REQUEST FOR PROPOSAL (RFP)

DESIGN BUILD SERVICES

SPORTS FIELD AT THE PEMBERTON AND DISTRICT RECREATION CENTRE LOCATED ON PEMBERTON FARM ROAD EAST

RFP No. #2020-01

September 2020

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VILLAGE OF PEMBERTON
REQUEST FOR PROPOSAL (RFP)
DESIGN BUILD SERVICES
SPORTS FIELD NO. 2 AT PEMBERTON FARM ROAD EAST
RFP No. #2020- 01

The Village is seeking Proposals from design-build teams to undertake the detailed design, specification, construction and construction inspection for a second new sports field located at the newly developed Pemberton & Area Recreation Site, located on Pemberton Farm Road East.

The Village is interested in a FIFA size multi-purpose sand-based natural grass field. Proponents are invited to submit a Proposal for the sports field.

Three (3) copies of the Proposal are to be submitted, of which one will be unbound. All shipping materials are to clearly identify the Proponent and the contents.

Proposals will be received by the Village of Pemberton no later than 4:00 pm (Local Time) on Friday, October 30, 2020 to the attention of:

Chief Administrative Officer - Nikki Gilmore
7400 Prospect, Village of Pemberton, BC, V0N 2L0

Sealed Proposals are to be marked as follows:

Design Build Proposal
Sports Field No. 2 at Pemberton Farm Road East
RFP No. #2020-01
Confidential - Do Not Open

Electronic copies of the Request for Proposal documents may be obtained from the Village of Pemberton Website and BC Bid Website at no charge.

All inquiries shall be directed to:

Richard Avedon-Savage, P. Eng.
Phone: (604) 815-4646
e-mail: rsavage@islengineering.com

Submissions will be evaluated based on the Proposal that, in the Village's opinion offers the best value for the Products and/or Services requested. Considerations will include the proposed scope of work (i.e., final deliverables), quality of design, team qualifications and track record, relevant recent experience, overall project cost, schedule, demonstrated ability to complete the project within the proposed schedule, as well as any other any factors the Village deems to be relevant to the project success. The Village of Pemberton reserves the right to reject any or all tenders; the lowest will not necessarily be accepted. The Village reserves the right to waive informalities in or reject any or all Proposals or accept the Proposal deemed most favorable to the interest of the Village of Pemberton.

PART A - GENERAL

1 DEFINITIONS

1.1 "Agreement" "Contract" "Services Agreement" means a contract that may be issued to formalize with the successful Proponent through a negotiation process with the Village based on the proposal submitted and will incorporate by reference the Request for Proposal, any addenda issued, the Proponent's response and acceptance by the Village.

1.2 "Village" "Owner" means Village of Pemberton.

1.3 "Consultant" "Contractor" "Project Manager" means the person(s), firm(s) or corporation(s) appointed by the Village to carry out all duties, obligations, work and services first contemplated in the Request for Proposal and all associated documentation, which may also include mutually agreed revisions subsequent to submission of a Proposal. Both "Consultant" "Contractor" "Project Manager" and "Proponent" are complimentary in terms of duties, obligations, and responsibilities contemplated at the Request for Proposal stage, through evaluation process, execution, and performance of the Design and Construction Services.

1.4 "Mandatory" "Must" "Shall" "Will" mean a requirement that must be met.

1.5 "Product" means, unless the context requires otherwise, any and all articles, goods, materials, supplies, commodities, machinery, equipment and fixtures to be supplied by the Contractor that comprise a portion of the Services, but specifically excluding facilities, equipment and materials used or constructed to carry out the Services that are not incorporated permanently into the Services.

1.6 "Proponent" means responder to this Request for Proposal.

1.7 "Proposal" means the submission by the Proponent.

1.8 "Provide" "Supply" shall mean provide and pay for, and supply and pay for.

1.9 "Request for Proposal" "RFP" shall mean and include the complete set of documents, specifications, drawings, and addenda incorporated herein, and included in this Request for Proposal.

1.10 "Services" means and includes the provision by the successful Proponent of all services, duties and expectations as further described in this RFP.

2 BACKGROUND AND INTENT OF THE RFP

2.1 The Village is seeking to construct a second new sports field on a partially developed property located at the south east corner of the Pemberton Farm Road East and the McKenzie Basin Forest Service Road intersection.

The site preparation has been partially completed on behalf of the Village and includes preload installation and removal (ongoing and underway). When fully completed, the property will be constructed as a multi-use recreation facility. The proposed work included in this RFP represents the second phase of a multi-phase development.

The land most suitable for sports field development has been identified on the property and is indicated on the attached concept plan for the overall development.

3 GENERAL CONDITIONS OF THE RFP

3.1 NO CONTRACTUAL OBLIGATIONS AS A RESULT OF RFP OR PROPOSAL

This is a Request for Proposal, and not a call for tenders or request for binding offers. The Village does not intend to enter into contractual relations as part of this RFP process and no contractual obligations whatsoever will arise between the Village and any Proponent who submits a Proposal in response to this RFP until and unless the Village and a Proponent enter into a formal, written contract for the Proponent to undertake this project. Attached for reference is the Village's Draft Design Build Services Agreement (Appendix B).

3.2 OWNERSHIP OF PROPOSALS AND FREEDOM OF INFORMATION

All documents submitted to the Village in response to this RFP or as part of any subsequent negotiation will become the property of the Village, and will not be returned. Proponents should also be aware that the Village is subject to the provisions of the Freedom of Information and Protection of Privacy Act (FOIPPA) ("Act"). A Proponent may stipulate in their Proposal that a portion(s) of their Proposal that contains confidential information and are supplied to the Village in confidence. However, under FOIPPA, the Village may nevertheless be obligated to disclose all or part of a response pursuant to a request made under the Act, even if the Proponent has stipulated that part of their Proposal is supplied in confidence. The Proponent should review Section 21 and other provisions of FOIPPA in order to gain a better understanding of the Village's disclosure responsibilities under the Act.

3.3 CONFIDENTIALITY OF VILLAGE INFORMATION

This RFP and all information provided by the Village to a Proponent is provided on a confidential basis, and Proponents will not disclose any such information to any person (other than the Proponent's legal advisers) without the Village's prior written consent, nor may any Proponent publicize or advertise its involvement with this RFP process or the Village in connection wherewith without the prior written consent of the Village.

3.4 PROPONENT'S EXPENSES

For clarity, Proponents will be solely responsible for their own expenses incurred in preparing a Proposal or in any subsequent negotiations with the Village.

3.5 CONTACTING VILLAGE REPRESENTATIVES

Proponents shall not contact Village elected officials, officers or employees directly or indirectly regarding this RFP, except as indicated in this RFP.

3.6 CONFLICT OF INTEREST

Proponents shall disclose any potential conflicts of interest and existing business relationships they may have with the Village, its elected or appointed officials or employees. The Village may rely on such disclosure. The Village may reject a Proposal from any Proponent that the Village judges would be in a conflict of interest if the Proponent is awarded a Contract. Failure to disclose, or false or insufficient disclosure of the nature and

extent of any relationship the Proponent may have with any employee, officer or director of the Owner shall be grounds for immediate termination of any agreement or contract with the Owner, in the Owner's sole discretion, without further liability of notice.

3.7 INSURANCE

The successful Proponent will, without limiting its obligations or liabilities and at its own expense, provide and maintain throughout the Contract term, the insurance stipulated in the Draft Contract (GC 11.1, and as amended in the attached Supplemental General Conditions).

3.8 PERMITS AND LICENSES

The successful Proponent will be required to obtain a Village of Pemberton business license prior to commencement of work.

4 STATEMENT OF REQUIREMENTS

4.1 OVERVIEW

The Statement of Requirements contains the overall general functional and performance requirements of the facility. Additional information is available for reference in the RFP attachments, including conceptual designs, performance specifications and drawing details. These materials represent one possible scenario and are intended to graphically display the Owner's initial assessment of the Project objectives. Proponents are encouraged to develop alternative designs that improve upon the response to the RFP requirements by way of appendix or attachment.

4.2 OBJECTIVES

The primary objectives of the Project are to design and construct a natural grass sports field to accommodate soccer and other field sports uses on a partially developed property located at the south east corner of the Pemberton Farm Road East and the McKenzie Basin Forest Service Road intersection (Address 7366 Pemberton Farm Road).

The Village has a maximum construction budget of $1,350,000 excluding GST for this project.

The Village is interested in a FIFA size multi-purpose sand-based natural grass field.

4.3 SCOPE OF WORK

The scope of work is as follows:

Natural Grass Field (minimum 70 m wide X 110 m long):

- Subgrade preparation including grading, shaping and compacting the existing granular base
- Field drainage including perforated drainage system and field collector
- Storm sewer connection from collector to existing storm drainage system for the Recreation Site
- Temporary Stormwater management pond
- 300 mm thick 100% sand drainage layer
- 150 mm thick growing medium layer (85% sand/15% organics)
- Irrigation system including controller and pump, if required
- Water connection for the irrigation system including cross contamination control
- Electrical service for the irrigation system
- Natural grass turf including establishment
- Chainlink fencing around the field with pedestrian gates at each corner and two maintenance vehicle gates
- Chainlink fencing behind the soccer goal area minimum 4.8 m high (40 m long, each end)
- Boot brushes at each gate
- Minimum 1.5 m wide asphalt strip around the outer edge of the field
- Sports lighting system providing a minimum of 300 lux lighting levels to include timers and/or key turn system.
- Electrical service from the road to the field lighting

5 MATERIALS AVAILABLE TO SUCCESSFUL PROPONENT

The following materials will be provided to the successful Proponent at no charge:

- Geotechnical reports (attached)
- Village as-built records

6 SCHEDULE

The successful Proponent must initiate work within 14 days of issuance of Notice to Proceed. The Village requires that the facility be constructed by no later than June 30, 2021.

Proponents are to include a detailed schedule for design and construction in their Proposal.

7 PROPOSAL FORMAT AND PREPARATION

Proposals should be provided double-sided on 8 ½" white paper, in a font colour of black and not less than 11 point.

Without limiting the requirements set out below, each Proponent should include in its technical submission proposal information and documentation that reasonably demonstrates and allows the Owner to evaluate whether the Proponent is capable of performing the Design-Builder's responsibilities and obligations.

8 PROPOSAL EVALUATION AND SELECTION

The Village of Pemberton will evaluate all submitted valid Proposals. The object of the evaluation and selection process is to identify the Proposal that, in the Village's opinion offers the best value for the Products and/or Services requested.

The Village is not obligated to accept the lowest priced Proposal or any Proposal, and may reject all submissions.

The Village has the absolute right to accept or reject any Proposal for any reason, to negotiate with any Proponent or Proponents and to evaluate the Proposals in accordance with all information submitted by the Proponents and to abandon the RFP at any stage, for any reason.

There shall be no obligation on the part of the Village neither to receive further information, whether written or oral, from any Proponent nor to disclose the nature of any Proposal received.

The Village at its discretion, may invite some or all Proponents for an interview to provide clarifications of their Proposals. In such event, the Village will be entitled to consider the answers received in evaluating Proposals.

The Village may award a Contract to the Proponent whose submission, in the Village's sole discretion, provides the best overall value to the Village for the work. In evaluating the overall value to the Village for the work in respect of each submission received, the Village, in addition to price, will have in mind its critical goals of obtaining a high quality product in accordance with the schedule established under the Request for Proposal documents.

In evaluating overall value, the Village may consider, without limitation, price, qualifications and past experience of Proponents, availability of necessary work forces and other resources, proposed methodology and schedule for completing the work, and the past performance of Proponents on similar projects in respect of quality of work, timeliness of work, costs of contract administration to the owner of the project, and costs associated with claims for extras in respect of the project. In this regard, considerations other that price may be of greater weight in the Village's evaluation of submissions received.

Proposals will be evaluated based on the following criteria:

a) Understanding of Assignment;
b) Proposed Approach;
c) Technical Proposal (Design);
d) Schedule; and,
e) Cost.

Proposed project teams must be capable of completing all identified tasks; the Village will not consider partial submissions.

Once the Preferred Proponent has been identified, the Village will enter into contract discussions to clarify any outstanding issues and agree to contract terms. It is not the Village's intent to revise the Financial Quotation at these discussions, unless cost-related adjustments to the Technical Quotation are identified by the Village and/or the Proponent.

If discussions are successful, the Village and the Preferred Proponent will develop a formal contract for contract award and commence the Project. If discussions are unsuccessful, the Village reserves the right to enter into contract discussions with other Proponents, and/or to decide not to award a contract at all.

PART B – PROPOSAL DOCUMENTS

1 FINANCIAL PROPOSAL

PROPONENT'S FINANCIAL PROPOSAL
Schedule of Prices

Proponents should provide the following breakdown of the Contract Price which represents the entire compensation to the Design-Builder by the Owner for any and all costs related to the Work, including but not limited to all fees, cash allowances, contingencies and all duties and taxes, excluding GST payable by the Owner to the Design-Builder (use the spaces provided and/or attach additional pages, if necessary):

Natural Grass Field Option

Item	Description	Price
	Professional Services	
1.1	Survey	
1.2	Design Stage	
1.3	Inspections	
1.4	Materials Testing	
1.5	As-Builts, Schematics & Close-Out	
	Construction Services	
2.1	Mobilization/Demobilization	
2.2	Site Preparation	
2.3	Drainage - Field	
2.3	Irrigation System - Field	
2.4	Sand & Growing Medium	
2.5	Fencing	
2.6	Asphalt and Concrete	
2.7	Electrical & Lighting	
2.8	Drainage and Electrical Service Connections	
2.9	Grass Installation & Establishment	
2.10	Miscellaneous	
	Total Contract Price (excluding GST):	**$**

TIME LINE (months)									
PROGRESS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Design Phase									
Mobilization									
Site Prep.									
Drainage									
Irrigation									
Field Construction									
Lighting System									
Grass Installation and Establishment									
OPENING									

2 TECHNICAL PROPOSAL

Provide the following information with your Proposal:

- **Project Management Plan:** Describe the overall approach to the team organization, structure and processes, including details regarding

  a) the frequency of project management meetings between the Design-Builder and the Owner;
  b) subcontractor relations and agreements;
  c) the planned approach to Project approvals, change management, and work procedures;
  d) A list of all team members including their roles and responsibilities (including consultants, material suppliers and subcontractors)
  e) the approach to document control and management of the Project;

- **Quality Management Plan:** Provide a draft design and construction quality management plan prepared specifically for this Project including:

  a) design reviews and record documentation;
  b) procurement of materials and traceability of Product;
  c) inspection and testing;
  d) process control for survey layout;
  e) special procedures for adverse weather conditions;
  f) control of non-conforming Products, corrective and protective actions;
  g) quality assurance and control of materials, including materials testing;

h) confirmation of design assumptions; and
i) commissioning and turnover.

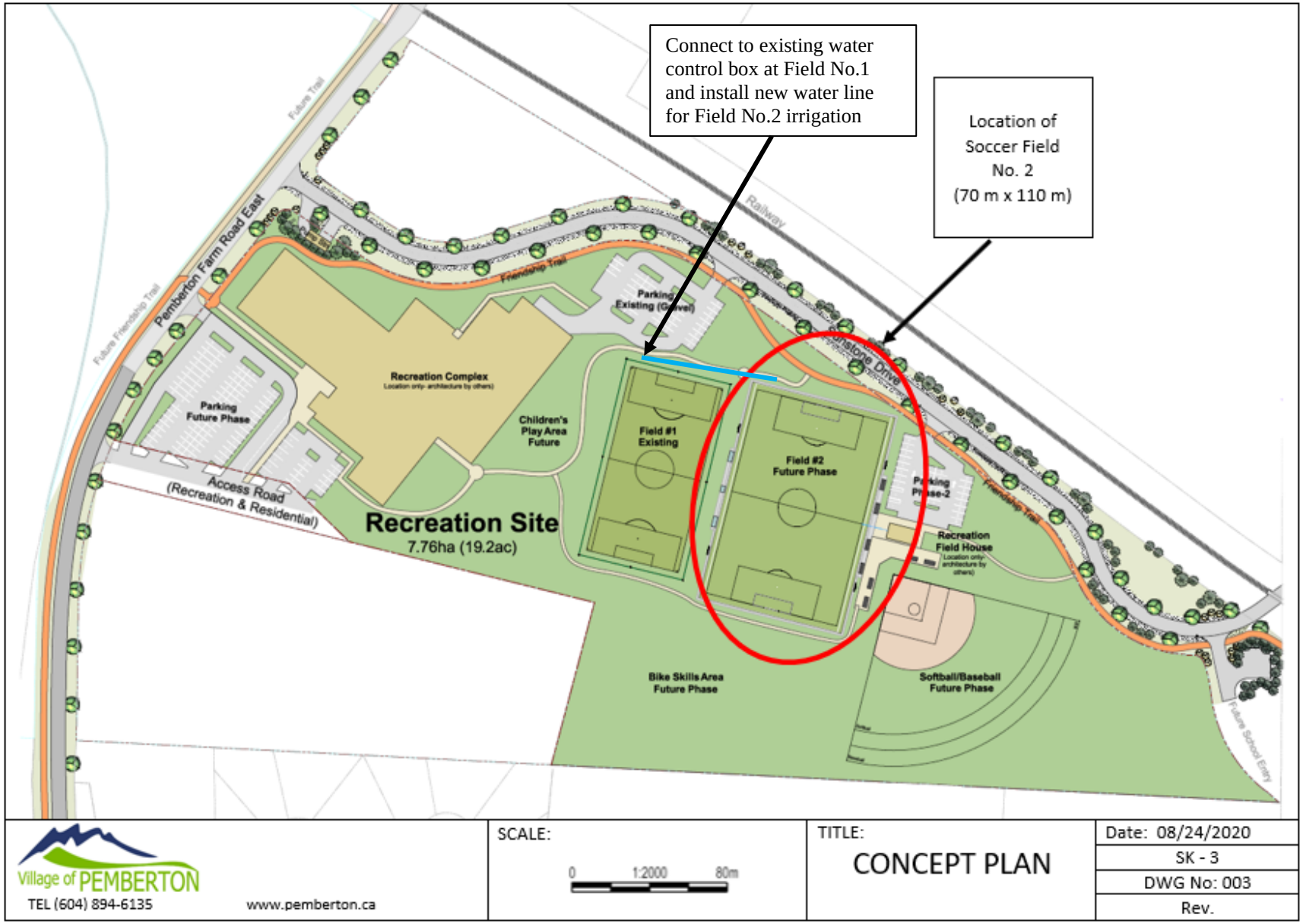
- **Design Proposal Plan:** Provide details on the proposed design process for the Project, including but not limited to the following:

  a) A narrative outlining how to achieve the Owner's Statement of Requirements, including:
  b) Outline specifications (if different from the performance specifications)
  c) Schematic design plan showing the layout of field drainage, irrigation, fencing and service connections.
  d) Schematic details of the field lighting systems
  e) Information on the equipment and materials to be incorporated into the project including irrigation components and lighting systems.
  f) List of equipment & fixtures, including brand, model & design life
  g) A geotechnical memo outlining the site preparation strategies including any anticipated total and differential settlements.
  h) Provide a complete list of any design non-conformances, separated by design discipline.

APPENDIX A - MAPS & FIGURES


Railway
Pemberton Farm Road
Railway
Soccer Field No. 1
Location of Soccer Field No. 2 (70 m x 110 m)
Village of PEMBERTON
TEL (604) 894-6135
www.pemberton.ca
SCALE:
0
1:2000
80m
TITLE:
AREA MAP
Date: 08/24/2020
SK - 1
DWG No: 001
Rev.


TO PEMBERTON DOWNTOWN CORE
Railway
SITE LOCATION
Soccer Field No. 1
Railway
Highway 99 (Sea to Sky Highway)
Pemberton Farm Road East
Pinewood Drive
Lillooet River
Highway 99 (Sea to Sky Highway)
Village of PEMBERTON
TEL (604) 894-6135
www.pemberton.ca
TITLE:
SITE LOCATION
Date: 08/24/2020
SK - 2
DWG No: 002
Rev.


Connect to existing water control box at Field No.1 and install new water line for Field No.2 irrigation
Location of Soccer Field No. 2 (70 m x 110 m)
Future Trail
Pemberton Farm Road East
Future Friendship Trail
Friendship Trail
Railway
Parking Existing (Gravel)
Recreation Complex
Location only- architecture by others
Parking Future Phase
Children's Play Area Future
Field #1 Existing
Field #2 Future Phase
Parking Phase-2
Recreation Field House
Location only- architecture by others
Access Road (Recreation & Residential)
Recreation Site
7.76ha (19.2ac)
Bike Skills Area Future Phase
Softball/Baseball Future Phase
Future School Entry
Village of PEMBERTON
TEL (604) 894-6135
www.pemberton.ca
SCALE:
0
1:2000
80m
TITLE:
CONCEPT PLAN
Date: 08/24/2020
SK - 3
DWG No: 003
Rev.

APPENDIX B - PERFORMANCE SPECIFICATIONS

PART l.0 - GENERAL

1.1 Requirements Included

.1 Section 32 18 23.27 refers to those portions of the *Works* that are unique to the supply, place, till, grade and compaction of the imported sport field medium. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the *Works* as specified herein. All work shall be accomplished to the complete satisfaction of the Contact Administrator.

.2 Industry standards shall apply where details and procedures not specified. The Contractor shall furnish all services, skilled tradesmen, materials, equipment and operations to complete the work described herein**.** The Contractor must provide an experienced on-site supervisor to direct the Work at the site

1.2 Related Work

Excavation, Trenching and	Section 31 23 01
Waterworks	Section 33 11 01
Storm Sewers	Section 33 40 01
Irrigation	Section 32 84 23
Chain Link Fencing and Gates	Section 32 31 13
Mechanical Seeding	Section 32 92 19
Manholes and Catch basins	Section 33 44 01

1.3 Description of the Work

.1 The supply and installation of 450mm deep sand growing medium.

1.4 Interpretation of the Work

.1 The Tenderer shall be fully acquainted with the existing site and shall fully understand the difficulties and restrictions attending the execution of the work under this contract. Interpretations by the Tenderer of the meaning of any section of the contract drawings and specifications herein prior to submitting a tendered price shall not remove the responsibility of completing the Work as per the directions of the Consultant, including all costs associated with that Work, should the Contractor's interpretation be incorrect. Prior to submitting a tendered price for the Work, the Contractor must seek clarification from the Village for any items within the contract drawings and specifications that may appear to be unclear or conflicting.

1.5 Samples and Submittals

.1 Provide to the Village for pre-placement review the source of sand and the sieve analysis of this sand source. Sand must meet the specified requirements set out herein. The identified source of the sand must not change without Village approval. Approval will not be granted without the submission of a sieve

analysis to the Village of the new source that indicates the new material meets the specified requirements set out herein.

1.6 Work Included

.1 Prior to the acceptance of a tender for the supply of the sand, the Contract Administrator shall carry out, or have carried out, by an approved laboratory the following tests on the sand field medium;

.1 Saturated hydraulic conductivity
.2 Salt content;
.3 pH;
.4 Particle size analysis by wet sieving;
.5 Analysis for available Copper, Zinc and Manganese.

1.7 Acceptance

.1 Confirm 'sub grade' based on a 10 meter grid, and trenching elevations by the Village Survey Crew.

.2 Confirm 'finish grade' elevations by the Village Survey Crew based on a 10 meter grid.

.3 Confirm Field Sand Medium by independent laboratory testing.

1.8 Payment

.1 Measurement and payment for this item shall be by the cubic meter of material supplied, placed, rototilled, compacted and finish graded as determined by field measurements by the Contract Administrator. Tender unit price to include full compensation for all labour, materials and equipment required to complete the work as specified. No further payment will be made for placing and compacting the material at its final location.

PART 2.0 – PRODUCTS

2.1 Materials

.1 Sport Field Sand Particle Size

.1 Sand to have < 3% fines complying with the chart below.

.2 The sand shall be an approved pumped river sand, washed and free of contaminants, chemicals and/or organic material.

.3 Identify source of sand and submit along with sand analysis to Contract Administrator. Contract Administrator must approve prior to award of contract.

.4 Gradation of particle sizes shall fall within the ranges outlined in the table below, however, the majority of the particle sizes must be within, and including, the #18 sieve and the #60 sieve ("percent" to be reported as the mass of the particles whose size is less than the designated sieve opening but greater than the next designated sieve opening).

USBS Sieve Number	**Sieve Size(mm)**	**Percent Composition**	**Material Class**
#4	4.75	0	Fine Gravel(4.75-2.00mm)
#10	2.00	0-10	Very Coarse Sand(2.00-1.00mm)
#18	1.00	0-20	Coarse Sand(1.00-0.50mm)
#35	0.50	60-80	Medium Sand(0.50-0.25mm)
#60	0.25	0-40	Fine Sand(0.25-0.105mm)
#140	0.105	0-4	Very Fine Sand(1.05-0.053mm)
#270	0.053	0-3	Silt & Clay(0.053mm)

.5 The sand shall have saturated hydraulic conductivity between 150mm and 300mm per hour.

.6 Test conditions shall be for a saturated sand, 15 blows compaction.

.7 The saturated hydraulic conductivity of the compacted sand shall be greater than 8 x 10-5 meters/sec.

.8 The sand shall have a salt content EC value less than 0.5mmhos/cm

.9 The sand shall have a pH between 5.0 and 7.0.

.10 The porosity shall be greater than 0.25 on a volumetric basis.

.11 The level of available Copper, Zinc, and Manganese following acid digest in 0.1 N HCl and shaken for ½ hour shall be less than 25 PPM.

.12 The sand shall be uniform in quality and will be tested as directed by the Village's Representative. Confirm stockpile of sand prior to delivery to site and obtain approval from the Contract Administrator.

.13 The water content of the delivered sand shall be less than 10% by weight.

.14 Any loads with a water content greater than 10% by weight shall be adjusted accordingly.

.15 Any sand found defective shall be removed from the site at the contractor's expense and replaced with satisfactory material as approved by the Inspector.

.16 Notwithstanding the foregoing requirements, the selection of field sand medium shall be at the sole discretion of the Contract Administrator.

2.2 Fertilizer

.1 Fertilizers to be to Canada "Fertilizers Act" and "Fertilizers Regulations". Product to be "Playfield Starter Fertilizer." Starter fertilizer and application as supplied and directed by the sod supplier.

2.3 Lime

.1 Lime to be 'Spread Easy Dolomite Lime'.

2.4 Testing:

.1 Installation can only commence if the material has passed the required testing. All testing costs are the responsibility of the Contractor. Provide test results to the Consultant.

.2 Obtain two randomly selected samples, under the supervision of the Contract Administrator, for testing by an independent testing agency for basic analysis to ensure conformity to the requirements set out herein. Test according to the following schedule.

1. At beginning of delivery and placement.
2. At midpoint of delivery and placement.
3. At end of delivery and placement.

.3 After the third cut of the grass, obtain two randomly selected grass tissue samples, under the supervision of the Contract Administrator, and send samples to an approved testing laboratory for fertilizer requirement testing.

PART 3.0 - EXECUTION

3.1 Workmanship

.1 Keep site well drained.

.2 Clean up immediately sand or debris spilled onto pavement, or pedestrian paths; dispose of materials.

3.2 Sub grade

.1 Excavate all organics from existing site to design elevations shown on Contract Drawings.

.1 Fine grade sub grade as shown on drawings.

.1 Sub grade to be minimum 400mm below finish grade.

.2 Confirm sub grade with BCLS independent survey.

.1 Provide survey report to Contract Administrator.

.2 Compact sub grade to 95% SPD.

.3 Comply with requirements:

.1 MMCD Section 31 23 01 Excavation, Trenching & Backfilling.

3.3 Placement of Sport Field Medium

.1 Grade stakes shall be installed at 10 meter intervals around the perimeter of the field showing intermediate and final grade elevations.

.2 Traffic to the field shall be as directed by the Inspector.

.3 No trucks shall be allowed to travel over the field drainage at any time.

.4 The Village Inspector shall be on-site at all times when sport field medium is being delivered and placed at the site.

.5 The Village Inspector shall personally examine the contents of each load and where necessary direct the placement of the materials.

.6 The Village Inspector shall keep a tally of the number of loads delivered to the site, the net tonnage delivered in each load, the weight bill number and delivery truck identification.

.7 The Village Inspector shall make note of any abnormal conditions in the material or the procedures.

.8 The Village Inspector shall maintain a plan of the site showing the general area of placement of each load.

.9 Prior to the start of sport field medium delivery, the Village Inspector shall take a representative sample of not less the 200 grams at the source for analysis.

.10 The sample shall be placed in a plastic bag sealed with a tie and labelled as to time and source.

.11 The sport field medium shall be delivered to specified locations at the field perimeter. From these delivery points, the material shall be pushed in a single lift at or near final grade with a crawler tractor equipped with a straight or "U" shaped blade.

.12 Once an area has been established to grade from the delivery point, and at the discretion of the Village Inspector, trucks maybe allowed to drive on this portion of the field and deposit the sport field medium on the field area.

.13 Under no circumstances shall trucks be permitted to pass over the lateral drain lines.

.14 Spreading of sport field medium shall be carried out in such a way as not to disturb the field drains, collector, or gravel bedding.

.15 Whenever possible, the spreading should be done parallel to the lateral lines.

.16 A crawler tractor or wheeled grader or both shall be used for spreading the sport field medium.

.17 Place a minimum 450mm total compacted depth of sand growing medium in all areas that are to receive sod or hydroseed. The final grade of the sand to ensure that the top of sod to match existing site grades.

.18 Sport Field Sand

.1 The first lift of Sand shall be placed to a minimum depth of 450mm (18").

.2 Place 25mm of soil amender over sand.

.3 Rototill the existing sand growing medium to a depth of 150mm.

.4 Rototill a second time at a 90 degree angle.

.5 The final 150mm (6") depth of sand growing medium shall be a homogenous mix.

.19 The sport field medium surface shall be graded smooth and level to the finished grades shown on the Contract Drawings.

.20 The final grades shall meet the design elevations shown on the Contract Drawings and the surface shall be a smooth, uniform and firm against any foot-printing.

.21 Water shall be applied to the sport field medium in order to get a trafficable surface.

.22 The finish grade shall be maintained at plus or minus 25mm.

.23 Co-ordinate sport field medium placement with Irrigation and Sub-drains Work.

.24 Feather out edges of prepared and level sand growing medium to meet surrounding finished grades.

.25 Apply fertilizer at the recommended rate of application.

3.4 Liming

.1 Lime shall be applied to the field surface in a uniform manner using a spreader that can deliver an even distribution of known rate.

.2 Lime shall only be applied in the case where the sand analysis has shown a need.

.3 The rate of application shall be determined by the Contract Administrator.

.4 Following application of the lime the surface shall be harrowed or diced to a depth of that least 100mm (4") in two directions perpendicular to one another.

.5 Following harrowing, the surface shall be brought to final grade with a tolerance of plus/minus 25mm (1").

.6 The surface shall be rolled with a non-vibratory roller so as to ensure that the surface is stable and trafficable.

.7 There shall be an interval of at least ten (10) days between the application of the lime and application of sodding or mechanical seeding.

3.5 Sub Grade

.1 Before placing the sand field medium, confirm 'sub grade' based on a 10 meter grid by Survey Crew.

.2 Carefully check the grade of the compacted sub base and make good deficiencies.

.3 Sub base tolerance shall be +/- 50mm in 3m when measured with a straight edge.

.4 Obtain Contract Administrator approval of sub grade.

3.6 Finish Grade

.1 Confirm 'finish grade' elevations by the Survey Crew based on a 10 meter grid.

.2 Finished grade tolerance shall be +/- 25mm in 3m when measured with a straight edge.

.3 The finished surface shall be compacted to 95% SPD.

3.7 Obtain Contract Administrator approval of finished grade. Finished Surface for Sodding or Seeding

.1 The finished grade shall be smooth to the extent required for the application of sod or mechanical seeding to be carried out, firm against footprints, and free of stone, roots, branches larger that 25mm (1").

.2 Obtain approval of prepared surface prior to commencement of sodding or seeding operations.

3.8 Acceptance and Village possession of the Field

.1 Sports field areas will be accepted when the following conditions are met.

.1 Surface conditions are as specified.

.2 Sod establishment is consistent throughout the sodded areas.

.3 There are no visible weeds.

.4 Sodded or seeded areas have to be cut at least three times, the last cut being carried out within 24 hours of acceptance.

.5 Areas sodded or seeded in fall will be accepted in the following spring, one month after start of growing season, provided that the conditions for acceptance are fulfilled.

3.9 Site Clean-Up

.1 Upon completion of the work, and daily, remove all containers, surplus materials, and installation debris, etc. Project area must be left in a clean and orderly condition.

END OF SECTION

SUPPLEMENTARY SPECIFICATIONS

The Supplementary Contract Specification takes precedence over the Master Municipal Construction Document (MMCD) – Platinum Edition

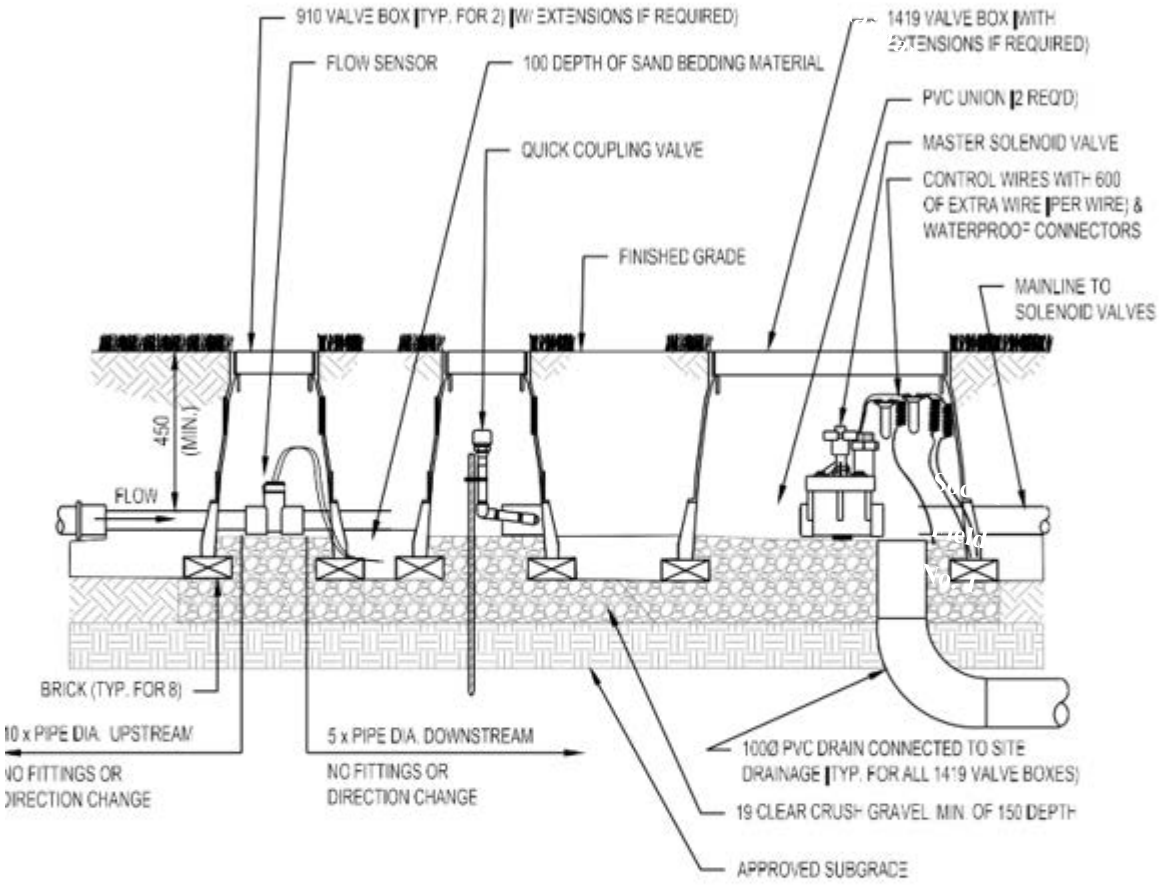
SECTION	DESCRIPTION	TYPE
Section 01 33 01	Project Record Documents	MMCD Supplemental
Section 01 53 01	Temporary Facilities	MMCD Supplemental
Section 01 55 00	Traffic Control, Vehicle Access and Parking	MMCD Supplemental
Section 01 57 01	Environmental Protection	MMCD Supplemental
Section 03 30 20	Concrete Walks, Curbs, and Gutters	MMCD Supplemental
Section 11 68 00	Site Fitments	MMCD Supplemental
Section 31 05 17	Aggregates and Granular Materials	MMCD Supplemental
Section 31 22 16.1	Reshaping Existing Subgrade	MMCD Supplemental
Section 31 23 01	Excavation, Trenching and Backfilling	MMCD Supplemental
Section 31 32 19	Geosynthetics	MMCD Supplemental
Section 32 31 13	Chain Link Fences and Gates	MMCD Supplemental
Section 32 91 21	Topsoil and Finish Grading	MMCD Supplemental
Section 32 92 19	Hydraulic Seeding	MMCD Supplemental
Section 32 93 90	Establishment Maintenance	MMCD Supplemental
Section 33 40 01	Storm Sewers	MMCD Supplemental

Electrical and Lighting Supplemental Specifications (attached separately)

APPENDIX C - TYPICAL DETAIL DRAWINGS

FLOW SENSOR, QUICK COUPLING VALVE & MASTER VALVE

SCALE: AS SHOWN



NOTES:

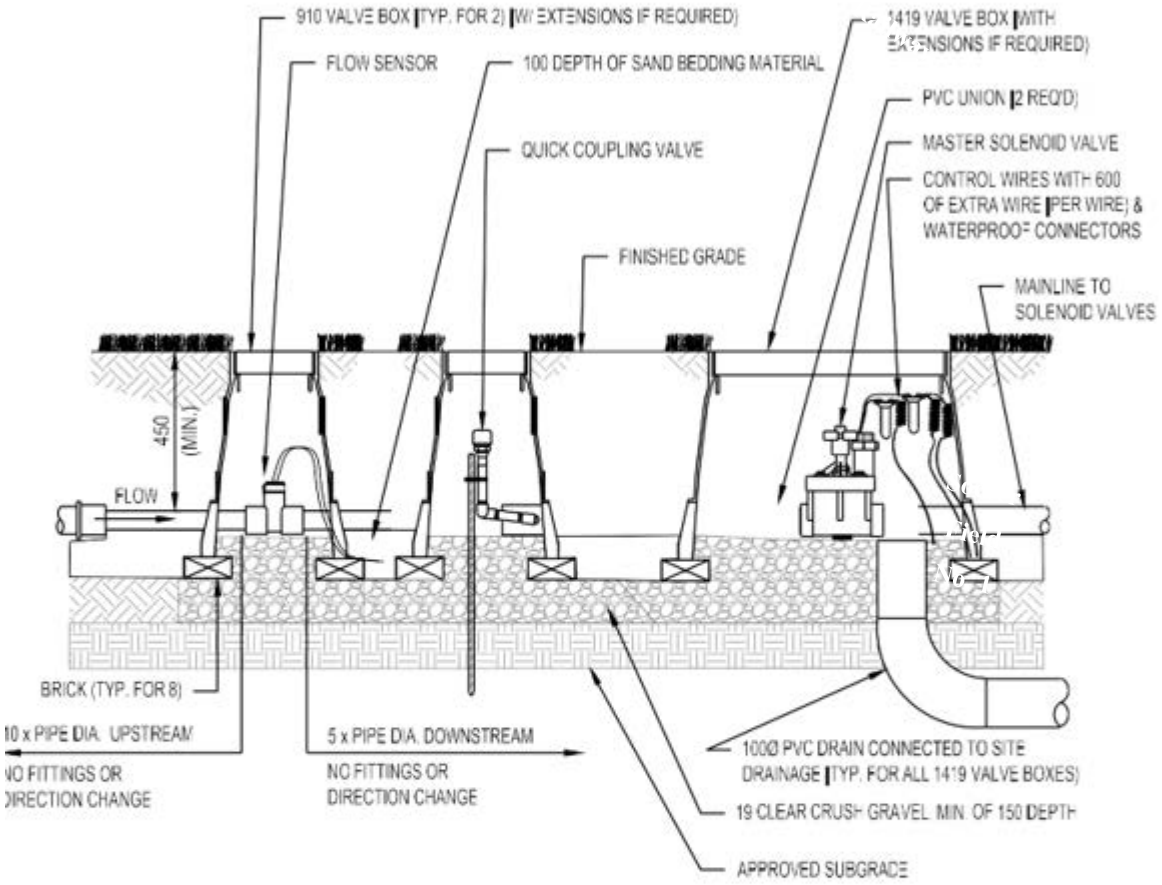
1. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
2. PIPING AND COMPONENTS SIZED TO SUIT MAXIMUM FLOW OF IRRIGATION SYSTEM.
3. 600 OF EXTRA WIRE, PER WIRE, COILED NEATLY, SHALL BE INSTALLED FOR THE MASTER VALVE AND FLOW SENSOR.

SCALE N.T.S.

Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: FLOW SENSOR, QUICK COUPLING VALVE &MASTER VALVE	Date: 2016-11-22 DWG No: IR02 Rev.

IRRIGATION MAINLINE AND LATERAL LINE TRENCH

SCALE: AS SHOWN



NOTES:

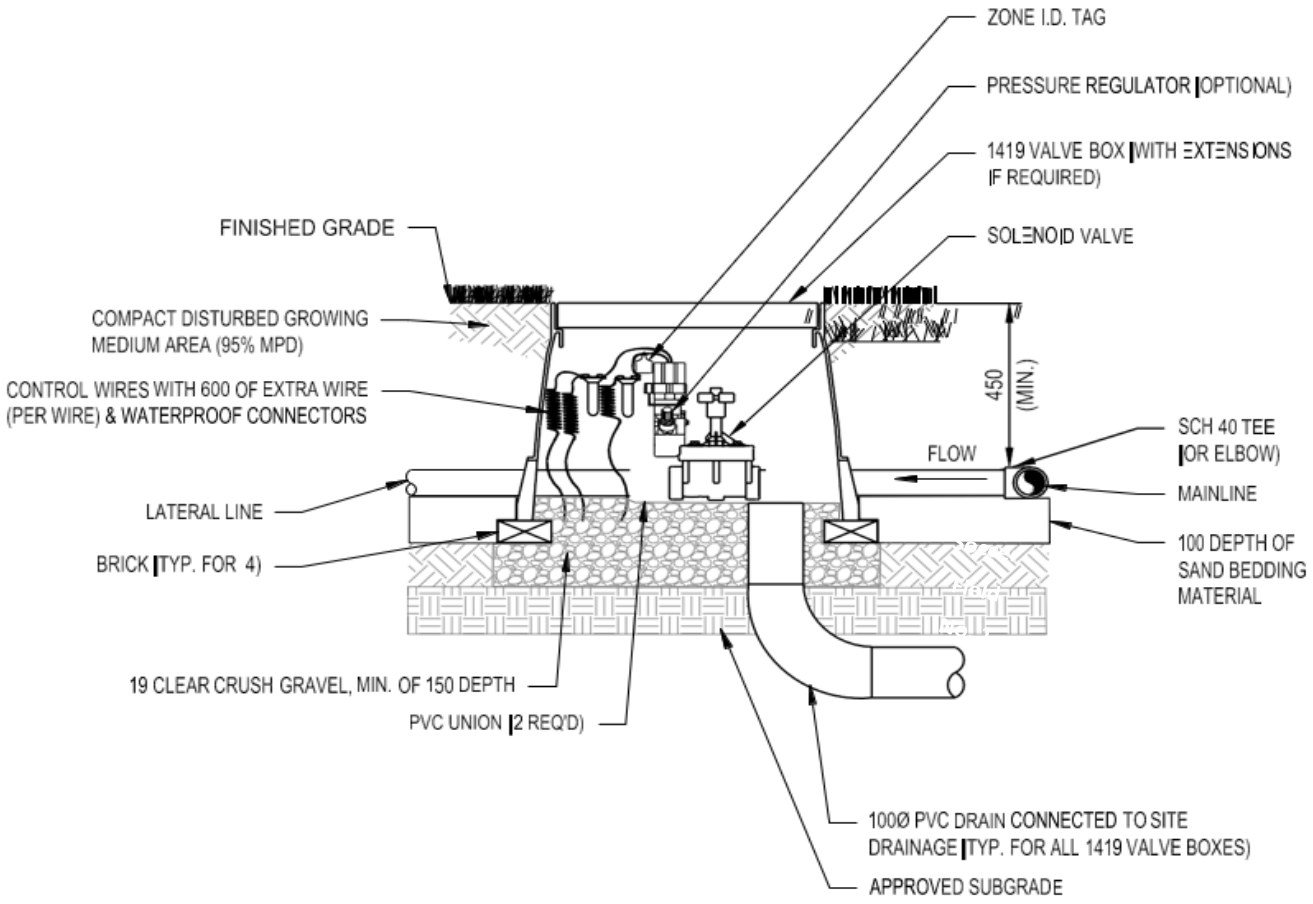
1. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH T-E MANUFACTURER'S SPECIFICATIONS.
2. PIPING AND COMPONENTS SIZED TO SUIT MAXIMUM FLOW OF IRRIGATION SYSTEM.
3. 600 OF EXTRA WIRE, PER WIRE, COILED NEATLY, SHALL BE INSTALLED FOR THE MASTER VALVE AND FLOW SENSOR.

SCALE N.T.S.

Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: IRRIGATION MAINLINE AND LATERAL LINE TRENCH	Date: 2016-11-22 DWG No: IR03 Rev.

ZONE SOLENOID VALVE

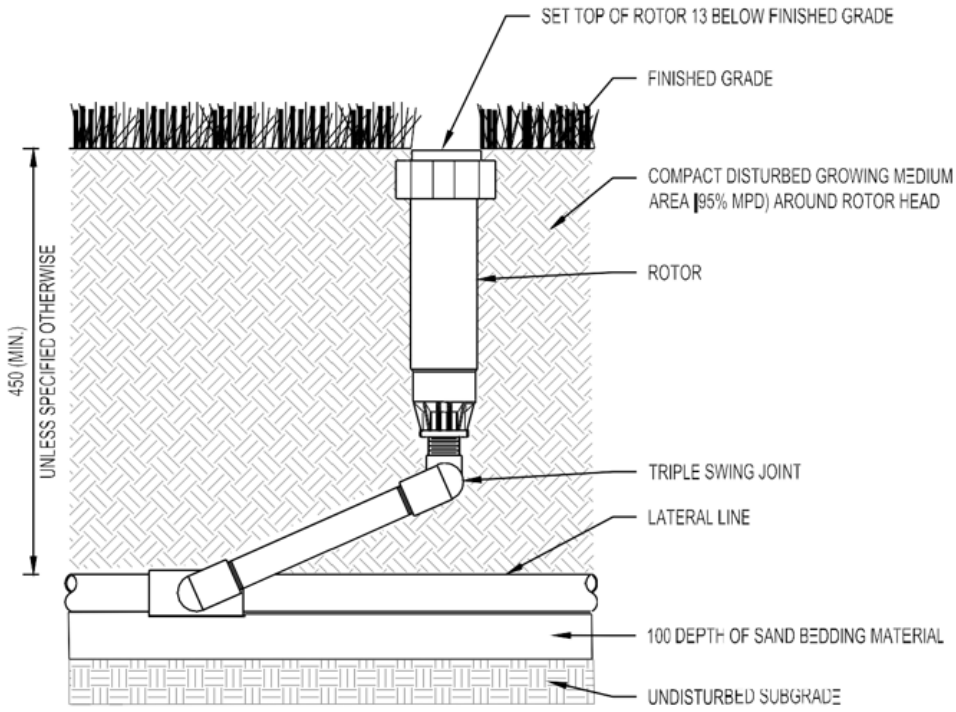
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: ZONE SOLENOID VALVE	Date: 2016-11-22 DWG No: IR04 Rev.

ROTOR

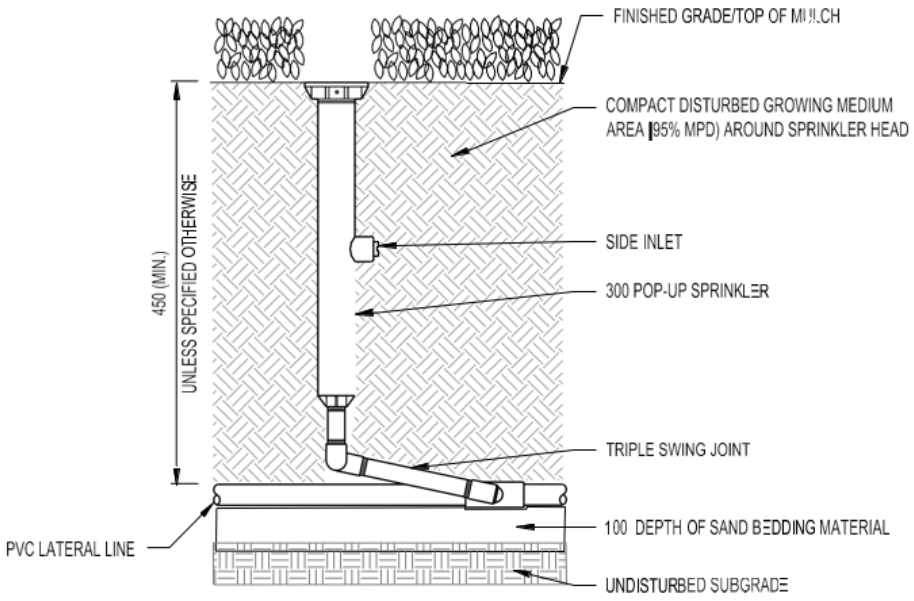
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: ROTOR	Date: 2016-11-22 DWG No: IR05 Rev.

300 (12”) POP-UP SPRINKLER

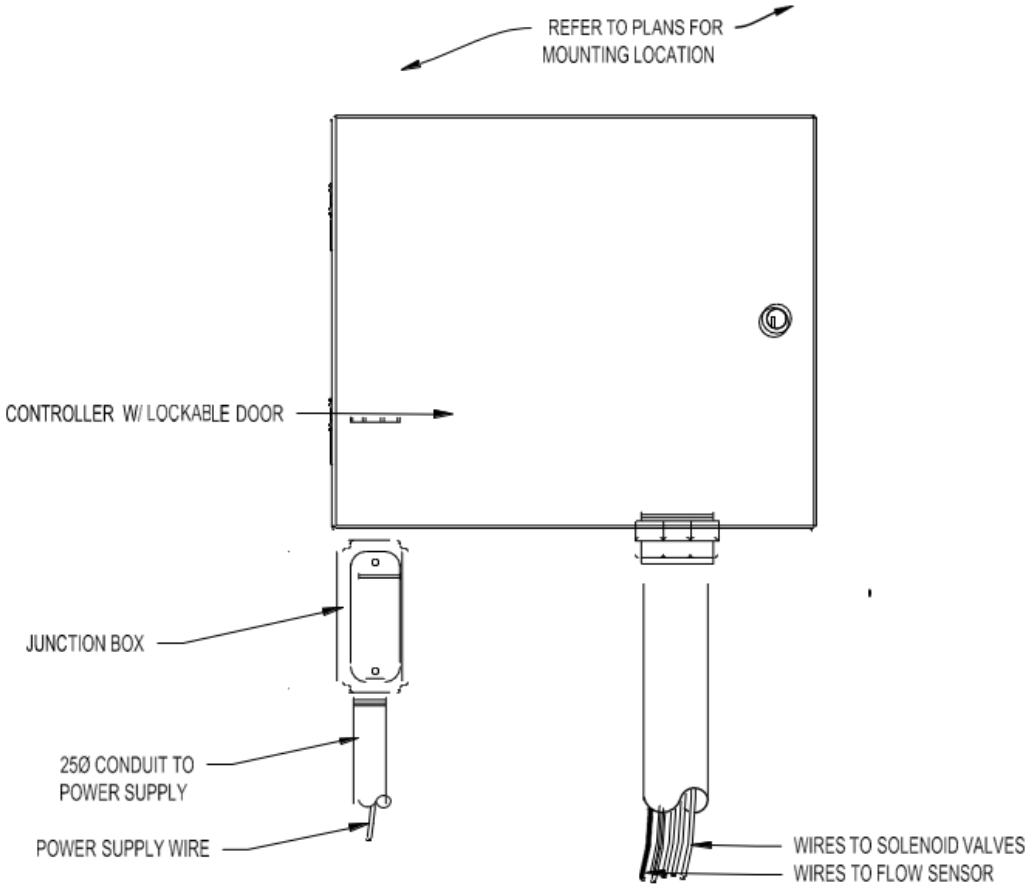
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: 300 (12”) POP-UP SPRINKLER	Date: 2016-11-22 DWG No: IR06 Rev.

COMMERCIAL CONTROLLER

SCALE: AS SHOWN



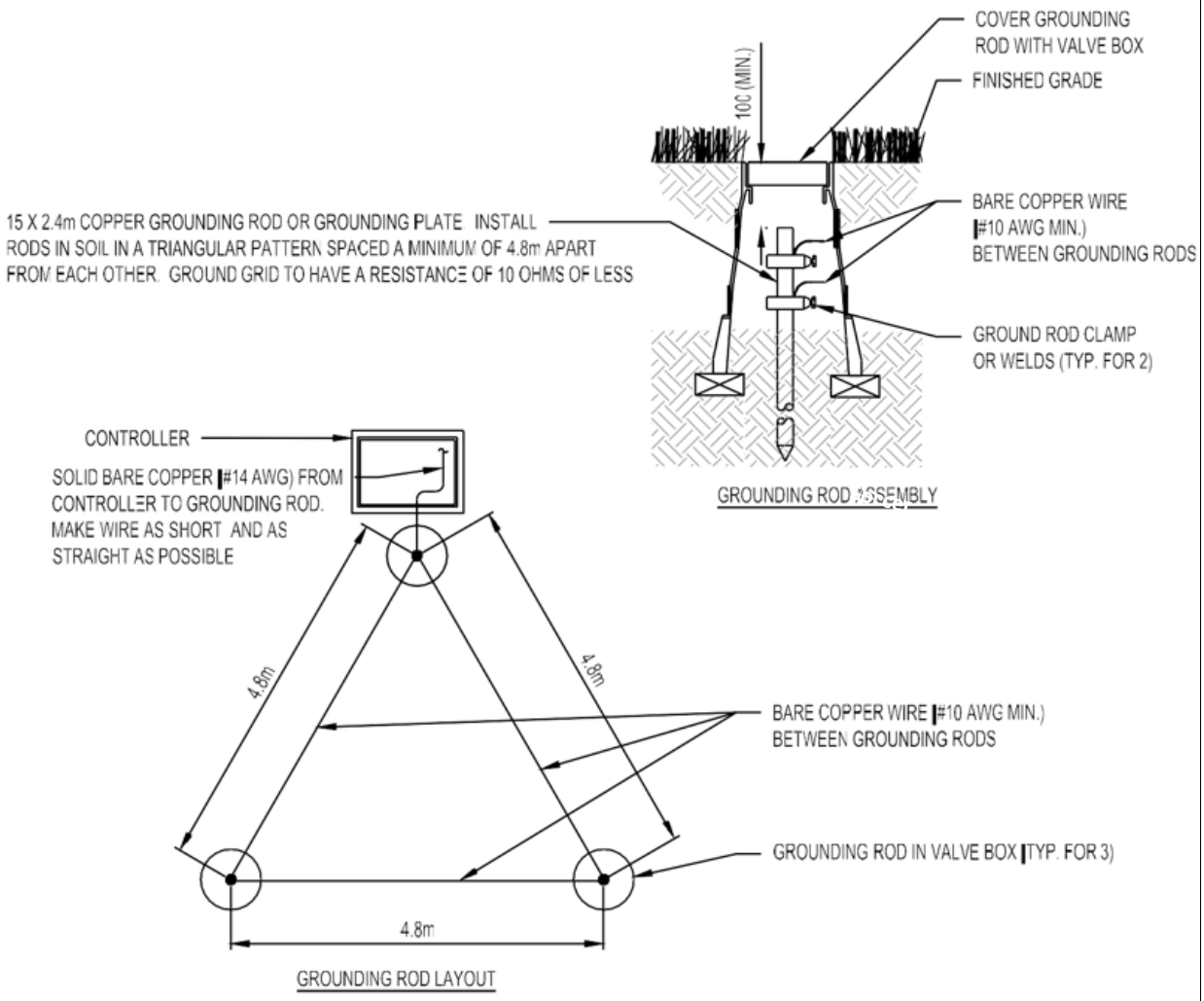
NOTES:

1. CONTROLLER SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
2. POWER: INPUT 120VAC, 60Hz. OPERATING VOLTAGE 24VAC, 50/60Hz.
3. AVAILABLE OUTDOOR AND INDOOR MODLS.
4. SEE MANUFACTURE FOR NUMBER OF STATIONS (ZONES) AVAILABLE AND FEATURES.
5. FOR CONTROLLERS HOUSED IN A KIOSK, THE CONTRACTOR SHALL SUPPLY SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALLATION.

Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: COMMERCIAL CONTROLLER	Date: 2016-11-22 DWG No: IR07 Rev.

CONTROLLER GROUNDING GRID

SCALE: AS SHOWN



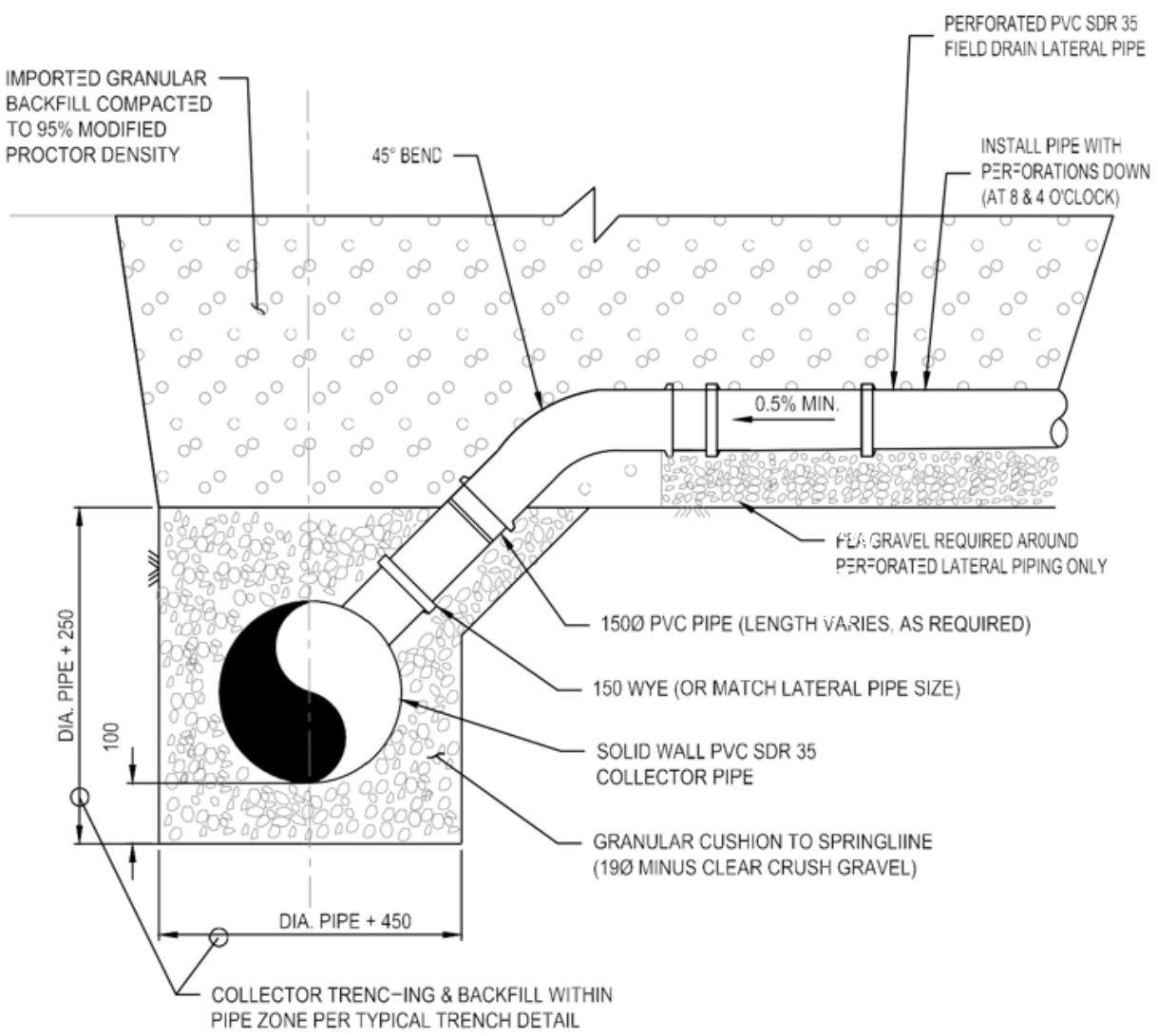
NOTES:

1. GROUNDING GRID FOR THE IRRIGATION CONTROLLER SHALL BE INSTALLED AS PER THE BC ELECTRICAL CODE.

Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: CONTROLLER GROUNDING GRID	Date: 2016-11-22 DWG No: IR08 Rev.

FIELD LATERAL COLLECTOR CONNECTION

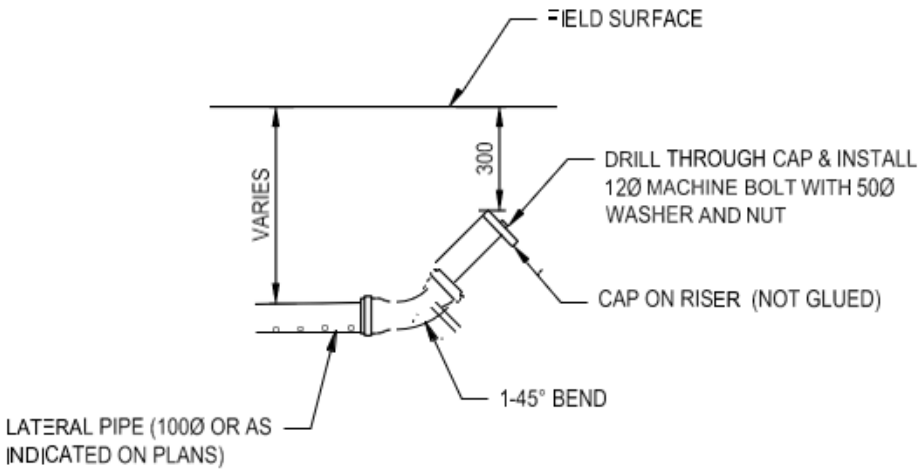
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: FIELD LATERAL COLLECTOR CONNECTION	Date: 2016-11-22 DWG No: SD01 Rev.

PERFORATED LATERAL END CLEANOUT

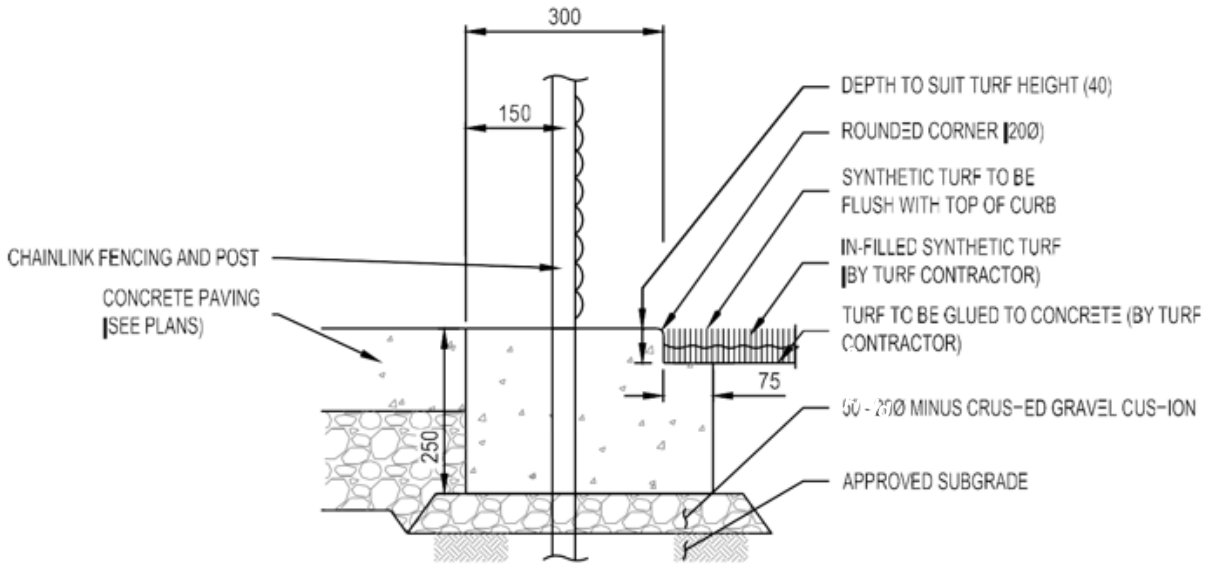
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: PERFORATED LATERAL END CLEANOUT	Date: 2016-11-22 DWG No: SD07 Rev.

CONCRETE EDGE ANCHOR

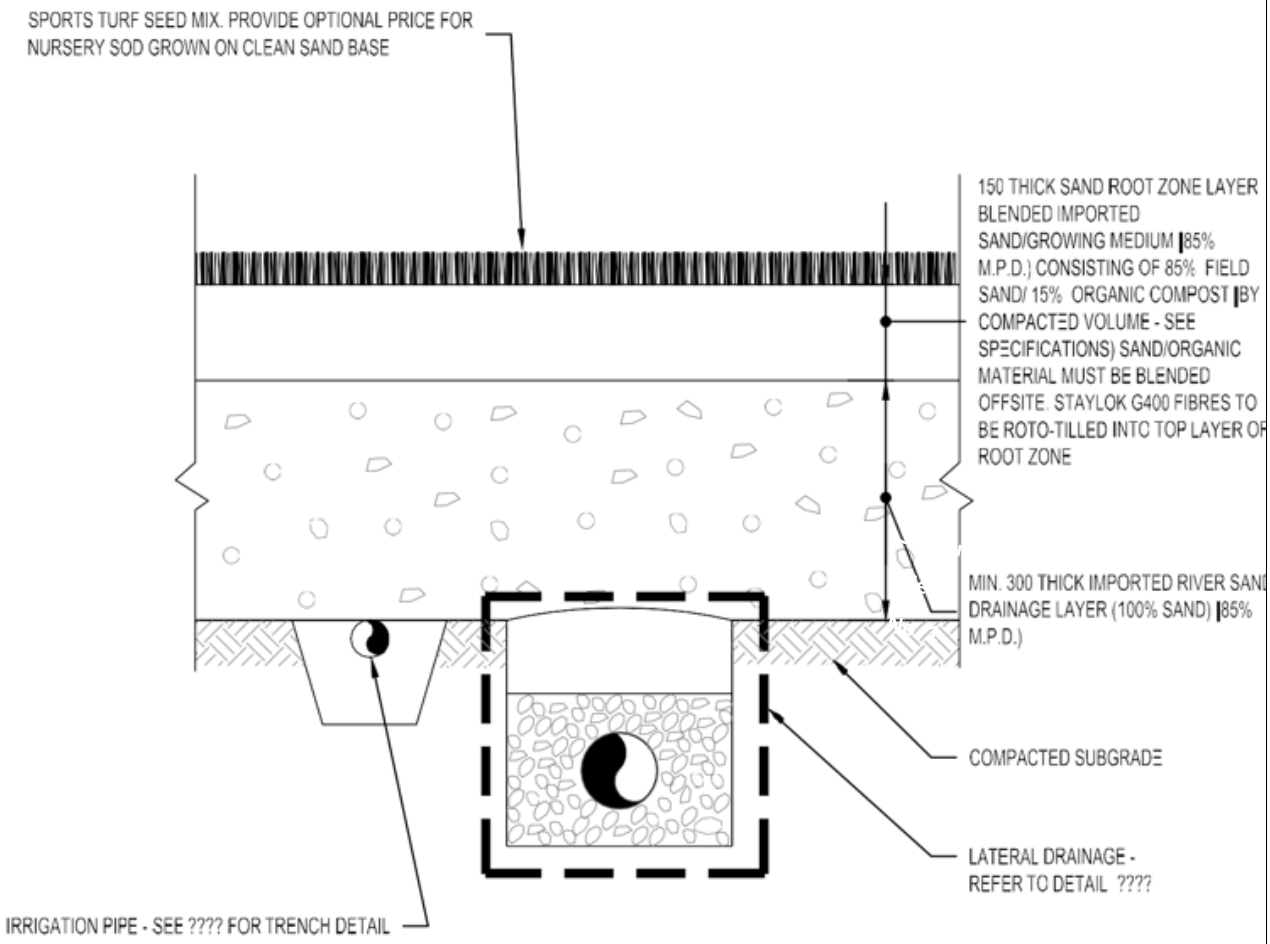
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: CONCRETE EDGE ANCHOR	Date: 2016-11-22 DWG No: SF01 Rev.

TYPICAL SECTION NATURAL GRASS FIELD

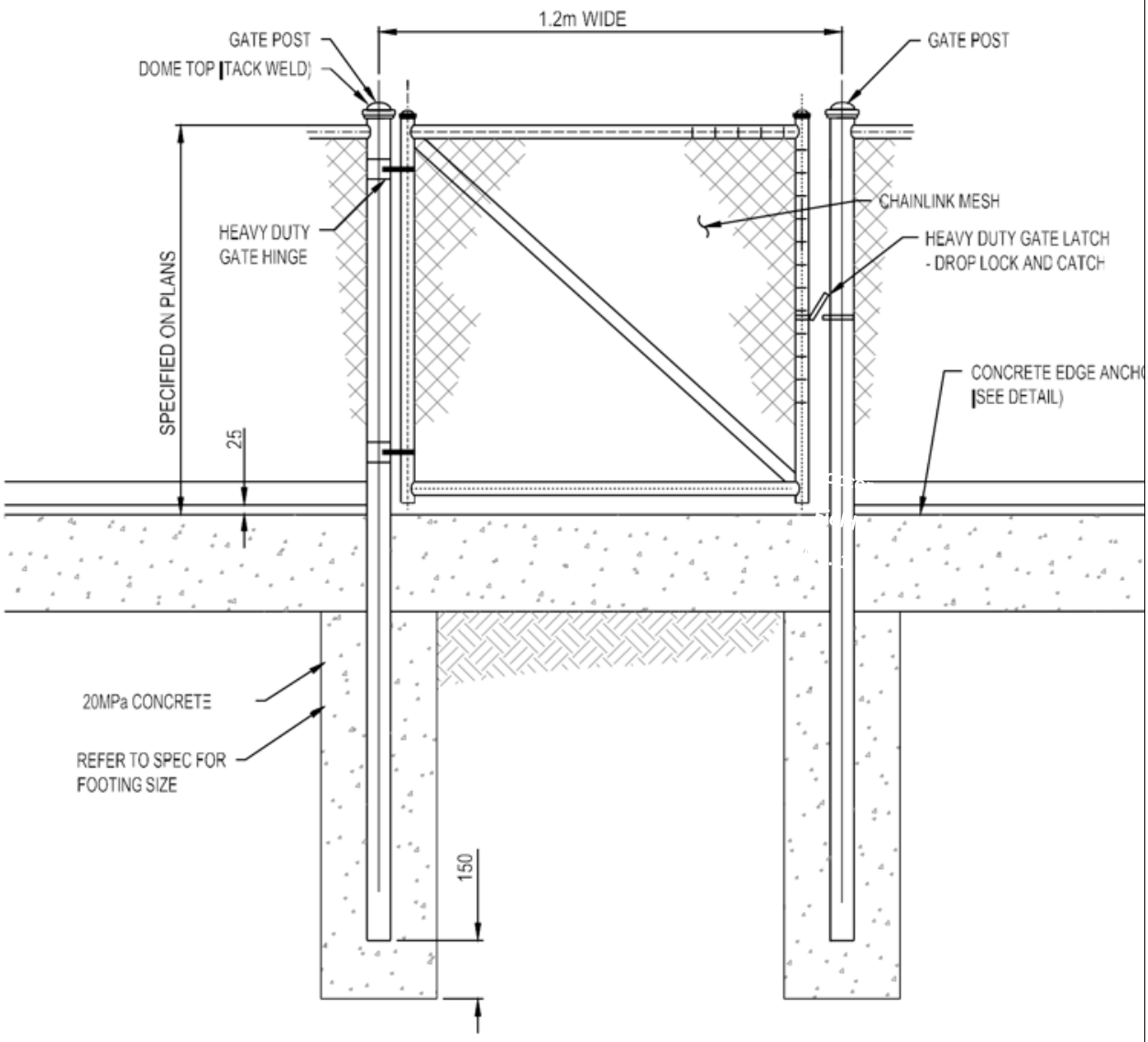
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: TYPICAL SECTION NATURAL GRASS FIELD	Date: 2016-11-22 DWG No: SF04 Rev.

PEDESTRIAN GATE

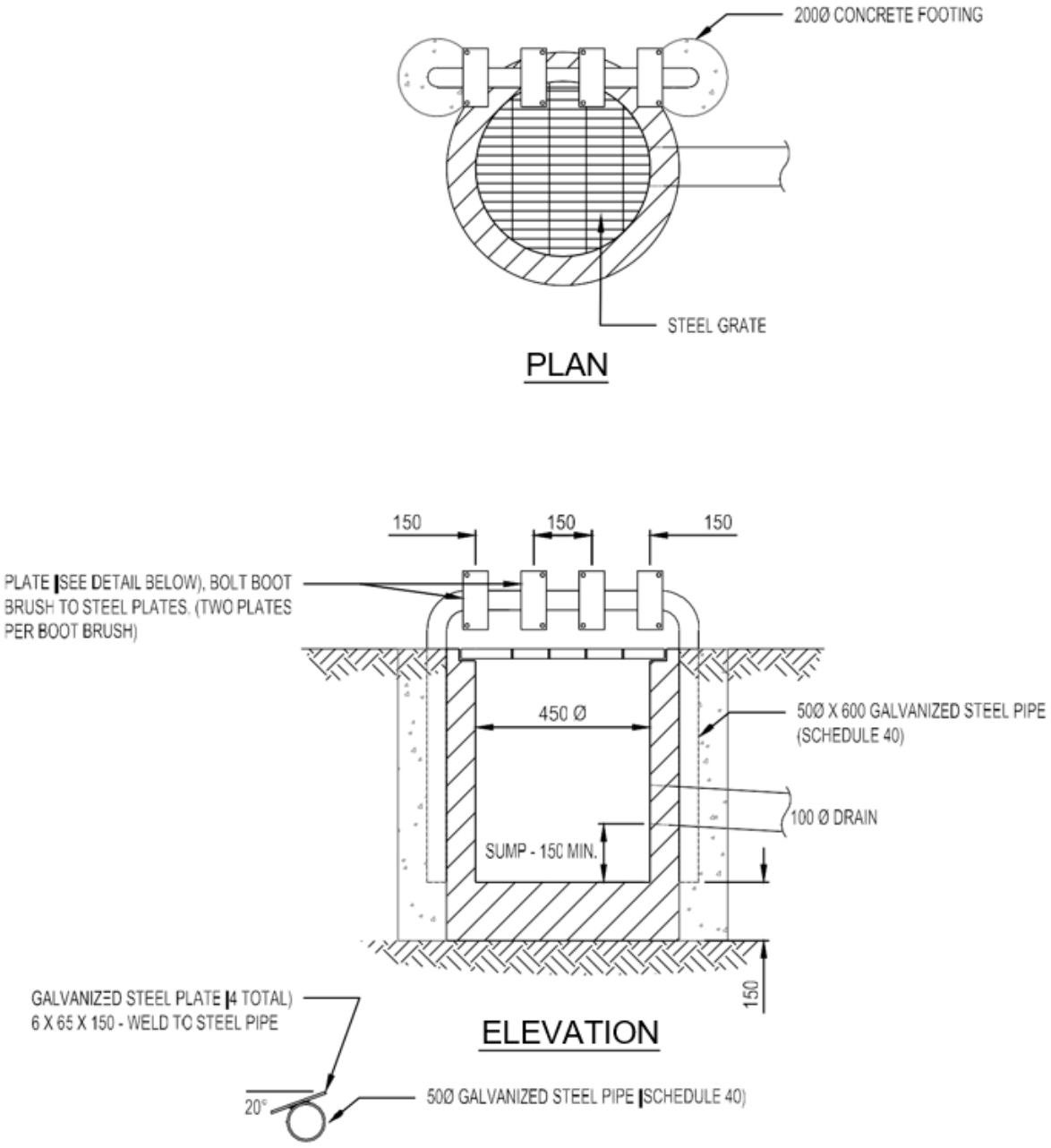
SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: PEDESTRIAN GATE	Date: 2016-11-22 DWG No: SF12 Rev.

BOOT BRUSH STATION

SCALE: AS SHOWN



Village of PEMBERTON TEL (604) 894-6135 www.pemberton.ca	SCALE: Not to Scale	TITLE: BOOT BRUSH STATION	Date: 2016-11-22 DWG No: SF17 Rev.

APPENDIX D – GEOTECHNICAL REPORTS

February 27, 2014

Reference No. VAN-00217089

Village of Pemberton
7400 Prospect Road
Pemberton, BC V0N 2L1

Email: clamont@pemberton.ca

Attention: Caroline Lamont

Re: Pemberton Recreation Complex
Preliminary Geotechnical Review

Dear Ms. Lamont:

1.0 INTRODUCTION

As requested, **exp** Services Inc. (**exp**) has completed a geotechnical review of a property regarding the development of a proposed recreational complex in Pemberton, BC. Our review was completed in general conformance with a proposal submitted to the Village of Pemberton on January 9, 2014. The proposal was accepted by Caroline Lamont for the Village of Pemberton on January 22, 2014.

For the purposes of the geotechnical review the proposed development has been divided into Phase 1 and Phase 2 with the western portion of the subject property (Phase 1) being generally considered for buildings, parking areas, a soccer/football field and running track and the eastern portion (Phase 2) being generally considered for soccer and baseball fields as shown on the attached Site Plan (Figure 2).

The scope of services for this geotechnical review was limited to the provision of geotechnical engineering services only and did not include any provisions for environmental assessment.

2.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is located about 3km east of downtown Pemberton on the east side of Old Pemberton Farm Road as shown on the attached Key Plan (Figure 1). The roadway intersects Highway 99 about 600m south of the subject site. The proposed development site is irregular in shape with an approximate area of about 8.7 Ha. The site is bounded by Old Pemberton Farm Road to the west, a railway to the north, undeveloped land to the east and eastern portion of the south boundary, and a rock quarry on the western portion of the south boundary. Residential, commercial and school developments are proposed along the northwest, east and western portion of the south boundary respectively.

Historically, the Phase 1 area has been used as a rock quarry with crushing done on-site. The Phase 2 area has been undeveloped and remains in a generally native state.

The subject site is generally flat lying with elevations ranging from about 210m in the eastern portion to 212m geodetic in the western portion. A steeply inclined slope is located at the grade change near the Phase 1 eastern boundary. At the time of our review there were stockpiles of gravel placed in the centre of the Phase 1 portion of the property. Bedrock cut slopes were noted adjacent to the western portion of the south boundary along a bedrock knoll with a maximum elevation of about 245m geodetic, with residential development at the top. Stockpiles of blast rock were located near the toe of the cut slopes. The Phase 2 portion of the property is generally flat lying with minor undulations. North of the railway topography consists of south facing, moderately inclined bedrock controlled slope to an elevation of about 750m geodetic.

Localized ponding water was noted in the Phase 1 portion of the subject site with more prevalent ponding noted in the Phase 2 portion.

Vegetation within the subject site was restricted to the eastern portion of the site and consisted of areas of grass (eastern portion of Phase 1), assorted deciduous trees with trunk diameters up to about 75mm and localized evergreen trees with trunk diameters up to about 75mm. Within the Phase 2 area evergreen trees appeared to be restricted to localized areas where slight increases in grade were noted (i.e. the area near HA 14-05).

3.0 GEOTECHNICAL EXPLORATION

Geotechnical exploration completed for the Phase 1 area consisted of the excavation of twelve (12) test pits ranging in depth from about 0.3m to 4.1m, one (1) hand auger to a depth of about 2.3m and two (2) solid stem auger holes to depths of about 6.4m and 9.1m. Test pits and auger test holes were supervised, located, logged and sampled by **exp** personnel. Due to the unexpectedly not being able to encounter bedrock within the maximum reach of the test pits in the area of the proposed arena solid stem auger holes were drilled to determine depth to bedrock in the area and to assess soils below the depth achievable with test pits. Geotechnical exploration within Phase 2 consisted of five (5) hand augered test holes to depths ranging from about 0.4m to 3.0m. Hand augers were located, completed, logged and sampled by **exp** personnel. Hand Auger HA14-06 was limited to 0.4m depth due to the presence of thick ice. Samples obtained during geotechnical exploration were taken to our laboratory for further soil classification and moisture content analysis.

Test hole locations are shown on the attached Test Hole Location Plan (Figure 2). Detailed descriptions of soils encountered in the test holes are provided on the attached Test Hole logs with results of moisture content analysis.

4.0 SUBSURFACE CONDITIONS

Description of subsurface conditions within the subject site has been divided into Phase 1, primarily related to building, parking and a running track with a football/ soccer field, and Phase 2 primarily related to the construction of soccer fields and a baseball diamond.

4.1 Phase 1

In general, subsurface conditions within Phase 1 consisted of two distinct zones. The zones may be designated as the south zone and the north zone with the dividing line being located approximately 50m to 80m from the southern property line (see Figure 2). In the vicinity of the dividing line it appears underlying bedrock dips steeply to the north with associated increasing overburden soil thickness.

The southern zone (TP14-09 through TP14-12) appears to generally consist of sand and gravel or blasted boulders with a sand and gravel matrix fill, up to about 1m thick, overlying bedrock.

The northern zone (TP14-01 through TP14-08, AH14-01 and AH14-02) contained a surficial layer of compact silty sand/ sandy silt with some gravel, cobbles and boulders fill (ranging in thickness from about 1m to 2m). This fill layer was typically underlain by native compact sand with a thickness ranging from about 0.5m to 1.5m (Test holes AH14-01 and AH1-02 and TP14-08 in the area of the proposed Arena did not encounter the native sand layer). The native sand layer was underlain by soft to very soft organic silt overlying firm peat. In the area of the proposed Arena, where the sand layer was not encountered, organic silt was encountered in the Auger Holes but not the test pits, likely due to limited depth of excavation. TP14-05, TP14-06, AH14-01 and AH14-02 encountered the organic silt and did not encounter peat; however, it is possible the test pits were not deep enough to expose a peat layer underlying the organic silt. The auger holes encountered a firm silt layer with increasing sand content with increasing depth, underlain by sandy silt in AH14-01 and sand with wood fibers in AH14-02. Bedrock was encountered at 6.4m and 9.1 m in AH14-01 and AH14-02 respectively. Based on the two auger holes the bedrock surface has an apparent dip to the north of about 1H: 2V; however, this is based on very limited data and should be confirmed with further geotechnical exploration. Test pits TP14-02 through TP14-04 and auger hole AH14-02 encountered substantial wood remnants and/or fibers within both the organic silt layer (Test Pits) and in the base sand layer (Auger Hole) indicating the possibility of buried trees within the subgrade soils.

The hand auger within Phase 1 was located in the undeveloped area east of the existing gravel pit area and encountered a layer, about 1.5m thick, of soft to firm silt to organic silt overlying soft to firm organic silty peat about 0.5m thick underlain by soft to firm peat. The hand auger hole was terminated at about 2.3m depth on buried wood.

Groundwater was encountered at depths ranging from about 0.9m (TP14-07) to 2.3m (TP14-04). Variability in groundwater table levels within Phase 1 appeared to be relatively large over short distances (i.e. 1.1m over about 40m between TP14-04 and TP14-05), possibly due to variability in soil types and land use. It should be noted that groundwater levels typically vary seasonally and with changes in precipitation, land use and other factors. It is pointed out that intermittent, shallow, perched groundwater conditions can occur where relatively impervious soils are overlain by a permeable soil layer.

4.2 Phase 2

Based on the hand auger information, subsurface conditions within Phase 2 generally consisted of silt, of varying consistency, and soft peat layers. The surficial silt and peat layers were generally underlain by other silt and peat layers. A localized surficial stiff silt layer was also noted (HA14-05). No firm

bottom to the peat and silt was encountered in the hand auger holes to depths of about 3m. Soils were typically wet, with the exception of HA14-05 where stiff moist silt was encountered.

Groundwater was generally noted at surface with the exception of the area near HA14-05, which had slightly higher elevation than the adjacent grades and groundwater was not encountered in the hand auger hole (ended at a depth of 0.8m due to hard augering). It should be noted that groundwater levels typically vary seasonally and with changes in precipitation, land use and other factors. It is pointed out that intermittent shallow perched groundwater conditions can occur where relatively impervious soils are overlain by a permeable soil layer.

5.0 DISCUSSION AND RECOMMENDATIONS

As discussed above, subsurface soils in the southern portion of Phase 1 generally consisted of sand and gravel fill materials overlying bedrock. Subsurface soils in the northern portion of Phase 1 generally consisted of sand and gravel fill materials overlying silt, organic silt, peat and sand. Subsurface conditions within Phase 2 generally consisted of surficial soft peat or silt underlain with peat or silt. Localized surficial stiff silt zones were also encountered.

It is anticipated that buildings would be supported with raft foundations placed on structural fill placed on preloaded ground or on pile supported foundations in the northern portion of Phase 1 and on conventional strip and pad footings placed on structural fill placed on bedrock in the southern portion of Phase 1. Consideration could be given to moving the proposed arena such that the building envelope is within the southern portion of Phase (shallow bedrock). The shift of the building envelope would result in site preparations, seismic considerations etc. being similar to those described for the southern portion of Phase 1 below. Consideration could be given to moving the proposed arena to the southern portion of Phase 1 where the building could be supported on conventional strip and pad footings with site preparation, seismic considerations being as described for the southern portion of Phase 1.

The sections below provide geotechnical recommendations for site preparations for building foundations and playing fields, foundation design recommendations for buildings, seismic considerations, parking and drive aisles, backfill, slab-on-grade, sub-drainage, methane considerations and further geotechnical exploration to finalize building design.

5.1 Foundation Design

Foundation design for proposed buildings is anticipated to vary with the variations in subsurface conditions, particularly with respect to the presence of shallow bedrock. In the southern portion of Phase 1 bedrock was generally encountered at less than 1m depth from existing surface elevation, whereas depth to bedrock was up to 9.1m in the northern portion.

It is expected that proposed buildings founded in the southern portion of Phase 1 (pool) could be supported on bedrock or structural fill placed thereon. The following foundation values should be used for design of footings in the southern portion of Phases 1:

Foundation Material	Factored Ultimate Bearing Resistance	Allowable Bearing Pressure
Bedrock or structural fill placed thereon	375 kPa	250 kPa

The bearing capacities provided above are subject to the following conditions:

- Footings are setback a suitable distance from finished fill or cut slopes with locations approved by the geotechnical engineer;
- Strip and pad footings have minimum widths of 450mm and 600mm respectively;
- Footings are founded a minimum of 600mm below adjacent finished grade for confinement and frost protection purposes;
- Site preparations are completed as described in Section 5.2 "Site Preparation" and load bearing surfaces have been reviewed and approved by the geotechnical engineer.

To address potential ongoing post construction settlement, in the northern portion Phase 1, we recommend a raft or pile foundation. In addition to settlement from static loading, there is potential for seismically induced settlement and lateral spread following the design earthquake (see Section 5.3 "Seismic Considerations" below). A relatively thick layer of structural fill is recommended beneath building raft foundations due to the low bearing strength of the native soils and to provide uniformity of support to further moderate differential settlement. A raft foundation underlain by a substantial layer of structural fill will be more tolerant of differential settlement arising from potential liquefaction, which could occur during the design earthquake, as well as from the continued consolidation under dead plus live loads.

The following foundation values should for the foundation design of a raft foundation (Northern portion Phase 1):

Foundation Material	Maximum Average Contact Pressure	Maximum Localized Contact Pressure	Modulus of Subgrade Reaction
Min. 1m structural fill placed on loose to compact native sand or silty sand	40 kPa	60 kPa	25,000 kN/m^3

The values provided above are subject to the following conditions:

- The foundation is setback a suitable distance from finished fill or cut slopes with locations approved by the geotechnical engineer;

- Foundation is a minimum of 600mm below adjacent finished grade for frost protection purposes;

- Site preparations have been completed as described in Section 5.2 Site Preparation and load bearing surfaces have been reviewed by a geotechnical engineer;

- Settlement due to surcharge material (preload) has been determined to be sufficient by the geotechnical engineer prior to removal.

Pile foundations for proposed buildings located in the northern portion of Phase 1 would be end bearing on bedrock. Details regarding pile foundation design could be supplied as further geotechnical exploration is completed and building design advanced.

It is recommended that footing support not transition between structural fill and bedrock due to potential for significant differential settlement.

5.2 Site Preparation

Recommendations regarding site preparation for proposed buildings and playing fields will vary based on building foundation design and tolerance for ongoing maintenance for playing fields. A discussion of recommended site preparation is provided below.

5.2.1 Buildings and Parking/ Drive Areas

In the southern portion of Phase 1, site preparation should include removal of vegetation and loose fill materials to expose bedrock. Restoration or increases in grade should be achieved by the placement of structural fill consisting of well-graded 75mm minus pit run sand and gravel or 150mm minus shot rock with less than 5% fines passing the 75µm sieve. The structural fill should be placed in lifts with a maximum loose thickness of 300mm compacted to at least 95% Modified Proctor Maximum Dry Density (MPMDD). Structural fill placed below footings should extend a distance beyond the outside edge of footings at least equal to the thickness of the structural fill layer.

In the northern portion of Phase 1, load supporting areas, parking areas, walkways and other hard landscape features site preparation should include removal of vegetation and deleterious materials to expose silty sand, gravel fill or compact sand.

If a raft foundation system, is to be used to support proposed buildings in this area preloading of the building envelope is recommended. Settlement monitoring of the preload should consist of placement of settlement gauges near the crest of each corner of the preload surcharge and within the centre of the preload surcharge. Final settlement gauge placement should be reviewed and approved by the geotechnical engineer. Monitoring of the settlement gauges should be conducted prior to placement of surcharge, immediately after placement of surcharge or after each lift as appropriate, once a week for the first month and every two weeks for the next two months and monthly thereafter. The preload height would be determined after proposed dead and live loading for the building is finalized. The surcharge crest should extend beyond the building envelope at least 2m with slopes no steeper than 2H: 1V.

For a raft foundation system the raft foundation should be founded on a relatively thick layer of structural fill. The recommended minimum thickness of the structural fill layer is 1.0m relative to the bottom of the slab.

Density testing of sand and gravel structural fill should be conducted to confirm recommended compaction has been achieved with confirmation of shot rock structural fill compaction being conducted by visual methods by the geotechnical engineer.

For pile supported foundations site preparation should include removal of vegetation and levelling and compaction of existing fill materials to provide a stable base for pile driving equipment. It should be noted that if buildings are pile supported, the surrounding areas may experience ongoing settlement relative to the building.

5.2.2 Playing Fields

The playing fields are generally located within Phase 2 and the northern portion of Phase 1. Subsurface conditions range from soft silt and peat at surface underlain by soft to firm silt and soft peat to firm silt at surface. It is assumed that some fill will be required to be placed on the areas considered for playing fields due to high (near surface) groundwater levels. Due to the highly variable nature of subsurface soils and their compressibility, differential settlement across the playing surfaces should be anticipated. Preloading of the playing surfaces would help mitigate the differential settlement; however, some long term differential settlement will still likely occur. The decision to preload should be based on economics of preloading versus performance issues and ongoing maintenance costs of releveling playing fields. Monitoring of preload will provide an estimate of differential settlement to expect over the long term.

Site preparation should include removal of vegetation and mowing of grass in peat areas leaving the sod untouched. Fill material to increase or restore grade should consist of pit run sand and gravel with less than 5% fines content to allow for suitable compaction. Fill material should be placed in lifts with a maximum loose thickness of 300mm, compacted with several passes of a ride-on type vibratory steel drum roller.

As final design elevations, playing field layout and general maintenance strategy is advanced; further geotechnical recommendations could be provided.

5.3 Seismic Considerations

The British Columbia Building Code (BCBC 2012) provides guidelines and parameters for seismic design. The design earthquake corresponds to a 2% probability of exceedance in 50 years, which is equivalent to a 1 in 2475 year return period. The Natural Resources Canada website provides site specific interpolated seismic hazard values and indicates a peak horizontal firm ground acceleration of 0.280g corresponds to the 1 in 2475 year earthquake event for the Pemberton area. The inferred earthquake magnitude for the design earthquake is 7.0.

Results of the geotechnical exploration indicates bedrock overlain with granular fill on the southern portion of Phase 1 and interbedded sand, peat, organic silt and silt in the northern portion. Based on this information, liquefaction of the subsurface soils in the southern portion of Phase 1 is not expected.

However, the design earthquake motion would be altered or amplified as the motion propagates though the loose, or soft soils at sites where the firm ground is deeper, such as the northern portion of Phase 1. To account for the amplification factor in this type of ground BCBC 2012 recommends the use of the Foundation Factor Fa and Fv for short and long period respectively. The site classification for the northern portion of Phase 1 from Seismic Response Table 4.1.8.4.A from BCBC 2012 is considered to be Site Class F. Assessment of liquefaction potential, lateral spread and seismically induced settlement for the northern portion of Phase 1 would require further geotechnical exploration (see Section 5.10 "Further Geotechnical Exploration").

5.4 Parking Lot and Drive Areas

Parking lot and drive areas in the northern portion of Phase 1 should be preloaded to mitigate future differential settlement issues (see Section 5.2 "Site Preparation").

The structural fill used for the buildings should be suitable for use as structural fill for grade increases below base and sub-base gravels. Sub-base and base gravels should conform to the gradation tables provided in the most recent MMCD (Tables 2.9 and 2.10 respectively). Sieve analysis of sub-base and base course fills should be completed to confirm compliance with MMCD.

Sub-base and base course should be compacted to at least 95% Modified Proctor maximum dry density with density testing conducted to confirm adequate compaction has been achieved.

5.5 Backfill

Backfill for perimeter areas or for support of exterior sidewalks, patios, etc. should consist of well-graded pit run sand and gravel with less than 5% fines content. The backfill should be placed in lifts with a maximum loose thickness of 300mm compacted to a minimum 95% MPMDD. Placed structural fill should be density tested to confirm recommended density has been achieved.

5.6 Slab-on-Grade

Slab-on-grade should be supported on suitably prepared subgrades as described in Section 5.2 "Site Preparation". A 100mm thick layer of 19mm clear crushed gravel should be placed beneath concrete slabs to provide a bedding and drainage layer for potential seepage zones. The clear crushed gravel layer should have an outlet to the perimeter drains (if required, see Section 5.9 "Sub-Drainage") via weep holes through the foundation walls of the building. A layer of 6 mil poly vapour barrier should be placed over the clear crushed gravel to protect it from concrete contamination and to limit dampness of the slab from capillary moisture which could damage floor coverings.

5.9 Sub-Drainage

A perimeter drain should be installed for buildings where the floor slab is less than 150mm above adjacent finished grade. The perimeter drain should consist of 150mm diameter perforated PVC pipe surrounded by at least 150mm of 19mm clear crushed gravel separated from the remaining backfill by a layer of birds eye gravel. The perimeter drains should be installed no deeper than the underside of the adjacent footing base. The perimeter drain should be connected to a pumped sump or suitable gravity outlet. Roof drainage should be in a separate drainage system.

5.10 Methane Potential

It is considered likely that methane gas will be generated by organic soils and peat in the northern portion of Phase1. In order to prevent build-up of methane, appropriate ventilation and mitigation of the building should be designed.

5.11 Further Geotechnical Exploration

In order to finalize geotechnical recommendations for the proposed development, further geotechnical exploration would be required, particularly with respect to seismic considerations.

Recommended additional geotechnical exploration would include the following tasks:

- Seismic Cone Penetrometer Tests (SCPT's) for building to be located in the northern portion of Phase 1;
- Additional auger test holes (in conjunction with SCPT's) to delineate depth to bedrock and confirm transition from bedrock to soft soil foundation regimes;
- Possibly further test pits within Phase 2 to further delineate surficial soil types; however, this item may be accomplished during construction after better access has been constructed.

5 CLOSURE

Exp has prepared this report based on the referenced information and our understanding of the project as described in this report. If the development plans change or if subsurface conditions are noted to differ from those described, **exp** should be notified and the recommendations provided regarding the geotechnical aspects of this project reviewed and, if deemed appropriate, modified.

This report was prepared for the exclusive use of our client and their designated consultants or agents and may not be used by other parties without the written consent of **exp** Services Inc. The attached "Interpretation & Use of Study and Report" forms an integral part of this report and must be included with any copies of this report.

Sincerely,

exp Services Inc.

PROFESSIONAL ENGINEER OF BRITISH COLUMBIA E. G. SYKES 28/14

Evan Sykes, P.Eng.
Senior Engineer

Reviewed by:

Ben Weiss, P.Eng.
Senior Engineer

Enclosure: Interpretation & Use of Study and Report
Key Plan (Figure 1)
Testhole Location Plan (Figure 2)
Test Hole Logs (TP14-01 through TP 14-10; AH14-01 & AH14-02; HA 14-01 through HA 14-06)

ES/es

exp RE 2014 02 27 Geotechnical Review Proposed Recreation Complex, Pemberton, BC

INTERPRETATION & USE OF STUDY AND REPORT

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental consulting unless specifically stated in the engineering report.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5. INTERPRETATION OF THE REPORT

a. Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b. Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

c. To avoid misunderstandings, **exp** Services Inc. (**exp**) should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by **exp**. Further, **exp** should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with **exp**'s recommendations. Any reduction from the level of services normally recommended will result in **exp** providing qualified opinions regarding adequacy of the work.

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The Client agrees that both electronic file and hard copy versions of **exp**'s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except **exp**. The Client warrants that **exp**'s instruments of professional service will be used only and exactly as submitted by **exp**.

The Client recognizes and agrees that electronic files submitted by **exp** have been prepared and submitted using specific software and hardware systems. **Exp** makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

275 – 3001 Wayburne Drive
Burnaby, BC V5G 4W3 Canada
T: 604.874.1245 • www.exp.com

Memorandum

Date:	February 26, 2016	**From:**	Evan Sykes, P.Eng.
To:	Pemberton Sports Field	**Project No.:**	VAN-00231683
Prepared By:	Evan Sykes, P.Eng.		
Project Name:	Pemberton Sports Field		
Subject:	Addendum Geotechnical Review dated February 24, 2016 Rev 1		
Distribution:	Cam McIvor (580049 BC Ltd.)		

As requested, **exp** Services Inc. (**exp**) is providing additional information regarding the proposed development of a parking/ sports field in the area of Pemberton Farm Road, Pemberton, BC. This addendum should be read in conjunction with the **exp** report titled "Geotechnical Review – Proposed Parking Lot/ Sports Field Rev 2, Pemberton Farm Road, Pemberton, BC", dated February 24, 2016. The purpose of this addendum is to clarify requirements for mowing of vegetation, structural fill and compaction. Each of these items is discussed below.

1. The referenced report recommends mowing of the vegetation within the proposed development area. This includes larger shrubs and small trees. As indicted in the report roots should be left in place so as not to disturb the sod mat. In addition, it is not considered necessary to remove the mulch left by the mowing process.

2. Prior to using the proposed structural fill material, granular soils dredged from a nearby creek, the material should be sampled and a grain size analysis completed. The structural fill material should have a fines content passing the 0.075mm sieve of less than 5%;

3. The placed and compacted structural fill should be tested to confirm that at least 95% Modified Proctor Maximum Dry Density (MPMDD) value has been achieved in the upper 300mm and 90% MPMDD in the fills below. Density testing for the upper 300mm should be completed with a spacing of not more than 30m and 60m for the lower fills.

If there are any questions regarding this addendum please call the undersigned.

Memorandum (*cont'd*)

Addendum Geotechnical Review, Pemberton Sports Field, Pemberton, BC
VAN-00231683
February 25, 2016

Sincerely,

exp Services Inc.

February 26, 2016

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. G. SYKES

Evan Sykes, P.Eng.
Senior Engineer

Reviewed by:

Matthew Yip, P.Eng.
Senior Engineer

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FIELD MEMO

65189

☒ BURNABY OFFICE
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☐ KAMLOOPS OFFICE
Unit 100B, 1425 Pearson Place
Kamloops, B.C., Canada V1S 1J9
Phone: 250 372-5321 Fax: 250 372-1678

CLIENT: ~~Cam~~ 580049 BC Ltd.
PROJECT NO.: VAN-00231683-A0
ATTENTION: Cam McIvor
DATE: March 8, 2016
CC:
FROM: Evan Sykes, P.Eng.
ATTENTION:

SERVICE PROVIDED: Site Review

LOCATION: Proposed Sports field, Old Pemberton Farm Rd, Pemberton, BC

OBSERVATIONS:

In accordance with agreed site Review requirements, exp Services Inc (exp) completed a field review of placement of structural fill required to increase grade to design elevations. Grass throughout the site had been mowed trees removed with trunk ground down to surface level ~~and~~ and geogrid placed on original ground surface with at least 300mm overlap. Sand and gravel was being placed over the geogrid and track packed in a single lift. Following placement the structural fill should be compacted with a heavy ride-on type roller to achieve 95% Modified Proctor density. Density testing at surface and at depth as recommended in previous memoranda should be completed.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. G. SYKES

"MEMO SHALL NOT BE CONSTRUED AS AUTHORIZATION FOR EXTRA PAYMENT. ALL CLAIMS FOR EXTRA PAYMENT REQUIRE THE APPROVAL OF THE CONTRACT ADMINISTRATOR."

exp Services Inc. Per

March 8, 2016

Signature

February 24, 2016 Reference No. VAN-00231683-A0

580049 BC Ltd.
c/o Festival Land Company
PO Box 494
Pemberton, BC V0N 2L0
Email: cmcivor@gmail.com

Attention: Mr. Cam McIvor

Re: Geotechnical Review – Proposed Parking Lot/Sports Field Rev 1
Pemberton Farm Road, Pemberton, BC

Dear Mr. McIvor:

1.0 INTRODUCTION

As requested, **exp** Services Inc. (**exp**) has completed a geotechnical review with respect to the development of a sports field to be located on an undeveloped parcel of land located near the north end of Pemberton Farm Road, Pemberton, BC. This review was completed in general conformance with an **exp** proposal submitted to 580049 BC Ltd. on February 17, 2016 and accepted by the Client on the same date.

This review is based on the following information:

- Site reconnaissance by **exp** personnel completed in 2014;
- Test pits, auger holes and hand augers completed within and adjacent to the proposed sports field completed by **exp**;
- Review of proposed location of the sports field as provide by the Client; and,
- Discussions with the Client with respect to development plans.

The scope of services for this geotechnical review was limited to the provision of geotechnical engineering only and did not include any provision for environmental assessment.

2.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is located about 3 km east of downtown Pemberton about 150m east of Old Pemberton Farm Road. The subject site is accessed via Highway 99 which intersects Old Pemberton Farm Road about 600m south of the subject site. The proposed development site is roughly triangular in shape with an approximate area of about 1.5 Ha. The site is surrounded by undeveloped land with a gravel-surfaced parking area immediately east of the site. The area to the southeast of the site has been used as a rock quarry with crushing operations on-site.

The site is generally flat lying with elevations ranging from about 206m to 207m geodetic, generally increasing from east to west. Localized water ponding has been noted within the subject site, particularly west of the quarry area.

Vegetation within the subject area was restricted to the eastern portion of the site and generally consisted of grass, assorted deciduous trees with trunk diameters up to about 100mm and localized evergreen trees with trunk diameters up to about 125mm.

We understand that the proposed development of the subject area consists of constructing a gravel-surfaced parking area for the Pemberton Music Festival in the near term, followed by construction of a sports field in the long term. We understand that the gravel parking to be located in the subject area is to be temporary and tolerant of significant potential settlement and could be regarded as required. The sports field would be developed as a permanent feature with considerably less settlement tolerance.

3.0 GEOTECHNICAL EXPLORATION

A previously completed geotechnical exploration consisted of twelve (12) test pits ranging in depth from about 0.3m to 4.1m, two (2) solid stem auger holes to depths of about 6.4m and 9.1m, and six (6) hand augers ranging in depth from about 0.4m to 3.0m. All test holes were located, logged and sampled by **exp** personnel with samples being returned to **exp**'s laboratory for further visual classification and moisture content analysis as deemed appropriate.

Test hole locations are shown on the attached Testhole Location Plan (Figure 2). Detailed descriptions of soils encountered in the test holes are provided on the attached Test Hole Logs with results of moisture content analysis.

4.0 SUBSURFACE CONDITIONS

In general, subsurface conditions within the subject area appeared to consist of relatively shallow bedrock in the southwestern portion of the site with increasing soil thickness to the north. It appeared the bedrock dipped steeply and the thickness of the soil overburden increases rapidly to the north. The southwestern zone (TP14-12) appeared to consist of sand and gravel or blasted boulders with a sand and gravel matrix up to about 1m thick underlain by bedrock.

The northern portion (TP14-02 and TP14-03) appeared to consist of a surficial layer of compact silty sand/ sandy silt with some gravel, cobbles and boulders fill with a thickness of about 1.3m to 2.0m. The fill layer was underlain by layers of peat and organic silt with interbeds of compact sand up to about 0.8m thick. A hand auger (HA14-01) located in the southeastern portion of the subject area encountered silt to organic silt and peat to depths of about 2.3m.

Based on the geotechnical exploration, groundwater levels appeared to vary considerably across the subject area, from a depth of about 1.2m to 1.8m in the north portion (TP14-02 and TP14-03, respectively), to 0.4m in the southeast area (HA14-0), and 1.2m in the southwestern area (TP14-12). It should be noted that groundwater levels typically vary seasonally and with changes in precipitation, land use and other factors. Intermittent, shallow, perched groundwater conditions can occur where relatively impervious soils are overlain by a permeable layer.

5.0 DISCUSSION AND RECOMMENDATIONS

Recommendations for site preparation for temporary parking lot and a permanent sports field are provided below.

5.1 Parking Lot

Site preparations for temporary parking lot should consist of mowing of grass in peat areas leaving the sod untouched. Trees and other shrubbery should be removed; however, the roots should be left in place so as to not disturb the adjacent sod. A layer of biaxial geogrid panels, such as Nilex BX 1200, or approved equivalent should be placed over the sod mat prior to placement of structural fill or surface gravels. In areas requiring grade increases, structural fill consisting of pit run sand and gravel should be placed with a maximum loose thickness of 900mm, compacted with several passes of a static ride-on type steel drum roller. We understand that material from nearby river dredging would be available for grading purposes. Previous experience with this material indicates it is generally low in fines content and would be suitable. In general, in areas where no previous fill has been placed the structural fill layer should be at least 900mm thick.

In order to provide a drivable surface a layer of base gravels (19mm minus crushed gravel) placed over the parking area may be prudent. The parking surface should be reviewed prior to the festival to confirm an adequate drivable surface is present.

5.2 Sports Field

Due to the permanent nature of the proposed sports field and relative low tolerance to settlement, it is recommended that the area be preloaded prior to construction of the field. Due to the highly variable and often compressible nature of the subsurface soils throughout the proposed sports field area, differential settlement across the playing surface should be anticipated. Preloading of the playing surface would help mitigate the differential settlement; however, some long-term differential settlement will still likely occur. Monitoring of the preload will provide an estimate of differential settlement to expect over the long-term.

Preload should be placed on prepared subgrade as described in the Section 5.1 above. In order to reduce the amount of preload removal and subsequent restoration of grade, structural fill for the sports field should be placed to an elevation above the design subgrade elevation such that anticipated settlement caused by the preload surcharge is less than the height of the structural fill above final design subgrade elevation (i.e., following preload removal, the structural fill is still present at design subgrade elevation). Settlement of about 1m should be anticipated; however, the thickness of the compressible soils is not known and will significantly affect the amount of settlement.

It is recommended that preloads at least 2m thick be placed over the sports field. The preload slopes should be inclined no steeper than 1.5H: 1V (Horizontal:Vertical) with the crest of the slopes extending at least 2m beyond the settlement sensitive areas. Settlement gauges should be installed in a grid pattern with a spacing of about 10m. The settlement gauges should be placed directly on the ground surface prior to placement of preload. Elevations of the preload surveyed prior to placement of any preload and immediately following placement of preload. The settlement gauges should be surveyed weekly following placement of preload for six (6) weeks and monthly after that. A plan of settlement gauge locations, toe and crest of preload slopes and all survey data collected should be forwarded to

the Geotechnical Engineer for review and analysis. Settlement tolerances over the long-term should be forwarded to the Geotechnical Engineer to allow for determination of timing for preload removal.

6.0 CLOSURE

Exp has prepared this report based on the referenced information and our understanding of the project as described in this report. If the development plans should change or subsurface conditions are noted to differ from those described in this report, **exp** should be notified in a timely manner and the recommendations provided regarding the geotechnical aspects of the project reviewed and, if deemed appropriate, modified.

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Sincerely,

exp Services Inc.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. G. SYKES

February 24, 2016

Evan Sykes, P.Eng.
Senior Engineer

Reviewed by:

Matthew Yip, P.Eng.
Senior Engineer

Enclosures: Interpretation & Use of Study and Report
Key Plan (Figure 1)
Testhole Location Plan (Figure 2)
Testhole Logs (HA14-01, TP14-02, TP14-03, TP14-12)

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INTERPRETATION & USE OF STUDY AND REPORT

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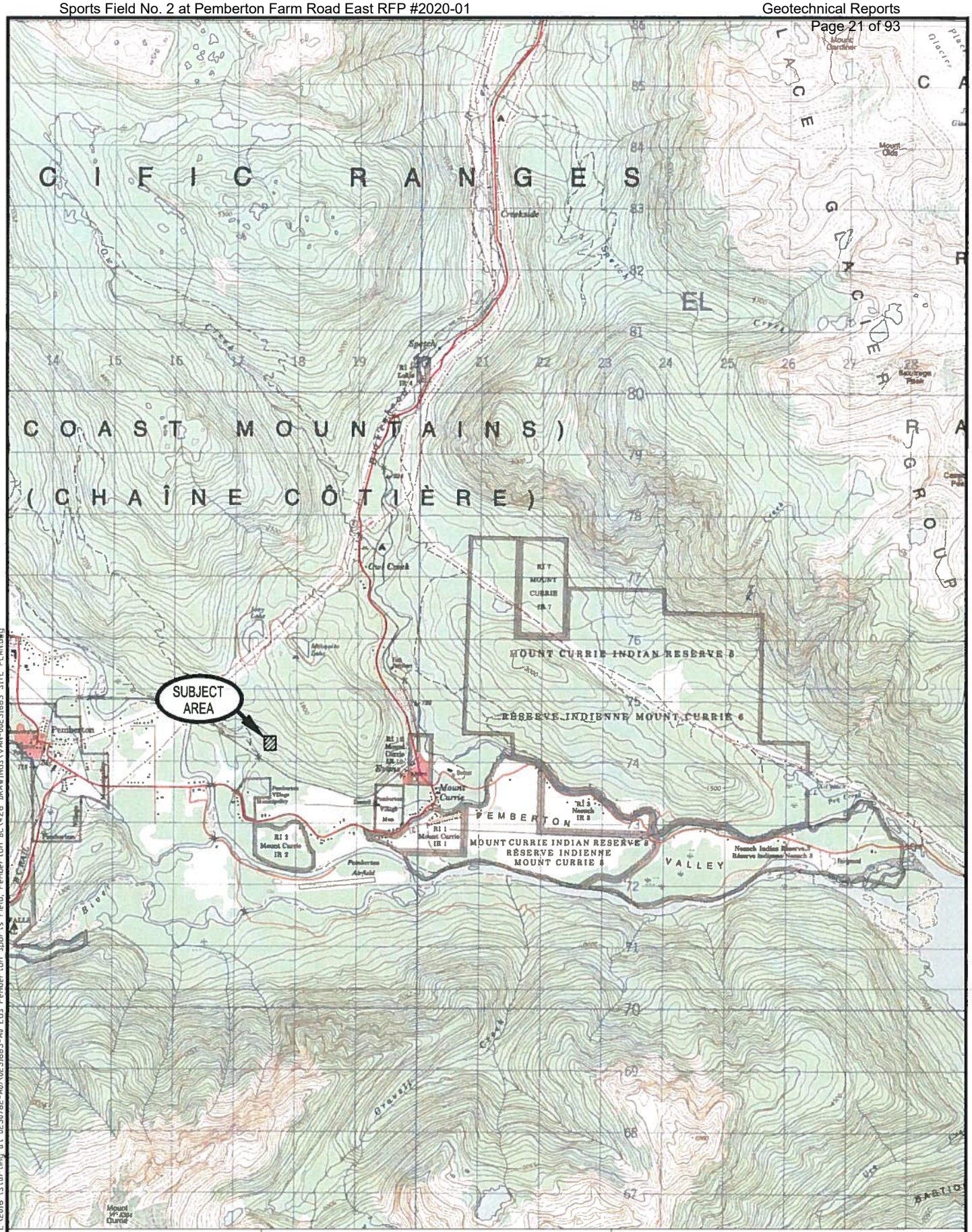

Tuesday, February 23, 2016 9:07:30 AM
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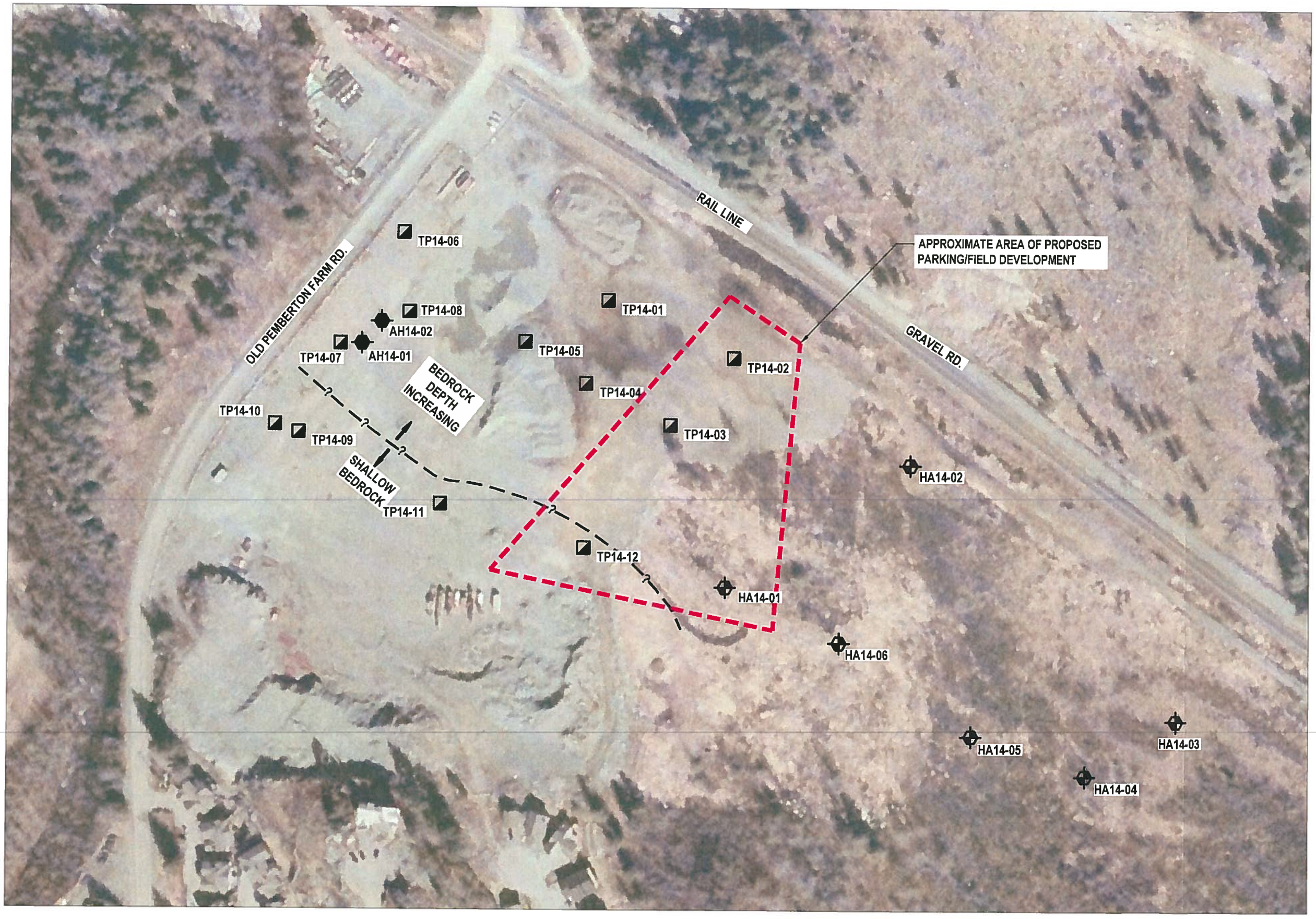
CLIENT: 5800049 BC LTD.				TITLE: KEY PLAN NTS MAP 92J07		
PROJECT: PARKING/FIELD DEVELOPMENT OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.						
PROJECT NO.: VAN-00231683-AO	DFTR.: PDL	DSGN.:	CHK.: EGS	DATE: 2016-02-23	SCALE: N.T.S.	DWG NO.: FIGURE 1



LEGEND

- TEST PIT
- AUGERHOLE
- HAND AUGER

REFERENCE DRAWING FROM CROSLAND DOAK LANDSCAPE ARCHITECTURE + BUILDING DESIGN DATED 2012-04-24

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exp Services Inc.
275–3001 Wayburne Drive
Burnaby, British Columbia V5G 4W3
Telephone: 604–874–1245
Fax: 604–874–2358
exp.com

DFTR. MG/PDL	REVISIONS	CLIENT 5800049 BC LTD.	TITLE: TESTHOLE LOCATION PLAN
DSGN. DS	No. / DESCRIPTION / DATE	PROJECT PARKING/FIELD DEVELOPMENT OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.	
CHK. EGS		PROJECT NO. VAN-00231683-A0	DATE 2016-02-23 / SCALE: 1:2000 / DWG NO. FIGURE 2

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exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF HAND AUGER : HA14-01

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
DRILLING DATE 2/3/14
HAND AUGER LOCATION N: 5574009 E: 517379
DRILLING CONTRACTOR exp Services Inc.
ELEVATION
DRILLING METHOD Hand Auger
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** 0.4m visible free water
LOGGED BY DGS **CHECKED BY** EGS
▽ **AFTER DRILLING** —

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILT to ORGANIC SILT, some sand, some rootlets, some organics, brownish grey with rust inclusions, moist to wet, (soft to firm) slight plastic							
1		-becomes sandier with depth		S17	GB				54
		ORGANIC SILTY PEAT, fibrous, brown, wet, (soft to firm)	1.4						
2		PEAT, fibrous, blackish brown, wet, (soft to firm)	2.0	S18	GB				296

Refusal at 2.3m.

NOTES: Refusal on wood

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-02

PAGE 1 OF 2

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
EXCAVATION DATE 2/3/14
TEST PIT LOCATION N: 5574125 E: 517383
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
ELEVATION
EXCAVATION METHOD Excavator
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.3m seepage
LOGGED BY DGS **CHECKED BY** EGS ▽ **AFTER EXCAVATION** —

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m 20 40 60 80	FINES CONTENT (%) 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
		SILTY SAND, some gravel to gravelly, some cobbles and boulders, some roots and rootlets, moist, brown, (compact) (FILL)		S4	GB				10
		-frozen from ground surface to 0.3m							
1		SILTY SAND & GRAVEL, pieces of plastic, grey, wet, (compact) well-graded (FILL)	0.9	S5	GB				9
		PEAT, fibrous, brown, wet, (firm) (FILL?)	1.3						
2		SAND, trace silt, grey, wet, (compact) fine grained	1.5						
		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic	2.1						
3		-becomes more wood than silt							
		PEAT, fibrous, brown, moist to wet, (firm)	3.2	S6	GB				273

Bottom of test pit at 3.5m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-02

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-02.1

Figure TP14-02.2

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
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Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-03

PAGE 1 OF 2

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
EXCAVATION DATE 2/3/14
TEST PIT LOCATION N: 5574091 E: 517351
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
ELEVATION ---
EXCAVATION METHOD Excavator
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.8m seepage
LOGGED BY DGS **CHECKED BY** EGS
▽ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
0		SILTY SAND & GRAVEL, some cobbles and boulders, some woodwaste, moist, brownish grey, (compact) (FILL)							
		-frozen from ground surface to 0.3m							
1									
2									
		SAND, trace silt, grey, wet, (compact) fine grained	2.0						
3		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic	2.8						
		PEAT, fibrous, brown, moist to wet, (firm)	3.7						

Bottom of test pit at 3.8m.

(Continued Next Page)

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-03

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-03.1
-

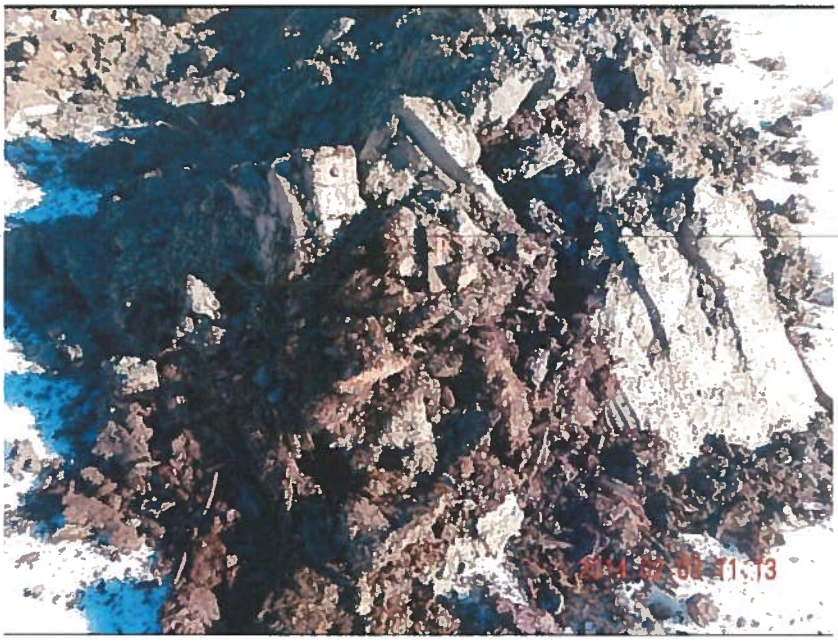


Figure TP14-03.2
-

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-12

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
EXCAVATION DATE 2/3/14
TEST PIT LOCATION N: 5574029 E: 517307
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
ELEVATION
EXCAVATION METHOD Excavator
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** —
LOGGED BY DGS **CHECKED BY** EGS
▽ **AFTER EXCAVATION** 1.2m abundant water flow

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL)							
1		BEDROCK, fractured, orange and grey, (hard) ▽	0.8						

Refusal at 1.5m.

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

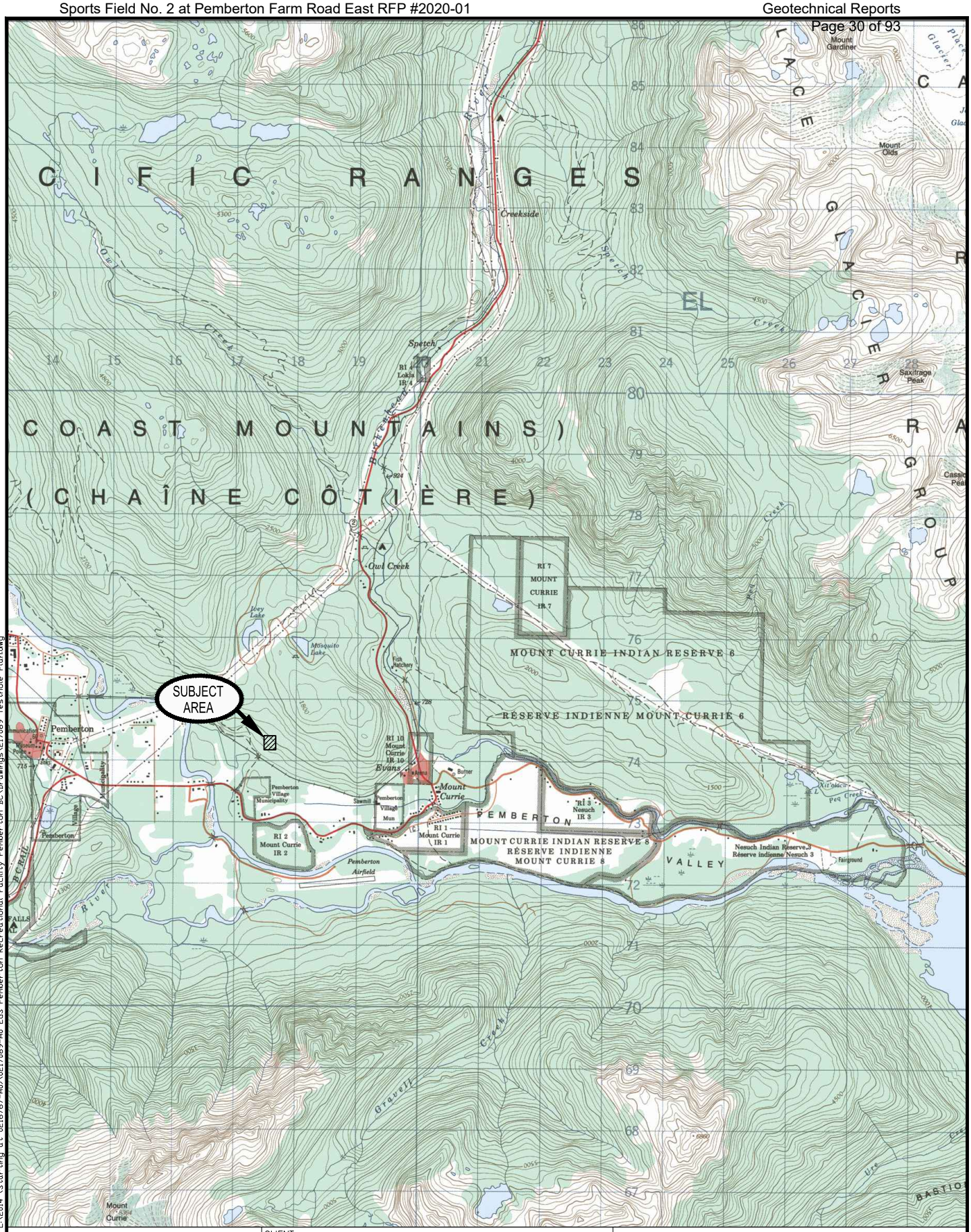
RECORD OF TEST PIT : TP14-12

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

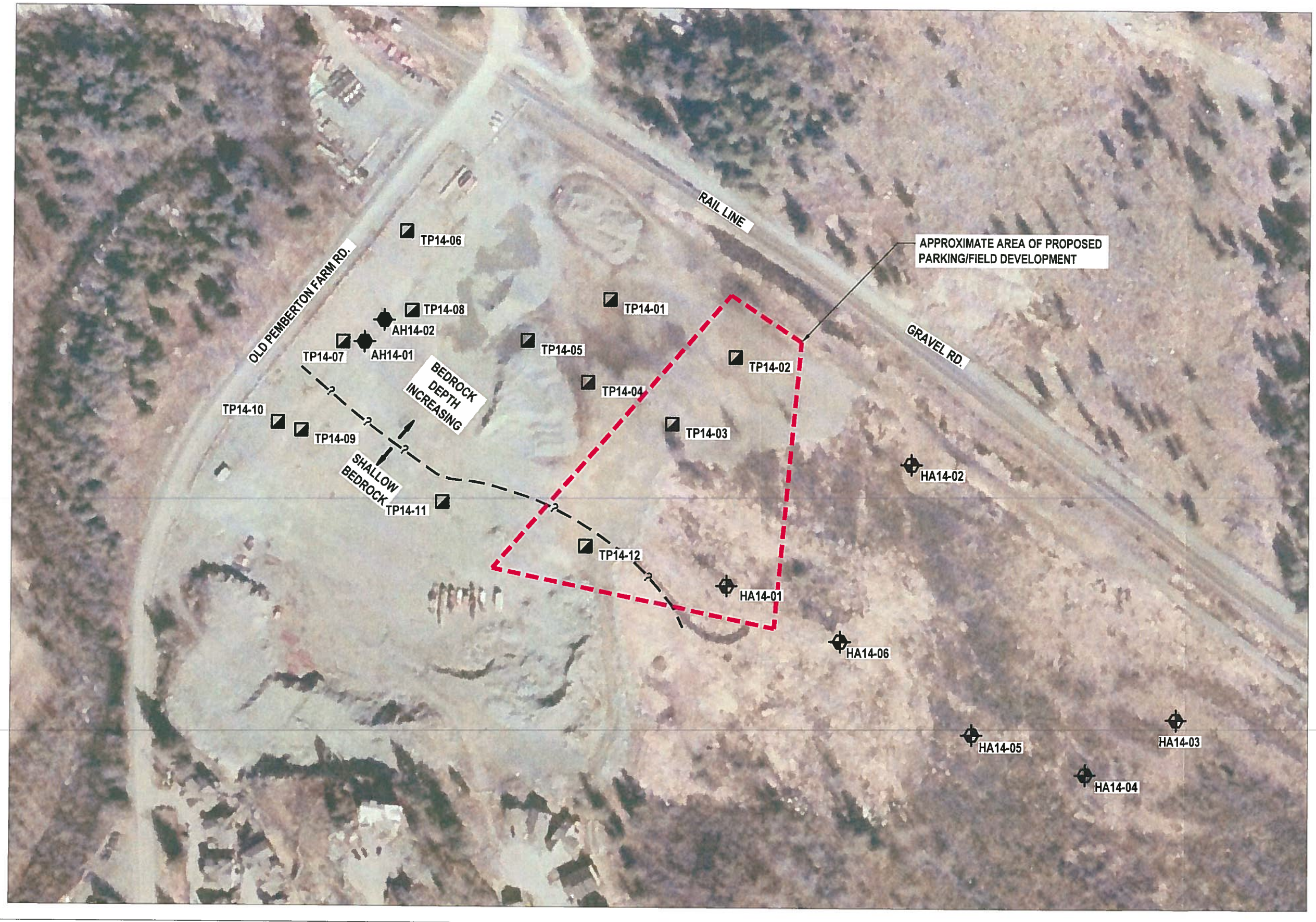
Figure TP14-12.1
-

Figure TP14-12.2
-



Wednesday, February 26, 2014 4:32:45 PM
L:\2014 YStarting at 02167767-A0\02170089-A0 EGS Pemberton Recreational Facility Pemberton BC\Drawings\2170089 Testhole Plan.dwg

exp.	CLIENT: VILLAGE OF PEMBERTON				TITLE: KEY PLAN NTS MAP 92J07	
	PROJECT: PEMBERTON RECREATIONAL FACILITY OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.					
	PROJECT NO.: VAN-00217089-AO	DFTR.: PDL	DSGN.:	CHK.: EGS	DATE: 2014-02-24	SCALE: N.T.S.	DWG NO.: FIGURE 1



LEGEND

- TEST PIT
- AUGERHOLE
- HAND AUGER

REFERENCE DRAWING FROM CROSLAND DOAK LANDSCAPE ARCHITECTURE + BUILDING DESIGN DATED 2012-04-24

0 1:2000 100

exp Services Inc.
275–3001 Wayburne Drive
Burnaby, British Columbia V5G 4W3
Telephone: 604–874–1245
Fax: 604–874–2358
exp.com

DFTR.	REVISIONS			CLIENT	TITLE
MG/PDL	No.	DESCRIPTION	DATE	5800049 BC LTD.	TESTHOLE LOCATION PLAN
DSGN. DS				PROJECT PARKING/FIELD DEVELOPMENT OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.	
CHK. EGS				PROJECT NO. VAN-00231683-A0	DATE 2016-02-23 / SCALE 1:2000 / DWG NO. FIGURE 2

Feb 23, 2016 - 9:18am L:\2016 (Starting at 0230782-A0)\0231683-A0 EGS Pemberton Sports Field, Pemberton BC\4_26 DRAWINGS\VAN-00231683 SITE PLAN.dwg

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF HAND AUGER : HA14-01

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
DRILLING DATE 2/3/14
HAND AUGER LOCATION N: 5574009 E: 517379
DRILLING CONTRACTOR exp Services Inc.
ELEVATION
DRILLING METHOD Hand Auger
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** 0.4m visible free water
LOGGED BY DGS **CHECKED BY** EGS
▽ **AFTER DRILLING** —

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILT to ORGANIC SILT, some sand, some rootlets, some organics, brownish grey with rust inclusions, moist to wet, (soft to firm) slight plastic							
1		-becomes sandier with depth		S17	GB				54
		ORGANIC SILTY PEAT, fibrous, brown, wet, (soft to firm)	1.4						
2		PEAT, fibrous, blackish brown, wet, (soft to firm)	2.0	S18	GB				296

Refusal at 2.3m.

NOTES: Refusal on wood

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-02

PAGE 1 OF 2

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
EXCAVATION DATE 2/3/14
TEST PIT LOCATION N: 5574125 E: 517383
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
ELEVATION
EXCAVATION METHOD Excavator
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.3m seepage
LOGGED BY DGS **CHECKED BY** EGS ▽ **AFTER EXCAVATION** —

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILTY SAND, some gravel to gravelly, some cobbles and boulders, some roots and rootlets, moist, brown, (compact) (FILL)		S4	GB				10
		-frozen from ground surface to 0.3m							
1		SILTY SAND & GRAVEL, pieces of plastic, grey, wet, (compact) well-graded (FILL)	0.9	S5	GB				9
		PEAT, fibrous, brown, wet, (firm) (FILL?)	1.3						
2		SAND, trace silt, grey, wet, (compact) fine grained	1.5						
		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic	2.1						
3		-becomes more wood than silt							
		PEAT, fibrous, brown, moist to wet, (firm)	3.2	S6	GB				27.3

Bottom of test pit at 3.5m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
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Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-02

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-02.1

Figure TP14-02.2

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-03

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
EXCAVATION DATE 2/3/14
TEST PIT LOCATION N: 5574091 E: 517351
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
ELEVATION —
EXCAVATION METHOD Excavator
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.8m seepage
LOGGED BY DGS **CHECKED BY** EGS
▽ **AFTER EXCAVATION** —

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
0		SILTY SAND & GRAVEL, some cobbles and boulders, some woodwaste, moist, brownish grey, (compact) (FILL)							
		-frozen from ground surface to 0.3m							
1									
2									
		SAND, trace silt, grey, wet, (compact) fine grained	2.0						
3		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic	2.8						
		PEAT, fibrous, brown, moist to wet, (firm)	3.7						

Bottom of test pit at 3.8m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-03

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-03.1
-

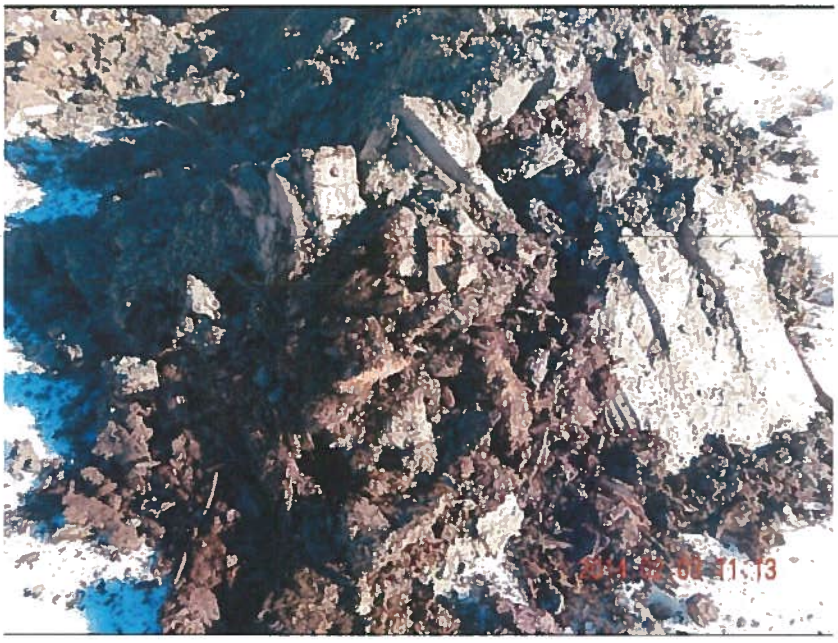


Figure TP14-03.2
-

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-12

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
EXCAVATION DATE 2/3/14
TEST PIT LOCATION N: 5574029 E: 517307
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
ELEVATION
EXCAVATION METHOD Excavator
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** —
LOGGED BY DGS **CHECKED BY** EGS
▽ **AFTER EXCAVATION** 1.2m abundant water flow

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL)							
1		BEDROCK, fractured, orange and grey, (hard) ▽	0.8						

Refusal at 1.5m.

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-12

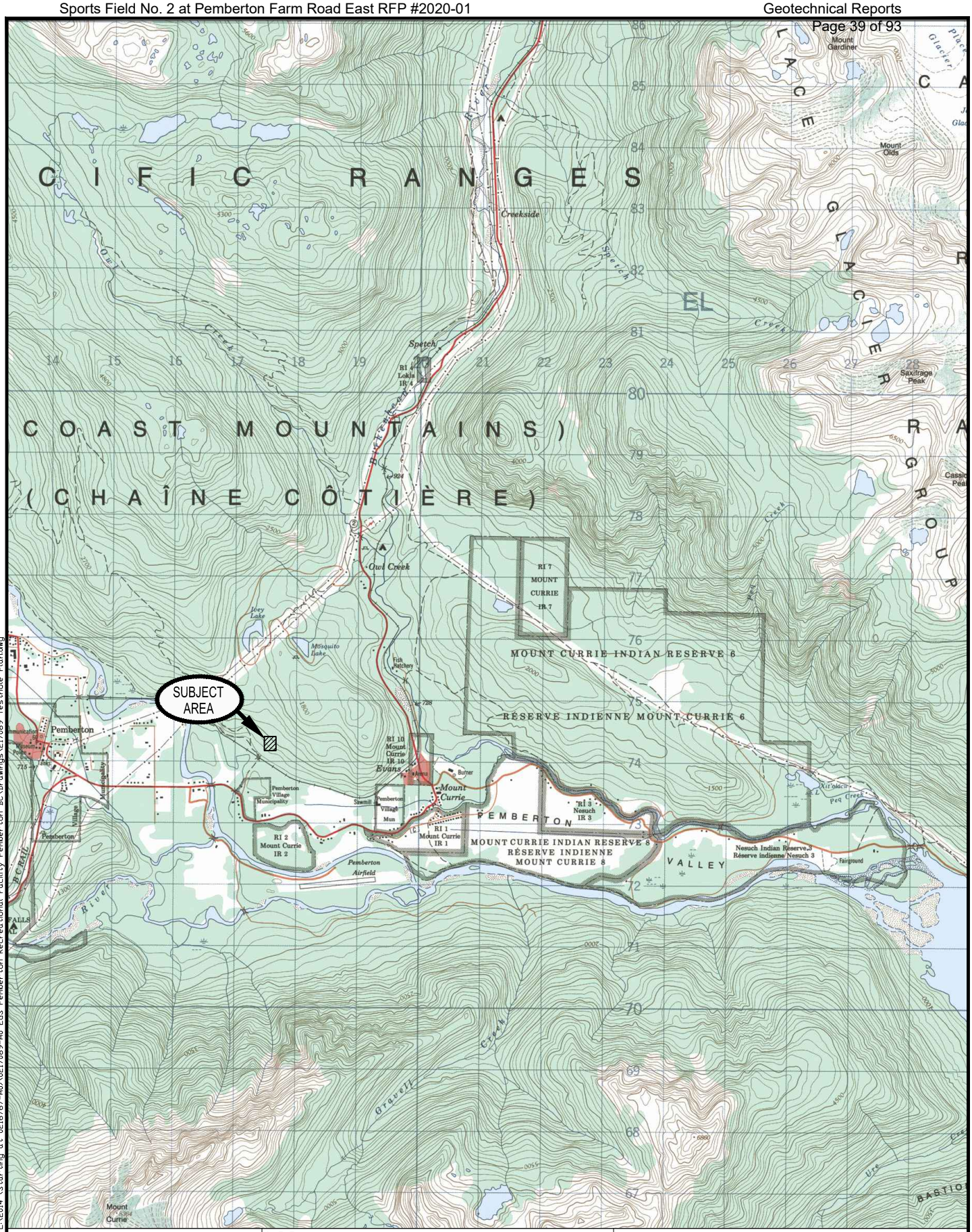
CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-12.1
-

Figure TP14-12.2
-

EXP GEO W/P: *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14



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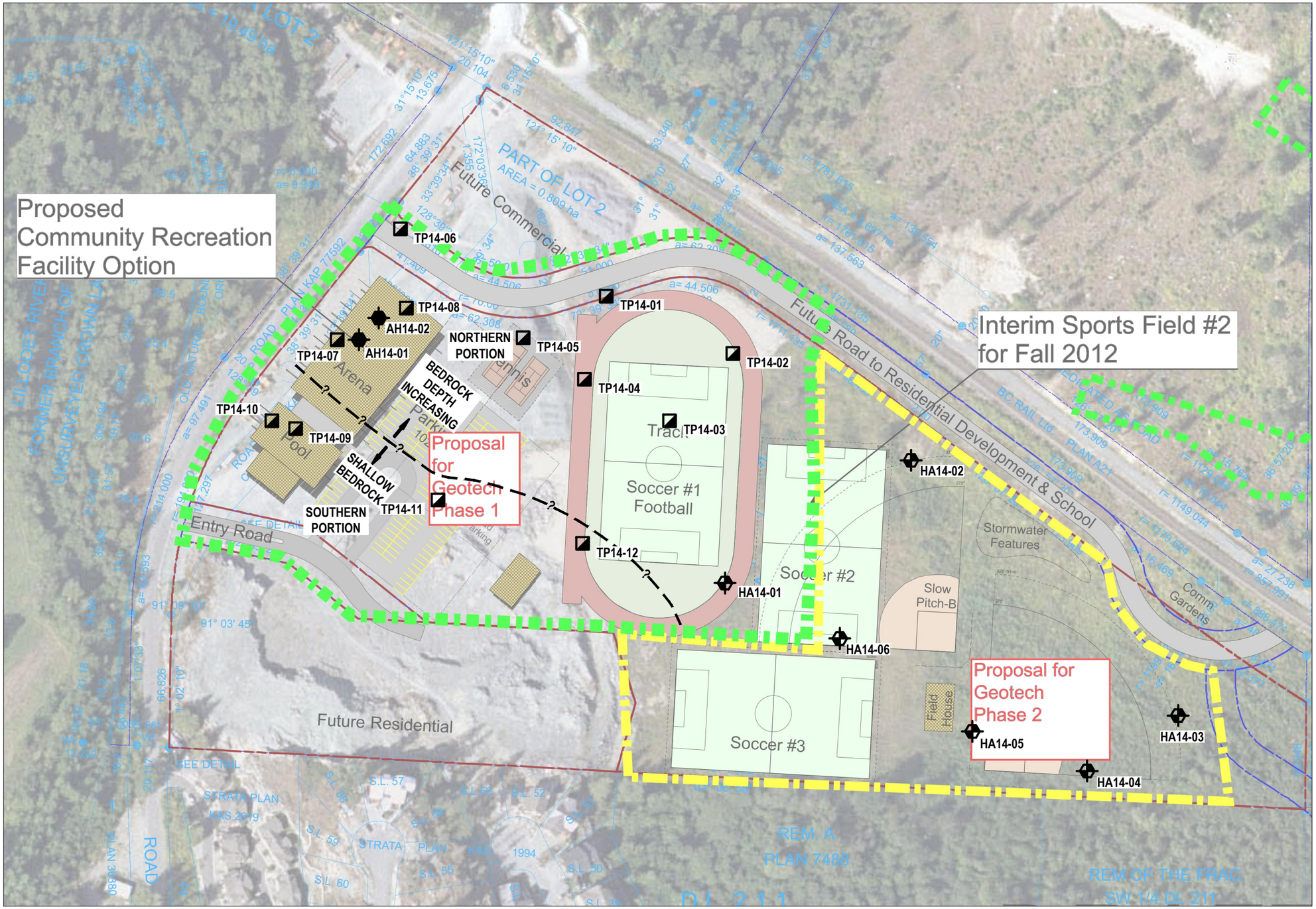
exp.	CLIENT: VILLAGE OF PEMBERTON				TITLE: KEY PLAN NTS MAP 92J07	
	PROJECT: PEMBERTON RECREATIONAL FACILITY OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.					
	PROJECT NO.: VAN-00217089-AO	DFTR.: PDL	DSGN.:	CHK.: EGS	DATE: 2014-02-24	SCALE: N.T.S.	DWG NO.: FIGURE 1



LEGEND

- TEST PIT
- AUGERHOLE
- HAND AUGER

REFERENCE DRAWING FROM CROSLAND DOAK LANDSCAPE ARCHITECTURE + BUILDING DESIGN DATED 2012-04-24

0 1:2000 100

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Feb 26, 2014 - 4:07pm

exp Services Inc.
275–3001 Wayburne Drive
Burnaby, British Columbia V5G 4W3
Telephone: 604–874–1245
Fax: 604–874–2358
exp.com

DFTR.	REVISIONS			CLIENT	TITLE:		
MG	No.	DESCRIPTION	DATE	VILLAGE OF PEMBERTON	TESTHOLE LOCATION PLAN		
DSGN. DS				PROJECT PEMBERTON RECREATIONAL FACILITY OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.			
CHK. EGS				PROJECT NO. VAN-00217089-A0	DATE 2014-02-14	SCALE: 1:2000	DWG NO. FIGURE 2

275 – 3001 Wayburne Drive
Burnaby, BC V5G 4W3 Canada
T: 604.874.1245 • www.exp.com

Memorandum

Date:	July 28, 2016	**From:**	Evan Sykes, P.Eng.
To:	Sports Field, Old Pemberton Farm Road, Pemberton, BC	**Project No.:**	VAN-00231638-A0
Prepared By:	Evan Sykes, P.Eng.		
Project Name:	Sports Field		
Subject:	Preload Recommendations Rev 1		
Distribution:	5800049 BC Ltd		

As requested, **exp** Services Inc. (**exp**) has completed a preload plan for a proposed sports field to be, located at the north end of Old Pemberton farm Road, Pemberton, BC. Existing site conditions generally consist of structural fill, up to about 1.5m thick, overlying peat up to about 2.5m in thickness. Preload has been recommended for the site in order to mitigate long term post construction differential settlement of the proposed sports field. A preload thickness of about 2m is recommended with the preload extending horizontally at least 2m beyond the prosed sports field edges with preload slopes being no steeper than 1.5H: 1V (Horizontal: Vertical). Anticipated settlement of the preload area is about 1m.

A sketch of the preload area is provide on the attached Location Plan (Figure 1); however, it should be noted that the extent of prepared area and location of the sports field are for illustration and preliminary volume calculation purposes only and are not based on survey or design. Figure also shows locations of settlement gauges to be installed and surveyed prior to placement of preload. The preload slopes and setbacks from proposed field edge are shown on the attached Figure 2.

Volume calculations for the preload quantities indicate a total volume of about 17,500 cu.m. will be required for the preload. This volume is based on the preload being placed on the existing prepared surface and the surface is at design grades.

Memorandum (*cont'd*)

Preload
Project Number: VAN-00231683
July 28, 2016

Sincerely,

exp Services Inc.

Evan Sykes, P.Eng.
Senior Engineer

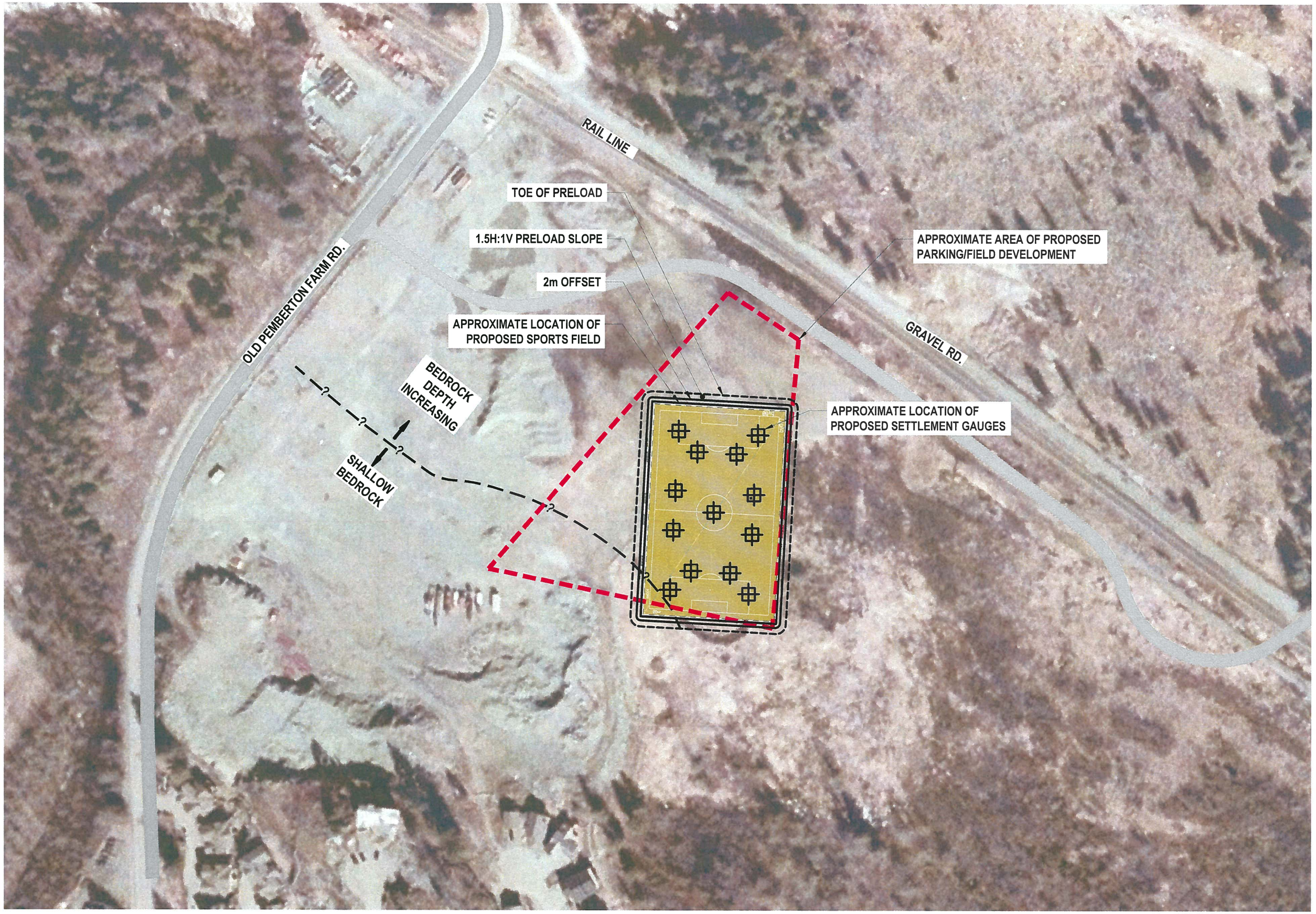
Reviewed by:

Matthew Yip, P.Eng.
Senior Engineer

Enclosure: Location Plan (Figure 1)
Preload Section (Figure 2)

ES/es

Exp ME 2016 07 28 Preload Recommendations



LEGEND

- TEST PIT
- AUGERHOLE
- HAND AUGER

REFERENCE DRAWING FROM CROSLAND DOAK LANDSCAPE ARCHITECTURE + BUILDING DESIGN DATED 2012-04-24

0 1:2000 100

exp Services Inc.
275–3001 Wayburne Drive
Burnaby, British Columbia V5G 4W3
Telephone: 604–874–1245
Fax: 604–874–2358
exp.com

DFTR.	DSGN.	CHK.
MG/PDL	DS	EGS

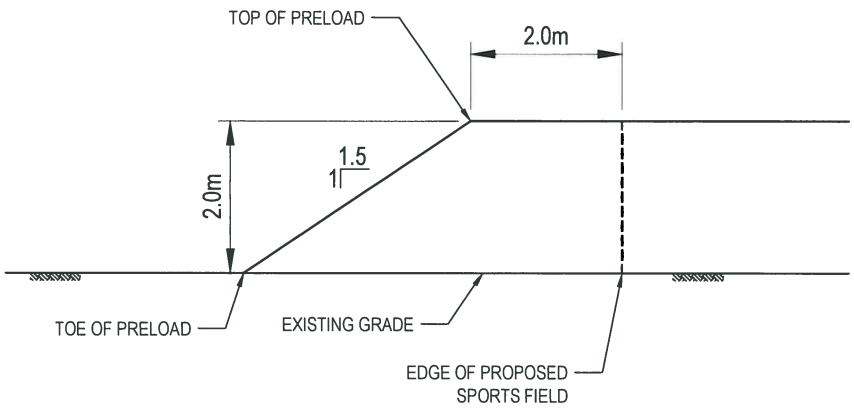
REVISIONS

No.	DESCRIPTION	DATE

CLIENT: 5800049 BC LTD.
PROJECT: FIELD DEVELOPMENT
OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.
PROJECT NO.: VAN-00231683-A0

TITLE:
LOCATION PLAN
PRELOAD AND SETTLEMENT GAUGES

DATE	SCALE:	DWG NO.
2016-02-23	1:2000	FIGURE 1



Wednesday, July 27, 2016 3:43:58 PM
L:\2016 Starting at 0230782-AO\0231683-AO EGS Pemberton Sports Field, Pemberton BC\426 DRAWINGS\VAN-00231683 SITE PLAN VER 2.dwg

exp.	CLIENT: 5800049 BC LTD.				TITLE: PRELOAD SECTION		
	PROJECT: FIELD DEVELOPMENT OLD PEMBERTON FARM ROAD, PEMBERTON, B.C.						
	PROJECT NO. VAN-00231683-AO	DFTR. PDL	DSGN.	CHK. EGS	DATE 2016-07-27	SCALE: 1:100	DWG NO. FIGURE 2

Metro Testing Laboratories Ltd.
1278 Stonemount Place
Squamish, BC, V8B 0R7

FIELD DENSITY REPORT

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

ATTN: MR. CAM McIVOR

PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.

PEMBERTON FARM ROAD
PEMBERTON

REPORT NO. 1 NO. OF DENSITIES 5 TESTED BY CD DATE TESTED 2016.Apr.22

CONTRACTOR SABRE
AREA PEMBERTON SPORTS FIELD
CONSTRUCTION TYPE GENERAL SITE BACKFILL

TIME TESTED 09:30

DENSITY NUMBER	LOCATION	LAB REFERENCE AND MATERIAL TYPE	MOISTURE		OVERSIZE MATERIAL	DRY DENSITY		COMPACTION %
			FIELD	OPTIMUM		FIELD	LAB	
1	NE CORNER	Proctor 1	4.0	8.5	27.0	1910	1990	96
2	SE CORNER	Proctor 1	3.9	8.5	27.0	1927	1990	97
3	SW CORNER	Proctor 1	3.8	8.5	27.0	1951	1990	98
4	SE CORNER	Proctor 1	4.4	8.5	27.0	1917	1990	96
5	CENTER	Proctor 1	4.0	8.5	27.0	1922	1990	97

FIELD METHOD Nuclear ASTM D6938
LABORATORY METHOD Modified Proctor ASTM D1557
ROCK CORRECTION METHOD ASTM D4718 Proctor Density Correction
OVERSIZE SCREEN SIZE Passing 3/4" - 19mm

SPECIFIED COMPACTION 95
LOW DENSITIES INDICATED WITH *

COMMENTS

Metro Testing Laboratories Ltd. PER.

Metro Testing Laboratories Ltd.
1278 Stonemount Place
Squamish, BC, V8B 0R7

MOISTURE - DENSITY RELATIONSHIP REPORT

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

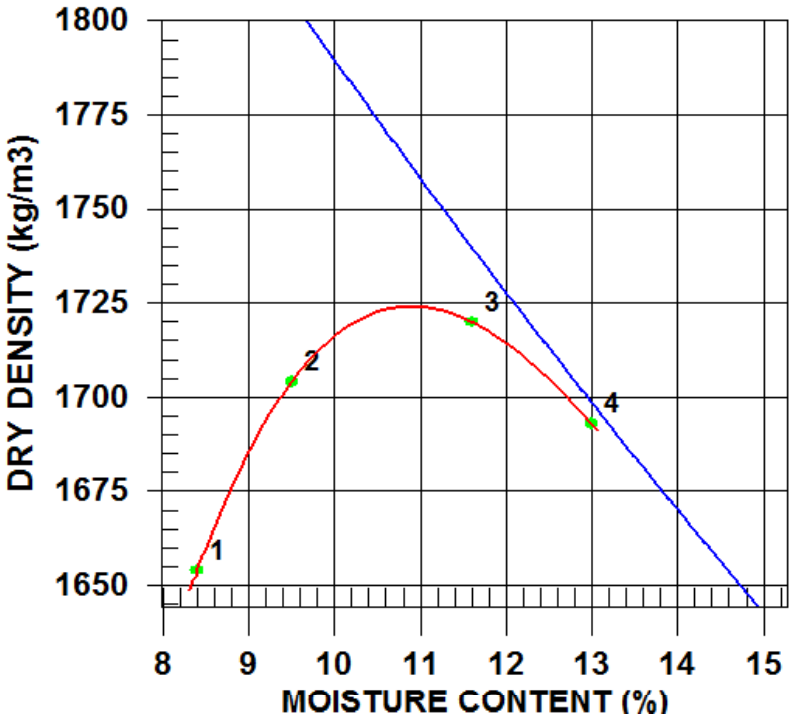
ATTN: MR. CAM McIVOR

PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON
CONTRACTOR SABRE GROUP

PROCTOR NO. 1 NO. OF TRIALS 4 DATE RECEIVED 2016.Mar.07 DATE SAMPLED 2016.Mar.05

INSITU MOISTURE 6.5 %
SAMPLED BY SS
TESTED BY
SUPPLIER DREDGE MATERIAL
SOURCE LILLOET RIVER
MATERIAL IDENTIFICATION
MAJOR COMPONENT
SIZE
DESCRIPTION GRAVELLY SAND
ROCK TYPE

COMPACTION STANDARD Modified Proctor, ASTM D1557
COMPACTION PROCEDURE C: 152.4mm Mold, Passing 19mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD ASTM 4718
RETAINED 19mm SCREEN 27.0 %
OVERSIZE SPECIFIC GRAVITY 2.14



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1793	1654	8.4
2	1866	1704	9.5
3	1920	1720	11.6
4	1913	1693	13.0

ZERO AIR VOIDS CURVE FOR ESTIMATED SPECIFIC GRAVITY OF 2.18	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1720	11.0
OVERSIZE CORRECTED	1820	8.5

COMMENTS
MATERIAL SAMPLED FROM ON-SITE STOCKPILE

Metro Testing Laboratories Ltd. PER.

Metro Testing Laboratories Ltd.
1278 Stonemount Place
Squamish, BC, V8B 0R7

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

ATTN: MR. CAM McIVOR

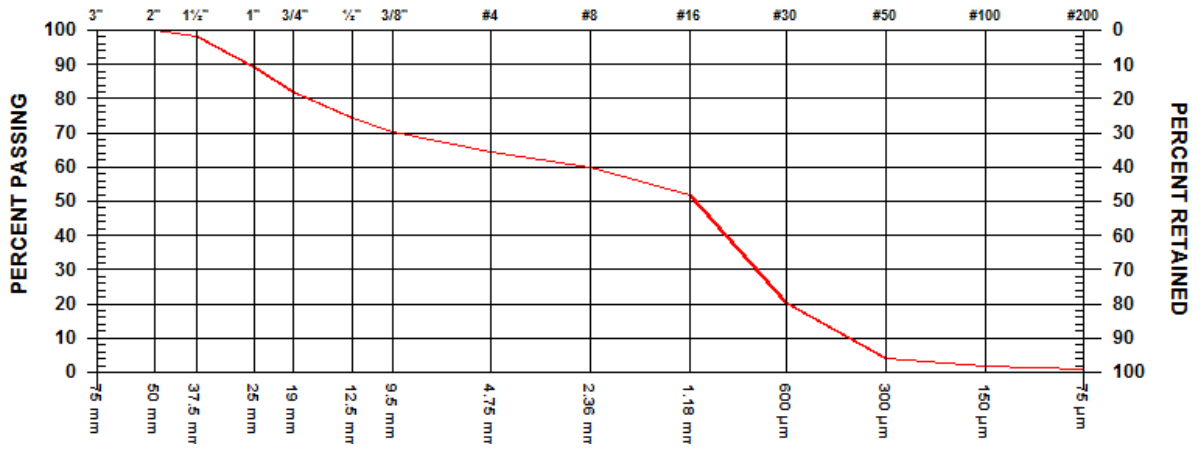
PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON

CONTRACTOR SABRE GROUP

SIEVE TEST NO. 1 DATE RECEIVED 2016.Mar.07 DATE TESTED 2016.Mar.07 DATE SAMPLED 2016.Mar.05

SUPPLIER DREDGED MATERIAL
SOURCE LILLOOET RIVER
SPECIFICATION
MATERIAL TYPE GRAVELLY SAND

SAMPLED BY SS
TESTED BY CD
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	98.3	
1"	25 mm	89.1	
3/4"	19 mm	82.1	
1/2"	12.5 mm	74.3	
3/8"	9.5 mm	70.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	64.3	
No. 8	2.36 mm	60.0	
No. 16	1.18 mm	51.9	
No. 30	600 µm	20.3	
No. 50	300 µm	4.2	
No. 100	150 µm	1.6	
No. 200	75 µm	0.7	

COMMENTS
MATRIAL SAMPLED FROM ON-SITE STOCKPILE

Metro Testing Laboratories Ltd. PER.

Metro Testing Laboratories Ltd.
1278 Stonemount Place
Squamish, BC, V8B 0R7

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

ATTN: MR. CAM McIVOR

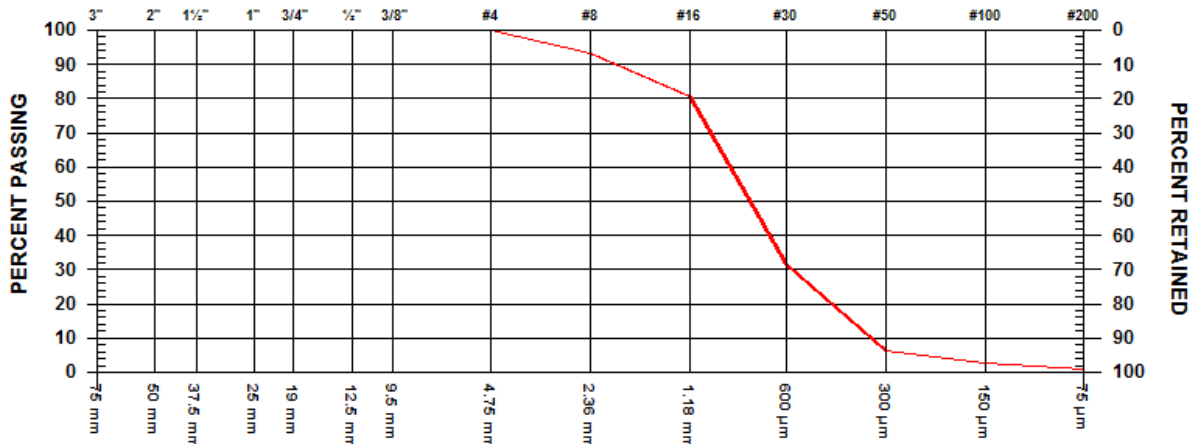
PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON

CONTRACTOR SABRE GROUP

SIEVE TEST NO. 2 DATE RECEIVED 2016.Mar.07 DATE TESTED 2016.Mar.07 DATE SAMPLED 2016.Mar.05

SUPPLIER DREDGED MATERIAL
SOURCE LILLOOET RIVER
SPECIFICATION
MATERIAL TYPE GRAVELLY SAND

SAMPLED BY SS
TESTED BY CD
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
3/4"	19 mm		
1/2"	12.5 mm		
3/8"	9.5 mm		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	100.0	
No. 8	2.36 mm	93.3	
No. 16	1.18 mm	80.7	
No. 30	600 µm	31.6	
No. 50	300 µm	6.5	
No. 100	150 µm	2.5	
No. 200	75 µm	1.1	

COMMENTS
THIS MATERIAL REPRESENTS THE SIEVE ANALYSIS RESULTS FOR ONLY THE MATERIAL

PASSING THE 4.75mm DIAMETER SCREEN, TAKEN FROM TEST NO. 1 OF THE LILLOET

Metro Testing Laboratories Ltd. PER.

Metro Testing Laboratories Ltd.
1278 Stonemount Place
Squamish, BC, V8B 0R7

MOISTURE - DENSITY RELATIONSHIP REPORT

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

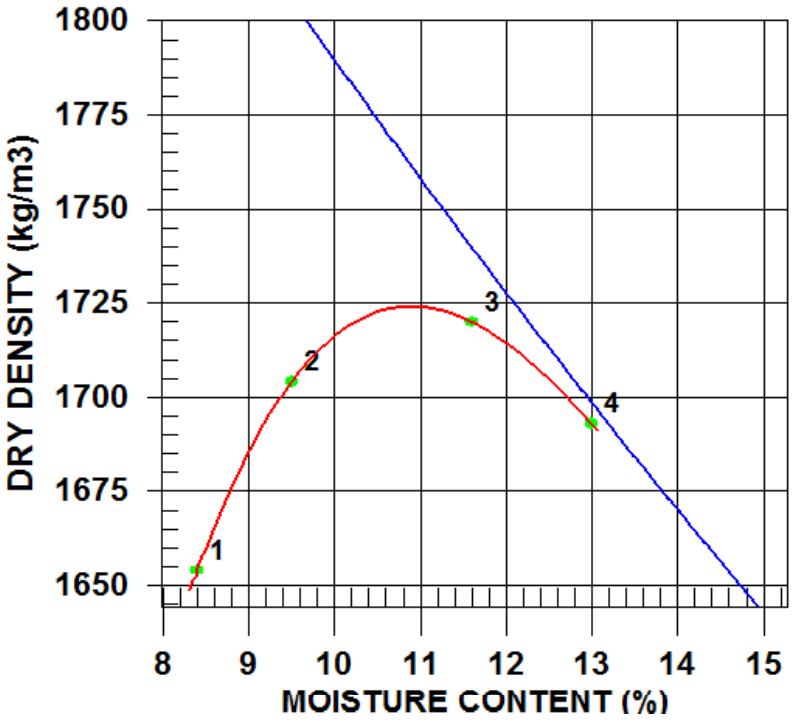
ATTN: MR. CAM McIVOR

PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON
CONTRACTOR SABRE GROUP

PROCTOR NO. 1 NO. OF TRIALS 4 DATE RECEIVED 2016.Mar.07 DATE SAMPLED 2016.Mar.05

INSITU MOISTURE 6.5 %
SAMPLED BY SS
TESTED BY
SUPPLIER DREDGE MATERIAL
SOURCE LILLOET RIVER
MATERIAL IDENTIFICATION
MAJOR COMPONENT
SIZE
DESCRIPTION GRAVELLY SAND
ROCK TYPE

COMPACTION STANDARD Modified Proctor, ASTM D1557
COMPACTION PROCEDURE C: 152.4mm Mold, Passing 19mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD ASTM 4718
RETAINED 19mm SCREEN 27.0 %
OVERSIZE SPECIFIC GRAVITY 2.14



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1793	1654	8.4
2	1866	1704	9.5
3	1920	1720	11.6
4	1913	1693	13.0

ZERO AIR VOIDS CURVE FOR ESTIMATED SPECIFIC GRAVITY OF 2.18	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1720	11.0
OVERSIZE CORRECTED	1820	8.5

COMMENTS
MATERIAL SAMPLED FROM ON-SITE STOCKPILE

Metro Testing Laboratories Ltd. PER.

SIEVE ANALYSIS REPORT
8 16 30 50 SERIES

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

ATTN: MR. CAM McIVOR

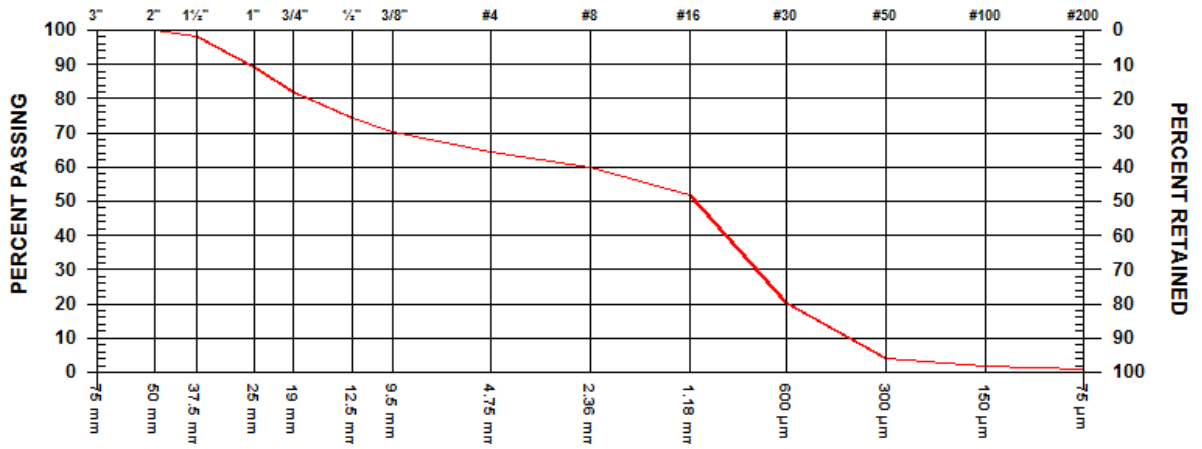
PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON

CONTRACTOR SABRE GROUP

SIEVE TEST NO. 1 DATE RECEIVED 2016.Mar.07 DATE TESTED 2016.Mar.07 DATE SAMPLED 2016.Mar.05

SUPPLIER DREDGED MATERIAL
SOURCE LILLOOET RIVER
SPECIFICATION
MATERIAL TYPE GRAVELLY SAND

SAMPLED BY SS
TESTED BY CD
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	98.3	
1"	25 mm	89.1	
3/4"	19 mm	82.1	
1/2"	12.5 mm	74.3	
3/8"	9.5 mm	70.2	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	64.3	
No. 8	2.36 mm	60.0	
No. 16	1.18 mm	51.9	
No. 30	600 µm	20.3	
No. 50	300 µm	4.2	
No. 100	150 µm	1.6	
No. 200	75 µm	0.7	

COMMENTS
MATRIAL SAMPLED FROM ON-SITE STOCKPILE

Metro Testing Laboratories Ltd.
PER.

PROJECT NO. W 1637
CLIENT 580049 B C LTD C/O FESTIVAL
C.C.

TO
580049 B C LTD C/O FESTIVAL LANDS
COMPANY LTD
BOX 494
PEMBERTON, BC
VON 2L1

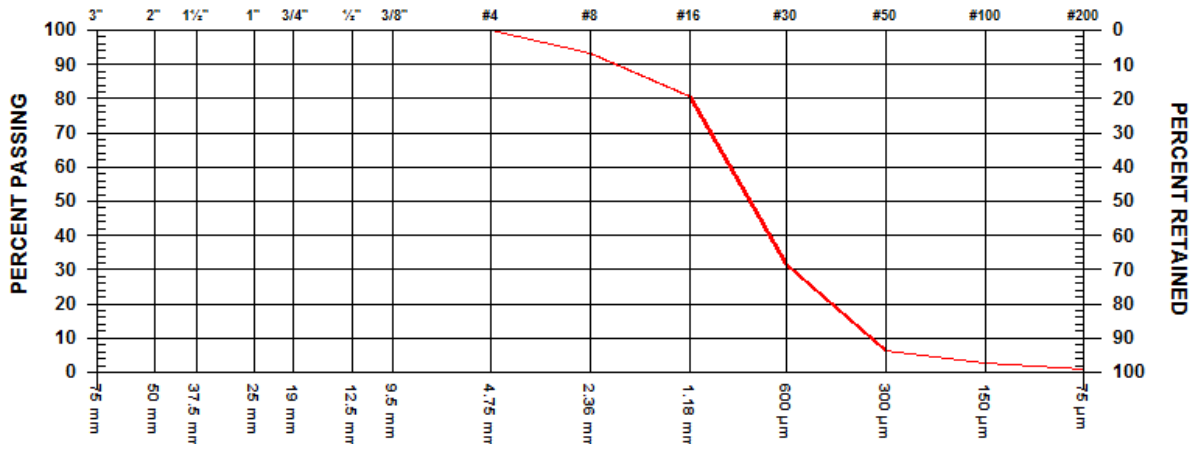
ATTN: MR. CAM McIVOR

PROJECT PEMBERTON SPORTS FIELD
SOILS:OTHERS.
PEMBERTON FARM ROAD
PEMBERTON
CONTRACTOR SABRE GROUP

SIEVE TEST NO. 2 DATE RECEIVED 2016.Mar.07 DATE TESTED 2016.Mar.07 DATE SAMPLED 2016.Mar.05

SUPPLIER DREDGED MATERIAL
SOURCE LILLOOET RIVER
SPECIFICATION
MATERIAL TYPE GRAVELLY SAND

SAMPLED BY SS
TESTED BY CD
TEST METHOD WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm		
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1/2"	12.5 mm		
3/8"	9.5 mm		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	100.0	
No. 8	2.36 mm	93.3	
No. 16	1.18 mm	80.7	
No. 30	600 µm	31.6	
No. 50	300 µm	6.5	
No. 100	150 µm	2.5	
No. 200	75 µm	1.1	

COMMENTS
THIS MATERIAL REPRESENTS THE SIEVE ANALYSIS RESULTS FOR ONLY THE MATERIAL

PASSING THE 4.75mm DIAMETER SCREEN, TAKEN FROM TEST NO. 1 OF THE LILLOET

Metro Testing Laboratories Ltd. PER.

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF AUGERHOLE : AH14-01

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
DRILLING DATE 2/7/14
AUGERHOLE LOCATION N: 5574143 E: 517204
DRILLING CONTRACTOR Sea to Sky Drilling Ltd.
ELEVATION
DRILLING METHOD Solid Stem Auger
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
LOGGED BY MAK **CHECKED BY** EGS
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		GRAVEL, some sand to sandy, trace silt, grey, moist, (compact to dense), medium to coarse sand, fine sub-angular gravel, (FILL)		S01	GB				
		SILT, some clay, trace sand, rootlets, brown, moist to damp, (firm)	0.8						
1		SANDY SILT TO SILTY SAND, trace fine gravel, trace rootlets, grey, moist, (compact), fine sand	0.9	S02	GB				24
				S03	GB				35
		-No gravel -becomes wet							
2	▼			S04	GB				38
				S05	GB				42
		ORGANIC SILT, trace to some peat, mottled grey and black, moist to wet, (soft)	2.4	S06	GB				82
3		SILT, some wood fibers, trace to some sand, trace peat, pockets and seams of clayey silt, mottled brown and grey, wet, (firm) -Sand content increases with depth	2.7	S07	GB				77
				S08	GB				56
4									
		-becomes some sand		S09	GB				52
5				S10	GB				43

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF AUGERHOLE : AH14-01

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT (PL MC LL; 20 40 60 80)
		SILT, some wood fibers, trace to some sand, trace peat, pockets and seams of clayey silt, mottled brown and grey, wet, (firm) *(continued)* -becomes SILT and SAND		S11	GB				37
		SANDY SILT, trace peat, mottled brown and grey, wet, (firm)	5.5	S12	GB				42
6									

Refusal at 6.4m.

NOTES: Refusal on bedrock

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF AUGERHOLE : AH14-02

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/7/14
DRILLING CONTRACTOR Sea to Sky Drilling Ltd.
DRILLING METHOD Solid Stem Auger
LOGGED BY MAK **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
AUGERHOLE LOCATION N: 5574132 E: 517194
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		GRAVEL, some sand to sandy, trace silt, grey, moist, (compact to dense), medium to coarse sand, fine sub-angular gravel, (FILL)							
1		SILT, some clay, trace to some sand, trace sand, rootlets, brown, moist to damp, (firm)	0.6						
2		-Becomes trace peat -becomes wet ▼							
3		ORGANIC SILT, trace to some peat, mottled grey and black, moist to wet, (soft)	2.3						
4		SILT, trace to some sand, trace peat, rust pockets, grey, wet, (firm)	3.2						
5		SAND AND ORGANIC WOOD FIBERS, some silt to silty, grey, wet,(compact), medium to fine sand	4.5	S13					57 ●

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF AUGERHOLE : AH14-02

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) / PLASTIC & LIQUID LIMIT MOISTURE CONTENT (PL MC LL; 20 40 60 80)
		SAND AND ORGANIC WOOD FIBERS, some silt to silty, grey, wet,(compact), medium to fine sand *(continued)*		S14					
		- Occasional Wood Chips layers		S15					48
6				S16					
7				S17					44
8				S18					
9			9.1	S19					

Refusal at 9.1m.

NOTES: Refusal on bedrock

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF HAND AUGER : HA14-01

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/3/14
DRILLING CONTRACTOR exp Services Inc.
DRILLING METHOD Hand Auger
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
HAND AUGER LOCATION N: 5574009 E: 517379
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** 0.4m visible free water
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
		SILT to ORGANIC SILT, some sand, some rootlets, some organics, brownish grey with rust inclusions, moist to wet, (soft to firm) slight plastic						20 40 60 80	20 40 60 80
1		-becomes sandier with depth		S17	GB				54
		ORGANIC SILTY PEAT, fibrous, brown, wet, (soft to firm)	1.4						
2		PEAT, fibrous, blackish brown, wet, (soft to firm)	2.0	S18	GB				256

Refusal at 2.3m.

NOTES: Refusal on wood

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF HAND AUGER : HA14-02

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/5/14
DRILLING CONTRACTOR exp Services Inc.
DRILLING METHOD Hand Auger
LOGGED BY EGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
HAND AUGER LOCATION N: 5574071 E: 517473
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m 20 40 60 80	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
1		SILT, light brown, wet, (soft)							
2		PEAT, fibrous, blackish brown, wet, (soft to firm)	1.5						
3									

Bottom of hole at 3.0m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF HAND AUGER : HA14-03

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/5/14
DRILLING CONTRACTOR exp Services Inc.
DRILLING METHOD Hand Auger
LOGGED BY EGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
HAND AUGER LOCATION N: 5573942 E: 517608
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		ORGANIC SILTY PEAT, fibrous, dark brown, wet, (soft)							
		SILT, light brown, wet, (soft to firm)	0.1						
1									
2									
		PEAT, fibrous, blackish brown, wet, (soft to firm)	2.4						
3									

Bottom of hole at 3.0m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

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Telephone: 604.422.2152

RECORD OF HAND AUGER : HA14-04

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/5/14
DRILLING CONTRACTOR exp Services Inc.
DRILLING METHOD Hand Auger
LOGGED BY EGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
HAND AUGER LOCATION N: 5573914 E: 517562
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
1		PEAT, fibrous, dark brown, wet, (soft to firm)							
2		SILT, light brown, wet, (firm)	2.7						

Bottom of hole at 2.9m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

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RECORD OF HAND AUGER : HA14-05

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/5/14
DRILLING CONTRACTOR exp Services Inc.
DRILLING METHOD Hand Auger
LOGGED BY EGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
HAND AUGER LOCATION N: 5573934 E: 517504
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
0.5		SILT, mottled brown and grey, moist, (stiff)							
		Bottom of hole at 0.8m.							

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RECORD OF HAND AUGER : HA14-06

PAGE 1 OF 1

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
DRILLING DATE 2/5/14
DRILLING CONTRACTOR exp Services Inc.
DRILLING METHOD Hand Auger
LOGGED BY EGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
HAND AUGER LOCATION N: 5573981 E: 517437
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF DRILLING** ---
▼ **AFTER DRILLING** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
0.1		PEAT, blackish brown, frozen							
0.2									
0.3									
0.4									

Refusal at 0.4m.

NOTES: Refusal due to ice

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

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RECORD OF TEST PIT : TP14-01

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574154 E: 517319
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.2m seepage
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m ↘ (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
1		SILTY SAND to SANDY SILT, some gravel, some cobbles and boulders, wood pieces, brownish grey, (compact) (FILL) -frozen from ground surface to 0.3m							
2		SAND, trace silt, grey, wet, (compact) fine grained	1.2	S1	GB				28
		ORGANIC SILT, some peat to peaty, some clay, trace sand, grey with black inclusions, (soft to very soft) plastic	2.0	S2	GB				281
3		PEAT, fibrous, brown, moist to wet, (firm)	2.5						
4				S3	GB				256

Bottom of test pit at 4.1m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-01

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-01.1
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Figure TP14-01.2
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RECORD OF TEST PIT : TP14-02

PAGE 1 OF 2

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574125 E: 517383
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.3m seepage
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT
		SILTY SAND, some gravel to gravelly, some cobbles and boulders, some roots and rootlets, moist, brown, (compact) (FILL)						20 40 60 80	20 40 60 80
		-frozen from ground surface to 0.3m		S4	GB				10
1		SILTY SAND & GRAVEL, pieces of plastic, grey, wet, (compact) well-graded (FILL)	0.9	S5	GB				9
		PEAT, fibrous, brown, wet, (firm) (FILL?)	1.3						
2		SAND, trace silt, grey, wet, (compact) fine grained	1.5						
		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic	2.1						
3		-becomes more wood than silt							
		PEAT, fibrous, brown, moist to wet, (firm)	3.2	S6	GB				273

Bottom of test pit at 3.5m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-02

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-02.1
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Figure TP14-02.2
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RECORD OF TEST PIT : TP14-03

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574091 E: 517351
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.8m seepage
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ 20 40 60 80 / DYNAMIC CONE BLOWS/0.3m 20 40 60 80	FINES CONTENT (%) □ 20 40 60 80 / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL 20 40 60 80
1		SILTY SAND & GRAVEL, some cobbles and boulders, some woodwaste, moist, brownish grey, (compact) (FILL) -frozen from ground surface to 0.3m							
2		SAND, trace silt, grey, wet, (compact) fine grained	2.0						
3		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic	2.8						
		PEAT, fibrous, brown, moist to wet, (firm)	3.7						

Bottom of test pit at 3.8m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-03

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-03.1
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Figure TP14-03.2
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RECORD OF TEST PIT : TP14-04

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574112 E: 517308
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 2.3m seepage
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL)							
		-frozen from ground surface to 0.3m							
		SAND, trace silt, grey, wet, (compact) fine grained	0.6						
1									
2		ORGANIC SILT, some peat to peaty, some clay, trace sand, abundant wood remnants, grey with black inclusions, (soft to very soft) plastic ▽	2.0						
3		PEAT, fibrous, brown, moist to wet, (firm)	2.8						

Bottom of test pit at 3.0m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-04

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-04.1
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Figure TP14-04.2
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RECORD OF TEST PIT : TP14-05

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574133 E: 517277
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.2m seepage
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
		GRAVEL, 25mm crush (FILL)						20 40 60 80	20 40 60 80
		-frozen from ground surface to 0.3m							
1		SILTY SAND & GRAVEL, some cobbles and boulders, pieces of cut wood, moist, brownish grey, (compact) (FILL) ▽	1.0						
2		SAND, trace silt, grey, wet, (compact) fine grained	1.8	S7	GB				44
3		ORGANIC SILT, some sand, layers of peat, grey with brown inclusions, (soft to very soft)	2.4	S8	GB				49

Bottom of test pit at 3.5m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-05

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-05.1
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Figure TP14-05.2
-

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RECORD OF TEST PIT : TP14-06

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574188 E: 517215
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.4m inferred
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL)						20 40 60 80	20 40 60 80
		-frozen from ground surface to 0.3m							
1		SILTY SAND, trace roots, grey, moist, (compact) fine grained	0.9	S9	GB				PL MC LL 35
		▽ SAND, trace silt, grey with rust stains, wet, (loose to compact) medium grained	1.4						
2				S10	GB				
		SILTY SAND, grey, wet, (loose to compact) fine grained	2.4						
		-grades to ORGANIC SILT, some sand by 2.6m							
3		ORGANIC SILTY PEAT, fibrous, brown, wet, (firm)	2.8	S11	GB				194

Bottom of test pit at 3.4m.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-06

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-06.1
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Figure TP14-06.2
-

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RECORD OF TEST PIT : TP14-07

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574132 E: 517183
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 0.9m inferred
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL) -frozen from ground surface to 0.3m						20 40 60 80	20 40 60 80
1		SAND, trace silt, grey, wet, (compact) fine grained	0.9	S12	GB				31
2		ORGANIC SILT, some sand, layers of peat, grey with brown inclusions, (soft to very soft)	2.0						
3		SILTY SAND, grey, wet, (loose to compact) fine to medium grained	2.6	S13	GB				42
4		SANDY SILT, seams of black peat, light brownish grey, moist, (stiff)	3.6	S14	GB				41

Bottom of test pit at 4.0m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

(Continued Next Page)

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RECORD OF TEST PIT : TP14-07

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-07.1
-

Figure TP14-07.2
-

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RECORD OF TEST PIT : TP14-08

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574148 E: 517218
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** ---
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY %	SAMPLES POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL)							
1		SILTY SAND, layers of sand, layers of silt, grey with rust stains, wet, (loose to compact) fine grained	0.9	S15	GB				35
2		-layers of peat remnants		S16	GB				45

Bottom of test pit at 2.4m.

NOTES: Due to surface frost, machine was unable to dig a big enough hole to go deeper than 2.4m

(Continued Next Page)

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RECORD OF TEST PIT : TP14-08

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-08.1
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Figure TP14-08.2
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EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

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RECORD OF TEST PIT : TP14-09

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574087 E: 517162
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** ---
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
0.1 0.2 0.3		SAND & GRAVEL, blast rock, brownish grey, frozen, (BEDROCK?)							

Refusal at 0.3m.

NOTES: Machine was unable to dig past 0.3m possibly due to frost.
May potentially be bedrock.

(Continued Next Page)

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RECORD OF TEST PIT : TP14-09

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-09.1
-

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RECORD OF TEST PIT : TP14-10

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574091 E: 517150
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** ---
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
0.1 0.2 0.3		SAND & GRAVEL, blast rock, brownish grey, frozen, (BEDROCK?)							

Refusal at 0.3m.

NOTES: Machine was unable to dig past 0.3m possibly due to frost.
May potentially be bedrock.

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-10

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-10.1
-

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-11

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574051 E: 517234
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** 1.6m visible free water
▼ **AFTER EXCAVATION** ---

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		BOULDERS, some sand, some gravel, light brownish grey, (loose to compact)							
1		-abundant voids between boulders from surface to final depth; voids generally filled with sand and gravel.							

Refusal at 1.2m.

▽

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-11

CLIENT Village of Pemberton
PROJECT NAME Pemberton Recreational Facility
PROJECT NUMBER VAN-00217089-A0
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-11.1
-

Figure TP14-11.2
-

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-12

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
EXCAVATION DATE 2/3/14
EXCAVATION CONTRACTOR Coastal Mountain Excavations Ltd.
EXCAVATION METHOD Excavator
LOGGED BY DGS **CHECKED BY** EGS

PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC
TEST PIT LOCATION N: 5574029 E: 517307
ELEVATION
GROUND WATER LEVELS: ▽ **AT TIME OF EXCAVATION** ---
▼ **AFTER EXCAVATION** 1.2m abundant water flow

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY %	SAMPLES: POCKET PEN. (kPa)	SPT N VALUE BLOWS/0.3m ▲ / DYNAMIC CONE BLOWS/0.3m (20 40 60 80)	FINES CONTENT (%) □ / PLASTIC & LIQUID LIMIT MOISTURE CONTENT PL MC LL (20 40 60 80)
		SILTY SAND & GRAVEL, some cobbles and boulders, moist, brownish grey, (compact) (FILL)							
1		BEDROCK, fractured, orange and grey, (hard) ▼	0.8						

Refusal at 1.5m.

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

(Continued Next Page)

exp Services Inc.
275-3001 Wayburne Drive
Burnaby, B.C. V5G 4W3
Telephone: 604.422.2152

RECORD OF TEST PIT : TP14-12

CLIENT Village of Pemberton
PROJECT NUMBER VAN-00217089-A0
PROJECT NAME Pemberton Recreational Facility
PROJECT LOCATION Old Pemberton Farm Road, Pemberton, BC

PHOTOS

Figure TP14-12.1
-

Figure TP14-12.2
-

EXP GEO W/P.P. *PHOTOS* 0217089-A0.GPJ EXP STD.GDT 2/25/14

KONTUR GEOTECHNICAL CONSULTANTS Inc.

MEMORANDUM

August 7, 2018
Project No.: **K-180334-00**

To:	Cam McIvor Sunstone Ridge Developments	**By Email:**	cwmicivor@telus.net
Cc:	Richard Avedon-Savage ISL Engineering and Land Services Ltd		rsavage@islengineering.com
From:	Evan Sykes, P.Eng. Kontur Geotechnical Consultants Inc.		esykes@kontur.ca
Subject	**Sports Field** **Pemberton Farm Road, Pemberton, BC**		

As requested, Kontur Geotechnical Consultants Inc. (Kontur) is providing a summary of completed site preparations and estimates for future settlement for a sports field located on the east side of the north end of Pemberton Farm Road, Pemberton, BC. The summary is based on observations of site preparations by Kontur personnel and review of preload settlement data provided by Bunbury & Associates Professional B.C. Land Surveyors (Bunbury). Based on review of subsurface information obtained from geotechnical exploration by others, the subsurface conditions within the subject area generally consisted of peat overlying native granular soils.

Site preparations for the proposed field included mowing the vegetation and cutting trees growing within the proposed field area. A biaxial geogrid was placed over the mowed area and structural fill consisting of dredged river sand and gravel over the site to increase grade. The base lift was placed with a thickness of about 1m with an additional lift about 0.5m thick placed on the base lift. Each lift was compacted with several passes of a heavy ride-on vibratory drum roller. A preload surcharge with a thickness of about 2m was placed on the structural fill in August 2016. Settlement measurements were obtained by Bunbury immediately after surcharge placement, monthly during the summer of 2017 and in May 2018. Preload was removed in July 2018 exposing the structural fill. Based on analysis of the settlement data the estimated settlement over 30 years for the field, following removal of the preload, ranges from about 25mm to 75mm. Settlement estimates for the field over 3 years following removal of preload ranges from about 5mm to 15mm. Differential settlement would be about half the total settlement values over a distance of about 10m. Some additional secondary settlement due to decomposition of organic peat should also be anticipated.

Provided the above settlement is acceptable for a sports field, the site is considered to be ready for construction and suitable for the intended use, that being the construction of a sports field.

Kontur trusts that the information described above meets your current requirements. If you should have any concerns or questions, please do not hesitate to contact the undersigned.

August 7, 2018
Project No.: **K-180334-00**

Memorandum
Sports Field
Pemberton Farm Road, Pemberton, BC

Sincerely,

Kontur Geotechnical Consultants Inc.

Aug 7, 2018

Evan Sykes, P.Eng.
Principal Geotechnical Engineer

Reviewed By:

Matthew Yip, P.Eng., M.Eng.
Principal Geotechnical Engineer

Attachments: **Interpretation and Use of Study and Report Document**

August 7, 2018
Project No : **K-180334-00**
Summary Site Preparation
Sports Field
Pemberton Farm Road, Pemberton, BC

INTERPRETATION AND USE OF STUDY AND REPORT DOCUMENT

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental engineering or consulting.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5. INTERPRETATION OF THE REPORT

Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

To avoid misunderstandings, KONTUR should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by KONTUR. Further, KONTUR should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with KONTUR's recommendations. Any reduction from the level of services normally recommended will result in KONTUR providing qualified opinions regarding adequacy of the work.

6. ALTERNATE REPORT FORMAT

When KONTUR submits both electronic file and hard copies of reports, drawings and other documents and deliverables (KONTUR's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by KONTUR shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by KONTUR shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of KONTUR's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except KONTUR. The Client warrants that KONTUR's instruments of professional service will be used only and exactly as submitted by KONTUR.

The Client recognizes and agrees that electronic files submitted by KONTUR have been prepared and submitted using specific software and hardware systems. KONTUR makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

KONTUR
GEOTECHNICAL CONSULTANTS

MEMORANDUM

October 29, 2018
Project No.: **K-180334-00**

To:	Cam McIvor Sunstone Ridge Developments Ltd.	**By Email:**	cwmcivor@telus.net
Cc:			
From:	Evan Sykes, P.Eng. Kontur Geotechnical Consultants Inc.		ESykes@kontur.ca
Subject	**Pemberton Sports Field Fill and Preload Materials Pemberton, BC**		

As requested, Kontur Geotechnical Consultants Inc. (Kontur) has completed a review of materials placed for achieving subgrade elevation and preload for development of Sports Field #2, Pemberton, BC. The subject proposed sports field is located at the north end of Old Pemberton Farm Road, Pemberton, BC.

Based on intermittent field reviews completed during the time design subgrade elevation was being established and preload materials were being placed. The following observations related to material types used is provided below:

- Fill materials used to achieve design subgrade elevation generally consisted of sand and gravel obtained from river dredging and sand with some gravel and silt obtained from excavations for the Ridge and Sunstone developments;
- Fill placed to achieve subgrade elevations were placed and compacted in general compliance with geotechnical recommendations;
- Preload material consisted of overburden soils excavated the Sunstone and Ridge developments generally considered unacceptable as structural fill.

Kontur trusts that the information described above meets your current requirements. If you should have any concerns or questions, please do not hesitate to contact the undersigned.

Sincerely,

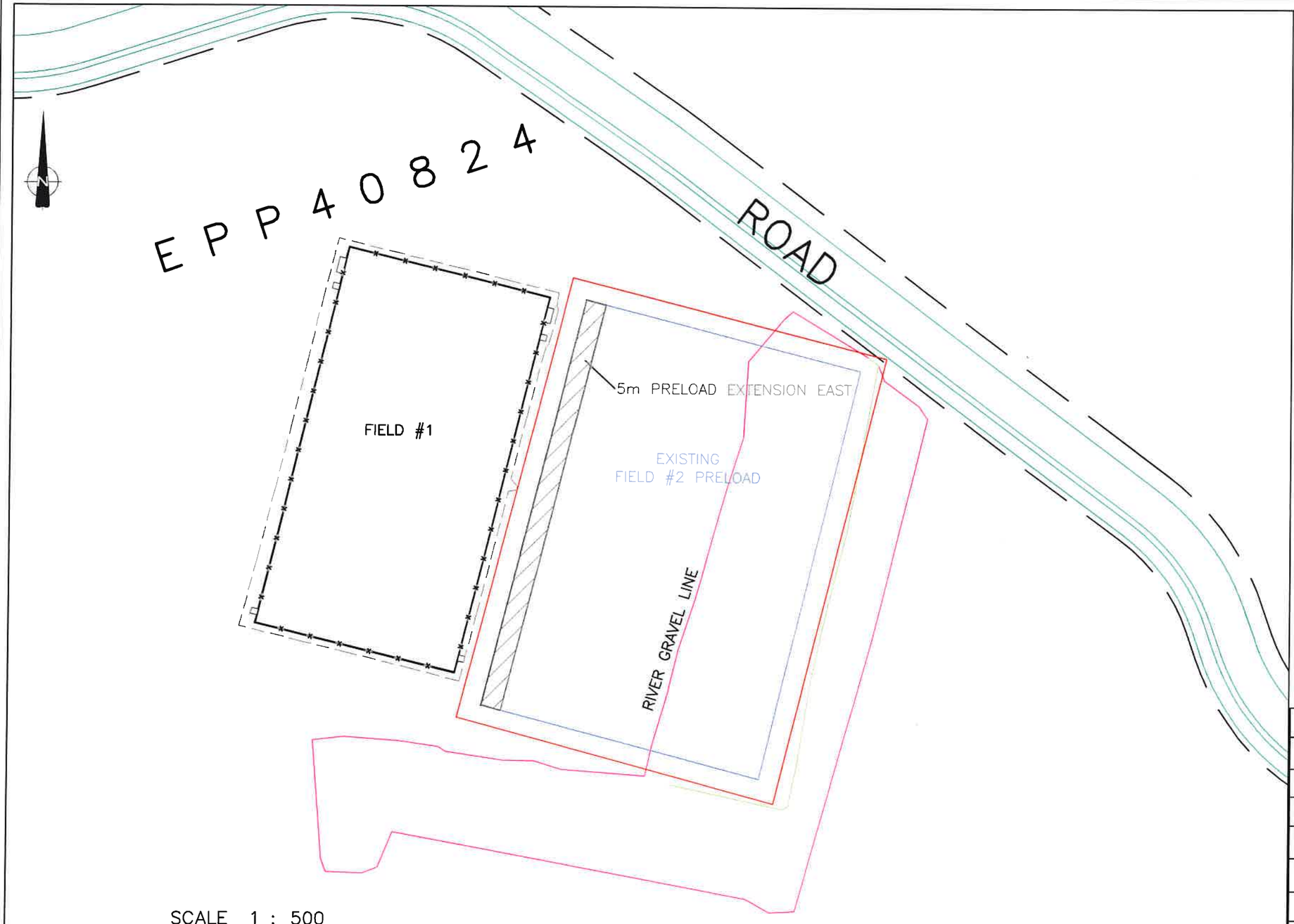
Kontur Geotechnical Consultants Inc.

Reviewed By:

Evan Sykes, P.Eng.
Principal Geotechnical Engineer

Matthew Yip, P.Eng., M.Eng.
Principal Geotechnical Engineer

Attachments: Sketch Plan (SK18044B)



SCALE 1 : 500

10 0 10 20 40

NOTES:

1. ALL DIMENSIONS ARE IN METRES. PILE DIMENSIONS APPROXIMATE IRREGULAR PILE SHAPES
2. ELEVATIONS ARE REFERENCED TO THE CGVD28 DATUM USING DUAL FREQUENCY GNSS OBSERVATIONS CONVERTED USING THE HTv2 GEOID MODEL.
3. VOLUMES ARE BASED ON TOE OF SLOPES AND DO NOT ACCOUNT FOR SETTLEMENT.
4. VOLUMES WERE SURVEYED ON OCT 4, 2018

LEGEND:

- EDGE OF RAFT SLAB FILL
- EDGE OF ROAD STRUCTURE
- ROAD RIGHT OF WAY
- GEO-GRID EXTENTS
- TOP OF PRELOAD #2
- TOE OF PRELOAD #2

VOLUME TABLE

MATERIAL DESCRIPTION	VOLUME
SUNSTONE STRUCTURAL RAFT SLAB	10455m^3
RIDGE STRUCTURAL RAFT SLAB	2522m^3
TOTAL STRUCTURAL	12977m^3
EXISTING SUNSTONE PRELOAD	14353m^3
EXISTING RIDGE PRELOAD	3218m^3
TOTAL PRELOAD	17571m^3
PRELOAD EXTENSION EAST	1296m^3

HIGHMARK LAND SURVEYING AND ENGINEERING LTD.
Phone:604-966-3733
Email:info@hmse.ca Web:www.hmse.ca

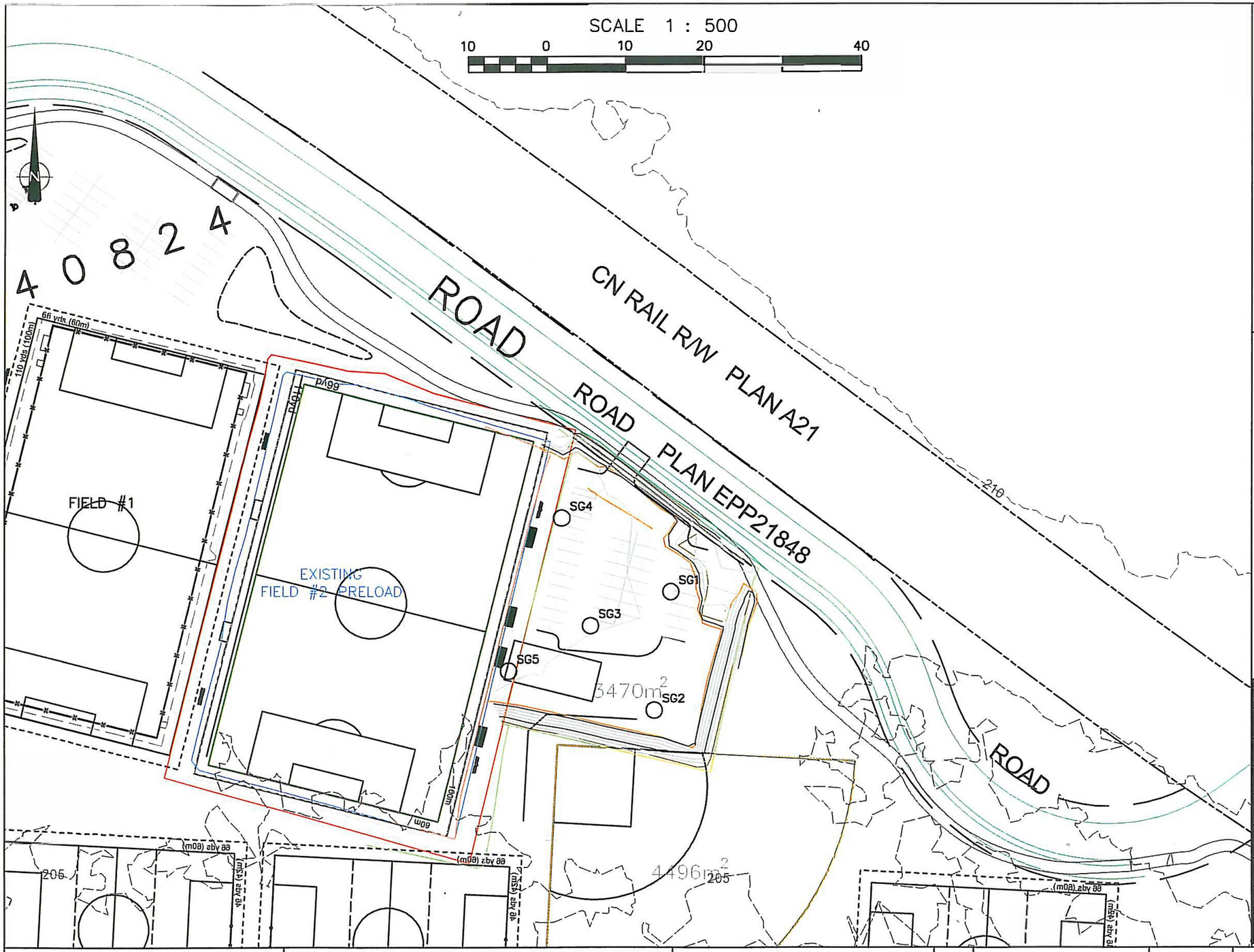
REV	DESCRIPTION	DATE	DRAWN
A	INITAL ISSUE	–	–

SKETCH PLAN

SHOWING PILE VOLUMES AT RECREATION SITE ON LOT B, DL 211, LILLOOET DISTRICT, PLAN EPP40824

SCALE	SIZE	JOB	SHEET	FILE
1:500	ANSI B	J17044	1 OF 1	SK18044B

VILLAGE OF PEMBERTON
September 2020



NOTES:

1. ALL DIMENSIONS ARE IN METRES. PILE DIMENSIONS APPROXIMATE IRREGULAR PILE SHAPES
2. ELEVATIONS ARE REFERENCED TO THE CGVD28 DATUM USING DUAL FREQUENCY GNSS OBSERVATIONS CONVERTED USING THE HTv2 GEOID MODEL.
3. VOLUMES ARE BASED ON TOE OF SLOPES AND DO NOT ACCOUNT FOR SETTLEMENT.
4. VOLUMES WERE SURVEYED ON MARCH 22, 2019 AND UPDATED SEPT 17, 2019

LEGEND:

- 0.5M CONTOUR
- EDGE OF ROAD STRUCTURE
- ROAD RIGHT OF WAY
- GEO-GRID EXTENTS
- TOP OF PRELOAD
- TOE OF PRELOAD

MARCH 22 2019 VOLUME TABLE	
RAFT SLAB VOLUME	3692m³
RIVER GRAVEL PRELOAD	6458m³
SEPT 17 2019 ADDITIONAL PRELOAD	998m³

HIGHMARK LAND SURVEYING AND ENGINEERING LTD.
Phone:604-966-3733
Email:info@hmse.ca Web:www.hmse.ca

REV	DESCRIPTION	DATE	DRAWN

SKETCH PLAN
SHOWING PARKING LOT VOLUMES AT RECREATION SITE ON LOT B, DL 211, LILLOOET DISTRICT, PLAN EPP40824

SCALE	SIZE	JOB	SHEET	FILE
1:500	ANSI B	J17044	1 OF 1	RIV_GRAVEL

CROSLAND DOAK DESIGN
Landscape Architecture + Building Design

3121 Alta Vista Road
Whistler, BC V0N 1B3
604. 966-8309
info@CroslandDoakDesign.com
CroslandDoakDesign.com

Date	Issued For
2019-01-08	Client Review On w Areas

Village of Pemberton

client

Pemberton Farm Road Recreation Facility

project title

Recreation Phase-2 Survey

drawing title

scale: 1:500 or as noted

project no. 1307

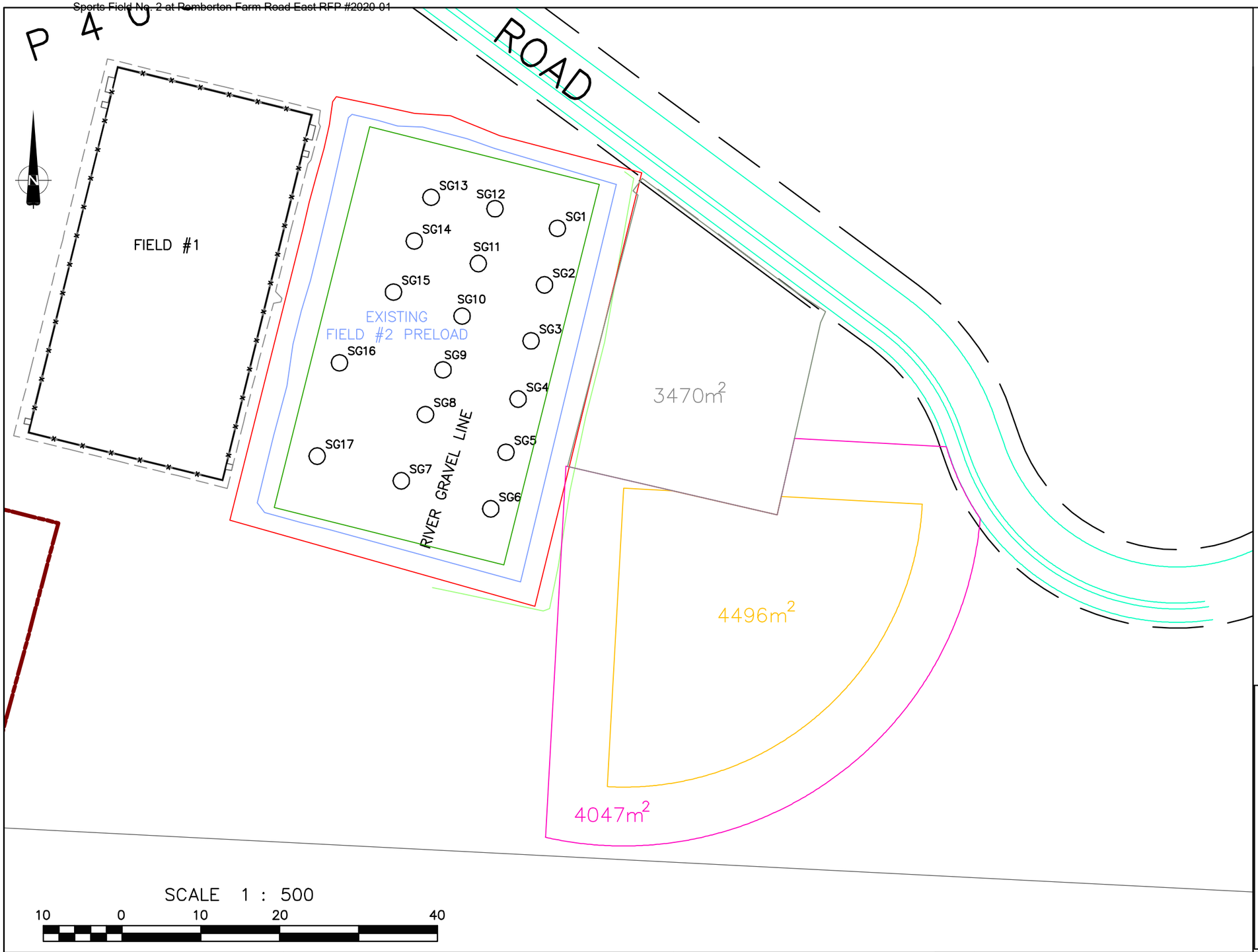
L1.4

drawing no.

L1.4 Recreation Phase-2 Survey

File name: PembertonRecSite_2019.01.02.vwx

Print Date: 2019 Jan 8



NOTES:

1. ALL DIMENSIONS ARE IN METRES. PILE DIMENSIONS APPROXIMATE IRREGULAR PILE SHAPES
2. ELEVATIONS ARE REFERENCED TO THE CGVD28 DATUM USING DUAL FREQUENCY GNSS OBSERVATIONS CONVERTED USING THE HTv2 GEOID MODEL.
3. VOLUMES ARE BASED ON TOE OF SLOPES AND DO NOT ACCOUNT FOR SETTLEMENT.
4. PARKING LOT GEOGRID SITS AT APPROX 205m IN ELEVATION – 1m BELOW RAFT HEIGHT

LEGEND:

- PARKING LOT GEOGRID
- BALL DIAMOND PLAY SURFACE
- 15 METRE APRON
- EDGE OF ROAD STRUCTURE
- ROAD RIGHT OF WAY
- GEO–GRID EXTENTS
- TOP OF PRELOAD #2
- TOE OF PRELOAD #2

SCALE 1 : 500

10 0 10 20 40

HIGHMARK LAND SURVEYING AND ENGINEERING LTD.
Phone:604–966–3733
Email:info@hmse.ca Web:www.hmse.ca

REV	DESCRIPTION	DATE	DRAWN
–			MV

SKETCH PLAN
SHOWING FIELD AREAS OF RECREATION SITE ON LOT B, DL 211, LILLOOET DISTRICT, PLAN EPP40824

SCALE	SIZE	JOB	SHEET	FILE
1: 500	ANSI B	J17044	1 OF 1	J17044_REC