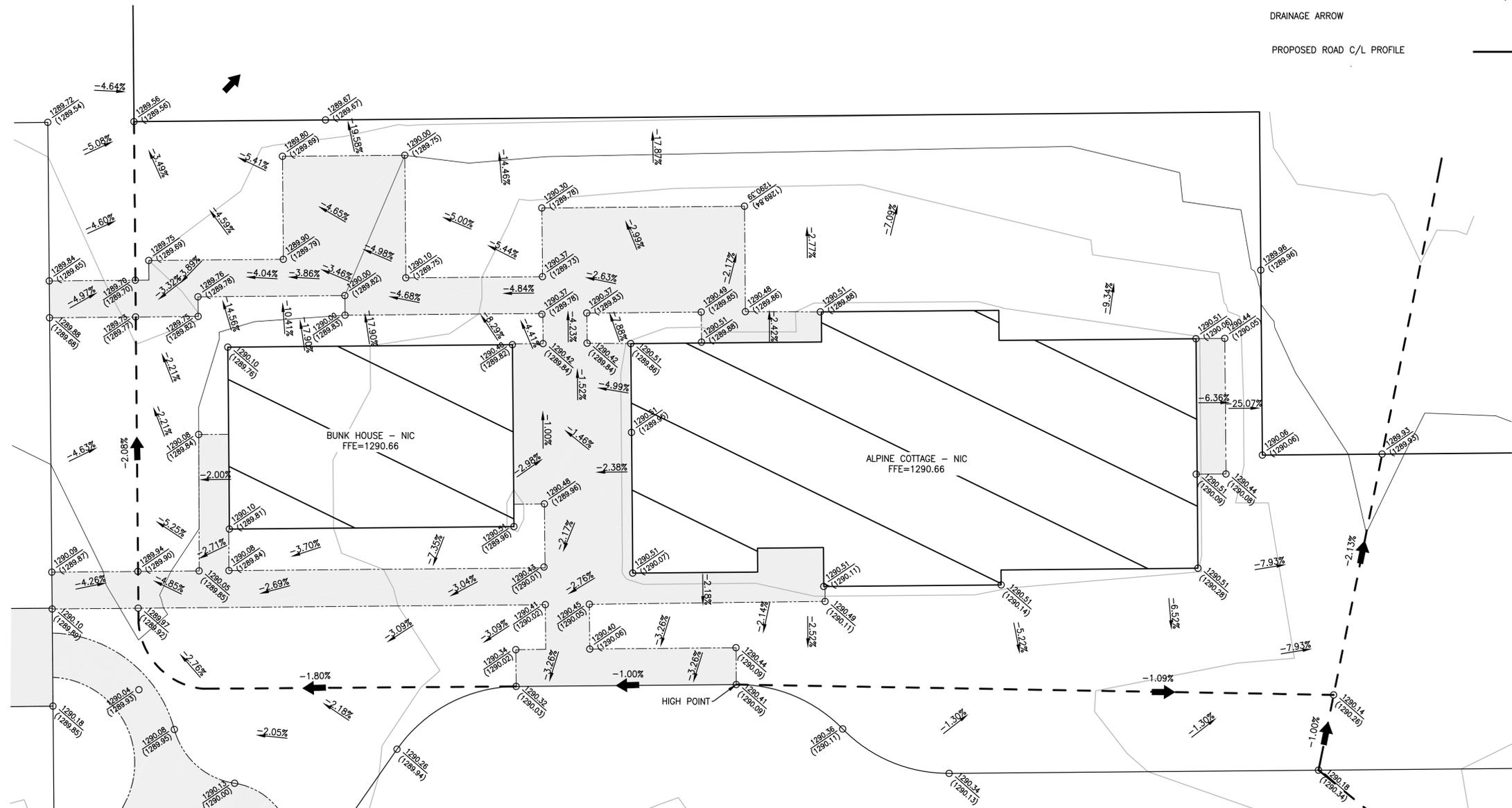
REPUBLIC ARCHITECTURE INC
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KGS GROUP
CONSULTING ENGINEERS
Proj #: 18-0109-009
Package #2

PROFESSIONAL ENGINEER ALBERTA
McDONNELL
Permit to Practice
KGS GROUP
P07205
APEGA

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



1 GRADING PLAN
C06 SCALE: 1:100



Revision	Description	Date
3	Issued for Construction	2018 10 25
2	Issued for Construction	2018 08 16
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

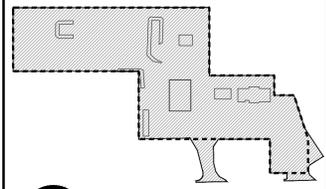
Approved by
RM

PWGSC Project Manager
MICHAEL LYZANOWSKI

Drawing title
GRADING PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	C06 OF 7	3





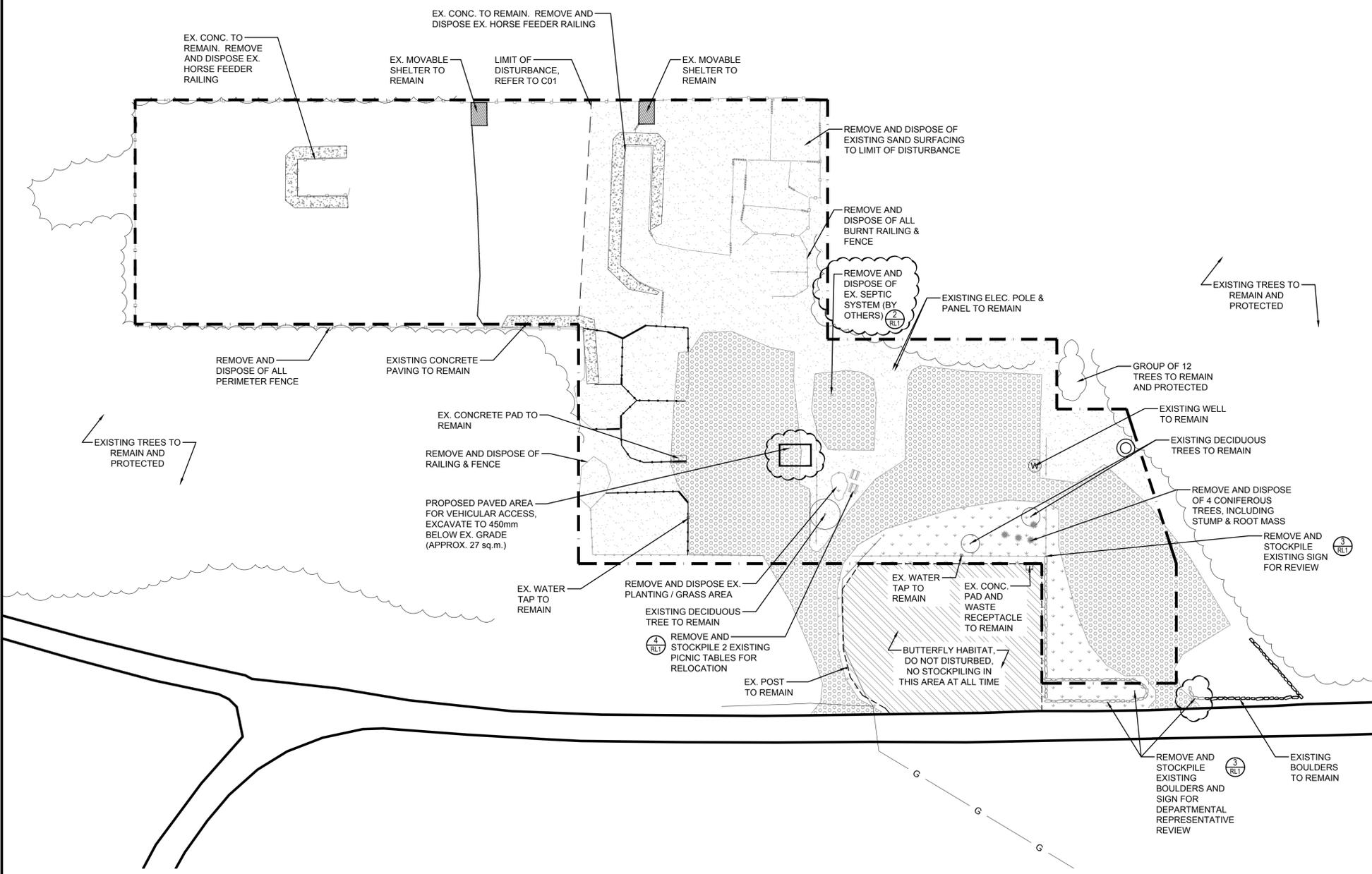
KEY PLAN
SCALE: 1:2500

PROPERTY LINE
AREA OF WORK

The Alberta Association of Landscape Architects
Deron T. Miller
September 13, 2018

- REMOVAL NOTES:**
1. INFORMATION CONCERNING EXISTING CONSTRUCTION WAS TAKEN FROM ORIGINAL DRAWINGS AND IS ASSUMED CORRECT.
 2. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF SITE MEASUREMENTS AND QUANTITIES OF MATERIALS REQUIRED.
 3. PERFORM WORK IN STRICT ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA AND ANY OTHER CODE OF APPLICATION OR ANY AUTHORITY HAVING JURISDICTION.
 4. DRAWINGS MUST NOT BE SCALED.
 5. WHERE NEW WORK CONNECTS WITH EXISTING AND WHERE EXISTING WORK IS ALTERED, PATCH, REPAIR AND MAKE GOOD TO MATCH EXISTING. CONTACT DEPARTMENTAL REPRESENTATIVE FOR CLARIFICATION AS REQUIRED.
 6. ALL FINISHES AND MATERIALS TO REMAIN ARE TO BE PROTECTED IN THEIR EXISTING CONDITION EXCEPT AS NOTED. ANY FINISHES DAMAGED IN THE COURSE OF CONSTRUCTION ARE TO BE PATCHED, REPAIRED AND MADE GOOD.
 7. IN CASE OF DOUBT, CONFLICT OR DISCREPANCIES ON THE DRAWINGS, SPECIFICATIONS, MATERIALS OR METHOD OF CONSTRUCTION, CONTACT DEPARTMENTAL REPRESENTATIVE FOR CLARIFICATION IN WRITING BEFORE PROCEEDING WITH WORK.
 8. SITE CONFIRM EXACT QUANTITIES OF ITEMS TO BE DEMOLISHED PRIOR TO TENDER CLOSE.
 9. TURN OVER EXISTING ITEMS ON WALLS TO BE DEMOLISHED TO DEPARTMENTAL REPRESENTATIVE FOR FIRST RIGHT OF REFUSAL.
 10. ALL CONSTRUCTION MATERIAL, RECYCLING & WASTE TO BE TAKEN OFF SITE BY CONTRACTOR.
 11. STOCKPILE LOCATION TO BE CONFIRMED AT STARTUP MEETING WITH DEPARTMENTAL REPRESENTATIVE. CONTRACTOR TO ENSURE ALL STOCKPILED MATERIALS ARE CONTAINED WITHIN SECURITY FENCING. MATERIALS AND EQUIPMENT ARE STORED AT THE CONTRACTOR'S OWN RISK. EXACT EXTENT OF DEMOLITION, REMOVAL AND EXCAVATION TO BE MARKED ON-SITE & APPROVED BY DEPARTMENTAL REPRESENTATIVE PRIOR TO CONSTRUCTION. IN GENERAL, EXCAVATION TO 300mm BELOW EXISTING GRADE, UNLESS NOTED OTHERWISE AND / OR REQUIRED BY SPECIFIC PROPOSED STRUCTURE.
 13. EXISTING SITE ELEMENTS TO BE REMOVED AND DISPOSED OF INCLUDING:
A) ALL PAVING (GRAVEL / SAND) WITHIN SITE BOUNDARY AND AS INDICATED;
B) SOD & TOPSOIL;
C) BURNT FENCE;
D) FENCE INDICATED FOR REMOVAL, EXACT EXTENT TO BE CONFIRMED PRIOR TO REMOVAL;
E) TREES AND ROOT MASS INDICATED FOR REMOVAL
 14. REFER ALSO TO WRITTEN SPECIFICATIONS.
 15. CONTRACTOR TO SALVAGE AND STOCKPILE SUITABLE, APPROVED (BY DEPARTMENTAL REPRESENTATIVE) MATERIAL ON SITE FOR REUSE (INCLUDING BUT NOT NECESSARILY LIMITED TO CLEAN TOPSOIL, CLAY FILL AND GRAVEL FILL) IN A SECURE LOCATION. REMOVE AND LEGALLY DISPOSE OF UNSUITABLE MATERIAL. STOCKPILE LOCATION TO BE RESTORED TO ORIGINAL CONDITION FOLLOWING REMOVAL AND RE-USE OF MATERIAL

- LEGEND**
- SITE BOUNDARY
 - BUTTERFLY HABITAT - DO NOT DISTURB
 - EXISTING TREE / VEGETATION TO REMAIN AND PROTECTED
 - EXISTING CONCRETE PAD
 - EXISTING BOULDERS TO REMAIN
 - EXISTING BOULDERS TO BE REMOVED (APPROX. 77 l.m.)
 - EXISTING STEEL FENCE TO REMAIN
 - EXISTING STEEL FENCE TO BE REMOVED AND DISPOSED OF (164 l.m.)
 - EXISTING WOOD FENCE TO BE REMOVED AND DISPOSED OF (339 l.m.)
 - EXISTING TEMPORARY FENCE TO REMAIN
 - EXISTING TEMPORARY FENCE TO BE REMOVED AND DISPOSED OF (201 l.m.)
 - EXISTING GATE TO REMAIN
 - EXISTING GATE TO BE REMOVED AND DISPOSED OF (31 l.m.)
 - EXISTING GRAVEL TO BE REMOVED AND DISPOSED OF (3,376 sq.m.)
 - EXISTING SAND SURFACING TO BE REMOVED AND DISPOSED OF (3,990 sq.m.)
 - EXISTING GRASS AREA TO BE REMOVED AND DISPOSED OF (810 sq.m.)



1
RL1
EXISTING & REMOVAL PLAN
SCALE - 1:500



A
SEPTIC SYSTEM
IMAGE SOURCE: WATERTON LAKE LEASEHOLDERS ASSOCIATION FACEBOOK PAGE



A
EX. SIGN
SCALE - NTS



B
EX. BOULDERS
SCALE - NTS



C
EX. SIGN
SCALE - NTS



A
2 PICNIC TABLE
SCALE - NTS

2
RL1
IMAGE OF EX. ITEM TO BE REMOVED AND DISPOSED OF (BY OTHERS)
SCALE - NTS

3
RL1
IMAGE OF EX. ITEMS TO BE REMOVED AND STOCKPILE FOR D.R. REVIEW
SCALE - NTS

4
RL1
IMAGE OF EX. ITEMS TO BE REMOVED FOR RELOCATION
SCALE - NTS

Revision	Description	Date
3	ISSUED FOR ADDENDUM	2018 10 24
2	ISSUED FOR CONSTRUCTION	2018 09 13
1	99% CONSTRUCTION DOCUMENTS SUBMISSION	2018 08 21
0	66% Construction Documents Submission	2018 07 26

Client
PWGS / 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**

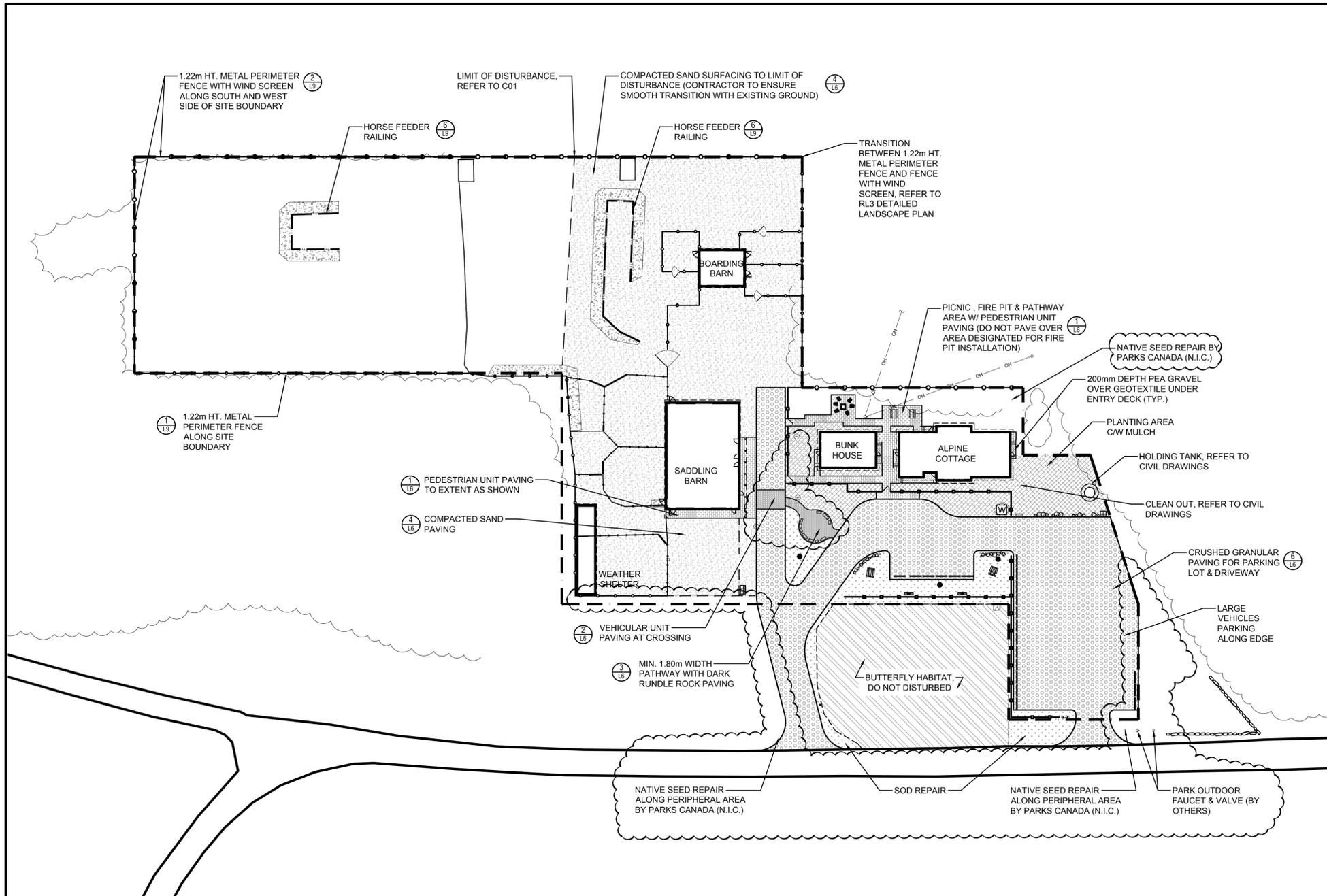
Designed by
CD
Drawn by
WF
Approved by
DM

PWGS Project Manager
MICHAEL LYZANOWSKI
Drawing title

EXISTING AND REMOVAL PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	RL1 OF	1



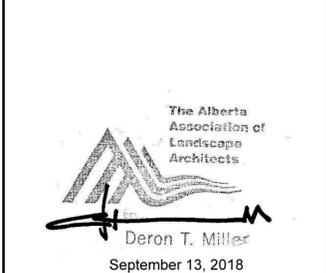
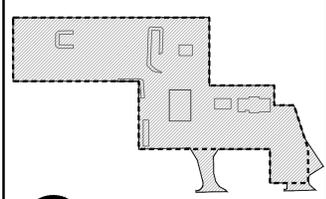


1 OVERALL SITE PLAN
RL2 SCALE - 1:500



- GENERAL NOTES:**
1. INFORMATION CONCERNING EXISTING CONSTRUCTION WAS TAKEN FROM ORIGINAL DRAWINGS AND IS ASSUMED CORRECT.
 2. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF SITE MEASUREMENTS AND QUANTITIES OF MATERIALS REQUIRED.
 3. PERFORM WORK IN STRICT ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA, AND ANY OTHER CODE OF APPLICATION OR ANY AUTHORITY HAVING JURISDICTION.
 4. DRAWINGS MUST NOT BE SCALED.
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 8. REFER ALSO TO WRITTEN SPECIFICATIONS.

- LEGEND**
- EXISTING**
- SITE BOUNDARY
 - BUTTERFLY HABITAT - DO NOT DISTURB
 - EXISTING TREE / VEGETATION TO REMAIN AND PROTECTED
 - EXISTING WATER WELL TO REMAIN
 - EXISTING WATER TAP TO REMAIN
 - EXISTING ELECTRICAL POLE & PANEL TO REMAIN
 - EXISTING STEEL FENCE TO REMAIN
 - EXISTING TEMPORARY FENCE TO REMAIN
 - EXISTING GATE TO REMAIN
 - EXISTING CONCRETE PAD
 - EXISTING BOULDERS TO REMAIN
 - PROPOSED PARK OUTDOOR FAUCET UNDER SEPARATE CONTRACT, INSTALLED PRIOR TO CURRENT CONTRACT
 - PROPOSED MANHOLE UNDER SEPARATE CONTRACT, INSTALLED PRIOR TO CURRENT CONTRACT
- PROPOSED**
- CONCRETE UNIT PAVER PAVING - PEDESTRIAN (272 sq.m.)
 - CONCRETE UNIT PAVER PAVING - VEHICULAR (24 sq.m.)
 - CRUSHED GRANULAR PAVING (2,110 sq.m.)
 - DARK RUNDLE ROCK PAVING (51 sq.m.)
 - COMPACTED SAND PAVING (3,215 sq.m.)
 - PEA GRAVEL UNDER STAIRS / DECKS (34 sq.m.)
 - SOD AREA (632 sq.m.)
 - NATIVE SEED AREA (583 sq.m.)
 - PLANTING AREA C/W MULCH COVER (590 sq.m.)
 - METAL PERIMETER FENCE (293 l.m.)
 - METAL PERIMETER FENCE WITH WIND SCREEN (233 l.m.)
 - METAL HITCHING RAIL (39 l.m.)
 - METAL FEEDER RAILING (83 l.m.)
 - WOOD CROSSBUCK FENCE (146 l.m.)
 - WOOD GATE & END POST
 - METAL GATE
 - BENCH
 - TYPICAL PICNIC TABLE
 - HEAVY DUTY ADIRONDACK CHAIR



September 13, 2018

Revision	Description	Date
3	ISSUED FOR ADDENDUM	2018 10 24
2	ISSUED FOR CONSTRUCTION	2018 09 13
1	99% CONSTRUCTION DOCUMENTS SUBMISSION	2018 08 21
0	66% 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

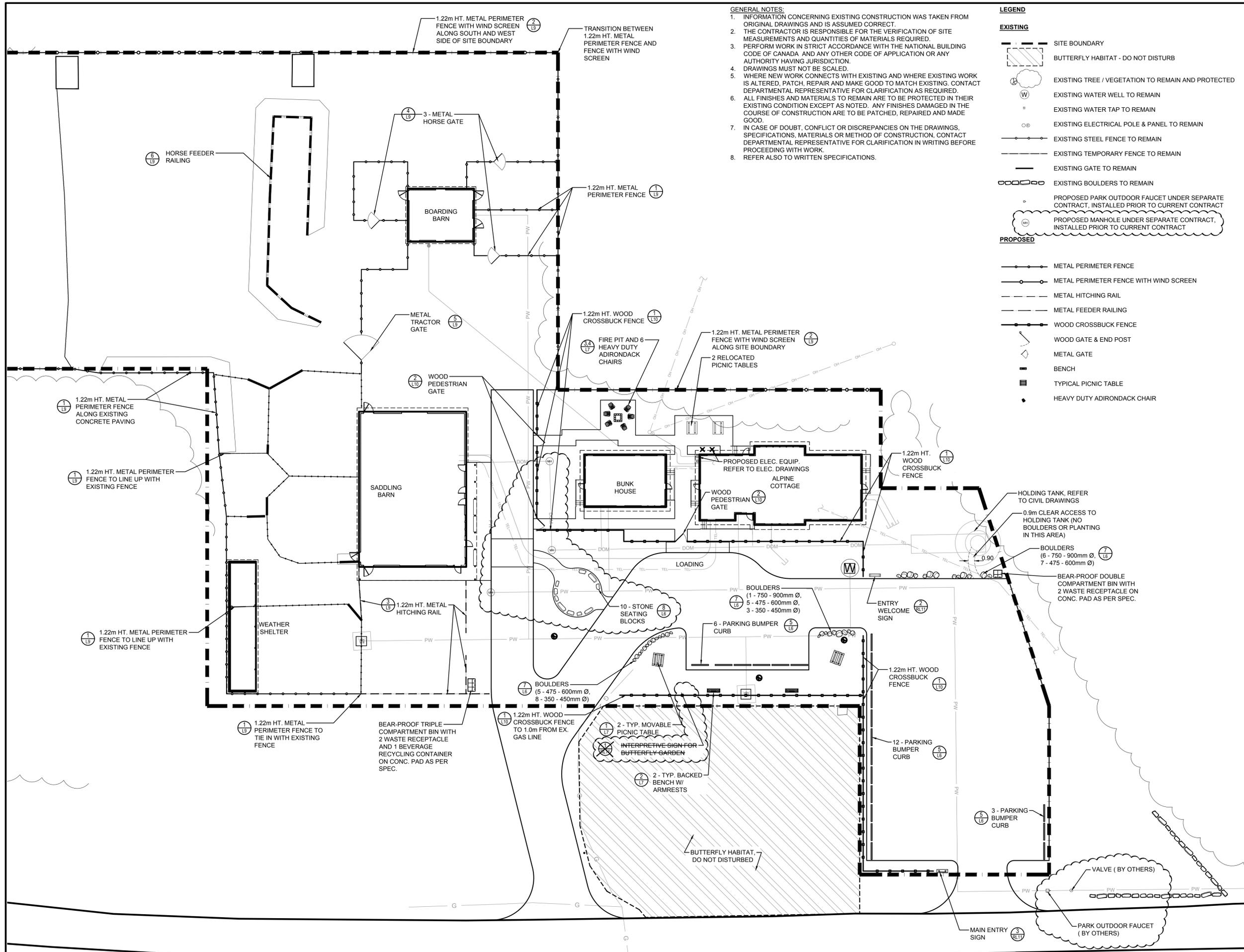
WLNP ALPINE STABLES RECONSTRUCTION
SADDLING BARN, BOARDING BARN, WEATHER SHELTER AND LANDSCAPE

Designed by
CD
 Drawn by
WF
 Approved by
DM

PWGSC Project Manager
MICHAEL LYZANIEWSKI

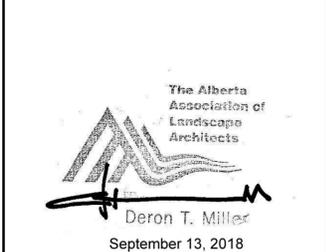
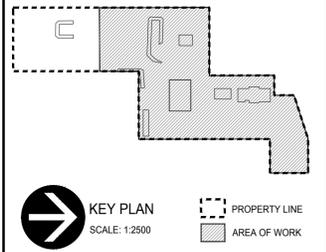
Drawing title
OVERALL SITE PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	RL2 OF	1



- GENERAL NOTES:**
1. INFORMATION CONCERNING EXISTING CONSTRUCTION WAS TAKEN FROM ORIGINAL DRAWINGS AND IS ASSUMED CORRECT.
 2. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF SITE MEASUREMENTS AND QUANTITIES OF MATERIALS REQUIRED.
 3. PERFORM WORK IN STRICT ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA AND ANY OTHER CODE OF APPLICATION OR ANY AUTHORITY HAVING JURISDICTION.
 4. DRAWINGS MUST NOT BE SCALED.
 5. WHERE NEW WORK CONNECTS WITH EXISTING AND WHERE EXISTING WORK IS ALTERED, PATCH, REPAIR AND MAKE GOOD TO MATCH EXISTING. CONTACT DEPARTMENTAL REPRESENTATIVE FOR CLARIFICATION AS REQUIRED.
 6. ALL FINISHES AND MATERIALS TO REMAIN ARE TO BE PROTECTED IN THEIR EXISTING CONDITION EXCEPT AS NOTED. ANY FINISHES DAMAGED IN THE COURSE OF CONSTRUCTION ARE TO BE PATCHED, REPAIRED AND MADE GOOD.
 7. IN CASE OF DOUBT, CONFLICT OR DISCREPANCIES ON THE DRAWINGS, SPECIFICATIONS, MATERIALS OR METHOD OF CONSTRUCTION, CONTACT DEPARTMENTAL REPRESENTATIVE FOR CLARIFICATION IN WRITING BEFORE PROCEEDING WITH WORK.
 8. REFER ALSO TO WRITTEN SPECIFICATIONS.

- LEGEND**
- EXISTING**
- SITE BOUNDARY
 - BUTTERFLY HABITAT - DO NOT DISTURB
 - EXISTING TREE / VEGETATION TO REMAIN AND PROTECTED
 - EXISTING WATER WELL TO REMAIN
 - EXISTING WATER TAP TO REMAIN
 - EXISTING ELECTRICAL POLE & PANEL TO REMAIN
 - EXISTING STEEL FENCE TO REMAIN
 - EXISTING TEMPORARY FENCE TO REMAIN
 - EXISTING GATE TO REMAIN
 - EXISTING BOULDERS TO REMAIN
 - PROPOSED PARK OUTDOOR FAUCET UNDER SEPARATE CONTRACT, INSTALLED PRIOR TO CURRENT CONTRACT
 - PROPOSED MANHOLE UNDER SEPARATE CONTRACT, INSTALLED PRIOR TO CURRENT CONTRACT
- PROPOSED**
- METAL PERIMETER FENCE
 - METAL PERIMETER FENCE WITH WIND SCREEN
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Client
PWGC / TPSGC

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

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

Designed by
CD

Drawn by
WF

Approved by
DM

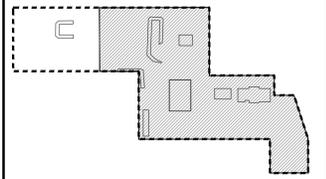
PWGC Project Manager
MICHAEL LYZANIEWSKI

Drawing title

DETAILED LANDSCAPE PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	RL3 OF	1





- GENERAL NOTES:**
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 - CONTROL LINE AND ROAD ALIGNMENTS ARE PROVIDED IN C02. ALL PATHWAY AND FENCE ARE ESTABLISHED FROM THESE LINES FOR LAYOUT PURPOSES. THE CONTRACTORS SHALL ADVISE DEPARTMENTAL REPRESENTATIVE OF ANY DISCREPANCIES.
 - DARK RUNDLE ROCK PAVING PATHWAY ARE A MINIMUM OF 1.8m WIDE (UNLESS NOTED OTHERWISE)
 - UNIT PAVER PATHWAY FOR PEDESTRIAN ARE A MINIMUM OF 1.5m WIDE (UNLESS NOTED OTHERWISE)
 - WOOD GATES AND / OR END POST TO BE CENTRED ON PATHWAY AS SHOWN ON PLANS. ADJUST LENGTH OF FENCE AS REQUIRED.
 - LOCATIONS OF ALL SITE FURNITURE, SIGNS, LIMESTONE BLOCKS AND PLANTING BEDS SHALL BE LAID OUT ON SITE AND APPROVED BY DEPARTMENTAL REPRESENTATIVE PRIOR TO CONSTRUCTION LAYOUT TO BE APPROVED BY DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY CONSTRUCTION OR REMOVAL.
 - REFER TO CIVIL DRAWINGS FOR GRADING INFORMATION.

- LEGEND**
- EXISTING**
- SITE BOUNDARY
 - BUTTERFLY HABITAT - DO NOT DISTURB
 - EXISTING TREE / VEGETATION TO REMAIN AND PROTECTED
 - EXISTING WATER WELL TO REMAIN
 - EXISTING WATER TAP TO REMAIN
 - EXISTING ELECTRICAL POLE & PANEL TO REMAIN
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 - METAL PERIMETER FENCE WITH WIND SCREEN
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 - METAL GATE

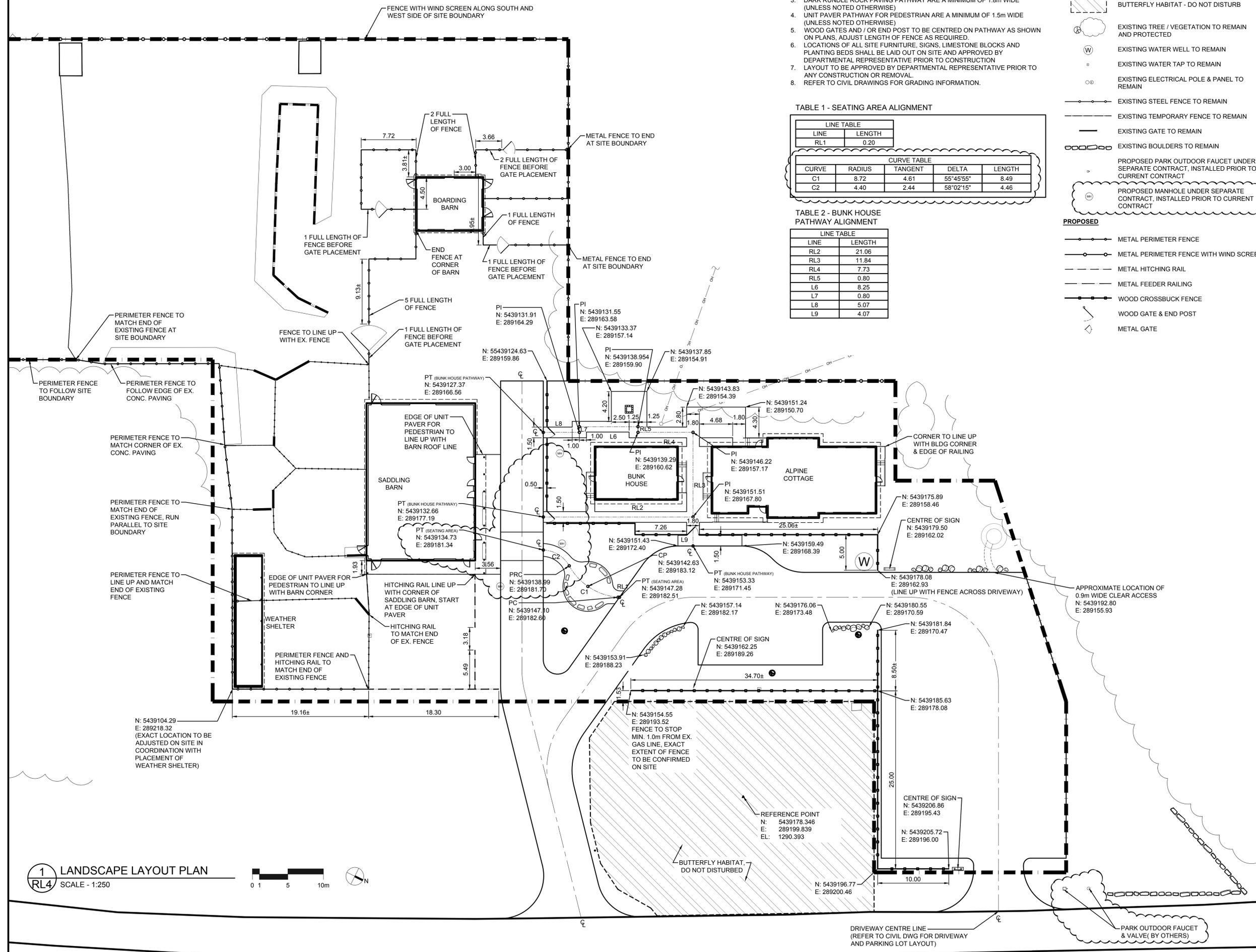
TABLE 1 - SEATING AREA ALIGNMENT

LINE	LENGTH
RL1	0.20

CURVE	RADIUS	TANGENT	DELTA	LENGTH
C1	8.72	4.61	55°45'55"	8.49
C2	4.40	2.44	58°02'15"	4.46

TABLE 2 - BUNK HOUSE PATHWAY ALIGNMENT

LINE	LENGTH
RL2	21.06
RL3	11.84
RL4	7.73
RL5	0.80
L6	8.25
L7	0.80
L8	5.07
L9	4.07



1 LANDSCAPE LAYOUT PLAN
SCALE - 1:250



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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
CD

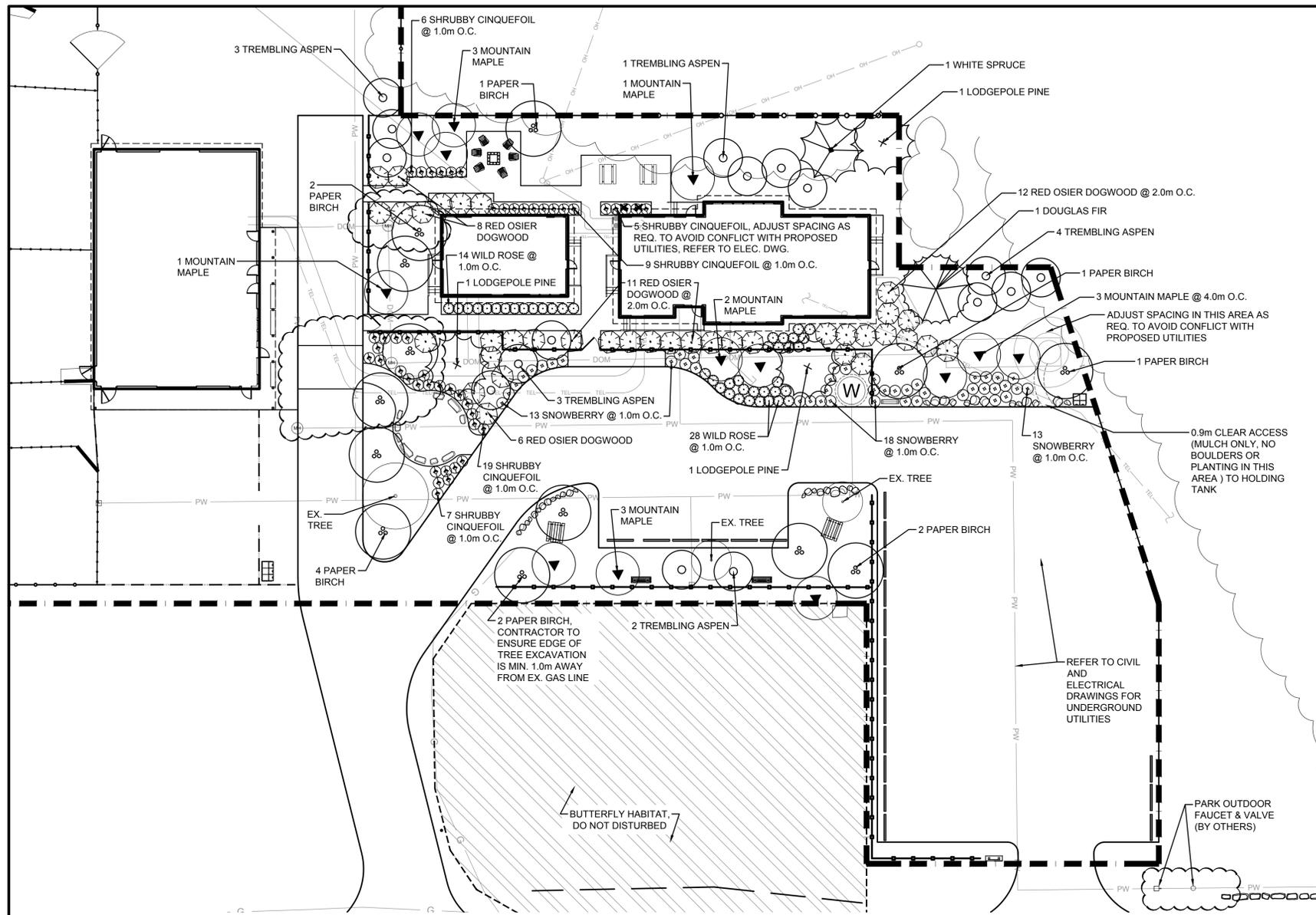
Drawn by
WF

Approved by
DM

PWGSC Project Manager
MICHAEL LYZANOWSKI

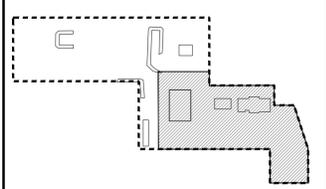
Drawing title
LANDSCAPE LAYOUT PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	RL4	1



GENERAL NOTES:
 1. ALL TREE LOCATIONS TO BE STAKED FOR APPROVAL BY DEPARTMENTAL REPRESENTATIVE PRIOR TO PLANTING.
 2. REFER ALSO TO WRITTEN SPECIFICATIONS.

- LEGEND**
- EXISTING**
- SITE BOUNDARY
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 - (W) EXISTING TREE / VEGETATION TO REMAIN AND PROTECTED
 - EXISTING WATER WELL TO REMAIN
 - EXISTING WATER TAP TO REMAIN
 - EXISTING ELECTRICAL POLE & PANEL TO REMAIN
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 - METAL GATE
 - BENCH
 - TYPICAL PICNIC TABLE
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1 PLANTING PLAN
 RL5 SCALE - 1:250

PLANT SCHEDULE (Refer to L8 for Planting Details)

QTY.	COMMON NAME	BOTANICAL NAME	SIZE AND REMARKS (shown are min. spec.)	SPACING
CONIFEROUS TREES				
1	DOUGLAS FIR	<i>Pseudotsuga menziesii</i>	2.4m ht., 900mm Base Width, Min. 900mm wide Root Ball, Single Upright Leader, Well Branched, Full Form 360° to grade. Machine Dug. Root Flare to be Visible.	AS SHOWN
1	WHITE SPRUCE	<i>Picea glauca</i>	2.4m ht., 900mm Base Width, Min. 900mm wide Root Ball, Single Upright Leader, Well Branched, Full Form 360° to grade. Machine Dug. Root Flare to be Visible.	AS SHOWN
3	LODGEPOLE PINE	<i>Pinus contorta</i>	2.4m ht., 900mm Base Width, Min. 900mm wide Root Ball, Single Upright (No Broken) Leader, Well Branched, Full Form 360° to grade. Machine Dug. Root Flare to be Visible.	AS SHOWN
DECIDUOUS TREES				
13	PAPER BIRCH	<i>Betula papyrifera</i>	60mm Calliper, 3.5 - 4.0m ht., 11 Major Branches in Well Formed Head 2.0m Above Grade. Straight Trunk. Wire Basket Machine Dug. Root Flare to be Visible.	AS SHOWN
16	TREMBLING ASPEN	<i>Populus tremuloides</i>	60mm Calliper, 3.5 - 4.0m ht., 11 Major Branches in Well Formed Head 2.0m Above Grade. Straight Trunk. Wire Basket Machine Dug. Root Flare to be Visible.	AS SHOWN
DECIDUOUS SHRUBS				
13	MOUNTAIN MAPLE	<i>Acer glabrum</i>	Multi-Stem, 30mm Calliper (All Stems), 2.5 - 3.0m ht., Well Branched and Balanced, Min. 5 Major Branches. 1.75m Above Grade. Wire Basket Machine Dug. Root Flare to be Visible.	4.0m O.C.
46	SHRUBBY CINQUEFOIL	<i>Potentilla fruticosa</i>	500-600mm ht. Min. 5 major basal branches. Well formed, bushy plants. Free of pests and disease. Container Grown	1.0m O.C.
37	RED OSIER DOGWOOD	<i>Cornus stolonifera</i>	600-800mm ht. Min. 5 major basal branches. Well formed, bushy plants. Free of pests and disease. Container Grown	2.0m O.C.
44	SNOWBERRY	<i>Symphoricarpos albus</i>	500-600mm ht. Min. 5 major basal branches. Well formed, bushy plants. Free of pests and disease. Container Grown	1.0m O.C.
42	COMMON WILD ROSE	<i>Rosa woodsii</i>	500-600mm ht. Min. 5 major basal branches. Well formed, bushy plants. Free of pests and disease. Container Grown	1.0m O.C.

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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

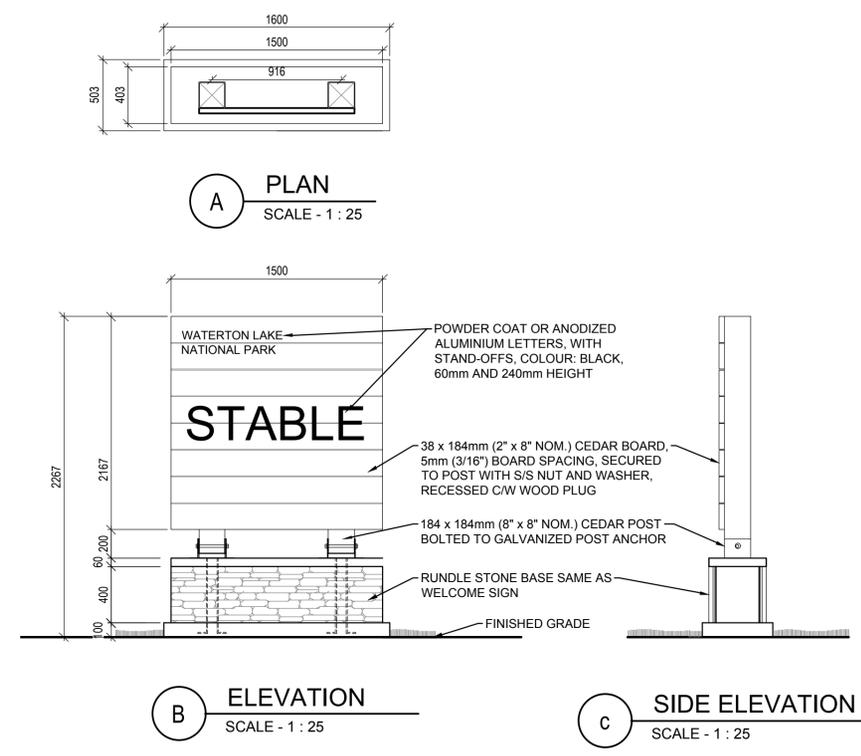
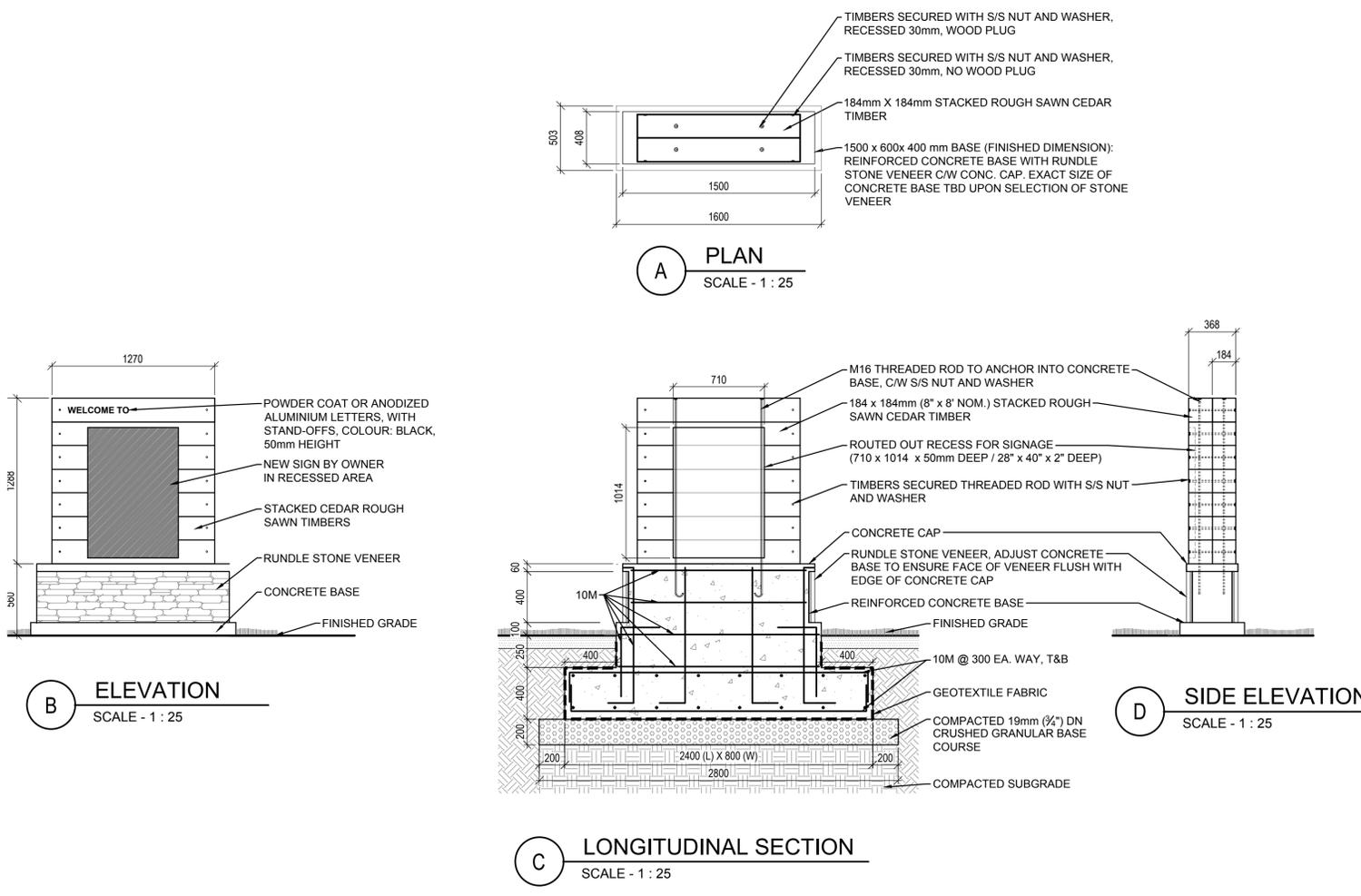
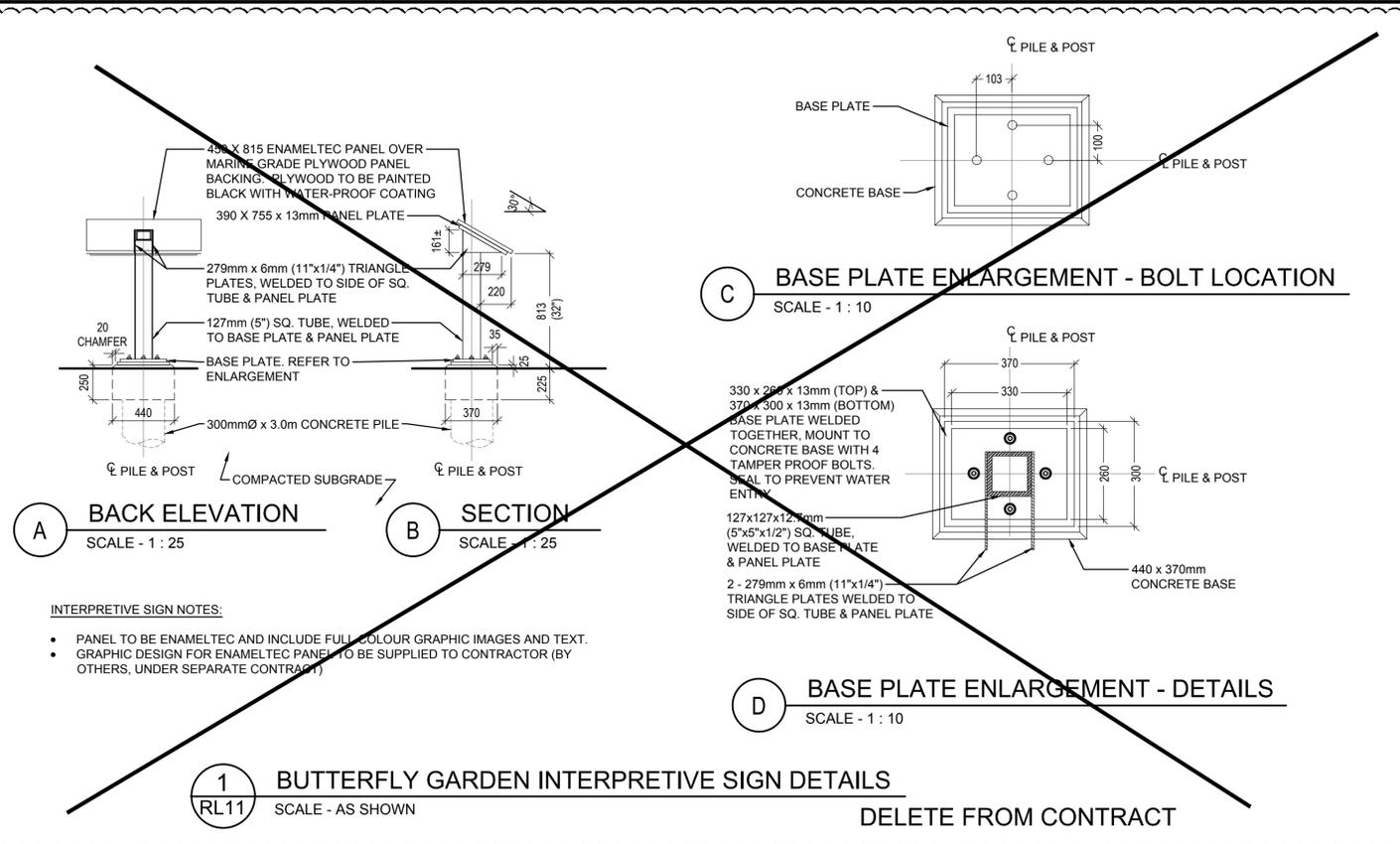
Designed by
 CD
 Drawn by
 WF
 Approved by
 DM
 PWGSC Project Manager
MICHAEL LYZANIWSKI

Drawing title
PLANTING PLAN

Project no.	Drawing no.	Revision no.
R.096286.001	RL5 OF	1

GENERAL NOTES:

1. CONTRACTOR TO SUBMIT SHOP DRAWINGS WITH ENGINEER STAMPS FOR ALL STRUCTURES AND FABRICATION FOR REVIEW AND APPROVAL BY DEPARTMENTAL REPRESENTATIVE PRIOR TO CONSTRUCTION



Revision	Description	Date
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2	ISSUED FOR CONSTRUCTION	2018 09 13
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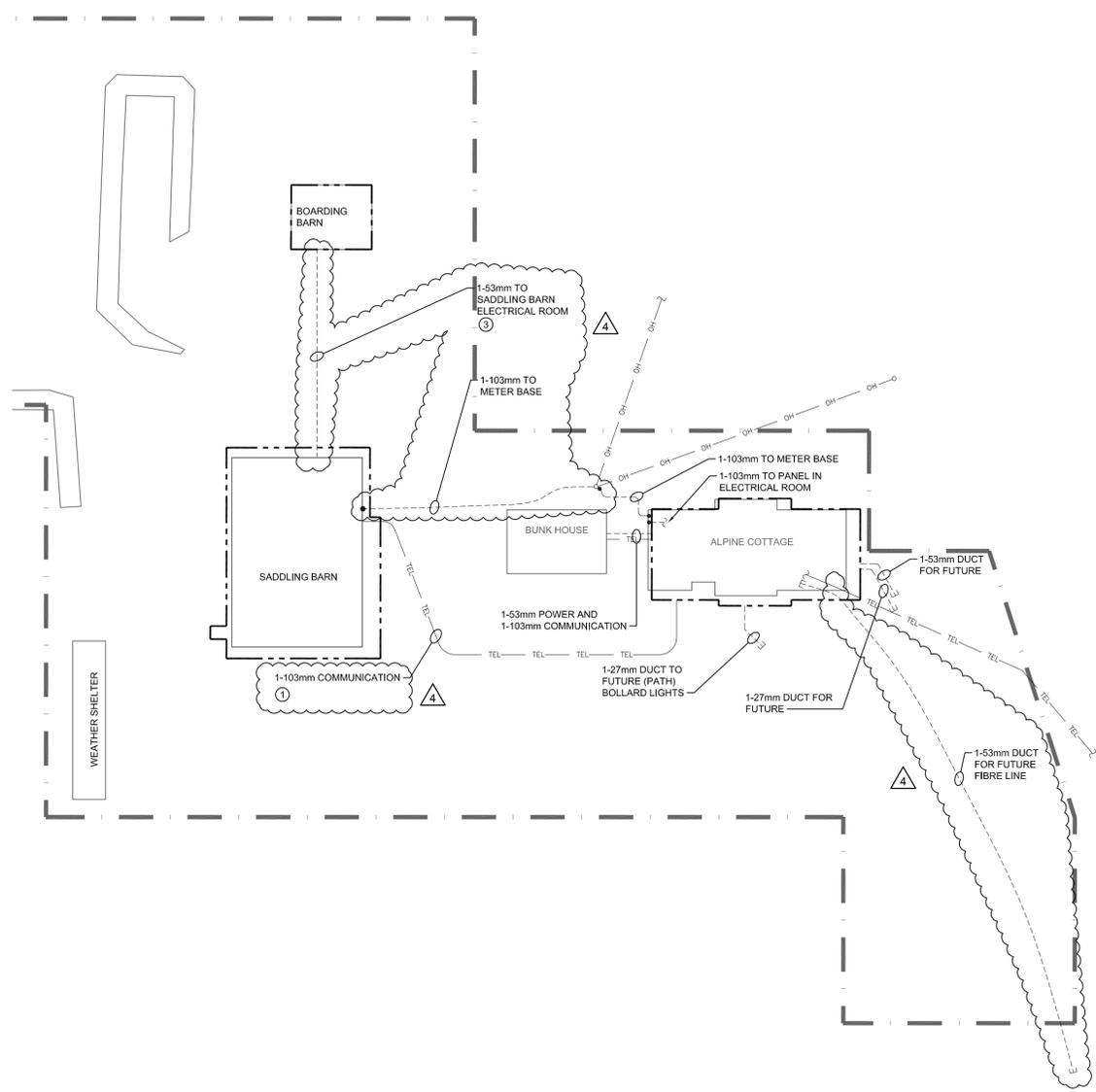
Client
PWGC / TPSGC
ATB Place North Tower
10025 Jasper Ave, 5th Floor
Edmonton, Alberta T5J 1S6

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

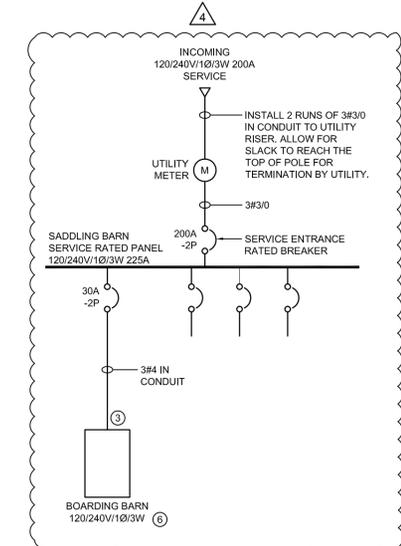
Designed by
CD
Drawn by
WF
Approved by
DM
PWGC Project Manager
MICHAEL LYZANIWSKI

Drawing title
LANDSCAPE DETAILS -
SIGNAGE

Project no.	Drawing no.	Revision no.
R.096286.001	RL11 OF	1



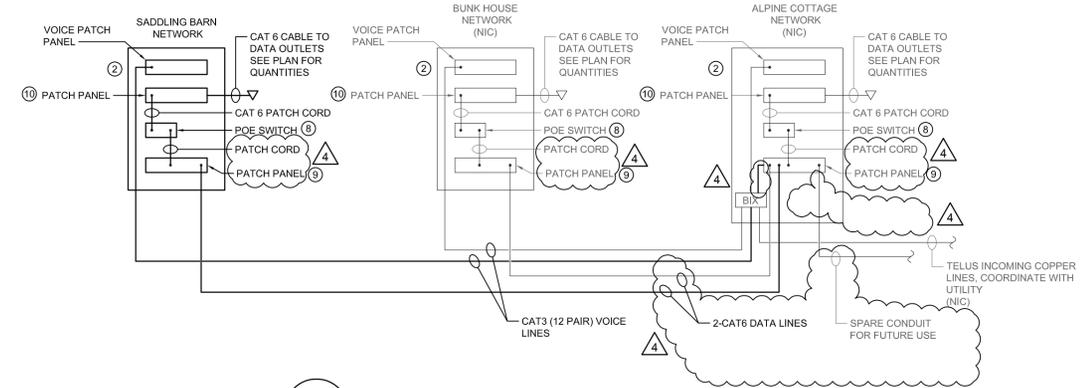
7 SITE PLAN
SCALE: 1:400



1 SINGLE LINE DIAGRAM
SCALE: NTS

KEY NOTES

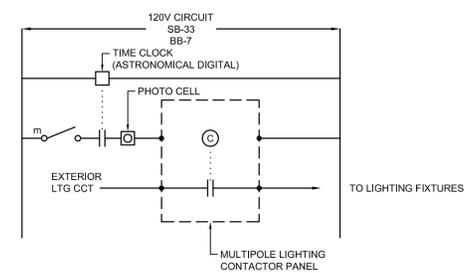
- CONTRACTOR TO SUPPLY AND INSTALL CAT6 CABLE IN EXISTING DUCT BETWEEN ALPINE COTTAGE AND SADDLING BARN. TERMINATE CABLE IN PATCH PANEL AT BOTH ENDS. COORDINATE WORK WITH DEPARTMENT REPRESENTATIVE.
- NETWORK ENCLOSURE TO BE TILT OUT RACK TYPE.
- CONTRACTOR TO PULL POWER CABLES THROUGH EXISTING DUCT FROM MAIN PANEL LOCATED IN SADDLING BARN TO BOARDING BARN.
- OPEN NUMBER.
- TYPICAL FOR SADDLING AND BOARDING BARN, PROVIDE SEPARATE CONTACTOR PANEL AND TIME CLOCK FOR EACH BARN TO CONTROL EXTERIOR LIGHTING AT EACH BUILDING.
- CONTRACTOR TO SUPPLY, INSTALL AND WIRE NEW PANEL AS SHOWN ON DRAWING E2. REFER TO PANEL SCHEDULE INCLUDED WITH SPECIFICATION.
- SITE RELATED DUCT WORK IS NOT IN SCOPE AND IS SHOWN FOR REFERENCE ONLY. WORK IS EXPECTED TO BE COMPLETE UNDER A SEPARATE TENDER PACKAGE (FOUNDATION PACKAGE). EXTEND DUCTS INTO FINAL POSITION IN BUILDINGS.
- POE/ETHERNET SWITCH TO BE CW 10Gb CAT6 PORTS. QUANTITY OF POE/ETHERNET SWITCHES TO SUIT NUMBER OF FIELD OUTLETS/DEVICES. SWITCH TO BE SUPPLIED BY DEPARTMENTAL REPRESENTATIVE. COORDINATE AND INSTALL EQUIPMENT IN RACK.
- PATCH PANEL(S), QUANTITY OF PATCH PANELS AND PORTS TO SUIT NUMBER OF INCOMING FIBER STRANDS.
- 24-PORT CAT 6 PATCH PANEL(S), QUANTITY OF PATCH PANELS TO SUIT NUMBER OF FIELD OUTLETS.



2 NETWORK WIRING DIAGRAM
SCALE: NTS

COMMS CABINET DETAIL NOTES

- CABLING AND TERMINATIONS BY ELECTRICAL CONTRACTOR.
- ELECTRICAL CONTRACTOR TO MAKE ALL 120V CONNECTIONS.
- ELECTRICAL CONTRACTOR TO SUPPLY COMMS. CABINET COMPLETE WITH ALL PATCH PANELS, ALL SWITCHES AND CABLES (UNLESS INDICATED ON PLANS). ELECTRICAL CONTRACTOR IS TO INSTALL AND PULL ALL CABLES TO CABINET FROM ALL DEVICES AND IS TO COORDINATE ALL CABLE TYPES PRIOR TO INSTALL. ELECTRICAL CONTRACTOR TO SUPPLY ALL CABLES AND MAKE ALL CABLE TERMINATIONS.
- QUANTITY OF PATCH PANELS AND SWITCHES IS TYPICAL.
- PATCH PANELS, SWITCHES AND CABINET TO BE INSTALLED BY ELECTRICAL CONTRACTOR. ALL ACTIVE EQUIPMENT TO BE SUPPLIED BY DEPARTMENTAL REPRESENTATIVE. COORDINATE REQUIREMENTS WITH DEPARTMENTAL REPRESENTATIVE.



3 EXTERIOR LIGHTING CONTROL SCHEMATIC
SCALE: NTS

770 Bradford Street
Winnipeg, Canada
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18-123-01



ORIGINAL CONTRACT DRAWING
SIGNED AND SEALED BY
C.J. HEWITT, P. ENG
September 12, 2018

Revision	Description	Date
4	ISSUED FOR ADDENDUM #2	2018 10 22
3	ISSUED FOR CONSTRUCTION	2018 09 12
2	ISSUED FOR 99% REVIEW	2018 08 21
1	ISSUED FOR 90% PRICING	2018 08 08
0	ISSUED FOR 60% REVIEW	2018 07 26

Client
PWGC / TPSGC

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

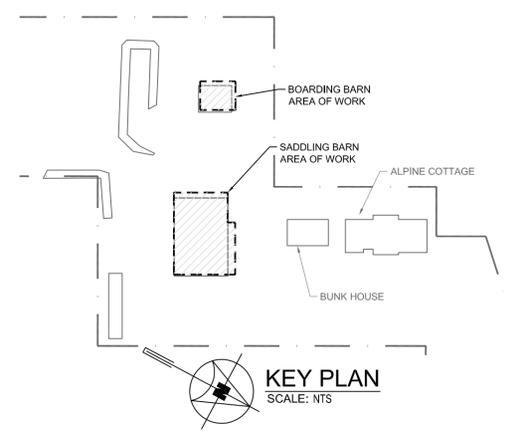
Project title
SECTION 25, NE CORNER, TOWNSHIP ONE, RANGE 30, WEST OF THE 4TH WATERTON, ALBERTA

WLNP ALPINE STABLES RECONSTRUCTION SADDLING BARN AND BOARDING BARN

Designed by
SS
Drawn by
WPD
Approved by
SS
PWGC Project Manager
MICHAEL LYZANOWSKI

Drawing title
SITE PLAN AND SINGLE LINE DIAGRAM

Project no.	Drawing no.	Revision no.
R.096286.001	E1	4



KEY NOTES

1. PROVIDE ON/OFF PHOTO SENSOR TO AUTOMATICALLY TURN EXTERIOR FIXTURES ON OR OFF BASED ON SELECTED AMBIENT LIGHT LEVELS. LOCATE PHOTO SENSOR HIGH UP ON EXTERIOR WALL WHERE SHOWN.
2. PROVIDE BACKBOARD C/W GROUND BAR AND RACK FOR VOICE/DATA. REFER TO DETAIL 2 ON DRAWING E1 FOR NETWORK WIRING DETAIL. PROVIDE #30 FT4 INSULATED. BOND TO ALPINE COTTAGE GROUND BAR TMGB. LABEL 'TELECOM BONDING CONDUCTOR'.
3. MAIN PANEL SB FED FROM POLE MOUNT TRANSFORMER.
4. WIRE AND CONNECT TO CEILING FANS. CONTROLS PROVIDED AND INSTALLED BY MECHANICAL. COORDINATE WITH MECHANICAL.
5. PROVIDE 120V CIRCUIT FOR GAS DETECTION PANEL.
6. PROVIDE 12VDC, 100W DC EMERGENCY LIGHTING BATTERY BANK. WIRE TO ALL DC LIGHTING WITH #10 AWG IN CONDUIT. BATTERY BANK TO PROVIDE 30 MINUTES OF EMERGENCY POWER.
7. PROVIDE AND INSTALL A 240V, 1 kW SURFACE MOUNTED FORCE FLOW HEATER IN BATHROOM. HEATER TO BE COMPLETE WITH BUILT-IN-THERMOSTAT.
8. PROVIDE AND INSTALL A 240V, 1.5 kW BASEBOARD HEATER IN OFFICE SPACE. HEATER TO HAVE BUILT-IN-THERMOSTAT.
9. PROVIDE AND INSTALL LIGHTING CONTACTOR PANEL TO CONTROL EXTERIOR LIGHTING. PROVIDE AND INSTALL TIME CLOCK AND INTERCONNECT WITH CONTACTOR PANEL. REFER TO DETAIL 3 DRAWING E1 FOR LIGHTING CONTROL SCHEMATIC.
10. PROVIDE RELAY FOR HRV-1 SO THAT HRV TURNS ON WHEN THE LIGHT SWITCH FOR THE WASHROOM OR OFFICE IS IN THE 'ON' POSITION. COORDINATE WORK WITH MECHANICAL CONTRACTOR.
11. AREA DEFINED AS 'ANIMAL AREA'.
12. SWITCHES FOR CEILING FANS, SUPPLIED BY MECHANICAL AND INSTALLED BY ELECTRICAL.

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Winnipeg, Canada
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SMSeng.com
18-123-01

ORIGINAL CONTRACT DRAWING
SIGNED AND SEALED BY
C.J. HEWITT, P. ENG
September 12, 2018

Revision	Description	Date
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0	ISSUED FOR 60% REVIEW	2018 07 26

Client
PWGC / TPSGC

Project title
**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
SADDLING BARN AND
BOARDING BARN**

Designed by
SS

Drawn by
WPD

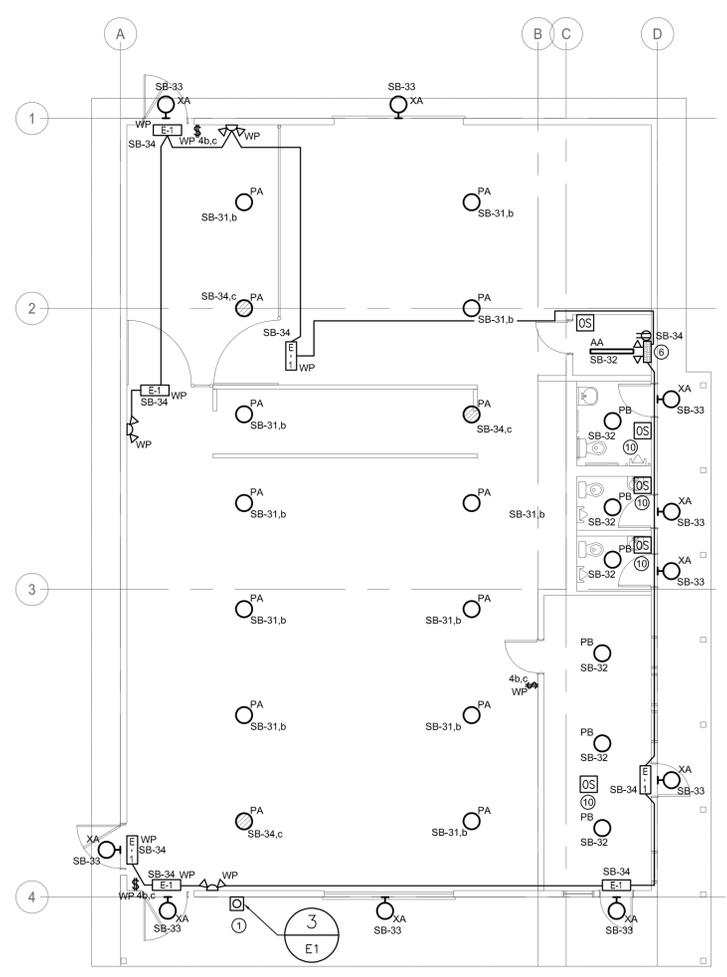
Approved by
SS

PWGC Project Manager
MICHAEL LYZANOWSKI

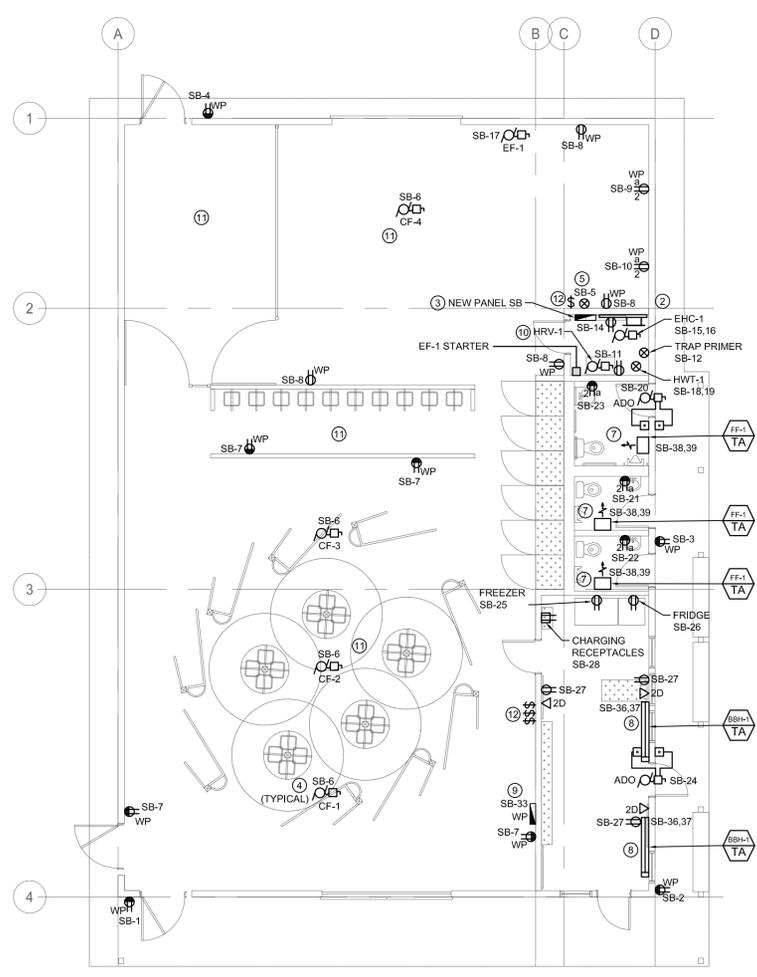
Drawing title
**SADDLING BARN AND BOARDING BARN
FLOOR PLANS - LIGHTING,
POWER AND SYSTEMS**

Project no.	Drawing no.	Revision no.
R.096286.001	E2	4

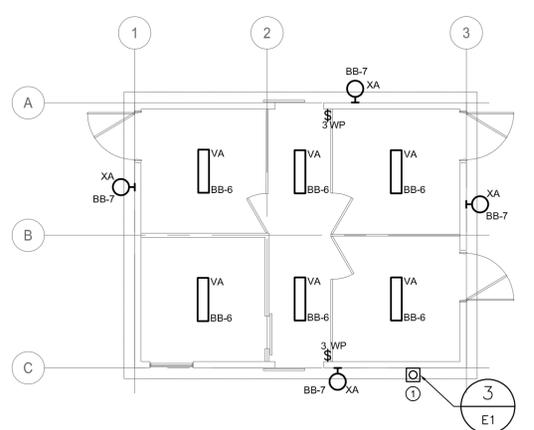
OF 3



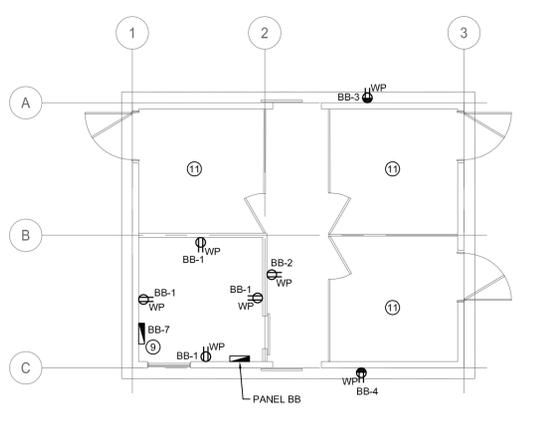
1 SADDLING BARN FLOOR PLAN - LIGHTING
SCALE: 1:100



3 SADDLING BARN FLOOR PLAN - POWER AND SYSTEMS
SCALE: 1:100



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



4 BOARDING BARN FLOOR PLAN - POWER AND SYSTEMS
SCALE: 1:100

